Research Data Librarians as Research Support Systems for Covid-19 During and Post-Pandemic: a case study of the Indonesian Institutes of Sciences

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Abstract

As the guardians of knowledge and information professionals, librarians have held numerous service approaches in responding to the pandemic situation. With their core service to be the research support systems, research data librarians face a paradigm-shifting from face-to-face consultation to a remote arrangement, which is a relatively new proposition for all service providers. When a pandemic occurs, all in-house services have to stop because most researchers work from home. It halts face-to-face library services. But on the other hand, a pandemic has turned out to be the basis for research data management to develop in Indonesia. The Indonesian National Scientific Repository (RIN Dataverse) as a data storage system is increasingly needed to support an online work approach. This study focuses on how research data librarians in the Indonesian Institute of Sciences successfully communicate and collaborate with researchers from different institutions to make an adequate environment in providing data-driven policies for stakeholders, especially during pandemics. We use a qualitative method with literature reviews and observations based on case studies. We also exercise a SWOT analysis to determine the scheme's opportunities and challenges implemented by research data librarians to be part of the research ecosystem. Based on this study, the librarians' roles are gradually changing following the demand for research assistantship during pandemics. It means that the interlink coordination between librarians and researchers within RIN Dataverse, as a platform, will help the collaboration be more asserted. These activities will also be a fundamental understanding in designing strategic implementation for a post-pandemic situation.

Keywords: research data librarians; research support systems; covid-19; Indonesian Institutes of Sciences

1. Introduction

Librarians have held numerous service approaches in responding to the pandemic situation. This health crisis phenomenon provides innovative opportunities for information professionals to maximize digital technology use in giving a better remote-service, such as library support for knowledge management (Ayatollahi, 2020; Chakraborty, 2020), research productivity (Bharati, 2020; Shettar, 2020), and mental health (Cox, 2020). Some challenges did come up when librarians tried to adapt to the dynamic situation, for instance, health protocols implementation (Johnson, 2020; Yuvaraj, 2020) and technology innovations services for information dissemination (Ali, 2020; Hamzat, 2020; Hornung, 2020). With their core service to be the research support systems, research data librarians face a paradigm-shifting (Matthews, 2020) from face-to-face consultation (Anderson, 2020) to a remote arrangement, which is a relatively new proposition for all service providers (Mandrekar, 2020). When a pandemic occurs, all in-house services have to stop because most researchers work from home. It halts face-to-face library services.

But on the other hand, a pandemic has turned out to be the basis for research data management to develop in Indonesia. The Indonesian National Scientific Repository (RIN Dataverse, www.rin.lipi.go.id) as a data storage system is increasingly needed to support an online work approach during a pandemic. Because most researchers work from home, requests for data and information are made online, including research data services. This study focuses on how research data librarians in the Indonesian Institute of Sciences successfully communicate and collaborate with researchers from different institutions to make an adequate environment in providing data-driven policies for stakeholders, especially during pandemics. The platform used is RIN Dataverse, an open research data repository in Indonesia, and it promotes FAIR Principles. This repository is one exemplification of how Indonesia supports the open data movement.

2. Literature review

This paper discusses the concept of how research data librarians are providing research data services on library patrons, which are mostly researchers. The literature review was divided into two topics: research data librarians' current definitions and roles and their innovation in providing research data services during pandemic Covid-19.

2.1 Research Data Librarian

Research Data Management has been actively applied in the Indonesian Institute of Sciences (LIPI) since 2019. Librarians have undergone a significant change in role with the implementation of this data management research. Referring to Riyanto (2016), most librarians at LIPI are still struggling with cataloging activities. Librarians at LIPI should provide more services that support research at LIPI because it is an institute that has a significant focus on research activities. Services that support research activities are mentioned by Duffield (2018) that librarians in academic libraries are required to support the activities of researchers during the entire scholarly communication life cycle. Furthermore, Semeler (2019) states that data librarians must contribute by providing organization, treatment, and preservation services for research data. Data librarians are concerned with the proposition of data management and curation services in academic libraries and other research organizations.

