

## Jon DeShazo

### Brief Statement of Research Interests

My interests are *public health informatics*. More specifically, I am interested in understanding how emerging technologies, such as the Internet and mobile devices are related to the health of populations, and can be used to promote the health of populations. Prior to my graduate training, I worked in the private sector designing and building information intense, web-distributed computer systems.

The combination of my strong background in information systems with my graduate training in both Medical Informatics as well as Health Services has prepared me to lead interdisciplinary research and teach concepts that are technology focused, public health oriented, and grounded in theory and evidence. My long term goal is to conduct independent research in public health informatics and teach the next generation of public health practitioners, health services management, and health informaticians.

### Research

My research agenda is a continuation of my past research projects and reflects my diversity and expertise. The first three years of my graduate training as a National Library of Medicine Fellow afforded me the independence and flexibility to pursue my own research interests early in my academic career. During these financially independent years I demonstrated initiative by authoring two NIH funding proposals related to natural language processing within health services. I contributed significantly on a Robert Wood Johnson Foundation proposal on 'health -promoting video games 'which was awarded and funded my final year.

### *Internet-Enabled Health Services*

The widespread adoption of the internet significantly affects the health of populations and poses new risks and opportunities to health. Unstructured natural language text is the de facto mode of Internet communication. This 'free-text' is found on message boards, chat rooms, blogs, emails, web pages, text messages and is a critical element to harness for future health surveillance and promotion.

My PhD. dissertation work, entitled "Automated Analysis and Surveillance for STI/HIV Online Behavior" is centered on developing and evaluating a new natural language processing data mining software tool. This tool is designed to analyze large numbers of text documents for health-related concepts and report these concepts in a meaningful manner. The software algorithm and interface are designed to be flexible and domain independent and may be easily applied to various other tasks. The tool recently ranked highly in the national i2b2 Natural Language Processing Shared Task competition where it detected explicitly referenced as well as implicitly deduced diseases related to obesity within medical discharge summaries.

Future research along this pipeline includes solidifying online HIV/STI behavioral surveillance work and applying the tool to other health domains. For example, the tool show promise in linking online behavior with outcomes as well as modeling partnering and other social networks for transmission research and program planning. This technique could also be applied to other health behaviors which manifest on internet-related technologies, such as social network mapping, measuring references to dietary habits across populations, etc.

### *Internet-Enabled Interventions*

Whereas surveillance is the backbone to our current public health services model, the key to realizing the full potential of internet based technology in public health lies in new interventions. Internet and mobile device channels can now reach more individuals, be targeted and tailored more precisely, and contain a richness and depth of information never before possible. However the evidence base supporting its public health practice is

sparse. Research is needed that takes full advantage of the technology, builds methodological informatics theory, and also updates individual and social –level theoretical frameworks for the new medium. My earliest graduate research consisted of an informational decision–aid that elicited patients’ preferences (as utility values) for certain outcomes and provided highly tailored information based on complex simulations of patient and population data. My recent work on mobile games for diabetes education expands on the use of tailoring in an educational intervention and adds an element of fun to learning.

Looking forward, I plan to develop other internet and mobile technology based health interventions from a health services (rather than engineering) perspective and build upon the public health informatics knowledge and theory base with: formative research, the use of theoretic underpinnings, and the evaluation of the methods. I also plan to examine motivators and barriers for the adoption of technology-based interventions beginning with single intervention area and ultimately identifying patterns that may be generalized across intervention areas.

### *Translational Opportunities in Health Services*

Identifying methods and technologies which facilitate the translation of public health research into evidence based practice is a priority interest. There is also growing evidence that population level intervention such as social marketing and empowerment education may be the most effective and sustainable health promotion activities. Internet and mobile technologies such as Web 2.0 are particularly well suited to this paradigm and hold immense untapped capability along the lines of knowledge dissemination and group empowerment . Moreover, these technologies may also bridge the gap between research and practice within health services.

My work evaluating the dissemination and adoption of a new CDC intervention in STD clinics across the country has identified key barriers and facilitators for the adoption of a simple yet effective intervention designed for local health departments. Research is needed to investigate how Web2.0 (and 3.0) and mobile device technologies may alleviate informational and structural barriers that exist in current effective interventions. For example, Web 2.0 technologies are well suited for information sharing and may promote awareness of new innovations to practitioners. Similarly, mobile phones may be a effective channel to deliver health education directly to the consumer in a convenient and private mode, thereby bypassing the structural barriers and resulting in increased penetration (and perhaps effectiveness) of the intervention.