

Center for Health Information & Research



School of Computing
and Informatics



chir@asu.edu



480 965 0122



480 965 5208



Arizona State University
Post Office Box 874711
Tempe, Arizona 85287-4711



660 South Mill Avenue
Suite 312
Tempe, Arizona 85281

The Center for Health Information & Research (CHIR) is a research center of the School of Computing and Informatics in Arizona State University's Ira A. Fulton School of Engineering. CHIR is a multidisciplinary team whose focus includes health care, clinical quality, the health care workforce, occupational illness and injury, medical malpractice, health care economics, and disability. CHIR is home of the Arizona HealthQuery (AZHQ), a community-university partnership, created by the voluntary participation of health care providers, insurers, and employers in Arizona. AZHQ is a community health warehouse containing health information on millions of Arizona residents.

CHIR Membership—2007

William G. Johnson, PhD, Director of CHIR, is a Professor in the Department of Biomedical Informatics of the School of Computing and Informatics in Arizona State University's Ira A. Fulton School of Engineering. His previous appointments include the economics department at Rutgers University, Syracuse University, and the medical schools of Rutgers University, the State University of New York, and the University of Arizona.

Professor Johnson is the founder of Arizona HealthQuery, a community health data system that includes more than five million persons. His research involves the first empirical studies of labor market discrimination against persons with disabilities and is the author or co-author of nearly every subsequent empirical study of the problem. He completed the first interview study of the families of asbestos-related death and disease victims in the United States and Canada. Professor Johnson was principal investigator or co-investigator on the first studies of workers' compensation health care costs in the United States, the first interview study of injured men and women workers in the United States, and the largest interview study of injured workers (conducted in Ontario). He is one of the authors of the Harvard Medical Practice Study, the largest study to date of medical malpractice.

Professor Johnson's professional activities include:

- Member, *National Academy of Social Insurance* and *North American Spine Society*
- Fellow, *Collegium Ramazzini* (Carpi, Italy) and *Employee Benefit Research Institute* (Washington)
- Associate Editor, *The Spine Journal*
- Associate Scientist, *Institute of Work and Health* (Toronto)
- Associate Investigator, Behavioral and Social Sciences Research Program, Arizona Cancer Center, University of Arizona Health Sciences Center
- Chairman, Scientific Review Committee, Centre for Research Expertise for Improved Disability Outcomes, Toronto, Ontario, Canada
- Co-editor, *Journal of Disability Income and Work Injury Compensation* (*National Academy of Social Insurance*)

william.g.johnson@asu.edu; WilliamJohnson1@cox.net; office 480.965.7442; home 602.840.4293

Wade Bannister, MS, is the Associate Director of Informatics for CHIR. He has substantial industry experience in analyzing health care data and the design and implementation of massive data warehouses. He designed and built the AZHQ data warehouse and also developed all of the automated data loading processes for the warehouse. Wade also has significant experience in developing analytic tools for health care data analysis, including physician performance measurement and health plan evaluation. He currently manages the data team at CHIR which is charged with providing all of the database, programming, and analytic support for the Center.

Richard "Dick" Butler, PhD, (CHIR Collaborator) is an Econometrician and Professor of Economics in the Department of Economics at Brigham Young University. A renowned expert in complex econometric analyses of patterns of work and disability, Dr. Butler has published extensively about the topics of insurance, worker's compensation, discrimination, income equality, and education. Dr. Butler is on the editorial board of the *Journal of Risk and Insurance* and was elected to the National Academy of Social Insurance in 1996, elected President of the Risk Theory Society in 1999, and listed in *Who's Who in Economics* in both 1999 and 2003. In 2004, Dr. Butler was appointed the Martha Jane Knowlton Coray Professor of Brigham Young University.

Pierre Côté, DC, PhD, (CHIR Collaborator) is an Adjunct Faculty with ASU and Assistant Professor of Epidemiology in the *Department of Public Health Sciences at the University of Toronto*. His research includes the epidemiology of disability related to musculoskeletal pain and depression, including the impact of health care delivery on the recovery of soft-tissue injuries.

Miwa Edge is a Senior Informatics Analyst with CHIR. She has extensive experience in health care database development and data management coupled with expertise in database programming and health care information systems. Her background includes substantial experience in working with large health care claims databases with both public- and private-sector health care systems. Currently Miwa manages the data warehouse operations for CHIR, including supervising the data loading and validation processes, updating the process and database design, and providing data extracts for analytics. She also is involved in data and information technology initiatives in a wide variety of CHIR projects.

