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Program Committee Report December 2010

Regenstrief Center for Healthcare Engineering

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A Changing Landscape

This has been an active year for those focused on healthcare improvements. National health reform legislation has taken center stage and the Regenstrief Center for Healthcare Engineering has been closely following the development of a variety of quality improvement initiatives created in the act. Several emphases in the health reform legislation reinforce center focus areas, including the patient-centered medical home, care coordination, and health disparities.

A key component of health reform, and a significant center focus, is improvement in primary care delivery. Primary care is a critical avenue to pursue in tackling many healthcare challenges including high costs, the need for chronic disease management, and reducing health disparities. The primary care system, as it exists today, is not well-equipped to handle these challenges; however, the Regenstrief Center for Healthcare Engineering believes that improvements in this area are likely to have tremendous improvement throughout the healthcare system. As such, many center projects link back to an overall goal of supporting improvements in primary care.

The center has also continued to work on strengthening partnerships with researchers and organizations around the country who are also working on healthcare delivery challenges. An increased federal focus on community and industry partnerships confirms the importance of developing these partnerships on the path to creating impact.

RCHE Operations

Selected Projects

The Regenstrief Center for Healthcare Engineering continues to develop its research focus through feedback from partners and reviews of national priority areas in healthcare delivery research.

Another area brought into focus again throughout the health reform discussions is the issue of health disparities. Recognizing this as a national and state priority, RCHE has underway three projects that seek first to understand the nature of the disparities in Indiana, and second, to develop the support and networks to begin to address them.

Healthcare Seeking Behaviors Among Indianapolis Safety Net Populations

The Safety Net system serves primarily underserved and un- and under-insured populations. In the past, the providers and the populations they serve have been primarily in the same locations. However, research suggests that the Great Recession has changed the distribution of Safety Net patients, creating groups of un- and under-insured patients not just in large cities but reaching out into suburban areas.

RCHE's project team is led by Haslyn Hunte, a faculty member in health and kinesiology, specializing in health disparities. Chris Miller, a geospatial librarian, will develop maps showing the geographic patterns of health seeking behaviors. Xuanyao He, an assistant professor of statistics specializing in spatial analysis, will provide data analysis.

Working with data from the Regenstrief Institute, the research team will analyze and map the healthcare seeking behaviors of some of the Indianapolis Safety Net population. In particular, the team would like to see if patients are traveling farther, past other clinics, for healthcare. A second, qualitative component will use personal interviews to explore in greater detail the reasons why patients select certain facilities.

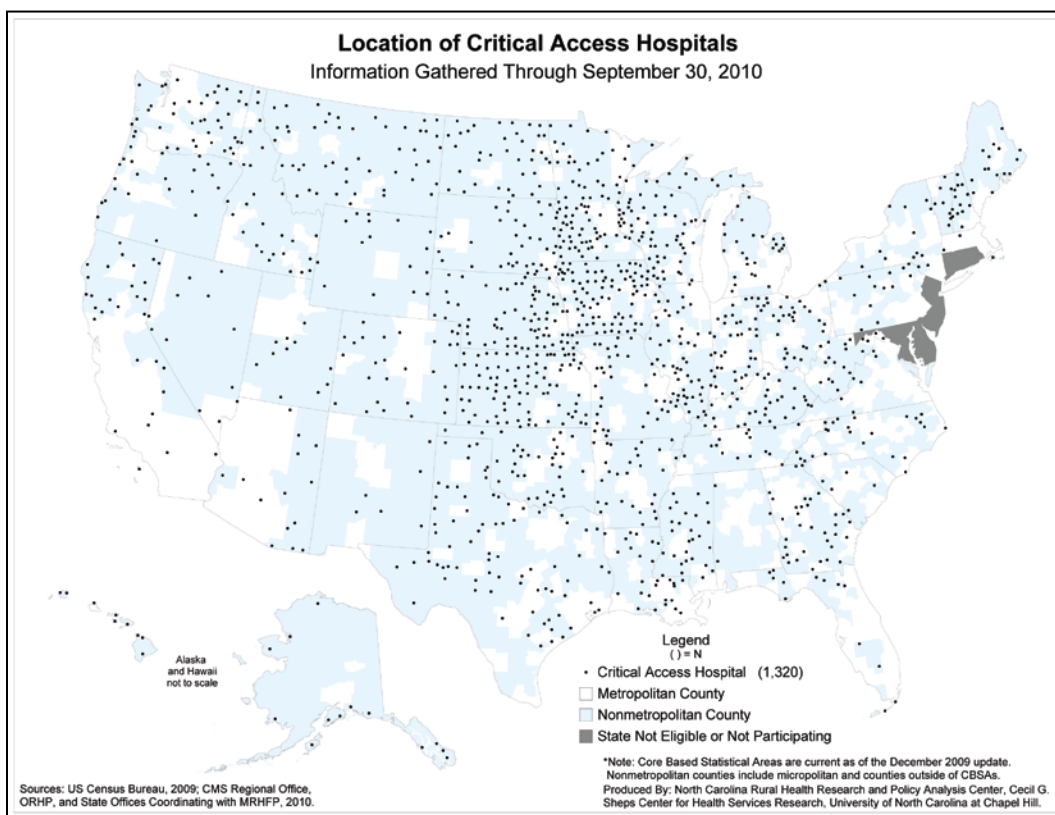
The project is expected to reveal patient and practice characteristics that influence healthcare seeking behaviors. Center partners in the Indianapolis area have expressed interest in using the results to help address their Safety Net populations more efficiently and effectively.

