Building Health IT Research Capacity

The Agency for Healthcare Research and Quality's (AHRQ's) Health Information Technology (IT) Portfolio uses a variety of mechanisms to fund projects that further the goals of the Agency and the Portfolio. This includes supporting the next generation of health IT researchers by funding health IT-focused Health Services Research Dissertation (R36) grants. Funding is intended to promote and build research capacity in the use of health IT to improve health care quality, safety, efficiency, and effectiveness. In 2008, AHRQ issued a Special Emphasis Notice (SEN) (http://grants.nih.gov/grants/guide/notice-files/NOT-HS-08-014.html[1]) announcing an interest in R36 applications that focus on the use of health IT. The SEN noted particular interest in funding dissertation research projects focused in one of three research areas: 1) the quality and safety of medication manage-ment, 2) the delivery of patient-centered care, or 3) health care decisionmaking.

To date, the Portfolio has supported six doctoral candidates from a range of disciplines working on health IT-focused projects. Four of these projects were completed between 2010 and 2012 and represent the variety of research activities supported by the R36 grants. This document provides an overview of each of the four projects, the implications of what each grantee has contributed to the field, and how the dissertation funding has influenced their research interests and career paths. A final project report for each grantee can be found on their respective project description page on the AHRQ National Resource Center for Health IT Web site (http://healthit.ahrq.gov/portfolio).

Web-Based Intervention for Alcohol Use in Women of Childbearing Potential	The Effects of Age, Cognition, and Health Literacy on Use of a Patient EMR	The Impact of Health IT on Demand for Inpatient Services	Creating a Foundation for the Design of Culturally-Informed Health IT
Katia Delrahim-Howlett evaluated a Web-based intervention to reduce risky alcohol intake among low-income women.	**Jessica Taha** examined the impact of age and other characteristics on successful use of an EMR patient portal.	**Eric Barrette** conducted a demand analysis to understand how adoption and use of health IT impacts patient hospital choice.	**Rupa Valdez** studied the health communication practices of diverse patients to inform health IT design.

Podcasts highlighting the projects are available at http://healthit.ahrq.gov/SuccessStories

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Web-Based Assessment Shows Promise in Preventing Prenatal Alcohol Use

Fetal alcohol spectrum disorders (FASDs) – resulting from prenatal exposure to alcohol – occur in about one of every 100 children born in the United States, and one in eight women report using alcohol during pregnancy.[2, 3] Interventions intended to reduce women's alcohol use before and during pregnancy are key to preventing FASD.

Principal Investigator:
Katia Delrahim-Howlett, Ph.D.

Grant Number:
R36 HS 018701

Project Dates:
6/1/2009 – 5/30/2010

Project Description:
http://healthit.ahrq.gov/Delrahim-HowlettR36HS018071

Katia Delrahim-Howlett, Ph.D., who completed her doctoral work at the University of California San Diego, evaluated a Web-based tool designed to assess alcohol consumption and provide personalized feedback on alcohol use and associated health risks, including information about FASD.

Dr. Delrahim-Howlett conducted a small-scale randomized, controlled trial (RCT) to test the tool's effectiveness in reducing risky alcohol use and evaluate the sustainability of the reduction. One hundred and fifty non-pregnant women 18 to 44 years of age participated in the RCT by completing the Web-based assessment during a visit to a participating Women, Infants, and Children clinic in San Diego County, California.

Key Results: The study found that Web-based screening alone substantially reduces risky alcohol consumption; furthermore, this reduction was sustained over time. More than 70 percent of participants reported a reduction in risky alcohol use whether they received personalized feedback or generic feedback during the intervention.

Implications: A Web-based tool can be used to effectively assess alcohol intake in a low-income population and encourage reduction in alcohol use. The results from Dr. Delrahim-Howlett's study also indicate a potential role for health IT in providing low-cost, effective tools for primary prevention of prenatal alcohol use to reduce the occurrence of FASD.

Factors that Influence Successful Use of a Patient Portal

As adoption of electronic medical record (EMR) systems becomes more widespread, use of patient portals is expanding to facilitate patient involvement in managing their health care. Most patient portals give patients access to a summary of their health data and permit two-way electronic communication between patients and providers.

Principal Investigator:
Jessica R. Taha, Ph.D.

