

NN/LM MidContinental Region
Proposal
2016-2021 Cooperative Agreement

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OVERALL COMPONENT

Goals and Mission of the NN/LM:

- Advance the progress of medicine and improve the public health.
- Provide all U.S. health professionals with equal access to biomedical information.
- Improve the public's access to information.
- Enable the public to make informed decisions about their health.

University of Utah

The University of Utah, founded in 1850, is the oldest state university west of the Mississippi River and is a major regional educational resource for the Intermountain West (comprising Utah, Idaho, Wyoming, Montana, and parts of Colorado and Nevada). The University currently educates over 32,000 students from all 50 states and 102 foreign countries, with over 3,400 faculty and 18,000 employees. It offers 74 undergraduate majors, more than 50 teaching majors and minors, and graduate degrees in 93 disciplines. The University is the leading research institution in the Intermountain West and is ranked among the top research institutions in the U.S. by the National Science Foundation, with particular distinction in medicine, genetics, and engineering.

The University of Utah Health Sciences (UUHS) anchors health science graduate schools including the Schools of Medicine and Dentistry and the Colleges of Nursing, Health, and Pharmacy. UUHS incorporates the University of Utah Hospitals and Clinics that log more than 850,000 inpatient and outpatient visits annually; every day more than 10,000 people pass through the front doors of University Hospital. It is the state's largest provider of ambulatory care services, with 80 general and specialty clinics for outpatients. In addition to education and the multitude of services that UUHS provides, research is a dedicated enterprise. Faculty and staff conduct, collaborate, and initiate research aimed at advancing knowledge through innovative basic and clinical science that translates discoveries into applications that improve health. UUHS has been recognized nationally for recent initiatives including the Value Driven Outcomes initiative and Algorithms for Innovation.

The Spencer S. Eccles Health Sciences Library (EHSL) at the University of Utah is located on the UUHS campus. The mission of the Spencer S. Eccles Health Sciences Library is to advance and transform education, research, and health care through dynamic technologies, evidence application, and collaborative partnerships. It supports the UUHS Schools of Medicine and Dentistry, the Colleges of Nursing, Health, and Pharmacy; the Hospital and Clinics; as well as several centers/institutes. The Library administers the Health Sciences Education Building, which serves as the heart of the Health Sciences campus. EHSL also operates a consumer library located in the University Hospital lobby – the Hope Fox Eccles Health Library. The EHSL benefits by its association with the University Hospital and Clinics, a learning institution that is looking to transform into a medical organization that incorporates value driven outcomes as well as its proximity Intermountain Healthcare, which is also located in the state. In this unique environment, EHSL will examine the role of librarians as participants in transformative healthcare. This experience will be shared with others in the region and the country.

The Library has been funded by the National Library of Medicine since 2001 and has been an exemplary Regional Medical Library (RML) for the NN/LM MidContinental Region, coordinating services for this six-state region. (See Appendix A for 2013 Site Visit Report) EHSL is the only library in the country to be awarded the contract for the NN/LM National Library of Medicine Training Center. The library is recognized locally and nationally as a leader of intellectual exploration and as a catalyst for innovative discovery. EHSL has a national and

international reputation as a leader in applying educational and information learning technologies. Dr. Vivian Lee, Senior Vice President for the UUHS, has stated her full endorsement of EHSL to continue its leadership as the RML for the NN/LM MidContinental Region. As an appointee to the NIH Council of Councils, Dr. Lee is very familiar with the NN/LM program. (See Letters of Support (LOS) for her endorsement)

The Region

Geography and Population

The geographic scale of the MidContinental Region offers both challenges and opportunities. From its western border to the Mississippi River in the east, the Region extends over 1,000 miles and across two time zones. Geographically, the region is extremely diverse, including the western desert, Rocky Mountains, Great Plains and Mississippi Valley. Population distribution is among the most extreme in the continental United States with many remote areas. A few metropolitan areas – St. Louis, Kansas City, Omaha, Denver, and Salt Lake City – break up the open landscape. The large metropolitan areas, like St. Louis, exemplify the inner-city environment.



The demographics of the population in the NN/LM MCR is primarily white. However, interspersed amongst the region are small, but significant, minority populations. The NN/LM MCR faces the same issues and challenges that are faced in all regions to improve health information literacy and reduce health disparities. The racial and ethnic percentages of our population are increasing. Health care providers are more frequently encountering refugees from different cultures and an increasing minority workforce of Spanish language speakers. The percentage of the uninsured in the region and the number of medically underserved counties contribute to health disparities that need to be addressed. The uninsured in the region in 2013 varies from 10% (KS, NE) to 17% (WY). The national average was 17%.¹ Many of the counties (428) in the Region have been designated as underserved by either the federal government or the state.²

Internet Connectivity

According to the 2013 census report, the Region is relatively well connected to the Internet.³ Four states rank above the national for average households with a computer; Nebraska meets the national average; Missouri falls below the national average. The same report indicates that five out of the six states in our region rank higher than the national average for people owning a computer with high-speed Internet use. Missouri was the only state that fell below the national average. Cities in Colorado, Kansas, and Utah also ranked highest among metropolitan areas for high-speed Internet use. No cities within our Region ranked among the lowest metropolitan areas. Google fiber is available in Kansas City, KS and Provo, UT and will soon be available in Salt Lake City, UT.

Membership

The NN/LM MCR membership is made up of 393 total members. Of these, 137 are full members; full members are our strongest members. All of the metropolitan areas of the Region have academic health sciences centers with libraries that are full members.

Qualifications for Full Membership:

Regularly staffed	Participate in DOCLINE	Regularly check for ILL requests
A local contact to the NN/LM	Access to the Internet	Lendable collection of resources
Provide information services		

The number of full members has been decreasing; we started the 2011-2016 contract with 164 full members and have lost 27. Despite our efforts, we lose full members every year due to budget reductions, non-replacement of librarians who leave, or merger/closure of the institution. However, Affiliate members (i.e. members who do not meet the qualifications of full membership) have been increasing. At 256, Affiliate members now outnumber full members. The number of Affiliate members has been increasing due to successful efforts to recruit K-12, community college, and public libraries.

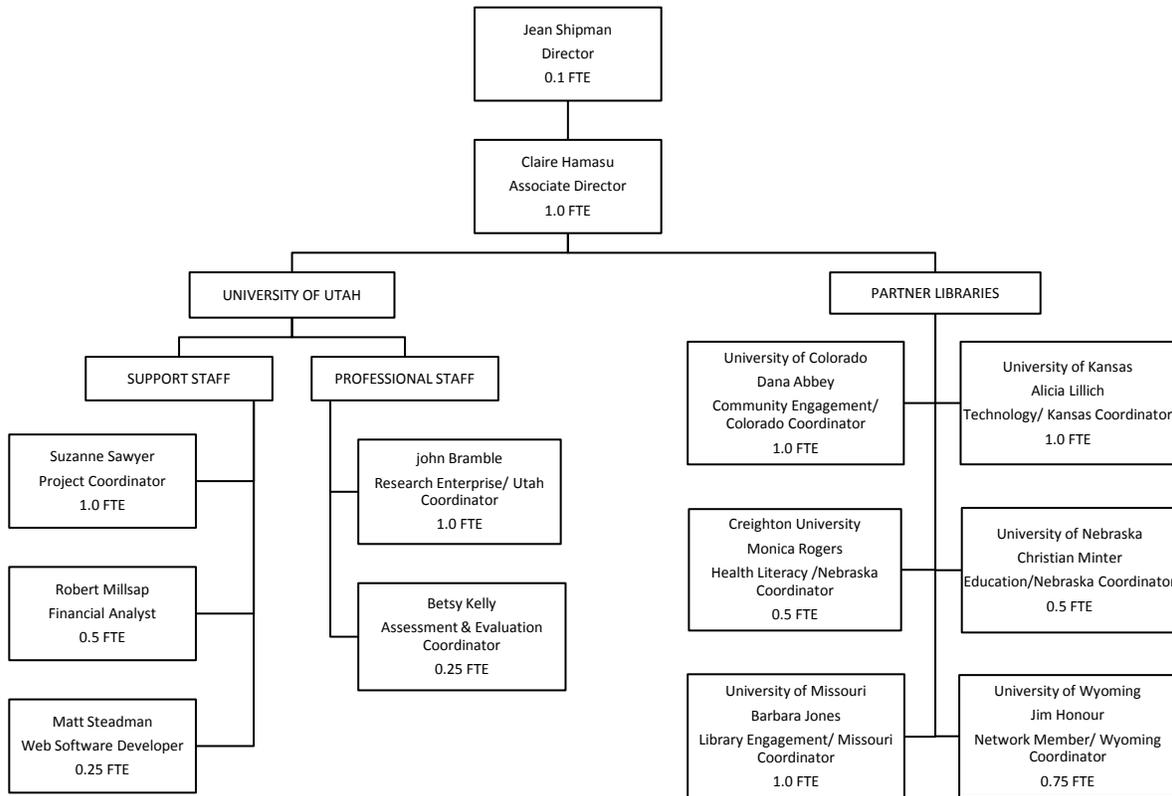
Organization and Governance

The University of Utah Spencer S. Eccles Health Sciences Library has a unique collaborative model, to conduct the activities integral to this grant. Six academic and academic health sciences libraries have been selected for their leadership and the resources they can contribute. Our partnership has been in existence since 2001 when the University of Utah was first awarded the contract for the NN/LM. Each of our Partner Libraries are subawardees for leading and managing an aspect of program. (See LOS for signed commitments from each Partner Library) Part of the commitment that each Partner Library makes is to designate staff for NN/LM MCR project areas. This enables the NN/LM MCR to bring its services closer to the communities we serve, and thus, enhance the development, assessment and coordination of services to each state. It also personalizes the program as each state has its own coordinator who attends local meetings and events. We have heard from our Region that they are very appreciative of having their “own coordinator” who understands local needs.

For 2016-2021, we propose the following division of responsibility:

Institution	Responsibility (See Appendix B for job descriptions)
University of Utah	Administration of grant, Research Enterprise Project, Assessment & Evaluation Project, Utah Outreach
University of Colorado	Community Engagement Project, Colorado Outreach
University of Wyoming	Member Services Project, Wyoming Outreach
University of Nebraska	Education Project, Nebraska Outreach
Creighton University	Health Literacy Project, Nebraska Outreach
University of Missouri	Library Engagement Project, Missouri Outreach
University of Kansas	Technology Project, Kansas Outreach

Jean Shipman is the Director of the Spencer S. Eccles Health Sciences Library and the PI/PD of the NN/LM MCR cooperative agreement with the National Library of Medicine. Claire Hamasu, Associate Director of the NN/LM MCR, reports directly to Ms. Shipman. All coordinators and support staff employed by the University of Utah report directly to Ms. Hamasu. The work of coordinators employed by Partner Library institutions is directed by Ms. Hamasu. Partner Library coordinators report to a library director or department head within their own library. Ms. Hamasu and Partner Library supervisors work together to resolve any governance problems that arise regarding personnel, budgets, or responsibilities.



Foundations for the NN/LM MCR

The NN/LM MCR was built on two foundations—collaboration and assessment and evaluation. These foundations have contributed to our success and will continue to support our program through 2021.

Collaboration

To ensure the success of our program, the NN/LM MCR needs to collaborate with other organizations in addition to our Partner Libraries. We have ongoing partnerships with each our state libraries to reach public librarians, with health science library organizations as an additional way to interact with our key Network members, with professional organizations and public health departments to reach other health professionals, and with community-based organizations to reach the underserved public. Health Literacy Nebraska is an example of one of our successful CBO partnerships. Coordinators in Nebraska helped with its organization and we have since supported them by providing the technology and presentations for their well-attended webinars and contributed to their Steering Committee. (See LOS from a sampling of organizations)

Assessment & Evaluation

“Making a difference” is a key value in the NN/LM MCR. By integrating assessment and evaluation into our program we can better understand how to improve our value. NN/LM MCR strongly encourages members to use evaluation methods to produce evidence to show the value of the library to their administration. Assessment and evaluation are integrated into the program from the first annual brainstorming session until we write our annual report. In addition,

we continuously reflect back on our logic model which offers direction through the goals, objectives and outcomes we have identified. The Activity Reporting System (ARS) is an online system based on the logic model and captures the work of staff. Coordinators add their activities into the ARS and select the goals and outcomes that the activities address. The reports produced from this data provide the staff with an update of our progress toward our outcomes. The status of our logic model is reviewed quarterly, enabling us to identify challenges before they become problems. This allows us to be flexible and change strategies in response to regional needs, user expectations, geographic factors, and environmental conditions. As we identify changes in the Region we will work in partnership with NLM, the RMLs, and Offices to address those changes.

