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## BIOGRAPHICAL SKETCH

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NAME: Ward, Marcia M

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eRA COMMONS USER NAME (credential, e.g., agency login): WARDMM

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POSITION TITLE: Professor of Health Management and Policy

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EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Ohio State University	B.A.	05/1973	Human Neuropsychology and Psychophysiology
Ohio State University	M.A.	05/1976	Psychology
Ohio State University	Ph.D.	05/1981	Clinical Psychology

### A. Personal Statement

I have served as Director of the Center for Health Policy and Research in the College of Public Health at the University of Iowa for the past 10 years. Also, I have been a member of the RUPRI Center for Rural Health Policy Analysis since it moved to the University of Iowa in 2011. In addition, I serve as Director of the newly-funded Rural Telehealth Research Center. I have considerable experience coordinating large multi-disciplinary grants involving implementation and evaluation across multiple organizations. My 40-year career has encompassed 20 years at a non-profit research institute and 20 years at a research-intensive university. As such, over 75% of my time/effort has been on funded research and I have published over 120 peer-reviewed journal articles. My research interests focus on healthcare quality and rural health services and have encompassed a variety of methodological approaches including mixed methods, secondary data analysis, and primary methods involving survey design, observation, interviewing, and qualitative data processing and analysis. For example, recent projects involved qualitative evaluation of American Heart Association efforts to coordinate state-wide systems of care for chest pain and myocardial infarction patients in four states, analysis of rural hospital bypass using large discharge databases, and qualitative evaluation of implementation of team-based quality improvement initiatives in a dozen small hospitals. My recent research activities have focused on rural telehealth. I have been involved in evaluating telehealth/telemedicine applications for the past 8 years and have in-depth experience with researching tele-emergency implementation. In particular, I am leading the evaluation center to identify common metrics across hospitals implementing tele-emergency, co-chairing the NQF telehealth measures framework committee, and directing several projects through the Rural Telehealth Research Center. In terms of mentoring activities, I directed the PhD program in the Department of Health Management and Policy for 15 years and have chaired numerous dissertation committees. I am currently the identified mentor for two junior faculty in our department and am serving as a faculty mentor for a recent K awardee in the Department of Epidemiology. I will bring this combination of experiences, especially in tele-emergency services research, mixed-methods evaluation, and rural hospital patient safety to my involvement as co-investigator on this proposed project.

### B. Positions and Honors

#### Positions and Employment

1973-1976 Graduate Research Assistant, Psychophysiology and Endocrinology Research Laboratory, Department of Clinical Psychology, Ohio State University, Columbus, OH

1977-1978 Pre-doctoral Psychology Intern, Veterans Administration Hospital, San Francisco, CA

1978-1993 Senior Research Psychologist, Health Sciences Program, SRI International, Menlo Park, CA

1993-1997 Senior Research Consultant, Center for Health Sciences, SRI International, Menlo Park, CA

1996-1997 Associate Director, Center for Health Sciences, SRI International, Menlo Park, CA

1997-2006 Associate Professor, Department of Health Management and Policy, College of Public Health, University of Iowa, Iowa City, IA

1999-2014	Director, Doctoral Program, Department of Health Management and Policy, College of Public Health, University of Iowa, Iowa City, IA
2000-2006	Deputy Director, Center for Health Policy and Research, College of Public Health, University of Iowa, Iowa City, IA
2004-2006	Senior Scientist, Center for Research in the Implementation of Innovative Strategies for Practice (CRIISP), Iowa City VA Center of Excellence
2006-Present	Professor, Department of Health Management and Policy, College of Public Health, University of Iowa, Iowa City, IA
2007-2010	Associate Head, Department of Health Management and Policy, College of Public Health, University of Iowa, Iowa City, IA
2007-Present	Director, Center for Health Policy and Research, Department of Health Management and Policy, College of Public Health, University of Iowa, Iowa City, IA
2015-2019	Director, Telehealth Focused Rural Health Research Center, Department of Health Management and Policy, College of Public Health, University of Iowa, Iowa City, IA
2017-Present	Interim Head, Department of Health Management and Policy, College of Public Health, University of Iowa, Iowa City, IA

### **Recent Honors**

College of Public Health Faculty Research Award, 2016

College of Public Health Distinguished Faculty Lecture, 2017

University of Iowa Graduate College Outstanding Faculty Mentor Award nominee, 2017

