

Risk Factors Associated with Perinatal Mortality in West Java, Indonesia (Study in Karawang, Garut, Indramayu and Tasikmalaya City)

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Abstract

Perinatal mortality is the death of a baby born at 28 weeks of gestation until less than 7 days after birth. Perinatal mortality is used to attribute causes of infant death to obstetric events such as stillbirth and infant mortality in the first week of life. The purpose of this study was to describe the causes, periods, and risk factors that influence perinatal mortality. The design of this study is the *Sequential Explanatory Mixed Methods*, Research Quantitative designed with analytical methods conducted *cross-sectiona l*. Sampling was done by total sampling. 396 research sample data. The subjects in this study were parents, health workers who were involved and understood about the causes of perinatal death and the person in charge of recording and reporting perinatal deaths in health care facilities. 60.6% of the fatalities that occurred were preventable deaths. Perinatal deaths that often occur are still births and early neonatal. At 2-21% perinatal deaths, it is carried out by non-health workers. The risk factors that affect perinatal mortality are birth spacing ($p = 0.04$) and comorbidities ($p = 0.019$).

Keywords : Perinatal Mortality, Antenatal, Still Birth, Risk Factors

Introduction

Perinatal mortality is used as an indicator of health quality during the antenatal and intranatal period.¹ Perinatal mortality is the death of a baby born at 28 weeks of gestation until less than 7 days after birth.² Perinatal mortality is used to attribute causes of infant death to obstetric events such as stillbirth and infant mortality in the first week of life. Perinatal mortality is an important indicator of maternal care and maternal health and nutrition during pregnancy.³ The World Health Organization (WHO) states that 4.5 million

infant deaths occur each year and 75% of infant deaths occur in the first week of life (early neonatal), and 25% -45% occur within 24 hours after birth.⁴

According to the Indonesian Demographic and Health Survey (IDHS) in 2012 mortality perinatal in Indonesia amounted to 118 stillbirths and 268 deaths Neonatal al premature, thus generating the perinatal mortality rate in Indonesia was 26 deaths per 1000 birth. In West Java Province, the perinatal mortality rate is 24 per 1000 births.⁵ The number of perinatal deaths was 2,563 cases, in which the number of stillbirths was 1,055 cases while the number of early neonatal deaths was 1,508 cases.⁶

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Several studies state that most of the factors of preventable perinatal mortality include factors

of health personnel, patient factors, transportation / referral factors and administrative factors . Patient factors are more influenced by maternal conditions such as maternal characteristics including age, parity, pregnancy distance, comorbidities and infant factors such as congenital disorders that have been carried since pregnancy. The officer factor is more influenced by the competence of health workers. Administrative factors influenced more by the availability of blood , equipment and medicine in referral health care facilities, while the transportation factor / reference, mileage, travel time to a referral, funding, geographical and residential areas will be a resistance factor in the referral process. ⁷The aim of this study was to describe the causes, periods and risk factors that influence perinatal mortality.

Method

The design of this study used a *Sequential Explanatory Mixed Methods design* , where data collection and quantitative analysis were carried out in the first stage followed by data collection and qualitative data analysis in the second stage to strengthen the results of quantitative research. *Sequential Explanatory Mixed Methods* research is used to deepen or strengthen the meaning of the results of quantitative research. Quantitative research is designed with analytical methods carried out in *cross-sectional* .

Sampling was done by total sampling. 580 research sample data. Subjects in this study were elderly, health workers involved and understand the cause of perinatal mortality and responsible for recording and reporting perinatal death facility p elaya nan k poor living

conditions Health. The object of research in this study is the recapitulation data of perinatal mortality and the *Maternal Perinatal Audit (AMP)* document at the Health Office of Karawang, Garut, Indramayu Regency and Tasikmalaya City.

The target population of the quantitative study were perinatal mortality recapitulation data and AMP documents. The qualitative research target population was the elderly and health workers associated with perinatal mortality and who understood the causes of perinatal death and officers for recording and reporting perinatal deaths.

The population reached by quantitative research is all perinatal mortality recapitulation data and AMP documents at the West Java Health Office 2015 . The population reached by qualitative research is the elderly , related health workers who understand the causes of perinatal death as well as recording and reporting officers in health care facilities and the Health Office .

The research variables studied were perinatal mortality, perinatal death period, birth attendant, age, parity, birth spacing, comorbidities and antenatal care.

Results and Discussion

Based on table 1, it can be seen that from the majority of cases of perinatal mortality that occurred in Karawang , Garut, Indramayu, and Tasikmalaya districts, it can be prevented rather than perinatal deaths that cannot be prevented.

