



*Commentary*

**Collaborating to Increase the Evidence Base in Library and Information Practice**

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As I was thinking about EBL while preparing to come and give this talk, I started thinking about evidence based practice in general. I know you didn't come here for a history lesson, but I think we can learn something from a quick look at how EBP has evolved.

The most common early examples used when discussing EBM are from the nineteenth century: John Snow and Florence Nightingale. John Snow (Wikipedia, n.d.) is famous for figuring out that cholera was spread through water, eventually resulting in the famous pump map of the London cholera outbreak in 1854. In 1856, Florence Nightingale started pushing for changes in medical care, notably sanitation, to save the lives of soldiers and patients in hospitals, based on data collected during her work as a nurse during the Crimean War (McDonald, 2001). I have also seen references to

earlier medical research, especially epidemiology research.

When reviewing these early examples, I noticed that they really just applied the scientific method, which can be used by anyone (Nerdy Baby, 2017):

1. Make an observation
2. Form a hypothesis
3. Perform the experiment
4. Analyze the data
5. Report your findings
6. Invite others to reproduce the results

What we now recognize as evidence based medicine, including the familiar evidence pyramid (Wikimedia Commons, 2016), 5 A's (Ask, Acquire, Appraise, Apply, Assess, e.g. University of North Carolina Health Sciences

Library, 2016 ) and Venn diagrams showing EBM as the intersection of evidence, patient, and doctor expertise (Weill Cornell Medical College Medical Library, n.d.), involves more than just the scientific method. EBM involves systematically collecting all the research and literature on a particular clinical query together, and analyzing it to provide a complete picture and make a better decision on the care to provide a patient. Claridge and Fabian (2005) provide a good history of evidence based medicine and the term itself doesn't show use in Medline until 1993, then shows a linear increase in Medline citations starting in 1995.

Despite the fairly recent origin of EBM – or at least to me it seems recent since I remember learning about EBM in 1998 at a meeting of MEDLI, the Medical & Scientific Libraries of Long Island (n.d.) during my time as director at the Cold Spring Harbor Laboratory Library and Archives – the idea of systematically analyzing multiple research papers on a topic to decide on the best action for a problem has been adopted by many disciplines. The Urban Institute (Turner, 2014) is using evidence based policy making, specifically for government spending and tax policies. The Laura and John Arnold Foundation (n.d.) is looking at policies for social problems such as unemployment or homelessness. Evidence is being used for management styles and decision making (Barends, Rousseau, & Briner, 2014). It is being used to design better schools and hospitals (Whitemyer, 2010). Evidence is being considered in education as well; in some cases to decide on the best methods for teaching, but also, using student data to design specific strategies for success, although there is some concern about privacy issues in these areas (Killian, 2013).

And of course, evidence is used in librarianship. We can see the beginnings of evidence based practice in early papers by Jonathan Eldredge (2000), Andrew Booth (2002), and Ellen Crumley and Denise Koufogiannakis (2002). Having spent most of my career as a biomedical sciences librarian, I'm happy that all of these are in

journals covering medical librarianship but, as Jonathan Eldredge pointed out in 2000, we were helping to teach EBM (as evidenced by my class back in 1998), so it isn't a stretch that medical librarians should start thinking about evidence for their own work around that time.

In 2006, *EBLIP* was the first journal to focus on evidence based librarianship, with the object of helping librarians make more informed decisions based on the best available evidence. The Evidence Summaries are especially helpful for busy librarians, saving time by providing a synopsis of the important points in a research article, and covering a wide range of topics and journals.

In 2012, Denise Koufogiannakis wrote about the state of LIS systematic reviews and announced the wiki she had created to gather known systematic reviews in library and information studies. Looking over the reviews in the LIS Systematic Review wiki (<http://lis-systematic-reviews.wikispaces.com/Welcome>) gives us an idea of the state of evidence based practice in library and information studies. We can see that many of the systematic reviews are in specific niche areas, not surprising considering the wide range of subjects covered by LIS. As Marcia Bates (2015) pointed out, LIS covers all disciplines, and includes many information sub-disciplines, so it is always going to be a challenge to find commonalities that can be compared in a systematic review. But overall, there aren't that many systematic reviews, given that librarians have been talking about evidence based practice for about 20 years.

