

Librarians as Catalysts for Healthy Communities

Jenny Bossaller and Denice Adkins, University of Missouri School of Information Science & Learning Technologies (MU-SISLT). Deb Ward, Director, University of Missouri Health Sciences Library (MU-HSL).

Chris Pryor, Missouri Coordinator for the National Network of the Libraries of Medicine, Mid-Continental Region (NNLM-MCR).

MU-SISLT is the lead applicant on a collaborative three-year **community catalyst** Project Grant with MU-HSL, and NNLM-MCR. The goal is to jointly develop an interdisciplinary community health information curriculum and create a network of practice throughout the Midwest focused on meeting information needs for low-income and rural communities. Specific aims of the grant are to create information and curricular resources that will be used within SISLT and widely distributed to the LIS education community and libraries, develop health information outreach and programming skills with collaborators and students, train a student cohort to lead community health information networks, and expand a community empowerment framework to library education. Working with MU's School of Health Professions (SHP) and the Department of Health Management & Informatics (DHMI), the Catalysts for Community Health (C4CH) program will engage 12 Master of Library and Information Science (MLIS) students in experiential and field-based learning as resources for healthy communities through information partnerships in underserved communities.

Principal Investigators (PIs) are Jenny Bossaller and Denice Adkins. Bossaller has expertise in community information needs, service learning, public libraries, and curriculum development. Adkins has expertise in information needs of ethnic populations and libraries serving rural mental health needs. Both have previous grant management experience. Collaborators at the Health Science Library include Deb Ward and Chris Pryor. As Director of MU's Health Sciences Library and founding member of the MAHEC Digital Library for health providers, Ward provides connections with the health sciences community. Pryor has extensive experience in training, communications, and marketing of health information and has connections with NNLM in 50 states. The PIs have relationships with SHP and DHMI, departments that will participate in building the health information curriculum.

The three-year grant period will include 1) forming and supporting a cohort of students (hereafter referred to as Catalysts for Community Health, or C4CH) who will focus on health and wellbeing and complete coursework while remaining in their own communities, 2) developing a cross-disciplinary curriculum for LIS students that focuses on community health issues and information, 3) building local networks for information services that includes both libraries and community health settings (e.g., health clinics, public health departments, senior centers, nursing homes, Boys and Girls Clubs, rural hospitals, and school-based programs), and 4) preparing students to assess, develop, and provide public programs using open-access health information resources, including traditional and alternative resources. The twelve C4CH students will attend online classes in LIS, DHMI, and SHP, and work together to develop services and information portals that enhance community health information through involvement and outreach in their communities throughout the Midcontinental United States.

Librarians as Catalysts for Healthy Communities

Statement of Broad Need

Our project is designed to 1) create networks to support information needs in health and wellbeing environments 2) train and embed health literacy librarians, and 3) to create a sustainable curriculum to promote the development of community health information specialists.

The National Challenge: Poverty and low health literacy affect the most vulnerable in the U.S. population. The nation's inner cities and rural areas have high rates of poverty. Poor health is often both a cause and a product of poverty – that is, poverty can cause poor health, and poverty also limits access to the resources that can improve health, such as doctors, hospitals, and also access to quality information about health. A number of studies confirm the relationship between poor rural and urban areas and health disparities (AHRQ, 2016; Gilmour, 2007).

There are many factors that contribute to poor health, but knowledge about healthy habits and disease management can mitigate some of those factors. Librarians are particularly interested in providing access to easily understood, evidence-based, and accurate health information. There is a wide availability of quality online health information, but it does not always reach people in areas of high poverty (cf. Levy, Janke, & Langa, 2014; Loignon, Dupéré, Fortin, Ramsden, & Truchon, 2018), and when it does, the messages provided by that information may not be culturally appropriate (Birru & Steinman, 2004).

Librarians can support health literacy efforts, and resources do exist for librarians who want to expand their health information knowledge (e.g., Medical Library Association Specialization in Consumer Health). However, studies have shown that librarians do not always feel comfortable providing health information (Flaherty, 2015). While some LIS programs have extensive health sciences and health informatics coursework, most do not (Raszewski, Dwyer, & Griffin, 2019). Moreover, most health information professionals have more in-depth curricular needs than are answered in regular LIS master's degree programs (Ma, in press). Some public libraries are hiring nurses, counselors, and social workers to provide services to vulnerable populations (Michaelson Monaghan, 2016), but rural public libraries are unlikely to have the capacity to hire non-librarians (many do not, in fact, have an MLIS librarian), and researchers have found that libraries in economically vulnerable communities provide fewer services than those in wealthier neighborhoods (Adkins, Haggerty, & Haggerty, 2015; Pribesh & Gavigan, 2009). There is, thus, a demonstrated divide between haves and have-nots regarding access to health information.