Table 1 Frequency Distribution of Causes of Perinatal Death

Perinatal Death	Karawang Regency		Garut Regency		Indramayu Regency		Tasikmalaya City	
	N	%	N	%	N	%	N	%
Cannot be Prevented	12	10.2	17	21.8	34	11.5	15	17.0
Can be prevented	106	89.8	61	78.2	262	88.5	73	83.0
Total	118	100	78	100	296	100	88	100

The cause of perinatal mortality are categorized there are two causes of death that can be prevented and that no cause of death could be prevented . Based on the review of OVP / RMP documents, it is concluded that most of the perinatal deaths that occur in West Java can be prevented. This result is in line with several studies which stated that approximately 97% of perinatal deaths could be prevented. ⁸⁻¹¹

Pregnancy complication contribute two thirds of maternal perinatal mortality. The main causes of stillbirths are pre-eclampsia, eclampsia and obstructed labor. Preterm birth is also an important risk factor associated with perinatal mortality. P ersalinan jammed with or without uterine rupture accounts for about a third of perinatal deaths. ¹²⁻¹⁴

Meanwhile, cases that cannot be prevented are caused by congenital abnormalities such as heart and blood disorders as well as mothers with comorbidities where early detection and treatment have been carried out early in pregnancy, but death still occurs. The WHO report states that there are three main causes of death in perinatal directly, namely complications of *premature* birth such as LBW, intrapartum conditions such as asphyxia and a small part is infection. ¹⁵ Several studies have suggested that most perinatal deaths are preventable. The factors that can be prevented consist of patient factors, health personnel factors, health facilities availability factors and referral factors. health worker factor is the biggest factor in reducing preventable perinatal mortality . ¹⁶

Table 2 Frequency Distribution of the Perinatal Mortality Period

Period of Death	Karawang Regency		Garut Regency		Indramayu Regency		Tasikmalaya City	
	N	%	N	%	N	%	N	%
Born Dead (Still Birth)	48	40.7	40	50.2	148	50	30	34.1
Early Neonatal	70	59.3	38	49.8	148	50	58	65.9
Total	118	100	78	100	296	100	88	100

According to the table 2 is seen that in Karawang and Tasikmalaya majority of perinatal mortality are in the early neonatal period were respectively 59.3% and 63.9% , while the District of arrowroot the majority are in the period of Still birth (50.2%). For Indramayu Regency, the distribution of respondents was the same between stillbirth and early neonatal periods.

The period of perinatal mortality is divided into two, namely stillbirth and early neonatal death. Most of the early neonatal deaths occurred in the first 24 hours,

which indicates that the fetus has been in a critical condition since it was still in the womb. This situation can be caused by prolonged labor and delivery assistance that is not clean and safe. ¹⁷⁻¹⁸

In some situations, lack of blood flow can result in stillbirths of the fetus. Infection the fetus can damage vital organs that result in death or anomaly that caused the death of *the fetus* / unborn child. Perinatal mortality due to early neonatal mortality occurs mostly within the first two hours of birth . This happens because most of

the neonates have suffered from asphyxia in the womb. Fetal asphyxia occurs due to obstructed /prolonged labor. Based on the report, WHO also mentions several causes

of stillbirth, including complications during childbirth, post-term pregnancy, maternal health problems such as hypertension, obesity and *diabetes mellitus* and congenital disorders . 2, 17-19

Table 3 Distribution of Frequency of Delivery Assistants in Perinatal Mortality

Childbirth Helper	Karawang Regency		Garut Regency		Indramayu Regency		Tasikmalaya City	
	N	%	N	%	N	%	N	%
Non- Health Personnel	3	2.54	17	21.8	15	5.1	4	4,6
Health workers	125	37.29	61	78.2	275	92.9	84	95.4
Helperless	0	60.17	0	0.0	6	2.0	0	0.0
Total	118	100	78	100	296	100	88	100

Table 3 shows that in the 4 Regencies / Cities in West Java there are still delivery assistance provided by non-health personnel, namely in Karawang Regency 2.54%, Garut Regency 21.8%, Indramayu Regency 5.1%, and Kota Tasikmalaya 4.6% .

Deliveries that have been assisted by health health workers that have been obtained are expected to be able

to reduce perinatal mortality, especially preventable perinatal mortality. Health workers/trained birth attendant is not enough just to be trained and recognized based on the applicable legislation in place, but the motivation, experience and an enabling environment did influence as well . 20-21 The problem that needs to be considered is that there are still some non-health workers who give birth. 22

