

Part II: Measuring What Matters: Crafting effective healthcare metrics

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Abstract

In the Healthcare Analytics landscape, designing a good metric is a challenging task. Regardless of how strongly you feel, the benefit of identifying the right metric and tracking it is worth investing some time to think about how to design a good metric. Well-designed metrics make it clear what actions are needed for a successful plan. Crafting a metric correctly will drive the business to excellence fulfilling the dream of the metric designers. It helps to achieve healthcare operational excellence and to meet healthcare quality and process improvement goals.

In Part I of this paper, we saw how introducing good healthcare metrics can improve the quality of care, patient experience, efficiency of the operations, healthcare effectiveness along with the patient safety.

Defining the right metrics is crucial for the leaders to steer the organization effectively. Setting the strategy, defining the metrics, and taking actionable steps are the key factors to the organization's success. Introducing good metrics can ease and improve the engagement of the physicians if we can assist them in terms of reimbursement, staffing, etc. This will, in turn, improve the quality of care and measuring the quality of care provided to the patients.

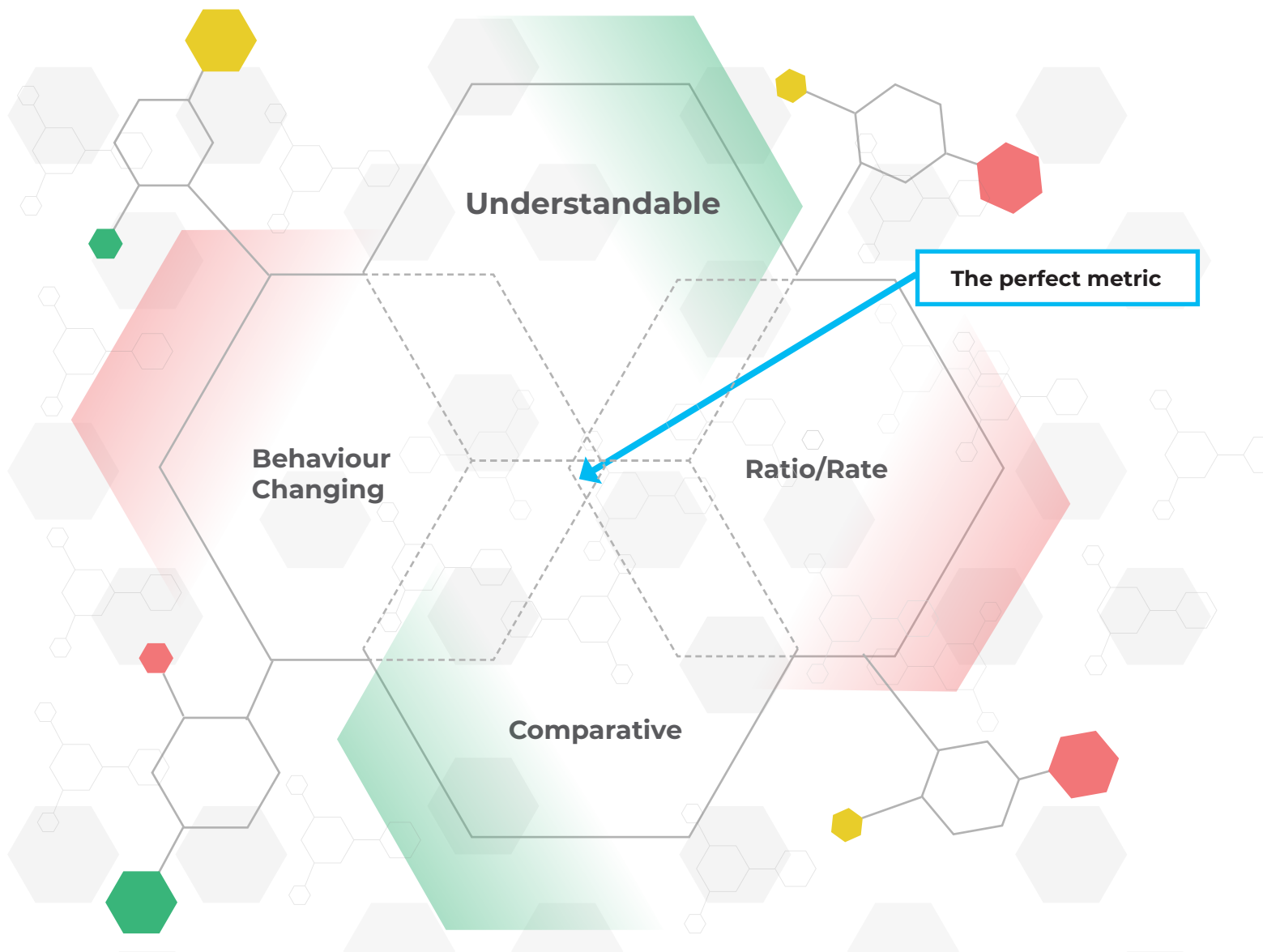
Identifying the right metrics and designing them effectively goes hand in hand. It reveals the truth of your performance and guides to provide an actionable way to achieve the overall business strategies and goals.

