



Coverage of maternal health services to maternal mortality ratio moderated by public health center accreditation status and causes of maternal death

Eka Nur Sejati^{1*}, Elsy Maria Rosa¹

¹ Department of Public Health, Master of Hospital Administration, Universitas Muhammadiyah Yogyakarta

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ABSTRACT

Maternal mortality is a benchmark in monitoring maternal health globally, the quality of reproductive health services in general, and the country's development towards the Sustainable Development Goals. The purpose of this study was to determine the effect of maternal health service coverage on the Maternal Mortality Ratio (MMR) moderated by the accreditation status of public health centers (PHC) and the causes of maternal mortality. This research is a quantitative analytic method of observational cross-sectional design. The research subjects included all pregnant women, mothers in labor, and postpartum mothers in Indonesia in 2020 with a total sampling technique. The data on the results of health program achievements in Indonesia in 2020, conducted a path analysis using the SmartPLS program. The coverage of maternal health services had a significant negative effect of 54.9% on the MMR ($p=0.036$) and a significant positive effect of 59.2% on the accreditation status of PHC ($p=0.002$). The accreditation status of PHC and causes of maternal death did not significantly affect the MMR ($p=0.632$; $p=0.531$). The coverage of maternal health services mediated by the accreditation status of PHC did not significantly affect the MMR ($p=0.657$). The coverage of maternal health services moderated by the accreditation status of PHC and causes of maternal death did not significantly affect the MMR ($p=0.643$; $p=0.318$). Increasing the coverage of maternal health services can reduce the MMR and improve the accreditation of PHC. The results of this study can be used as material for evaluation and motivation to increase the coverage of maternal health services in PHC.

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Kata kunci:

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Rasio kematian ibu

* Corresponding author

Eka Nur Sejati, MD

Department of Public Health, Master of Hospital Administration, Universitas Muhammadiyah Yogyakarta
Jl. Lingkar Selatan, Tamantirto, Kasihan, Bantul, Yogyakarta - Indonesia 55183

ABSTRAK

Kematian ibu merupakan tolak ukur dalam memonitor kesehatan ibu secara global, kualitas pelayanan kesehatan reproduksi secara umum, dan perkembangan negara dalam Sustainable Development Goals (SDGs). Tujuan penelitian ini adalah untuk mengetahui pengaruh cakupan pelayanan kesehatan maternal terhadap rasio kematian ibu dimoderasi oleh status akreditasi Puskesmas dan penyebab kematian ibu. Penelitian ini merupakan kuantitatif metode analitik observasional desain cross sectional. Subjek penelitian meliputi seluruh ibu hamil, ibu bersalin, dan ibu nifas di Indonesia pada tahun 2020 dengan teknik total sampling. Data hasil capaian program kesehatan di Indonesia pada tahun 2020 dilakukan analisis jalur menggunakan program SmartPLS. Cakupan pelayanan kesehatan maternal berpengaruh negatif signifikan 54,9% terhadap rasio kematian ibu ($p=0,036$) dan berpengaruh positif signifikan 59,2% terhadap status akreditasi Puskesmas ($p=0,002$). Status akreditasi Puskesmas dan penyebab kematian ibu tidak berpengaruh signifikan terhadap rasio

Email: eka.nur.psc21@mail.umy.ac.id

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kematian ibu ($p=0,632$; $p=0,531$). Cakupan pelayanan kesehatan maternal yang dimediasi oleh status akreditasi Puskesmas tidak berpengaruh signifikan terhadap rasio kematian ibu ($p=0,657$). Cakupan pelayanan kesehatan maternal yang dimoderasi oleh status akreditasi Puskesmas dan penyebab kematian ibu tidak berpengaruh signifikan terhadap rasio kematian ibu ($p=0,643$; $p=0,318$). Peningkatan cakupan pelayanan kesehatan maternal dapat menurunkan rasio kematian ibu dan meningkatkan status akreditasi Puskesmas. Hasil penelitian ini dapat dijadikan sebagai bahan evaluasi dan motivasi untuk meningkatkan cakupan pelayanan kesehatan maternal di Puskesmas

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INTRODUCTION

Maternal mortality is an unpredictable event as a benchmark for monitoring maternal health globally, the quality of reproductive health services in general, and the progress of various countries in achieving international development goals (Geller et al., 2018). The maternal mortality ratio has a role in assessing the progress of a country in realizing Sustainable Development Goals (SDGs) (Merdad & Ali, 2018). SDG-3 by 2030 targets the maternal mortality ratio to decrease to 70 per 100,000 live births globally (WHO, 2018).