Health information librarianship models discuss curricular needs for people who intend to work in the health sciences librarianship community. The Medical Librarian Association (MLA) has developed a curricular specialization entitled *Consumer Health Information Specialization* (CHIS), designed for medical librarians, public librarians, allied health professionals, and other information professionals. NNLM likewise delivers health information training to librarians around the United States. The Medical Library Association's 2018 Symposium on Health Information for Public Librarians brought together public librarians and health sciences librarians for the *All of Us* Research Program, and developed a list of learning objectives for health information professionals. We will draw from these wide-reaching models together to provide a deep and holistic education for community health librarianship, in conjunction with our partners in DHMI and SHP.

Models and theories of **embedded librarianship** demonstrate the impact that librarians can have when they work directly with information seekers. Many studies have been oriented toward subject librarians embedded in student classes, finding that they provide just-in-time help and become valuable members of the learning team. Pendleton and Chatman (1998) found that the information-poor are more likely to seek help from their peers rather than seeking experts. Placing librarians in clinics and other settings where health information is available will bring evidence-based health information to vulnerable people, leading to better health outcomes than personal experience and hearsay.

The C4CH model places embedded public health librarians at the point of need, a model that has proven successful. Lyon et. al. (2015) found that most librarians who serve at the clinical point-of-care were considered valuable members of the team, and their research even saved lives. However, the librarians reported that their training was limited, as they were mostly self-trained and said that they would have benefited from medical training (e.g., language, procedures) so that they could become valuable team members more quickly. Caulfield-Noll & Gorman (2017) write that the value-added services offered to patients by librarians (such as customized packets) were appreciated by both the healthcare team and patients. While our students will not necessarily be making rounds with doctors, they will serve in a related capacity: by working with clinicians and social workers at the point of need and in their own communities, and adding value to the health practitioners' goals by providing patients with easily comprehended and culturally sensitive information about conditions, wellbeing, or lifestyle that they can use to support healthy decision-making in their daily lives.

Populations we aim to serve. There are two underserved groups that this project aims to work with: underserved urban and rural residents in the Midwestern United States (states that are part of the MidContinental Region of the NNLM network: Colorado, Kansas, Missouri, Nebraska, Utah, and Wyoming). Students will gain experience in both a community health or social service setting and a public library setting, following the model of the *deconstructed library* proposed by Haseltine (2018), in which some library services actually take place outside of the library. In this case, it is with embedded librarians in health settings. While the urban and rural experience of poverty and access to information is different, both have problems that can be addressed by embedded librarians. This cohort of students will on the information needs in varied, high-need environments across the Midcontinental United States.

Rural areas: The U.S. Census confirms that people in rural areas across the U.S. are significantly more likely to live in poverty. The National Rural Health Association (NRHA) reports that rural residents have lower rates of access to medical professionals, insurance, and high-speed internet, reducing access to health information (NRHA 2018). Lack of access to information in rural areas is not new. A major study published almost twenty years ago found that rural practitioners use fewer journals, ask fewer clinical questions, and experience “barriers to information access including lack of time, isolation, inadequate library access, lack of equipment, lack of skills, costs, and inadequate Internet infrastructure” (Dorsch, 2000). This study found that information outreach to clinics was an important component of equitable services. Caldwell et. al. (2016) found that rural residents of all ethnicities were likely to have less access to healthcare (such as screenings). Bradley, Getrich and Hannigan (2015) reported that rural doctors in New Mexico do have adequate access to internet resources, but they are not satisfied with patient education resources and lack time to find them. Adding a librarian to rural clinics could alleviate some of the time constraints experienced by these physicians, building on the model described by Caulfield-Noll & Gorman (2017), in which librarians are trained to create customized packets of information for patients.

Urban underserved areas: While urban residents have more access to hospitals and clinics, wide disparities remain in health outcomes between poor and wealthy communities. Library and information

services have been found to be effective in reducing these disparities. For instance, Morgan et. al. (2016) facilitated the Health Library Initiative partnership between the University of Pennsylvania and the Free Library of Philadelphia. Part of this partnership was building the South Philadelphia Community Health and Literacy Center, which combined a public library that focuses on health with clinics and a recreation center. They report that in 2015, 500,000 people visited the library to attend “specialized programs that addressed multiple health determinants, such as housing and literacy. Library staff provided intensive support to vulnerable populations including homeless people, people with mental illness and substance use, recent immigrants, and children and families suffering from trauma” (p. 2030). The C4CH model bridges library and information services with community nonprofit and public services, bringing information to the point of need and aiding urban clinics and other spaces where people receive health information, aiding clinicians and others who face serious time constraints.

Studies demonstrate a clear need for health information support in these communities. Librarians can support health literacy efforts, though many lack training and expertise (Luo & Park, 2013; Rubinstein, 2017). Resources do exist for librarians who want to expand their health information knowledge (e.g., Medical Library Association Specialization in Consumer Health). C4CH will offer a different model of distribution and training, as MLIS students will be embedded in community health settings for part of their training and public libraries for part of their training, gaining immersive educational experiences across multiple domains while they complete coursework that is specially developed and evaluated by LIS *and* Health Sciences educators. This will distinguish their career trajectory as public health information experts, which they can potentially use in either clinical settings or in public libraries. The interdisciplinary training and development of community partnerships will create a new, replicable model of information outreach.

