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Late adopters of the electronic health record should move now

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Internationally, the last decade has seen the rapid adoption of electronic health records (EHRs) in hospitals and ambulatory care; EHRs are now an accepted enabler of a high-performing health system.[1] However, the uptake and extent of use of this technology varies substantially. At the country level, Estonia and Sweden are among those nations with mature, interoperable EHRs with high patient access.[2 3] In contrast, Switzerland and the UK have only patchy adoption in secondary care,[4 5] and New Zealand, an early exemplar of primary care digitisation,[6] has not yet integrated this information nationally, nor that of hospitals, at scale. Within countries also, there is variation. Even in jurisdictions with high overall rates of adoption, some providers are sophisticated 'super-users' of EHRs, whereas others use only their rudimentary functionalities.[7–9]

The adoption and full employment of an EHR reflects multiple factors, not the least of which are the financial and nonfinancial costs of procuring and implementing these platforms.[10] Federal-level investment—including policy development, use of legislative levers, and support with resources or subsidies—undoubtedly affects the speed of adoption.[11] However, even within a maximally supportive environment, there are those who remain 'EHR-wary', citing both uncertain benefit and risk of harm (particularly to clinicians). In this viewpoint, we argue that these EHR concerns may be overstated, irrelevant and/or mitigable, and should neither be used to justify delays in adoption nor full use. We maintain that late adopters and 'under-users'—be they countries, hospitals or individual clinicians—should embrace this technology, and would benefit from prioritising its adoption and comprehensive use.

We acknowledge that the *digital patient record itself*—that is, the collation of health encounters with multiple providers across space and time for a given healthcare consumer—has not yet yielded the predicted benefits to healthcare quality or patient outcomes in many countries.[12] That said, in this case the marketing of the 'Electronic Health Record' may be more to blame than the technology itself, as the literal 'record' is potentially both the least beneficial and the most problematic aspect of the technology. If the EHR were a human: the record can be thought of as the 'spine', to which multiple health technology functionalities or 'limbs' attach, and the 'brain' is the data and knowledge obtained from the collation of records from multiple individuals and encounters. Late adopters and under-users should expect benefits to healthcare processes and patients, not principally from the spine, but from the use of the brain and limbs.

Many early EHRs evolved from databases designed for billing or scheduling, to which patient information was appended, and the initial limbs were simplistic innovations required to circumvent issues related to their interconnected table structure.[13] However, later limbs were developed purposively and with a clinical lens, and these are largely supported by robust empirical evidence of benefit. E-messaging, clinical decision support, patient portals, and health information exchange have all been shown to improve quality of care and patient outcomes, and all have the capacity to contribute more in time.[14–18] Similarly, the importance of the data brain of the EHR should not be underestimated. Collecting and collating individual-level health and social data enables exploration into healthcare quality and operational inefficiencies, and can inform best management for an individual at the point of care. It can also generate subgroup understandings of health need, utilisation, quality of care

and outcomes, which are critical for policy making. These data represent assets of both local and national significance.

When weighing up the risk and benefit of EHRs, significant concerns include their impact on clinician satisfaction, their association with clinician burn-out,[19] and their potential to decrease face time spent with the patient.[20] Clinician burn-out is real and has system impact, and it is possible that EHR vendors and developers have neither sufficiently responded to their clinical users, nor understood the importance of the user experience.[21] It is also likely that some of the dissatisfaction and burn-out reflects fatigue with ever-changing EHRs. Like many innovations, the EHR technology is not yet stable, and steady incremental revision (driven in part by evolving requirements) has meant that disruption due to the EHR for early adopters has been frequent and repeated, as opposed to a one-time transformation.

However, we suggest late adopters may in fact benefit from the pitfalls already identified by others, in their position to make choices around vendors, products and limbs (the strengths and weaknesses of the various options have become clearer), and to provide supportive environments to their staff. Major vendors have made many improvements in their software,[13] and smaller developers are rapidly filling in gaps enabled by Application Programming Interfaces (APIs) and web services. Research has provided signposting to the EHR limbs that offer the greatest potential for gains in quality of care (including the reduction of inequities).[22] The implementation of these functionalities, and those that remove pain points for clinicians in current workflows, should be prioritised, as should design features that improve the user experience and make high quality care 'more effortless'.[23] We also have information around strategies to mitigate clinician burn-out, including identifying those at risk or having problems, and providing training and support.[24] Additionally, scribes, and recent advances in natural language processing, voice recognition and sensing, provide new ways of data capture and user interaction that can support providers.[24]

The fundamental reasons to adopt an EHR still hold—access to tools to improve healthcare quality, and to enable population-level understanding. We suggest that late adopters of the EHR, and those who are limited users only, should not further delay— remaining on the sidelines is not an effective strategy. Economic analyses show that there are major potential health system savings to be made,[25] and in the context of finite resources, it may hurt financially not to fully use the technology available. For larger health systems, creating a supportive policy environment may take years, as will implementation of an interoperable system at scale. Finally, further postponement of EHR adoption and full use will also delay the benefit patients may gain from better quality of care and exploration

of health data. (Although notably, these factors may be of lesser importance to later adopters than, for example, financial drivers[26]). The EHR represents a technology that is here to stay, and is a critical enabler for organisations wanting to become high-performing health systems. However, in contrast to where it came from—usually billing or administration—a contemporary EHR should have patients and the healthcare team at the very centre, with its primary function being to support and drive the delivery of high value and high quality care.

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