RESEARCH ARTICLE / ARTICLE DE RECHERCHE

Preferred but not Required: Examining Research Data Management Roles in Health Science Librarian Positions

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Abstract: Introduction: Research data management (RDM) is being recognized as an increasingly important role for librarians, but little work has been done to investigate whether RDM tasks are being asked of librarians in their professional roles. In this paper, current job postings in health science librarianship are examined to investigate whether research data management job duties are being included in advertised health science librarian positions. **Methods:** Job postings available as of April 5th, 2018 on the University of Toronto's Faculty of Information (iSchool) jobsite were collected and analyzed to identify positions related to health science librarianship. The job responsibilities and descriptions were further examined to identify instances where research data management was mentioned. **Results:** Thirty-two job descriptions were identified as meeting the inclusion criteria. Of these thirty-two health science librarian postings, eight included supporting research data management services, in some capacity, as part of the position description. **Discussion/Conclusion:** Through the job posting analysis, a trend emerged where RDM is not consistently seen as a role for health science librarians. However, the literature indicates that in many instances, research data management is already being done by health science librarians, and is a service which is likely to continue in the future. As such, it is important that research data management roles start being acknowledged and reflected in education and job description opportunities.

Introduction

In the past decade, libraries have begun to recognize the importance of supporting research data management (RDM), and the emerging and significant role that it plays for librarians [1]. As acknowledgement has increased of the importance of proper data storage, sharing, preservation and dissemination, librarians have been at the forefront of supporting researchers in these endeavors [2]. Across Canada, most academic libraries have produced, or are in the process of producing, research data management plans to clarify the roles and boundaries of librarians when collaborating with academics during their research process [2]. Health and hospital libraries provide a unique setting where there is opportunity to undergo research data management in partnership with health care practitioners and researchers, due to the existing role of librarians on the research team when collaborating on knowledge synthesis projects. However, there has been less of a focus on research data management services in this sector so far [1, 3]. Generally, extensive RDM services are not provided or acknowledged in health libraries or are just starting to emerge as an area of importance [3].

In this paper, the current expectations for health science librarians in supporting research data management endeavors will be examined through a quantitative key word analysis of job postings for positions related to health librarian jobs. Job descriptions are assessed for indications of research data management responsibilities and tasks. Ultimately, it is argued that supporting research data management is an important and logical extension of what health science librarians do, and that these skills should be an acknowledged and supported part of the health librarian role.

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Definitions

Before continuing, it is important to clarify some definitions and outline the scope which will be investigated in this paper. Firstly, there is the term research data management, which may encompass many elements and be varied in extent. The Canadian Association of Academic Research Libraries (CARL) presents one definition, describing research data as "factual records... used as primary sources for research" and research data management as the maintenance of that data throughout all stages of the data's lifecycle [4]. This endeavor incorporates many elements, including tasks such as backing up data in well-preserved and accessible storage locations, creating metadata and controlled vocabularies, sharing and reusing data, and ensuring the security and privacy of data [5].

Next, it is important to explicitly define the title of health science librarian, and discuss what this role entails. In using the term health science librarian throughout this paper, it refers to any professional librarian whose role is to either a) to liaison to health and biomedical research areas, b) to collaborate with health care practitioners on any area of their research, including as part of the research team, and (or) c) to provide a focus on health information resources, databases, or medical terminology as part of their expertise. Based on this definition, librarians employed in a variety of sectors may be health science librarians, including those in academic, public, hospital, health care, government, association and not-for profit libraries. Other job titles which may be considered synonymous to "health science librarian" are, for example: health information librarian or specialist, health research librarian or specialist, medical librarian, hospital librarian, consumer health librarian and liaison librarian to health or biomedical subject areas [6]. For the rest of the paper, the term health science librarian will be used to refer to any librarian working in a health-discipline related capacity as defined here.

Background

Research data management (RDM) is an emerging field, as more and more governing bodies recognize the growing importance of properly organized, reported, and stored data. In 2011, the National Science Foundation in the United States declared that all grant proposals would require a research data management plan, which meant that researchers needed to start planning for proper data management and stick to that plan throughout the research life cycle [7]. There has been similar progress in Canada, with major grant governing bodies such as the National Science and Engineering Research Council (NSERC) and the Social Science and Humanities Research Council (SSHRC) releasing the Tri-Agency Open Access Policy in 2015, which calls for improved transparency and accessibility of data of Canadian Institutes of Health Research (CHIR) funded research projects [8].

