

Human Resources Needs for Medical Records Officers at the Mataram City Health Center

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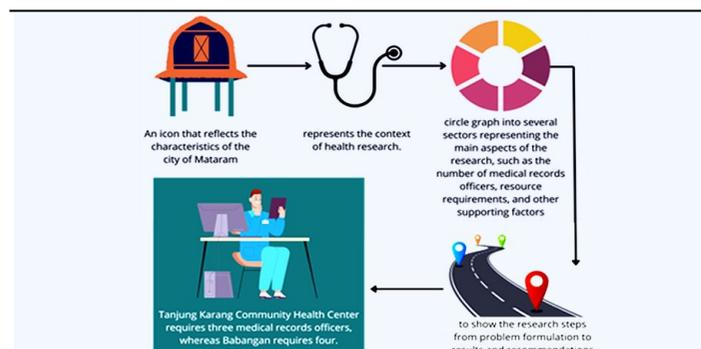
ABSTRACT

Human resources are the most important and integral part of any organization, including the health sector. Therefore, this study aimed to examine human resources needs in the medical records field, with a particular focus on the roles and responsibilities of medical records officers. The analysis was carried out to identify critical challenges faced by medical record officers in meeting health service standards and managing patient data. Secondary data were collected from a survey of workload and human resources needs for medical records in 2023. The samples were selected using the Stratified Sampling method, by dividing the population into two groups (strata) based on the accreditation levels of health centers in Mataram city. Specifically, Tanjung Karang represented the main accredited center, while Babangan was categorized as a basic accredited center. Data analysis was performed with the Workload Indicators of Staffing Need Method (WISN) to calculate labor requirements and health crew members necessary for evaluating the distribution of health worker availability. The results showed the scarcity of medical record officers, difficulties in managing patient data, as well as the need for training and skills development in line with advances in information technology within the health sector.

ABSTRAK

Sumber daya manusia menjadi bagian terpenting dan vital dalam sebuah organisasi. Oleh karena itu, tujuan dari penelitian ini adalah untuk mengkaji kebutuhan sumber daya manusia di bidang rekam medis, dengan penekanan khusus pada peran dan tanggung jawab petugas rekam medis. Analisis ini dilakukan untuk mengidentifikasi tantangan kritis yang dihadapi petugas rekam medis dalam memenuhi standar pelayanan kesehatan dan pengelolaan data pasien. Metode penelitian ini menggunakan data sekunder dari survei beban kerja dan kebutuhan sumber daya manusia rekam medis tahun 2023. Penarikan sampel dalam studi ini menggunakan metode Stratified Sampling yaitu populasi dibagi menjadi 2 kelompok (strata) berdasarkan karakteristik tingkat akreditasi di puskesmas kota mataram, yaitu terpilih puskesmas tanjung karang terakreditasi utama dan babakan terakreditasi dasar (puskesmas besar vs puskesmas kecil). Analisis data menggunakan metode Workload Indicators of Staffing Need Method (WISN) untuk perhitungan kebutuhan tenaga kerja dan ABK Kesehatan untuk mengevaluasi distribusi ketersediaan tenaga kesehatan. Hasil temuan studi ini menyoroti kelangkaan tenaga rekam medis, kesulitan dalam mengelola data pasien, dan perlunya pelatihan dan pengembangan keterampilan sejalan dengan kemajuan teknologi informasi di sektor kesehatan.

GRAPHICAL ABSTRACT



Keyword

health services
human resources
medical records
workforce
workload

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INTRODUCTION

In a globalized world, the use of medical records is crucial to improve the quality of health services, care coordination, medical studies, and decision-making (Bernasinski et al., 2014). Meanwhile, the Electronic Medical Record (EMR) is a revolutionary technology that has the potential to transform the approach of caring for patients. When used properly, EMR can increase the quality and dependability of healthcare delivery. According to previous studies, there is a need to closely monitor the impact of EMR on clinical processes to fully capitalize on its potential to improve patient care (Janett & Yeracaris, 2020; Kiri & Ojule, 2020). Clinical data will continue to grow in volume, and doctors should take advantage of this resource to improve patient care (Abid & Schneider, 2023).