Characteristics of a Good Metric

*'Metrics vary from business to business and from field to field, but there are rules of thumb, as described by **Alistair Croll** and **Benjamin Yoskovitz**.*

A good metric is **understandable**

- ▶ It should be straight forward.
- ▶ It should be self-explanatory to know what is being measured, how it is calculated, what the targets are and, more importantly, what they can do to affect the outcome in a positive direction.



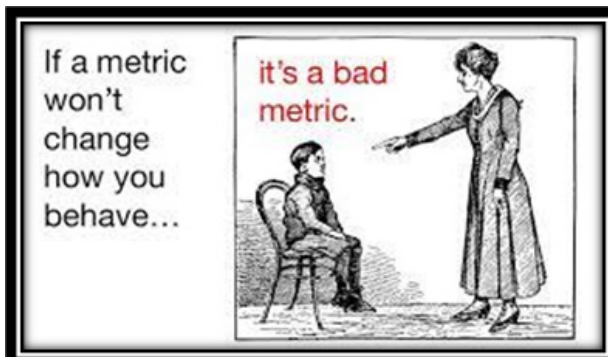
A good metric is a **ratio or rate**

- ▶ It provides you with a brief logical view about the fundamental health of a company.
- ▶ In addition, they are also easy to act upon.

A good metric changes **the way you behave**

- ▶ If it does not change the way you behave — well, then why measure it?
- ▶ When our actions improve the metrics that we are concerned about, then we start doing more of these actions as we notice their value or their significance.

It is rightly said: Good Metrics Drive Actions and Behavior.



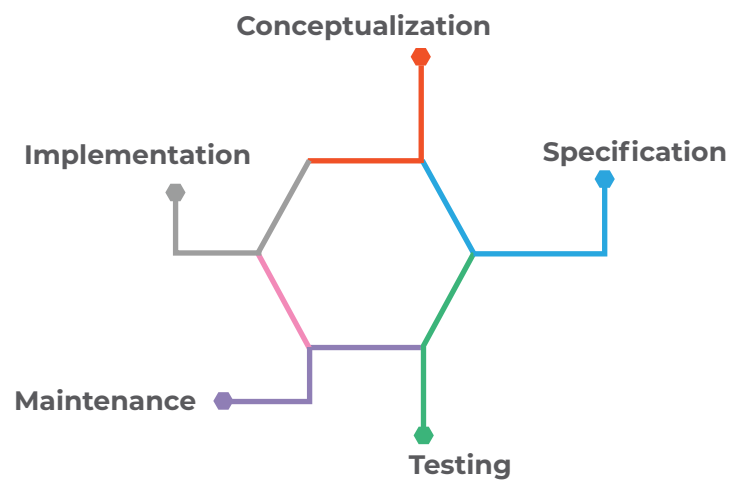
A good metric is **comparative**

- ▶ Being able to compare the metrics across different dimensions.
- ▶ Being able to compare numbers to other time periods, group of users, or competitors helps you understand which way things are moving.

Lifecycle of a Healthcare Metric

The metric lifecycle is a 5-step dynamic process. The stages are not necessarily sequential but are iterative and can occur concurrently.

This involves a multidisciplinary approach as it requires contribution from multiple stakeholders through a long march. Metrics, just like codes, are evolving artifacts that need to be tested, re-evaluated, tweaked, and eventually replaced when they no longer satisfy the criteria of users [1]



The following points brief the key activities in the quality metric development. Prior to the Conceptualization phase, it is important to define the goals of the metric. The intended audience too needs to be clearly identified.

1. Conceptualization

Based on the defined goal and the area of measure, the tasks listed below are covered in the Conceptualization phase.

