Research Article

Social Determinants of Maternal Mortality Trends in Banyumas Regency: A Qualitative Study

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Abstract

Objective: To explore the underlying social determinants contributing to the post-2020 increase in maternal mortality in Banyumas Regency. Specifically, it seeks to examine how systemic, workforce-related, and sociocultural factors particularly those exacerbated by the COVID-19 pandemic have influenced maternal healthcare delivery, referral processes, and care-seeking behaviors.

Methods: This qualitative study employed the Standards for Reporting Qualitative Research (SRQR) framework. In-depth interviews were conducted with 45 purposively sampled stakeholders including healthcare providers, policymakers, midwives, and community health cadres across four sub-districts in Banyumas Regency. One focus group discussion was conducted for triangulation. Hybrid thematic analysis was performed using NVivo12 software.

Results: Most participants were aged 40–50 with over three years of experience. Five interconnected social determinants emerged: healthcare workforce adequacy and competency, emergency training continuity, referral system effectiveness, hospital standardization, and sociocultural influences on care-seeking behavior. Key findings included workforce training programs hindered by COVID-19, coordination delays affecting 70% of surgical response times, family reluctance toward PONEK-accredited hospitals, and resource constraints disrupting community programs. Despite quantitative workforce adequacy, qualitative competency gaps and geographic distribution inequities persisted.

Conclusion: Findings reveal that systemic and cultural factors, amplified by pandemic disruptions, significantly contribute to rising MMR. Evidence supports integrated interventions targeting workforce strengthening, referral system optimization, hospital standardization, and culturally sensitive community engagement to reverse adverse trends and advance Indonesia's SDG commitments.

Keywords: maternal mortality, qualitative research, social determinants.

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INTRODUCTION

Maternal mortality is a sentinel event used globally to monitor maternal health, the quality of reproductive healthcare services, and a country's progress toward international development goals. Despite a 44% global reduction in the Maternal Mortality Ratio (MMR) between 1990 and 2015, the burden remains high in many low-and middle-income countries. Indonesia, in particular, has made significant progress in reducing its MMR from 390 per 100,000 live births in 1994 to 228 in 2007. However, after a brief period of improvement, the MMR rose again to 305 in 2015.[1–3] Similar fluctuations have been observed in Banyumas Regency. The maternal mortality rate in Banyumas showed a decline from 2014 to 2020 but has risen sharply from 2021 to 2023, reaching an alarming rate of 180.5 per 100,000 live births in 2021.[4]

Efforts to reduce maternal mortality through *Badan Penyelenggara Jaminan Sosial (BPJS)*

Kesehatan, the Expanding Maternal and Neonatal Survival (EMAS) program, and Banyumas Regency's *Deteksi Dini Nang Masyarakat Ben Slamet (DENMAS SLAMET)* initiative have improved screening, safety, and postpartum care. However, equitable and timely access to maternal healthcare in Banyumas remains a challenge, particularly after pandemic-related disruptions.

The McCarthy & Maine framework categorizes maternal death determinants into proximate, intermediate, and contextual factors.[5] These categories align with the WHO's Social Determinants of Health (SDH) framework, which emphasizes how socio-economic conditions, such as education, occupation, and cultural norms, impact maternal health outcomes.[6] The rise in MMR post-2020, especially in Banyumas regency region, has not been adequately examined, and the role of social determinants in this upward trend remains underexplored. While many studies have focused on the medical causes of maternal deaths, such as hypertensive disorders and hemorrhage, the broader social, economic, and cultural factors influencing these trends have not been comprehensively addressed (figure 1). The socioeconomic position, including income, education, occupation, and also race and ethnicity, is thought to affect exposure and vulnerability to certain levels of intermediary social determinants of health.[7–11] The identification of such determinants of each regency might be important and helpful in pursuing the evidence-based policy and elimination programs that are well-modified according to the current issues.

This qualitative study explores how post-pandemic social determinants have intensified maternal mortality risks in Banyumas. Through interviews and focus group discussions with health workers, it highlights persistent healthcare and socio-cultural barriers affecting maternal outcomes.