By combining clinical decision support systems with electronic health records, developments in EMR have the potential to alter healthcare by making precision medicine a reality (Caraballo et al., 2017; Fennelly et al., 2020). Although the evidence is preliminary, EMR has shown benefits by facilitating the detection of medical errors, improving medication adherence, as well as facilitating communication between patients and healthcare providers (Dendere et al., 2019; Greysen et al., 2020). EMR systems can reach full potential when combined with evidence-based treatment methodologies, quality improvement initiatives, and team-based care (Al Bahrani & Medhi, 2023). However, as stated in the 2016 IMIA Medical Informatics Yearbook Electronic Health Records: Past, Present, and Future, broad implementation of EMR has been impeded by high prices, data input mistakes, poor initial physician acceptability, a lack of meaningful incentives, and insufficient personnel (Evans,

2016; Mills, 2019)

Current data shows differences in the adoption and implementation of EMR between developing and developed countries. In 2017, about 96% of hospitals in the United States have implemented this innovation (Henderson et al., 2020). Furthermore, in 2019, Japan, Canada, and Australia had adoption rates of 95%, 85%, and 90% respectively (Rashid et al., 2022; Bowman & Holzer, 2021). Across developing countries such as India, about 20% of hospitals were found to have adopted EMR in 2019 (Jagetia, 2022). In the same year, about 10% of hospitals in Indonesia (Amin et al., 2021), 50% in Brazil, and 40% in Mexico adopted EMR (Moriyama et al., 2022).

Similar to many other regions in Indonesia, West Nusa Tenggara is currently experiencing developments in the implementation of EMR systems and the modernization of health services. However, in the city of Mataram, previous studies found a gap between the number of patient visits and medical records officers available. At Tanjung Karang Health Center, the period from July 2022 – July 2023 witnessed 13.572 patient visits averaging 60 to 70 people per day. Conversely, at Babakan Health Center, the number of patient visits for the same period was 12.819. The shortage of medical record officers poses a risk of overwhelming these professionals, resulting in a high workload (Suryanto, 2020). According to (Putri & Hidayati (2021), medical record officers overwhelmed with workload experience reduced job satisfaction, impacting overall work stress levels.

One method used to calculate the amount of power based on needs is the *Workload Indicators of Staffing Need* (WISN), coupled with Health Workload Analysis (HWA) for health human resources assessment. Based on the workload that exists in a work unit, the

WISN method is used to compare the amount of human resources needed with the available ones. This method can help in determining the amount of health human resources needed to provide optimal health services (Hasrawati et al., 2020). On the other hand, the HWA method is used for calculating available working time, workload standards, and supporting task standards (STS) to assess the workload of medical record officers. This approach helps in determining the number of officers needed based on the workload in the work unit (Nazhifah et al., 2021; Putri & Hidayati, 2021; Hasanah et al., 2022; Lestari & Harno, 2018). Several studies have shown the effectiveness of the WISN program, including Tripković et al., (2022), Doosty et al., (2019), Dimiri et al., (2022), and Nguyen et al., (2022). Similarly, studies conducted by Pantelakos & Agrogianis (2023), Swiger et al., (2016), Alghamdi (2016), and (McVey, 2023) reported the effectiveness of the HWA method. Compared to previous studies which relied solely on one method, this study used two methods to strengthen the results, thereby presenting a more comprehensive and in-depth perspective on the phenomenon being explored.

The WISN method and HWA can be justified based on several key considerations such as accuracy, precision, and usefulness in the context of human resources planning in the health sector. Other considerations include conformity with health management principles, the ability to accommodate temporal variability, and integration with planning systems that enable organizations to holistically plan and manage human resources (Namaganda et al., 2022; Jing et al., 2022; de Menezes et al., 2022; Al-Dabbagh et al., 2022; Asamani et al., 2021). Gaining a deeper understanding of policy responses to human resources and workload speeds is crucial. Despite efforts by Tanjung Karang and Babakan Health

Centers, there is still a lack of systematic knowledge about the procedures and strategies needed by community health centers to overcome human resources problems. Therefore, this study aimed to examine the needs of human resources in the field of medical records, based on the roles and responsibilities of medical record officers at the Mataram City Health Center.

METHODS

This study adopted a quantitative design with a descriptive approach, using secondary data from the 2023 medical record workload and human resources needs survey. The survey included two Community Health centers, namely Tanjung Karang and Babakan in Mataram City. In the first stage, observations carried out found two medical record officers at the Tanjung Karang Health Center and one at Babakan.