The condition of the COVID 19 pandemic that has occurred has also encouraged librarians to develop as a research data librarian. Librarians can utilize the policy of working from home for researchers to provide literature needs from e-resources and managing research data at RIN.
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2.2 Research Data Services during Pandemic Covid-19

Markovic (2020) and Patin (2020) proposed a resilient library design in the short term and long term for a post-covid situation. The Coronavirus pandemic has forced almost all libraries to be innovative and creative to continue serving the library patrons with digital content and community support (second responders for emergency). Markovic stated that the library as a public space needs to consider cleanliness, spacing, and traffic, and increased demand for "third places" - the place for social interaction. Global Workplace Analytics in Markovic (2020) also predicts that there will be a 25-30% increase of remote working from "home" or third places. This also relates to the mental health and well-being of library patrons. In Cox (2020), UK academic libraries provide student support activities during pandemics. It transforms into a new vision of services while building new relationships with library patrons (Tammaro, 2020). They mainly use online services, especially in providing authentic information resources (Chakraborty, 2020). In Ireland, Hornung (2020) experienced being a solo librarian and faced some challenges while doing remote services.

Greenberg (2020) and Jones (2020) discuss librarians' and archivists' roles during the pandemic based on its long history, from Black Death to HIV/AIDS, as it seems that each event produces information overload. For instance, The National Library of Medicine, National Institute of Health Maryland used a web archive to record materials on 'Global Health events.' And they also see how a professional group: Librarians, Archivists, and Museum Professionals in the History of the Health Sciences (LAMPHSS) gathered to discuss the procedure of material collection and sharing. Knowledge management could improve the quality of performance in an organization, especially in a research institution. Ayatollahi (2020) stated four factors influencing its implementation, especially in healthcare organizations: organizational culture, information technology, organizational structure, and performance evaluation and measurement. Librarians could be considered knowledge brokers between health care organizations and health care staff in supporting the knowledge management initiatives in their workplace.

Moreover, Hamzat (2020), Kasa (2020), Mandrekar (2020), and Neog (2020) investigated the use of social media for emergency information dissemination in Nigeria and India. They found that various social media have been used during the pandemic, and librarians playing an active role in informing the public about Covid-19. However, some medical terms are considered not familiar enough to be known by laypeople. So, Daqing He (2020) used the case of those difficulties and found that the terms could be more understandable by using the National Library of Medicine's Consumer Health Vocabulary. The access to CORD-19 (COVID-19 Open Research Dataset), which contains over 280,000 scholarly articles about the novel coronavirus for use by the global research community, would be easier to retrieve by using the Search engine for Laypeople to access the COVID-19 literature (SLAC).

There was also an issue proposed by Ifijeh (2020) and Igere (2020) about the paradigm shift in the role of librarians in supporting teaching methods at the Nigerian university since Covid-19. The shifted environment to virtual teaching and learning is considered as a notable change. Librarians should support the transition by providing an adequate ICT infrastructure and a blended librarianship model in serving library patrons. Meanwhile, as health information professionals, they could work together with health professionals to map their information needs, disseminate knowledge, and support digital and health literacy (Johnson, F., 2020). However, the service transition from physical to online mode has made librarians and users experiencing a digital divide, information anxiety, lack of digital literacy skills, slow internet speed, budget

constraints, and licensing issues (Rafiq, 2020; Yousuf, 2020; Radecki, 2020; Naeem, 2020). On the other hand, there are many opportunities to offer during COVID by librarians and information personnel, such as virtual assistants, AI Robotics, Big Data, COVID Altmetric readership, infodemic, virtual conference, and Higher Educational Commission digital resources.