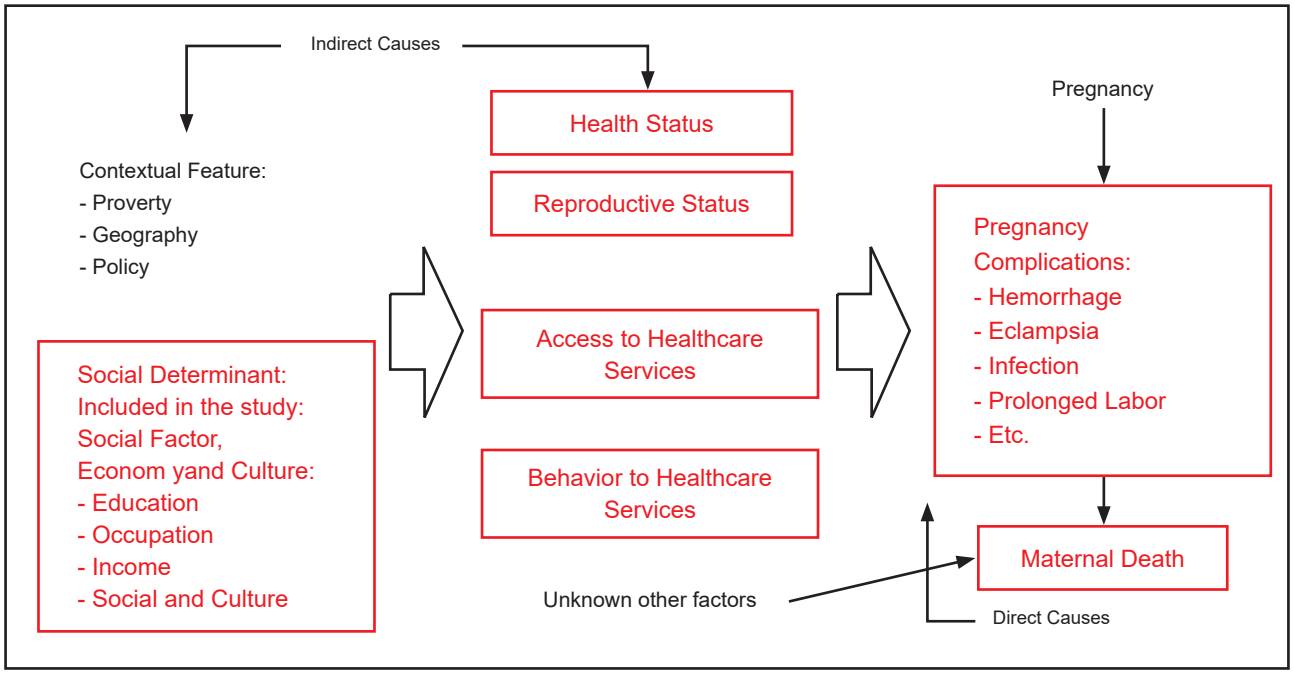

Figure 1. Conceptual Framework of Maternal Death

METHODS

This study employed a qualitative research design following the Standards for Reporting Qualitative Research (SRQR) as outlined.[12] A qualitative approach was deemed appropriate given the complexity of the maternal mortality issue in Banyumas, which is shaped by medical, socio-economic, and cultural factors. The study aimed to explore the perspectives of key stakeholders involved in maternal healthcare and identify social determinants impacting maternal mortality trends.

Informants were selected through purposive sampling. Inclusion criteria were as follows; Health professionals (e.g., midwives, doctors, nurses) working in Banyumas' healthcare facilities, Community health workers (e.g., kader, village midwives) involved in maternal and child health programs, and District Health Office staff

involved in maternal health policy-making.

Exclusion criteria included; Individuals not directly involved in maternal healthcare or policy-making in Banyumas, Participants unable to communicate effectively due to language barriers or other factors.

A total of 45 participants were included in the study. According to qualitative sampling norms, the sample size is sufficient when thematic saturation is reached, meaning no new themes or insights emerge from further interviews. Saturation was determined when additional interviews and focus group discussions (FGDs) yielded no significant new information. Given the relatively small number of maternal healthcare workers in Banyumas, 45 participants were considered an adequate representation of the population.