The dependent variable was the labor requirement of medical records, while the independent variables considered included the number of patients, service time, and workload level. The data were analyzed using the calculation of labor needs based on the WISN Method and HWA. The WISN method was selected because it could assist health organizations in planning and managing workforce needs more effectively, ensuring sufficient numbers and types of health workers to meet the existing workload. Meanwhile, HWA assists in monitoring and evaluating the distribution and availability of health workers, as well as providing information for health policy planning.

The target population in this study comprised medical record officers working at health centers in Mataram City, but the selected samples were those at Tanjung Karang and Babakan. Sample selection was carried out using the *Stratified Sampling method*, where

Table 1
The Characteristics of Respondent

Workload Capabilities	Service Time	
	Tanjung Karang	Babakan
Base		
Patient registration	3 minutes	4 minutes
Delinquent Medical Record (DMR) capture	1 minute	2 minutes
Writing a register book	3 minutes	3 minutes
Input data into SIMPUS	2 minutes	2 minutes
Distributing DMR	2 minutes	2 minutes
Check DMR back to poly	1 minute	2 minutes
Assembling and fulfillment of DMR incompleteness	3 minutes	3 minutes
DMR retrieval to the filling rack	1 minute	1 minute
Support		
Meeting	3 hours/week (8640 minutes/year)	3 hours/week (8640 minutes/year)

the population was divided into 2 groups (strata) based on the characteristics of the accreditation level. Specifically, Tanjung Karang represented the main accredited center, while Babangan was categorized as a basic accredited center (large vs small health center).

The stages in this study entailed formulating problems, developing conceptual frameworks, defining objectives, selecting methods, developing instruments, collecting data, processing and analyzing data, interpreting results, preparing reports in the form of scientific publications, and disseminating results to policy stakeholders. The instruments used were (1) observation sheets to determine the effectiveness of medical record officers in serving patients, (2) questionnaire sheets, to identify what activities were carried out in one year of service, and (3) stopwatch, used to measure the duration of service for patients, (4) literature studies from various scientific sources such as reputable journals.

Supporting task standards (STS) and Supporting Task Factors (STF) were calculated by determining the time allocated to supporting activities, such as Field Practice Guidance and Meetings, followed by an assessment of their impact on the overall workload. The formula for calculating the supporting task standards (STF) is given by the equation:

$$STF = (\text{Activity Time} / \text{WISN}) \times 100\% \quad (1)$$

After determining the STF, the STS was calculated using the formula:

$$STS = 1 / (1 - (\text{STF}/100)) \quad (2)$$

To calculate health human resources needs, formula was used as follows:

$$\text{Human resource} = \text{Visit (1 year)} / \text{HWA} \quad (3)$$

Additionally, this study received ethical approval from the Health Research Ethics Committee of the Polytechnic Medica Farma Husada Mataram with ethical approval number 64-KEPK/2023.

RESULTS

Table 1 shows the workload analysis results for medical record officers at Tanjung Karang and Babangan Health Center using the health workforce method. The data were sourced from Permenkes RI Number 53 of 2012 concerning Guidelines for the Implementation of Workload Analysis within the Ministry of Health. Eight major and two additional duties of medical record officers at the Tanjung Karang and Babakan Health Center were identified. Service time on the main task was calculated using a stopwatch. Meanwhile, additional duty service time was obtained from the results of

Table 2
The Characteristics of Respondent

Workload Capabilities	Tanjung Karang Health Center			Babakan Health Center		
	Service Time (Minutes)	AWH (minutes)	HWA (AWH/Time)	Service Time (Minutes)	AWH (minutes)	HWA (AWH/Time)
Patient registration	3	72000	24000	3	72000	18000
MR data Capture	1	72000	72000	1	72000	36000
Writing a register book	3	72000	24000	3	72000	24000
Input data into SIMPUS	2	72000	36000	2	72000	36000
Distributing MR data	2	72000	36000	2	72000	36000
DRM checklist back to poly	1	72000	72000	1	72000	72000
Assembling and fulfillment of MR data incompleteness	3	72000	24000	3	72000	24000
Return MR Data back to the filing rack	1	72000	72000	1	72000	72000

Note: HWA; health workload analysis; AWH= Avaluable Working Hour; MR= Medical Record; SIMPUS= Sistem Informasi Manajemen Puskesmas (English: Community Health Center Management Information System)

interviews with medical record officers.