Heather Gray, MS, is an Informatics Analyst with CHIR. She has substantial experience in analyzing health care data and with the management and manipulation of large databases. She also has experience with programming, database development, process planning, and working with biological metric and nonmetric data. In previous positions she has worked on a variety of health care and public policy data analysis projects. Heather is currently involved with providing programming and data analysis expertise to a wide variety of projects within CHIR. She is also pursuing her PhD in Biological Anthropology at the University of New Mexico.

Tameka Jackson, MBA, is an Administrative Specialist. She brings a wealth of administrative and technical expertise from several supervisory and support positions from the early childhood level to secondary education. She is responsible for general administration, staffing, community relations, and student worker supervisory functions as well as grant account management and some project oversight.

Tricia Johnson, PhD, (CHIR Collaborator) is a Senior Economist and Assistant Professor in the Department of Health Systems Management at Rush University Medical Center. Tricia is a former member of CHIR.

George Runger, PhD, (CHIR Collaborator) is a Professor in the Department of Industrial Engineering in ASU's Ira A. Fulton School of Engineering. His research is on real-time monitoring and control, data mining, and other data-analysis methods with a focus on large, complex, multivariate data streams. His work is funded by grants from the National Science Foundation and corporations. In addition to academic work, he was a senior engineer at IBM. He holds degrees in industrial engineering and statistics

Kathleen Russell is Program Manager. She spent nearly two decades in the Virginia public behavioral health care system, specializing in the improvement of health care for individuals with mental health, mental retardation, and substance abuse disorders as well as chronic physical illnesses and disabilities. Through her management experience, she has supervised large domains of data, policies, and budgets. She combines a vast knowledge of administrative systems and a sociology academic background with extensive clinical experience within the public health field.

Infrastructure

CHIR is responsive to and compliant with all Federal, State, and University regulations regarding security of electronic and physical data. CHIR follows a strict protocol to ensure compliance with confidentiality of health data. For more information regarding our policies and procedures, please email us at chir@asu.edu.

CHIR utilizes very large databases containing confidential health care information for millions of individuals in Arizona and has the technological capability to efficiently store, manage, and analyze this vast amount of data. CHIR owns four dedicated servers optimized for processing, analyzing, and storing this data. CHIR owns a Network Appliance® Network Attached Storage (NAS) file server with capacity for over sixteen terabytes (TB)

of data, along with two IBM application servers each running dual Intel processors for the processing, summarizing, and analyzing of the data using cutting edge industry-standard software tools. In addition, these servers are secured behind a firewall server and are maintained in a secure facility on the ASU campus. All appropriate physical and electronic security protocols have been implemented to restrict access to this highly sensitive data, including the encryption of all sensitive database tables.

Active Projects

Arizona HealthQuery (AZHQ)

Primary Contact: Wade Bannister wade.bannister@asu.edu 480.965.1623
Sponsor: St. Luke's Health Initiatives; ASU Office of the Vice President for Research & Economic Affairs

The purpose of this project is to develop and maintain a community health data system that stores comprehensive health information for the entire population of Arizona. AZHQ is a unique, massive relational database of health information on millions of Arizonans. The AZHQ data system is unequalled in its ability to provide vast amounts of routinely updated health care information linking patients across health care providers and systems over time. AZHQ is a community-university partnership that is based in CHIR. More than fifty data partners voluntarily contribute administrative health data to AZHQ, including the entire Arizona Medicaid program, federally qualified community health centers, the major private and public health systems in the state, and self-insured employers. The Arizona Department of Health Services also contributes data to AZHQ on all hospital discharges, births, and deaths. The AZHQ data warehouse consists of a set of normalized relational data tables comprised of tables containing patient demographic information, claim header information (i.e., visit level information), claim detail information (i.e., service level information), provider information, diagnosis codes, as well as patient Medicaid eligibility and health plan information, AZHQ has been successfully used in a wide range of community health studies on asthma, emergency department (ED) utilization, racial disparities in health care, and other topics. As the data system continues to expand to include more services, efforts are focused on building additional partnerships with large employers, third party administrators, and physician groups.