Data were collected through in-depth interviews, participatory observation, and focus group discussions (FGDs) for triangulation. Interviews lasted 45–60 minutes and FGDs about 90 minutes, conducted in Bahasa Indonesia at *Pusat Kesehatan Masyarakat (Puskesmas)* or Community Health Centers, hospitals, and some participants' homes. A piloted interview guide led to minor revisions for clarity. Responses were documented using recordings, field notes, and structured prompts.

Data were analyzed using hybrid thematic content analysis: initial coding was inductive for emergent themes, followed by deductive mapping against the study's conceptual framework (proximal, intermediate, distal social determinants). Two independent coders conducted the analysis, with regular meetings to discuss and resolve discrepancies. Inter-coder reliability was checked using percentage agreement, which reached 92% after three rounds of coding. Coding and data management were performed using NVivo12 software.

This study established trustworthiness through prolonged engagement, triangulation, and peer debriefing with maternal health experts to reduce bias. Negative case analysis enhanced rigor, while recordings, photos, and transparent documentation supported confirmability. A phenomenological approach balanced subjective experience with objective analysis through reflexivity and contextualization.

Ethical approval was obtained from the Health Research Ethics Committee of Gadjah Mada University (Ref. No: KE/FK/0392/EC/2024). Confidentiality was maintained through de-identification (assigning pseudonyms and codes), secure password-protected data storage, and controlled access to digital files. Written informed consent was obtained from all participants, who were explicitly informed of their rights including voluntary participation and the right to withdraw at any stage without consequences.

Potential limitations include reliance on self-reported perceptions, limited regional scope, and omission of patient and family perspectives. These may constrain generalizability and depth of contextual understanding.

RESULTS

In the conceptual framework of this study, the social determinants hypothesized to influence the maternal mortality trend in Banyumas Regency from 2014 to 2023 included education, occupation, socio-cultural aspects, and other contributing factors. Broadly, the trend in maternal mortality in Banyumas showed a gradual decline, excluding the impact of the COVID-19 pandemic between 2020 and 2022. These determinants influenced maternal health and reproductive status as well as access to maternal healthcare services, ultimately contributing to the observed reduction in maternal mortality rates. To explore these findings in depth, in-depth interviews were conducted with 45 key informants, consisting of personnel from the Banyumas District Health Office, hospital representatives, public health center puskesmas midwives, and village health cadres. Additionally, one Focus Group Discussion (FGD) was carried out to enrich the data. The majority of respondents had been working in their respective healthcare settings for more than three years and were aged between 40 and 50 years.

Table 1 presents the characteristics of the study informants. Most were female (57.8%), and the dominant age group was 40–50 years (42.2%). In terms of educational background, nearly half were midwives (46.7%). Informants were drawn from four sub-districts Ajibarang (37.7%), Baturraden (24.4%), Cilongok (20.0%), and Jatilawang (17.7%). In terms of work experience, a large proportion had served for more than three years (86.7%). Regarding their roles in maternal audit activities, most respondents were in functional roles (82.2%).

Table 1. Informants' Characteristics

Characteristics	N (n=45)	%
Age (y o)		
30 – 40	16	35.5
40 – 50	19	42.2
50 – 60	10	22.2
Gender		
Male	19	42.2
Female	26	57,8
Education level		
Obstetrics and gynecology specialist	3	6.7
Master's degree	8	17.7
General practitioners	13	28.9
Midwives	21	46.7
Sub-districts		
Cilongok	9	20.0
Jatilawang	8	27.7
Baturraden	11	24.4
Ajibarang	17	37.7
Works experience (years)		
1 – 3	6	13.3
>3	39	86.7
Auditing roles		
Structural management	8	17.8
Functional	37	82.2

This study explored the social determinants influencing maternal mortality trends in Banyumas Regency from 2014 to 2023 through in-depth interviews with 45 key stakeholders and one focus group discussion. The majority of participants were experienced healthcare professionals, with 86.7% having worked for more than three years in their respective fields and 42.2% aged between 40 and 50 years. Most respondents were female (57.8%), predominantly midwives (46.7%), drawn from four sub-districts across the regency. Our thematic analysis grouped interconnected social determinants into five broad themes.