Questionnaires and focused discussions are examples of tools that provide us with baseline data on our members, help us to assess needs, and determine the impact of our program. We use these tools to provide us with feedback on NLM resources and services. This regional input is always forwarded to NLM. The Outreach Evaluation Resource Center has contributed to the development and implementation of our evaluation plan and we will continue to use the services as the NN/LM Evaluation Office. Just as we encourage our Network members to show their value to their institutions, our assessment and evaluation program produces data that shows to the National Library of Medicine and our Region, our effectiveness, our impact, and our ultimate value.

Programming Structure for the NN/LM MCR

The goals of the NN/LM were used to develop outcomes to guide work over the next five years. Each of these outcomes has been assigned to appropriate project(s). The coordinators for the projects take leadership responsibility to design a logic model that will guide us to achieve the NN/LM MCR outcomes. The chart below summarizes the programming structure for the NN/LM MCR.

Goals - Mission	Outcomes	Responsible Projects
Provide all U.S. health professionals with equal access to biomedical information.	Network members work with healthcare providers to increase shared decision making due to access to evidence, information, and knowledge seeking skills.	Library Engagement, Health Literacy
Advance the progress of medicine and improve the public health.	Information therapy is reimbursed by payers.	Library Engagement, Health Literacy
Advance the progress of medicine and improve the public health. Enable the public to make informed decisions about their health.	Network members have adopted effective practices promoted by the NN/LM MCR.	Education Member Services
Improve the public's access to information.	Participants in NN/LM MCR programs are aware of appropriate resources and have the skills to use them.	Education

Goals - Mission	Outcomes	Responsible Projects
Improve the public's access to information. Enable the public to make informed decisions about their health.	Underserved populations in the MidContinental Region, who are ready, benefit from NN/LM MCR programs.	Community Engagement
Provide all U.S. health professionals with equal access to biomedical information.	Healthcare providers and the public engaged with NN/LM MCR experience significant increase to health information access.	Technology
Provide all U.S. health professionals with equal access to biomedical information. Improve the public's access to information.	The reach of the NN/LM MCR is extended as a result of work with organizations and Network members.	Network Members, Community Engagement
Advance the progress of medicine and improve the public health.	Recipients are better informed about best tools and methods for describing the healthcare ecosystem identified and disseminated as a result of NN/LM MCR contributions and collaborations.	Research Enterprise

NN/LM MCR Outcomes

The NN/LM MCR has eight outcomes that our activities will address in 2016-2021. By addressing these outcomes the NN/LM MCR will address the goals-mission of the NN/LM.

1. Network members work with healthcare providers to increase shared decision making due to access to evidence, information, and knowledge seeking skills.
We will support librarians to become change agents for health literacy in their institutions and their work with healthcare providers so that shared decision making can take place.
2. Information therapy is reimbursed by payers.
Libraries and librarians are generally perceived as an expense rather than a revenue generator. The NN/LM MCR will explore how this conception can be turned around by identifying how provider-provided information to patients can be reimbursed by payers and insurers.
3. Network members have adopted effective practices promoted by the NN/LM MCR.
Because Network members are physically closer to end users, they are the best conduit for improving equitable access. By sharing effective practices of librarians in the Region in order that their colleagues can adopt what will work for them, we can improve the efficiency of our members to provide the right information at the right time.
4. Participants in NN/LM MCR programs are aware of appropriate resources and have the skills to use them.
Participants include everyone that NN/LM MCR interacts with in all of our varied outreach programs. This incorporates trainings, site visits, exhibits, presentations, webinars, etc. The participants include health professionals, librarians from multi-type institutions, the public, and staff working in health care clinics and community-based organizations. Through this outreach, we intend to increase awareness of relevant and appropriate health information resources to suit the need. We also intend that

participants will learn the skills to use the resources to locate the information they are seeking.

5. Underserved populations in the MCR, who are ready, benefit from NN/LM MCR programs. Underserved populations may be underserved for a number of reasons: scarcity of health professionals and healthcare resources, unaffordable healthcare, and inability to navigate the healthcare system. Whatever the reason that a population is underserved the NN/LM will work with organizations that assist this population to make health information more accessible both to the organization and the clients they are assisting.
6. Healthcare providers and the public engaged with the NN/LM MCR experience significant increase to health information access.
Through our extensive outreach efforts, the skills and knowledge of our Network members and populations on whom we focus our efforts, will increase. This will result in an increase in health information access.
7. The reach of the NN/LM MCR is extended as a result of work with organizations and Network members.
Through a variety of methods that include subawards, subsidies, collaborations, recruitment of new members, and active participation in professional organizations the NN/LM MCR extends its outreach and infrastructure reach and impact.
8. Recipients are better informed about best tools and methods for describing the healthcare ecosystem identified and disseminated as a result of NN/LM MCR contributions and collaborations.
We will focus on the support of research and data management and curation in the healthcare ecosystem to improve skills, awareness of tools, and awareness trends.

References

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- ² Shortage Areas: MUA/P by State and County [Internet]. Rockville (MD): Department of Health and Human Services (US), Health Resources and Services Administration; [cited 2015 Jul 5]. Available from: <http://muafind.hrsa.gov/>.
- ³ File T, Ryan C. Computer and Internet use in the United States: 2013. [Internet]. Washington, DC: U.S. Census Bureau; 2014 Nov. [Cited 2015 Jul 10]. Report No.: ACS-28. Available from: <http://www.census.gov/content/dam/Census/library/publications/2014/acs/acs-28.pdf>

Administrative Core Specific Aims

Goals and Mission of the NN/LM:

- Advance the progress of medicine and improve the public health.
- Provide all U.S. health professionals with equal access to biomedical information.
- Improve the public's access to information.
- Enable the public to make informed decisions about their health.

Aims:

Aim 1. Communicate with regional Network members, RMLs, the NNCO and the NNSC to plan, promote, implement and evaluate network programs and services. The NN/LM MCR will use electronic and in-person methods to communicate with our members, our partners and our funding agency.

Aim 2. Serve as a communication contact point by building a web and social media presence at the nnlm.gov domain. The NN/LM MCR will continue to improve the usability and usefulness of our web site. We will conduct an audit of our membership to determine the feasibility of implementing a social media presence.

Aim 3. Maintain current members, identify and recruit new regional Network members. The NN/LM MCR will support current members to keep them as members and use DOCLINE records and attendance at events to recruit new members.

Aim 4. Maintain an accurate and up to date NN/LM members directory. The NN/LM MCR will promote keeping DOCLINE information current, use DOCLINE records to monitor member updates, and contact members whose records may require updating.

Aim 5. Monitor the regional Network membership program to measure success, to identify and resolve problems which impede the effective delivery of health information services. The NN/LM MCR will use a variety of assessment and evaluation tools to monitor the program, and identify and resolve problems impeding the delivery of health information services.

Aim 6. Use tools and guidelines developed by the NEO to target and measure success, to provide the NNSC with regular feedback, and to participate in the review of the regional program. The NN/LM MCR will use NEO tools and guidelines, will provide feedback to the NNSC, and participate in the review of the regional program.

Aim 7. Develop and support the National Emergency Preparedness & Response Plan. The NN/LM MCR will support the National Emergency Preparedness & Response Plan by providing backup to NLM's customer service, maintain a backup plan with our buddy RML, and maintain the currency of our own continuity of service plan.

Impact:

Our expert staff and their aggregate experiences are vital for achieving these specific aims. New Network members will be recruited. Emergencies will be addressed. Through established relationships within and outside of the region, the NN/LM MCR will collaborate to address health information access issues. The expert leadership of the RML will result in responsible management of the budget and programs.

The Team:

Our team brings together 63 years of collaborative experience working for the RML. We have the subject expertise and state familiarity to carry out the project requirements and provide insight to improving the NN/LM program. Jean Shipman at .1 FTE is PI/PD for the program. She is currently Director of the Spencer S. Eccles Health Sciences Library, Information Transfer, Center for Medical Innovation, and the NN/LM MCR. Claire Hamasu at 1 FTE has been associate director since 2001. Betsy Kelly, at .25 FTE, is Assessment & Evaluation Coordinator; John Bramble, at 1 FTE is Utah/Research Enterprise Coordinator; Dana Abbey, at 1 FTE is Colorado/Community Engagement Coordinator; Jim Honour, at .75 FTE is Wyoming/Member Services Coordinator; Monica Rogers, at .5 FTE, is Nebraska/Health Literacy Coordinator; Christian Minter, at .5 FTE, is Nebraska/Education Coordinator; Alicia Lillich, at 1 FTE, is Kansas/Technology Coordinator; and Barb Jones, at 1 FTE, is Missouri/Library Engagement Coordinator.

Administration Core Research Strategy

SIGNIFICANCE

This program insures that Network members are providing evidence-based support for patient care and informed decisions. It addresses health information access for health professionals and the public.

INNOVATION

- Unique regional Partner Library program.
- Knowledge is transferred to others through education programming and regional communication venues (e.g., digital medical games and apps, data management, assessment strategies, etc.).
- Integration of assessment and evaluation provides data on Network members and the impact of the NN/LM on the MidContinental Region. This data is important for understanding the challenges of providing access to health information and finding solutions.
- A distributed model which allows for more in-person communication with regional constituents.
- Promotion of health information resources by publishing in organization publications of populations we want to reach.
- Single click access to the most popular pages on the program's web site.
- Communication from NLM and NIH are available through a social media wall on our web site.

APPROACH

See Overall Component for the organizational structure and governance of the NN/LM MCR.

Aim 1: Communicate with regional Network members, RMLs, the National Network Coordinating Office (NNCO) and the National Network Steering Committee (NNSC) to plan, promote, implement and evaluate network programs and services.

1.1 Outcome: The reach of the NN/LM MCR is extended as a result of work with organizations and Network members.

1.2 Methodology: The NN/LM MCR has a tradition of close communication with the regional constituency and other entities that make up the NN/LM. With coordinators located in each state, communication is exchanged personally as well as electronically.

Coordinators participate in community-based organizations, local exhibits, health sciences library consortia meetings, professional conferences and events where they meet with the audiences they want to collaborate with and impact. In addition we communicate electronically via our listserv, our webinars, our newsletter, and our RSS feed. We use these communication strategies to share, plan, promote, implement and evaluate our programs and services. Coordinators regularly meet with their counterparts in monthly NN/LM Coordinator teleconferences. The NN/LM MCR will communicate through reports to the NNCO and participation in the NNSC.

Methodology--Plan: We will continue our successful planning practice. Once a year all NN/LM MCR coordinators from each of the Partner Libraries, the Director and Associate Director meet to develop the logic model for the upcoming year. All staff members contribute to decisions about activities and the metrics used to measure success; i.e., what can be improved upon, continued with no change, or dropped for another approach. Our regional advisory boards will also have a role in our planning process. We will have four groups representing the three major audiences for our services and our Partner Libraries. One advisory board will consist of academic health sciences librarians, another of hospital librarians, and a third will consist of representatives from organizations and agencies involved in training future health professionals as well as those working with minority and underserved communities. In addition to these three advisory boards, we will continue to hold bi-monthly meetings with the directors of our Partner Libraries. All meetings will be used to learn more about the information challenges encountered by members of the boards, obtain input on challenges faced by NN/LM MCR staff, and to promote NN/LM and NLM resources and services. In addition, the Director of the NN/LM MCR will inform staff of NNSC decisions that should be considered when developing programs and services and will share regional issues and topics with the NNSC.

Methodology--Promote: The NN/LM MCR uses a variety of communication tools to promote programs and services of the NN/LM and the NLM. On an ad hoc basis, individuals can view what has been posted on the MidContinental Region News (MCR News) blog and the Bringing Health Information to the Community (BHIC) blog, and they can receive RSS feeds from both blogs. Every Tuesday, we send out through our listserv a compilation of the posts from our MCR News blog. We hold monthly webinars to inform members of past and future activities. Examples of past webinars include a presentation of the findings from a communication audit, sharing of participant experiences from our app evaluation project, and reports by recipients of professional development awards. On a quarterly basis, we publish an e-newsletter, *Plains to Peaks Post*, with longer pieces explaining topics such as altmetrics or data visualization, member support of systematic reviews, and updates on NLM resources. Through our quarterly and annual reports to the NNCO we promote and keep NLM informed of our accomplishments. In addition to these required deliverables to the NNCO, we also produce reports assessing or evaluating our region. These have included reports on user feedback of our BHIC blog¹ and the Network Member Questionnaire (NMQ)². All reports are forwarded to NLM, posted on our web site and shared with interested parties via announcements.