- To define measurement topic(s) within areas of interest
- Create use cases to describe how and why new measures need to be created or why the existing ones need modification
- During measure conceptualization, the work group needs to consider:
 - i) What important processes or outcomes need to be improved?
 - ii) Do the processes relate to improved outcomes?
 - iii) Can the outcomes be influenced?
 - iv) Can the processes or outcomes be measured?
 - v) What will the measures be used for?
- Perform a gap analysis to identify whether any of the potential measures could support the selected measurement topic

2. Specification

Healthcare performance measures need to be formatted in a manner that enable widespread, seamless implementation and use. This formatting is called specification. Performance measure specification is the process of defining healthcare clinical concepts using standardized terminologies and formats that are recognized by

common healthcare technologies. These standardized formats also enable easier technological implementation, measure concept harmonization, interoperability, and information sharing [2]. In the specification phase, you draft the technical specifics and conduct a feasibility evaluation. You also define the data source, specify code systems, and construct data protocols. The goal of this phase is to have complete, detailed, clear, rigorous, and precise technical specifications, i.e., harmonize the measure specifications.

3. Testing

Testing can be initiated on completion of the specification step. Measure testing ensures the measure is feasible and scientifically acceptable (reliable and valid) [2]. The testing tasks include:

- Create a testing plan including alpha and beta testing
- Document and publish the test results for review
- Assess the intended use and unintended consequences
- Work on the refinement of the metric

The measure testing summary should reflect expert findings/consensus with respect to the measure including importance, scientific acceptability, feasibility, and usability and use.

4. Implementation

Rolling out the developed measures to assess its intended use.

Implementation phase covers the following activities:

- Creating the implementation plan including the initial roll out, data management, review, and validation
- Identifying the key users and training them with the help of cheat sheets and training manuals
- Conducting the dry runs

5. Maintenance

Once the measure is developed, tested, and implemented, the Metric maintenance steps in. The following activities are managed in this step:

- Update the codes—add, edit, delete
- Collect, aggregate, and create reports and evaluate the data
- Assess the impact, efficiency, and effectiveness
- Publish the reports for the stakeholders to give their reviews
- Perform gap analysis in the performance
- Ensure the metric still holds true with the clinical evidence and is relevant and up to date.
- Gather feedback or review comments from the user groups.

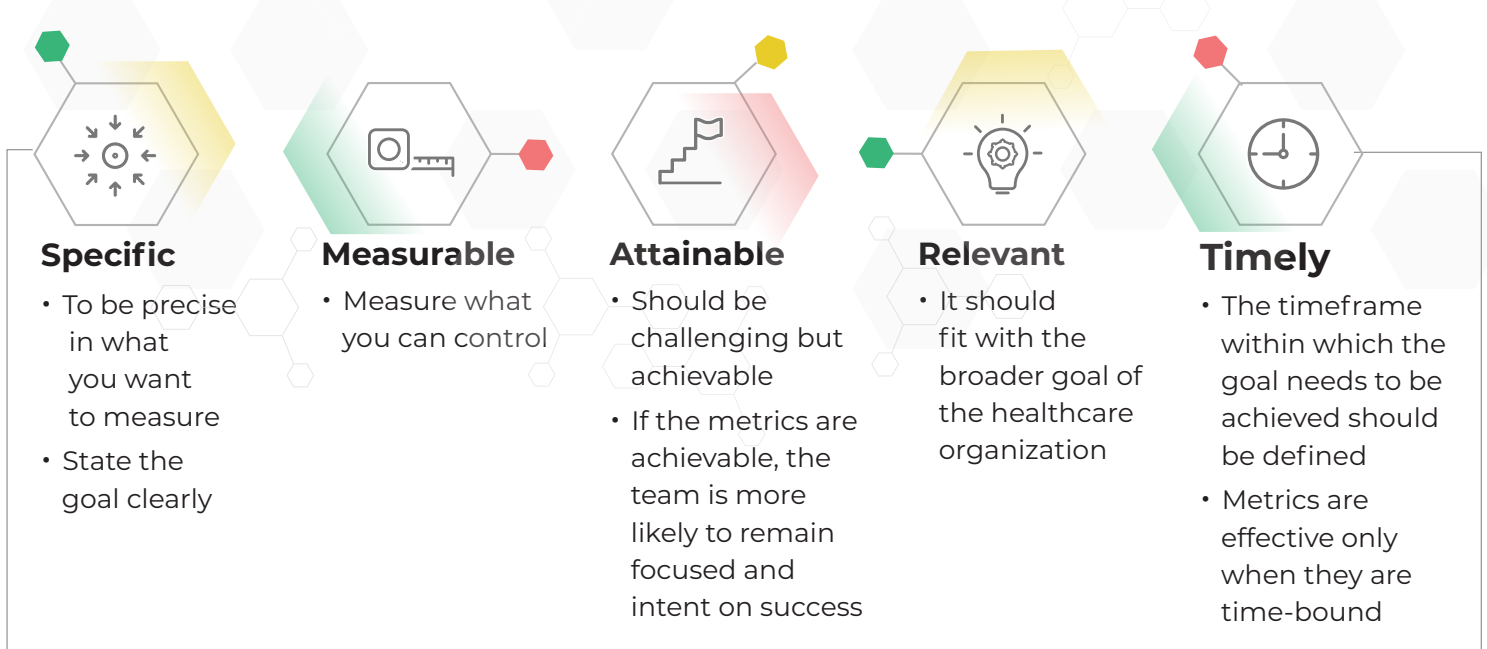
Principles for the design of a good metric