The investigation revealed that pre-eclampsia, hypertension during pregnancy, and hemorrhage remained the primary causes of maternal death across healthcare facilities in Banyumas. While hospitals had established standard operating procedures to manage these complications, implementation gaps emerged as significant barriers to optimal care. Healthcare providers consistently reported that bureaucratic delays hindered timely interventions, with one hospital respondent noting that "consultation bureaucracy is lengthy," resulting in only 70% compliance with 30-minute surgical response times for emergency cesarean sections.

Despite these challenges, emergency departments generally performed well, with 80-100% of patients receiving initial treatment within five minutes of arrival. However, coordination between departments remained problematic, particularly for surgical interventions where "no coordination with anesthesiologists, pre-operative preparation, and long resident visits" created delays that could prove critical in emergency situations. Hospital staffing followed established Comprehensive Emergency Obstetric Neonatal Services protocols, also known as *Pelayanan Obstetri Neonatal Emergensi Komprehensif (PONEK),* with creative solutions implemented where specialists were unavailable, including on-call arrangements where "specialists can arrive at the hospital within 10 minutes."

Our findings indicate that although the number of healthcare staff may seem sufficient, there is a critical need for ongoing investment in skill development and workforce stability, especially in the aftermath of the COVID-19 pandemic. The pandemic intensified pre-existing staffing challenges by causing reassignments and turnover that disrupted consistent service delivery. Participants frequently noted that the "quality and capabilities of healthcare workers still require enhancement, particularly in managing maternal health issues." Moreover, disparities in staff distribution were evident, with some urban areas lacking midwives at the subdistrict level, highlighting the necessity for workforce planning that balances both numerical adequacy and equitable geographic allocation.

At the community level, a remarkable transformation had occurred in birth attendance practices. Village midwives had successfully established themselves as the primary providers of delivery care, with traditional birth attendants now relegated to supportive roles. As one midwife explained, "The role of traditional birth attendants is only to care for and bathe the baby and accompany during birth. The midwife's role is greater than that of traditional birth attendants." This shift represented a significant positive change in skilled birth attendance, directly addressing one of the key intermediate determinants of maternal mortality.

However, sociocultural barriers persisted in influencing care-seeking behavior and treatment acceptance. Families generally viewed maternal deaths through a fatalistic lens, with communities typically responding that they "just express regret and do not blame health workers" because severe cases involved comprehensive care teams. While

this reduced blame on healthcare providers, it also potentially delayed urgent help-seeking behavior. More concerning was the preference pattern where families requested referral to non-*PONEK* private hospitals despite their inadequate emergency capabilities, with approximately one-third of midwife respondents reporting this phenomenon.

The referral network connecting villages to higher-level care facilities generally functioned effectively, though several determinants influenced its efficiency. Communication between village midwives and primary health centers was described as good, but hospital-level coordination faced challenges, particularly related to bed availability and insurance coverage issues. One midwife noted that "the obstacle is that the nearest hospital is full of patients," while another highlighted that "the difficulty is for pregnant women who don't have Indonesian Health Card *(Kartu Indonesia Sehat/ KIS),* lengthy discussions with families."

Early detection systems for high-risk pregnancies operated well through routine antenatal care programs, with midwives successfully identifying conditions such as preeclampsia, anemia, and previous cesarean deliveries. However, treatment compliance presented ongoing challenges, particularly when medical interventions were recommended. Healthcare providers reported difficulties with "preeclampsia cases when patients are about to undergo termination by obstetrician-gynecologists, patients and families are still difficult to motivate."

Cross-sectoral coordination emerged as both a strength and limitation in maternal mortality reduction efforts. While stakeholder commitment was generally strong, resource constraints significantly affected program continuity. The Mother's Care Movement *(Gerakan Sayang Ibu/ GSI),* previously implemented across many villages, faced suspension during the COVID-19 pandemic due to budget constraints. Respondents explained that "GSI is stuck because there is no budget from the village" and that "there used to be maternity savings and social funds managed by Family Welfare Movement *(Pemberdayaan Kesejahteraan Keluarga/ PKK),* now there are none."