Readmissions at Critical Access Hospitals

Critical access hospitals are faced with unique challenges when attempting to reduce potentially preventable readmissions. To qualify as a critical access hospital, the facility must be located more than a 35-mile drive from any other hospital, maintain no more than 25 inpatient beds, and maintain an annual average length of stay of no more than 96 hours. As

such, critical access hospitals, which treat patients with more severe conditions requiring a more extended hospitalization, must transfer that patient to another hospital.

Building off of another center study in readmissions in acute care hospitals, this study will use similar data elements and methodology to analyze and compare the readmissions at critical access hospitals. Hospitals of initial interest include rural providers in Indiana and Kansas.



A Community Approach to Reducing Health Disparities

According to the U.S. Department of Health and Human Services, health disparities are the persistent gaps between the health status of minorities and non-minorities. “Despite continued advances in health care and technology, racial and ethnic minorities continue to have higher rates of disease, disability, and premature death than non-minorities.”

According to the American Heart Association, African-Americans have more severe high blood pressure and are at a higher risk for heart disease than Caucasians with other similar risk factors. While some risk factors are uncontrollable — age, family history, and heritage — others, including weight, stress, and diet, are manageable. Currently, many health communication campaigns are developed by studying the target population before creating

materials. In this project, the researchers will test a more participatory method, in which the target population will be developing and communicating the health information.

Two health communication professors, Mohan Dutta and Bart Collins, will leverage Purdue's HUBzero platform to create an online space where African-American community leaders can share their questions and opinions on health issues. Working with the Indiana Minority Health Coalition, Lake County Minority Health Coalition, and the Minority Health Coalition of Marion County, the Purdue team will provide the technological infrastructure, training, and support of community leaders who will work within their communities. The research team will conduct focus groups and individual interviews, and offer workshops for local community members to create culturally tailored communication solutions.

The project is funded through a \$1.5 million grant from the Agency for Healthcare Research and Quality (AHRQ).

Center Operations: Looking Ahead

The center continues to build a strong research portfolio focusing on its core areas of care coordination and population health. In the coming years, RCHE will build upon successful research projects and collaborations developed during these projects, taking these projects through the impact portion of the research-to-impact process.

Affiliated Faculty and Staff

As of November 2010, RCHE has 77 affiliated faculty members.

Unit	Faculty affiliates
Agriculture	2
Education	1
Engineering	14
Health & Human Sciences	19
Krannert (Management)	4
Liberal Arts	8
Library Sciences	4
Medical Education	1
Pharmacy	5
Science	7
Technology	10
Vet Med	2
TOTAL	77

Note: Health & Human Sciences is a new college at Purdue that includes the departments of child development and family studies, consumer sciences and retailing, foods and nutrition, health and kinesiology, health sciences, hospitality and tourism management, nursing, psychological sciences, and speech, language, and hearing sciences.

RCHE also attracts staff members throughout Purdue who wish to be affiliated with the center.