The problem is the lack of data and research. As the leader of one of the MLA Research Agenda systematic review projects (Eldridge, Ascher, Holmes, & Harris, 2012), I know first-hand that finding appropriate evidence to answer a question can be difficult.

Our question is: "Do health sciences libraries and librarians have any measurable (statistically significant) positive impacts on consumer

health, the outcomes of medical care, the productivity of biomedical researchers and the knowledge obtained by graduates of biomedical and health sciences training programs, and at what total cost?" We presented a poster at MLA 2015 (Henderson et al., 2015) and we still aren't finished (team members finding the time to work on a project outside their usual job duties can be a problem with some collaborative projects). Even though we started with a set of over 4000 articles, we ended up with just over 100 that fit all criteria, and even fewer had actual data. And when there was data, the papers covered very dissimilar measures, so there was no way to combine results to bring together a more robust result, as noted by Wagner and Byrd (2004) in a systematic review of clinical medical librarian effectiveness.

The bottom line: we need to do more LIS research that results in data!

So, when I was planning a survey on the research data needs of Virginia Commonwealth University (VCU) faculty earlier this year, I pulled questions from other papers to allow me

to do some comparisons. This is a step towards being able to compare results and pull together a large body of evidence. The following are a few of the questions I asked, and the responses I received, compared with one of the papers I used as inspiration.

The results on data formats faculty are collecting compared to those at Northwestern, in a 2015 report of a survey by Cunera Buys and Pamela Shaw are shown in Figures 1 and 2.

I can compare most of the reasons for not sharing data with the responses to a 2015 study by Federer, Lu, Joubert, Welsh, and Brandys at the NIH Library (2015). (Tables 1 and 2)

Responses on how much data is being stored, and where it is being stored, can be compared with results from Katherine Akers and Jennifer Doty at Emory in 2013 (Table 3, Figures 3 and 4):

But it isn't enough to just look for other studies and make comparisons; we need to be more intentional about what we are doing.

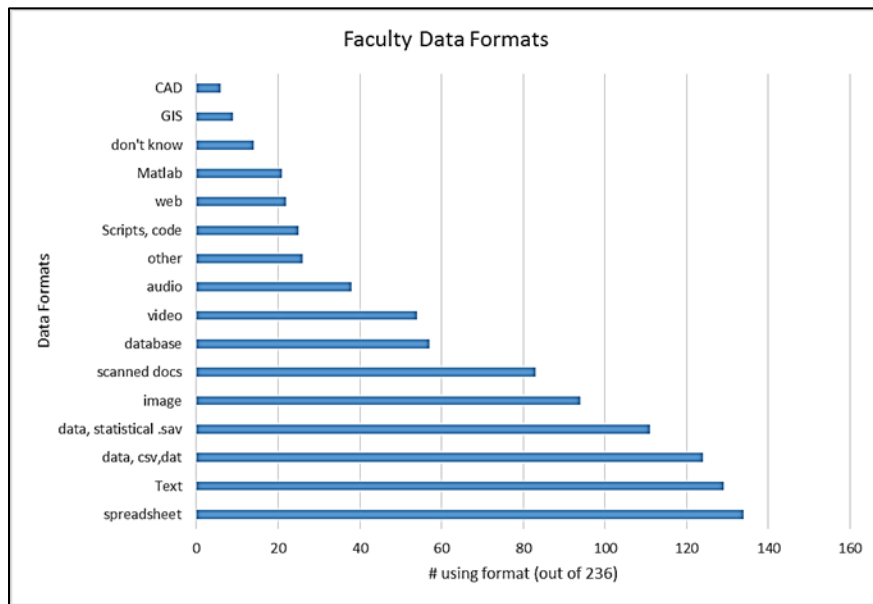


Figure 1  
Faculty data formats from VCU survey.

