



LIBRARIES

UNIVERSITY OF MINNESOTA

AN INFORMATION SCIENCE NEEDS
ASSESSMENT OF SCHOOL OF PUBLIC
HEALTH RESEARCHERS AT THE
UNIVERSITY OF MINNESOTA:
SUMMARY REPORT

Shanda L Hunt

University of Minnesota - Twin Cities, hunt0081@umn.edu

Caitlin J Bakker

University of Minnesota - Twin Cities, cjbakker@umn.edu

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Introduction

Beginning in Fall 2016, the University of Minnesota joined with six other institutions to participate in an Ithaka S+R study investigating the information needs and behaviors of public health researchers. Ithaka S+R is a non-profit organization that "helps the academic community navigate economic and technological change."¹ The organization is divided into two programs: Educational Transformation and Libraries & Scholarly Communication. Since 2012, the Libraries & Scholarly Communication program has been engaging in multi-site research projects to produce reports in a range of scholarly disciplines.

This report will outline information behaviors, including information seeking and organization, data management practices, publishing and dissemination activities, and research challenges and opportunities. The information in this report is a summary of the data collected at the University of Minnesota only.

The School of Public Health

The UMN SPH is one of the first public health programs offered in the United States² and is ranked 8th in the nation.³ Today SPH offers 21 master's degrees and 4 doctoral degrees in four divisions: Biostatistics, Environmental Health Sciences, Epidemiology & Community Health, and Health Policy & Management. There are also 25 established training and research centers housed in SPH. There are over 130 award-winning international faculty.⁴

Methodology

Participants were recruited through convenience sampling. The recruitment list was downloaded from the UMN School of Public Health's list of faculty members, which included assistant, associate, and full professors. We sent email invitations to the first 20 faculty from each of the four SPH divisions on the list. Of the 80 faculty invited to participate, 24 said yes (See Table 1), six said no due to time constraints ($n=5$) or no research experience ($n=1$), and 50 never responded.

When participants agreed to an interview, they were scheduled for a one-hour meeting with one of the authors. There was no incentive. All interviews were conducted in the office of the participant or a nearby conference room. Interviews were collected from November 2016 - January 2017, digitally audio recorded, and lasted 19 - 71 minutes. Audio files were sent to a professional online transcription company. The semi-structured interview instrument was developed by Ithaka S+R and focused broadly on four areas: research focus, research methods, dissemination practices, and the future state of the public health field. They consulted with library scientists from the Medical Library Association and public health professionals from the American Public Health Association in order to develop a comprehensive

¹ <http://www.sr.ithaka.org/about/>

² <https://www.ncbi.nlm.nih.gov/books/NBK221176/>

³ <https://www.usnews.com/best-graduate-schools/top-health-schools/public-health-rankings>

⁴ <http://www.sph.umn.edu/>

and relevant survey. The UMN investigators made small revisions to three questions and added a question on researcher self-promotion (See Appendix A).

Qualitative analyses were conducted using NVivo 11 Pro. Four interviews were independently coded by both authors, using line-by-line open coding, after which coding agreement was assessed and a coding scheme developed. All transcripts and field notes were independently coded by both authors. The two NVivo Pro databases were merged, which showed great accordance between coders. The authors then pulled emergent themes from the data. An exempt application was submitted to the UMN's Institutional Review Board (IRB) on August 1, 2016. The IRB subsequently determined that this project did not qualify as human subjects research and had no further obligations to the IRB. Funding was provided by the University of Minnesota Libraries.

Table 1. Distribution of Interview Participants

Department	Assistant Professor	Associate Professor	Full Professor	Total	
				(n)	(%)
Biostatistics	2	1	1	4	17
Environmental Health	1	2	3	6	25
Epidemiology & Community Health	0	4	5	9	38
Health Policy & Management	1	1	3	5	21
Total (n)	4	8	12		
Total (%)	17	33	50		

Findings

Research Processes

“Public health promotes and protects the health of people and the communities where they live, learn, work and play.”⁵ With such a broad field of study, the research foci are multifarious. The 24 participants in this study each had their own public health passion, and many worked on more than one project at a time (up to seven). Their research areas included, but were not limited to, tobacco use in Native American communities, health promotion in African American male youth, alcohol establishment zoning, healthcare administration systems, tick-borne diseases, health communication via social media, and hydraulic fracturing.

