



Evaluating the Triple Elimination Screening Program for Pregnant Women in Rokan Hilir District, Indonesia

Riauni Syaputri^{1*}, Budi Hartono², Azzah Rawani³

^{1,2} Prodi Magister Kesehatan Masyarakat Universitas Hang Tuah, Pekanbaru
Jl. Mustafa Sari No.5, Tengkerang Sel., Kec. Bukit Raya, Kota Pekanbaru, Riau 28281
¹riaunisyaputri19@gmail.com, ²coachbuton@gmail.com

ABSTRACT

The Triple Elimination program aims to prevent mother-to-child transmission of HIV, hepatitis B, and syphilis during pregnancy. This qualitative phenomenological study evaluated the implementation of the Triple Elimination program among pregnant women at the Rokan Hilir District Health Office in Indonesia. Five informants were purposively selected for in-depth interviews and document reviews. Data were analyzed using fishbone and SWOT analyses. Major barriers included limited knowledge and motivation among pregnant women due in part to inadequate midwife competencies in conducting screenings, insufficient health promotion infrastructure and activities, budget constraints, limited involvement of community stakeholders, and lack of supportive policies. Recommendations encompass enhancing midwife competencies, garnering policymaker support, optimizing community health cadres' roles, employing mobile health education strategies, and fostering partnerships through a Pentahelix approach. This streamlined abstract concisely summarizes the key aspects of the study including aims, methods, findings, and conclusions in clear language appropriate for an international audience.

Keywords: pregnant women, problem solving, triple elimination.

1. INTRODUCTION

Pregnant women are among the populations at risk of contracting HIV/AIDS, hepatitis, and syphilis. Globally in 2020, an estimated 1.3 million women were living with HIV, with 57% of child HIV infections occurring via mother-to-child transmission (MTCT). Meanwhile, 16% of pregnant women contract hepatitis and syphilis yet only 6% receive treatment (WHO 2021). A study by Sari and Anggeriani (2022) on triple elimination testing to prevent sexually transmitted diseases in pregnant women found high risks of mother-to-child transmission for HIV/AIDS (20%-

45%), syphilis (69%-80%), and hepatitis B (over 90%).

To address this, Indonesia's Ministry of Health launched the Triple Elimination (HIV, Syphilis, Hepatitis B) program per Regulation No. 52/2017. This integrated program aims to prevent mother-to-child disease transmission and improve women's, children's, and family health. Simultaneous screening for syphilis and hepatitis B along with HIV prevention from mother-to-child complements the integrated antenatal care package in an effective, efficient and cost-effective manner. However, 2021 national health data showed only 45.9% of pregnant women were tested for HIV, with 0.18% being positive. For hepatitis

* Riauni Syaputri

Tel.: -

Email: riaunisyaputri19@gmail.com



B, 60.37% were tested with 1.6% positive results. In Riau Province, coverage rates were even lower at 33.9% for HIV and 38.37% for hepatitis B (Indonesian Ministry of Health, 2022).

Triple elimination testing represents one of fourteen standards for integrated antenatal care. Yet stigmatization and discrimination towards infectious diseases, especially HIV and AIDS, persists. Up to 80% of people living with HIV face stigma and isolation, deterring pregnant women from getting tested during antenatal care (Rufaridah, 2019; Zhang et al., 2022).

In Rokan Hilir District, the 2022 Basic Health Services Minimum Service Standards (SPM) report showed that out of twelve health indicators, services for people at risk of HIV infection had the lowest coverage at 49.79%, missing the 100% target. Aligning with this, only 42.2% of pregnant women underwent hepatitis B screening, 38% for HIV, and 48.3% for syphilis.

Evidently, greater efforts are needed to address barriers and increase community awareness and participation in triple elimination testing. This study analyzes the implementation of the triple elimination screening program for pregnant women by Rokan Hilir District Health Office during antenatal care, identifies key problems and priorities, explores alternative solutions, and develops an action plan for interventions.

2. RESEARCH METHODOLOGY

This qualitative phenomenological study aimed to garner insights through in-depth interviews, observations, and document reviews regarding the implementation of the Triple Elimination screening program for pregnant women within antenatal care at the Rokan Hilir District Health Office. Fieldwork spanned November 27th to December 14th, 2023. Purposive sampling aligned with qualitative principles of appropriateness and adequacy guided informant selection. Appropriateness involved choosing key informants based on program knowledge, while adequacy meant obtaining sufficiently diverse, quality information to meet research standards. Informants encompassed the HIV Program Section Head, Rokan Hilir District P2P Unit

Coordinator, person in charge of maternal and child health programs, village midwife, and pregnant woman. Data collection relied on in-depth interviews with primary, key and supporting informants, triangulated via cross-checking interview data against secondary documentation and theories to derive accurate, meaningful conclusions. Manually-analyzed data underwent thematic analysis.