Assumptions: This proposal assumes that we will be able to partner with local organizations to find students who are interested in this program, and that we will be able to place students from underserved areas in appropriate settings where they are needed. We do have experience with this; for instance, the Public Libraries Leadership Grant required students to do service projects outside of libraries, and the students found this experience to be meaningful. Bossaller has completed training in leading Service-Learning courses and has completed her own Service-Learning project as a faculty fellow. While the PIs have not worked with a broad coalition of health workers, our NNLM partner (Pryor) helps us address this gap. Our relationships with libraries will also help recruit students. We feel that the most viable avenue for recruitment is through library administrators that serve underserved urban and rural areas that employ library assistants who want to (but cannot afford to) get their Master’s degree. We will ensure that any libraries we work with for recruitment have active partnerships and outreach activities and fully understand the goals of the grant so that their employees will be able to devote part of their time to working in a health setting.

Risks: Again, one risk that we face is with recruitment: will we be successful in recruiting students who live in high-need areas? We have designed the program so that students will only attend classes part-time (6 hours per semester), so that they can remain employed part-time throughout the duration of their educational experience. We realize that balancing school and work can be difficult. MU has a variety of academic resources to help students that we will encourage students to take advantage of as needed. We believe that the cohort model will encourage students to continue in the program, and we hope that students will be placed in relevant positions during the second year of their program if they are not already employed in a public library.

The second risk is that students will not find meaningful and beneficial placement opportunities in their communities. We recognize that our program’s success will be dependent upon stewardship of

relationships between MU and the host site, and we will be prepared to intervene and possibly change course if placement is not meeting our goals that define programmatic success.

Project Design

This grant project will have direct impact by creating 12 Catalysts for Community Health (C4CH) who are prepared to deliver health information to their communities. The program also has indirect impact by creating a curricular structure for creating further C4CH programs for librarians across the country.

Working Toward the Solution. C4CH will offer a different model of action research and education, as librarians will be embedded in health and wellbeing settings, training across several domains that will distinguish their career trajectory as public health information experts. The interdisciplinary training and development of community partnerships creates a new model of information outreach to people in community health settings. The librarians will move fluidly between public libraries and health settings and will be equipped to provide health information services and programming in the library settings as well as in clinics. This bridges professional boundaries and settings in order to create more holistic and inclusive services for healthy communities.

Building on Theory, Research, and Practice for C4CH. In creating the C4CH model, we bring together several disparate strands of LIS and health information research: health information librarianship, embedded librarianship, and research on the impact of librarians upon their communities. Combining these areas allows us to customize a curricular program that is oriented toward public health and uses librarians' roles as community catalysts to impact regional and national well-being.

The three-year grant period will include: 1) **forming and supporting a cohort of students** who will focus on community health issues *while remaining in their own communities*, 2) **developing a cross-disciplinary curriculum** for LIS students that focuses on community health issues and information, 3) **building local networks** for information services that includes both libraries and community health settings (e.g., health clinics, public health departments, senior centers, nursing homes, Boys and Girls Clubs, rural hospitals, and school-based programs), and 4) **preparing students** to assess, develop, and provide public programs using open-access health information resources, including traditional and alternative resources.

We will follow Shahidi et. al.'s (2015) description of a "framework for empowerment" that uses an "established structure of self-governance in the community of interest" (p. 1). During the first phase of the project, we will create a Community Advisory Board made up of local representatives (e.g., librarians, health information professionals, Boys & Girls Club mentors, nurses) from the communities where we intend to recruit students. This Board will play a leading role in establishing community health information needs, identifying promising potential students, guiding students through their community-based research, and sharing community values and strengths. This model, along with our partnership with public health and network of librarians across the Midwest and following the guidance from the What Works Clearinghouse Model (IES, 2014A) will enable success in both recruitment and retention. The Advisory Board will also be tapped to evaluate the program during the third year.

We will admit students who are interested in both librarianship and community health. Applicants will complete an application and write two short essays that answer the questions: *What makes you think you are a good candidate for the C4CH Program?* And *Reasons why you should be in this program.* With the help of our Advisory Board, a cohort of twelve students will be selected to attend online classes in

SISLT's Library and Information Science (LIS) Master's program, the Department of Health Management and Informatics (DHMI), and the School of Health Professions (SHP). In the second and third years of their program, they will work together as a cohort to (1) identify health information gaps in services and (2) review and develop services and information portals that meet the identified community health information needs. The students will engage in outreach activities by working with professionals (physicians, nurses, social workers) in existing social service spaces. The students will take only two courses per semester so that they can work part time, with the intention that students can be employed either in a public library or in a public health setting, if not throughout their entire program, by the end of their program.

Specific Performance Goals and Outcomes. The goals for this project are to develop a multidisciplinary graduate certificate for health information leadership that enables students in the program to remain embedded in their communities throughout the duration of their program. We seek to accomplish this goal by working with health workers in order to develop a model for outreach and programming for community health information partnerships in a variety of settings. Specific performance goals are: 1) a fully developed, online community health information leadership **graduate certificate**, 2) **development of community networks** that advance the work of LIS in promoting healthy communities, 3) development of a **Framework for Empowerment** for replication in LIS programs, and 4) a series of communications about the program in the form of a **website** that holds comprehensive information about the program, targeted conference **presentations**, **scholarly articles**, and **articles in professional journals**. The communications will be done by and with the students using a mentorship model, training the students to communicate the value of their work in order to expand the model.

