A nudge towards increased experimentation to more rapidly improve healthcare

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In any healthcare setting, the quality of care depends on the effectiveness of a given treatment, and on the way that the treatment is delivered. The complexities of modern healthcare have created gaps in our ability to consistently deliver the most effective and efficient care. As a result, significant undertreatment and overtreatment co-occur.1–3 This reality has led diverse stakeholders to overhaul the environment, context and systems in which healthcare professionals practice. However, while well intentioned, most ‘advances’ in healthcare delivery rely on untested or poorly tested interventions.4 5 This means that effective interventions don’t scale as fast as they should and that ineffective interventions persist despite providing no benefit. The current status quo presents an opportunity improve the delivery of care through a more systematic approach.

Successful innovation requires experimentation. Embedded research teams around the world have started to systematically test the impact of using subtle changes to the way information is framed or choices are offered to nudge medical decision making.6 7 The trial by Schmidtke demonstrates the feasibility and necessity of rapid-cycle, randomised testing within a healthcare system.8 The authors randomly assigned 7540 frontline staff to either receive a standard letter reminding them of influenza vaccination or one of three letters that used insights from behavioural economics to try and better nudge healthcare workers through different ways of framing social norms. Despite this effort, they found that all four arms had the same vaccination rate of 43%, meaning none of the social norm interventions led to meaningful changes in behaviour. All too often, policies and programmes that ‘make sense’ have been implemented without any kind of formal evaluation. In the Schmidtke trial, however, the rigorous study design allowed researchers to quickly and decisively conclude that the social norms letters were no better than a simple reminder letter. In turn, system leaders were able make an informed choice about whether to iterate until the intervention proved successful, or to abandon the intervention in favour of other competing quality improvement initiatives. Innovation is non-linear but experimentation is efficient. Through other trials, we have learnt that nudge interventions can improve medical decision making in a wide range of behaviours such as generic prescribing, cancer screening and imaging tests at the end of life.9–12 This growing area of research provides a road map for change.

Randomised experiments that occur within a healthcare system are often perceived as falling into a grey area between quality improvement and research.5 13 14 This creates scientific, political, logistical and ethical challenges. Humans are inherently uncomfortable with randomisation—people frequently rate A/B tests designed to establish the comparative effectiveness of two policies or treatments as inappropriate even when universally implementing either A or B, untested, is seen as acceptable.15 Rigorous embedded research is only possible to the extent that it reconciles the sometimes competing needs of the research team, service managers and system leaders. Different levels and types of randomisation have trade-offs. Do you randomise a lab test, the patient, the physician, a provider organisation or an entire hospital? Is the control group the standard of care or something else? Pragmatic study designs can be used to ‘naturally’
randomise people or groups. For example, a stepped-wedge cluster randomised clinical trial within a network of 5 radiation oncology practices was used to test the effectiveness of introducing a default imaging order in the electronic health record (EHR) to reduce unnecessary daily imaging during palliative radiotherapy.\textsuperscript{12} Even in the absence of a formal evaluation, this policy likely would have been scaled in a similar way.

Randomised experiments have an uncanny ability to produce surprising, but credible, results. Just as in clinical care, ‘health policy reversals’ occur when a new, more rigorous evaluation, contradicts current practice.\textsuperscript{16} Without a rigorous study design, findings that conflict with our a priori hypotheses are selectively discounted and discarded in favour of dogma. No matter the result, randomised trials advance our understanding about how best to improve our healthcare system. The movement around price transparency illustrates this tension. Despite inconsistent evidence about its effectiveness, price transparency has gained significant legislative traction in USA. While ‘shopping about’ its effectiveness, price transparency has gained illustrious this tension. Despite inconsistent evidence about its effectiveness, price transparency has gained significant legislative traction in USA. While ‘shopping about’ its effectiveness, price transparency has gained.

There are a number of design choices that can improve the feasibility and impact of rapid-cycle, randomised trials on healthcare delivery.\textsuperscript{4 14} First, we must embed research teams within health systems in order to create the capacity for this kind of work. Expertise is required to identify a promising intervention, design the conceptual approach, conduct the technical implementation and rigorously evaluate the trial. These teams are also able to design interventions within the context of existing workflows in order to ensure that successful projects can be quickly scaled and that ineffective initiatives can be seamlessly terminated. Second, we must take advantage of existing data systems. The field of healthcare is ripe with detailed and reliable administrative data and electronic medical record data. These data offer the potential to do high-quality, low-cost, rapid trials. Third, we must measure a wide range of meaningful outcomes. We should examine the effect of interventions on healthcare costs, healthcare utilisation and health outcomes. In addition, we need to carefully consider and test for potential spillover effects or unintended consequences. Fourth, we must design randomised studies that consider the mechanism of action—it is not enough to know that an intervention works. A mechanistic approach to system redesign will allow us to deploy efficient interventions that nudge enough, but not too much. Finally, we need to adopt the principles...
of registering, prespecifying and disclosing from the world of medicine. The sustained publication of rapid-cycle, randomised interventions, whether positive or null, is needed to create synergies and avoid duplication of efforts across different healthcare systems.

We owe it to our patients to deliver better, evidence-based care. Meaningful innovation will require a commitment to experimentation. Luckily, the complex world of healthcare provides endless opportunities for rapid-cycle, randomised trials that target healthcare costs and outcomes.

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**REFERENCES**


