Evaluation of Biomedical Informatics Innovations and Their Impact on Public Health

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Summary
This issue of Methods of Information in Medicine contains four feature articles that are focused on the theme of evaluation. Evaluation approaches are increasingly essential in the assessment of determining the potential impact of contemporary informatics innovations. The featured articles offer practical perspectives to determining the impact of advancements. Internationally, there are significant advances being made across biomedical informatics and its related sub-disciplines. As with any scientific discipline, it is important for practitioners to be able to relate the potential importance of findings. To this end, it is especially important for biomedical informaticians to convey, in a quantifiable and comparable form, the significance of the informatics findings – not only to peers but also to those across the biomedical research spectrum. As such, the feature articles in this issue describe the evaluation of core infrastructure and fundamental informatics innovations as well as evaluation of informatics-based resources that are a core aspect of public health initiatives.

1. Evaluation
Evaluation is a fundamental feature of the scientific method. For each innovation, its importance must be contextualized relative to its advance of a field based on established metrics. Evaluation does not necessarily have to be quantitative; there are many times when only a qualitative assessment is possible. Within the context of biomedical informatics, evaluation is especially paramount to ascertain the potential impact and utility of techniques for better managing and eliciting potentially new knowledge from the spectrum of available biomedical data. Evaluation is certainly a challenging task in other basic sciences, but it is especially challenging in biomedical informatics – which regularly straddles the interface of theoretical advancement of computational or information science methods with practical application relative to a particular biomedical domain. This challenge also reflects the importance in the necessary discourse about evaluation approaches in biomedical informatics.
2. Quantifying the Latest Informatics Innovations

The first two featured articles in this issue of *Methods of Information in Medicine* focus on assessing advances to the mostly infrastructural or theoretical aspects of biomedical informatics. The infrastructural aspect of biomedical informatics is often overlooked in favor of theoretical or practical application of computer or information science techniques.

Borycki et al. explore the impact of such infrastructures relative to detectable errors [1]. Based on a systematic review of peer-reviewed literature (as indexed in and identified from MEDLINE), the authors explore the reported impact of errors that might be attributed to technological frameworks and related infrastructure. Such issues can obfuscate or at least complicate the evaluation of fundamental theoretical contributions.

De Keizer et al. leverage a structured rubric for evaluating health informatics studies (called STARE-HI) [2]. Focusing on conference proceedings, which continue to be a major repository for describing informatics innovations internationally, the authors demonstrate how a ranked list can be used to assess the quality, and thereby target areas of potential improvement, of evaluation studies in conference proceedings.

3. Assessing the Impact of Informatics in Light of Public Health

The broader impact of informatics innovations, and its impact relative to public health innovations, is gaining increasing attention internationally. The second two featured articles describe evaluation approaches relative to national initiatives.

Emmert et al. assess the quality of information acquired electronically (via websites) for rating physician quality [3]. The findings reveal a broad array of data that are available for assessing physician quality within Germany, and offer a means to compare to physician quality systems from other nations.

Sockolow et al. describe the need for a broader set of criteria associated with traditional health services research compared to those currently used for evaluating health information technology in the United States (which has increased significantly due to federal legislation put in place in 2009) [4]. The literature-based study highlights the current disconnect between technology (e.g., health information technology) and the potential beneficiaries (e.g., health services researchers).

4. Conclusion

A necessary step in the maturation of a field is the continued evaluation of innovations within the field as well as the impact on other fields. As biomedical informatics becomes an increasing component of public policy (e.g., assessment of physicians or uniform health informatics infrastructure), there will be an increased need for quantifying the impact of the infrastructure as well as reported results (e.g., as in conference proceedings). The true hallmark of a successful field is its incorporation as a core component across many application areas. Thus, the increased success of biomedical informatics internationally will further underscore the importance of evaluation approaches.

References