Unit	Staff affiliates
Discovery Park administration*	12
Information Technology	2
Human Resource Services	1
Technical Assistance Program (leadership)	2
TOTAL	17

*Includes six RCHE staff members.

Communications

CatalyzeCare

RCHE is spearheading the effort to create this online hub for research and education in healthcare delivery. The design and basic functionalities are in place and several tools have been uploaded to the site. The Infusion Pump safety project now operates through the hub, which also now allows the group to have private discussions about results within the security of the hub.

Center Website

The RCHE website is a primary vehicle for disseminating news about center projects and researchers. From October 2009 through October 2010, the site had the following visitor statistics:

- 14,470 visits
- 5,176 unique visitors

- Visitors from 91 countries, of which the top five were the U.S., India, Canada, China, and the United Kingdom.
- Visitors from all 50 states, of which the top five were Indiana, Illinois, California, New York, and Texas.

Research Effectiveness

Research Partners

RCHE continues to build both living laboratory and national dissemination partnerships. Currently, we have active partnership agreements with:

- American College of Physicians
- Ascension Health
- Community Health Network
- Indiana Hospital Association
- Indiana State Department of Health
- IU Medical Group
- IU School of Medicine
- Mayo Clinic
- St. Vincent Health
- U.S. Department of Veterans Affairs

Research Validation

The Regenstrief Center for Healthcare Engineering seeks external sources of information to validate the focus and quality of its research. In addition to the input of our partners, RCHE derives useful information from competitive funding, publication in peer-reviewed journals, professional conference presentations, and advice from our advisory council.

During the 2009–10 academic year, RCHE affiliated faculty reported 24 papers published in peer-reviewed journals, with an additional 10 accepted but in press. The complete list of papers is available on the RCHE website. Highlights include:

Yehle K., Sands L., Rhynders P., & Newton, G.(2009). “The effect of shared medical appointments on knowledge and self-care in patients with heart failure: A pilot study.” *Heart & Lung*, 38(1) 25-33.

Leung J, Sands L, Paul S, Joseph T, Kinjo S, Tsai T. “Does postoperative delirium limit the use of patient-controlled analgesia in older surgical patients?” *Anesthesiology*, 111(3):625-631, 2009.

Caldwell, Barrett S., Sandra K. Garrett, and Karim C. Boustany. "Healthcare team performance in time critical environments: Coordinating events, foraging, and system processes." *Journal of Healthcare Engineering* 1, no. 2 (2010)

Bute, J. J., & Jensen, R. E. (in press). “Low-income women describe fertility-related expectations: Descriptive norms, injunctive norms, and behavior.” *Health Communication*.

Faculty and staff were asked to present their work at more than 25 conferences or professional meetings this year. Highlights include:

Hess, A., Plake, K., Yehle, K., Murawski, M., & Mason, H. (2010). "Health Literacy and Self-Care of Patients with Heart Failure". American Pharmacists Association, Washington, D.C.

Jensen, R. E., & Bute, J. J. (2009). "Fertility and sexuality-related perceptions and behaviors among low-income women: Injunctive norms, sanctions, and the assumption of choice." Competitively selected paper presented in the Health Communication Division at the National Communication Association, Chicago, IL.

Huang, P. (2009). "Sustaining the Medical Home: A game theory approach." Presented at INFORMS, San Diego, CA.

Musselman, K. (2010). "IE Frontiers in Healthcare." Presented at IIE Annual Conference and Expo 2010, Cancun, Mexico.

Schaffer, S., Reyes, L., Kim, H., & Collins, B. (2010). "Design and Validation of a Performance Support System in a Healthcare Setting." International Society for Performance Improvement Conference, San Francisco, CA.

Research Collaboration

RCHE collaborates with other universities and centers at Purdue to further the field of healthcare engineering and develop research projects and proposals whose impact can reach beyond Purdue.