The 2015 Millennium Development Goals (MDGs) program as a global development agenda has ended, and Indonesia has only been able to reduce the maternal mortality ratio from 390 per 100,000 live births (1990) to 305 per 100,000 live births (2015), where the target maternal mortality ratio should be 102 per 100,000 live births. This shows that until the 2015 MDGs program ends, Indonesia has not been able to achieve the specified maternal mortality ratio, even though it is still 3 times higher than the MDG-5 target (Hartinah et al., 2020; Kemenkes, 2021). Indonesia has had trouble lowering its maternal mortality rate for 15 years. This shows that a comprehensive strategy is needed to speed up development in the health sector, especially in Indonesia, a developing country, in order to reach the MDG-5 goal (Manyeh et al., 2018).

The maternal mortality ratio in 2017 globally was 211 per 100,000 live births. In the same year, the Southeast Asia region had a maternal mortality ratio of 137 per 100,000 live births, and the State of Indonesia ranked third with the highest maternal mortality ratio in Southeast Asia (177 per 100,000 live births) (WHO, 2019b). The maternal mortality ratio in Indonesia in 2020 was 97.6 per 100,000 live births, whereas in 2019 it was only 87.9 per 100,000 live births. Based on these results, it shows that in Indonesia the maternal mortality ratio is increasing (Kemenkes, 2021). To reach the SDG-3 goals and keep this problem from becoming a global crisis, Indonesia needs a comprehensive plan to deal with the rise in the rate of maternal deaths.

High maternal mortality indicates that the level of maternal health records is still not good in monitoring maternal health. In addition, high maternal mortality also indicates poor quality of health services associated with low levels of prenatal examinations and low postnatal visits (Zalvand et al., 2019; Zhao et al., 2019). To be able to reduce the maternal mortality ratio, health care facilities must provide quality health services. In this study, the researchers wanted to know the effect of the coverage of maternal health

services on the maternal mortality ratio mediated by the service quality of the public health center.

This study can provide information about the level of coverage of maternal health services, accreditation status of public health centers, causes of maternal death, and maternal mortality ratio in Indonesia and can be used as a means of evaluation and motivation to increase the coverage of maternal health services in first-level health facilities. Maternal health services aim to provide maternal health insurance so that women can give birth to healthy and quality children; reduce maternal and newborn morbidity and mortality; guarantee the fulfillment of quality of life and reproductive rights; and maintain and improve the quality of maternal and child health services (Kemenkes, 2014).

METHOD

Study Design

This study employs a quantitative research approach to determine the effect of maternal health service coverage on the maternal mortality ratio, which is moderated by the public health center's accreditation status and the causes of maternal mortality. This research method uses observational analytic methods to be able to identify and evaluate risk factors or determinants of the accreditation status of public health centers and maternal mortality ratios without intervening, only observing and assessing the relationship between exposure and research variables. The design of this study used a retrospective approach because it used secondary data on the results of health program achievements in Indonesia in 2020. This study used a cross-sectional research design in which researchers examined data on maternal health service coverage, accreditation status of public health centers, causes of maternal mortality, and mortality ratios. mother at a certain point in time.

Sample and Sampling Technique

The sample of this study was all pregnant women, mothers in labor, and postpartum mothers in Indonesia in 2020. The sample size in this study was calculated using a sample size calculator with a 95% confidence level, a 5% confidence interval, a 50% population proportion, and a population size of 10,197,206 people. Total sampling was used in this study, so all pregnant women, mothers in labor, and postpartum mothers who had recently given birth who

met the inclusion and exclusion criteria were included in the sample.