Good metrics are always trackable, important, and explainable. This simple framework makes the complicated task of choosing metrics straightforward and easy to understand.

a) Setting Goals through SMART system

- Metrics should pass the “SMART” test; they should be Specific, Measurable, Attainable, Relevant and Timely.
- Metrics are tools for supporting actions that allow programs to evolve into successful outcomes, promote continuous improvement, and enable strategic decision making.





There are a few other considerations to be made before designing the metrics:

- Make sure you have considered the best industry standards.
- Clearly state the specific definitions of the metrics and identification of the target population and data sources.
- Standardize data collection using case-mix adjustment system.
- Make the metric measurement more efficient by incorporating it in the routine patient care.

This will ensure that your goals are meaningful.

b) Metrics driven by National Standards

- Measures are primarily defined and prioritized by national organizations, including Centers for Medicare & Medicaid Services (CMS), The Joint Commission, the National Association for Healthcare

Quality (NAHQ), Healthcare Effectiveness Data and Information Set (HEDIS), National Committee for Quality Assurance, and so on [3].

- The National Quality Forum (NQF), a CMS-funded measure endorsing organization, describes performance measures as a method for calculating whether and how often a healthcare entity does what it should.
- On similar lines, the National Commission on Correctional Health Care (NCCCHC), Jail Standards too defines the compliance standards to be met by the correctional facilities.
- Measures are regularly reported to the government, commercial payers, and organizations. The accreditation enables the organization in demonstrating commitment to quality care and patient safety thereby ensuring best clinical outcomes.

- Although healthcare outcomes and targets are defined at the national level, health systems need to set more aggressive targets to improve the quality of care.
- Regulatory and reporting requirements influence the improvement initiative the organization launches.
- E.g., HbA1c screening compliance: HbA1c screening should be done every 90 days for patients diagnosed with diabetes.

Thinking from a different angle

Standard organizations are focused on achieving the goal of quality care along with patient safety. Supporting the healthcare priorities by developing quality measures that address these priorities and goals, and implements them through provider feedback, public reporting, and links to payment incentives is crucial. The emphasis now should be on the electronically specified measures for implementation in the quality initiatives.

With technological advancements, digital transformation has brought massive changes in the overall health ecosystem. Telehealth has significantly improved the accessibility of care. It has also benefited

in chronic care management with timely consultation visits. It's time to now rethink on the existing metrics or identify new ones that record the improvement in the key areas due to digitalization.

Steve Betts, Chief of Operations and Products at Gray Matter Analytics comments as Analytics Divide Intensifies: Just like the digital divide is widening in society, the analytics divide will continue to intensify in healthcare. The role of data in healthcare has shifted rapidly, as the industry has wrestled with an unsustainable rate of increasing healthcare costs. The transition to value-based care means that it is now table stakes to effectively manage clinical quality measures, patient/member experience measures, provider performance measures, and much more. In 2021, as the volume of data increases and the intelligence of the models improves, the gap between the haves and have nots will significantly widen at an ever-increasing rate.

*“Get your transformation metrics right and you’ll improve your ability to succeed and describe that success to your key stakeholders,” says **Proctor**.*

The choice of metric invariably depends on the type of the healthcare setting.