Other Universities

RCHE works with researchers at other universities as a means of strengthening collaborations, growing the field, and learning from others. Collaborations with other universities in 2009–10 include:

- Northeastern University — readmissions
- University of South Florida — readmissions
- University of Wisconsin — Infusion informatics
- Indiana University — no-show behavior, trauma care
- University of California, San Francisco — surgical outcomes in older adults

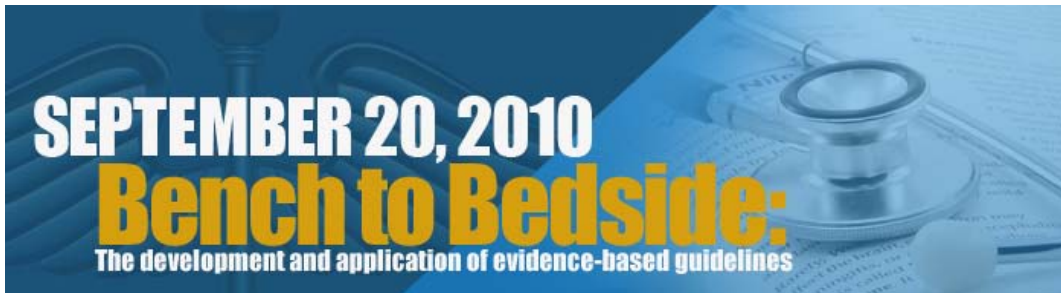
Regenstrief Institute

Several projects and researchers collaborated with the Regenstrief Institute this year, including:

- Haslyn Hunte on the Safety Net project. The Institute has been instrumental in helping to create and define the scope of the research.
- Laura Sands continues to work with Institute researchers on various projects.
- RCHE and the Regenstrief Institute both participated in the HITEC grant.
- The center will work with Dr. Willis at IUMG and with Regenstrief Institute data on the Patient-Centered Medical Home II project.

Learning and Innovation

Fall Conference



The center's fall conference featured guest speakers Richard Norling, former president and CEO of Premier Inc., and Mark Chassin, president of the Joint Commission. The speakers addressed their experiences with implementing and evaluating evidence-based guidelines.

More than 130 attendees packed the conference room. Attendees included students, faculty, and healthcare leaders from local and regional organizations.

Nursing Conference

Health IT Systems: Creating Meaningful Change in Practice, Education and Research in the Context of "Meaningful Use"

RCHE partnered with the School of Nursing to host a conference covering the impact on nursing of electronic health records and meaningful use. Patricia Hinton-Walker delivered the keynote address. Featured speakers included Marc Rosenmann from the Regenstrief Institute, Sara McComb from Texas A&M University, and Andrew Hamilton from the Alliance of Chicago Community Health Services.

Speaker Series

Jake Jensen, communication (September 8, 2010)

Lee Schwarz, management (September 22, 2010)

Scott Schaffer, education (October 13, 2010)

Bart Collins and Melanie Morgan, communication (October 27, 2010)

Ji Soo Yi, industrial engineering (December 8, 2010)

Pioneer Speakers

Richard Norling
Former president and CEO
Premier Inc.
September 20, 2010
“Reliable Execution of Evidence-Based Process”

Mark Chassin, MD
President of the Joint Commission
September 20, 2010
“Quality, Evidence, and High Reliability in Health Care”

Financial Management

Awards

The center is pleased to report the following key awards:

2009–10:

- I-HITEC. Vic Lechtenberg, Engagement; Steve Witz, RCHE; Dave McKinnis, TAP; Mary Anne Sloan, HTAP. Funded by the Office of the National Coordinator. \$12,000,000.
- Prognostic Significance of Insufficient ADL Help on Health Outcomes/Utilization. Laura Sands, Nursing. Funded by the National Institutes of Health. \$1,112,313.
- Healthcare Engineering Research Program. Steve Witz, RCHE. Funded by Mayo Clinic. \$831,000.
- Tailored health communication and interactive technology: Developing a computer-based algorithm to encourage utilization of breast cancer diagnostics. Jake Jensen, Communications. Funded by the National Institutes of Health. \$144,050.

2010–11 (first six months):

- Pathfinder Award to Promote Diversity in the Scientific Workforce. Brad Duerstock, Center for Paralysis Research. Funded by the National Institutes of Health. \$2,000,000.
- I-ADAPT. Mohan Dutta and Bart Collins, Communications. Funded by the Agency for Healthcare Research and Quality. \$1,500,000.