Research Variables

The independent variable as the predictor variable in this study was the coverage of maternal health services. The intervening variable is a mediating variable that theoretically affects the relationship between the independent variable and the dependent variable; it is the accreditation status of the public health center. The moderating variables as confounding variables were the accreditation status of the public health center and the causes of maternal mortality. The dependent variable is the dependent variable that is observed and influenced by the independent variable of this study, which is the maternal mortality ratio.

Data Analysis

Data analysis in this study using path analysis was carried out using the Structural Equation Modeling-Partial Least Square (SEM-PLS) method using the SmartPLS 3.3.9

program through 3 stages, namely testing the outer model, inner model, and hypothesis. The outer model test is carried out through 2 stages of testing, namely the validity test and the construct reliability test. Inner model testing is evaluated using the value of R-square (R²), the value of path coefficients, the value of predictive relevance (Q²), and model fit. Hypothesis testing with two-tailed p values (<0.05) and t values (>1.96) to determine the structural relationship between latent variables. In total, there were 10,197,206 samples that met the criteria for data analysis.

RESULTS AND DISCUSSION

The number of pregnant women, mothers in labor, and postpartum mothers in Indonesia in 2020 was 10,197,206, consisting of 5,221,784 pregnant women and 4,975,442 mothers in labor and postpartum mothers. The distribution of the population of pregnant women, mothers in labor, and postpartum mothers in 34 provinces in Indonesia in 2020 is shown in Figure 1 below.

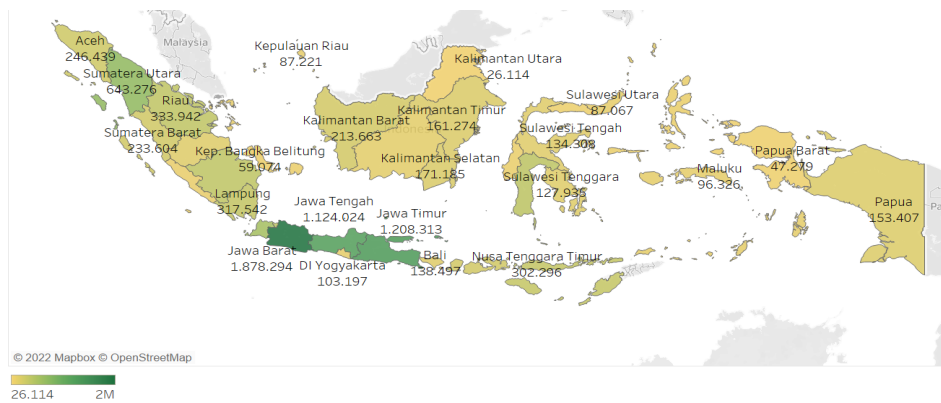


Figure 1. Pregnant Women, Mothers in Labor, and Postpartum Mothers in Indonesia in 2020.

Figure 1 shows the diversity of the population of pregnant women, mothers in labor, and postpartum mothers in 34 provinces in Indonesia in 2020. The more the population, the more green the color of the province in the picture will be, and the less the population, the more yellow the color of the province will be. The smallest population of pregnant women, mothers in labor, and postpartum mothers is in North Kalimantan Province (26,114 people), which is marked in yellow, while the largest population is in West Java Province (1,878,294 people), which is marked in green.

Table 1 shows 3 variables of the coverage of maternal health services, namely the coverage of health services for

pregnant women, mothers in labor, and postpartum mothers. In the coverage of health services for pregnant women, there is still coverage that has not met the target, namely the coverage of early detection of hepatitis B (51.37%) with a target of 80%. In the coverage of health services for mothers in labor, the delivery coverage at the health facilities has not met the target (≥87%) which is 86%. In the coverage of health services for postpartum mothers, the percentage of postnatal family planning coverage is the percentage with the lowest coverage (2.9%).