The audience we want to reach is diverse and we know that they may not find their way to our communication tools. By publishing in the communication tools of their own organizations, we can promote our resources to a broader audience. Coordinators frequently have articles published in their state library association newsletters or blogs. We have also posted an article on multi-language patient education resources on parish nurse social media sites.

- More information on our communication at conferences is available in the Outreach Core.
- More information on our communication via our web site and social media is available under Aim 2.

Methodology--Implement: Communicating with other groups such as our MLA chapter, other RMLs, the NNSC and the NNCO will help us to implement NN/LM MCR programming. Our Education Coordinator and Library Engagement Coordinator are ex officio members of the Midcontinental Chapter of The Medical Library Association (MCMLA) Education Committee and Library Advocacy Committee, respectively. Their presence on these committees allows both organizations to communicate with and help each other implement initiatives. For example, RML priorities have been addressed as CE at annual chapter meetings. Our communication with other RMLs has resulted in a number of collaborative efforts: contributions by other RML staff to the BHIC blog, sharing responsibility for national DOCLINE training, co-sponsoring events on disaster preparedness and on the research lifecycle. These communications will continue. In Year 2, we will co-sponsor a trans-regional event with the NN/LM Pacific Northwest Region and the Middle Atlantic Region. We will communicate with the NNSC and the NNCO on issues that affect more than a single region. Webinars enable us to offer sessions on a monthly basis to introduce and train librarians, the public health workforce, and health professionals to use NLM resources. More information on our webinars is available in the Outreach Core.

Methodology--Evaluate: Our webinars are a multi-purpose communication tool. In addition to promoting and implementing our program they are useful in interacting with our members and in obtaining feedback. These interactions provide us with insight that can be further pursued if appropriate. In addition to our webinars, we interact with our constituencies to obtain feedback through site visits and phone conversations.

1.3 Evaluation: We will use our annual end-of-year questionnaire to determine the effectiveness of our communication strategy. This feedback will provide us with information about each of the communication methods employed.

Aim 2: Serve as a communication contact point by building a web and social media presence at the nnlm.gov domain.

2.1 Outcome: Participants in the NN/LM MCR programs are aware of appropriate resources and have the skills to use them.

2.2 Methodology: The NN/LM MCR web site will serve as the central communication contact point for our member libraries, information networks, health organizations and professional associations in the region. The web site will be maintained according to NWSO guidelines. As new activities are implemented by the NN/LM MCR, appropriate content will be added to our web site. We will review the content and design of our web site for currency and usability at least annually; information that is no longer accurate or appropriate will be updated or removed as necessary. Two new features are being added to the web site this year; a quick link access to popular pages and a social media wall. The NN/LM MCR's top pages are the MCR News blog, *Plains to Peaks Post* newsletter, Evaluation, Education, and About Us. To be responsive to our frequent users, we will prominently display icons linked to these pages on our front page. The social media wall will be comprised of a curated list of social media feeds from the various NLM and NIH outlets. We will review, revise, and update the highlighted information on a monthly basis. The NN/LM MCR will continue to add new features as described above to improve the usability and usefulness of our web site.

In 2013, the NN/LM MCR ceased using social media for outreach due to very low engagement and member feedback of disinterest. A communication audit will be performed during Year 1 to assess if our members are now interested in using social media for professional communications or if there are new communication methods that they would prefer. Based on the results, the MCR will consider adding a social media presence or adopting new communication methods.

2.3 Evaluation: The NN/LM MCR will continue to conduct an annual end-of-year questionnaire which includes questions about our web site. The responses will be evaluated and used to improve our communication strategy. Media wall analytics will be reviewed yearly for possible improvements.

Aim 3: Maintain current members, identify and recruit new regional Network members.

3.1 Outcome: The reach of the NN/LM MCR is extended as a result of work with organizations and Network members.

3.2 Methodology: NN/LM MCR will continue to provide support and assistance to maintain current membership and pursue opportunities to add new members. NN/LM MCR staff will refer to the guidelines of the MCR Network Recruitment Plan--available to all staff via our intranet. More information on recruitment is available in the Support Access to Biomedical and Health Information Core.

Aim 4: Maintain an accurate and up to date NN/LM members directory.

4.1 Outcome: The reach of the NN/LM MCR is extended as a result of work with organizations and Network members.

4.2 Methodology: In Year 1 the NN/LM MCR will conduct a membership renewal for all existing Network members. As part of the renewal process, institutional records will be brought up to date to establish a baseline. Beginning in Year 2, we will use our communication tools to promote maintenance of DOCLINE institutional records in the region. We regularly urge DOCLINE participants to keep their institutional records current since those are directly linked to the NN/LM membership directory. We will also review the DOCLINE report "Institution Records Not Updated Within 1 Year" and contact full Network members to review and update their data as needed. In Years 3 and 4, Affiliate Network members will be contacted to review and approve their institution's online information. The NN/LM MCR Network Member Coordinator will work with and comply with record keeping policies and procedures of the NDCO and the NWSO to monitor Network member data in DOCLINE institutional records. We will work with the NDCO on other items as requested.

Aim 5 : Monitor the regional Network membership program to measure success, to identify and resolve problems which impede the effective delivery of health information services.

5.1 Outcomes: Participants in NN/LM MCR programs are aware of appropriate resources and have the skills to use them. Underserved populations in the MidContinental Region, who are ready, benefit from NN/LM MCR programs. Healthcare providers and the public engaged with NN/LM MCR experience significant increase to health information access. The reach of the NN/LM MCR is extended as a result of work with organizations and Network members. Recipients are better informed about best tools and methods for describing the healthcare ecosystem identified and disseminated as a result of NN/LM MCR contributions and collaborations.

5.2 Methodology: Monitoring the NN/LM MidContinental Region program has been an essential focus since the inception of this RML. The first proposal, written in 2000 for the NN/LM contract, included an assessment and evaluation position, the first of its kind for an RML. Since then, the NN/LM MCR has continuously staffed a position to guide us in monitoring our program. This has helped us to measure success and identify and resolve problems which

could impede the effective delivery of health information services. Over the past three contracts the NN/LM MCR used a variety of methods to monitor our membership program: questionnaires, DOCLINE data, advisory boards, and one-on-one conversations. We have found all of these to be effective.

A questionnaire directed at Network members will be administered at the end of each grant year to address the issues specifically identified in our logic model. The annual questionnaire will continue to be a mainstay of our outward facing evaluation practice. In previous questionnaires, assessments have included whether people in the region increased their awareness of new technologies from reading articles in our newsletters, and whether the advocacy tools on our web site helped our members advocate for themselves. This questionnaire helps us determine the effectiveness of our activities and helps us make decisions about continuing on as planned, tweaking to improve results, or reconsidering how we want to approach our outcomes.

Additionally, an in-depth questionnaire is administered once per five-year period that provides a picture of the state of health sciences libraries in the region. Since 2002, the NN/LM MCR has collected data on the demographics of our member libraries, budget information, their involvement in technology decisions, their access to online resources, the size of print and digital collections, the training they offer and take, their outreach activities, and their use and appreciation of NN/LM and NLM resources and services. Each Network Member Questionnaire (NMQ) report includes both the results of the questionnaire and a longitudinal look at past results to illustrate how access to health information has changed over time. For example, from our 2008 data, we know that the majority of our hospital libraries (54%) were experiencing budget increases, but that percentage greatly decreased by 2013 when only 30% of hospital library respondents indicated budget increases over the previous five years.³ Data from the NMQ affects services. We started monitoring all of NLM's listservs and reposting pertinent items on our own listserv when we learned that the majority of members were not subscribing to NLM listservs. The NMQ will be administered in the fall of 2018, affording us and the NLM a nearly 20-year look at health information services and resources in the Region.

During Year 1, the NN/LM MCR will contact the Network membership to better understand how they use social media tools. Early efforts to use Facebook and Twitter met with little success and we want to revisit this to determine whether the maturing of these tools might enable the NN/LM MCR to broaden its communications methods beyond its highly regarded weekly news emails, other just in time emails, blog posts, and the quarterly online *Plains to Peaks Post* newsletter. We have solid evidence of the effectiveness of these latter tools and will employ the consultant who conducted the communication audit in 2011, to administer, collect and analyze data, and report on the attitudes of and uses by Network members of a range of social media products.

DOCLINE institutional records and reports are a valuable resource for determining whether there are roadblocks in health information services for health professionals and the public. NN/LM MCR staff monitors service data to identify problems that may impede the flow of health information. A drop in fill rates or a long term DOCLINE hold alerts us that changes are happening at a member library that warrants investigation. Is the librarian going on vacation or has an emergent situation temporarily caused the library to close? A conversation with the member reveals if assistance is needed. Whether or not a major shift is happening that affects the library, we have heard from our members that they appreciate this indication of interest from the NN/LM MCR about the welfare of their library.

One-on-one conversations and site visits with members are also a way to monitor the Region, whether initiated by staff or members. Members call on RML staff for advice on

advocacy/marketing, interlibrary loan/document delivery, technology, and evaluation. A significant issue, especially with hospital libraries, is the threat of closures due to budget cuts, or failures to replace professional librarians. NN/LM MCR coordinators will continue to monitor and support hospital libraries that are potentially vulnerable. We have generated a checklist of areas (e.g., awareness of products, technology and services; marketing and professional development) to review with members during a site visit or call. This information helps us to improve programming and practices to better fit the needs of Network members and the NN/LM's goals.

Our advisory boards will be another way to monitor what is happening with our membership. From our hospital library, academic health sciences library, organization, and Partner Library meetings the NN/LM MCR will hear about problems and will be assisted in identifying actions that we can take solely or in collaboration with other organizations to resolve.

Aim 6: Use tools and guidelines developed by the NEO to target and measure success, to provide the NNSC with regular feedback, and to participate in the review of the regional program.

6.1 Outcome: The reach of the MCR is extended as a result of work with organizations and Network members.

6.2 Methodology: Evaluation has been a mainstay of the NN/LM MidContinental Region since 2001. The NN/LM MCR follows an outcome-based logic model, as described in a number of NEO resources, including identifying desired outcomes and articulating how progress and success (or failure) will be measured. We use an online reporting system developed by the NN/LM MCR to collect detailed data about staff activities and employ a variety of instruments to obtain feedback from Network members. In Year 1, we plan to use key informant interviews with community health centers, an assessment tool employed by the Outreach Evaluation Resource Center (OERC) to gather data about the information use (i.e., materials are on site, where they go for additional information) and needs of a specific population (i.e., information gaps). In the current contract OERC guided members of the Community College Task Force and MedlinePlus Connect Task Force on the use of key informant interviews. We have consulted regularly with OERC staff to review our practices and improve our skills and will continue to do so with the NEO staff. We look forward to the tools and guidelines that the NEO will produce that will help us improve how we implement the NN/LM program in the Region. We will use these tools and guidelines to provide feedback to the NNSC and the NNCO. The results of NN/LM MCR evaluation efforts are included in quarterly and annual reports to the NLM and will be shared with the NNSC. The NN/LM MCR will actively participate in a review of the program as scheduled by the NNCO.

Aim 7: Develop and support the National Emergency Preparedness & Response Plan.

7.1 Outcome: The reach of the MCR is extended as a result of work with organizations and Network members.

7.2 Methodology: Emergency preparedness came to the fore when Hurricane Katrina devastated health sciences libraries along its path in 2005. The NN/LM responded by making emergency preparedness a national initiative for the 2006-2011 contract. Claire Hamasu, Associate Director, was on the NN/LM team that developed the initiative. She was also one of the participants who worked on the procedures for the RMLs to serve as backup for NLM's customer services inquiries.

The NN/LM MCR will serve as backup for NLM customer service inquiries during emergency situations. When the Continuity of Operations Plan (COOP) is activated and a request for information is sent from one of our six states it will be forwarded to us. The request will go to the NN/LM MCR generic email address and staff will respond to it on behalf of NLM.

The NN/LM MCR has developed its own continuity of service plan that insures that RML services will continue no matter where or how extensive a disaster may be. Ultimately service responsibility could be transferred to the NN/LM New England Region, our buddy RML, should the NN/LM MCR be incapacitated. We communicate annually with our buddy RML about changes to the NN/LM MCR emergency plan.