Arizona HealthQuery Data and Valley Fever Among Persons with Community Acquired Pneumonia

Primary Contact: Kathleen Russell kathleen.m.russell@asu.edu 480.965.3533
Sponsor: Valley Fever Center of Excellence

CHIR is partnering with University of Arizona's Valley Fever Center for Excellence to investigate the incidence and potential misdiagnosis of Valley Fever. Valley Fever (coccidioidomycosis) is increasingly recognized as a significant cause of community-acquired pneumonia in Arizona. Recent studies have found that as many as one-third of all patients presenting to primary and urgent care with community acquired pneumonia syndromes may, indeed, have Valley Fever. Misdiagnosis can lead to the prescription of inappropriate and ineffective antibiotics.

Better Quality Information for Medicare Beneficiaries

Primary Contact: Kathleen Russell kathleen.m.russell@asu.edu 480.965.3533
Sponsor: Centers for Medicare and Medicaid Services

CHIR is one of six national demonstration projects designed to pioneer the development of more adequate measures of compliance with health care standards in the treatment of Medicare patients. A collaborative national effort sponsored CMS, this pilot project will provide a national framework for performance measurement and public reporting as well as test the most effective methods to provide consumers with meaningful information that they can use to make choices about which physicians and physician groups will best meet their needs.

Community Health Needs Assessments

Primary Contact: Kathleen Russell kathleen.m.russell@asu.edu 480.965.3533

CHIR, using Arizona HealthQuery, has developed a model of community assessment that can be used by nonprofit organizations in their strategic planning efforts and community benefit planning. CHIR works with the organization to identify relevant health indicators and provides analysis using selected data sources for the lowest level comparisons available. Community health needs assessments are designed to study community concerns at the community level.

Health Care Workforce: Physicians

Primary Contact: Kathleen Russell kathleen.m.russell@asu.edu 480.965.3533
Sponsors: St. Luke's Health Initiatives; the Flinn Foundation; BHHS Legacy Foundation

CHIR, in partnership with the University of Arizona and the Arizona Medical Education Consortium (AzMEC) has created a longitudinal data system tracking the health care workforce in Arizona. The data are used to analyze and forecast the supply and demand for health care providers.

Health Care Workforce : Nurse Practitioners and Nurses

Primary Contact: Kathleen Russell kathleen.m.russell@asu.edu 480.965.3533
Sponsor: Arizona Healthcare and Hospital Association

CHIR, in partnership with the University of Arizona and the Arizona Healthcare and Hospital Association is creating a longitudinal data system tracking the nursing workforce in Arizona. The data are used to analyze and forecast the supply and demand for nurses.

Health Patterns of Hispanic and Non-Hispanic Children

Primary Contact: Dr. William Johnson william.g.johnson@asu.edu 480.965.7442
Sponsor: National Institute for Child Health and Human Development

This study addresses important public health and public policy questions relating disparities in the health and health care utilization of Hispanic children age 0 through 19. The study compares nearly 34,000 Hispanic children, primarily of Mexican descent or origin, to more than 15,000 non-Hispanic children living in an agricultural county on the Arizona-Mexico-California border. It uses data from the Yuma County HealthQuery (YHQ) to make cross-sectional estimates for each of three years (1999-2001) and to analyze patterns of insurance coverage and episodes of uninsurance among a subset of the children for which the YHQ includes three continuous years of data.

Recently Completed Projects

Child Fatality Review Program

Primary Contact: Tameka Jackson tameka.jackson@asu.edu 480.727.6397
Sponsor: Arizona Department of Health Services

This program conducts detailed reviews of the circumstances surrounding the deaths of children, birth to 17 years, in Maricopa County and determines the preventability of each death. Reviews include data collected from all agencies and organizations involved in each death and submission of reports to state teams to develop data-driven recommendations for reducing preventable childhood deaths.

AHCCCS 2006 Survey of Providers

Primary Contact: Kathleen Russell kathleen.m.russell@asu.edu 480.965.3533
Principal Investigator: Dr. William Johnson
Co-investigator: Dr. Mary Rimsza

Sponsor: Arizona Health Care Cost Containment System (AHCCCS)

A survey of all physicians, dentists, and office managers currently treating AHCCCS patients in one of the eight AHCCCS managed care plans. Project will conclude with an analysis of the survey data to measure the administrative efficiency and overall provider satisfaction with the plans.

Asthma in Maricopa County: A Case Study in Medical Data Understanding

Primary Contact: Kathleen Russell kathleen.m.russell@asu.edu 480.965.3533
Principal Investigator: Dr. Mary Rimsza
Co-investigator: Dr. George Runger, Dr. Gerald Farin

Sponsor: ASU Office of the Vice President for Research & Economic Affairs

This project formed an interdisciplinary team of ASU researchers to create a case study of application of data mining and multidimensional visualization to Arizona HealthQuery (AZHQ) data related to asthma in Arizona. The combination of data mining and scientific visualization offers powerful new capabilities for finding meaningful patterns and relationships embedded within large complex public health data that have not been possible using current analysis.