University of Iowa Scholar of the Year Award nominee, 2018

## **C. Contribution to Science**

### **1. Telehealth/Telemedicine**

Most recently, my research has focused on evaluations of telehealth/telemedicine applications in rural hospitals and other healthcare settings. Through the recently funded HRSA cooperative agreement that formed our Rural Telehealth Research Center, we have had the opportunity to conduct multiple projects each year the help HRSA build the evidence base for telehealth. I recently published a systematic literature review of tele-emergency research papers including a classification of three types of applications. We are currently using a similar approach to identify measures applicable for telehealth in school-based health clinics.

- Mohr N, Harland K, Chrischilles E, Shane D, Bell A, **Ward MM**. Emergency department telemedicine is used for more severely injured rural trauma patients, but does not decrease transfer: A cohort study. *Academic Emergency Medicine*. 24: 177-185, 2017.
- Ward MM**, Jaana M, Natafqi N. Systematic review of telemedicine applications in emergency rooms. *International Journal of Medical Informatics*, Published online May 22, 2015, <http://dx.doi.org/10.1016/ijmedinf.2015.05.009>, 2015.
- Natafqi N, Shane D, Ullrich F, MacKinney AC, Bell A, **Ward MM**, Using tele-emergency to avoid patient transfers in rural emergency department: An assessment of costs and benefits. *J of Telemedicine and Telecare* (in press).
- MacKinney AC, **Ward MM**, Ullrich F, Ayyagari P, Bell A, Mueller KJ. The business case for tele-emergency. *Telemedicine and e-Health*. 21(12): DOI: 10.1089/tmj.2014.0241, 2015.

### **2. Mixed Methods Research Approaches**

In addition to teaching a PhD level course on mixed methods and primary data collection, my research has evolved over the past decade to embrace mixed methods approaches. We made use of this approach in our early publications on telehealth applications. Our evaluations of telehealth/telemedicine applications in the Avera Health system have afforded us the opportunity to examine effects of implementation in a large network of critical access hospitals. In particular, we have examined multiple factors related to telemedicine use in emergency departments including its effect on physician recruitment and retention, community perceptions of benefits, clinical and administrative staff views of care processes and quality, relationship to patient diagnosis and transfer, and the business case for tele-emergency. A paper I recently led showed that tele-emergency is activated for only 3.5% of emergency room patients, but that the activation occurs for patients needing immediate attention for serious conditions (e.g., stroke, chest pain, trauma) and prompt transfer to regional referral hospitals. Using a mixed methods approach to examine secondary data from electronic medical records plus interviewees at hospitals that implemented tele-emergency demonstrated the merits of mixed

methods approaches, where the interviews explicated the patterns that were observed in the electronic medical record data.

- a. Mueller KJ, Potter AJ, MacKinney AC, **Ward MM**. Lessons from tele-emergency: Improving care quality and health outcomes by expanding the care team and supporting rural care systems *Health Affairs*. 33(2): 228-234, 2013.
- b. Potter AJ, Mueller KJ, MacKinney AC, **Ward MM**. Effect of tele-emergency services on recruitment and retention of US rural physicians. *Rural and Remote Health*, 14: 2787, 2014. PMID: 25115747
- c. **Ward MM**, Ullrich F, Potter AJ, MacKinney AC, Kappel S, Mueller KJ. Factors affecting staff perceptions of tele-ICU service in rural hospitals. *Telemedicine and e-Health*, 21(6): 459-466, 2015. PMID: 25734922
- d. **Ward MM**, Ullrich F, MacKinney AC, Bell A, Shipp S, Mueller KJ. Tele-emergency utilization: In what clinical situations is tele-emergency activated? *Journal of Telemedicine and Telecare*, 22(1): 25-31, 2016.

### **3. Quality Improvement and Implementation Science in Rural Critical Access Hospitals**

I have also worked for many years on projects examining rural critical access hospital efforts dedicated to improving healthcare quality and patient safety. Early studies examined organizational factors affecting processes and outcomes. Other studies examined the process of implementing electronic medical records and clinical information systems. I received funding from the American Heart Association to examine the process and outcomes of their Mission: Lifeline program in four north-central states which is a national effort to develop systems of care for patients with myocardial infarction. Recently, through grant support from the Agency for Healthcare Research and Quality, I lead projects to examine TeamSTEPPS implementation in 17 critical access hospitals. Our work is noteworthy because we are incorporating mixed methods – the combination of qualitative and quantitative analysis – to explicate factors that affect adoption of these evidence-based change management approaches in small rural hospitals.