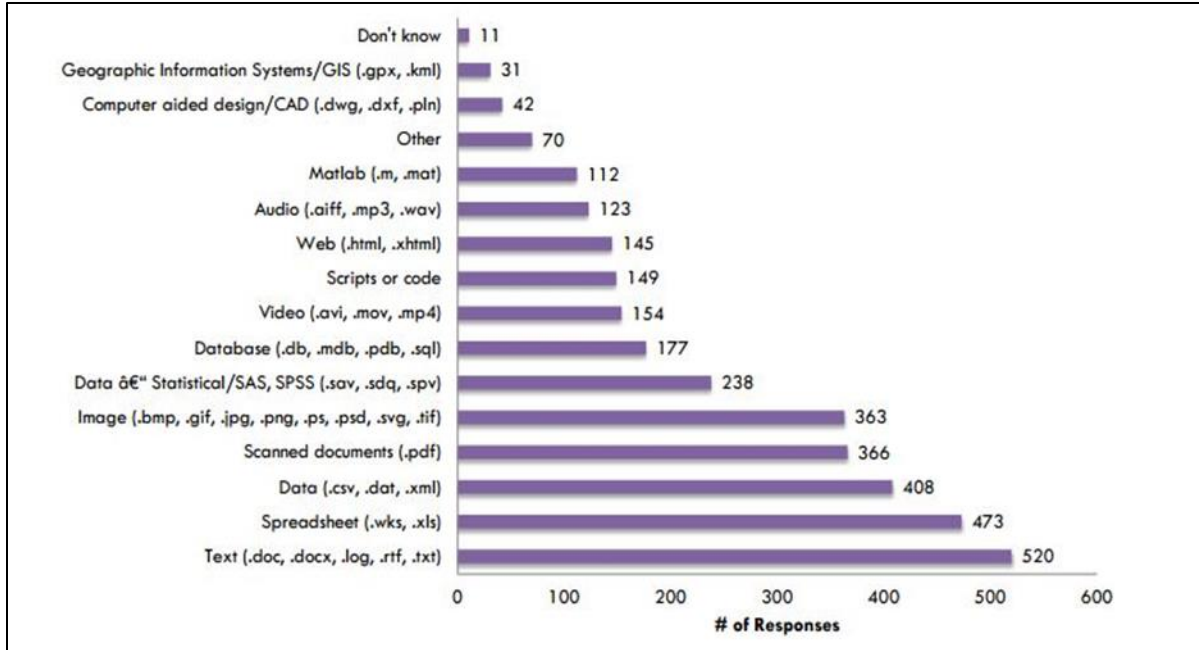


Figure 2  
Type/format of data from Northwestern study (Buys and Shaw, 2015).

Table 1  
Reasons for Not Sharing Data, from VCU Faculty Survey

Privacy or protection of subjects	148
Data require secure/restricted access	94
Data might be misinterpreted/misused	71
To protect my intellectual property rights	71
Might not get credit (e.g., citation, acknowledgment, authorship)	59
Requires too much time/effort	50
Not licensed to share data	47
Data of little value to others	26
I don't know where to share it	25
Commercialization/patent concerns	25
No repository exists for my type of data	21
Other	5

We need to collaborate from the start to plan research that is applicable to multiple libraries, such as a recent study looking at the evolving needs of researchers in information and data management (Cain, Cheek, Kupsco, Hartel, & Getselman, 2016). The authors hope to develop

new information service models that can be used by others, based on surveys conducted at two research-intensive universities. Marshall, et al. (2013), conducted a large, multi-site study to learn about the impact of medical libraries on patient care. This large collaboration included

physicians, residents, and nurses at 118 hospitals, making the results more generally applicable than a single site study.

We need to make sure that, where possible, we change our promotion and tenure requirements to include credit for open and shared resources. And we make sure that we include time for research in our work plans.

We need to relate our research to assessment measures so it can be a bigger part of the job we do. Librarians often shy away from research because there isn't enough time (Fox, 2007), so building research into the assessment we should already be doing is a good way to get started.