Regular meetings between participants and PIs, as well as regular attendance at virtual national and regional meetings and webinars, will facilitate program development, ensuring that course assignments are mapping to programmatic goals, giving PIs insight into community health needs and giving program participants broad exposure to health professions. PIs will present program results and selected curricular materials at the 2021 meeting of the Medical Library Association and place them in appropriate open document repositories at MU and the NNLM web sites.

The **community engagement** research that is produced through our partnerships will be ripe for testing across multiple contexts. Poverty and poor health occur in tandem around the world, and we hope that this interdisciplinary model focusing on empowerment through health information will be widely adopted as a model within LIS. Tiwari, Lommerse, and Smith (2014) present a variety of models of community engagement. One is participatory action research, defined as research that focuses on change, shared respect, and capacity building to help people build healthy communities. Importantly, they present the various models of community transformation as a distinctly transdisciplinary effort. Professionals who can speak across disciplines and who are grounded in empowering their own community can lead powerful transformation. The students in this program will be recruited to remain in their community as they research and serve as part of their education, working across several academic disciplines with professionals in libraries and healthcare settings. They will contribute to knowledge that leads to healthy community change.

There are many relevant projects that students will be able to complete throughout their program that are currently embedded in LIS program. Current assignments in required MLIS classes will be modified with guidance from our partners in SHS and DHMI in order to meet the program's curricular goals. Some examples from required MLIS classes are:

- ISLT 7301, Introduction to Information Technology: C4CH students will have specialized readings, and the main assignment will be modified to focus on health information technologies.

- ISLT 7305, Foundations of Library and Information Science: specialized readings will focus on health information needs of people in underserved urban or rural areas; their annotated bibliography and paper will focus on C4CH goals.
- ISLT 7314, Reference Sources and Services: students will focus on health and wellbeing, creating a LibGuide that is tailored to a specific identified community need. The LibGuide will be evaluated by the local NNLM partner and the community agency worker with whom they are working.
- ISLT 7315, Management of Information Agencies: C4CH students will create a program budget for a health/wellbeing initiative or grant, which will be evaluated by the NNLM partner and community agency.

Students will share their work within their Canvas LMS site. All program partners will be added to the site, and they will evaluate the assignments prior to summits. Based on their success or perceived needs, we will change the assignments for future classes.

By working with the University and with the MidContinental Region of NNLM, students will have multiple opportunities for meaningful networking as they contribute to the knowledge base about their community. Our library partners and NNLM partners will be able to facilitate meaningful placement throughout the Midwest. For instance, students in Columbia might choose to work with MedZou, the University of Missouri's Medical School Outreach program that provides free medical services to vulnerable populations. Students might work in a residential facility serving youth with mental or substance abuse problems. Every regional NNLM office has an *All of Us* coordinator, which is dedicated to serving vulnerable populations, which will allow us to place students where they are most needed while remaining in their own communities as they work on a variety of place-based and online projects for local impact, and contributing to an online platform for broad impact. At the same time, we recognize that not all placement opportunities go smoothly or as planned. We will look to programs such as the National Digital Stewardship Residency, the Inclusive Internship Initiative mentorship program, and our own service-learning programs that have taken place in situ to ensure that we are meeting mutually beneficial goals. We will also rely on our local support networks through the NNLM to find new placement opportunities should the first placement be unsuccessful. We will have regular meetings with students and hosts to ensure that the placement is working out, and when it is not we will be prepared to change course.

We build on existing models of **curricular development of specialized programs**. The IMLS-funded Knowledge River program created cohorts of Latinx and Native American students and embedded them deeply into professional learning opportunities while they were enrolled in the LIS program. Our previously-funded Public Library Leadership Fellows program used a specialization model to emphasize specific topics, combined with specialized practical work. This project will combine these approaches by supporting students from low-income areas to engage with professionals in health and community service environments as they complete a topical specialization in community health librarianship. We borrow **student recruitment and retention strategies** from the National *What Works Clearinghouse* (IES, 2014A) to develop a cohort of students, who will engage in participatory research, learning about and meeting the information needs of the people in their community. They will develop strategic plans of action for health information during their final semester capstone project.

Summary of plan of action:

- 1) **Recruitment:** During August 2019, we will work with our Strategic Communications Department to create recruitment materials, which we will distribute by mail and email to public

libraries, colleges, and universities throughout the Midwest region. We will use public library networks and those of our partners (NNLM and SHS) to recruit students.