Table 1
The Distribution of Maternal Health Service Coverage in Indonesia in 2020

Maternal Health Service Coverage	Percentage (%)	Median (%)	Min. (%)	Max. (%)
Coverage of health services for pregnant women				
K4 Coverage	84,6	81	27,5	98,9
Class coverage of pregnant women	69,92	85,3	5,6	100
Coverage of Td2+ immunization	54,7	48	0	86,9
Coverage of blood supplement tablets	83,6	81,2	25,3	99,3
Coverage of pregnant women at risk of chronic energy deficiency receiving additional food	89	95,9	65,7	100
Scope of early detection of hepatitis B	51,37	49	9,8	76,5
Coverage of health services for mothers in labor				
Coverage of deliveries assisted by health workers	89,8	86,8	0	108,3
Coverage of deliveries in health care facilities	86	82,9	31,4	99,6

Maternal Health Service Coverage	Percentage (%)	Median (%)	Min. (%)	Max. (%)
Coverage of health services for postpartum mothers				
KF3 Coverage	88,3	82,3	0	122,9
Vitamin A coverage	87,5	85,1	0	106,5
Coverage of postnatal family planning	2,9	6,3	0	111,6

Notes. K4 = The fourth visit for pregnant women. Td2+ immunization = Tetanus diphtheria immunization more than twice. KF3 = The third postpartum visit.

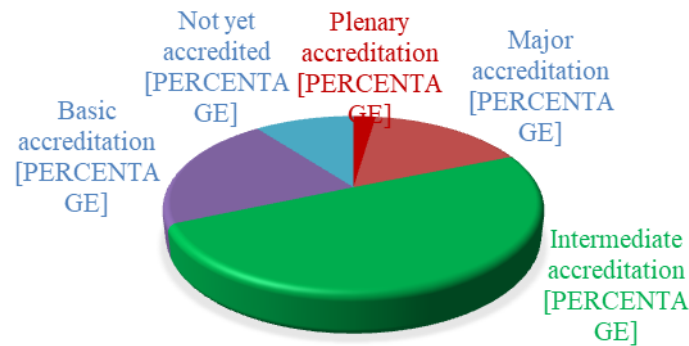


Figure 2. Distribution of Public Health Center Accreditation Status in Indonesia in 2020.

Figure 3 shows the causes of maternal death divided into 9 categories, namely bleeding, hypertension in pregnancy, circulatory system disorders, infections, metabolic disorders, heart disease, COVID-19, abortion, and others. Maternal mortality in Indonesia in 2020 was 28.6% due to bleeding, 23.9% due to hypertension in pregnancy, 4.9% due to

circulatory system disorders, 4.6% due to infection, 3.1% due to metabolic disorders, 0.7% due to heart disease, 0.1% due to COVID-19, 0% due to abortion, and 34% due to other causes. The causes of maternal death in Indonesia in 2020 were dominated by other causes (34%).

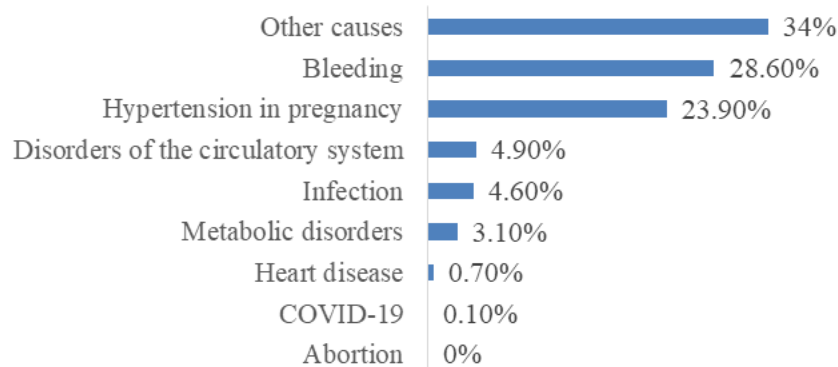


Figure 3. The Distribution of Causes of Maternal Death in Indonesia in 2020

Figure 4 shows the distribution of maternal mortality ratios in 34 provinces in Indonesia in 2020. Provinces with a maternal mortality ratio of below 70 per 100,000 KH (target MMR SDG-3) are colored in green, while provinces with a maternal mortality ratio of above 70 per 100,000 KH are colored yellow, orange, and red. The higher the maternal mortality ratio, the more the province's color will be orange to red. Based on the picture above, it can be seen that almost