Table 2 illustrates the standard calculation of workload capability and service time. In terms of service time in Tanjung Karang Health Center, the task of retrieving medical record (MR) data had the shortest time, namely 1 minute, while handling incomplete and returning the MR data to the storage shelf had the longest time of 3 minutes. The highest health workload analysis (HWA) was achieved in tasks such as writing register books and returning MR data to the polyclinic, with a value of 72,000. The task of registering patients, writing register books, as well as assembling and fulfilling incomplete MR data had the lowest HWA of 24,000.

For Field Practice Guidance (FPG), the activity time was 360 minutes per year, and the WISN was 72,000. Therefore, for calculating the supporting task standards (STF) is given by the Formula 1.

$$\text{STF for FPG} = (360/72000) \times 100\% = 0,5 \%$$

For Meetings with an activity time of 8,640 minutes per year and the WISN of 72,000:

$$\text{STF for Meetings} = (8640/72000) \times 100\% = 12 \%$$

The Total STF is the sum of the individual factors:

$$\text{Total STF} = \text{STF for FPG} + \text{STF for Meetings} = 12,5 \%$$

Substituting the value of STF into the Formula 2:

$$\text{STS} = 1 / (1 - (12,5/100)) = 1,143$$

STS was calculated to be 1.143, representing the adjustment factor applied to the workload standards to account for the time spent on supporting tasks. These tasks include Field Practice Guidance and Meetings, together with primary activities outlined in the WISN system.

Table 2 shows in terms of service time in Babakan Health Center, the task of MR data checklist back to the polyclinic and returning back to the filing rack had the shortest time of 1 minute, while also having the highest workload analysis (WHA) grade with a score of 72,000. Writing a register book and assembling and fulfilling MR data incompleteness had the longest time of 3 minutes as well as the lowest workload analysis grade of 24,000.

In the calculation of STS, only the time spent on meetings was considered sup-

Table 3*The Characteristics of Respondent*

Workload/activity components	Tanjung Karang Health Center			Babakan Health Center		
	Visit (1 year)	HWA	Human Resources	Visit (1 year)	HWA	Human Resources
Patient registration	13,572	24000	0.65	12.819	18000	0.71
MR data rollback	13,572	72000	0.22	12.819	36000	0.36
Writing a register book	13,572	24000	0.65	12.819	24000	0.53
Input data into SIMPUS	13,572	36000	0.43	12.819	36000	0.36
Distributing MR data	13,572	36000	0.43	12.819	36000	0.36
MR data checklist back to poly	13,572	72000	0.22	12.819	72000	0.18
Assembling and fulfillment of MR data incompleteness	13,572	24000	0.65	12.819	24000	0.53
Return MR Data back to the filing rack	13,572	72000	0.22	12.819	72000	0.18
Total			3.45			3,21

Note: HWA; health workload analysis; MR= Medical Record; SIMPUS= Sistem Informasi Manajemen Puskesmas (English: Community Health Center Management Information System)

porting. The meeting time obtained was 8,640 minutes/year, while the percentage of STF obtained by dividing meeting activity time by total working hours was 12%. Therefore, the STS score was 1.136.

Table 3 illustrates the one-year visit was obtained by calculating the number of patients who ended up at the Tanjung Karang Health Center, Mataram City starting from June 2022 to July 2023. The data were obtained from the counter visit register book containing the number of patients at each visit. Based on secondary data, counter visits amounted to 13,572 with average visits of 42 patients per day. The calculation results regarding the requirements of each work component with use Formula 3. The individual results of each component were summed up to provide an overview of the additional health workers needed. The total human resources needs for medical records officers at the Tanjung Karang Community Health Center were calculated by multiplying the human resource need of 3.45, by the STS of 1.143. Therefore, the total human resources needs were obtained which equals 3.94. This shows that the Tanjung Karang Community Health Center needs around 3.94 medical records officers to meet

the main work requirement and supporting duties. This calculation considered efficiency and support factors. Based on the calculation of workload analysis, it was found that medical record officers at the Tanjung Karang Health Center were still lacking. Currently, there are only two medical record officers instead of four.

Table 3 shows the one-year visit was obtained by calculating the number of patients who ended up at the Babakan Health Center, Mataram City starting from June 2022 to July 2023. The data was obtained from the counter visit register book, containing the number of patients at each visit. Based on secondary data, counter visits amounted to 12,819 with average visits of 40 patients per day. The health human resources needs based on main tasks, after multiplying the 1-year visit by the standard workload for each component. Subsequently, the health human resources need was calculated using the Formula 3, each component was summed up, leading to a requirement value for the main task of 3.21. The required value of the main task was multiplied by the standard of supporting tasks from the previous step, namely $3.21 \times .136$, to obtain a value of 3.65 which was rounded

to 4. Based on the calculation of workload analysis, it was found that medical record officers at the Babakan Health Center were still lacking. Currently, there is only one medical record officer instead of three, based on the results of the workload calculation.