This NN/LM MCR plan covers communication among RML staff, to the Region, and to NLM. It includes responsibility for placing the affected libraries' DOCLINE accounts on hold. Currently, annual drills identify areas of the plan that no longer work and help to keep the plan current. The NN/LM MCR emergency preparedness procedures include assisting Network members when localized emergencies affect their libraries. During one of our annual drills, one Network member in each state was enlisted to contact their state coordinator and ask for assistance for their own imagined disaster. Incorporating members into our drill had four benefits. It gave us practice in assisting members and resulted in updating that section of the plan. Members also realized where their own plans had gaps, and the idea that the NN/LM state coordinators could assist them was reinforced. We will continue to enlist the assistance of Network members in testing our emergency preparedness plan.

Coordinators have continuously offered the "10-Step Approach to Disaster Readiness" workshop to Network members as developed by Dan Wilson, Coordinator for the NN/LM Disaster Ready Initiative. As part of our gamification effort, the 10-step workshop was converted into an online modular workshop that has three elements: the importance of a continuity service plan, creating a plan, and using the plan as a tool for advocacy. Our training efforts have resulted in more members in the region writing their own plans. The 2013 (most recent) data collected from our Network members indicate that since 2008, 18% more members have emergency response plans. Our Regional Advisory Board suggested that we add a consultation service to our training sessions for additional support and encouragement as participants work on their plans. We will offer this consultation service to workshop participants in the future.

We will continue to work with all sectors of the NN/LM organization to ensure continuity of access to health information and the effective use of libraries during large-scale threats, both acts of nature and human; provide assistance to Network members in preparing for and responding to disasters or localized emergencies; and help with all emergency preparedness and response activities, including risk assessment, education, and keeping the regional emergency preparedness and response plan current.

7.3 Evaluation: For each training we will collect data on whether the class objectives were met. We will collect data to assess whether the number of Network members with service continuity plans has increased. We will identify needed improvements to the MCR emergency preparedness plan.

Milestones & Timeline: Administrative Core	Year 1	Year 2	Year 3	Year 4	Year 5
Aim 1. Hold planning meetings	X	X	X	X	X
Aims 1, 5. Hold Advisory Boards and Partner Library Meetings	X	X	X	X	X
Aim 1. Employ communication tools to promote, implement and evaluate programming	X	X	X	X	X
Aim 1. Communicate through non-NN/LM MCR communication tools	X	X	X	X	X
Aim 1. Communicate with NNSC	X	X	X	X	X
Aim 1. Communicate with NNCO	X	X	X	X	X
Aims 1, 2. Evaluate effectiveness of NN/LM MCR communication tools	X	X	X	X	X
Aim 2. Update social media wall	X	X	X	X	X
Aims 2, 5. Conduct social media audit	X				
Aim 3. Maintain current membership	X	X	X	X	X
Aim 3. Recruit new Network members	X	X	X	X	X
Aim 3. Maintain Network members directory	X	X	X	X	X
Aim 5, 6. Conduct ongoing data collection, analysis, reporting	X	X	X	X	X
Aim 5. Administer end-of-year questionnaire	X	X	X	X	X
Aim 5. Administer Network Member Questionnaire			X		
Aim 5. Monitor DOCLINE service data	X	X	X	X	X
Aim 5. Conduct one-on-one interactions for feedback	X	X	X	X	X
Aim 6. Conduct interviews with community health centers	X				
Aim 6. Employ tools and guidelines developed by NEO	X	X	X	X	X
Aim 6. Conduct Regional program review			TBD	BY	NLM
Aim 7. Conduct disaster preparedness drill	X	X	X	X	X
Aim 7. Update NN/LM MCR Emergency Plan	X	X	X	X	X
Aim 7. Consult with NN/LM NER on emergency plans	X	X	X	X	X
Aim 7. Offer emergency preparedness training in conjunction with consultation	X	X	X	X	X
Aim 7. Collect data on the number of Network members with service continuity plans			X		

References

¹ Rogers M. An Overview of BHIC Subscribers and Content [Internet]. NN/LM MidContinental Region; 2014 Sep [cited Jul 7, 2015]. 5 p. Available from:

https://nnlm.gov/sites/default/files/atoms/files/bhic_report_2015.pdf

² Olney C, Kelly B, Hamasu C. Report on the 2013 Network Member Questionnaire [Internet]. Salt Lake City: National Network of Libraries of Medicine, MidContinental Region; 2013 Jun [cited Jun 24, 2015]. 75 p. Available from:

http://nnlm.gov/mcr/evaluation/docs/2013_Network_Member_Questionnaire_Final_Report.pdf

³ Ibid. p.18.

Outreach & Education Core Specific Aims

Goals and Mission of the NN/LM

- Advance the progress of medicine and improve the public health.
- Provide all U.S. health professionals with equal access to biomedical information.
- Improve the public's access to information.
- Enable the public to make informed decisions about their health.

Aims:

Aim 1. Use innovative methods and approaches to maintain, develop and implement a regional outreach program addressing Healthy People 2020/health disparities, health literacy, patient safety, minority health professionals/students, and underserved populations. The NN/LM MCR will work with intermediaries, support partnerships, and engage communities to increase access to health information for a variety of audiences.

Aim 2. Promote awareness of health information resources by developing collaborations with organizations serving health professionals, public health workers, and consumers. The NN/LM MCR will contribute to a strong culture of health information collaborations by supporting the sharing of information and resources, maximizing expertise, and minimizing cost.

Aim 3. Implement a process for announcing, reviewing, and making sub-awards to regional Network members to help achieve outreach, education, and technology goals. The NN/LM MCR will fund sub-awards to regional Network members to help achieve outreach, education, and technology initiatives, and to encourage collaborations.

Aim 4. Implement a regional education program on electronic health information resources, in collaboration with the NTO. The NN/LM MCR training program will improve Network members, unaffiliated health professionals, non-health sciences librarians, and personnel in community health centers and community-based organizations' skills to locate the health information they need.

Aim 5. Promote NLM and NN/LM programs and services by exhibiting at national, state, and local health professional, public health workforce, and librarian meetings. The NN/LM MCR will utilize conferences and meetings to instruct, raise awareness of health information resources, and garner feedback on NLM programs and services.

Aim 6. Develop, deliver, and evaluate a technology improvement program for regional Network members, health professionals and consumers. The NN/LM MCR will assess and address technology barriers in order to increase access to health information and to support essential technology developments pertinent to library sciences.

Impact:

The NN/LM MCR, through engagement of Network members, those they work with, and other community and institutional entities will: enhance access to reliable health information to improve patient outcomes and reduce health disparities; support programs for those involved in preparing and training future health professionals; and deploy assistance to improve technology to support access to health information.

The Team:

Our team brings together 63 years of collaborative experience working for the RML. We have the subject expertise and state familiarity to carry out the project requirements and provide insight to improving the NN/LM program. Jean Shipman at .1 FTE is PI/PD for the program. She is currently Director of the Spencer S. Eccles Health Sciences Library, Information Transfer, Center for Medical Innovation, and the NN/LM MCR. Claire Hamasu at 1 FTE has been associate director since 2001. Betsy Kelly, at .25 FTE, is Assessment & Evaluation Coordinator; John Bramble, at 1 FTE is Utah/Research Enterprise Coordinator; Dana Abbey, at 1 FTE is Colorado/Community Engagement Coordinator; Jim Honour, at .75 FTE is Wyoming/Member Services Coordinator; Monica Rogers, at .5 FTE, is Nebraska/Health Literacy Coordinator; Christian Minter, at .5 FTE, is Nebraska/Education Coordinator; Alicia Lillich, at 1 FTE, is Kansas/Technology Coordinator; and Barb Jones, at 1 FTE, is Missouri/Library Engagement Coordinator.

Outreach and Education Core Research Strategy

SIGNIFICANCE

Introducing relevant health information at the right time can improve the ability for individuals to become involved in their own health care decisions. Increased knowledge and familiarity with available treatment options can facilitate better communication and shared decision-making between patients and clinicians resulting in a better quality of clinical care. Outreach and education are foundational to support this continuum of information flow by raising awareness of resources and enhancing skills in information retrieval. Keeping current with health information is challenging: the biomedical knowledge base doubles about every 19 years,¹ and nine out of ten adults are not fully able to use readily available health information.² Consumers, patients, caregivers, librarians, clinical staff, public health workers, community based organizations, policy makers, researchers, and other stakeholders benefit from the expertise of the NN/LM MCR staff to identify and instruct on health information resources that are in the appropriate format, language, and cultural context.

INNOVATION

- The NN/LM MCR's distributed model has Partner Library-hosted coordinators working locally in each state. As part of the communities where they conduct outreach and training, coordinators build trust and long-term partnerships with a 15-year track record of providing reliable health information and related knowledge.
- Coordinators leverage their "boots on the ground" approach with the use of technology to provide the most effective interaction with those ready to benefit from NN/LM MCR programming.
- Integrating coordinators into clinical professional organizations increases the awareness of health care providers of the skills and resources that librarians have to offer.
- Research study shows the cost benefit of the librarian as part of the patient care team.
- Reimbursement of information therapy by payers and insurers confirm and advance librarians as a valuable asset to their institution in today's health care reform era.
- Opportunities for online learning equalize access to information to improve skills.

APPROACH

Aim 1: Use innovative methods and approaches to maintain, develop and implement a regional outreach program addressing Healthy People 2020/health disparities, health literacy, patient safety, minority health professionals/students, and underserved populations.

Outcomes. See “Outcomes” for specific programs as noted below in 1.1 through 1.5.

1.1 Healthy People 2020 and Health Disparities

1.1.1 Outcomes: The reach of the NN/LM MCR is extended as a result of work with organizations and Network members. Healthcare providers and the public engaged with NN/LM MCR experience significant increase to health information access. Participants in NN/LM MCR programs are aware of appropriate resources and have the skills to use them.

1.1.2 Methodology: Colorado and Nebraska rank high in binge drinking. Kansas has low immunization rates. Missouri has a high number of smokers. Utah lacks primary care physicians. Wyoming has a high number of work-related deaths.³ Increasing public awareness regarding improving quality of life, healthy development, and healthy behaviors - tailored to the individual and the population across all life stages - are shared goals among Healthy People 2020 (HP 2020) and community stakeholders (e.g., hospitals, clinics, policy makers, public health departments, community based organizations, health ministries, schools, and libraries). Key to public awareness is access to health information. The NN/LM MCR works with public libraries across the Region to improve 1) the identification of and access to health information resources; 2) the ability to evaluate, analyze and understand content; and 3) the ability to use health information to make informed decisions.

Public libraries continue to be an excellent conduit for transferring health information to consumers; even small remote communities have public libraries. The NN/LM MCR has 1,464 public libraries spanning the vast geography of our Region, and 141 of these are Network members. Outreach to public libraries is critical as these sites provide access to computers and technology for those in our Region with low or no online access. Community members visit public libraries looking for programming and information related to managing medical conditions, living healthy lifestyles, and preventative activities to improve health. Cultivating partnerships and providing learning opportunities involving health information with public libraries continues to be a major strategy in the NN/LM MCR. Leveraging the public library’s focus on serving their local constituency, the NN/LM MCR will fund public libraries to offer health promotion projects, in addition to providing training on health information resources. Our methods are discussed in more detail in the subaward section of Aim 3.

Schools are another great venue for getting health information into communities. Adolescent health and addressing youthful behaviors that can lead to chronic adult diseases is a new HP2020 initiative. This initiative also focuses on the significant disparities, racial and ethnic, that adolescents experience, including obesity, teen pregnancy and tooth decay.⁴ The NN/LM MCR has over 4,000 school librarians and media specialists. The school librarian, school nurse, and health and science teachers all need authoritative, age appropriate health information for students and parents, as well as supplementary information that supports career pathway programs encouraging high school students to pursue careers in the health sciences. Coordinators will continue to conduct trainings for resources pertinent to K-12 audiences, and work to increase the number of school libraries/media centers as Affiliate Network members.

1.1.3 Evaluation: The NN/LM MCR, in conjunction with the tools and guidelines developed by the NEO, will use a variety of metrics to target and determine the impact of NN/LM MCR interactions with those involved in supporting preventive initiatives with the NN/LM MCR.

1.2 Health Literacy

1.2.1 Outcomes: Network Members work with healthcare providers to increase shared decision making due to access to evidence, information, and knowledge seeking skills. Information therapy is reimbursed by payers.

1.2.2 Methodology: Informed patients can foster improved patient-provider relationships, shared decision making and greater engagement in care. Numerous studies show the positive impact on patients who are actively engaged in their health, but conclude that most patients lack the necessary health literacy skills. Therefore physicians should counsel patients about where to find reliable and accurate health information.⁵

The NN/LM MCR will continue to support librarians to become change agents in their institutions in the area of health literacy. For many years the NN/LM MCR has offered classes and presentations to increase knowledge of health literacy and health information resources. NN/LM MCR coordinators will continue to offer training in this area through workshops, asynchronous classes, live sessions, and archived recordings. Classes that are included for credit in the Medical Library Association's (MLA) Consumer Health Information Specialization will be offered.