Transportation accessibility varied considerably across the regency, representing a critical geographic determinant of maternal outcomes. While some communities had established village ambulance services, others relied on private transportation, with residents noting that "village ambulances are not yet available. Alternatives use private transportation or family, assistance from nearest residents, with relatively low costs." This disparity directly impacted the ability to address the "third delay" in emergency obstetric care.

The focus group discussion provided crucial synthesis, identifying five interconnected themes that aligned with the study's conceptual framework. Participants emphasized that human resource adequacy, emergency training continuity, referral system accessibility, inter-facility collaboration, and hospital standardization operated as interconnected determinants rather than isolated factors. Healthcare experts noted that "primary health facilities have many burdens, sometimes there are priority programs that make monitoring limited," while also observing that "some hospitals still do not meet standards for emergency services, even though that is crucial."

Sociocultural determinants emerged as particularly complex, with focus group participants highlighting community resistance rooted in hospital stigma. The observation that "many patients don't want to go to Margono Hospital because it's considered haunted, they prefer private non-*PONEK* hospitals even though the facilities are inadequate" illustrated how cultural beliefs could override medical logic in critical situations.

While the study was predominantly qualitative, several quantifiable patterns emerged that contextualized the findings. Approximately 70% of hospitals reported interruptions in surgical response times, over 80% of midwives confirmed strong community trust and effective collaboration with traditional birth attendants, and roughly 15% of families exhibited reluctance to accept referrals to appropriate emergency facilities. Importantly, experiences were not uniform across the regency. Some villages reported no maternal deaths and demonstrated high engagement in preventive maternal health activities, while certain healthcare workers expressed frustration over systemic constraints including heavy workloads and insufficient resources.

District health officials acknowledged that while midwife numbers were quantitatively adequate, quality improvements remained necessary. One official noted that "every village in Banyumas Regency already has its village midwife, but urban areas do not all have kelurahan

midwives. In terms of quality and competence, they still need to be continuously improved." This highlighted the ongoing need to address both distribution and capacity-building aspects of human resource development.

These findings revealed that maternal mortality determinants in Banyumas operated through interconnected pathways spanning individual, community, and health system levels. While proximate determinants such as hemorrhage and pre-eclampsia remained consistent with global patterns, intermediate determinants particularly referral coordination and resource availability and distal determinants including sociocultural beliefs and economic constraints significantly influenced maternal outcomes. The community's enthusiastic response to emergencies, described as wanting to "help and ensure that deaths do not occur in pregnant women," demonstrated positive social capital that could be leveraged for maternal health improvements.

This multi-level interaction of determinants explained the observed mortality trends and provided evidence for comprehensive interventions addressing each level of influence. The successful transition from traditional to skilled birth attendance, combined with persistent challenges in emergency care access and treatment acceptance, illustrated both the progress achieved and the work remaining to further reduce maternal mortality in the region.

DISCUSSION

This study represents the first comprehensive qualitative exploration of social determinants influencing maternal mortality trends in Central Java using the Standards for Reporting Qualitative Research (SRQR) framework during the post-COVID-19 period. Unlike previous quantitative studies that primarily focused on clinical risk factors, our research provides nuanced insights into the complex interplay between healthcare system capacity, workforce competency, emergency preparedness, referral coordination, and sociocultural beliefs that collectively shape maternal outcomes in rural Indonesian settings.

Based on the WHO Commission on the Social Determinants of Health (CSDH) framework, our analysis identified interconnected social determinants that significantly influence maternal mortality trends in Banyumas Regency; Healthcare Service Quality, healthcare workers adequacy and competency, emergency preparedness and training continuity, functional referral systems and accessibility, inter-facility collaboration and standardization, and sociocultural dynamics impacting care-seeking behavior.[6,7]

Hospital standardization and inter-facility coordination addresses the systemic inequities in service quality and capacity. Our findings confirm that inconsistencies in hospital standards create barriers to optimal maternal care, with some facilities lacking the equipment or accreditation to serve as emergency referral centers.