- 2) **Program Development:** We will work with program partners in SHS and DHMI to modify at least one existing assignment in each required LIS class that will meet the programmatic requirements and prepare the students for their classes in SHS and DHMI during Year 3.
- 3) **Student Orientation:** Students will receive their laptops in December, and we will have an online orientation for students in January 2020. This will take place in conjunction with our LIS orientation, but the C4CH students will have a longer orientation with program leaders and peer mentor to cover program specifics.
- 4) **Students take classes:** We will admit students in October – November 2019 for Spring 2020 classes. We will create a special organization site within Canvas (our Learning Management System) for the C4CH students, mentors, and program partners. The site will be used to for communication, storage of relevant materials, and to support the cohort. We will also store course materials here that will be used to build the website during Year 3. Students will take required courses in LIS beginning in Spring 2020 (see class lists in the schedule of completion). They will have full access, as distance students, to all academic support units offered by MU, such as the library, the Online Writery, and MU’s new Center for Academic Success and Excellence (CASE). Students take classes across SHS and HMI. They will complete their graduate e-portfolio (a requirement of all LIS students) that emphasizes health librarianship. They will graduate in May, 2022.
- 5) **Mentorship:** Students will have a local librarian and partner organization mentor. We will also hire a *Graduate Assistant as a peer mentor* who is interested in health librarianship. The peer mentor will be available to aid students navigating online education, library resources, enrollment, and will also provide an extra resource for faculty and students in maintaining a strong cohort and bridge to the program. We will hire a second peer mentor during Year 3 who will help with website development.
- 6) **Professional Development:** As a cohort, students will attend webinars offered by organizations such as NNLM, ALA, PLA, and Amigos that support their professional development. They will maintain a blog on the website to document and communicate about professional development.
- 7) **Student Placement:** Students will begin working a minimum of 5 hours per week beginning in Years 2 and 3 in public library and community health settings (placement details will be determined in consultation with community partners). We aim for part-time employment during year 3, as students finish their classwork in SHS and HMI and while they are working on their capstone projects. We will meet with their community partners to ensure that the relationship will be mutually beneficial and that students will have proper supervision and meaningful placement.
- 8) **Nurturing Partnerships:** We will hold biannual online meetings with our partners to ensure that community needs are being met by the program. Partners will give regular feedback on students’ successes and needs.
- 9) **Communication:** Using materials developed by students and gathered in the Canvas LMS, PIs and students will *create a website* and write a series of *papers, webinars, and conference presentations* to communicate program outcomes, research findings. The Community Empowerment Model will be emphasized. Students, PIs, and partners will work with MU’s Strategic Communications Department and the Connector at Mizzou to disseminate results directly with city planners, mayoral commissions, and decision-makers who allocate funding for library and social services, giving wide exposure to the benefits provided by this model of embedded librarianship.
- 10) **Evaluation:** Community Partners and NNLM Coordinators will evaluate the program’s effectiveness (see Evaluation Plan, below).

Diversity Plan

One of the strengths of this proposal is the built-in diversity of the entire project: we plan to recruit students who live in underserved urban and rural areas by reaching out to colleges and universities in both rural and urban areas, specifically HBCUs and rural schools, and to public libraries that are located in high-need areas. We will develop recruitment materials to attract students who want to remain in their communities to improve the health and well-being of the people who live there. The program itself tackles a problem that is inherently based in structural inequalities that are exacerbated by race and ethnicity, and we are excited to attract and retain these students who will add rich diversity to our LIS program.

In addition to working with educators and librarians in the MidContinental Region of the U.S. to identify potential students, we will follow the *Framework for Empowerment* and *What Works Clearinghouse* models for recruiting for diversity and community involvement for this program. Members of the team are well established in professional networks, including ALISE, which includes schools with undergraduate programs in LIS, ALA, and NNLM. Additionally, Adkins is a former President of REFORMA with deep ties to librarians in Latinx and other underserved communities, whom she will reach out to for recruiting purposes.

Recruitment will be directed towards traditionally underserved groups by going through established networks (e.g., listservs in LIS and our partners' healthcare association listservs), personal contacts throughout the MidContinental Region, advising offices of minority-serving and rural institutions (e.g., Haskell Indian Nations University, Lincoln University), and the community partners. Success will be found by targeting students who want to remain in and serve their home community as they complete this online program. Advanced communication technologies will provide both academic and social integration as students become part of an active learning community that has "intentional integration of the themes and concepts that they are learning [and uses] active learning in a community based setting [to] improve academic outcomes." (IES 2014B).

Communication Plan:

The project partners in the C4CH program are committed to the launch of this interdisciplinary community health information curriculum and plan to contribute to its success through a strategic communications approach. The outreach to promote this program will begin at the inception of the project and will evolve and continue as needed for the duration. The project intentionally incorporates a variety of partners and stakeholders, all of whom will be instrumental in promoting the program to potential applicants as well as to develop fieldwork opportunities for the students. The communications strategy for the project will focus on three primary areas: 1) Recruitment of applicants to the program, 2) Contacting and developing relationships with potential fieldwork hosts that will provide meaningful hands-on learning opportunities for the students during the program, and 3) Publishing the results of the program.