In addition, the NN/LM MCR will build on the success of prior partnerships between healthcare providers and Network members. The integration of information for evidence-based medicine, such as MedlinePlusConnect, into the EHR (electronic health record) supports meaningful use and shared decision making with patients. NN/LM MCR Coordinators have long provided resources for Network members to raise awareness and knowledge of these resources, how they relate to clinical care, and encouraged librarians to be involved. Coordinators will continue to offer training and support for these resources. We will continue to advance the new role for librarians in the education, monitoring and dissemination of new developments and advances on the use of the EHR as an avenue to deliver evidence based health information.

The NN/LM MCR will also develop a pilot project demonstrating the feasibility of information therapy reimbursement. Information therapy is prescribed information that assists patients in making decisions about their health. The NN/LM MCR will assess the insurance reimbursement environment to determine progress made by others pursuing this concept. This will include a comprehensive literature review as well as contacting individual programs working toward the goal of improving health literacy through information therapy services. The NN/LM MCR will work with the University of Utah Wellness Plan and the University of Utah's internal health plan to establish a pilot project. The project will identify how expenses attributed to information services can be reimbursed. It may be part of a bundled payment or a reimbursement directly to the physician. The project will also explore the effectiveness of information therapy provided by a health sciences librarian to a patient/family via prescription from the patient's physician and measure the impact of information provision on patient outcomes and satisfaction.

1.2.3 Evaluation: The NN/LM MCR, in conjunction with the tools and guidelines developed by the NEO, will use a variety of metrics to target and determine the impact of NN/LM MCR interactions with healthcare providers including questionnaires, interviews, and observation. Additionally, NN/LM MCR coordinators will continue to evaluate all training sessions, including those provided to Network members.

1.3 Patient Safety

1.3.1 Outcome: Network members work with healthcare providers to increase shared decision making due to access to evidence, information, and knowledge seeking skills.

1.3.2 Methodology: Patient safety is a compelling and expensive issue with medical errors costing Medicare \$8,800,000,000, and resulting in 238,337 preventable deaths of Medicare patients.⁶ The NN/LM MCR believes that the inclusion of the librarian as a partner in patient care is important to patient safety and improvement of patient outcomes. To date the importance of highly reliable information, evidence and knowledge provision and processes is largely ignored by the larger healthcare system. “The notion of a literature review serving to fill a hole in the Swiss cheese – a stop function to mitigate overuse and misdiagnosis – is hardly documented or talked about.”⁷

The NN/LM MCR is currently working to develop a methodology to determine how a librarian impacts the overall cost and outcomes for the patient. This report will be completed by April 30, 2016. After that date, the NN/LM MCR will work with interested hospital librarians in the Region and nationally to implement the methodology. Data from the participating hospital librarians will be collected, analyzed, and a final report will be completed in 2020 with the results published in the following year. We anticipate that this work will assist in promoting the financial value of evidence, information, and knowledge provided by the librarian to healthcare administrators and providers and will increase use of the librarian to address patient safety.

All NN/LM coordinators will join and participate in the activities of a professional organization of their choice that serves a clinical profession. This will raise the awareness of other professionals about the value of a librarian and how librarian services can complement their work. This awareness will lead to use of librarian skills and expertise in determining and obtaining the best evidence to support the implementation of evidence based care, with the goal of increased patient safety outcomes. This has been piloted during the past five years with involvement in both the Society to Improve Diagnosis in Medicine and the Health Care Education Association, and has been shown to be a successful way to integrate librarian expertise into both the society and other professions’ workflow.

1.3.3 Evaluation: The MCR will track the contributions of the Coordinators to their chosen organizations.

1.4 Minority Health Professionals and Students.

1.4.1 Outcomes: Participants in NN/LM MCR programs are aware of appropriate resources and have the skills to use them. Healthcare providers and the public engaged with the NN/LM MCR experience significant increase to health information access.

1.4.2 Methodology: A diverse healthcare workforce is essential for the adequate provision of culturally competent care, but in communities across the Region there are vast shortages of minority providers, as well as minority students pursuing health careers to fill these shortages. The NN/LM MCR has established successful ongoing collaborations and partnerships with groups and organizations serving minority health populations (e.g., community based organizations, faith community nurses, refugee health coordinators, patient navigators, urban/rural/tribal health clinics, promotoras) and educational institutions and organizations involved in healthcare workforce development (e.g., community colleges, schools of allied health, K-12 career pathway programs).

Those serving minority populations have a high need for access to limited English-proficient and culturally sensitive patient education resources. Research has shown that access to culturally and linguistically appropriate resources and training has the potential to improve the

quality of care and health outcomes, and assist patients and consumers to make informed decisions about their health. However, there are barriers to accessing appropriate language resources; these include lack of existing materials, expense of buying or producing materials, finding qualified interpreters and translators, and frequently shifting language groups within a community. The NN/LM MCR will continue to advance access to culturally and linguistically appropriate resources through exhibits and presentations at conferences for those serving minority or underserved communities, and through training opportunities. Training resources will include MedlinePlus language entries; HealthReach; and the NLM-funded app, Canopy Medical Translator; for brief patient communications. The NN/LM MCR will also continue to maintain and manage the successful Bringing Health Information to the Community (BHIC) blog, a national resource that highlights health information resources, professional development opportunities, and funding opportunities for community based organizations, especially those working in underserved communities. With multi-regional contributors (NN/LM MCR, MAR, PNR, and PSR) the blog reaches a broader audience and readers benefit from a wider knowledge base and a greater number of resources.

Healthcare workforce development relies on pipeline programs to fill gaps in health professional shortages and diversity by enhancing opportunities for racial and ethnic minorities, and disadvantaged students to pursue careers in the health sciences. Studies have shown that student participation in these pipeline programs leads to improved academic performance and the increased chance of enrollment in a health professions school.⁸ The NN/LM MCR will continue to work with groups and organizations involved in pipeline programs, including HOSA-Future Health Professionals and accredited schools of allied health. HOSA is a high school and postsecondary organization for students interested in healthcare careers providing training beyond basic technical skills needed for entry-level employment. The NN/LM MCR is a participant in the HOSA-NLM Health Information Ambassador 2015 pilot program. The pilot, taking place in Utah, encourages students to be familiar with – and teach peers how to use – MedlinePlus. If successful, this pilot will be expanded to other states in the Region. Allied health encompasses more than 80 different professions and comprises nearly 60% of the healthcare workforce.⁹ The NN/LM MCR has developed fruitful relationships with community college librarians and faculty, and accredited schools of allied health library staff and faculty. The NN/LM MCR will conduct health resources training for these librarians and faculty. We will exhibit and present at conferences addressing those involved in preparing and training future health professionals.

1.4.3 Evaluation: The NN/LM MCR, in conjunction with the tools and guidelines developed by the NEO, will use a variety of methods, including questionnaires, interviews, and observations to target and determine the impact of NN/LM MCR interactions with minority health professionals and allied health program staff.

1.5 Underserved Populations

1.5.1 Outcome: Healthcare providers and the public engaged with NN/LM MCR experience a significant increase to health information access. Underserved populations in the NN/LM MCR, who are ready, benefit from NN/LM MCR programs.

1.5.2 Methodology: The NN/LM MCR has a high prevalence of Medically Underserved Areas (MUA), with 80% of the Region's 428 counties designated by Health Resources Services Administration (HRSA) as having too few primary care providers, high infant mortality, high poverty, or a high elderly population.¹⁰ Even patients with insurance and numerous resources can become underserved as they try to navigate the United States' complex healthcare system. The NN/LM MCR has developed collaborations and partnerships with entities serving rural and urban populations, including community-based organizations (CBO), health ministries, the

public health workforce, and publically supported K-12. To expand on existing programming, the NN/LM MCR will seek avenues to enrich relationships with the Region's community health centers and school health programs through programming, awards, and exhibiting.

Community health centers (CHC) provide community based healthcare to poor urban and rural citizens needing medical, dental, mental/behavioral, pharmaceutical, and vision care. In practice for over 50 years, these centers - with 519 sites in the NN/LM MCR - have become the largest safety net and most successful primary care system in the U.S. The centers provide a medical home for the underserved by addressing the public health of the greater community through preventative care. Many of these centers serve migrant and seasonal farmworkers and their families. These "mobile uninsured" individuals face unique health challenges due to their work environment, poverty status, limited access to clean water, inadequate housing and cultural and language barriers. The majorities of these workers speak little to no English, and generally have less than an eighth grade education. The NN/LM MCR will establish relationships with CHC staff to understand how the services and resources of the NLM and NN/LM can support them in providing care to underserved populations. The NN/LM MCR will seek opportunities to provide training on health information resources, and to exhibit and present at conferences for health professionals serving minority or underserved communities.

School-based health centers and school nurses play a critical role in the health of students. With as many as 1 in 4 children in the U.S. (many of whom are uninsured and underserved) suffering from a chronic health problem, school health professionals need to address students' unique needs. School-based health centers, staffed by an interdisciplinary team including nurse practitioners, physicians, clinical social workers, psychologists, nutritionists, and dentists, provide a medical home for preventative and primary health services for students. School nurses address daily health needs and provide leadership for the health and safety of students through school policy and program oversight. The NN/LM MCR will work with school nurses and interested staff at the 71 school-based health centers operating in the Region to provide training for clinic and school health staff on health information resources. In addition, the NN/LM MCR will build on the success of prior K-12 funded projects involving health and/or science information by offering awards to past recipients interested in growing their proof of concept project, designed in this RML contract, by incorporating new organizational partners and reaching new audiences. Funding recipients will provide quarterly progress reports on their expanded projects.

1.5.3 Evaluation: The NN/LM MCR, in conjunction with the tools and guidelines developed by the NEO, will use a variety of methods, including questionnaires, interviews, and observations, to target and determine the impact of NN/LM MCR interactions with CHC and school health staff.

Aim 2: Promote awareness of health information resources by developing collaborations with organizations serving health professionals, public health workers, and consumers.

2.1 Outcome: The reach of the NN/LM MCR is extended as a result of work with organizations and Network members. Healthcare providers and the public engaged with NN/LM MCR experience significant increase to health information access. Participants in NN/LM MCR programs are aware of appropriate resources and have the skills to use them.

2.2 Methodology: Community health relies on collaborative efforts between health, public health, and community sectors. Community organizations throughout the Region are addressing ways to help their citizens live long, healthy lives. Improving health is a complex undertaking, requiring many areas of expertise, collaboration, and resources to make headway. Information is one of those resources. Health professionals and public health workers need access to

reliable information to develop guidelines, policies, practice evidence-based medicine, and utilize data; consumers and patients need information to make informed decisions about their health. The Region's distributed model provides a unique opportunity for NN/LM MCR coordinators to develop partnerships, facilitate collaborations, and conduct training with local stakeholders in their state. The NN/LM MCR has successful alliances with health professionals, public health workers, and institutions serving consumers, including community-based organizations, clinics, patient navigators, health ministries, schools and libraries. Coordinators will continue to conduct training sessions for clinical staff on limited English proficient and patient education resources; they will continue working with public health and community-based organization staff to raise awareness of culturally competent and limited-English proficient resources; and continue working with state librarians to train on consumer health resources.

The NN/LM MCR is continuing a successful collaboration with the Health Care Education Association (HCEA) which is a national, multi-disciplinary professional organization of health educators that provides relevant resources, reference tools, and information on health care education for patients and health care providers. The NN/LM MCR hosts and monitors HCEA's three listservs, responding to questions, and provides health information resources when appropriate. We have a coordinator serving on the HCEA's Communication Committee.

Our coordinators also serve on state public health association boards and hold workshops at state public health departments.

The Region's state libraries provide leadership and expertise in developing quality services for school, public, academic, and special libraries. The NN/LM MCR has worked closely with state library staff to provide relevant health information programming and training for library staff around the Region. NN/LM MCR coordinators are members of their state library association and exhibit and present at association annual conferences.

2.3 Evaluation: The NN/LM MCR, in conjunction with the tools and guidelines developed by the NEO, will use a variety of methods, including questionnaires, interviews, interviews, and observations, to target and determine the impact of NN/LM MCR interactions with those involved in collaborations with the NN/LM MCR.

Aim 3: Implement a process for announcing, reviewing, and making sub-awards to regional Network members to help achieve outreach, education, and technology goals.