all provinces in Indonesia have not reached the target of a maternal mortality ratio below 70 per 100,000 KH. In 2020, North Sumatra province is the only province in Indonesia that has achieved the SDG-3 target with a maternal mortality ratio of 62.5 per 100,000 KH, while the highest maternal mortality ratio is in West Papua Province (332 per 100,000 KH). The average maternal mortality ratio in Indonesia in 2020 was 97.6 per 100,000 KH

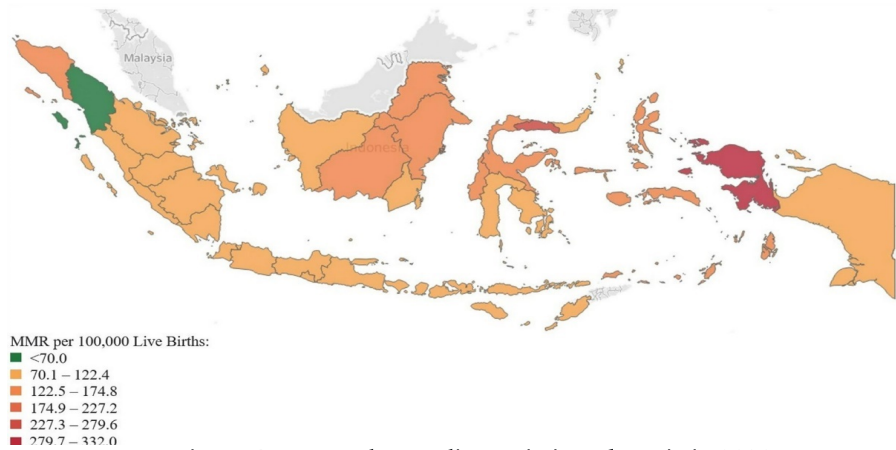


Figure 4. Maternal Mortality Ratio in Indonesia in 2020

Outer Model Test

In the outer model test, there are 4 variables with 26 indicators, namely 11 indicators for coverage of maternal health services, 5 indicators for the accreditation status of public health centers, 9 indicators for causes of maternal death, and 1 indicator for maternal mortality ratio. The construct validity test was based on the loading factor value.

There were 10 indicators that met the loading factor value > 0.70, namely K4 coverage (0.844), blood supplement tablet coverage (0.883), delivery assisted by health workers (0.887), delivery coverage at health facilities (0.823), KF3 coverage (0.936), vitamin A coverage (0.918), primary accreditation (0.725), intermediate accreditation (0.857), hypertension in pregnancy (1,000), and maternal mortality ratio (1,000).

Table 2
SEM-PLS Analysis Result

Variable	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Coverage of maternal health services (X)	0,943	0,948	0,955	0,779
Public health center accreditation status (Z1)	0,422	0,444	0,772	0,631
Cause of maternal death (Z2)	1,000	1,000	1,000	1,000
Maternal mortality ratio (Y)	1,000	1,000	1,000	1,000

Table 2 shows the AVE value of all variables ≥ 0.50 namely coverage of maternal health services (X), accreditation status of public health centers (Z1), causes of maternal death (Z2), and maternal mortality ratio (Y). This shows that these four variables are declared valid and can be processed further because they meet the requirements of convergent validity. Overall indicators for the variables forming the construct of maternal health service coverage, accreditation status of public health centers, causes of maternal death, and maternal mortality ratio have a cross loading value ≥ 0.70 . Thus, it can be concluded that all variable indicators already have good discriminant validity. The composite reliability value of all constructs is ≥ 0.70 , so it can be concluded that all constructs already have good reliability and are declared reliable.