The study uncovered ongoing problems with integrating the Triple Elimination program into antenatal care. The problem-solving cycle began by identifying and prioritizing key issues, followed by exploring potential solutions and interventions (Suhada & Ain Ratu, 2021). Specific techniques included fishbone analysis and SWOT analysis to analyze the situation, pinpoint challenges, rank priorities, and determine alternatives. While interviews were guided by protocols, they involved one-time in-depth dialogues predicated on pre-established rapport between the researcher and informants through working in the District Health Office since 2018.

3. RESULTS AND DISCUSSION

Research Informants

Data collection in this study was conducted through in-depth interviews. The key informant in this study was the Rokan Hilir District P2P Unit Coordinator (1 person). The main informants were the HIV Program Section Head of the Rokan Hilir District Health Office (1 person) and the Family Health and Community Nutrition Administrator (1 person). Supporting informants included a village midwife (1 person) and a pregnant woman (1 person). Informant characteristics are presented in Table 1.

Tabel 1. Research Informant Data

Informant Code	Age (yr)	Latest Education	Position / Job	Years of Service
IK	56 yrs	Bachelor	Rokan Hilir District P2P Unit Coordinator	25 yrs
IU 1	44 yrs	Bachelor + Ners	HIV Program Section	3 yrs

			Head, Rokan Hilir District Health Office	
IU 2	51 yrs	Master's Degree	Family Health & Communit y Nutrition ADministr ator	8 yrs
IP 1	38 yrs	Diplom a in Midwife ry	Village Midwife	10 yrs
IP 2	31 yrs	High School	Pregnant woman	-

Notes:

IK: Key informat

IU: Primary informant

IP: Supporting informant

Situational Analysis of Problems

The situational analysis utilized document review and in-depth interviews with the HIV Program Section Head, Rokan Hilir District P2P Unit Coordinator, person in charge of the maternal and child health program, village midwife, and pregnant woman to obtain results on the selected problem topic as follows:

1. Analisis situasi dari Unsur manajemen

Based on the in-depth interviews with key and primary informants, it was found that laboratory staff and doctors were already competent after triple elimination training. However, some midwives had not yet participated in such training. Laboratory facilities and infrastructure for triple elimination testing were complete. Operational costs were funded from the regional revenue and expenditure budget (APBD) through health operational assistance (BOK). There were funding limitations in providing media and health promotion activities. This can be seen from the following interview results:

"...I believe staffing levels are adequate, though some midwives have yet to receive relevant training but are already competent. The infrastructure for conducting tests is well equipped in every community health center, financed through the regional budget (APBD) via health operational funds (BOK).

The limitation is on budgets constraining optimization of health promotion media." (IU 1)

"...Qualitatively, lab analysts and doctors are proficient although village midwives generally are not. Health center supplies are fully stocked...Our program funding stems completely from the health agency's BOK budget." (IU 2)

"...I attended workshops on triple elimination testing before, but fellow midwives haven't uniformly been covered. Thankfully health center stocks are ample, though rarely dipped into given the low uptake. No glitches in procuring testing kits, just lacking health education leaflets and booklets specifically on HIV and hepatitis B." (IP 1)

2. Analisis situasi dari Fungsi Manajemen

In terms of management functions, the implementation of triple elimination testing encompassed planning, organizing, execution, monitoring and evaluation.

a. Planning

Based on in-depth interviews with key and primary informants, it was found that planning aligned with the 2021-2026 Rokan Hilir District Health Office work plan, adjusted to available BOK funds and referral guidelines for the prevention of HIV, syphilis and hepatitis B transmission from mother to child (PPIA) issued by the Ministry of Health in 2019. The constraint in planning involved limited budget availability within the Rokan Hilir District APBD. This can be seen from the following interview excerpts:

"...Planning aligned with the existing work plan and available BOK budget as per referral guidelines." (IK)

"...The program plans also support central and district government initiatives, working towards realizing Rokan Hilir District's vision and mission." (IU 1)

b. Organizing

In-depth interviews with key and primary informants revealed that organizing was supported by Ministry of Health Regulation