3.1 Outcome: The reach of the NN/LM MCR is extended as a result of work with organizations and Network members.

3.2 Methodology: In the current contract, the NN/LM MCR has offered competitive funding enlisting our Network members to help achieve our established outcomes. Network members have used our funds to pilot EFTS and then received approval from their administration to fully participate. Schools have found that public libraries make excellent partners to incorporate health information resources in their curricula, promote healthy behavior, and increase awareness of the resources, especially NLM resources.

In the next grant period the NN/LM MCR will continue to offer small awards; a two-year award will be offered in Year 4 to extend the reach of the NN/LM MCR. We will announce the availability of funding in the grant year preceding the start of the project so that the paperwork for the funding can be completed by May 1 of the project year. This will allow a full year for the awardee to carry out the project. Applications will be reviewed by a committee composed of at least one NN/LM MCR coordinator and representatives from the Region. Coordinators will work with applicants to revise their project ideas and applications to reach a fundable status. Sub-awards will be handled on a reimbursable basis. The NN/LM MCR is always interested in

sharing lessons learned from funded projects and will feature results and experiences from the projects through regional media such as the *Plains to Peaks Post* newsletter and our “Breezing Along with the RML” webinars. We will also share the projects nationally by submitting a summary to WebJunction, an online environment for library staff professional development.

The sub-awards planned for 2016-2021 build on programming conducted during 2011-2016. The K-12 expansion project is open to applicants from our current K-12 collaboration projects. We will re-fund past awardees up to \$2,500 to build on their initial activity e.g., to add another community partner to the initial collaboration partners. This will encourage past awardees to continue working with health information and expand their health information project. For our health sciences Network members, we will offer funding to upgrade old technology or explore cutting-edge technologies to enhance user access. We have initiated programs in the current contract providing members with an iPad in our iTest iPad project and for-fee apps in the Mobile App Sharing Project. The iTest iPad project provided us feedback on how librarians would use an iPad and the impact it would have on their work and services.^{11,12,13} In the Mobile App Sharing Project participants shared evaluations of mobile apps with their colleagues.

Two new awards will be offered during the grant period. One will fund public library members to present programming to increase the awareness of and education on health topics incorporating health information resources relevant to their community. Of particular focus will be programming on the public health priorities of their community and programs for underserved populations. Later in the grant period (Year 4), we will offer a new multi-year competitive sub-award. We have identified three topics that may have increased in relevancy by 2019. We will select one of them in Year 3 and accept applications for Years 4 and 5 funding and implementation.

Topic 1) *An exploration of the librarian’s role in the organization and findability of non-trial clinical big data rather than basic sciences data.* This brings in the issues of HIPAA and patient privacy as it applies to the use of data and the security of the data. We expect the output to be a model of how hospital librarians can contribute to the management and curation of data collected in the clinical setting. It may also result in a comparison of how working with clinical data is different from working with basic science data.

Topic 2) *An environmental scan, analysis and report on the health sciences library landscape using criteria of interest to administration.* Health sciences librarians continue to be challenged to communicate their value whether they work in an academic or hospital setting. This study would provide information on the state of health sciences libraries using metrics and criteria that administrators value. The results of the study would be useful at many levels by a library director, by professional organizations with health sciences librarian members, and by organizations that work with health sciences librarians.

Topic 3) *A research study that investigates the outcome of librarians providing information intervention looking at a specific population (e.g., seniors) for a specific issue (e.g., drug information).* This could be a randomized controlled trial conducted with scientific rigor that would have credibility with the medical community and increase the inclusion of librarians on patient care teams.

3.3 Evaluation: Funded project evaluations will be based on whether stated outcomes were met.

Aim 4: Implement a regional education program on electronic health information resources, in collaboration with the NTO.

4.1 Outcome: Participants in NN/LM MCR programs are aware of appropriate resources and have the skills to use them.

4.2 Methodology: The NN/LM MCR will collaborate with other RMLs, the NTO, and the NEO to implement a regional training program on electronic health information resources. We will work with other RMLs in identifying topic gaps, writing curricula, creating training materials, and deciding on the evaluation metrics. The NN/LM MCR will follow the procedures outlined in the NN/LM Guidelines for Classes.

Methodology--Training for Network Members: The NN/LM MCR has produced courses in the online format on NLM resources, project planning, assessment and evaluation, and technology awareness. During the current contract we have offered monthly hands-on training focusing on NLM health resources. The majority of our Network member audience comes from health sciences libraries, but public librarians, academic librarians, and community college librarians also participate. All attendees for the synchronous session and the recorded session (within a month of the live session) can earn MLA CE credit.

During 2013-2016 the NN/LM MCR introduced gamification to its self-paced online training offerings. This was a way to corral a variety of training opportunities under a single interface. We followed the Experiential Education Theory adopted by many medical schools of “See One, Do One, Teach or Share One”. Each course incorporated the three levels of learning and each level required more effort on the part of the participant. As members advanced through the levels they earned increasing MLA CE credits and game points. The setting for the educational offerings was Librarian’s in the Wonderful Land of Oz. Gamification inserted fun and competition into these educational opportunities. With permission from course authors from other RMLs, we plan to transition their online offerings into our Oz setting and expand the offerings we offer to Network players. Our self-paced online offerings have had participation from many parts of the country outside of the MidContinental Region in part due to this interactive gaming environment.

Once a week we send out an email announcing the URL for recordings of past training sessions and information for upcoming training sessions and presentations. While gamification has corralled our online self-paced training sessions, members still have to check various locations (NN/LM MCR calendar, National Training Registration Page, MCR News blog) to locate information about other in-person and online sessions (synchronous or recorded). In the next grant period we will come up with a process to use the National Training and Registration Page to provide one location where our constituency can locate all of our synchronous, in-person, and recorded training offerings.

The NN/LM MCR also supports education of our Network members through professional development funding. Academic health sciences librarians gave this resource the highest percentage of “very useful” ratings. Applicants will be asked to describe the workshop or conference they would like to attend, how they will use what they learn, and how they will share what they learn both within their organization and with the region. An advocacy activity is part of the application process. Applicants are required to consult with a non-library administrator in the choice of the activity. Recipients share their experience with colleagues in the region, thereby increasing the return on our investment. Past recipients have increased their skills and knowledge about systematic reviews, the Animal Welfare Act, leadership, and technology. In the upcoming grant cycle we will initiate training offered by Lynda.com. This service offers a wide variety of courses on software updates, business and marketing skills that will be useful to our

members. The benefit is that they will be able to take these courses when it's convenient to them.

We will explore the feasibility of identifying and developing classes that result in Network members attaining a competency in different areas of health sciences librarianship. This program would emulate the specialization program offered by the Medical Library Association. By earning a specified number of CE credits for a certain topic, members will achieve a competency rating. MLA offers Levels I and II for its specializations. Competencies could be attained for assessment and evaluation, advocacy, educational design, data management, and health literacy.

Methodology--Outreach Training: Training will be a significant component of the NN/LM MCR outreach efforts to reach unaffiliated health professionals, non-health sciences librarians, and personnel in community health centers and community-based organizations. These audiences interface with the general public and the medically disadvantaged who would benefit from having access to relevant information presented in a way that incorporates health literacy principles. In support of health literacy, the program will incorporate and promote cultural competency resources when appropriate. Training will take place at conferences where we exhibit. We regularly submit proposals for workshops and presentations to organizations when we decide to exhibit at their meetings. Small group or one-on-one training will take place as part of our relationship building with selected organizations.

All training and presentations will be reported in the NLM Activity Reports Application, NN/LM MCR Activity Report System, and the NLM External Exhibit System.

4.3 Evaluation: The success of our training program will be determined by the participants of our training sessions. At the beginning of the training, they will be informed of the objectives established for the sessions and at the end, they will provide feedback on whether the sessions met the set objectives.

Aim 5: Promote NLM and NN/LM programs and services by exhibiting at national, state, and local health professional, public health workforce, and librarian meetings.

5.1 Outcomes: The reach of the NN/LM MCR is extended as a result of the work with organizations and Network members. Participants in NN/LM MCR programs are aware of appropriate resources and have the skills to use them.

5.2 Methodology: Exhibiting and presenting at conferences is an effective means for coordinators to meet face-to-face with health professionals, public health workforce, and librarians who work with populations we ultimately want to affect. It is also a cost-effective means for reaching a large number of these constituents at a single location. These events provide an excellent venue to raise awareness of and provide instruction on NLM resources and services. In addition, coordinators can ascertain health information needs, obtain feedback on resources and services, and make contacts for future training opportunities. The in-person conversations in the exhibit hall also inform coordinators of the concerns and trends of the professions and their perception of clients and patients' needs. (e.g., signing up for insurance, wait times for seeing providers). Promoting NLM and NN/LM programs and services is a shared responsibility among the coordinators, and the Region's distributed model places coordinators in an excellent position to identify and exhibit at local and state meetings. NN/LM MCR coordinators will submit program proposals to local, regional, state, or national events. Coordinators will focus on exhibiting and presenting at the following:

- State library association
- Conferences for those involved in preparing and training future health professionals (e.g., K-12, community college, HOSA)
- Conferences for those serving minority or underserved communities
- Community events (e.g., community health fairs)
- National conferences assigned by NLM

Coordinators will report their exhibit activities in the NLM External Exhibit System, the NLM Activity Reports Application, and the NN/LM MCR Activity Report System.

5.3 Evaluation: The NN/LM MCR will use a variety of metrics to determine whether our participation at a conference was successful. As we have in the past, the data we collect for exhibits will include the number of conference attendees, number of visitors to the booth, types of resources promoted, number of resources demonstrated, and feedback from visitors on how they intend to apply what they learned. We will note the meetings where we were able to present, track follow-up opportunities that result from exhibiting and presenting, and will develop a formula for determining the ROI of the meeting. Data for presentations will include number of participants and feedback as to whether the sessions met stated objectives.

Aim 6: Develop, deliver, and evaluate a technology improvement program for regional network members, health professionals and consumers.

6.1 Outcome: Healthcare providers and the public engaged with NN/LM MCR experience significant increase to health information access.

6.2 Methodology: The NN/LM MCR will send a questionnaire to all Network members to determine the type and currency of their hardware and software, mobile devices, and electronic health record systems. Using questionnaire results, the NN/LM MCR will offer technology improvement sub-awards to purchase new hardware, mobile devices, software upgrades, charging stations, audio/visual equipment, or other appropriate technological resources. Sub-award recipient's evaluations of the technological enhancements will be shared with the Region. In addition, the NN/LM MCR will continue to look for effective ways to support the access to restricted online network services for under-connected members, primarily affecting hospital-based members.

The NN/LM MCR defines Network members as being "under-connected" if they are prohibited, due to institutional policies, from accessing valuable online network services. Finding workable strategies to eliminate these barriers remains important because providers of information resources and services use social media and collaborative services to add value to their products or to keep users informed about them. NLM, NN/LM, and other highly authoritative entities are among these providers and rely on online network services to engage, educate, and inform their users.

The NN/LM MCR will provide resources that will increase awareness, knowledge, and skills for Network members to assist their constituents by creating online training and outreach content. Resources will incorporate emerging technologies, best practices in online learning, and project-based examples.

According to the NN/LM MCR's most recent Network Member Questionnaire, videoconferencing, broadcasts, and streaming video are technology tools used by a majority of our member libraries. To support this trend, the NN/LM MCR will provide resources that increase awareness, knowledge, and skills for Network members so they create online training for their user populations. Resources will incorporate emerging technologies, best practices in online learning, and project-based examples.

