



## Major article

# Institutional origins of health care—associated infection knowledge: Lessons from an analysis of articles about methicillin-resistant *Staphylococcus aureus* published in leading biomedical journals from 1960–2009



Fabio Rojas PhD<sup>a,\*</sup>, W. Carson Byrd PhD<sup>b</sup>, Sanjay Saint MD, MPH<sup>c,d,e</sup>

<sup>a</sup> Department of Sociology, Indiana University, Bloomington, IL

<sup>b</sup> Department of Pan-African Studies, University of Louisville, Louisville, KY

<sup>c</sup> Hospital Outcomes Program of Excellence, Department of Veterans Affairs, Ann Arbor Healthcare System, Ann Arbor, MI

<sup>d</sup> Department of Internal Medicine, University of Michigan Medical School, Ann Arbor, MI

<sup>e</sup> Department of Veterans Affairs/University of Michigan Patient Safety Enhancement Program, Ann Arbor, MI

## Key Words:

Methicillin-resistant *Staphylococcus aureus*

Citation analysis

Biomedical research

Databases

History

Organizations

**Background:** Biomedical research journals are important because peer reviewed research is viewed as more legitimate and trustworthy than non-peer reviewed work. Therefore, it is important to know how knowledge transmitted through academic biomedical journals is produced. This article asks if some organizations are more likely to produce research than others and if organizational setting is linked with an article's impact, as measured by citation counts.

**Methods:** Using research on methicillin-resistant *Staphylococcus aureus* (MRSA) as a case study, we examined the role that hospitals, universities, public health agencies, and other organizations have in shaping an emerging research area. We collected public data on the organizational affiliations of researchers who authored 1,721 articles in general interest and selected specialty journals.

**Results:** MRSA research appears to have evolved in stages that require the participation of different types of organizations. Additionally, our analyses indicate that an author's organizational affiliation predicts citation counts, even when controlling for other factors.

**Conclusion:** Organizations vary greatly in their ability to produce research, and this should be taken into account by those who manage or award funds to research organizations.

Copyright © 2015 by the Association for Professionals in Infection Control and Epidemiology, Inc.

Published by Elsevier Inc. All rights reserved.

\* Address correspondence to Fabio Rojas, PhD, Department of Sociology, Indiana University, Ballantine Hall 744, 1020 E Kirkwood Ave, Bloomington, IN 47405.

E-mail address: [frojas@indiana.edu](mailto:frojas@indiana.edu) (F. Rojas).

Funding/support: This work was supported by the Robert Wood Johnson Foundation while the first author was a Robert Wood Johnson Foundation Scholar in Health Policy Research. We received financial support from the College of Arts and Sciences at Indiana University, The Robert Wood Johnson Foundation, and Department of Internal Medicine at the University of Michigan.

Potential conflicts of interest: Dr. Rojas has received honoraria and speaking fees for lecturing at various universities and private organizations on the subject of organizational change. Dr. Byrd has no conflicts of interest to disclose. Dr. Saint has received numerous honoraria and speaking fees from academic medical centers, hospitals, group-purchasing organizations (eg, Veterans Health Administration, Premier), specialty societies, state-based hospital associations, and nonprofit foundations (eg, Michigan Health and Hospital Association, Institute for Healthcare Improvement) for lectures about catheter-associated urinary tract infection, leadership and followership, and implementation science.

Every year, public agencies, medical schools, and for-profit firms spend billions of dollars on biomedical research that creates the knowledge used in clinical practice. For this reason, health policy scholars examine the institutional underpinnings of medical knowledge. For example, researchers explore the knowledge produced at for-profit firms compared with nonprofit agencies to determine whether private funding of university biomedical research undermines the integrity of the research process.<sup>1–3</sup> The historical and sociological literature on biomedical research asks how personal interests, laboratory conditions, and scientists' social background shapes what they research.<sup>4–6</sup> In contrast, less is known about whether some organizations have an advantage in producing biomedical research and publications. Little is known about how the setting of biomedical research (eg, university medical schools vs public health agencies) leads to systematic differences in the volume and impact of research.

We address this issue by comparing the scientific output (in the form of publications) from organizations that produce biomedical research. Because studying the entirety of biomedical research is untenable, we focus on one area: the study of methicillin-resistant *Staphylococcus aureus* (MRSA). We chose MRSA research for both substantive and methodological reasons. Substantively, MRSA and other health care-associated infections (HAIs) are a known threat to public health, with thousands of people injured or killed each year by MRSA and other antibiotic-resistant infections.<sup>7</sup> Methodologically, examining MRSA research is beneficial because of the field's relatively low barriers to entry; MRSA research does not always require the financial or bureaucratic resources associated with the most well-endowed research universities.

In the remainder of this article, we briefly discuss the MRSA research area and the organizations that produce MRSA research. Then we present an analysis of the MRSA literature published in leading journals from 1960-2009. Through a 3-pronged analysis, we discovered that MRSA research evolved in distinct phases requiring organizations of varying research capacity. We also show that hospital- and university-based researchers produce more highly cited articles.

