IHI Conference White Paper

4 steps to reducing variation in healthcare and improving patient outcomes

Variation is a fact of life. In healthcare, we face an endless list of areas that can bring variation in to play; patients may not always arrive on time or treatment times differ. This makes healthcare processes harder to manage and raises questions like, how can I allocate resource effectively, how can I manage costs efficiently, or how do I plan for increased demand?

A key point from Maureen Bisognano’s keynote speech at the IHI conference this year was about taking steps to reduce that variation to improve performance and overall patient outcomes. Easier said than done, we know. So here we explain our four steps to reducing variation and how simulation can help.

Step 1 - Variation exists, understand the impact
Step 2 - Identify where variation impacts your process
Step 3 - Manage and Improve your processes
Step 4 - Standardize and implement best practice

**Step 1 - Variation exists, understand the impact**

Variation is everywhere in healthcare and we need to understand the impact it has on performance and patient outcomes.

It’s simply not enough to say that; a patient will arrive into my clinic on average every 5 minutes, they will be treated for an average of 10 minutes, and then discharged at an average of 10 minutes.

Planning healthcare delivery on the basis of averages is risky. Let’s show you why.
We’ve created a pretty basic example simulation of a typical healthcare scenario. Patients arrive at a clinic, enter a waiting room, are treated, and then discharged. (You can view and interact with these simulations at www.SIMUL8.com/IHI)

Clinic 1 is run on the basis of average treatment times. Clinic 2 assumes that, as in real life, the time taken to complete steps within the process will vary.

You can see from the simulations that the waiting time in Clinic 2, where variation is accounted for as in real life, increase over time and patients take longer to get through the system resulting in a poorer patient experience overall.

Now we know variation exists, we still need to answer those same questions; how can I allocate resource effectively, how can I manage costs efficiently, or how do I plan for increased capacity? This is where simulation can help. Other, static tools like a spread sheets, are outdated and simply can’t give you the accuracy you need to plan healthcare services effectively.

**Step 2 - Identify where variation impacts your process**

In any healthcare process there are a number of different steps that will impact the overall outcome. So, we know we have a queue building up in the waiting room, but how do we know what part of the process is causing the backlog?

Simulation gives you a birds-eye view of your clinic, department, hospital, or health system. It lets you look at your process as a whole and gives a visual indication of where a problem exists. From the example, we can clearly see there is a large queue at the waiting room, so what’s the cause?
The dynamic nature of simulation allows you to see results across the whole clinic and across time. It’s not just a snapshot of a single period, you can project over an hour, a week, whenever. Whether it’s a high waiting time or low revenue, you can accurately identify the area to improve.

**Step 3 - Manage and improve your processes**

We’ve identified where variation exists and how it impacts our process. Now we need to manage that impact and take steps to improve the outcomes. In healthcare, our focus is the patients, and we need to be sure any change we make to a process doesn’t have a negative effect on patient outcomes.

In a busy Emergency Department we don’t have time to experiment with a new unit layout, or new shift patterns and wait 2 or 3 months to get the results. It’s too risky. Simulation gives you a quick and risk free way to test out new ‘what-if’ ideas for improvement. The ability to test out different scenarios means that any risks can be identified and resolved before implementation meaning you can be sure you make the right decision, first time.

**Step 4 - Standardize your processes**

Maureen’s point about reducing variation was about variation in quality. Simulation can help by replicating best practice models and allowing others to understand the impact that implementing a new model of care would have in their own healthcare environment.

Healthcare improvement practitioners want to make a change for the better, and need to demonstrate the impact that a new model of care would have and persuade stakeholders it is a good idea to adopt it. Simulation helps to show the impact of change in terms of patient outcomes but also the impact on staffing, beds, costs and patient waits. It provides a robust evidence base for decision-making and can support spread.

**Variation is normal, but predictable**

No-one would say that managing healthcare is an easy job. In the real world, patients have a range of different needs and requirements and effective healthcare delivery needs to take these into account. In this sense, variation is normal, but it is also predictable and simulation can help to plan effectively for the optimum capacity to meet patient needs efficiently.