Grant Number:
R36 HS 018239

Project Dates:
9/1/2009 – 11/30/2011

Project Description:
http://healthit.ahrq.gov/TahaR36HS018239

Jessica Taha, Ph.D., who completed her doctoral work at the University of Miami, examined the ability of adults 40 to 85 years of age to use a patient portal to perform common health management tasks. Dr. Taha also studied individual characteristics that impact successful use of the portal including age, health literacy, and cognitive abilities.

The study involved 107 participants: 56 middle-aged adults, aged 40 to 59, and 51 older adults, aged 60 to 85. A simulated patient portal containing a fictitious medical record, based on EPIC's MyChart patient portal, was developed for the study. Using the simulated portal, participants were evaluated on their ability to perform 15 tasks involving medication management, interpreting laboratory results, and health maintenance (which includes tasks associated with maintaining or promoting health, such as scheduling and attending a doctor's appointment).

Key Results: This study found that older adults (age 60 to 85) had more difficulty using the patient portal than middle-aged adults (age 40 to 59). Characteristics that influenced use included age; cognitive abilities, including verbal ability and executive function; health numeracy; and Internet experience. Many participants reported some difficulty in using the patient portal; 40 percent of participants thought the portal was difficult to navigate and 50 percent found it difficult to locate information they needed. Nonetheless, almost 90 percent of participants indicated they would use a similar patient portal if it were available from their doctor. In addition, almost all participants (95 percent) felt that a patient portal would provide access to information to help them better understand their health.

Implications: Patient portals have the potential to deliver useful and reliable health information to help patients better manage their health. However, the benefit of patient portals is contingent on patients' ability to navigate the technology and use the information in a meaningful way. Dr. Taha's study suggests that older adults may encounter difficulties performing common tasks when using patient portals, and certain individual characteristics may influence success in using these tools. These findings provide important considerations for the design of health IT applications to ensure applications can be successfully used by and benefit users of all ages.

Does Adoption of Health Information Technology Spur Hospital Demand by Patients?

Adoption and use of health IT can improve patient quality of care.[4, 5] However, it is not known whether health IT influences patient preference and choice in where to obtain services.

Eric Barrette, Ph.D., who completed his doctoral work at the University of Minnesota, conducted a demand analysis to better understand how adoption and use of health IT might impact patient choice of hospital. The analysis examined how changes in the demand for hospital inpatient services related to the use of three types of health IT systems: EMRs, computerized provider order entry, and picture archiving systems.

Principal Investigator:
Eric G. Barrette, Ph.D.

Grant Number:
R36 HS 018272

Project Dates:
8/31/2009 – 4/30/2011

Project Description:
http://healthit.ahrq.
gov/Barrette
R36HS018272

Dr. Barrette analyzed patients' hospital choices by exploring several models to estimate the probability of a patient choice relative to defined factors, including hospital and patient characteristics. Data analyses were conducted using three linked datasets. Analyses focused on patient characteristics such as age, gender, and race; hospital characteristics, such as location, number of full-time physicians, and number of beds; and detailed information on health IT software, hardware, and infrastructure.

Key Results: The analysis found that hospital use of health IT generally does not affect patient choice and does not have a large impact on overall hospital demand.

Implications: While health IT adoption and use may contribute to improved quality of care and health care service delivery, Dr. Barrette's analysis suggests that it does not play a substantial role in health care market demand at this time. However, as health IT adoption and use increase, patient choice may evolve to drive demand. Of note is that the data used for this analysis was collected prior to the enactment of the Health Information Technology for Economic and Clinical Health (HITECH) Act, which was signed into law in 2009. A demand analysis with data collected after 2009 may demonstrate an impact of health IT adoption and use on health care market demand.

Designing Culturally Informed Consumer Health IT

Patients are increasingly encouraged to use health IT applications such as personal health records and decision support systems to manage their own health care. The design of these applications must reflect how culture impacts health information communication practices so that they are relevant to diverse patient populations.

Principal Investigator:
Rupa S. Valdez, Ph.D.

Grant Number:
R36 HS 018809

Project Dates:
2/1/2010 – 7/31/2012

Project Description:
http://healthit.ahrq.gov/ValdezR36HS018809

Dr. Valdez, who completed her doctoral work at the University of Wisconsin-Madison, conducted research to identify key factors in the development of culturally-informed consumer health IT applications. Using a mixed-methods approach, drawing on both anthropological and industrial and systems engineering methods, Dr. Valdez explored the health information communication practices of a culturally diverse sample of study participants.