Tanjung Karang and Babakan Community Health Center have a total of six working days a week, with a working time of 8 hours/day for medical records officers. Therefore, the available working hours (AWH) results obtained from the Patient registration, Filling, Assembling, Analysis, and Reporting sections were 2,080 hours/year and 124,800 minutes/year with 6 working days/week. The AWH value was the same for the coding and indexing sections.

Based on the AWH value, the total workload standards value obtained was 370,313.2 minutes/year for the Tanjung Karang Community Health Center which had two medical records officers. Meanwhile, for Babakan which had one medical records officer, the total workload standards value was 354,871.1 minutes/year.

The WISN method was also used to calculate activities outside working hours such as ceremonies (30 minutes/day), worship and lunch (60 minutes/day), and daily meetings (360 minutes/day). From this value, the total standard allowance was 0.0027 and 0.0023 minutes at the Tanjung Karang and Babakan Community Health Center. Meanwhile, for calculations in the coding and indexing section, the total standard allowance was 0.0005 minutes and 0.0003 respectively. This showed that the calculation of worker needs according to the WISN method was based on per unit. Based on the results, at the Tanjung Karang Community Health Center for the Patient registration, Assembling, Filling, Analysis, and Reporting sections, an additional two workers were needed, while in the coding and indexing

section, an additional one worker was needed. At the Babakan Community Health Center, two workers were needed for the Patient registration, Assembling, Filling, Analysis, and Reporting sections, while for the coding and indexing sections, an additional two workers were required.

DISCUSSION

This study underscored the insufficiency of medical record officers at the Mataram City Health Center. Analyzing workload analysis among health workers is in line with the study conducted by [Alghamdi \(2016\)](#). Moreover, other studies have showed the importance of adequate medical record officers in healthcare facilities. As stated by [Janett & Yeracaris \(2020\)](#), lack of medical records officers will lead to data errors, delays in information processing, difficulty monitoring service quality, operational inefficiencies, service delays, and increased workload ([Ghotane et al., 2021](#); [Safer et al., 2016](#); [Gile et al., 2022](#)).

Based on the results, one of the main problems is the scarcity of medical record officers. With heavy workloads, these professionals may find it difficult to meet the demands of maintaining medical records accurately and promptly. This underscores the need to address the direct impact of labor shortages on health services, as well as potential solutions including increased staffing or task sharing. In addition, managing patient data including security and accuracy is a challenge characterized by inefficient data retrieval and the risk of errors in record maintenance.

Several studies have been conducted to assess the human resources needs of medical record officers in various institutions using the ABK-Kes technique ([Putri & Hidayati, 2021](#)). The results can be used to improve the quality

of service and monthly reporting (Parulian Gultom & Sopian, 2019). To manage human resources effectively, it is important to consider the type of work, the number of workers needed, and the personal qualities required in each medical records unit (Wardanis, 2018). In addition, studies have been conducted using alternative methodologies to determine the human resources needs of medical record officers, such as the WISN (Saiful et al., 2022).

This study showed significant data gaps for healthcare managers and decision-makers in designing COVID-19 workforce initiatives. These gaps include occupational and psychosocial factors affecting healthcare worker absenteeism and risk of burnout. Others include gender considerations of health human resources capacity, evaluations in low- and lower-middle-income countries, as well as policy-actionable assessments to inform post-pandemic recovery and health sustainability (Coates et al., 2021).

These estimates use existing methodologies, with additional assumptions such as in Chile and Colombia. Bolivia applied the PAHO model, while Peru and Ecuador adopted innovative approaches. This study specifically focused on resource analysis and planning to help make the right decisions (WHO, 2021). Countries have underscored the relevance of data and information analysis in understanding health human resources dynamics and concerns, as well as suggesting policy measures for the planning process. In this context, policy dialogues allow countries to exchange and debate their experiences, such as how to improve interoperability of human resources information systems and evidence-based decision-making. This has proven important in establishing and/or improving policymaking processes that address workforce readiness in different countries (Bustamante Izquierdo et al., 2023).

