

# Health Informatics Meets eHealth

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Health informatics develops methods and tools that should, when applied to health care, contribute to a high-quality, efficient care of individuals and populations [1]. The translation of health informatics research into practice can be seen as a “continuum” from IT development to healthcare problem solving [2], starting with developing and validating early solutions (tools, algorithms, technologies ...) that are then integrated and tested in clinical practice, first in small pilot projects, later in larger evaluation studies. Scientific publication of the outcome of these projects and studies is an important step to increase awareness on new solutions, to allow sharing of experiences, and to decide on continuation or stop of the developments as part of evidence-based health informatics [3].

Health informatics has been developing solutions for intra-organizational information systems for many decades now. Recently, with the emergence of inter-organizational (or trans-institutional) information systems [1, 4], the term “eHealth” has been shaped to describe “an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies” [5]. Generally speaking, the term eHealth encompasses more traditional concepts such as telemedicine and telemonitoring [6] as well as newer concepts such as shared electronic health records [7] or pervasive health care systems [8].

eHealth applications offer the potential for large benefits for health care, such as

improved quality of care, patient empowerment, health promotion, and cost savings [9–11]. However, a lot of challenges need to be overcome to exploit these potential benefits, such as semantic and technical integration and human-computer interaction [12], but also social, cultural, economical and organizational challenges [10, 13], as eHealth will have an impact on the way health care is delivered in the future.

This special issue presents the best three contributions from the eHealth2009 conference in Vienna, highlighting recent challenges and achievements in the area of eHealth. The eHealth-conference series is an annual series of scientific events dealing with health informatics methods and their applications to eHealth [14].

The paper by Christoph Rinner and coauthors [15] tackles the problem of semantic interoperability. At the moment, XML-based document standards such as Clinical Document Architecture (CDA) or ISO/EN 13606 are being developed to support semantic interoperability within inter-organizational information systems. The authors present an approach to automatically validate EHR documents, to assess whether they are conformant to the described standards. Their approach allows EHR documents to be validated for conformance with the underlying reference models and archetypes of the mentioned standards by means of XML schema, without requiring an additional validation language. This will allow simplifying the overall validation process in the future.

The paper by Tuncay Namli and Asuman Dogac [16] addresses the technical interoperability of EHR systems. There are many standards and initiatives (such as HL7 v3 or IHE) that support the exchange of data. To allow interoperability based on these standards, application systems need to prove that they are conformant to these standards. The authors present an automated, modular and scenario-based testing framework that allows testing conform-

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Methods Inf Med 2010; 49: 269–270

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ance with regard to different interoperability standards using just one single test scenario. This will ease the technical conformance testing in the future.

The paper by Bernhard Pfeifer and co-authors [17] finally presents an example how simulation can be used to improve prediction models for infectious diseases. The authors developed software to simulate and predict infectious diseases. They test their tool with data from the Brisbane H3N2 flu virus. Based on available disease data, population data and geographical data, they develop prediction models for all federal states of Austria. The results are promising, showing how these kinds of public health tools may help to improve prediction of infectious diseases in the next years.

The selected papers present different aspects of relevant research needed to respond to the rising eHealth challenges, ranging from development to validation, from standards to applications, from data exchange to data analysis, and from individual health to public health.

### Acknowledgments

We gratefully acknowledge the support of the scientific programme committee of eHealth2009 and of the reviewers of this special issue.

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