There is a great deal of collaboration that happens in public health research; as most participants stated, public health is, by its very nature, interdisciplinary (See Table 2). Most partnerships were formed with researchers from their own division, the SPH, departments across the UMN, and other universities, in that order of frequency -- although, the partnerships with researchers from other universities often formed at the UMN prior to one partner leaving for another institution. The collaborations could be small, including only one research team, to very large, as in multi-center consortiums. Public health researchers also frequently partnered with local and national health departments as well as local and state agencies. Less frequently, they partnered with community members to conduct community-engaged participatory research.

Table 2. Disciplines of Public Health Researchers’ Collaborators

Medicine	7	Psychology	7
Sociology	5	Biostatistics	4
Epidemiology	3	Microbiology	3
Statistics	3	Agriculture	2
Animal Science	2	Chemistry	2
Environmental Health	2	Family Medicine	2
Health Economics	2	Journalism	2
Neurology	2	Biochemistry	1
Bioinformatics	1	Cardiology	1
Civil Engineering	1	Communications	1
Demography	1	Economics	1
Education	1	Energy Policy	1

⁵ American Public Health Association. (2017). What is public health? Retrieved from <https://www.apha.org/what-is-public-health>

Entomology	1
Industrial Hygiene	1
Lab Medicine	1
Management	1
Mental Health	1
Nutrition	1
Occupational Medicine	1
Health Policy	1
Psychometrics	1
Radiology	1
Social Work	1
Veterinary Medicine	1

Genomics	1
Infectious Diseases	1
Law	1
Mathematics	1
Nursing	1
Obesity	1
Pediatrics	1
Political Science	1
Public Affairs	1
Social and Behavioral Science	1
Sports Medicine	1
Virology	1

Relationships with potential collaborators developed organically -- at meetings, conferences, and forums. Researchers reported that they relied on word-of-mouth for finding new collaborators. The teamwork approach to public health research was valued and appreciated by participants. There were clear role definitions and each member brought their own expertise to the effort. Some took full advantage of the opportunities provided by cross-disciplinary collaborations, formally sharing their knowledge as part of the team experience.

There were some who felt that interdisciplinary collaborations were ideal, but perhaps not practical or as frequent as they could be. One participant suggested more formal training on interdisciplinary science as part of the public health education process as a means of teaching students how to establish connections in their future careers. This participant cited the difficulties in breaking historical ties and imagining new ones. Participants also acknowledged that collaborations with community partners were too infrequent, most likely due to the time it requires to establish relationships with community members, and that community-driven science should be a priority and approached with intention.

The research methods of the participants were as varied as their research foci and disciplinary backgrounds (See Table 3).

Table 3. Research Methodologies of Participants

Secondary data analysis, including systematic reviews	10
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Surveys	8
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Lab experiments, including animal studies	7
Randomized trials	6
Modeling, including computer modeling	5
Mixed methods	4
Content/text analysis	2
Ethnography	1

Observational studies	7
Focus groups	5
Interviews	4
Fieldwork	3
Genetics or genomics	2

Information Retrieval & Organization

Information Seeking Behaviors

Participants sought out various types of information throughout the research lifecycle. They conducted literature reviews to scan for existing studies, identify gaps in the research, and contextualize their own results. They also conducted task-specific targeted searches (e.g., search for measurement instruments or methodologies). A common thread was that they worried they would miss an important study that would impact their grant and publication submissions.

The frequency of literature searching was dependent on the researcher's familiarity with the topic. The literature search was not always considered essential to the research process. Some participants had been working in the same research area for decades, so they relied on their existing knowledge and articles they had kept from long ago. Others were part of a research team that included a subject expert, so they relied on that person for information retrieval. In addition to literature, participants sought out data sources including health statistics and datasets.

Researchers often relied on the reference lists of their or others papers to identify relevant articles rather than engaging in an active literature search. Although one researcher was familiar with subject headings, most engaged with more passive information retrieval activities. Several researchers noted having tables of contents from bibliographic databases sent to them, or having suggestions based on their Google Scholar profiles. Less than a handful of participants discussed search strategies.

Public health researchers utilized a variety of subscription and non-subscription sources for their information needs. They cited PubMed, Google Scholar, and Google as their most frequently used information sources. Some researchers explored subscription databases such as SciFinder, Ovid MEDLINE, and PsycINFO. Researchers placed a high value on grey literature, and they accessed it in a variety of ways. Their sources included, but were not limited to, community partners, funding agencies, health organizations, tables of contents, national archives, Wikipedia, and social media. Some did speak of the difficulties in knowing how and where to look for unpublished information, especially in terms of searching for data sources.