- a. Natafji N, Zhu X, Baloh J, Vellinga K, Vaughn T, **Ward MM**. Critical access hospital use of TeamSTEPPS to implement shift-change handoff communication. *Journal of Nursing Care Quality*. 32(1): 77-86, 2017.
- b. **Ward MM**, Zhu, X, Lampman M, Stewart G. TeamSTEPPS training in community hospitals. Adherence to recommended approaches. *International Journal of Health Care Quality Assurance*, 28(3): 234-244, 2015
- c. **Ward MM**, Baloh J, Zhu X, Stewart GL. Promoting Action on Research Implementation in Health Services framework applied to TeamSTEPPS implementation in small rural hospitals. *Health Care Management Review*, 42(1): 2-13, 2017.
- d. Zhu X, Baloh J, **Ward MM**, Stewart G. Deliberation makes a difference: Preparation strategies for TeamSTEPPS implementation in small and rural hospitals. *Medical Care Research and Review*. 73(3): 283-307, 2016.

### **4. Health Information Technology Applications in Rural Hospitals**

Preceding my work in telehealth/telemedicine, I worked extensively to evaluate health information technology applications in rural hospitals. I led a group of faculty and student researchers that published more studies examining health information technology in critical access hospitals during that period than any other group.

- a. Roberts LL, **Ward MM**, Brokel JM, Wakefield DS, Crandall DK, Conlon P. Impact of health information technology on detection of potential adverse drug events at the ordering stage. *American Hospital-System Pharmacy Systems*, 67: 1838-1846, 2010.
- b. **Ward MM**, Vartak S, Schwichtenberg T, Wakefield DS. Nurses' perceptions of how clinical information system implementation affects workflow and patient care. *Computer Informatics and Nursing Journal*, 29(9): 502-511, 2011.
- c. Jaana M, **Ward MM**, Bahensky J. EMR and clinical IS implementation in hospitals: A statewide survey. *Journal of Rural Health*, 28(1): 34-43, 2012.
- d. **Ward MM**, Vartak S, Loes J, O'Brien J, Mills T, Halbesleben JR, Wakefield DS. CAH staff perceptions of patient care processes and quality before and after implementation of a comprehensive clinical information system implementation. *American Journal of Managed Care*, 18(5): 244-252, 2012.

### **5. Health Outcomes Analysis in Large Databases**

Much of my work supervising PhD students and mentees over the past decade has involved analysis of large healthcare utilization databases to examine organizational factors affecting patient outcomes. For these

projects we often combined datasets from the AHRQ Healthcare Cost and Utilization Project (HCUP) including the Nationwide Inpatient Survey and multiple State Inpatient Databases (SID) with the American Hospital Association annual survey datasets and other public-use datasets. Many of our papers contributed substantially new findings. An analysis of the SID from Iowa using instrumental variable analysis showed that high unadjusted mortality rates following myocardial infarction in rural hospitals were attributable to patients not transferring to urban hospitals for procedures, either due to poor clinical appropriateness or patient choice rather than quality of care issues. Our work demonstrated that administrative databases can be used to answer important clinical questions if care is taken to frame the research question and analysis appropriately.

- a. Mohr NM, Harland KK, Shane DM, Ahmed A, Fuller BM, **Ward MM**, Torner JC. Rural patients with severe sepsis or septic shock who bypass rural hospitals have increased mortality: An instrumental variables approach. *Critical Care Medicine*. 45: 85-93, 2017.
- b. Weigel P, Ullrich F, Finegan C, **Ward MM**. Rural bypass for elective surgical procedures *Journal of Rural Health*, 33(2): 135-145, 2017.
- c. Natafji N, Baloh J, Weigel P, Ullrich F, **Ward MM**. Surgical patient safety outcomes in critical access hospitals: How do they compare? *Journal of Rural Health*, 33(2): 117-126, 2017.
- d. Weigel P, Ullrich F, **Ward MM**. Rural bypass of critical access hospitals in Iowa: Do visiting surgical specialists make a difference? *Journal of Rural Health*, 34(S1): s21-s29, 2018.