ASU Healthy Back Study

Primary Contact: Dr. William Johnson william.g.johnson@asu.edu 480.965.7442
Principal Investigators: Dr. William Johnson and Dr. Marjorie Baldwin

Sponsor: Arizona State University

This study is an inception cohort study of injured workers with low back pain. It is designed to collect all the data, including injured worker interviews, workers' compensation claims data, and detailed medical billing data for a comprehensive analysis of the factors that determine the costs and outcomes of different modes of care for occupational back pain. Initial findings have been released and additional multivariate analyses are in progress.

The Impact of Demographic and Labor Force Participation Changes on the Social Security Disability Insurance and Medicare Programs)

Primary Contact: Dr. Tricia Johnson Tricia_J_Johnson@rush.edu 312.942.7107
Principal Investigator: Dr. William Johnson

Sponsor: Disability Research Institute, funded by the U.S. Social Security Administration

This project will examine the effects of the changing size and composition of the baby boom-aged labor force on the Social Security Disability Insurance and Medicare programs using secondary data. The project puts forth a comprehensive model to analyze the effects of the impact of the baby boom generation on health care costs with special attention to the more general effects of the large increase in the absolute number of women with disabilities.

Recent Publications

Journals

2007

Butler, R.H., Johnson, W. G., & Côté, P. (February 2007). It pays to be nice: Employer-worker relationships and the management of back pain. *Journal of Occupational and Environmental Medicine*, 49(2), 214-225.

Butler, R.J., Johnson, W.G. (forthcoming 2007). Satisfaction with Low Back Pain Care. *The Spine Journal*.

Butler, R.J., Johnson, W.G., & Gray, B. (November 2007). Timing makes a difference: Early nurse intervention and low back pain. *Professional Case Management*.

Furukawa, M., Ketchum, J., & Rimsza, M.E. (2007). Physician practice revenue and use of information technology in patient care. *Medical Care*, 45(2), 168-176.

Rimsza, M.E., Butler, R.J., & Johnson, W.G. (May 2007). The impact of Medicaid disenrollment on health care utilization and cost. *Pediatrics*.

2006

Baldwin, M. L., Butler, R. J., & Johnson, W. G. (June 2006). The effects of occupational injuries after returns to work: Work absences and losses of on-the-job productivity. *Journal of Risk and Insurance*, 73(2), 309-334.

Johnson, W.G., Baldwin, M.L., & Johnson, T.J. (July 2006). Does network care prolong work absences? *Industrial Relations: A Journal of Economy & Society*, 45(3), 348-376.

Johnson, T.J., Rimsza, M.E., & Johnson, W.G. (2006). The effects of cost-shifting in the State Children's Health Insurance Program. *American Journal of Public Health*, 96(4), 709-715.

2005

Côté, P., Baldwin, M., & Johnson, W.G. (2005). Early patterns of care for occupational back pain. *Spine*, 30(5), 581-587.

Greydanus, D.E., Rimsza, M.E., & Matytsina, L. (2005). Contraception for the college student. *Pediatric Clinics of North America*, 52(1), 135-162, ix.

Johnson, W.G. (2005). Cost-based evaluations of the treatment of back pain: A primer for health care professionals. *The Spine Journal*, 5(4), 361-9.

- Rimsza, M.E., & Kirk, G.M. (2005). Common medical problems in the college student. *Pediatric Clinics of North America*, 52(1), 9-24, vii.
- Rimsza, M.E. (2005). Sexually transmitted infections: New guidelines for an old problem. *Pediatric Clinics of North America*, 52(1), 217-228, vii.
- Rimsza, M.E., & Moses, K. (2005). Substance abuse on the college campus. *Pediatric Clinics of North America*, 52(1), 307-320, xii.

2004

- Johnson, W.G. (2004). Back pain, acute injury or chronic disease? *Workers' Compensation Policy Review*, 4(5), 9-18.
- Johnson, W.G., & Rimsza, M.E. (2004). The effects of access to pediatric care and insurance coverage on emergency department utilization. *Pediatrics*, 113(3 Pt 1), 483-487.