Participants were asked what kinds of challenges they faced in information seeking. The majority said not being able to access a specific article they needed. Some were aware that they could make requests for the publication via Interlibrary Loan (ILL) and others asked colleagues at other institutions to access it for them. Most, however, said they simply gave up once they realized the UMN did not have access to that particular article.

Information Organization Strategies

Once researchers obtained the information they sought, most organized it using a citation management tool -- EndNote and Mendeley being the most popular. There were mixed reviews on the functionality of these tools. Some found them to be “bulky” and not user friendly, while others liked their versatility.

Some participants talked about losing all of their research in the past with the discontinuation of a citation manager. Those researchers were hesitant to learn a new system. A significant number of participants used their own literature filing system on their computers. A few were able to describe sophisticated file naming conventions, some created their own databases using a tool like Microsoft Excel, one used her email, and another stated: “I think I’m using the desktop.” No one reported being completely satisfied with any of their organization methods.

Throughout our discussions with researchers on information seeking and organizing, they expressed a desire and willingness to learn more given the opportunity and time. Several participants had sought one-on-one help from a librarian on topics ranging from how to select Medical Subject Headings (MeSH) to developing search strategies to track research center success. Participants also noted that they had not set foot in the library’s physical space in years. They felt that the age of electronic access to information has created a divide between the libraries and researchers.

Working as an Interdisciplinary Research Team

Researchers utilized a variety of ways to communicate and interact during the research process. The collaborative nature of public health research demanded a variety of tools and strategies to communicate with partners.

Meetings

There was a blend of in-person and virtual meetings. For virtual meetings, researchers used GoToMeeting, WebEx, and Skype.

Data Storage

A combination of storage media were used: university or department servers, personal computers, flash drives, Microsoft Access (even though the tool is not meant for data storage), NetFiles (UMN resource no longer in existence), Dropbox, and Google Drive. Large, multi-site projects implemented more

sophisticated data management strategies, featuring coordinating centers and distributed databases to ensure backup and data integrity. International collaborations were seen as particularly complicated, as the data needed to be contained in a certain geographic location or was subjected to additional security considerations. Smaller projects tended to employ less elaborate strategies and relied on local infrastructure.

Problems emerged regarding data storage and management. One researcher noted that she lost all of her old work because it had been stored on UMN NetFiles and managed by a study coordinator who no longer worked with her. When NetFiles was discontinued, she could not access her old work. Similarly, a faculty member was working with a graduate student who stopped communicating with her when they finished their program but prior to project completion. As the principal investigator (PI), she needed to take over data management, but could not locate the information she needed.

Data Analysis

Few public health researchers work entirely with qualitative or quantitative data, or wholly with mixed methods. Their research data often challenged strict definitions of data types, with one researcher working with animal models referring to her data as both "quantitative" and "descriptive." Spreadsheets were the most commonly used format. Tools for analysis were more diverse, with participants referencing SAS, R, SPSS, MATLAB, and NVivo. One researcher mentioned the need to use multiple tools, stating: "I have to use regularly three or four or five in my everyday life because none of them are complete."

Data Sharing

Sharing data throughout the analysis process was a more complicated issue. At times they used their storage tools for sharing (e.g., Google Drive), but other times they would transfer files via File Transfer Protocol (FTP) or through e-mail. There was evidence that researchers were resistant to learn the new tools as they emerged with new-career researchers being more open to switching tools, showing a possible trend in the acceptance of new technologies by new researchers versus senior researchers. Most participants named email as the most common way to share projects. De-identification of human subjects data always took place prior to sharing. Full professor participants sometimes had their administrative assistants share data on their behalf and were unsure what methods were used in that process.

While data sharing was generally viewed positively, some challenges were noted. One participant felt that keeping track of datasets that were shared was difficult – he wondered if the recipient still had the data, if they would respond to requests to return the data, and if they would protect the data, especially if they are at another institution. Another researcher who coordinated with a local hospital had issues with their firewall during the data sharing process. Finally, depending on the type of sharing tool that researchers needed, cost of the tool was a prohibitive factor.