No. 52 of 2017, Regulation No. 4 of 2019, and Regulation No. 21 of 2021. However, policy support from the Rokan Hilir District Head was not yet visible. The regional apparatus organization (OPD) responsible for the Triple Elimination screening program was the Rokan Hilir Health Office, integrated with hospitals and health centers as technical implementers. This can be seen from the following interview quotes:

"...Related policy support includes Indonesian Ministry of Health Regulation Number 52 Year 2017 along with Regulation Number 4 Year 2019. However, there are no specific local regulations from the District Head regarding the triple elimination program yet." (IK)

"...In terms of technical program management, coordination is handled by the District Health Office, while implementation lies with the health centers and hospitals within our jurisdiction." (IU 1)

"...Backing regulations encompass Indonesian Ministry of Health Regulation Number 52 Year 2017, with the latest decree superseding Regulation Number 97 Year 2014 namely Ministry Regulation Number 21 Year 2021." (IU 2)

c. Execution

Based on in-depth interviews with key and primary informants, it was found that health promotion had not been provided to all pregnant women, and advocacy and community empowerment had not been carried out. Surveillance relied on monthly screening coverage reports from health centers. Early detection was only given to pregnant women willing to undergo triple elimination screening. Positive cases were referred to RSUD dr. RM Pratomo Hospital. The implementation of health promotion was identified from the following informant quotes:

"...We've provided health promotion, but those not in contact never receive information regarding triple elimination testing...No advocacy has occurred beyond counseling for expectant mothers." (IU 2)

"...Yes I received it during maternal classes." (IP 2)

Surveillance implementation was based on the following informant statements:

"...Surveillance relies on recorded indicators and reporting of Elimination activities from each health center." (IK)

"...Surveillance for the Transmission Elimination program has been properly conducted through recording, reporting and analyzing data on HIV, syphilis and hepatitis B exposures among mothers and infants, forming the foundation for Elimination efforts moving forward." (IU 1)

Implementation of early detection was identified from the following informant quotes:

"...Triple elimination testing for early detection occurs during the first antenatal visit at health facilities like maternal classes or community health centers. Expectant mothers undergo counseling and screening by midwives or doctors, then if agreeing to proceed, sign consent forms for examinations done directly by lab technicians." (IU 2)

"...We conduct early detection during the first trimester checks. As midwives, we interview and counsel pregnant women before linking them to lab officers for testing." (IP 1)

Implementation of early detection was identified from the following informant quotes:

"...If testing positive, then routine re-examinations take place, reported to relevant program managers for documentation and follow-up including treatment and referrals." (IK)

"...When there are positive findings, the health centers will refer cases to RSUD dr. RM Pratomo Hospital for further management." (IU 1)

d. Monitoring and Evaluation

In-depth interviews with key and primary informants revealed that monitoring and

evaluation were conducted by the Health Office each month based on data reports submitted online by health centers, while technical supervision through health center inspections had never been carried out. This can be seen from the following interview excerpts:

"...We have yet to directly monitor health centers, only limited to evaluating data entered into the health information system. Constraints include delayed reports partly due to poor internet connectivity especially for remote community health clinics." (IK)

"...Monitoring and evaluation of the Elimination program relies on submitted reports from health centers to gauge achievements. Main challenges are technical issues with networks leading to lagging data." (IU 1)

The results of triple elimination screening implementation in Rokan Hilir District had not achieved expected targets. In 2022, only 42.2% of pregnant women underwent hepatitis B screening, 38% HIV screening, and 48.3% syphilis screening. Such low coverage was due to reluctance among pregnant women towards testing stemming from embarrassment, stigma, and fear of positive results. This was apparent from the interviews as follows:

"...The targets are still far from what we hoped for. From the data I saw, as of 2022 only 42.2% of pregnant women underwent hepatitis B screening, 38% underwent HIV screening, and 48.3% had syphilis screening done." (IU 1)

"...Not yet, we have yet to reach the targets, because indeed HIV and syphilis remain taboo diseases in society, requiring additional efforts to reassure the public that HIV examinations should not be embarrassing." (IU2)

3. Problem Identification

Based on the problem identification process through interviews with informants, issues were revealed regarding the low coverage of the triple elimination screening program due to lacking awareness among pregnant women and

the community about testing, many pregnant women visiting private clinics and obstetricians, as well as the strong societal stigma towards HIV disease that hindered program implementation. This was apparent from the following interview excerpts:

"...The constraints include lacking awareness among pregnant women about this screening, as many are already attending private obstetric clinics so they get examined there without undergoing triple elimination testing." (IK)

"...Nowadays more of the public go for antenatal checks at obstetrician-gynecologists making our targets missed, and even those who visit public health centers or maternal classes remain unwilling to participate." (IU 2)

"...The biggest barrier lies in societal stigma towards HIV disease, hence health promotion thus far has been ineffective in transforming mindsets. Additionally, many skip antenatal care at clinics by opting for midwife practices or obstetricians instead." (IP 1)

Document review uncovered maternal and child health service coverage rates in Rokan Hilir District as shown in Table 2 below.

Table 2. Coverage of Maternal and Child Health Service Indicators

No	Maternal and Child Health (MCH) Service Indicators	2022 %	MSS Target %
1	Pregnant mother care	88.08	100
2	Antenatal care	92.59	100
3	Postnatal care	88.6	100
4	Neonatal care	93,5	100
5	Infant care	94.53	100
6	Toddler care	85.60	100
7	Obstetric emergency management	75.6	100
8	HIV screening among pregnant women	38	100
9	Hepatitis B screening among pregnant women	42.2	100
10	Syphilis screening among pregnant women	48.3	100

4. Prioritization of Issue

To address the various problems identified, further prioritization was carried out using Urgency, Seriousness and Growth (USG) analysis. USG analysis was undertaken together with the District P2P Unit Coordinator, HIV Program Section Head, and Family Health and Community Nutrition Administrator. Each issue was rated on a 1-5 scale for urgency, seriousness and scope. The alternative solution with the highest total score became the priority to tackle the main problem.

Table 3. Priority Determination of Issues

ISU	ANALYSIS			Score	Rangking
	U	S	G		
Lacking awareness and motivation among pregnant women for triple elimination screening	5	5	5	15	I
Many pregnant women visiting private clinics and obstetricians	4	5	4	13	II
Societal stigma and discrimination	4	4	4	12	III

Alternative Problem Solving

Based on the priority issues, the key factor underlying low triple elimination screening coverage was identified to be lacking awareness and motivation among pregnant women to get tested. For deeper insight into the root causes, a fishbone diagram analysis was constructive. The fishbone effectively inverted the issue to reveal potential solutions for each contributing factor as depicted in Figure 1 below:

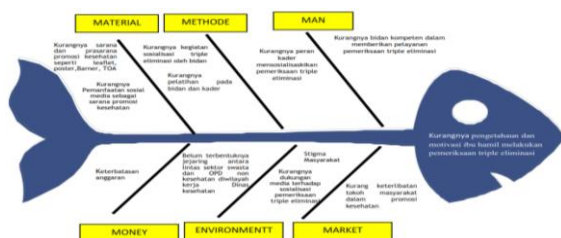


Figure 1. Fishbone Analysis to Identify and Analyze Problems

The strategy to address these challenges involved a SWOT analysis to determine appropriate interventions based on the strengths, weaknesses, opportunities and threats confronted by the organization. The SWOT analysis began by identifying positive aspects such as strengths and opportunities versus negative elements like weaknesses and threats faced. These were then assembled into a matrix, clearly delineating between external opportunities and threats adjusted against internal strengths and weaknesses. Several objectives of the SWOT analysis encompassed:

Table 4. SWOT Analysis

Strengths (S)		Weaknesses (W)	
<ul style="list-style-type: none"> Ministry of Health Regulation No. 4 of 2019 Ministry of Health Regulation No. 52 of 2017 Ministry of Health Regulation No. 21 of 2021 Support from Rokan Hilir District Health Office leadership National Health Insurance (JKN) Minimum Service Standards (SPM) 		<ul style="list-style-type: none"> Lacking competency among midwives Insufficient involvement of community figures Lacking commitment and support from policymakers Limited training for midwives and cadres Inadequate socialization/counseling activities Lacking media support Shortage of health promotion infrastructure like leaflets, posters, banners Under-utilized social media platforms Budget constraints Absence of inter-agency partnerships Stigma and discrimination 	
Opportunities (O)		Threats (T)	
<ul style="list-style-type: none"> Alignment with Rokan Hilir Health Office vision and mission Engagement of community leaders 		<ul style="list-style-type: none"> Low awareness and knowledge about testing Strong societal stigma that HIV is a shameful disease Lacking multi-sectoral involvement Suboptimal coordination across stakeholders 	

- Collaboration with stakeholders and other agencies
- Presence of social groups, NGOs and private sector
- Ease of accessing information

The alternative solutions to address the priority issue of lacking awareness and motivation among pregnant women to undergo triple elimination screening are presented in Table 5.