We need to relate our research to the research interests of faculty outside of the library, especially with the current focus on interdisciplinary research. Our research will be more useful if it can inform decisions outside of the library, and have impact throughout our

institutions. There are issues about student success or researcher support that are common everywhere and we should do the work together. Yesterday, I quickly tweeted a question about who worked with faculty outside of the library, and on what, just to give you a few examples:

- Cynthia Hudson Vitale works on data citation practices, EHR research on transparency and qualitative health data sharing. Plus systematic reviews.
- Roy Brown works on Nurses Magnet Status research and teaching EBN in curriculum. Plus systematic reviews.
- Patricia Anderson works on bibliometrics, comics, wearable tech, systematic reviews, video game design, and educational design.
- Abigail Goben works on scholarly impact, bibliometrics, copyright education, electronic health record federated search tools, and health information literacy.

Table 2  
Reasons for Not Sharing Data from NIH Study (Federer et al., 2015)

**Table 16. Responses to "You have indicated that you have never shared your data nor uploaded to a repository. Please indicate the reason(s) for not sharing your data. Please check all that apply."**

	Scientific (n = 15)		Clinical (n = 5)		Total (n = 20)	
I would be willing to share my data, but I haven't had an opportunity to do so	8	53%	1	20%	9	45%
My data contains personally identifiable information and sharing would compromise my subjects' privacy	2	13%	5	100%	7	35%
I am prohibited from sharing my data for some reason other than subject privacy	2	13%	4	80%	6	30%
I don't know any repositories that accept the kind of data I produce	7	47%	2	40%	9	45%
It's too difficult to prepare my data and documentation for sharing with others	0	0%	0	0%	0	0%
I don't know how to prepare my data and documentation for sharing with others	6	40%	0	0%	6	30%
Repositories' requirements for format or description of data are too difficult to meet	0	0%	0	0%	0	0%
I don't feel I would get credit for sharing my data	1	7%	0	0%	1	5%
I put in a great deal of time and effort to gather my data, and I don't want to give it away	0	0%	1	20%	1	5%
I'm concerned that another researcher could beat me to publication if I share my data	1	7%	0	0%	1	5%
My data has commercial value, so I don't want to give it away for free	0	0%	0	0%	0	0%
I don't think anyone else would have any reason to use my data	4	27%	0	0%	4	20%
It isn't customary to share data in my research field	4	27%	3	60%	7	35%
I'm concerned another researcher might find errors in my data	0	0%	0	0%	0	0%
I'm concerned another researcher might misinterpret my data	1	7%	2	40%	3	15%

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Table 3  
Current Data Storage Amounts by Faculty at VCU

Approximately how much digital research data are you currently storing? (Choose one)			
		Frequency	Percent
Valid	Megabyte range	40	16.9
	Gigabyte range	72	30.5
	Terabyte range	43	18.2
	Don't know	76	32.2
	Total	231	97.9
Total		236	100.0

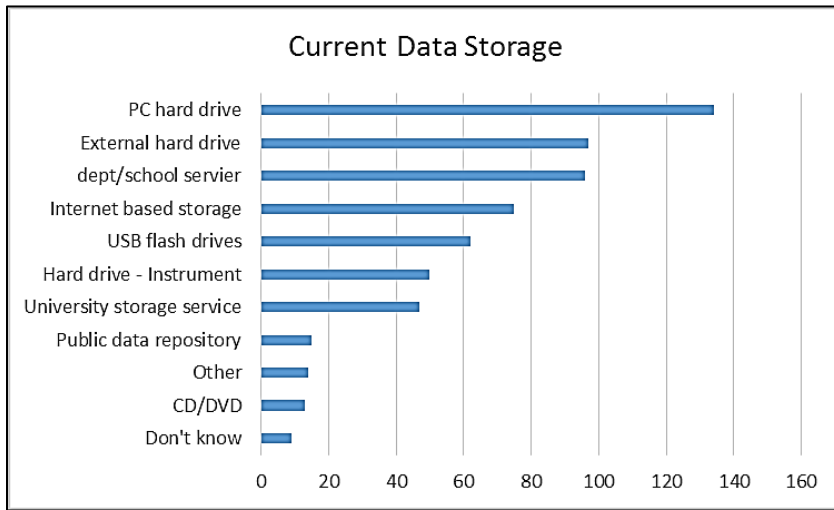


Figure 3  
Current data storage locations of VCU faculty.