Data Archiving

Participants frequently kept their research data indefinitely. When they indicated that they did destroy data, the timeline for destruction was ambiguous (i.e., 3-5 years, eventually, study end, once published, never thought about it). While the data is retained, it is rarely revisited or reanalyzed. The retention is largely precautionary, with one researcher noting that "there's always this like slight anxiety that someday someone will ask me like 'how did you get that result?' and I would like to be able to say how I got that result." Several participants equated data storage to "hoarding," perhaps signifying that they do not see value in data preservation. In contrast, other participants said data was "invaluable," "gold," or "useful 100 years later".

Research Outputs

Journal Selection and Article Publication

It was clear that public health researchers published their research via traditional methods. Their research articles were published in peer-reviewed journals, with priority placed on journals that were "top tier", had high impact factors, reached the desired audience, and published related articles. This selection process was related to the promotion system set up within the SPH. In order to achieve promotion and tenure, faculty must prove their research impact, and they use publication in particular journals to do so. Secondary factors in selecting a journal were innovation of the article, turnaround time, and word limit.

While researchers felt comfortable with traditional publishing, they expressed some limitations. Some found the different submission requirements for each journal to be "cumbersome and unpleasant". They expressed a desire for a standardized submission process. Some struggled with selecting the best journal for their research, wondering if there was a "master list" they could refer to. One faculty noted the challenge of lengthy review processes, recalling a submission that went through a three year revision process.

Faculty had mixed feelings about impact factor as a measurement of journal quality and its value in the journal selection process. Some pointed out that there were few journals with high impact factors in their subdisciplines. However, some researchers indicate that they did consider impact factor when selecting journals, with one noting that "impact factor is a reflection of our view of the journal." One faculty member was on a self-proclaimed solo mission to change the entire system of journal rankings to one more focused on risk of bias. In any case, faculty members recognized that the publishing landscape is changing and weren't sure how to navigate a new system without a clear hierarchy.

A few researchers were experimenting with other ways to publish their work. A few published their work on personal websites, but they struggled with maintaining an updated site. A few had been reviewers and one faculty member was an editor. Many had some level of experience with open access publishing.

Open Access and Publishing Structures

Most researchers had submitted at least one open access article,⁶ although someone else on their research team may have made the decision to do so. There were mixed impressions: some were very happy with the review process and production, while others felt distrust for the review process. They were concerned about unblinded review, credibility of the reviewers, and relaxed standards for acceptance. There were concerns about how publishing open access would affect their opportunities for career advancement, particularly in the promotion and tenure process.

Above all else, researchers were deterred by the fees associated with publishing in an open access journal. At worst, they described the fees as “insulting” and “hilarious”. Still, some were determined to make their work available in open access journals in order to reach the broadest audience possible. They utilized discretionary, grant, division, and startup funds to pay the fees. One faculty member put aside the money she earned as a consultant for the purpose of paying open access fees. While publishing in open access journals was divisive, a few faculty mentioned making their preprints available through repositories, particularly bepress and arXiv.

Participants also seemed to both misunderstand and distrust the funding structures of publishers. As stated, they did not feel the fees associated with open access publishing were justified, but they also could not comprehend how the publishing companies were making any money at all -- they questioned the motivation of the publishers and editors. Some were advised by mentors or their departments not to publish anywhere that charged a fee. They were well aware of predatory and illegitimate journals and did not feel they could distinguish those from legitimate open access journals. While not many participants questioned the funding structure of traditional publishers, one faculty member defended their legitimacy by saying they made all their money with membership fees.

Whether participants preferred traditional publishing or experimenting with new methods, there seemed to be misunderstanding about author rights. A few researchers talked about publishing in a traditional journal, but then making the PDF of that article available on their faculty, division, or personal website in order to reach a broader audience -- whether or not the journal approved that output was not clear.

Dissemination Methods to Reach Various Stakeholders

Public health researchers placed value on disseminating their research findings beyond research article publications, and they did so via multiple avenues. Most commonly, they distributed their work through presentations at conferences, seminars, and webinars or in reports to funders, various stakeholders, and community partners. These are often tailored to the audience: “...we disseminate some findings from our formative research [in a newsletter], and then we feature an organization within the community that really dovetails nicely with the research findings.”

⁶ An open access article is one that is made immediately available online at no cost to end users. Users do not need to subscribe to the journal or purchase the article in order to have access. Open access publications may also be associated with more limited copyright and licensing restrictions.