In recent years, literature about the state of health science librarianship, particularly in North America, sheds light on a field with evolving roles and activities, marking a distinct difference between librarian jobs in the present and future compared to the past. One of the clear trends which stands out when examining recent investigations into the field is that research data management responsibilities and roles are being seen as an increasingly important place for health science librarians. In Crum and Cooper's systematic review on emerging roles for biomedical librarians from 1990-2012, a popular trending new role in both hospital and academic library settings was support for research, including researcher collaboration tools and data curation and management [7]. Holst et al. further identified that hospital librarians are "leaders in knowledge management" and that support of hospital research, including data management, is a clearly significant part of the role that health librarians play [9].

Embracing research data management as a new area of expertise makes sense, because it is a natural extension of what health science librarians already do. Health science librarians play an extremely important role during the knowledge synthesis processes as an embedded member of the research team and are often recognized as co-authors on knowledge syntheses and other projects [10]. Traditionally, some of the roles for librarians as part of this team has been to clarify and fine-tune research questions, identify resources to search including both indexed databases and grey literature, to construct and run comprehensive and exhaustive searches and to document their search strategies and search methodologies [9]. There have been multiple studies which indicate that having a librarian as a partner during this process results in enhanced quality of research and improved patient outcomes [9, 11]. As health science librarians are

already collaborating with researchers during this process, extending this role to include research data management is a logical and natural extension of the part that health science librarians are already playing, and is likely to result in similar benefits of increasingly well documented, preserved and transparent information.

Finding new areas of expertise and service, and expanding the librarian's role to include RDM also has benefits for the librarian. Crum and Cooper write, that through "seizing [the] opportunity" to support biomedical researchers, librarians are able to develop new skills and build relationships. Further, having the opportunity to gain additional insight into the research that is being done by the library's users provides an important "learning opportunity to gain insights into the types of research being completed" which in turn "serves to inform [...] future service development" [12]. In other words, when librarians are more involved in the research process throughout all of it stages, we are given the opportunity to provide better service, and understand the needs of our users in a more significant way. In turn, this provides us an opportunity to fill a gap for our users, and become more knowledgeable and practiced librarians in the process.

With this background information in mind, an investigation into recent health science librarian job postings was conducted to examine whether or not research data management tasks and responsibilities are being reflected in current health science librarian positions.

Methods

Job descriptions found on job advertisements provide an excellent source of information for examining the tasks and responsibilities of librarians in different areas of specialty. To investigate the role that health science librarians are currently expected to play in supporting and collaborating on research data management, all job postings as of April 5th, 2018 available on the University of Toronto's Faculty of Information (iSchool) jobsite were analyzed (https://ischool.utoronto.ca/job-site/). Job postings found on this website are manually submitted for posting using an online form, and are then added to the site within a short time period. Jobs remain on the site even after the deadline to apply has passed, resulting in a small repository of both current and recently closed job opportunities. The jobs available on the site at the time of writing included postings from approximately February 2017 to April 2018.

The website's built-in search bar was used retrieve job postings which were related to health science librarian positions. This search bar retrieves items when search terms are found in the job title, or in the description of the job itself. Table 1 details the search terms used to find relevant postings (including terms such as health, hospital, medicine, medical and biomedical), as well as the number of total and relevant job posts that were retrieved with each search.

Tab. 1 Search terms used to retrieve results from the iSchool Jobsite.

Search Term	Postings retrieved	Unique postings that met the inclusion criteria, and were not already retrieved in another search
Health	158	27
Hospital	41	3
Medicine	28	2
Medical	51	0
Life science	35	0
Biomedical	25	0

Job postings were included in the analysis if they referred to any professional librarian position (i.e., requiring an ALA accredited Master's degree in a library or information related area) that included duties to support or collaborate with health science professionals and subject areas. The full descriptions of the jobs were read and examined, even if the job titles did not indicate a health focus, to ensure all relevant postings were included. For the scope of this research, library technicians and other library staff were not considered. However, librarians in all types of libraries were included in the analysis. There were no limits placed on when the job posting was created, and all available job posts on the website were searched. There were also no limits placed on the geographical location of the job opportunities, which

included jobs located across Canada and the United States. For a summary of inclusion and exclusion criteria used when analyzing the job postings as relevant to this study, please see Table 2. Ultimately, 32 postings were identified as meeting the inclusion criteria, and were therefore included in the analysis.

Tab. 2 Inclusion/exclusion criteria for job descriptions retrieved.