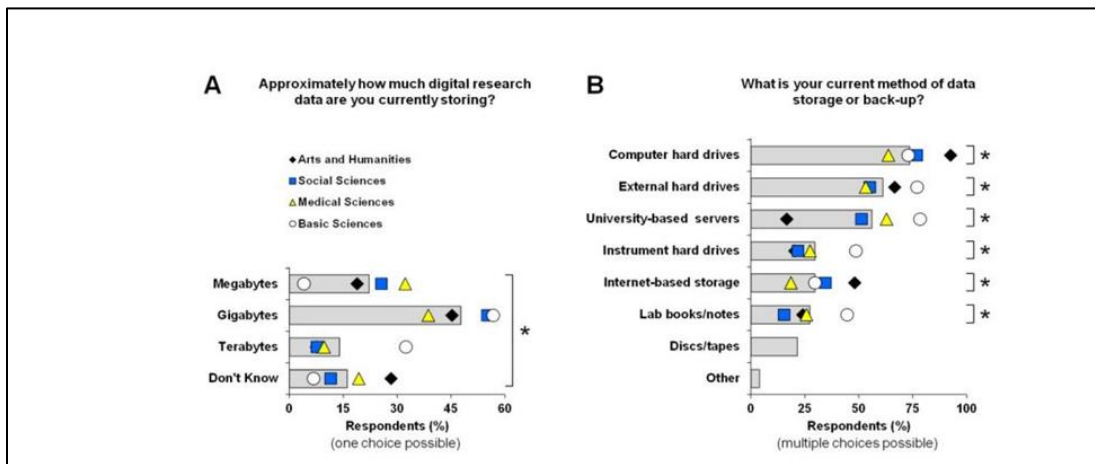


Figure 4  
Digital research data storage amounts and locations from Emory survey (Akers & Doty, 2013).

And to make sure we can publish and share any insights we have from surveys or questionnaires we use, we should always get IRB/ethics board approval before starting our research.

We need to make our articles, research instruments, and data open so research can be replicated using the same survey instruments or methods, and so that data can be combined to create a more robust evidence base. The ACRL Value of Academic Libraries Bibliography (<http://acrl.ala.org/valueography/>) allows sharing of research in a blog post, but there is no good way to find a listing of all the studies submitted and no way to share data. I recommend setting up an OSF (<https://osf.io>) project or depositing materials in the new SocArXiv Preprints (<https://osf.io/preprints/socarxiv>). Librarians are pushing for open access; some researchers are pushing for open science. Wouldn't it strengthen our position to have our research out there where it can be scrutinized?

The reasons we give to researchers in other areas for sharing are the same for us. Sharing research methods and results:

- Helps to avoid duplication, thereby reducing costs and wasted effort.
- Promotes scientific integrity and debate.
- Enables scrutiny of research findings and allows for validation of results.
- Leads to new collaborations between data users and data creators.
- Improves research and leads to better science.
- Enables the exploration of topics not envisioned by the initial investigators.
- Permits the creation of new datasets by combining data from multiple sources.
- Increases citations. A study by Piwowar, Day, and Fridsma (2007) showed a 69% increase in citations.

And we can use the same repositories to make our data available.

- DataVerse <http://dataverse.org/>
- figshare <http://figshare.com/>
- Open Science Framework <https://osf.io>
- Zenodo <https://zenodo.org/>
- Your Institutional Repository

I have been a librarian for 30 years now, and I've seen many changes, but I'm still enthusiastic about the profession and see a wonderful future for us. I hope you will see the value in LIS research and feel enthusiastic for our future as well.

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