The Economist INTELLIGENCE UNIT | HEALTHCARE

Reducing unwarranted variation in healthcare

Does identifying and putting in place processes to reduce variation lead to better quality of care?

A summary of recent literature

A report by The Economist Intelligence Unit

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Introduction

Unwarranted variation in healthcare has been on the radar of providers, payers and policymakers for over 40 years. The term refers to variation in medical practices that cannot be explained by illness, medical need, patient preferences or the recommendations of evidence-based medicine. There is an overwhelming amount of evidence about the existence of unwarranted variation within and across countries in the form of national atlases, such as the Dartmouth Atlas of Healthcare and the NHS Atlas of Variation, and publications such as the OECD's project report, which covers 13 countries.[1] Numerous studies have been published exploring the scope and scale of variation in care provision.[2]

However, research is less clear on how successful the next step—the attempted reduction of variation—has been, and whether reduction in variation has been seen to improve patient outcomes. We set out to review the recent evidence regarding the effectiveness of attempts to reduce unwarranted variation in healthcare settings, with a particular focus on interventions at the hospital level.

Our rapid review focused on the most reliable, high-quality literature from the past five years, focusing on controlled studies where they existed.[a] We reviewed evidence on the approaches taken to reduce variation and how successful they have been. Importantly, do they benefit the patient? We describe below the key findings and provide some recommendations on how organisations can move beyond merely identifying variation and take action to reduce inappropriate care.

1. What approaches have been tried to reduce variation?

It has been suggested that one of the key drivers for variation in healthcare is uncertainty stemming from the paucity of evidence about the effectiveness of particular diagnostic and treatment interventions. Consequently, when there is strong evidence, it would be expected that there is little to no variation in care. However, research has shown that despite clear evidence from randomised controlled trials (RCTs) and meta-analyses significant knowledge gaps remain.[3,4] For example, a recent UK study found persistent variation in diabetes care, despite the existence of a disease-specific atlas, national diabetes audits and other quality-improvement initiatives.[5]

Our evidence review revealed a range of approaches that have been used to try and reduce unwarranted variation. More than half of the included studies used a combination of approaches or multifaceted interventions—for example, combining evidence-based tools (such as guidelines or pathways) with an IT approach (such as computerised order sets or decision support systems). The goal of reducing variation requires both technical and non-technical approaches, such as education and training, because successful implementation requires behaviour change in healthcare providers.

Based on the main component, the interventions can be grouped into three broad categories: evidence-based approaches, medical technologies, and care-delivery system interventions. (Table 1)

[a] This is an executive summary of a longer EIU evidence review for Siemens Healthineers

Table 1. Types of interventions for reducing variation in healthcare

Evidence-based approaches	Medical technologies	Care-delivery system interventions
• Appropriateness criteria	• Diagnostic technologies	• Caseload care model
• Care bundles	• IT tools	• Enhanced recovery programme
• Care pathways	- Computerised order sets	• Focused factory model of care
• Checklists	- Decision support systems	• National Awareness and Early Diagnosis Initiative
• Clinical practice guidelines	- Electronic health records (EHRs)	• Regional trauma networks
• Clinical protocols	- Electronic process-of-care checklists	• Sepsis response team
• Standardised clinical assessment and management plans (SCAMPs)	- Laboratory forced-function systems	
• Stewardship programmes		

2. Which interventions have been successful?

We identified two high-quality reviews and 34 primary studies published since 2012. The majority of the primary studies were observational in nature comparing pre- and post-intervention cohorts, which are less powerful than gold-standard, randomised controlled trials. Most of the studies focused on describing a particular approach or intervention in a specific setting, so it is difficult to extrapolate results to other settings. The most striking finding of this review is that, even though these were studies of interventions designed to reduce variation in healthcare, none of the studies reported change in variation as a quantitative outcome. Where reduction in variation was mentioned, it was just as a narrative statement.

Therefore we looked at "health services utilisation" as a surrogate outcome for reduction in variation. Health services utilisation is an umbrella term we use to cover more specific outcomes measuring the use of any diagnostic or therapeutic services. In the context of this review, an improvement in health services utilisation means that the use of ***appropriate*** services has increased and/or that the use of ***inappropriate*** services has decreased, or both. Looking at this outcome, 20 of the 34 studies reported a significant improvement. The following specific interventions were associated with an improvement in health services utilisation:

- **Evidence-based approaches:** Appropriateness criteria; clinical practice guidelines; care pathways; care delivery protocols; standardised clinical assessment and management plans (SCAMPs); and stewardship programmes
- **Medical technologies:** Diagnostic technologies; computerised order sets; decision support systems; and laboratory forced-function systems
- **Care delivery system interventions:** Caseload care model; National Awareness and Early Diagnosis Initiative; and regional trauma networks.

Only nine of the 34 studies measured the impact of the interventions for reduction of variation on direct medical costs, and all of these reported savings. Few studies reported patient outcomes, and those that did found that approaches which improved service utilisation did not cause significant harms to patients—most studies reported no change.