6.3 Evaluation: Identify needs of under-connected members in the end-of-year questionnaire.

Timeline & Milestones: Outreach and Education Core	Year 1	Year 2	Year 3	Year 4	Year 5
Aim 1.1, Conduct training for public libraries on health resources	X	X	X	X	X
Aims 1.1, 1.5, Conduct training for K-12 entities on health resources	X	X	X	X	X
Aim 1.2, Train Network members to be health literacy change agents	X	X	X	X	X
Aim 1.2, Obtain approval for information therapy project at the University of Utah	X	X			
Aim 1.2, Develop infrastructure, work/process flow for information therapy project		X	X	X	
Aim 1.2, Publish results on information therapy and cost effectiveness					X
Aim 1.3, Develop and conduct pilot project for cost impact of the librarian study		X	X		
Aim 1.3, Publish results of cost impact of the librarian study					X
Aim 1.3, Select and participate in a clinical professional organizations (each coordinator)	X	X	X	X	X
Aim 1.4, Maintain, manage and contribute to the BHIC blog	X	X	X	X	X
Aim 1.4, Distribute BHIC blog subscriber satisfaction questionnaire		X			
Aim 1.4, Conduct training for those involved with developing future health professionals	X	X	X	X	X
Aim 1.4, Conduct training for those involved in school health	X	X	X	X	X
Aim 1.5, Establish relationships with community health centers	X	X			
Aim 1.5, Conduct training for community health centers		X	X	X	X
Aim 1.5, Evaluate outreach with community health centers					X
Aim 2, Monitor and post to health-related listservs	X	X	X	X	X
Aim 2, Collaborate with health professional and public health organizations, and state libraries to provide professional development and program opportunities	X	X	X	X	X
Aim 3, Offer sub-awards for K-12 expansion and public library project	X	X	X	X	X
Aim 3, Offer technology funding		X	X	X	X
Aim 3, Offer multi-year project funding				X	X
Aim 4, Collaborate to implement regional training program	X	X	X	X	X
Aim 4, Review effectiveness of training program	X	X	X	X	X
Aim 4, Offer professional development funding	X	X	X	X	X
Aim 4, Offer training through Lynda.com		X	X	X	X

Timeline & Milestones: Outreach and Education Core	Year 1	Year 2	Year 3	Year 4	Year 5
Aim 5, Exhibit and present at local and national conferences	X	X	X	X	X
Aim 6, Provide resources for online training.	X	X	X	X	X
Aim 6, Assess current technology available to Network members	X				
Aim 6, Promote tools and provide consultations to assist under- connected Network members to access restricted online services	X	X	X	X	X
Aim 6, Identify needs of under-connected Network members in the end-of-year questionnaire	X	X	X	X	X

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Support Access to Biomedical and Health Information Core Specific Aims

Goals and Mission of the NN/LM:

- Advance the progress of medicine and improve the public health.
- Provide all U.S. health professionals with equal access to biomedical information.
- Improve the public's access to information.
- Enable the public to make informed decisions about their health.

Aims

Aim 1: Implement the NN/LM Document Delivery and Interlibrary Loan Plan in the Region. The NN/LM MCR will support programs to provide biomedical and health information to affiliated and unaffiliated health professionals, researchers, librarians, and the public.

Aim 2. Efficiently and effectively support access to biomedical and health information. The NN/LM MCR will identify, disseminate, and promote effective practices as described by our Network members.

Aim 3. Recruit members to participate in MedPrint. The NN/LM MCR will identify potential Network members for the Medical Serials Print Retention program and attempt to recruit their participation.

Aim 4. Support biomedical big data. The NN/LM MCR will begin a program to increase our Network members' knowledge and skills as related to biomedical big data. We will also collaborate to develop a health big data specialization and symposium on clinical data.

Impact:

The NN/LM MCR will establish an efficient system to provide information access throughout the region, where each member library contributes to the best of its ability to offer document delivery, reference services, and training on health information resources. As a result of our efforts Network members will increase support to researchers, administrators and clinicians on the use and management of biomedical big data and NLM research tools.

The Team:

Our team brings together 63 years of collaborative experience working for the RML. We have the subject expertise and state familiarity to carry out the project requirements and provide insight to improving the NN/LM program. Jean Shipman at .1 FTE is PI/PD for the program. She is currently Director of the Spencer S. Eccles Health Sciences Library, Information Transfer, Center for Medical Innovation, and the NN/LM MCR. Claire Hamasu at 1 FTE has been associate director since 2001. Betsy Kelly, at .25 FTE, is Assessment & Evaluation Coordinator; John Bramble, at 1 FTE is Utah/Research Enterprise Coordinator; Dana Abbey, at 1 FTE is Colorado/Community Engagement Coordinator; Jim Honour, at .75 FTE is Wyoming/Member Services Coordinator; Monica Rogers, at .5 FTE, is Nebraska/Health Literacy Coordinator; Christian Minter, at .5 FTE, is Nebraska/Education Coordinator; Alicia Lillich, at 1 FTE, is Kansas/Technology Coordinator; and Barb Jones, at 1 FTE, is Missouri/Library Engagement Coordinator.

Support Access to Biomedical and Health Information Core Research Strategy

SIGNIFICANCE

The National Network of Libraries of Medicine, MidContinental Region (NN/LM MCR) is committed to supporting access to biomedical and health information. This support is essential in meeting our goals of advancing the progress of medicine and improving the public's access to information. To do this it is of vital importance that we effectively perform document delivery and interlibrary loan programs and support our members in data management. This plan addresses a critical barrier to progress by increasing access to biomedical and health information for Network members, unaffiliated health professionals, and the public. This program also intends to increase our members' scientific knowledge and technical capability – allowing them to better understand and utilize biomedical big data as well as the most effective practices of their peers. Successful completion of the proposed aims will improve how biomedical information and data is described, located, discovered, shared and utilized.

INNOVATION

- Promotion of public access collections as a source of document delivery to unaffiliated health professionals and the public.
- With the help of unaffiliated health professionals and the public, identification of locations where a Network member is needed. Locate a library or information resource center in the “health information desert” to become a Network member.
- Development of an environment where effective practices are shared and findable.
- Recognition of MedPrint participants on the NN/LM MCR web site to encourage more participation.
- Development of a program to increase awareness, knowledge, and skills about managing biomedical big data and supporting the research enterprise.
- Encourage use of innovative research tools to locate and connect researchers and measure their impact.

APPROACH

Aim 1: Implement the NN/LM Document Delivery and Interlibrary Loan Plan in the Region.

1.1 Outcome: The reach of the NN/LM MCR is extended as a result of work with organizations and Network members.

1.2 Methodology: The NN/LM MidContinental Region will provide leadership, in collaboration with the NN/LM DOCLINE Coordination Office, to implement the NN/LM Document Delivery and Interlibrary Loan Plan and educate our members on the points of the plan. This strategy will enable a wide variety of users to have access to biomedical and health information. We will seek new DOCLINE member libraries and encourage all existing members to provide as many avenues as possible for document delivery and information services in a timely and efficient manner. We will urge DOCLINE members to support services for health professionals and the public including reference, online search training and onsite collection access. We will identify and inform members of new avenues of biomedical and health information access.

Methodology – Interlibrary Loan and Document Delivery: We anticipate that Loansome Doc will continue to be a robust document delivery service for unaffiliated health professionals and the public. The NN/LM MCR will promote Loansome Doc at health professional meetings and

conferences and public events. We will encourage DOCLINE libraries to provide this service especially to the unaffiliated such as the public health workforce, community health center and community based organization staff, and the public.

Public access collections such as PubMed Central and alternative document delivery services are growing resources for unaffiliated health professionals, the public, and librarians to obtain biomedical resources that are free or low cost. The NN/LM MCR will form a working group for interested members who will be tasked to identify reliable and trustworthy resources. Examples of services include on demand services such as Get It Now and ReadCube or full-text linking systems such as CrossRef. NN/LM MCR staff and Network members will promote vetted services, especially to unaffiliated health professionals and the public. Reviews will be shared with the NDCO so that the NDCO can compare the features, costs and efficiencies with DOCLINE. The NDCO can then make national recommendations to Network members to use DOCLINE or a more appropriate service.

Methodology – Recruitment: In Year 1 of the cooperative agreement, a membership renewal will be conducted for all current full and Affiliate members. Network Members will be emailed an invitation to renew online. Staff will follow-up with non-responders to complete the renewal process. We will make an effort to maintain our full members who provide resource sharing services for unaffiliated health professionals and the public. As part of the renewal process, all existing Network member institutional records will be brought up to date.

The NN/LM MCR will also recruit new members. A list of non-member institutions exists in DOCLINE and NN/LM MCR coordinators will give priority to approaching institutions whose collections support the minimal requirements for DOCLINE participation. There are 11 academic health sciences libraries in the Region and all are Network members participating in DOCLINE. Suitable new members for DOCLINE participation subscribe to at least 25 biomedical titles, agree to share their collections with other member libraries, and uphold minimum fill rate standards. There are 213 institutions listed as non-members with 45 academic, 59 hospital, 39 public, and 70 other libraries that have potential for sharing their resources. NN/LM MCR will monitor this category and recruit if and when new institutions are formed. There are approximately 266 academic libraries in the MCR. Of these, 118 (44%) support programs offering degrees in a health-related field. Forty of these are current full members leaving potentially 78 institutions to recruit for Network membership. Although we are confident that we have enrolled all possible full member candidates from academic health institutions and hospitals, we will continue searching. From time to time new libraries are started in hospitals so a focused effort will be made to identify potential new Network members.

Staff will use a variety of venues to promote membership. Members will be recruited at state and regional health sciences consortia meetings, multi-type librarian meetings, and while exhibiting and participating in the annual conference of the MidContinental Chapter of the Medical Library Association (MCMLA). The training environment will also continue to be used as an opportunity to promote membership--an example would be to invite membership during a presentation at a professional conference for librarians. The NN/LM MCR web site is also a promotional resource for membership. Procedures and systems, such as the online membership application and online Network member agreement form, have been established to ensure efficient and timely responses to membership applications. All applicant data will be shared with the NDCO for record creation in DOCLINE. The NN/LM MCR will encourage health professionals, community based organizations and the public encountered at conferences, training sessions, health fairs, and other events to assist us in the recruitment process. For example, during the course of the conversation, we will inform health professionals or health consumers that they can access health information and services from Network members located near them. Using the NN/LM Members Directory (<http://nnlm.gov/members/adv.html>),

we can locate the nearest Network member. If there are no participating members in their area, staff now has an opportunity to focus recruitment efforts in that area. This also gives us an opportunity to partner with health professionals or health consumers to encourage a library or resource center to become a Network member. We anticipate that this recruitment strategy will boost membership.

Focus for Network member recruitment falls into eight categories:

1. Non-members listed in DOCLINE
2. Academic libraries supporting higher education health programs
3. Academic health sciences libraries that solely support health programs
4. Hospital libraries/information resource centers
5. Public libraries
6. Community - based organizations
7. Community colleges
8. K-12 schools

Methodology—Member Services: As the Regional Medical Library (RML), the Spencer S. Eccles Health Sciences Library chooses Partner Libraries based on their leadership within the Region and the resources they can contribute to improve regional and national programs. In the MidContinental Region’s decentralized model, the Partner Libraries agree to assist the RML with the implementation of the NN/LM cooperative agreement. There is at least one Partner Library in each state. Each Partner Library has statewide outreach and/or regional special project responsibilities and participates in DOCLINE and EFTS. Partner Libraries are instrumental in improving access to biomedical information in the Region.

DOCLINE institutional records are useful tools to monitor and coordinate member services. Institutions can indicate in their DOCLINE record the services they provide for health professionals (unaffiliated, affiliated), and the public, i.e., Internet training, mediated searching, onsite collection access, online search training, reference services. DOCLINE participants can be monitored for their fill rates, timely updates of the information in their institutional records and routing tables. Electronic Funds Transfer System (EFTS) is an efficient method for DOCLINE users to pay and receive payment for ILLs. It is also a way for members to hold down costs for transactions for their institutions. We currently have 57 members who could but are not participating in EFTS. We will provide a financial incentive for participation by offering a deposit of \$100 for new EFTS members.

Evaluation: We will confer with the NEO on ideas for assessment tools to assist us with measuring the impact of services in the Region and utilize questionnaires and other tools when we feel they are needed. We will monitor Network member awareness of public access and the how new resource sharing programs and tools impact our Region’s Network members when shared within their institutions. We will track the effectiveness of our recruitment efforts. We will regularly encourage Network members to indicate to the NDCO if DOCLINE meets their needs for supporting/providing access to health information and what improvements could be made to its functionality and services.

Aim 2. Efficiently and effectively support access to biomedical and health information.

2.1 Outcome: Network members have adopted effective practices promoted by the NN/LM MCR.

2.2 Methodology: During the quint-chapter MLA meeting in 2014, participants suggested new programming for the RMLs. One of the most popular suggestions, as rated by attendees, was enabling members to share “great ideas/solutions to various problems.” During the 2014-2015

contract year, the NN/LM MCR selected three respected Network members from hospital and academic health sciences libraries and asked them to share their effective practices in a 2-3 minute videotaped interview. These interviews are available on the NN/LM [MCR's YouTube channel](#). The brevity of these videos makes them easy to produce and captures the essence of an effective practice. The interviewees identified strategies such as getting involved in meeting organizational needs, collaborating with members of the organization, and asking questions. Network member feedback indicated that the effective practices were helpful or validated their own practices. In the next round of videos, members will be asked to share an effective practice on how they stay relevant to their organizations, how they impress their supervisors, or how they have integrated themselves into their organizations. We will continue recording effective practice videos during 2016-2021 and make them available on the NN/LM MCR YouTube channel.