Books

- Baldwin, M. L., & Johnson, W. G. (May 2006). A critical review of studies of discrimination against workers with disabilities. In W. M. Rodgers III (Ed.), *Handbook on the economics of discrimination*. Northampton, MA: Edgar Elgar Publishing.

“Outstanding Academic Book 2006,” CHOICE (Review Journal of the American Library Association)

- Greydanus, D., Rimsza M.E., & Patel D. (Eds.). (2005) *College health: Pediatric clinics of North America*. W.B. Saunders: Philadelphia, PA.
- Johnson, W.G. (panel member): National Research Council. (2004). *Hearing loss: Determining eligibility for social security benefits*. Washington, DC: Board on Behavioral, Cognitive, and Sensory Sciences, Division of Behavioral and Social Sciences and Education. The National Academies Press.

Reports

- Rimsza, M.E., Johnson, W.G., & Speicher, M., & Grossman, M. (2006). *The Arizona physician workforce, part II: The numbers of practicing psychiatrists 1995-2005*. Tempe, AZ: Center for Health Information & Research, Ira A. Fulton School of Engineering, Arizona State University
- Butler, R.J., Johnson, W.G., & Rimsza, M.E. (2006). *The effect of AHCCCS disenrollment on health care utilization in Maricopa County*. Tempe, AZ: Center for Health Information & Research, L. William Seidman Research Institute, Arizona State University.
- Johnson, W.G., Rimsza, M.E., Garcy, A., & Grossman, M. (2005). *The Arizona physician workforce, part 1: The numbers of practicing physicians 1992-2004*. Tempe, AZ: Center for Health Information & Research, L. William Seidman Research Institute, Arizona State University.

Johnson, W.G., & Johnson, T.J. (2005). *The impact of demographic and labor force participation changes on the Social Security Disability Insurance and Medicare programs, a report to the Social Security Administration*. Washington, DC: Department of Health and Human Services.

Rimsza, M.E., Johnson, W.G., & Speicher, M. (2005). *The Arizona psychiatric physician workforce, part 1: The numbers of practicing psychiatrists 1992-2004*. Tempe, AZ: Center for Health Information & Research, L. William Seidman Research Institute, Arizona State University.

Community Reports

Johnson, W.G., Speicher, M.R. (2007). *Health insurance in Arizona part I: The children of Yuma county 1999-2004. A report to the community from Arizona HealthQuery, a community-university partnership*. Center for Health Information & Research, Arizona State University.

Rimsza, M.E., Bartels, A.M., & Bannister, W. (2006). *Emergency Department Visits: A report to the Maricopa County community from Arizona HealthQuery*. Tempe, AZ. Center for Health Information & Research, School of Computing and Informatics, Ira A. Fulton School of Engineering, Arizona State University.

Rimsza, M.E., Bartels, A.M., & Bannister, W. (2006). *Asthma in Maricopa County: A report to the Maricopa County community from Arizona HealthQuery*. Tempe, AZ. Center for Health Information & Research, L. William Seidman Research Institute, Arizona State University.

Rimsza, M.E., Johnson, W.G., Johnson, T.J., & White, R. (2004). *Kids and asthma: A report to the Yuma community*. School of Health Management & Policy, Arizona State University, Tempe.
(Recipient of the 2005 President's Medal for Social Embeddedness, Arizona State University)

Rimsza, M.E., Johnson, W.G., Garcy, A., & White, R. (2004). *Children with diabetes: A report to the Yuma community*. School of Health Management & Policy, Arizona State University, Tempe.

Rimsza, M.E., Johnson, W.G., Garcy, A., & White, R. (2004). *Children and thyroid disease: A report to the Yuma community*. School of Health Management & Policy, Arizona State University, Tempe.

Rimsza, M.E., Johnson, W.G., White, R., & Bannister, W. (2005). *Children with asthma: A report to the Maricopa County community*. School of Health Management & Policy, Arizona State University, Tempe.

Working Papers

Baldwin, M., Butler, R.J., Johnson, W.G., & Côté, P. *Self-reported severity measures as predictors of return-to-work outcomes in occupational back pain*. Tempe, AZ. Center for Health Information & Research, School of Computing and Informatics, Ira A. Fulton School of Engineering, Arizona State University.

Butler, R.J., & Johnson, W.G. *Alternative providers and satisfaction with low back pain care*. Tempe, AZ. Center for Health Information & Research, School of Computing and Informatics, Ira A. Fulton School of Engineering, Arizona State University.