The disparity in service standards reflects broader socioeconomic inequalities in Indonesia, where regional differences in infrastructure and resources create uneven access to quality obstetric care.[9,12,13] These findings confirmed previous studies showing that inequity persists in maternal health in Indonesia.[12–14] Specifically, disparities in terms of rural-urban and regional differentials in health outcomes, with utilization found to be significantly lower in rural areas.[9]

Respondents advocated for "focus on quality rather than just adding the number of PONEK hospitals," emphasizing that standardization should prioritize functional capacity over numerical targets. Implementation of *PDCA cycles (Plan-Do-Check-Act)* for continuous quality improvement, alongside standardized monitoring tools from *EMAS* and the Ministry of Health, provides a framework for sustainable quality enhancement.[15]

Our findings reveal that while quantitative staffing may appear adequate, qualitative competencies and post-pandemic workforce resilience require sustained investment. The COVID-19 pandemic exacerbated existing workforce challenges, with staff reallocation and turnover disrupting service continuity. Participants consistently reported that "the quality and competence of health workers still need to be improved, especially in handling problems of pregnant women." Inadequate personnel training directly correlates with increased maternal complications, particularly in post-partum care.[8]

The distribution imbalance between rural and urban areas, where "not all urban areas have midwives in subdistrict level," demonstrates that workforce planning must address both quantity and geographic equity. These findings are consistent with global evidence showing that healthcare staffing shortages and inadequate training significantly impact maternal survival rates.[9,10] Strategic human resource development

through continuous professional development and competency-based training programs emerges as a critical intervention priority, as recommended by previous studies identifying the need to increase medical personnel in maternal healthcare.[8,10]

Emergency preparedness represents a distinct determinant from general workforce capacity, as highlighted by systematic reviews indicating that most of maternal deaths in Asia result from direct obstetric causes, primarily hemorrhage and hypertensive disorders such as eclampsia.[12,16] Our findings demonstrate that while emergency training programs exist, their effectiveness is diminished without corresponding improvements in equipment and facilities.

Respondents emphasized that "emergency training is important, but more important is ensuring that equipment and facilities support it." Showing gaps in emergency care service delivery in Indonesia compared to neighboring countries like Thailand, Malaysia, and Sri Lanka.[12] The integration of healthcare workers training with infrastructure development creates a synergistic effect that enhances overall system responsiveness to maternal emergencies, supporting UN recommendations for maintaining "at least two skilled birth attendants available 24 hours a day, seven days a week assisted by trained staff" as the standard for quality emergency obstetric care.[12]

The third determinant encompasses the technical and logistical aspects of referral coordination, distinct from broader inter-facility collaboration. Our study revealed that referral system effectiveness is hampered by communication gaps, transportation barriers, and insurance-related delays. The preference for non-*PONEK* private facilities despite their inadequate emergency capabilities illustrates how perceived accessibility can override clinical appropriateness.

These findings align indicating challenges in hospital care access during emergency conditions, proving that patient reluctance due to distance and travel time causes delays in adequate health services.14 Treatment delays mainly occurred due to family reluctance and great distances to referred facilities, consistent with global evidence that delay-related maternal deaths can be significantly reduced through efficient referral communication and transport mechanisms.[14,17]

Digital health innovations, including mobile health *(mHealth)* referral tracking systems, offer evidence-based solutions for improving communication and care coordination. Strengthening the implementation of *mHealth* referral tracking systems improves communication and coordination of care in referrals.[17] The implementation of standardized communication protocols and real-time patient tracking systems could address the current fragmentation in referral pathways, ensuring timely access to appropriate levels of care.

The care-seeking behavior is the result of complex sociocultural beliefs, traditional practices, and community attitudes that influence maternal healthcare utilization. Our findings reveal that despite successful transitions from traditional birth attendants to skilled midwives, significant barriers persist in emergency care acceptance and hospital preference patterns.