**Complete List of Published Work in My Bibliography:**

<http://www.ncbi.nlm.nih.gov/pubmed?term=Marcia+M+Ward&cmd=DetailsSearch>

**D. Research Support**

**Ongoing Research Support (selected)**

<p>1 U1CRH29074 US Department of Health &amp; Human Services, HRSA Telehealth Focused Rural Health Research Center – Cooperative Agreement Program The goal of this cooperative agreement is to establish the Telehealth Focused Rural Health Research Center-Cooperative Agreement Program at the University of Iowa in collaboration with the University of North Carolina-Chapel Hill and the University of Southern Maine. Role: PI</p>	<p>Ward (PI)</p>	<p>2015 – 2019</p>
<p>Robert Wood Johnson Foundation (Zhu, Xi) Building a Local Culture of Health: The Roles of Rural Communities and Hospitals To lead a special effort to research community and health-system characteristics that contribute to building and sustaining a local Culture of Health in rural communities. Role: Co-I</p>	<p>Zhu (PI)</p>	<p>2015 – 2017</p>

**Completed Research Support (selected)**

<p>5 U1 CRH20419-02 (Mueller, Keith) US Department of Health &amp; Human Services, HRSA Rural Health Research Center – Cooperative Agreement Program To establish the Rural Health Research Center-Cooperative Agreement Program at University of Iowa--RUPRI Center. I am responsible for leading sub-projects. Role: Co-I</p>	<p>Mueller (PI)</p>	<p>2012 – 2016</p>
<p>1 R18 HS018396-01A1 Agency for Healthcare Research and Quality Evaluation of TeamSTEPPS Implementation for Community Hospital Patient Safety This grant retrospectively and prospectively evaluates in community hospitals the elements of the TeamSTEPPS approach to identify the factors that are most important for success. Role: PI</p>	<p>Ward (PI)</p>	<p>2010 – 2016</p>
<p>The Leona M. and Harry B. Helmsley Charitable Trust Assessing the Impact of e-Health Services in Rural Settings</p>	<p>Ward (PI)</p>	<p>2011 – 2015</p>

This project determined the impacts of e-health care in Avera Health hospitals on the delivery of services, patient satisfaction, provider use, and cost of care.

Role: PI

American Heart Association – Midwest Affiliate                                      Ward (PI)                                      2012 – 2016  
Program Evaluation of AHA’s STEMI Program in Rural Minnesota

This project conducts a qualitative evaluation of the state-wide system of care for chest pain and acute myocardial infarction care from emergency responders to intervening hospitals.

Role: PI

American Heart Association – Southwest Affiliate                                      Ward (PI)                                      2012 – 2015  
Program Evaluation of AHA’s STEMI Program in Wyoming

This project conducted a qualitative evaluation of the state-wide system of care for chest pain and acute myocardial infarction care from emergency responders to intervening hospitals.

Role: PI

American Heart Association – Midwest Affiliate                                      Ward (PI)                                      2012 – 2014  
Program Evaluation of AHA’s STEMI Program in North Dakota

This project conducted a qualitative evaluation of the state-wide system of care for chest pain and acute myocardial infarction care from emergency responders to intervening hospitals.

Role: PI

American Heart Association – Midwest Affiliate                                      Ward (PI)                                      2011 – 2014  
Program Evaluation of AHA’s STEMI Program in South Dakota

This project conducted a qualitative evaluation of the state-wide system of care for chest pain and acute myocardial infarction care from emergency responders to intervening hospitals.

Role: PI

American Society of Clinical Oncology                                      Ward (PI)                                      2010 – 2013  
ASCO Study of Geographical Access to Oncology Care

This project analyzed the supply and demand for oncology services in a specific geographic area and identified factors related to travel for treatment by chemotherapy, radiation, and also non-treatment.

Role: PI

HHS 29020060002                                      Ward (PI)                                      2006 – 2013

Agency for Healthcare Research and Quality  
Accelerating Changes and Transformation in Organizations and Networks (ACTION)

Aim was to develop and diffuse scientific evidence about what does and does not work to improve health care delivery systems through a series of specific task orders.

Role: PI