- ▶ National Accreditation Board for Hospitals & Healthcare Providers (NABH) defines the standards that small healthcare organizations and large tertiary hospitals need to comply to pursue continual excellence. The accreditation stimulates continuous improvement.
- ▶ Correctional facilities target improving the quality of correctional health services and helping jails to provide effective and efficient care. Failure in meeting the compliance imposes heavy penalties for lack of quality care.
- ▶ Government regulations impose heavy penalties for poor outcomes and provide incentives for improving the population health. which leads to the evaluation or monitoring of the care that hospitals deliver. They need to meet the compliance in accordance with the defined national standards.
- ▶ Reviewing clinical evidence-based literature to see what the best practices are and whether you are following them.

Key Concepts to understand

Risk Adjustment

Risk adjustment (also known as severity adjustment) is the process of statistically

accounting for differences in patient case mix that influence healthcare outcomes. When considering outcome measurement, it is vital to have the involvement of the risk adjustment technique. A risk adjustment strategy reduces the possibility of external factors influencing the measure and ensures that the measure is a true reflection of the process being measured. It enables the comparative analysis of the care providers or facility's performance. Risk adjustment is not applied to the process measures.

According to CMS, use of high-quality data meaning the data is valid, relevant, up to date, reliable and comprehensive is extensively required. The variables should be clinically meaningful or related to variables that are clinically meaningful. Selecting the correct statistical model is imperative.

Logistic regression or hierarchical logistic regression is often used when the outcome is dichotomous; but, in certain instances, the same data may be used to develop a linear regression model when key statistical assumptions are not violated.

Is 90 a perfect number?

Ninety days window period is the most common standard measurement period for the metrics calculation.

The time intervals should be clearly defined in the measure specification to bring stability and standardization in the measurement process.

We want a time window where the metric is stable, and the 90 days period is a stable frequency for any diagnostic testing, consultation visit, follow-up for medical evaluation, treatment plan review, etc. The 15- 30-day duration may underestimate the outcomes, but 90 days metric duration provides more reliable, and accurate outcomes. Hence, it is a preferred time interval for assessing the metrics performance.

E.g., 90-day mortality, chronic care patients should undergo chronic care visits every 90 days.

Be sure to choose your time window appropriately for your scale.

Effective visualisation for healthcare metrics

Data visualization is a crucial component in the data analytics process. Only identifying the right metric and collecting the data is not sufficient. Metrics succeed only if they are well-represented, helping decision makers to get valuable insights and achieve the objectives. It gives a clear idea of what the data wants to convey to us. Using various visualization types such as graphs, charts, maps, and cards, it becomes easier to interpret the underlying trends, correlations, and patterns among the variables in the dataset along with storytelling. Allowing better analysis, it improves decision making for the stakeholders and the executives. Reporting the data to the stakeholders needs to be outlined aptly.

Dashboards can sometimes be colour-coded to indicate performance against a goal or target. Colours can be used to represent performance. Could be something like:

- Green, to indicate good performance
- Amber, to indicate average performance with scope for improvement
- Red, to indicate unsatisfactory or alarming performance requiring due attention

Data-driven storytelling is a powerful force as it collects the data, analyzes (stats and metrics) and presents in form of engaging stories through narratives that everyone within and outside of an organization can comprehend. By asking what story you want to showcase with the data, you will be able to choose the right visualization type.

Creating striking, engaging, and meaningful data visualizations can help break down even the most complex and convoluted healthcare problems into manageable component parts, giving providers a new level of insight into how to deliver the highest quality care to patients while succeeding with their strategic goals [5]. For example, a gauge chart can be chosen to showcase the readmission rate; a pie chart to show the distribution of diabetic patients by ethnicity/race; a bar chart for patient satisfaction ratings.

Conclusion

The right metrics will give you valuable insights on health, its strength and weaknesses, potential threats, and let you improve it greatly.

Choose only a handful of metrics that will provide you with the most strategic insights.

Spend your resources to collect and report a few metrics focusing on their proper utilization or tracking the return on investment in the effort.

As stated by **Ben Schneiderman**,
“Visualization gives you answers to questions you didn’t know you had.”

Visualization gets us to the truth and drives people to change their minds and get into action. To derive the maximum benefits, follow the principle of KEEP IT SIMPLE, STUPID.

Choose a few effective metrics and make them drive the action. The metrics that have been identified and developed based on the factors identified in this document are more likely to lead to measurements that can be confidently relied upon by the decision makers.

Leverage the data visualization methods as successful data-driven analytics strategy and improve the performance and outcomes of the healthcare setting.

Knowing what it takes to choose an effective metric is like winning half the battle. The rest lies with how you build and showcase it.

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