The stigma surrounding certain hospitals, where "many patients don't want to go to Margono Hospital because it's considered haunted," demonstrates how cultural perceptions can override medical logic in critical situations. This finding is consistent with qualitative study among rural women in West Java, which found that many still preferred traditional birth attendants due to issues of lack of trust and communication, delaying pregnant women's willingness to seek appropriate care.[18]

Similar cultures were studied showing sociocultural beliefs of taboo in giving birth by cesarean section because it would be seen as a sign of laziness.[13] However, our study also identified positive community dynamics, including the fatalistic acceptance of maternal deaths that reduces blame on healthcare workers and strong community mobilization during emergencies. These social assets provide foundation for culturally sensitive interventions that build on existing community strengths while addressing harmful traditional practices.

These findings have significant relevance for maternal health strategies in rural and resource-limited settings across Indonesia and similar contexts globally. The framework provides a comprehensive lens for understanding how individual competency, system capacity, coordination mechanisms, quality standards, and cultural factors interact to influence maternal outcomes.

The innovative local program *"DENMAS SLAMET"* and its community-based early detection approach demonstrate that locally adapted interventions can effectively address

multiple determinants simultaneously. This model could serve as a replicable framework for other regencies facing similar challenges, particularly in post-pandemic recovery contexts.

This study's scope, confined to a single regency with a relatively small purposive sample (n=45), limits broader generalizability, and the absence of direct patient and family perspectives restricts understanding of care experiences from the user viewpoint. The study duration was limited to six months, and potential bias may have been introduced due to the researcher's professional affiliation in the same region as participants.[19] Future research should employ mixed-methods designs with larger, multi-site samples and include beneficiaries' voices to validate and extend these findings across different Indonesian contexts.

The evidence supports immediate policy actions targeting all five determinants through integrated interventions. Healthcare workforce development should emphasize both quantitative planning and qualitative competency enhancement. Emergency preparedness programs must integrate training with infrastructure development to ensure sustainable capacity. Referral system strengthening should leverage digital health innovations while addressing transportation and insurance barriers.

Hospital standardization initiatives should prioritize functional quality over numerical expansion, supported by rigorous accreditation processes following the Hospital *PONEK* Standardization as outlined in KMK No. HK.01.07/ MENKES/1277/2024.[20] Community engagement strategies must be culturally sensitive, building on existing social assets while addressing harmful traditional practices through sustained education and trust-building initiatives.[10,17]

CONCLUSION

This qualitative study provides the first comprehensive examination of social determinants influencing maternal mortality trends in Banyumas Regency during the post-COVID-19 period. We identified five interconnected social determinants that significantly impact maternal mortality; adequacy and competency of healthcare human resources, continuity of emergency training for maternal and neonatal healthcare workers, accessibility of referral systems and inter-facility collaboration, consistent implementation of hospital *PONEK* accreditation standards, and sociocultural factors influencing care-seeking behavior.

The evidence supports immediate policy action targeting all identified determinants through integrated interventions. Healthcare workforce development must emphasize both quantitative planning and qualitative competency enhancement, with particular attention to post-pandemic recovery and geographic equity in staff distribution. Emergency preparedness programs should integrate continuous training with infrastructure development to ensure sustainable capacity, while referral system strengthening should leverage digital health innovations to address communication gaps and transportation barriers. Hospital standardization initiatives must prioritize functional quality over numerical expansion, supported by rigorous *PONEK* accreditation processes that ensure equitable access to comprehensive emergency obstetric care. Community engagement strategies should build on existing social assets such as strong community mobilization during emergencies and established trust in village midwives while addressing persistent barriers including hospital stigma and reluctance to accept emergency referrals to appropriate facilities.

The study's innovative approach to examining social determinants in the post-pandemic context provides a replicable framework for other regions facing similar challenges. The locally adapted "DENMAS SLAMET" program demonstrates that community-based early detection approaches can effectively address multiple determinants simultaneously, offering a model for scale-up across Indonesia and similar resource-limited settings globally.

Future research should employ mixed-methods designs with larger, multi-site samples and include patient and family perspectives to validate and extend these findings. Long-term evaluation of intervention effectiveness and cost-effectiveness analyses would strengthen the evidence base for sustainable maternal health improvements.

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