In the context of global perspectives, many international organizations put updated initiatives on their website, from ALA, ALIA, IFLA to CILIP UK (Yuvaraj, 2020; Sulaiman, 2020). Major journal publishers are also made articles on COVID-19 available to the world. As stated by Ali (2020), librarians could support the research teams to the updated and relevant studies published in medical journals. In conclusion, during many historical emergencies that have happened before, libraries continue to evolve and shift, highlighting their value on people, place, and platform (Jones, 2020).

2.3 Indonesian Institute of Sciences

In Johnson, P. (2020), The International Coalition of Library Consortia (ICOLC) issued a "Statement on the Global COVID-19 Pandemic and Its Impact on Library Services and Resources," which considers open access to Covid-19 materials to facilitate research and public health response. Most scientific works related to Covid-19 are stored in preprint servers, such as bioRxiv and medRxiv. In this case, the Indonesian Institute of Science uses RIN Dataverse to store the raw data of Covid-19 research. It supports data deposit, preservation, citation, analysis, and sharing. Researchers, publishers, and affiliated institutions will receive academic credit and web visibility. This program is in line with the Indonesian National System of Science and Technology Policy, Law No. 11.2019. Specifically, in article 40, it explains deposit data requirements, highlighting the primary use of RIN Dataverse in Indonesia.

3. Method

This study uses a qualitative method with literature reviews and observations based on case studies in the Indonesian Institute of Sciences. This paper also exercises a SWOT analysis to determine the scheme's opportunities and challenges implemented by research data librarians to be part of the research ecosystem. For the literature review, we put specific search strings (Ayatollahi, 2020) below and evaluate the result for the SWOT analysis additional material.

1. Scopus, Number of papers **10**
   "librarian" AND "research support" AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020)) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (EXACTKEYWORD , "Research Support") OR LIMIT-TO (EXACTKEYWORD , "Librarian") OR LIMIT-TO (EXACTKEYWORD , "Research Data Management")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (SRCTYPE , "j"))

2. Science Direct, Number of papers **9**
   "research support" AND "librarians" AND "data management" , Year: 2020-2021

3. Wiley, Number of papers **2**
   "librarian" in Title and "research support" anywhere and "data management" anywhere and "pandemic" anywhere and "covid" anywhere , publication date: March 2020 - January 2021 , publication type: Journals

4. Taylor and Francis, Number of papers **9**

[Publication Title: librarian] AND [All: research support] AND [All: data management] AND [All: pandemic] AND [All: covid] AND [Publication Date: Last Year]
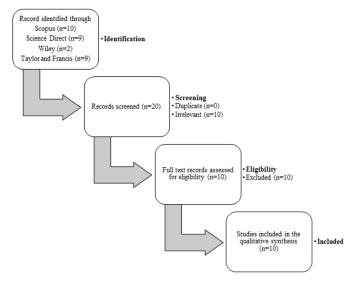

Figure 1. Article selection (Primary data, 2021)

4. Results and discussions

Based on this study, the librarians' roles are gradually changing following the demand for research assistantship during pandemics. Table 1 shows the literature review result based on Scopus, Science Direct, Wiley, and Taylor & Francis's findings.

Tabel 1. Literature Review

No	Author, Year, Country	Title	Journal	Objective	Methods	Results
1	Johann Van Wyk, Theo Bothma and Marlene Holmner, 2020, South Africa	A conceptual virtual research environment model for the management of research data, a South African perspective	Library Management	An overview of a Virtual Research Environment (VRE) conceptual model for managing research data at a South African university.	Qualitative (critical literature review and case studies)	VRE conceptual model in different research settings/disciplines. The role of VREs throughout the research lifecycle. The guidelines for setting up a conceptual VRE model.
2	Charissa Odelia Jefferson, Katrina Stierholz, Kristin Fontichiaro & Lynette Hoelter, 2020, USA	Considering data literacy using Kuhlthau's Information Search Process: Implications for librarians and data providers	Journal of Business & Finance Librarianship	Through students' research phases, data literacy instruction experiences determine synergies and intervention points that both librarians and data providers can leverage.	Qualitative (Kuhlthau's ISP model)	Kuhlthau's Information Search Process: a framework that provides specific areas where librarians and data providers can each support users in their data searches.
3	Mayank Yuvaraj, 2020, India	Global responses of health science librarians to the COVID-19 (Coronavirus) pandemic: a desktop analysis	Health Information & Libraries Journal	Significant initiatives by health science librarians to meet the needs of library users in the COVID-19 health crisis.	Qualitative (desktop analysis)	Librarians are playing crucial roles, such as: • generating awareness, • filtering fake information, • supporting researchers and faculty members to provide reference and document delivery services.