At times the outputs were simply variations of publications (i.e., book chapters, books, white papers) and other times they were for the purpose of getting information out to the public (i.e., radio and print interviews, press releases, policy briefs). A few of our participants were statisticians and felt that sharing their code via repository was an important part of their work. A few researchers indicated that their projects had personalized websites that featured study results, interactive visualizations, and/or resources/tools.

Dissemination to the Greater Public

Researchers identified three areas of emerging avenues through which to share their work: social media, data sharing, and data visualization. While researchers were generally intrigued by the possibilities afforded by social media (e.g., Twitter), they wondered about who would manage such a campaign and what the associated costs might be (e.g., full time social media consultant).

Researchers made note of the possibility of sharing data sets underlying study results. Numerous motivations were offered, including funder agency requirements, journal requirements, or research replicability/transparency. A few had deposited their work in the Data Repository for the University of Minnesota (DRUM). While researchers did not express strong opinions on the data sharing process, they indicated that it was time consuming.

Finally, many researchers spoke about various ways to disseminate their results visually, noting that data visualization is of growing importance and interest. They wanted to be able to “tell a story” by summarizing results into a few images that are easily understood and interpreted. There was a spectrum of comfort with this concept. Some were attempting to create visuals with PowerPoint, Excel, Word, and Photoshop -- but most indicated that their creations were basic and they needed help from tech-savvy assistants or communications experts.

The researchers who were more invested in the concept--generally methodologists and statisticians--were utilizing programs such as MATLAB, SigmaPlot, and R, but they were self-taught in their visualizations. Many expressed a desire to learn more, specifically how to create user-friendly charts and graphs or a workshop on tools and best practices. Despite the great interest in data visualization, there were concerns that the subtle nuances of public health research could not be summarized in an infographic. One participant expressed interest in learning more, but worried that it was perhaps a passing fad.

Research Challenges and Opportunities

Participants were asked about both challenges and opportunities in the field of public health. There was no question that the biggest challenge they faced was funding. Waning resources have led to a very competitive grant environment, reduced support staff with high turnover rates, less time to produce quality publications, and conflicting obligations. Nearly all participants also cited a lack of time to accomplish all that they need to do.

While time and money were obvious sources of stress and concern, participants shared additional challenges for the field. They felt that people did not see the value of public health, that there has not been enough communication from the field to the public regarding the benefits of the absence of disease. As a result, they stated that the uptake of proven interventions was poor and policy recommendations ignored. They also had ethical concerns over training students -- future researchers -- in an environment where jobs may not be available to them as they graduate.

Traditional approaches to research were also questioned. Participants noted the need for more scientific rigor and reproducible research, despite the fact that much of public health research is observational. They saw the increased trend toward big data as both an opportunity and a challenge. On one hand, synthesizing data was viewed as forward thinking, but participants also worried they were not prepared to work with this new data technology. Statisticians cited the lack of computing strength as one of those barriers.

Finally, participants saw the need for new partnerships that could prove to be challenging. One researcher felt that public health academics tend to reject economic theories, yet several participants stated there must be more cost/benefit analyses in the future of public health. A number of participants also foresaw the need to partner with corporate entities, which is counter-intuitive to most public health researchers -- public health is about the greater good versus making a profit.

Not only did participants see hope and opportunity for the future, they demonstrated some creative solutions to the problems they were facing. One research team, as part of a coalition, was preparing the other members to continue public health work within communities after the grant funding ended. Another faculty member conducted her own unfunded pilot studies in order to present background work for new grants. When asked how she got fellow faculty to work with her on these projects, she said she simply asked them nicely. Many faculty expressed excitement for up-and-coming topics specific to the work they do, but they also spoke more broadly. They felt that team science was very important, especially with tighter funding structures. In order to facilitate the adoption of evidence-based practice, they felt that implementation and dissemination science were essential. They saw data visualization as a way to communicate to the public, and quasi-experiments and intervention research as a way to increase scientific rigor.

Conclusion

The participants were experienced researchers, some of whom exhibited strong information science skills. There was a broad range of skill levels, particularly in the area of information retrieval, and there were areas of misunderstanding and confusion, as seen in the researchers' assessment of the current publishing landscape and open access. Few participants were fully aware of the depth and breadth of librarian knowledge and skill sets, although many did express a desire for further skill development in information science. Public health faculty are in need of research support, both for their existing endeavors as well as in future activities, particularly in the current and projected funding environment. The authors of this summary report have conducted analyses of the data and are in the process of writing a manuscript for publication which makes recommendations for an information science response to the needs laid out here.