In addition to developing a website that will include student reflections on professional development, selected curricular materials, and information about program outcomes, we will submit proposals for conferences in a wide range of venues that reach librarians: the American Library Association (ALA), the Public Library Association (PLA), the Medical Library Association (MLA), in addition to state and regional conferences (e.g., state library association conferences, regional associations of the Medical Library Association, the National Association of Community Health Centers). The Association of Library and Information Science Educators (ALISE) and the Association for the Society of Information Science and Technology (ASIST) are venues that will allow us to disseminate information about the

program to LIS educators and Information science researchers. In order to reach practitioners, we will aim to publish in venues such as Public Libraries Magazine and American Libraries. We will also aim to submit several papers with students to research journals in LIS and Allied Health.

Broad Impact.

This program intends to boost the number of embedded health information librarians (direct impact), and provide a curricular structure for educating health information librarians that can be emulated by other LIS programs (indirect impact).

This program is designed to engage students to engage in meaningful projects throughout their program. They will work with professionals and the community to gather and create materials that meet demonstrated health information needs. Furthermore, the program will connect information workers to health clinics in underserved areas to increase knowledge of and access to digital libraries and increase knowledge of public health problems within LIS. The program itself will kickstart partnerships for a new public health information program for student practicum placement, leading to better outreach for public libraries and digital library development for this population.

Local impact: This program grant will directly benefit the communities where the students are located, which might be in any of the states in the MidContinental Region of the United States (MU-SISLT is online and currently approximately 1/3 of the students are outside of Missouri). Students and community partners will add personal and community insights, helping to fill in missing information regarding the information needs of people who live in their area. Their input will help us build a more comprehensive academic program, and will also be the basis for research that we will be able to present to LIS educators, which will improve LIS education in meeting the needs of diverse students and constituents. In rural areas, there are fewer opportunities for both health workers and information workers; this program will help extend the reach of both, in a model that we hope might be used widely to help create a more robust health information system for people in rural areas and increase opportunities for librarians who work in rural areas.

National impact: The curricular modules that we create will provide other LIS programs and practicing librarians' ideas about how to connect LIS programs and libraries with healthcare and community health workers, making libraries catalysts for healthy communities. It will provide models of programming for evidence-based consumer health information (including traditional and alternative information), linking public libraries with clinics, social work, and community settings. There are other venues; for instance, we might be able to work with the Department of Health and Information Services to contribute to the RHHub. Other communication venues are listed under "Communications Plan" above.

Importantly, though, the interdisciplinary nature of this program will enable a wider reach of librarianship, as we work with partners in public health and informatics. Future partners might include the extension offices of land-grant universities, which have the mission of serving their state that have a tradition of working with rural communities. We will also work with MU's Broader Impacts office to ensure that we can take advantage of other opportunities to reach out to our communities.

While much of this narrative has focused on students and community, we will also leverage the students' positions to provide engagement and research capacity with University partners. The McLean Institute for Public Service and Community Engagement at the University of Mississippi has created a holistic model of community engagement including collaboration between the university and partnering communities. Adapted from the National Institute of Health's Principles of Community Engagement

(2010), this model includes health and well-being, agency-based partnerships, and other groups, which is similar to the C4CH model. Franz's (2010) model of Engaged Scholarship provides six points of entry for faculty to "practice engaged scholarship and tell their engagement stories" (p. 33) through research, outreach, and teaching. Our inclusion of students in all aspects of research and writing is built around academic mentorship, and it aims to include people from traditionally underserved areas as scholars, writing about their own experiences in community.

Evaluation Plan

One of the jobs of our Advisory Board will be to evaluate the effectiveness of the program. They will advise and supervise evaluation, as follows:

Curriculum: (1) PIs and university partners in SHP and HMI will evaluate student performance prior to each year's summit, across the entire curriculum, to uncover program strengths and needed areas of support for curriculum changes that are needed for the certificate. (2) Students will be surveyed at the end of their third year (prior to graduation) to gather their thoughts on program strengths and weaknesses. The Advisory Board will review the surveys and advise on program improvement.

Outcomes: (1) Embedded librarian model: after practicum in health/social agency, PIs will meet with community partners to discuss student strengths and weaknesses. (2) Job placement: six months after graduating PIs will interview program participants to find out about their current job, how they are using their education, and strengths of the program.

Dissemination: (1) Publications: how many publications focused on program development, outcomes, and effects? (2) Presentation and Webinars: How many people attended presentations and webinars? Where were they located? How can we disseminate findings more widely?

Sustaining the program: Once created, this program will be sustainable because we will have proven the value of this kind of work (embedding students and librarians in health and that healthcare centers and libraries will create opportunities for internships for LIS students outside of libraries. Within our department and our joint program with other units on campus, we look forward to increased placement opportunities for practicum experiences and internships. Creation of a joint certificate program with SHP and DHMI for Community Health Information Partnerships.

Schedule of completion
Year 1: August 2019 – July 2020

	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July
MU planning												
Form advisory board												
NNLM Planning Conference												
Recruit students												
Student orientation												
Meetings/webinars												
Sem. 1												
Sem. 2												

Curriculum development and Recruitment: PIs work with SHP, DHMI, and NNLM Coordinators to develop learning outcomes and an interdisciplinary curriculum for community health information professionals. PIs will advertise the program widely to community partners and undergraduate programs in underserved areas to recruit students (based on the model described by Shahidi et. al., 2015). PIs will establish relationships with community health partners to create placement opportunities for students and to ensure that community needs are embedded into the program plan. We will recruit an exemplary student as a peer mentor who has an interest in health librarianship to help steward students through the program.