4	Eleanor Barker and Veronica Phillips, 2020, USA	Learning how to teach unfamiliar subjects: developing training on writing for publication and presentation of research for health libraries	Health Information & Libraries Journal	The techniques used by the library's teaching staff to gain an understanding of written communication. The new courses' impact discusses the next steps and provides advice for other librarians wishing to develop similar systems.	Qualitative (dissemination stage of the research life cycle)	There is a demand for further training and support in writing for publication and the research cycle. The library could add training and increase its visibility in research support.
5	Hilary Bussell , Jennifer Schnabel & Amanda K. Rinehart, 2020, USA	Meeting graduate student needs: an exploration of disciplinary differences	Public Services Quarterly	How disciplinary differences impact individual and collective outreach efforts within a subject librarian model of engagement.	Quantitative (survey, open-ended questions)	Discipline-specific library instruction may be more relevant than large, in-person orientations. The trend of situational challenges.
6	Winner Dominic Chawinga & Sandy Zinn, 2020, South Africa	Research Data Management in Universities: A Comparative Study from the Perspectives of Librarians and Management	International Information & Library Review	(1) What is the role of librarians in research data creation? (2) How competent are librarians in RDM? What are the gaps? (3) What is the status of research data infrastructure at the universities? (4) What are the challenges affecting librarians' involvement in RDM?	mixed methods (questionnaire & interview)	RDM remains a new and emerging concept. Librarians involved in some very basic RDM activities. Generally, university affiliation does not affect the key factors affecting RDM initiatives.
7	Winner Dominic Chawinga & Sandy Zinn, 2020, South Africa	Research data management at an African medical university: Implications for academic librarianship	The Journal of Academic Librarianship	Current status of research data management at a medical school in a developing African country. Four aspects of research data management: generation; preservation and backup; competencies; and challenges.	mixed methods (questionnaire & interview)	A better understanding of research data management perspectives amongst health researchers in a developing country.
8	Elizabeth Sterner, 2020, USA	Science/STEM Librarianship in 2020: Opportunities and Insight	Science & Technology Libraries	An updated snapshot of current science/STEM opportunities in 2019/2020.	Quantitative (survey)	Most of the positions are for research librarians with liaison duties in medicine/health science, mathematics, engineering, chemistry, and physics.
9	Alice Read, Andrew Cox, 2020, UK	Underrated or overstated? The need for technological competencies in scholarly communication librarianship	The Journal of Academic Librarianship	Investigation of SC librarians' own perceptions of the importance of technical skills in their work.	Qualitative (thematic analysis of in-depth semi-structured interviews)	SC librarians need soft skills and specific positive orientations to technology rather than practical technical skills. It could be through learning on the job and through communities of learning. A concept of socio-technological competence is proposed to encapsulate this skillset.
10	Colin Nickels and Hilary Davis, 2020, USA	Understanding researcher needs and raising the profile of library research support	Insights	A two-year study to help inform the development of outreach strategies to enable new research engagement opportunities to scale and transform the model of research support strategies and engagement.	Qualitative (semi-structured qualitative interviews)	A solid grounding for building our awareness of researchers' behaviors, expectations, and workflows as well as presenting a unique picture of both unmet and unarticulated needs. Shared recommendations for evolving library research support and enhancing outreach strategies to provide an easier starting point for different types of researchers to discover relevant research assets provided by libraries.

