CIO

By Damian Mingle
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Healthcare - moving beyond average

Can healthcare providers break informational influence enough to tell a more comprehensive narrative for patients as opposed to simply providing a meaningless statistic?

There is an obvious incentive for healthcare providers to realize the full potential of value-based care; however, for that to happen, the industry needs to recognize how widespread conformity is in the profession, and how many individuals change attitudes and behaviors to match the norms. Many of the best and brightest mimic the healthcare organizations they believe should be followed.

The question becomes, "Can healthcare providers break informational influence enough to tell a more comprehensive narrative for patients as opposed to simply providing a meaningless statistic?"

What's in an average?

A few healthcare areas discussed using the term average:

- The average length of stay for any given patient condition.
- The average wait time in an emergency department.
- Increasing health plan premiums by an average of 11 percent.

Averages are everywhere in healthcare. The reality is if you cannot make clinical, financial, and operational decisions using the "average" concept, you simply cannot get very far professionally. "Averages" as a form of communication, both internally and to patients, seem to be incredibly important.

So what's the problem?

In truth, averages simply mask more helpful information. This is the case whether you aim to improve your organization operationally or you are communicating clinical outcomes to a patient. Averages have a very real risk of distorting the big picture.

Let's consider a scenario where a business analyst is analyzing patient data in which pneumonia is present at four different hospitals. It's important to note that hospitals generally are reimbursed by diagnosis and by the length of stay a patient has at their hospital. Being able to best the average means proper reimbursement for the hospital. However, only targeting this average could invite inadequate care for a patient resulting in a future readmission.

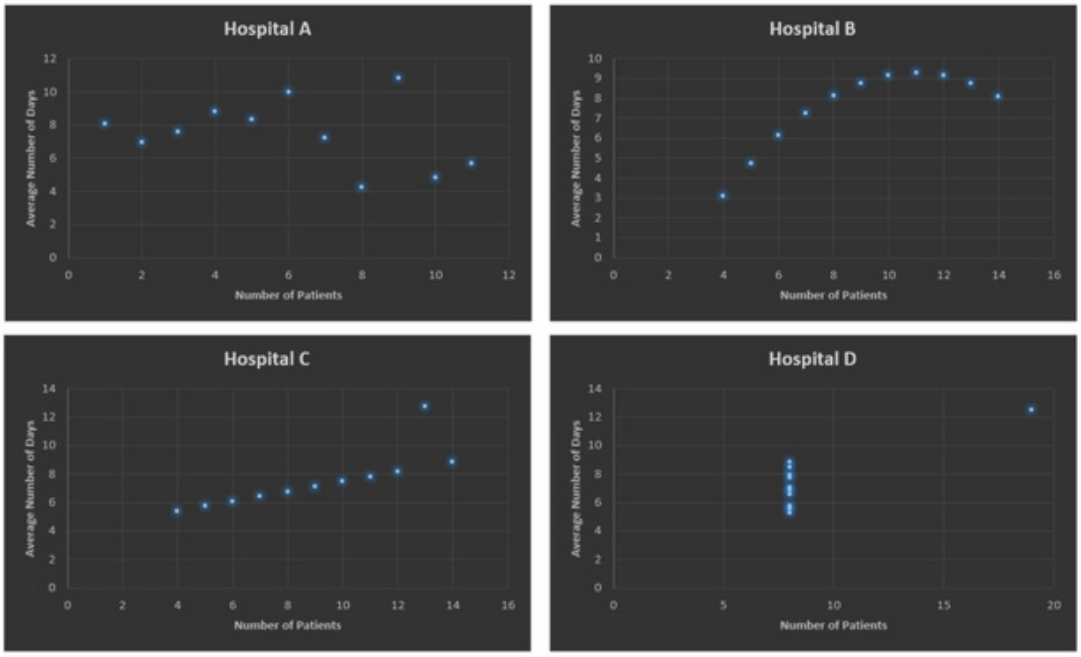
Here are the results of pneumonia patients from a sample of four hospitals over 11 days:

Hospital A	Avgerage Number of Days	8.04	6.95	7.58	8.81	8.33	9.96	7.24	4.26	10.84	4.82	5.68
	Number of Patients	10	8	13	9	11	14	6	4	12	7	5
Hospital B	Avgerage Number of Days	9.14	8.14	8.74	8.77	9.263	8.1	6.13	3.1	9.13	7.26	4.74
	Number of Patients	10	8	13	9	11	14	6	4	12	7	5
Hospital C	Avgerage Number of Days	7.46	6.77	12.74	7.11	7.81	8.84	6.08	5.39	8.15	6.42	5.73
	Number of Patients	10	8	13	9	11	14	6	4	12	7	5
Hospital D	Avgerage Number of Days	6.58	5.76	7.71	8.84	8.47	7.04	5.25	12.5	5.56	7.91	6.89
	Number of Patients	8	8	8	8	8	8	8	19	8	8	8

The truth under the hood

Most of us believe the average to represent a middle value or something balanced. Let us not forget it is a simple calculation: just add and divide. Yet, there is a not-so-pleasant reality when dealing with averages – it can be skewed by outliers. The truth is that averages do not deal well with wildly varying samples.

A data-driven approach to averages and their sensitivities to outliers is to graphically represent the data points that represent the pneumonia patients and their length of stay in order to provide context for the average generated. In doing this we discover something unsettling: all hospitals have the same average number of days for pneumonia patients in the hospital, but the real behavior of the data is something significantly different.



This visualization makes the case that a single measure like “average” should not be devoid of further analysis. Even simple analysis like representing the data visually to determine if the average statistic calculated makes sense with the true behavior of the data can be helpful in moving healthcare towards value-based care with increased visibility. Although all the hospitals in our example present the same average statistic, they are utterly different in their truest representation.

Healthcare organizations both big and small often overlook the value of digging into their data, and instead continue to make important decisions on partial information. As the healthcare landscape changes from fee-for-service to a value-based model, it will become even more important to ask new questions of the data. The future belongs to those healthcare providers who decide to cultivate their understanding of patient data, being data-driven for their organizations and their patients in the face of an industry that historically has marginalized the impact of data. This is just the sort of bravery required for moving healthcare beyond the average.