Using realist reviews to understand how health IT works, for whom, and in what circumstances

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In a recent *JAMIA* article, Otte-Trojel *et al.*[1] present a realist review of patient portals. We commend the authors for using this approach to synthesizing evidence, which is a divergence from traditional systematic review methodology. We believe realist approaches have much to offer the medical informatics community, providing a means to not only determine if health IT interventions provide benefit in terms of outcomes, but to understand why and in what contexts such benefits may occur. However, we feel it is important to address some concerns we have regarding the way in which the authors used realist methods in their review. Our intention is to encourage the authors to expand on this work and to clarify for readers some of the key concepts of realist reviews and how they differ from traditional systematic reviews. In this, we respond to the call of realist evaluators for collective scrutiny of each other's work to drive the method forward.[2]

Realist reviews identify theories of how an intervention works, for whom, and in what circumstances, and then test and refine those theories through consideration of primary studies.[3] For realists, interventions themselves do not produce outcomes. Rather, interventions offer resources; outcomes depend on how recipients respond to those resources, which will vary according to the context. Realist theories, referred to as Context Mechanism Outcome configurations, explain how different contexts trigger particular mechanisms (the reasoning and responses of recipients) which, in turn, give rise to a particular pattern of outcomes.

An important initial stage in a realist review is "theory elicitation," where reviewers explore the literature with the explicit purpose of identifying theories.[4] Otte-Trojel *et al.*[1] undertook an exploratory review to "identify ways in which patient portals may contribute to health service delivery and patient outcomes." In reporting the results of this initial review, the authors describe what could be considered a mixture of resources that patient portals might offer (patient access to information and services, patient decision-support) and possible outcomes (coordination of care around the patient; interpersonal continuity of care; health services efficiency; and service convenience to patients and caregivers). However, nothing has been

reported about how patients might *respond* to those resources or how their responses might vary according to the context. Looking at the reference list, it seems the authors drew primarily on journal articles. We suggest that a broader search might have assisted in identifying theories; while journal articles can provide some insight, stakeholders' theories about how patient portals work are likely to be found in editorials, websites of healthcare providers and patient portal vendors, medical informatics mailing lists, and patient information websites.

In a realist review, it is only once the theories have been identified that identification of primary studies takes place. Searching should be purposive and iterative, driven not by the intervention but by the theories.[4] For example, if one of the theories suggests that giving patients access to their health record will increase their understanding of their condition and thereby enable them to take a more active role in their care, a relevant search would not only look for primary studies on patient portals but also other interventions that seek to engage patients in their care by increasing their knowledge of their condition. Rather than taking this approach, the search strategy employed by Otte-Trojel *et al.*[1] is closer to that of a traditional systematic review, with search terms that describe the intervention. Similarly, the choice of outcomes to focus on should be driven where possible by the theories, rather than being based on an existing review as Otte-Trojel *et al.*[1] have done.

In the results section of the paper, the authors describe four mechanisms. We would suggest that the authors' descriptions of mechanisms focus on resources that the intervention provides, rather than the response of recipients. For example, the mechanism "interpersonal continuity of care" describes how patient portals allow patients to communicate asynchronously with a preferred provider but does not explain what would motivate a patient to do so. In describing context, the authors refer only to organisational context, stating that context at the service unit level and patient-provider level was rarely described in detail. We appreciate that studies do vary in the extent to which context is described. However, an important aspect of context is at the individual level in terms of nature and severity of the patient's condition. While not identified as a context by

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the authors, they implicitly acknowledge this as a context when discussing outcomes, pointing to the emphasis in the studies on chronic disease patients and the modest outcomes for patients whose condition is already well controlled.

Finally, we feel it is important to acknowledge that different study designs make different contributions to theory testing. From our reading of the paper, Otte-Trojel et al.[1] appear to have treated all studies as potentially providing evidence on contexts, mechanisms, and outcomes. Randomized controlled trials (RCTs) provide information on outcome patterns and, by examining differences in, for example, intervention delivery or patient population, some pointers to likely contextual differences might also be identified. However, RCTs seldom provide information about mechanisms as RCTs are concerned with identifying regularity between a particular intervention and a particular outcome, not with understanding how the intervention changed the reasoning and behavior of recipients. To understand how recipients respond to an intervention, it is necessary to look at qualitative studies, which explore these responses in detail. Realist reviewers would not typically look to qualitative studies for evidence on outcome patterns because such studies rarely explore outcomes and, where they do, small numbers and lack of standardised measurement make it difficult to draw reliable conclusions. We feel Otte-Trojel et al's[1] findings would have produced more sharply defined Context Mechanism Outcome configurations if they had engaged in a process of knitting together different forms of evidence from different study types as we describe above. Contexts, mechanisms, and outcomes do not just fall out of the primary studies so the realist reviewer has to shuttle between theory and data, integrating the data in imaginative rather than mechanistic ways.[5]

COMPETING INTERESTS
None.

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