Student Development and Training: Orientation and laptop distribution, computer setup in December. They meet their peer mentor, and take 2 required LIS classes during the fall semester, and 1 during the summer. They attend regular online meetings with PIs and partners to discuss progress, interests, problems, and questions as they develop expertise. They will attend webinars and online conferences offered by the NLM, MLA, and other related organizations that solidify their understanding of health information and healthy communities.

Year 2: August 2020 – July 2021

	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Ma y	Jun e	July
Sem. 3												
Sem. 4												
Sem. 5												
Students work in libs/partner												
PD/Webinars												
C4CH Summit												

Nurture Partnerships: PIs and partners will meet on an as-needed basis to solidify student placement opportunities and evaluate the success of the partnerships. MU will host an online summit for students, partners, and NNLM during December of Year 2, when we will discuss student progress, concerns, and identify opportunities for continuous professional development.

Student Development and Training: Students complete course work in LIS and begin taking courses in SHS and DHMI. Students will gain experience working on health project in either partner organization or public library (5 hrs/week) during their fourth semester. Students attend webinars and online conferences offered by the NLM, MLA, and other related organizations that will deepen their understanding of health information and healthy communities. They will continue to have support from their peer mentor.

Communication: Students will continue to add coursework and community research to the Canvas LMS site. This will form the basis for website development, publications, and other communication produced during Year 3.

Year 3: August 2021 – July 2022

	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Jul
Sem. 6												
Sem. 7												
Capstone												
Graduation												
PD/Webinars												
Communicate results												
Write certificate												
C4CH Summit												
Prog. Eval												

Student Development and Training: Students will complete a detailed community analysis, compare and contrast communities, and develop suitable health information materials with partners. They will attend webinars and online conferences offered by the NLM, MLA, and other related organizations to increase understanding of health information and healthy communities. They complete their capstone project, blending work in information agencies and health information with research about and with their communities. Students will work a minimum of five hours per week in a local public library and five hours per week in a community health and wellness setting (ideally as paid employees), creating information bridges between those settings.

Nurture Partnerships: PIs and partners will meet on an as-needed basis to solidify student placement opportunities. MU will host online summit for all involved in August to discuss student progress, concerns, and evaluate professional development.

Communicate Results: PIs will develop a website to houses course information, projects developed by the students during the course of the program, research, and webinars related to the program. Students, PIs, and Community Partners communicate research and program outcomes. PIs will host webinars and present at selected conferences on the curriculum and research findings for the Association of Library and Information Science Educators (ALISE), NLM, and Medical Library Association (MLA), and well as state library associations. PIs and primary partners will attend the NNLM meeting in Denver to meet with regional partners and disseminate findings.

Program Evaluation: Our Advisory Board will aid in program evaluation, which will determine the program's strengths and weaknesses and will provide feedback to guide future efforts, including development of the graduate certificate, which will be submitted to the University for approval in July 2022.



DIGITAL PRODUCT FORM

Introduction

The Institute of Museum and Library Services (IMLS) is committed to expanding public access to federally funded digital products (e.g., digital content, resources, assets, software, and datasets). The products you create with IMLS funding require careful stewardship to protect and enhance their value, and they should be freely and readily available for use and re-use by libraries, archives, museums, and the public. Because technology is dynamic and because we do not want to inhibit innovation, we do not want to prescribe set standards and practices that could become quickly outdated. Instead, we ask that you answer questions that address specific aspects of creating and managing digital products. Like all components of your IMLS application, your answers will be used by IMLS staff and by expert peer reviewers to evaluate your application, and they will be important in determining whether your project will be funded.

Instructions

All applications must include a Digital Product Form.

- Please check here if you have reviewed Parts I, II, III, and IV below and you have determined that your proposal does NOT involve the creation of digital products (i.e., digital content, resources, assets, software, or datasets). You must still submit this Digital Product Form with your proposal even if you check this box, because this Digital Product Form is a Required Document.

If you ARE creating digital products, you must provide answers to the questions in Part I. In addition, you must also complete at least one of the subsequent sections. If you intend to create or collect digital content, resources, or assets, complete Part II. If you intend to develop software, complete Part III. If you intend to create a dataset, complete Part IV.

Part I: Intellectual Property Rights and Permissions

A.1 What will be the intellectual property status of the digital products (content, resources, assets, software, or datasets) you intend to create? Who will hold the copyright(s)? How will you explain property rights and permissions to potential users (for example, by assigning a non-restrictive license such as BSD, GNU, MIT, or Creative Commons to the product)? Explain and justify your licensing selections.

A.2 What ownership rights will your organization assert over the new digital products and what conditions will you impose on access and use? Explain and justify any terms of access and conditions of use and detail how you will notify potential users about relevant terms or conditions.