So while we cannot say with confidence whether interventions have reduced unwarranted variation, we can at least infer that a range of intervention types have been associated with either an increase in appropriate service utilisation or a decrease in inappropriate services use.

3. SCAMPs: an example of what success looks like?

The standardised clinical assessment and management plan (SCAMP) is an innovative tool that aims to reduce practice variation, optimise resource utilisation and improve patient care. SCAMPs were first implemented in 2009 at Boston Children's Hospital in the US to overcome the limitations of clinical practice guidelines and other more traditional research tools to address complicated questions related to defining effective care.[6] It is not surprising that SCAMPs were developed in paediatrics, considering the lack of high-quality evidence for many paediatric conditions.

SCAMPs are an example of a complex, multifaceted intervention that comprises an evidence-based pathway and an IT system for data collection. Physicians' adherence to the pathway recommendations is automatically monitored and the rationale for any deviations from the pathway is recorded, such as physician preference, parental concerns, medical condition or abnormal examination finding.[7,8] What distinguishes SCAMPs from static care pathways is that they are being continuously updated, based on the deviation rationale presented. The process of developing and using SCAMPs therefore relies on clinicians' engagement and autonomy in making decisions.

Clinician engagement is the single most important factor contributing to improving quality of patient care. A number of studies have evaluated the impact of SCAMPs and found that they reduced practice variability, resource utilisation and overall cost of care while maintaining clinical outcomes. However, as previously noted, they offer no quantitative evidence to support the finding about reducing variability.[7-9] While the annual SCAMP implementation cost of US$50,000 is not cheap, it compares favourably with the cost of conducting a clinical study or updating existing guidelines.[6]

Conclusions and recommendations

After more than 20 years of public reporting researchers continue to uncover persistent or "glaring" variations, as stated on the Dartmouth Atlas website.[10] We therefore have to consider whether we need to reframe the question how to tackle variation. When it comes to delivering value, healthcare providers, payers and policymakers need to focus their efforts to reduce unwarranted variation in clinical practice. Furthermore, they should escalate their efforts to redesign health systems in alignment with the principles of value-based healthcare, or to quote Porter and Lee, "it's time for a fundamentally new strategy".[11]

To achieve this strategy, we suggest the following recommendations for provider organisations and other stakeholders:

- Move to bundled payments for care cycles to address supply-driven variation in care provision.
- Introduce integrated care delivery systems with multidisciplinary teams to ensure the provision of effective and appropriate care.
- Measure costs and outcomes for individual patients to ensure that only high-value services are provided to achieve the outcomes that matter to patients.

- Use IT tools such as decision-making systems or learning systems that capture clinical knowledge to provide an environment for continuous care quality improvement.

If healthcare organisations focus on these principles of value-based healthcare, their implementation will inevitably reduce unwarranted variation in medical practice.

References

1. OECD. Geographic Variations in Health Care: What do we know and what can be done to improve health system performance? [Internet]. Paris: OECD Publishing. Available from: http://www.oecd.org/health/geographic-variations-in-health-care-9789264216594-en.htm
2. Corallo AN, Croxford R, Goodman DC, et al. A systematic review of medical practice variation in OECD countries. Health Policy. 2014;114(1):5-14.
3. Loberiza FR, Cannon AC, Cannon AJ, et al. Insights on practice variations in the management of lymphoma and leukemia. Leukemia and Lymphoma. 2014;55(11):2449-56.
4. Sunol R, Wagner C, Arah OA, et al. Implementation of departmental quality strategies is positively associated with clinical practice: Results of a multicenter study in 73 hospitals in 7 European countries. PLoS ONE. 2015;10(11).
5. Grant PS. Variation in practice: Should we be standardising diabetes care to improve quality? British Journal of Diabetes and Vascular Disease. 2014;14(1):30-4.
6. Farias M, Friedman KG, Lock JE, et al. Gathering and learning from relevant clinical data: a new framework. Academic medicine : journal of the Association of American Medical Colleges. 2015;90(2):143-8.
7. Luther G, Miller PE, Mahan ST, et al. Decreasing Resource Utilization Using Standardized Clinical Assessment and Management Plans (SCAMPs). Journal of Pediatric Orthopaedics. 2016.
8. Verghese GR, Friedman KG, Rathod RH, et al. Resource utilization reduction for evaluation of chest pain in pediatrics using a novel standardized clinical assessment and management plan (SCAMP). Journal of the American Heart Association. 2012;1(2).
9. Farias M, Jenkins K, Lock J, et al. Standardized Clinical Assessment And Management Plans (SCAMPs) provide a better alternative to clinical practice guidelines. Health Aff (Millwood). 2013;32(5):911-20.
10. The Dartmouth Atlas of Healthcare: Understanding of the Efficiency and Effectiveness of the Health Care System [Internet]. Dartmouth, NH: The Dartmouth Institute for Health Policy and Clinical Practice. Available from: http://www.dartmouthatlas.org/.
11. Porter M, Lee T. The Strategy That Will Fix Health Care. Harvard Business Review. 2013;October.

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