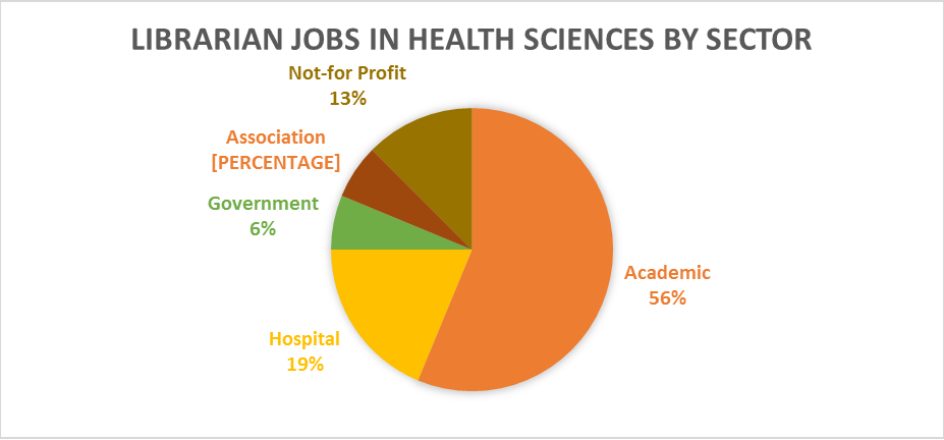
Postings were included if:	Postings were not included if:
• The posting was full-time or part-time, permanent or contact position • The job included the words "health", "hospital", "life science", "medical", or "medicine" or "biomedical" in the job title OR job description, referring to the area of focus for the position • Through reading the job description, it was clear that the position is some way related to health science librarianship	• The position was a volunteer, student, or internship position • If the position did not require a professional Masters degree (ie. was not a librarian position, but a library technician or other library position) • The job posting did not clearly indicate a focus on health science as part of the expected role

Once these 32 postings were identified, further work was done to investigate the job responsibilities and roles to be carried out in the position. The job responsibilities and descriptions were carefully read through in detail, to identify instances where research data management was mentioned. Postings were included if they mentioned the phrase research data management specifically, or if they discussed elements of RDM, namely; the scholarly life cycle, data storage, data preservation, data security, or other responsibilities involving data management. For the purposes of this paper, the emphasis was placed on examining the way that health science librarians are supporting RDM initiatives of the researchers and professionals that they collaborate with, and any mention of RDM as it related to a librarian's *own* research was not considered in the analysis. Following this review, several key results emerged, which will be presented and discussed in the remainder of the paper.

Results

As mentioned, 32 postings from the search results were identified as meeting the inclusion criteria. The job titles for these positions ranged from clearly related to health librarianship (such as "health sciences librarian") to those which were less clear ("research information specialist" for example). Twenty were full time permanent positions, 1 was a part time permanent position, and 12 were temporary or contract positions. The positions were located in various library settings, including college and university libraries, hospital libraries, associations, government institutions and not-for profits. Figure 1 displays the breakdown of various sectors in which these positions were found. Three of the positions were located in the United States, whereas the remaining 29 were located across Canada. The jobs also ranged from management positions requiring significant years of prior experience, to jobs appropriate for entry level applicants. Following a detailed review, the job responsibilities in these positions, of the 32 health science librarian postings which were included in the analysis, 24 did not include supporting research data management services, in any capacity, as part of the position description.

Fig. 1 Health Science Librarian Positions Retrieved by Sector.



Of the 8 postings which did include some aspect of research data management, the scope and types of tasks varied in multiple and significant ways. Four of the postings included terms such as research management and scholarly communication in the titles, and through reading the job descriptions it was clear that job tasks relating to research data management comprised of the main responsibilities for the successful candidate. For these positions, some job tasks included:

- "Supporting campus scholars in sharing and preserving their publications, coordinating the deposit of scholarly output in appropriate repositories, and consulting on methods for meeting funder and/or publisher requirements"
- "Supports, enables, and contributes to the research process on campus through the development of library services, and the provision of expertise in research impact, scholarly publishing, and the research lifecycle"

In 2 of the 4 other cases, it was clear that research data management tasks seemed to be an expected part of the role, but were to be conducted in addition to job responsibilities in other areas. These duties included, for example:

- "Partner and collaborate in an array of arenas such as scholarly communication, open access, hosting/publishing institutional scholarly output"
- "Communicate the value of scholarly communication, digital initiatives, the development of new online tools, copyright, data management, affordability, and the integration of information literacy skills into the curriculum and the impact to the scientific community".

In the final 2 postings which included research data management tasks, RDM was only mentioned as an area that librarians should be aware of and remain current with, not an area that would be critical to their everyday practice. Some examples of job tasks include:

- "Remain current with, and implement in practice, emerging concepts in scholarly communication, research data management, and instructional technology"
- "Foster an understanding of the research culture, data needs and publication trends of science and technology researchers"

Discussion

Before continuing, it is important to acknowledge some limitations to this methodology. Firstly, the University of Toronto's iSchool jobsite was chosen because it does not tend to remove postings, even after the deadlines for them have passed. Other popular Canadian library job sites, such as Partnership for example, remove postings shortly after the deadline for applications has closed. So that the wider landscape of RDM for health science librarians both currently and in the recent past could be investigated, a jobsite was chosen which includes both currently open and recently closed postings. However, it is acknowledged that the University of Toronto's job board may include postings which are skewed towards Ontario workplaces, and it is not representative of all library jobs across Canada or North America. Secondly, utilizing job postings as a source of data can be a limitation. Other researchers have utilized job postings as a source of data, recognizing benefits such as that they explicitly outline specific qualification and job responsibilities, and are a snapshot of the attributes and duties of specific specialist librarians at various points in time ([6, 13] for example). However, there are also limitations to this approach, including that not every responsibility of the librarian is always listed on the posting. Further, additional responsibilities may arise there were not necessarily intended to be part of that librarian's job during the time of posting. With these limitations in mind, there are still several key insights that emerged from the study, which will now be explored for the remainder of the paper.