Eighteen patients with type 2 diabetes were recruited from two Federally Qualified Health Centers in Madison, Wisconsin. Dr. Valdez conducted two interviews with each participant to learn about their health communication practices. During the first interview, each participant was asked to describe what, to whom, why, and how they communicate health information. Participants provided information about their social networks, the health information they share, and how this information is communicated. During the second interview, participants were asked to validate information from their first interview, about their cultural identities, and their use of information and communication technologies.

Key Results: Dr. Valdez found that health information communication practices within this culturally diverse sample population were complex and varied. For example, the size and composition of participants' social networks ranged from 7 to greater than 87 individuals. Furthermore, Dr. Valdez found that participants held a wide range of views on if and how their cultural identity influenced their health information communication practices; some perceived there to be a very clear relationship between their cultural identity and their health communication practices while others did not feel their cultural identity impacted their health communication practices at all.

Implications: Integrating cultural factors into consumer health IT design poses many challenges, but is important for developing effective tools and enhancing their usefulness among culturally diverse patient populations. Findings suggest a tailored design approach that incorporates features and applications for a range of behaviors and factors that are relevant across diverse cultural identities may be appropriate.

Updates from the Field

Dissertation grant funding support from the Health IT Portfolio serves as a valuable resource to doctoral students with an interest in health IT, providing an opportunity for funding their dissertation research interests, and facilitating future career paths.

Dr. Delrahim-Howlett, now a Project Director at Synergy Enterprises, Inc. (SEI), is working to translate research from the National Institute on Drug Abuse

> "The dissertation grant I received and the study I completed have continued to influence my research and career interests well beyond the year of funding."
>
> **Dr. Katia Delrahim-Howlett**

into tools, resources, and training events to help implement evidenced-based practices in community and medical settings. She notes that her grant-funded dissertation project improved her understanding of the application of health IT in general and within the context of translational research. She now applies this knowledge in her job at SEI, where she is investigating how to incorporate assessment of drug use and substance use disorders into the functionality of EMRs.

> **"The grant I received from AHRQ gave me the opportunity to investigate a number of topics that interest me, namely the intersection of aging, technology-based health care systems (specifically patient portals of EMRs), and health literacy/numeracy."**
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> **Dr. Jessica Taha**

Dr. Taha, now a Research Associate at the Center on Aging at the University of Miami Miller, continues to work in research related to older adults and health IT systems. Dr. Taha credits the funding she received to support her dissertation project with providing her the opportunity to study several topics that interested her and with sparking her interest in how adults, especially older adults and individuals of lower socio-economic status, are able to use emerging health care technologies in a meaningful way to manage their health. Dr. Taha intends to continue building on this area of research.

Dr. Barrette, now a Senior Consultant at Bates White Economic Consulting, provides government agencies and other clients with advanced economic and

> **"The dissertation grant presented me with first hand management experience…. This experience as well as knowledge of the Federal grant system was an exceptional set of skills and qualifications to have on my résumé when applying for jobs."**
>
> **Dr. Eric Barrette**

econometric analysis. Dr. Barrette expresses great appreciation for the dissertation grant funding, as it afforded him the opportunity to conduct in-depth research of numerous econometric methods applicable to his project topic. In his current position, he is using these methodological skills on a daily basis.

Dr. Valdez received her Ph.D. degree in Industrial and Systems Engineering in December 2012, and is now an Assistant Professor at the University of Virginia. The funding support allowed Dr. Valdez to refine her career interests. This project also proved valuable experience by expanding her skill sets as a researcher and providing interdisciplinary experience.

A variety of additional health IT-focused dissertation grants are currently ongoing and will continue to help cultivate a workforce of highly skilled health IT and health services researchers.

> **"Receiving the dissertation grant paved a way for me professionally… by providing external validation of the importance of my work."**
>
> **Dr. Rupa Valdez**

1   The SEN was reissued in 2011 and is available at: http://grants.nih.gov/grants/guide/notice-files/NOT-HS-11-016.html.

2   Sampson PD, Streissguth AP, Bookstein FL, et al. Incidence of fetal alcohol syndrome and prevalence of alcohol-related neurodevelopmental disorder. Teratology 1997 Nov;56(5):317-26.

3   Centers for Disease Control and Prevention. Behavioral Risk Factors Surveillance System surveys. 1991-2005.

4   Chaudhry B, Wang J, Wu S, et al. Systematic review: impact of health information technology on quality, efficiency, and costs of medical care. Ann Intern Med 2006 May 16;144(10):742-52.

5   Health Policy Connection: Health Care Quality Issue Brief. Does Health Information Technology improve quality of care? Robert Wood Johnson Foundation. July 2011.