## FIELD OF BIOMEDICAL RESEARCH

Biomedical research exists in a variety of settings ranging from solo medical practitioners who may report case studies to major government institutions, such as the Centers for Disease Control and Prevention (CDC), which conduct large, complex studies. In the United States, the rise of medical research is synonymous with the growth of institutions, such as medical schools; academic departments that specialize in human biology, biochemistry, and medicine; and government agencies (eg, National Institutes of Health) that fund, evaluate, and disseminate research findings. The for-profit sector generates a great deal of research as well, especially companies producing drugs and medical devices. As a result of for-profit sector growth and its influence on academia, the literature now documents differences between research generated in for-profit and that produced in nonprofit environments. Additionally, a robust debate exists about the effects of private funding on research findings.<sup>3,8</sup>

This brief description of the biomedical research field omits 2 important factors motivating the research presented in this article. First, an organization's role in research changes over time because there is a research cycle.<sup>9,10</sup> Those resources that are needed for a newly created specialty are different than those needed for long-standing mature fields. This suggests that the organizational context of research might change as a result. Young research specialties are more open to unaffiliated scientists, whereas researchers affiliated with institutions that can support large and ambitious research projects may dominate more mature specialties.

Second, the content of the research also influences whether some organizations possess an advantage in conducting it. For example, highly complex medical procedures (eg, organ transplants) require enormous resources that only the largest universities and hospitals can provide. In contrast, other fields require minimal resources to study (eg, MRSA research), which often revolve around disease control strategies that require resources that are available to many researchers, not only those in leading medical centers or teaching hospitals. An independent researcher, for example, that wishes to conduct research on a hand hygiene intervention and subsequently publish the results does not require the formidable resources needed to develop pharmaceutical treatments and bring the results to publication.

## THE CASE: MRSA RESEARCH

MRSA has long been recognized as a major public health issue.<sup>11,12</sup> MRSA and other drug-resistant infections are responsible for thousands of patient deaths per year and billions of dollars in medical expenses.<sup>7,13</sup> Starting in the 1990s, researchers grew concerned over recently discovered community-based MRSA, which suggested that antibiotic-resistant infections were no longer an idiosyncratic feature of the hospital.<sup>14,15</sup> Research on the multiple strains of MRSA raised concerns among microbiologists, epidemiologists, and hospital infection specialists because some strains were resistant to even the most powerful antibiotics. Furthermore, there was a dramatic increase in the total number of MRSA infections in the United States. As a response to the proliferation of MRSA strains, community-based MRSA, and the resilience of MRSA to newer drugs, various public institutions and private foundations directed billions of dollars to the control, management, and prevention of the disease, leading to a dramatic increase in MRSA research.<sup>7,13,15,16</sup> Although enormous resources have been expended to study the basic science of the bacteria and infectious process, the conditions that facilitate and inhibit transmission of the bacteria, and the development of treatments for infected patients, little research addresses the institutional context of where these projects are conducted.

## METHODS

### *Study overview and search strategy*

To understand which organizations participate in MRSA research, we conducted an automated Medical Subject Headings (MeSH) term search of PubMed and collected data on the organization listed by authors as their institutional affiliation. We wrote a program that gathered data on MRSA from 1960-2009 using the MeSH tree number B03.510.400.790.750.100.500. The exact phrase for this number is "methicillin-resistant *Staphylococcus aureus*." Although there are broader *Staphylococcus* terms, our specific interest is in MRSA. The program was run through the Python language (Python Software Foundation, Beaverton, OR), and the data stored in Structured Query Language were then exported into Microsoft Excel (Microsoft Corp, Redmond, WA). We focused on MeSH terms because they indicate that the authors believed that the article substantially addressed MRSA. In contrast, we believe that searching the full text of an article could yield tangential mentions of MRSA. Our analysis focuses on articles that appeared in the following leading clinically oriented biomedical journals: *American Journal of Infection Control*, *Annals of Internal Medicine*, *Archives of Internal Medicine*, *British Medical Journal*, *Clinical Infectious Diseases*, *Infection Control and Hospital Epidemiology*, *Journal of Hospital Infection*, *Journal of the American Medical Association*, *Lancet*, and *New England Journal of Medicine*. These journals were selected by both expert guidance and impact scores. Our goal was to select journals that would have high impact and that would be read by professionals who deal with HAIs. Therefore, this is not a survey of all articles written on the topic of MRSA.

Our search generated 1,721 articles. The results included all items in PubMed indexed under the search term (ie, editorials, letters, complete research articles). We then extracted the article title, abstract, page numbers, names of all authors, and journal title. We used the lead author affiliation as a representation of where the research had been conducted. To extract this information, we had a team of undergraduate research assistants read all 1,721 articles. Unfortunately this could not be automated because PubMed, as with most other databases, does not consistently report author affiliations. Furthermore, we found that many names, in particular those from outside the United States, were incorrectly or

Download English Version:

<https://daneshyari.com/en/article/5867419>

Download Persian Version:

<https://daneshyari.com/article/5867419>

[Daneshyari.com](https://daneshyari.com)