To summarize the findings from this analysis, only 8 out of 32 positions related to health science librarianship posted in the iSchool jobsite in a 16-month period mentioned elements of research data management. Four of these are research data management jobs in themselves, with an emphasis on health sciences data. Out of the remaining 4, only 2 included information which indicates that there is an expectation for the successful candidate to actively engage with research data management initiatives. It is also significant to note that all 8 positions are located in academic libraries, and therefore there was no mention of research data management in any hospital, not-for profits, or other health institutions.

There is literature on the subject that may explain this lack of research data management responsibilities found in health science librarian positions. Firstly, it may be that the role of supporting research data

management in these institutions falls with a specialist RDM librarian, data librarian, or RDM department who supports and collaborates on RDM concerns across multiple disciplines, not limited to the health sciences alone. This is certainly a logical explanation, as particularly in academic libraries, positions for data librarians are becoming ever more prominent and popular [14]. Further, in many institutions, RDM services are not yet provided in a centralized manor, and members of the research team, such as research assistants or the principal investigator, conduct the RDM for their projects informally through their own processes. In a 2011 study by Peters et al., all 10 principal investigators that were interviewed indicated that they were mainly and solely responsible for the research data management on their projects [15].

Therefore, another explanation is that when hiring health science librarians, research data management is not prioritized as an major role or responsibility to be undertaken, despite an acknowledgement in the health science librarian field of the potential and important role of librarians in this area. Creamer et al. describe discussions with 20 health science librarians who performed tasks such as data interviews, assessment of researcher's data needs, and the development of data plans, but whose titles and job descriptions did not include data management at all [16]. Similarly, studies such as Crum and Cooper and Holst et al. demonstrated that librarians consider research data management to be a significant part of their jobs [7, 9]. However, as the jobsite analysis indicates, the responsibility of RDM is not being translated into the job positions that are currently available.

Potential reasons for this disconnect are highlighted when challenges of including research data management in health science librarian roles are examined. Firstly, health science librarians are already undertaking many significant roles in both academic and clinical settings, including support of clinical care, operations and management, education and teaching, customer service, and collections development [9]. Adding the significant and time-consuming task of supporting research data management should not be done without consideration of the impact that this initiative would have on the work load and work distribution for librarians. Additionally, health science librarians often struggle with how to be seen and respected not as support staff, but as collaborators and partners with health professionals. Research data management practices are sometimes seen as "administrative" tasks, and by giving the work to librarians which researchers are not excited to do themselves, it may reinforce the stereotype of the librarian as simply, support [17].

An additional concern for health science librarians is that RDM is seen as a concentrated skill, requiring a specialized knowledge base that heath science librarians may not feel like they have [2]. Despite predictions that research data management will become a major responsibility for librarians, studies such as Corrall et al. indicate that librarians feel a "lack of confidence" and constrained in their knowledge of RDM practices [2, 14]. This disconnect needs to be addressed, so that the role of the health science librarians in research data management can be clearly defined and documented. Librarians should further have the opportunity and support to pursue continuing education initiatives to increase their understanding and awareness of research data management practices. Indeed, studies such as Creamer at al. indicated that health science librarians desire to develop their skills in research data management, yet lack the training and resources to do so [16].

In order to create the space in which health science librarians are educated and effectively supported, there must first be a recognition of the work that health science librarians are playing in RDM already, and the potential future opportunities for health science librarians in this role. Through the background examination of the literature, it was clear that health science librarians do play a significant role in research data management, and will likely continue to embrace these responsibilities in the future [1, 7, 16]. However, the jobsite analysis discussed above did not seem to paint health science librarianship as a field which considers RDM an important knowledge base in the clear majority of job postings.

Conclusion

In this paper, the ways in which RDM initiatives are and are not being acknowledged as a role for health science librarians was discussed. Through a jobsite analysis which investigated job descriptions, a picture emerges where RDM is not consistently seen as a role or a required skill for health science librarians. However, the literature indicates that in many instances, research data management is already being done by health science librarians, and is a trend which is likely to continue in the future. As such, it is

important that research data management services start being acknowledged and reflected in education and job description opportunities for health science librarians.

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