Table 5. Problem Alternative Solutions

No	Masalah	Alternatif Pemecahan Masalah
Man		
1	Lacking competency among midwives in conducting triple elimination screening	Enhancing competencies for midwives without prior training through workshops on Prevention of HIV, Syphilis and Hepatitis B Transmission from Mother to Child (PPIA) via triple elimination testing
2	Insufficient role of community health workers in socializing triple elimination screening	Empowering cadres to amplify their role
Method		
3	Inadequate socialization of triple elimination screening for pregnant women by midwives	Elevating awareness through innovative mobile health education strategies
4	Limited training for midwives and cadres	Providing digital e-learning based training
Material		
5	Shortage of health promotion materials like leaflets, posters, banners, audio visual aids	Fostering partnerships via Corporate Social Responsibility (CSR) engagement of private sector and businesses to supply

		health promotion media
6	Under-utilization of social media platforms for health promotion	Innovating Mobile Health (mHealth) Campaigns leveraging Instagram, Facebook, TikTok for public health messaging
Money		
7	Budget constraints	Garnering commitment from policymakers through advocacy efforts to issue a special budget allocation decree for the triple elimination program
Market		
8	Lacking media support towards triple elimination screening	Audiencing local mass media outlets in Rokan Hilir District to endorse and disseminate information about testing
9	Community stigma	Running anti-stigma campaigns through localized, culturally-aligned communication approaches
10	Insufficient involvement of community leaders and figures in socializing triple elimination screening	Bolstering community engagement as public relations by audiencing influential figures to convey the imperative for awareness raising about testing among pregnant women
Environment		
11	Absence of networked partnerships encompassing governmental health departments, private sector, community, academia and media across	Conducting advocacy efforts through audiencing forums to establish broad Penta-helix model collaborations from provincial to village levels

Rokan Hilir District

The root cause underlying the low coverage of triple elimination screening among pregnant women in Rokan Hilir District stems from lacking awareness and motivation to get tested.

Knowledge plays a vital role in shaping one's actions. Awareness among pregnant women about triple elimination screening is critical, as around 80% rarely receive pertinent information. Moreover, their knowledge regarding testing greatly reduces the risk of HIV/AIDS, hepatitis B and syphilis transmission between mother and child (Koamesah, Trisno, & Rante 2021).

The process flow in the fishbone diagram indicates the dearth of awareness stems from insufficient socialization by midwives and community health workers lacking competency to perform their duties. Such competency gaps result from inadequate training for midwives and cadres. As Linda Raniwati et al. (2022) espoused, training quality for health officers and workers is a predominant factor impacting their performance, knowledge and skills in fulfilling roles.

The obstacles in disseminating triple elimination information to the public and pregnant women are multifaceted. Budget limitations impede health promotion efforts through media campaigns and materials. As Petralina (2020) underlined, nearly 80% of expectant mothers have minimal exposure to messaging about screening, underscoring subpar promotional initiatives thus far in targeting this group.

The limited involvement of community leaders and figures in raising awareness about testing may also dampen knowledge and willingness among pregnant women to participate. Moreover, lacking commitment from policymakers and absence of local Rokan Hilir District decrees backing the Triple Elimination program weakens cross-departmental coordination between health agencies, private sector and wider community.

According to Indonesia's Health Ministry Regulation (2015), community groups play a strategic role in tackling HIV and AIDS largely by spearheading prevention initiatives. Hence, central and local government partnerships with

influential public personalities is indispensable to enhance social consciousness regarding disease prevention and control.

The stigma circulating about those afflicted with HIV is pronounced within the general populace, with 60-80% of patients facing forms of shame or exclusion. This stigma deters pregnant women from agreeing to screening during antenatal care visits (Zhang et al., 2022).

As the forefront of health services, community health centers confront unique challenges in conducting elimination testing (Barus et al., 2020). These encompass knowledge gaps, inadequate social support, and the lingering stigma faced by expectant mothers especially towards HIV testing (Fatimah, Respati, & Pamungkasari 2020).