Appendix A: Interview Instrument

Research focus

1. Describe your current research focus or projects.
 - a. In what ways is your work interdisciplinary?

Research methods

2. What research methods do you currently use to conduct your research?
 - a. Are these methods typical for your field?
 - b. Do you collaborate with others as part of your research?
 - i. Tell me more about your collaborations.

Who

Division of work

How information is created and stored

3. What kinds of data does your research typically generate?
 - a. Tell me what your research outputs look like.
 - i. Do you think of how to present your data visually?
 - b. How do you manage and store your data?
 - i. For what purpose do you store your data?
 - ii. For how long do you store your data?
 - iii. Do you ever return to your old data for any reason?

4. When you are formulating a new research idea, what kinds of information do you rely on when doing your literature review?

- a. How do you locate this information?
 - b. How does information retrieval differ at the initial stages of research versus during the implementation or analysis phase?
 - c. How do you manage and store information for your ongoing use?
 - d. Do you experience any challenges with information retrieval?
5. Think about a past or ongoing research project where you faced challenges in researching the initial idea. Describe these challenges.
- a. What could have been done to mitigate these challenges?
 - b. Are there any other challenges you regularly experience when conducting research?
6. More broadly, what do you think the trends in public health research are?
- a. How do you keep up with trends?

Dissemination Practices

7. Where do you typically publish your research in terms of the kinds of publications and disciplines?
- a. What factors are important to you when choosing a journal?
 - b. Do you disseminate your research beyond scholarly publications?
 - i. Where?
 - ii. Why do you choose to publish via this venue?
 - c. Are your publishing practices typical for your public health researchers? Explain.
 - d. Have you ever made your publications available through open access?
 - i. If yes, what was your motivation for doing so?

What was the overall experience like for you?
 - ii. If no, why not?
8. Have you ever made your research data or materials available through open access?
- a. If yes, where did you make them available?
 - i. What was your motivation for doing so?

ii. What was the overall experience like for you?

b. If no, why not?

9. If used open access publishing for any materials, was there a charge? How was the cost paid for?

10. Throughout your career, how have you marketed yourself as a researcher?

a. Did you consciously think about how marketing yourself and dissemination of your work are linked?

Future State of the Field

11. What future challenges do you see for the broader field of Public Health?

a. What future opportunities do you see for the broader field of Public Health?

12. If you were to imagine any services or tools that could make your research and publication process smoother, what would that look like?

Follow-up

13. Is there anything else about your experiences as a public health scholar that you think it is important for me to know that was not covered in the previous questions?

Appendix B: Coding Scheme

Code	Definition
Broad Issues	broad social or political issues; beyond public health
Collaborative Partners	people and organizations that researchers collaborate with; how they came to be
Communication & Interaction	all communication strategies, including collaborative; communicating about research activities and self as researcher
Communicating Public Health to the Public	communicating public health issues to the public
Current Library Use	how researchers currently use the library
Data Management	how researchers are practicing all aspects of data management, including storage, archiving, sharing, staffing
Dissemination	formalized channels of dissemination, focused on traditional publication practices
Education & Training	individual or group education and training practices/backgrounds of researchers
Historical Library Use	how researchers have used the library in the past
Idea Generation	how new research ideas are formed
Impact & Assessment	how researchers assess their success and overall impact; individuals, groups, journals
Information Retrieval	sources of information; information seeking behaviors; barriers to information retrieval; lifecycle of information
Library Expectations	what researchers expect or want from an academic library
Organizing Information	the process of organizing any research information; citation management; file and folder organization
Research Focus	current or past research areas
Research Methods	loose definition of methodology; how they design and implement their studies
Research Outputs	strategies and processes for the production of research outputs; professional, academic, and nontraditional outputs
Research Timeline & Resources	various resources that go into conducting research, including time, money, personnel, etc.
Research Tools	tools to support research practices and structures, collaborative strategies, collaborative communication, day to day functioning; not methods
Teaching Activities	teaching and mentoring practices; how researchers support their students
Trends/Challenges	negative trends in public health; challenges in the field
Trends/Opportunities	positive trends in public health; opportunities in the field