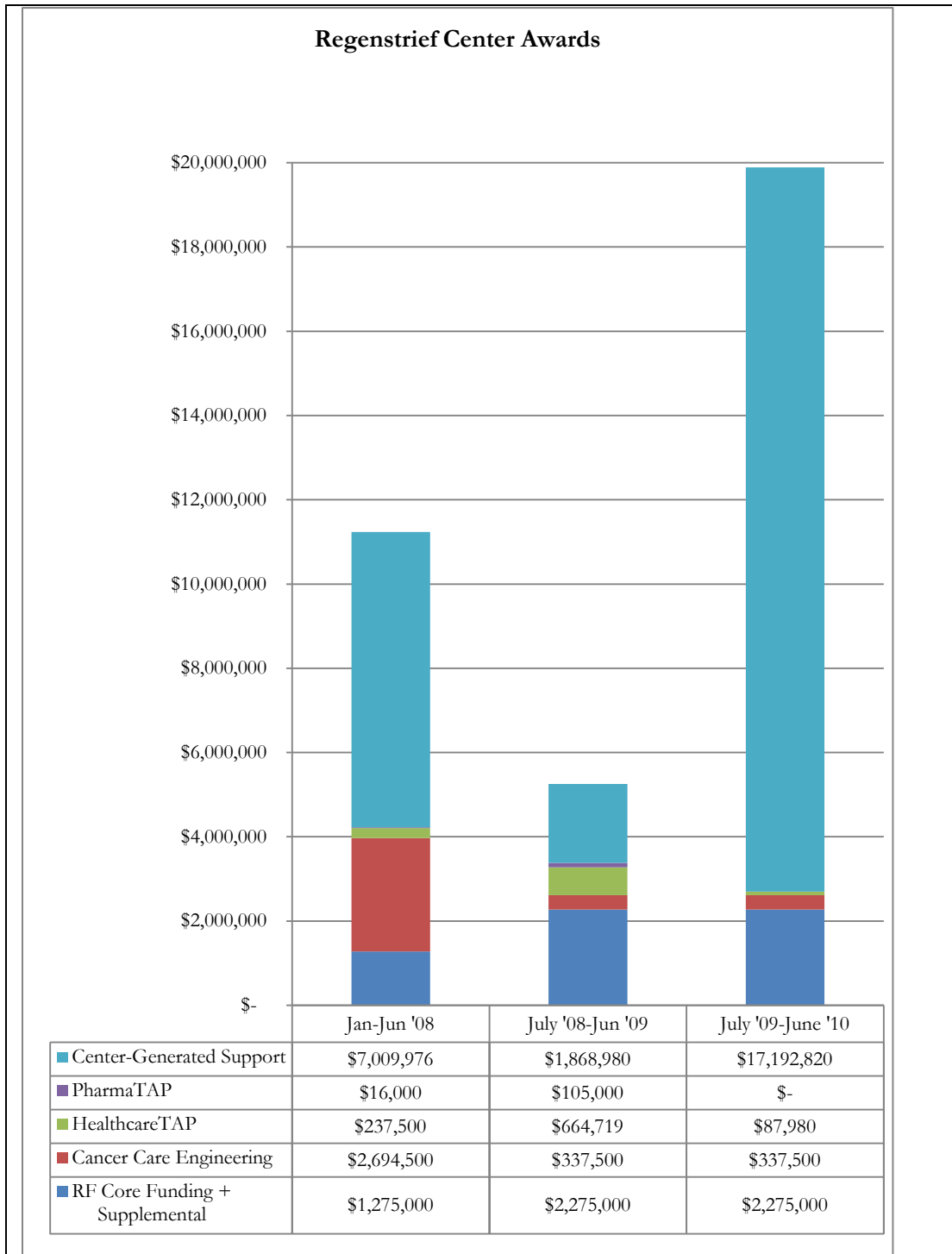
Funding Sources

RCHE and its researchers continue to draw funding from organizations around the country.

In 2009–10, these included:

- National Institutes of Health
- Office of the National Coordinator for Health Information Technology
- Indiana State Department of Health
- The Helene Fuld Health Trust
- University of California at San Francisco

2009–10 Financials



Note: Center-generated support does not include the \$25,000,000 CTSI grant, of which RCHE was a part, nor the VERC awards for regions other than Indiana. I-HITEC award is counted in Center-Generated Support, although the project benefits from a significant contribution by HealthcareTAP. VERC is listed under Center-Generated Support.

Cumulative Center Funding