The inner model is evaluated using the R-Square (R2) value, path coefficients value, predictive relevance (Q2) value, model fit and indirect effects. The R-Square value of the accreditation status of the public health center (0.351) and the maternal mortality ratio (0.455). The value of path coefficients to determine the influence of the independent variable on the dependent variable is illustrated in the results of hypothesis testing in table 3. The value of predictive relevance (Q2) for the accreditation status of public health centers (0.144) and the maternal mortality ratio (-0.016). The model fit the chi-square value (164.358) and the NFI value (0.569). This shows that the PLS model is fit and can be used to test the research hypothesis. The indirect effect of maternal health service coverage mediated by the accreditation status of public health centers on the maternal mortality ratio is 0.078 (> 0.05).

Inner Model Test

Table 3
Hypothesis Test Result

Hypothesis	Variable	Original Sample	t value	p value
H1	Coverage of maternal health services (X) -> Maternal mortality ratio (Y)	-0,549	2,095	0,036
H2	Coverage of maternal health services (X) -> Public health center accreditation status (Z1)	0,592	3,119	0,002
H3	Public health center accreditation status (Z1) -> Maternal mortality ratio (Y)	0,131	0,479	0,632

Hypothesis	Variable	Original Sample	t value	p value
H4	Cause of maternal death (Z2) -> Maternal mortality ratio (Y)	-0,132	0,627	0,531
H5	Coverage of maternal health services (X) -> Public health center accreditation status (Z1) -> Maternal mortality ratio (Y)	0,078	0,445	0,657
H6	Coverage of maternal health services (X) * Public health center accreditation status (Z1) -> Maternal mortality ratio (Y)	-0,162	0,464	0,643
H7	Coverage of maternal health services (X) * Cause of maternal death (Z2) -> Maternal mortality ratio (Y)	0,431	0,999	0,318

* $p < 0.05$.

Hypothesis Test

Hypothesis testing to determine the structural relationship between latent variables by comparing the t value with the t table value and looking at the p value. The hypothesis is accepted if the t value $>$ t table (1.96) or the p value $<$ alpha value (0.05) and vice versa.

The effect of maternal health service coverage on maternal mortality ratio

The coverage of maternal health services has a significant negative effect of 54.9% on the maternal mortality ratio (t-value $>$ 1.96; p-value $<$ 0.05). Mothers who started antenatal care in the first and second trimesters of pregnancy were shown to have a lower maternal mortality rate than mothers who started antenatal care in the third trimester (Sundari, 2020). Delivery in health care facilities has a high negative correlation to the maternal mortality ratio (Labasangzhu et al., 2018). The coverage of delivery assistance by health workers is also significantly negatively correlated with the maternal mortality ratio (Nurjannah et al., 2018). The risk of maternal death is high in districts/cities with low K4 coverage, low delivery coverage by health workers, and low postpartum visit coverage (Nurrizka & Wahyono, 2018).

The effect of maternal health service coverage on the accreditation status of public health centers

The coverage of maternal health services has a significant positive effect of 59.2% on the accreditation status of public health centers (t-value $>$ 1.96; p-value $<$ 0.05). The results of this study are in accordance with previous research which states that there is a significant difference between accredited health centers and unaccredited public health centers in terms of adequate antenatal care records. The completeness of midwives in documenting antenatal services is related to the accreditation status of public health centers (Afrizal et al., 2020). Community-oriented, safe, and high-quality health services, continuous service, and human resource management are high priorities among public health center accreditation programs (Tabrizi & Gharibi, 2019). Therefore, the existence of continuous maternal health services can increase the chances of achieving the accreditation status of public health centers. One way to improve the accreditation of public health centers is to improve maternal health services. This is because maternal health services are one of the most important programs in Indonesia for public health centers to reach their goals of improving public health degrees (Limato et al., 2019).