Countries already experiencing health resources shortages in essential occupational

groups, gaps in skills and competencies, and/or sub-national health resource imbalances face additional challenges during the pandemic. This study identified two aspects of governance critical to pandemic preparedness and response namely: (a) positioning health human resources objectives across ministries to define and generate policy regulations and actions; (b) agreeing on a strategy for managing health human resources between the government and the private sector, as well as the central and local governments (Nelson et al., 2007). Latin American countries have begun implementing systems geared towards increasing the availability of health human resources, as well as protection and training, through coordinated strategies across ministries of health, education, labor, and finance. Coordination between central and local governments is needed to agree on local health human resources initiatives and share information. For example, Bolivia, Chile, Colombia, and Ecuador, are promoting central-regional relations to implement coordinated procedures to address health resource gaps (WHO, 2021).

Health human resources shortages occur in Caribbean countries due to the migration of health human resources, specifically medical record officers (Williams et al., 2020). Another contributing factor is the insufficient production of health human resources in the countries studied, which affects the quality of services provided (Pan American Health Organization, 2022). In line with the WHO global code of practice on the recruitment of international health workers (Walton-Roberts, 2022), there is the need to increase technical, financial, and other support to the country of origin for migrant health workers. The private sector plays a crucial role in actively recruiting health workers from countries facing critical health worker shortages, underscoring the importance of discouraging and prohibiting such practices (Köppen et al.,

2021).

This study underscores the importance of preparing health workers as a crucial element of disaster preparedness. The results also show that investing in primary health workers is, in essence, an investment in health security. The relevance of health human resources data and information analysis, health human resources governance, and the need to improve the design of effective retention mechanisms through improved working conditions have also been identified.

Preparing and executing the pandemic response requires collecting health human resources data and information, consequently strengthening existing data for information analysis or establishing the collection procedures. This study underscores three key areas for strengthening health human resources information and its application in decision making: (1) human resources information systems, (2) techniques for estimating the needs; and (3) data analysis teams for informed decision making.

Numerous opportunities to improve human resources information systems through policy discourse were identified. The first step is the standard definition requirement, while the second step entails integrating information systems to combine human resources data from both the public and private sectors, as well as at national and regional levels. For example, the Action Task Force in the Caribbean identified and selected the WHO NHA system to integrate human resources data. This shows how countries are working to identify human resources requirements. Some countries use procedures tailored to their needs, while others follow the PAHO model or develop new procedures. In this context, it is important for modeling to determine the right variables and assumptions. In response to the policy debate, Caribbean and Latin American

countries should build digital platforms to strengthen the analytical capacity of their interdisciplinary teams (O'Byrne et al., 2020).

Countries should collaborate with many stakeholders to agree on goals, resources, and policy measures. Across the Caribbean, CARICOM health ministers implement policy initiatives to improve human resources response and increase vaccination acceptance among health professionals (Pan American Health Organization, 2022). To address the uneven distribution of health resources at the sub-national level, various governments in Latin America set different pay scales for sub-regions. However, this strategy is not sufficient to promote the mobility of health human resources (Pan American Health Organization, 2022; WHO, 2021).

CONCLUSIONS

In conclusion, this study underscored the paucity of medical records workers, the challenges of handling patient data, as well as the necessity for training and skill development. The use of technology, such as Electronic Health Information Systems can enhance the efficiency of medical record management.

Implications of these results include the need for policy reform in the field of medical records human resources management, increased access to technology, and strategic approaches in training and skill development of medical record officers. This study provided an in-depth view of the challenges and needs of human resources in the field of medical records, laying the foundation for developing systems that are more efficient and responsive to changes in health care.

This study had several limitations, first, sampling was constrained to certain locations or cases, hence, the results may not fully reflect the human resources needs of medical record officers at the Mataram City Health

Center. Second, the analysis did not take into account external variables, which could affect human resources needs such as changes in regulations or technological developments occurring after the study was conducted.

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AUTHORS' CONTRIBUTIONS

Syamsuriansyah Syamsuriansyah design the study, formal analysis, methodology, Hizriansyah Hizriansyah and Nik A. N. Arifin acquired data, critically review the article and approved the final version to be published. Rizal P. A. Putra writing the original draft, review and editing article.

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COMPETING INTERESTS

The authors confirm that all of the text, figures, and tables in the submitted manuscript work are original work created by the authors and that there are no competing professional, financial, or personal interests from other parties.

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