A. 3 If you will create any products that may involve privacy concerns, require obtaining permissions or rights, or raise any cultural sensitivities, describe the issues and how you plan to address them.

Part II: Projects Creating or Collecting Digital Content, Resources, or Assets

A. Creating or Collecting New Digital Content, Resources, or Assets

A.1 Describe the digital content, resources, or assets you will create or collect, the quantities of each type, and the format(s) you will use.

A.2 List the equipment, software, and supplies that you will use to create the content, resources, or assets, or the name of the service provider that will perform the work.

A.3 List all the digital file formats (e.g., XML, TIFF, MPEG) you plan to use, along with the relevant information about the appropriate quality standards (e.g., resolution, sampling rate, or pixel dimensions).

B. Workflow and Asset Maintenance/Preservation

B.1 Describe your quality control plan. How will you monitor and evaluate your workflow and products?

B.2 Describe your plan for preserving and maintaining digital assets during and after the award period of performance. Your plan may address storage systems, shared repositories, technical documentation, migration planning, and commitment of organizational funding for these purposes. Please note: You may charge the federal award before closeout for the costs of publication or sharing of research results if the costs are not incurred during the period of performance of the federal award (see 2 C.F.R. § 200.461).

C. Metadata

C.1 Describe how you will produce any and all technical, descriptive, administrative, or preservation metadata. Specify which standards you will use for the metadata structure (e.g., MARC, Dublin Core, Encoded Archival Description, PBCore, PREMIS) and metadata content (e.g., thesauri).

C.2 Explain your strategy for preserving and maintaining metadata created or collected during and after the award period of performance.

C.3 Explain what metadata sharing and/or other strategies you will use to facilitate widespread discovery and use of the digital content, resources, or assets created during your project (e.g., an API [Application Programming Interface], contributions to a digital platform, or other ways you might enable batch queries and retrieval of metadata).

D. Access and Use

D.1 Describe how you will make the digital content, resources, or assets available to the public. Include details such as the delivery strategy (e.g., openly available online, available to specified audiences) and underlying hardware/software platforms and infrastructure (e.g., specific digital repository software or leased services, accessibility via standard web browsers, requirements for special software tools in order to use the content).

D.2 Provide the name(s) and URL(s) (Uniform Resource Locator) for any examples of previous digital content, resources, or assets your organization has created.

Part III. Projects Developing Software

A. General Information

A.1 Describe the software you intend to create, including a summary of the major functions it will perform and the intended primary audience(s) it will serve.

A.2 List other existing software that wholly or partially performs the same functions, and explain how the software you intend to create is different, and justify why those differences are significant and necessary.

B. Technical Information

B.1 List the programming languages, platforms, software, or other applications you will use to create your software and explain why you chose them.

B.2 Describe how the software you intend to create will extend or interoperate with relevant existing software.

B.3 Describe any underlying additional software or system dependencies necessary to run the software you intend to create.

B.4 Describe the processes you will use for development, documentation, and for maintaining and updating documentation for users of the software.

B.5 Provide the name(s) and URL(s) for examples of any previous software your organization has created.

C. Access and Use

C.1 We expect applicants seeking federal funds for software to develop and release these products under open-source licenses to maximize access and promote reuse. What ownership rights will your organization assert over the software you intend to create, and what conditions will you impose on its access and use? Identify and explain the license under which you will release source code for the software you develop (e.g., BSD, GNU, or MIT software licenses). Explain and justify any prohibitive terms or conditions of use or access and detail how you will notify potential users about relevant terms and conditions.

C.2 Describe how you will make the software and source code available to the public and/or its intended users.

C.3 Identify where you will deposit the source code for the software you intend to develop:

Name of publicly accessible source code repository:

URL:

Part IV: Projects Creating Datasets

A.1 Identify the type of data you plan to collect or generate, and the purpose or intended use to which you expect it to be put. Describe the method(s) you will use and the approximate dates or intervals at which you will collect or generate it.

A.2 Does the proposed data collection or research activity require approval by any internal review panel or institutional review board (IRB)? If so, has the proposed research activity been approved? If not, what is your plan for securing approval?

A.3 Will you collect any personally identifiable information (PII), confidential information (e.g., trade secrets), or proprietary information? If so, detail the specific steps you will take to protect such information while you prepare the data files for public release (e.g., data anonymization, data suppression PII, or synthetic data).

A.4 If you will collect additional documentation, such as consent agreements, along with the data, describe plans for preserving the documentation and ensuring that its relationship to the collected data is maintained.

A.5 What methods will you use to collect or generate the data? Provide details about any technical requirements or dependencies that would be necessary for understanding, retrieving, displaying, or processing the dataset(s).

A.6 What documentation (e.g., data documentation, codebooks) will you capture or create along with the dataset(s)? Where will the documentation be stored and in what format(s)? How will you permanently associate and manage the documentation with the dataset(s) it describes?

A.7 What is your plan for archiving, managing, and disseminating data after the completion of the award-funded project?

A.8 Identify where you will deposit the dataset(s):

Name of repository:

URL:

A.9 When and how frequently will you review this data management plan? How will the implementation be monitored?