

# Where do we stand in the maze of health information systems?

doi:10.1136/amiajnl-2012-001134

Lucila Ohno-Machado, *Editor-in-Chief*

This issue of *JAMIA* focuses on the opportunities and challenges for implementing and evaluating practical systems to handle health information for a variety of end users, including patients. Early on, electronic systems usually consisted of simple electronic health records (EHRs) with the purpose of providing clinicians with efficient access to patient information during the encounter. As our field evolved, selecting, implementing, and evaluating these systems became very complex, as EHR systems have increasingly added (a) EHR-based clinical data warehouses to support quality improvement and research, (b) clinical decision support (CDS) features, and (c) programming interfaces to support health information exchange (HIE) across different systems. As the informatics community takes important steps toward developing systematic frameworks to evaluate the cost-effectiveness of these different system features, *JAMIA* presents studies and perspectives that document the current state of development in health information systems.

Two randomized controlled trials present systematic evaluations of CDS. Tamblin (*See page 635*) compares the effectiveness of a new generation of computer-based drug alerts, and Wright (*See page 555*) compares the completeness of problem lists when CDS is utilized. Parsons (*See page 604*) validates the use of EHR for clinician performance monitoring, Adler-Milstein (*See page 537*) describes organizational complements to the EHR that improve physician performance, and Fleurant (*See page 541*) reports on EHR implementation challenges. Related to patient use, Slack (*See page 545*) and Rosenbloom (*See page*

*549*) describe patient interactions with EHRs related to past history documentation and influenza prevention, respectively. Wagner (*See page 626*) studies the relationship between hypertension control and use of personal health records in a randomized trial, and Yu (*See page 514*) systematically reviews web tools for management of diabetes and cardiovascular disease.

Several authors study the impact of EHR, CDS, and HIE systems on clinician behavior. Hains (*See page 506*) systematically reviews the impact of Picture Archiving and Communication Systems on ICU clinicians. Ronquillo (*See page 570*) focuses on genetic testing behavior by physicians, and Love (*See page 610*) studies the association of provider's perception of healthcare quality with EHR quality. Articles by Eastabrooks (*See page 575*), Dowding (*See page 615*), Abramson (*See page 644*), and Mandl (*See page 649*) describe EHR impact in clinical care. Crotty (*See page 621*) describes the impact of an interactive web tool in a residency program. Related to CDS, Koch (*See page 583*) describes information needs of ICU nurses, and Hripcsak (*See page 529*) proposes a visualization tool for operating ranges of a classification system. Related to HIE, Lenert (*See page 498*) provides a perspective on the successes and failures of HIE initiatives, and Schank (*See page 562*) reports on a statewide survey of healthcare provider beliefs about the value of HIE.

This issue also describes early experiences with novel aspects of EHR and CDS systems: Seto (*See page 503*) provides a perspective on multimedia EHRs, Mandl (*See page 597*) describes system archi-

itecture for interoperable EHR applications, and Okoniewska (*See page 674*) describes experience with an in-hospital positioning system. Feldman (*See page 591*) reports on the association between key EHR findings and high-risk diagnoses, and Zheng (*See page 660*) describes an approach to structure clinical narratives. Dalal (*See page 523*) describes an email notification system for laboratory tests pending at discharge, and Jung (*See page 533*) describes the execution of medical logic modules expressed in ArdenML. Kalb (*See page 668*) reports on internet-mediated survey response by parents of children with autism, and Rajput (*See page 655*) evaluates a mobile-based system for disease surveillance.

The articles in this issue represent the diverse uses and evaluations of a variety of systems. Heated debate has stirred the informatics community about the importance of developing homegrown versus commercial systems, the need for institutional- and user-customization, the lack of universally accepted evaluation methods and benchmarks, as well as the relative paucity of interoperable solutions. This issue of *JAMIA* sheds light on some of these topics, but much remains to be done, and we will not accomplish this alone. The informatics community must increase its outreach, widely disseminate its knowledge, and promote higher involvement of other academics, industry and government representatives, as well as the public. Without a concerted, inclusive effort to address the massive challenge of effectively implementing and evaluating computer-based health information systems, we are at risk of wasting our resources in limited, fragmented, non-sustainable initiatives.