This study also uses the implementation of the National Health System Consortium for Pandemic as the case study. This consortium utilizes RIN Dataverse for collaborations, and research data librarians accommodate the process. Many institutions were exchanging current research about Covid-19 in different aspects, such as social, economic, and infrastructures. The Research and Innovation Consortium Covid-19, Ministry of Research and Technology/National Agency for Research and Technology is a collaborative scientific activity forum in order to strengthen the Indonesian National Health System in the context of a pandemic/endemic disaster. In collaboration with the Knowledge Sector Initiative (KSI), the Deputy for Social Sciences and Humanities - Indonesian Institute of Sciences (IPSK LIPI) initiated a series of routine discussion activities starting April 23, 2020, until October 2020 (around six months). At each discussion, there were representatives from institutions or individuals in the consortium who discussed the activities or research carried out by each of these institutions, along with the important findings that were produced. Furthermore, the synthesis of the series of discussions and collaborative scientific activities resulted in a policy paper which is expected to become material for advocacy that has a real impact on strengthening the Indonesian National Health System that is resilient to health disasters in Indonesia.
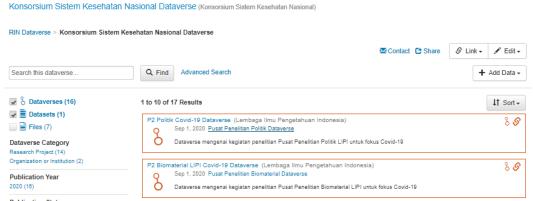
Figure 2. The example of the Indonesian National Health System Consortium Dataverse (RIN, 2021)

Based on Figure 2, the use of RIN Dataverse to document any research activities in the National Health System Consortium for Pandemic is shown. There are 16 Dataverses, one dataset, and seven files that have been up in RIN Dataverse, while some of the on-going data are still in close access. The role of librarians in the consortium is to carry out advocacy on research data deposit and to assist researchers in implementing research data management. However, because researchers lacked time to manage data, librarians were asked to help researchers. They help them by storing the data on the RIN Dataverse system, starting from filling in metadata, determining data access policies, and advocating for data licenses according to researchers' needs. Research data librarians in the consortium are actively engaged with the researchers from different institutions to gather the current and updated dataset files. However, as it is on-going research, the documentation process is done periodically.

Referring to the literature review and case studies above, we could conceptualize how research data librarians could support the research activities, especially during a pandemic and post-pandemic, in Table 2 below in the SWOT analysis form.

Tabel 2. SWOT Analysis

Strength	Weakness
Research data librarians have exceptional experience in providing service about researchers' information needs, for instance, Virtual Research Environment (VRE) or discipline-specific library instruction.	Research data librarians need to upgrade their skills in Research Data Management (RDM), liaison duties, writing publications, and socio-technological competence.
The library is a trusted place where publication management is conducted.	The research culture in depositing data is not yet built.
Opportunities	**Threats**
Research data librarians in the academic and research institutions in Indonesia have not implemented the RDM policy.	Research data librarians are not involved directly in the research activities.
Researchers understand that research data is an asset but are not aware of the importance of data deposit.	Research data about COVID-19 is not well-stored and well-preserved.

5. Conclusions

Based on this study, the librarians' roles are gradually changing following the demand for research assistantship during pandemics. From the findings and SWOT analysis, we found that research data librarians have enough experience in supporting researchers. However, they need to build more skills in data management and its implementation. Researchers are also under an obligation to upgrade their literacy about data deposit and preservation. It means that the interlink coordination between librarians and researchers within RIN Dataverse, as a platform, will help the collaboration be more asserted. Research data librarians will guide them through the lifecycle of research activities, from planning, storing, sharing to reusing the research data. These activities will also be a fundamental understanding of designing strategic implementation for a post-pandemic situation (Johnson, 2020: Jones, 2020). Simultaneously, there is always room for improvement to provide a better research ecosystem by research data librarians.

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