The effect of the public health center accreditation status on the maternal mortality ratio

The accreditation status of public health centers has no significant effect on the maternal mortality ratio (t-value $<$ 1.96; p-value $>$ 0.05). Accredited service facilities are not associated with lower mortality (Lam et al., 2018). Health facility accreditation does not have a significant relationship with mortality rates (Almasabi & Thomas, 2017). The accreditation status of a public health center can describe how far the public health center can carry out its health services according to established national standards. Accreditation is expected to have an impact on maternal health outcomes through increasing the quantity and quality of health services (El-Shal et al., 2021).

The effect of maternal death causes on the maternal mortality ratio

The cause of maternal death had no significant effect on the maternal mortality ratio (t-value $<$ 1.96; p-value $>$ 0.05). Causes of maternal death, such as hypertension in pregnancy, are not related to maternal mortality (Yuningsih & Rumiatur, 2018). The accuracy of midwives in carrying out early detection of high risks such as pre-eclampsia and eclampsia in pregnancy, childbirth, and postpartum as well as the speed of midwives in referring mothers to health facilities can make mothers handled properly and prevent maternal death. The cause of maternal death is not a factor that affects the maternal mortality ratio, but the quality of maternal care. Inappropriate or delayed referrals, poor coordination between health facilities, and lack of planning to manage potential complications will affect maternal health (Mahmood et al., 2021).

The effect of coverage of maternal health services is mediated by the accreditation status of public health centers on the maternal mortality ratio

The coverage of maternal health services mediated by the accreditation status of public health centers did not significantly affect the maternal mortality ratio (t-value $<$ 1.96; p-value $>$ 0.05). Accredited public health centers will carry out comprehensive maternal health service program development, which includes planning, organizing, actuating, and controlling as an effort to reduce maternal mortality (Wijayanti et al., 2020). The implementation of integrated maternal health services can be hampered if in terms of funding sources, standard operating procedures, human resources, facilities, and infrastructure are not met. This can cause health workers to experience obstacles in the implementation of maternal health services according to standards (Fatahilah, 2020).

The effect of the coverage of maternal health services is moderated by the accreditation status of the public health center on the maternal mortality ratio

The coverage of maternal health services moderated by the accreditation status of public health centers did not significantly affect the maternal mortality ratio (t-value <1.96; p-value >0.05). Midwives, as the main health workers who deliver in public health centers, play an important role in reducing maternal mortality. Based on the research that has been done, after the midwife was given training in cases of preeclampsia and cases of postpartum hemorrhage for 2 years, the maternal mortality rate decreased (Setiawan & Chalidyanto, 2021). Midwives who have been trained will provide good care for mothers and help reduce the number of mothers who die during childbirth.

In the strategic plan of the Ministry of Health for 2020–2024, the government has not included performance targets for indicators of the percentage of K4 and the provision of iron for pregnant women, which were previously included in the strategic plan of the Ministry of Health for 2015–2019 (Kemenkes, 2015, 2020). The elimination of this performance achievement target causes the targets to be achieved to become unclear and health workers to lose motivation in providing quality antenatal services because there are no performance targets to be achieved. Clear and measurable performance goals will make health workers more motivated and make it more likely that performance goals will be met (Fatahilah, 2020).

The coverage of maternal health services moderated by the accreditation status of public health centers does not affect the maternal mortality ratio. It is possible that health workers do not provide comprehensive and quality maternal health services according to the Ministry of Health's provisions due to the absence of performance targets that must be achieved in the strategic plan of the Ministry of Health for 2020–2024, so that the utilization of existing public health center resources is also not optimal.

The effect of the coverage of maternal health services is moderated by the cause of maternal death on the maternal mortality ratio

The coverage of maternal health services moderated by the cause of maternal death did not significantly affect the maternal mortality ratio (t-value <1.96; p-value >0.05). Complications of pregnancy and childbirth are the leading causes of maternal death globally. 80% of these complications are caused by postpartum hemorrhage, infection, hypertension in pregnancy, and unsafe abortion. To be able to prevent and manage these complications, mothers need to receive maternal health services during pregnancy, childbirth, and the postpartum period from professional health workers so that they can carry out timely management and treatment (WHO, 2019a).