A methodological limitation of this study was the relatively small sample size, with only 5 informants identified through purposive sampling. Hence, representation across the spectrum of pregnant women partaking in Rokan Hilir District's Triple Elimination agenda may not be fully comprehensive. Larger samples can furnish wider perspectives and experiences to derive richer data analysis and potentially robust conclusions.

CONCLUSION

Lacking awareness and motivation among pregnant women to undergo triple elimination screening constitutes a priority issue hampering implementation of the Triple Elimination program in Rokan Hilir District. It is vital to optimize health promotion efforts encompassing socialization, advocacy, community empowerment and partnerships to heighten participation in testing, boost community involvement in awareness-raising and mitigate stigma. Policy lobbying to secure robust governmental support along with intensifying commitment through the Penta-helix approach with all stakeholders (public sector, private enterprises, society, academia, mass media) is imperative.

RECOMMENDATIONS

Healthcare workers are urged to perpetuate intervention efforts to improve maternal and child wellbeing while attaining coverage goals for triple elimination screening among pregnant

women within the Jurisdiction of Rokan Hilir District Health Office.

REFERENCES

- Barus, Darwita Juniwati, Marthalena Simamora, Jek Amidos Pardede, and Galvani Volta Simanjuntak. (2020). "Beban Keluarga Sebagai Caregiver Orang Dengan HIV/AIDS." *Jurnal Kesehatan* 11(3):442. doi: 10.26630/jk.v11i3.2278.
- Fatimah, Mei, Supriyadi Hari Respati, and Eti Poncorini Pamungkasari. (2020). "Determinants of Pregnant Women Participation on Triple Elimination of HIV, Syphilis, and Hepatitis B, in Semarang." *Journal of Health Promotion and Behavior* 5(2):124–34. doi: 10.26911/thejhp.2020.05.02.07.
- Kemendes RI. (2022). *Profil Kesehatan Indonesia Tahun 2021*. Jakarta: Kemendes RI.
- Koamesah, Sangguana Marthen Jacobus, Idawati Trisno, and Su Dji To Rante. (2021). "Relationship between Knowledge, Family Support, Frequency of Information, and Attitude Towards Triple Elimination Testing During COVID-19." *Lontar: Journal of Community Health* 3(1):1–9. doi: 10.35508/ljch.v3i1.3821.
- Linda Raniwati, Ernawati, Nurul Indah Sari, Dewi Erlina Asrita Sari, and Haryati Astuti. (2022). "Faktor-Faktor Yang Mempengaruhi Kinerja Kader Dalam Pelaksanaan Kegiatan Posyandu Di Wilayah Kerja Puskesmas Anak Air Kota Padang." *Jurnal Indonesia Kebidanan* 6(2):106–17.
- Permenkes RI. (2015). *Profil Kesehatan Indonesia 2015*. Indonesia.
- Petralina, Bintang. (2020). "Determinan Tingkat Pengetahuan Ibu Hamil Tentang Pemeriksaan Triple Eliminasi." *Husada Mahakam: Jurnal Kesehatan* 10(1):85. doi: 10.35963/hmjk.v10i1.217.
- Rufaridah, A. (2019). "Pelaksanaan Antenatal Care (ANC) 14 T Pada Bidan Di Wilayah Kerja Puskesmas Lubuk Buaya Padang." *Jurnal Menara Ilmu* 13(2):1–12.
- Sari, S., and Anggeriani, R. (2022). Pemeriksaan Triple Elimination untuk Mencegah Penyakit Menular Seksual pada Ibu Hamil di Wilayah Kerja PKM Saboking-King Palembang. *Jurnal Peduli Masyarakat*, 4(4), 659–664.
- Suhada, M. A., and Ain Ratu Q. (2021). "Pelaksanaan PKRS Di Rumah Sakit Berdasarkan Telaah Jurnal." *Muhammadiyah Public Health Journal* 1(2):79–193.
- WHO. (2021). *Global Guidance on Criteria and Processes For Validation: Monitoring and Evaluation Elimination of Mother-To-Child Transmission of HIV, Syphilis and Hepatitis B Virus*. Geneva: World Health Organization.
- Zhang, Dan, Zhiyong Lin, Feinian Chen, and Shuzhuo Li. (2022). "What Could Interfere with a Good Night's Sleep? The Risks of Social Isolation, Poor Physical and Psychological Health among Older Adults in China." *Research on Aging* 44(7–8):519–30. doi: 10.1177/01640275211065103.