Our Network members enjoy sharing ideas and practices during our “Breezing Along with the RML” webinars. Because of the popularity of these discussions, we usually schedule one or two each year where we pose a question and facilitate a discussion. One of the topics for 2014 was Best Practices for Resource Sharing facilitated by Member Services Coordinator, Jim Honour. Following the session, he turned the discussion into an article that was published in our *Plains to Peaks Post* newsletter, resulting in a wider distribution of resource sharing practices. “Breezing Along with the RML” recordings are deleted after two years because the relevance of the content is transitory; our newsletter issues are archived and therefore permanently accessible. We will continue to schedule webinars that encourage members to share their effective practices with each other. For our effective practices sessions, we will document the ideas by incorporating them into newsletter articles.

During the current contract, we have established a policy of regularly talking one-on-one with at least 10 of our members in each state per year as a way of maintaining relationships, identifying challenges that they are facing, and giving members the opportunity to raise issues with coordinators. If we feel that these challenges and issues are ones that other members are also addressing, they will become the topic for our videos or a discussion topic for our “Breezing Along with the RML” sessions. Through these conversations, we will identify programming and practices that would be useful to others. We will again employ the newsletter as a way of disseminating and preserving effective practices.

During the grant period, we will revisit the use of social media such as LinkedIn as a medium for communicating with our Network members. From our 2011 communication audit, we learned that most of our members, no matter how few or many years they had been practicing, were not using social media for professional communication. This may have changed in the last five years. If that is the case, we will also use social media to engage members in sharing effective practices they have used successfully.

Another activity will be to create a member clearinghouse to encourage knowledge sharing between NN/LM MCR members. Members’ newsletters, articles, and other media will be promoted on an NN/LM MCR sponsored web page. This page will include a directory of items with links to the materials or a digital copy if possible. This page will be promoted monthly and a digest of new posts will be shared on a quarterly basis.

As we disseminate a growing number of resources on effective practices, we will have to organize this information to make it easily findable. Practices that address different topics and that exist in different formats (e.g., video, audio, print, social media) will be categorized and shared on our web site to make them accessible to our members.

2.3 Evaluation: We will solicit feedback from Network members to determine whether our efforts to share effective practices have been useful and how they have been applied. Once a

directory of practices is available from our web site, we will track and analyze the practices most searched for and viewed during each year.

Aim 3. Recruit members to participate in MedPrint.

3.1 Outcome: The reach of the NN/LM MCR is extended as a result of work with organizations and Network members.

3.2 Methodology: As libraries face increasing pressures on repurposing space and using digital content, print retention and preservation will be less and less common. A total of six member libraries in the MCR have committed to the Medical Serials Print Retention program (MedPrint) as of May 1, 2014. The NN/LM MCR will research and identify which non-MedPrint libraries in the Region are potential matches for the program and generate a quarterly report to be shared with the NDCO. The NN/LM MCR will also promote the MedPrint program, quarterly, to member libraries via the MCR News blog, email distribution lists, and webinars. A web page will be maintained on the NN/LM MCR web site dedicated to the MedPrint program and will display an honor roll celebrating the participation of MedPrint libraries and the titles they have committed. The NN/LM MCR will communicate its promotional strategy to the NDCO and will incorporate any ideas, which that office may suggest, into the Region's promotion strategy. The first steps in MedPrint recruitment will be identifying regional libraries with print holdings that meet the program's requirements and contacting the pertinent decision-makers in each potential participating institution. The NN/LM MCR state coordinators will inform them of the value of participating in a program that ensures the preservation of and continued access to the literature, describe the scope of the program, and explain the requirements and procedures for joining the MedPrint program.

3.3 Evaluation: We will expect a net increase in the number of NN/LM MCR libraries participating in MedPrint each year.

Aim 4. Support Biomedical Big Data.

4.1 Outcome: Recipients are better informed about best tools and methods for describing the healthcare ecosystem identified and disseminated as a result of NN/LM MCR contributions and collaborations.

4.2 Methodology: Biomedical big data (BBD) is a term coined by the NIH data science community and is referred to in the Big Data to Knowledge (BD2K) initiative¹ launched in 2012. BBD is a subset of big data, and in the context of BD2K, means identifying the opportunities and challenges that biomedical researchers have when "releasing, accessing, managing, analyzing, and integrating datasets of diverse data types. Such data types may include imaging, phenotypic, molecular (including –omics), clinical, behavioral, environmental, and many other types of biological and biomedical data. They may also include data generated for other purposes. The datasets are increasingly larger and more complex, and they increasingly exceed the abilities of currently used approaches to manage and analyze them. Biomedical big data primarily emanate from three sources: 1) a few groups that produce very large amounts of data, usually as part of projects specifically funded to produce important resources for the research community; 2) individual investigators who produce large datasets for their own projects, which might be broadly useful to the research community; and 3) an even greater number of investigators who each produce small datasets whose value can be amplified by aggregating or integrating them with other data."²

The NN/LM MCR will create a program for our primary audience that increases their awareness, knowledge, and skills on the issues of biomedical big data. Our program will consist

of developing or co-developing courses or seminars, inviting expert speakers, and writing articles for own publications. In Year 1, we will develop biomedical big data web guides that will aid Network members to keep informed of current trends. The web guides will be reviewed and updated as needed, or at least annually.

This program will directly address the following areas:

- a. **Health Big Data** – Health Big Data (HBD), a subset of biomedical big data, focuses on clinical and administrative data generated by healthcare providers and payers. HBD refers to the large amounts of biomedical data collected, and the variety of ways it is being manipulated and analyzed. HBD excludes data collected in controlled clinical trials and focuses on the trend of increased use of “always-on” devices (e.g., heart monitors) that collect large volumes of data about patients. Currently this data is underutilized due to a lack of transparency, organization, and consistency. HBD supports “the ‘learning health care system,’ which aims to leverage health information to improve and disseminate knowledge about effective prevention and treatment strategies, in order to enhance the quality and efficiency of health care.”³ With improvements in data processing capabilities, educational and awareness resources will be developed or identified that assist in the understanding of the methods of how to improve data storage, sharing and analysis.
- b. **Data Management Plan (DMP)** - We will address key elements of the research lifecycle, such as: identifying appropriate data repositories, methods to effectively assist researchers with metadata, and descriptors/ontologies that can enhance the capacity to share data so it is useable by other researchers as recommended by NIH.
- c. **NIH Public Access Policy (NIHPAP)** - These resources will address how Network members can assist scientists with submitting their final peer-reviewed journal manuscripts to PubMed Central upon acceptance of publication. They will also address key competencies, such as, understanding the portion of a publisher agreement that affects posting to PubMed Central, and the process of submitting manuscripts to PubMed Central.
- d. **MyNCBI** - We will provide resources that increase awareness, knowledge, and skills for Network members to assist their institution in tracking the publications of their researchers and ensuring compliance with the NIHPAP for publically-funded research. We will emphasize utilizing MyNCBI tools, such as saving/receiving updates of searches, managing peer review article compliance with NIHPAP via MyBibliography, creating/maintaining professional profiles (SciENcv), setting up LinkOut, and selecting document delivery preferences. This will increase member competencies to navigate MyNCBI and the tools and allow them to better assist researchers at their institutions.
- e. **Connecting Researchers with Researchers** - We will increase the knowledge of Network members about the growing trend and importance of researcher specific social media and researcher profiling sites. Researchers are using these online venues to locate and connect with other researchers and share their publications and data. Many sites are providing stats about views, downloads, and citations of publications and data.⁴ Network members support researcher engagement to this social side of the research lifecycle.
- f. **ClinicalTrials.gov Results** - In 2013, one of the principles impacting ClinicalTrials.gov was refined at the 64th World Medical Association

General Assembly. They wrote that the importance of public access to study results is an “ethical obligation.” They further explained that “[r]esearchers have a duty to make publicly available the results of their research on human subjects and are accountable for the completeness and accuracy of their reports. All parties [i.e., researchers, authors, sponsors, editors and publishers] should adhere to accepted guidelines for ethical reporting. Negative and inconclusive as well as positive results should be published or otherwise made publicly available.”⁵ We will provide resources that increase awareness, knowledge, and skills of Network members’ understanding of the process for Applicable Clinical Trial and Voluntary Submissions.

- g. **Biomedical Big Data Specialization (BBDS)** - We will also lead or co-lead the efforts in working with other RMLs and MLA to create a Biomedical Big Data Specialization (BBDS). This will be similar to the process that was implemented to create the MLA Consumer Health Information Specialization (CHIS). The BBDS will help library professionals keep current with the biomedical big data field and obtain an additional, recognized level of expertise. BBDS will help advance the careers of medical librarians, academic librarians, and librarians working with biomedical researchers. There will be two levels for BBDS.

Level I: For those who desire a basic familiarity with issues of biomedical big data.

This will require 12 hours of approved BBDS courses to be completed. Eight of the required 12 hours must be MLA-approved coursework.

Level II: For those who want additional training on issues of biomedical big data.

This will require 24 hours of approved BBDS courses. Eighteen of the required 24 hours must be MLA-approved coursework.

This specialization will be routinely evaluated to determine if librarians taking courses have gained the necessary skills to effectively work with biomedical big data.

- h. **Joint Regional Symposium on Clinical Data** - In Year 2, three RMLs (MCR, PNR, and MAR) plan to hold a symposium on clinical data. Speakers will be invited who can present their perspectives and examples of sharing, mining, and discovery tools that have been developed for BBD. We predict that the audience for this symposium will include librarians, informaticians, informationists, information technologists, researchers, and hospital administrators. Because a majority of our health sciences librarians work in the hospital setting, we expect that focusing on clinical rather than basic sciences data will be of more interest and relevance to them. The symposium will take place on site in Utah, Washington and Pennsylvania, and presentations will be video broadcast to the other sites. The MidContinental Region and the Pacific Northwest Region successfully used video broadcasting technology to present such a symposium on the research lifecycle in Utah, Washington and Oregon in the current contract. This approach enables more NN/LM members to benefit from shared programming and reduces costs compared to if each region were to conduct such a symposium individually.
- i. **Research Impact** - We will provide resources that increase awareness, knowledge, and skills for Network members of research impact tools so they can assist their institutional researchers in exploring ways to increase their visibility and measure research impact through the use of social media and altmetrics.

4.3 Evaluation: The NN/LM MCR, in conjunction with the tools and guidelines developed by the NEO, will use a variety of metrics to target and determine the impact of NN/LM MCR BBD interactions with our primary audiences. For our courses, seminars, and symposium, we will ask participants if the learning objects were met and as appropriate, distribute the Medical Library Association's evaluation questionnaire (sample questionnaire: <https://www.surveymonkey.com/s/samplemlaevaluationform>). To evaluate the effectiveness of our publications, web pages and web guides in increasing the awareness of BBD issues and trends among our Network members; we will obtain feedback on whether they found the information useful, whether it impacted their work, and how they applied the information.

Milestones & Timeline: Support Access to Biomedical and Health Information Core		Y1	Y2	Y3	Y4	Y5
Aim 1	Recruit new members from DOCLINE non-member report	X	X	X	X	X
Aim 1	Recruit new members at conferences and events.	X	X	X	X	X
Aim 1	Form public access working group; identify resources for Network members; raise awareness; promote resources	X	X	X	X	X
Aim 1	Evaluate effectiveness of DOCLINE services				X	
Aim 1	Recruit Loansome Doc libraries	X	X	X	X	X
Aim 1	Promote EFTS and enroll new users	X	X	X	X	X
Aim 2	Generate videos, webinars where effective practices are shared.	X	X	X	X	X
Aim 2	Decide whether social media is a good venue to share effective practices	X				
Aim 2	Develop a finding tool for effective practices for the Region.			X	X	X
Aim 3	Recruit MedPrint participants	X	X	X	X	X
Aim 3	Promote MedPrint	X	X	X	X	X
Aim 4	Offer big data courses and seminars	X	X	X	X	X
Aim 4	Sponsor big data guest speakers	X	X	X	X	X
Aim 4	Publish about big data	X	X	X	X	X
Aim 4	Develop big data web guides	X				
Aim 4	Update and review big data web guides		X	X	X	X
Aim 4	Petition MLA to consider development of BBDS	X	X			
Aim 4	Work with RMLs and NTO to identify courses that would support BBDS	X	X			
Aim 4	Promote and launch BBDS offering to Network members		X	X		
Aim 4	Offer enough qualifying BBDS courses for Network members to earn their BBDS.		X	X	X	X
Aim 4	Sponsor and host clinical data symposium.		X			

References

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