There are three types of delays that are known to contribute to maternal mortality. The first delay is the delay in deciding to seek care when experiencing a maternal emergency. The second delay is the delay in reaching the appropriate health facility. The third delay is being late in receiving appropriate and adequate care after reaching a health facility (Tesfay et al., 2022).

The first delay is related to the mother's lack of knowledge in recognizing the signs of a maternal emergency. The second delay is related to access to health care facilities and the availability of a maternity waiting room. The third delay is related to the readiness of health workers, health

facilities, and infrastructure to make referrals (Tesfay et al., 2022). These three delays, which may cause an increase in maternal mortality, cannot be suppressed even though health workers have provided adequate maternal health services.

LIMITATION OF THE STUDY

This study uses secondary data so that the accuracy of recording, recording compliance, and reporting data on health program achievements at the level of public health centers, the Health Office, and the Ministry of Health plays an important role. The diversity of demographic, educational, economic, social, and cultural conditions in various provinces in Indonesia is likely to influence the research results. Other determinants that cannot be controlled in this study include education, residence, socioeconomic conditions, mother's perception, support from husband, family, and society, maternal health status, reproductive status, access to health services, behavior in using health facilities, and health resources. When researchers use secondary data, it is hard for them to find out what causes their research results to be meaningless.

CONCLUSIONS AND SUGGESTIONS

Increasing the coverage of maternal health services will reduce the maternal mortality ratio and increase the accreditation status of public health centers. Maternal health services that are carried out continuously can monitor maternal health status properly so that maternal emergencies can be detected early and managed appropriately in order to avoid the risk of maternal death. Improving maternal health services is one way to raise the accreditation status of public health centers. This is because maternal health services are one of the most important programs in Indonesia for public health centers to achieve their goals and improve the health of the public.

The accreditation status of public health centers does not have a significant effect on the maternal mortality ratio. This is possibly related to the lack of skills of health workers in managing maternal health services so that maternal health services in health facilities are less than optimal and have no impact on the accreditation status of public health centers. The cause of maternal death does not have a significant effect on the maternal mortality ratio. This is possible because the cause of maternal death is not the main factor that causes an increase in the maternal mortality ratio but is more influenced by the accuracy of health workers in managing the causes of maternal death so as not to cause maternal death.

The coverage of maternal health services mediated by the accreditation status of public health centers does not have a significant effect on the maternal mortality ratio. This is possible because the coverage of maternal health services supported by the accreditation status of community health centers with the availability of resources, facilities, and infrastructure but not supported by a comprehensive maternal health service program (planning, organizing, acting, and controlling) will not affect the maternal mortality rate.

The coverage of maternal health services moderated by the accreditation status of public health centers does not have a significant effect on the maternal mortality ratio. This

is possible because health workers do not provide comprehensive and quality maternal health services in accordance with the provisions of the Ministry of Health due to the absence of performance targets that must be achieved in the strategic plan of the Ministry of Health, so that the utilization of resources, facilities, and infrastructure of existing public health centers also becomes inadequate. optimal and has no impact on the number of maternal deaths.

The coverage of maternal health services moderated by the cause of maternal death did not have a significant effect on the maternal mortality ratio. This is possible because there are delays in making decisions about treatment, reaching health facilities, and getting treatment, so that although the coverage of maternal health services has been running well, it cannot reduce the number of maternal deaths.

Suggestions for further research can use mixed methods research with an explanatory sequential design, namely by collecting and analyzing quantitative data on maternal health services, accreditation status of public health centers, causes of maternal mortality, and maternal mortality ratio, followed by collecting and analyzing qualitative data on variables. We include these variables to be able to get more information about the factors that influence the research results.

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ETHICAL CONSIDERATIONS

All research protocols were approved by the research ethics committee of the Faculty of Medicine and Health Sciences at Universitas Muhammadiyah Yogyakarta (permission number 043/EC-EXEM-KEPK FKIK UMY/IV/2022) in compliance with research ethical standards.

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Conflict of Interest Statement

This research contains no conflicts of interest.

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