Table 4: Relationship between Patient Risk Factors and Perinatal Mortality

Risk Factors	Perinatal Death				Total		P value *
	Cannot be Prevented		Can be prevented		n	%	
	N	%	n	%			
Age High risk No Risk	21 42	12.6 13.0	146 283	87,4 87.0	167 325	34.0 66.0	0.509
Parity It's risky No Risk	5 58	18.5 12.5	22 407	81.5 87.5	27 465	5,5 94.5	0.390
Birth Spacing It's risky No Risk No Data	6 39 26	85.7 11.1 19.6	1 313 107	14.3 88.9 80.4	7 352 133	1.4 71.5 27.1	0.040 *
Comorbidities With Comorbidities No Comorbidities	13 50	10.9 13.4	106 323	89.1 86.6	119 373	24.2 75.8	0.019 *
ANC Visit History <4 times ≥ 4 Times No Data	7 50 6	7,7 15.8 7,1	84 266 79	92.3 84.2 92.9	91 316 85	18.5 64.2 17.3	0.611

* Fisher Exact test is significant if the p value is ≤0.05

Table 4 shows that there is no relationship between age, parity, and history of ANC visits with preventable perinatal mortality in 4 districts / cities in West Java (p value > 0.05). Preventable perinatal deaths were more common in mothers with age and parity who were not at risk than age and parity of mothers was not at risk, while perinatal deaths in mothers that could be prevented were mostly in mothers who had a history of ANC ≥ 4 times. The significant risk factors were birth spacing and comorbidities (p value < 0.05).

The lack of public knowledge about health causes patients to be unaware of the disease or history of disease in their family. The community does not perform an examination, if there are no symptoms or signs of illness in them.

Diseases that accompany the mother during pregnancy have direct consequences for the fetus and the baby. Women who experience danger signs during pregnancy have a 2.5 times higher risk of experiencing difficulties during pregnancy and childbirth.²³⁻²⁴

Hypertension in pregnancy including preeclampsia is also reported to increase the risk of perinatal death because it increases the incidence of preterm birth, fetal growth disorders and respiratory problems in neonates.^{25, 26} In addition, fetal mortality was also five times greater in mothers with diabetes mellitus.²⁷

Anemia, hypertension in pregnancy, preeclampsia and diabetes mellitus that occur in pregnant women can be detected early during prenatal care. Based on the case in Indramayu where the disease is caused by consumption patterns, it is necessary to strengthen the provision of health information regarding foods with balanced nutrition for pregnant women. To prevent anemia, the government has a program of giving Fe tablets as much as 90 eggs during pregnancy. The administration of these tablets should be monitored by health workers so that the Fe tablets are really consumed, especially for mothers who have anemia. Mothers who are detected to have the aforementioned diseases should be closely monitored during pregnancy and childbirth.²⁶⁻²⁸

Perinatal mortality in this study occurred more frequently at low-risk births (first birth and ≥ 2 years). The results of a study in Ethiopia showed that birth spacing ≥ 2

years had a double risk of causing infant mortality with birth order ≥ 5 .²⁹ This suggests that perinatal mortality at a distance of ≥ 2 years can be influenced by parity that the mother has. In this study, low-risk birth spacing was dominated by first birth (primiparous), which is known to have a risk of having labor complications.

Some research results show that the best time limit for regulating birth spacing for mothers is 3 to 5 years after the birth of the last child. The risk of perinatal mortality was 2.2 times higher in live births with a birth interval of less than 2 years compared to births with an interval of 2 years or more.³⁰⁻³¹

By carrying out health promotion to mothers and the general public, it is hoped that it can increase public knowledge of their health. The increase in knowledge of health is expected to change people's attitudes so that they can access health services more optimally so that they can be more sensitive to their own health.

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Conclusion

Most of the cases of perinatal deaths that occurred in Karawang District, Garut Regency, Indramayu Regency, and Tasikmalaya City were preventable rather than non-preventable perinatal deaths. Perinatal deaths that occur include stillbirth and early neonatal. Personnel who assist in the delivery process are health workers, although there are still non-health workers. Risk factors that affect perinatal mortality include comorbidities and birth spacing.

References

1. Mpembeni R, Jonathan, Mughamba. Perinatal mortality and associated factors among deliveries in three municipal hospitals of Dar Es Salaam, Tanzania. *J Pediatr Neonatal Care*. 2014;1(4):1-7.
2. WHO. Maternal, newborn, child and adolescent health. Geneva: 2016.
3. WHO. Neonatal and perinatal mortality: country,

- regional and global estimates. Geneva: 2006.
4. WHO. Infant mortality: Situation and trends. In: WHO, editor. Geneva: WHO; 2016.
 5. BKKBN, BPS, Kemenkes. Survei Demografi dan Kesehatan Indonesia. Jakarta: BKKBN, BPS, KEMENKES; 2012.
 6. Dinkes Jawa Barat. Profil Kesehatan Jawa Barat 2014. In: Jabar D, editor. Bandung: Dinkes Jabar; 2015.
 7. Merali HS, Lipsitz S, Hevelone N, Gawande AA, Lashoher A, Agrawal P, et al. Audit-identified avoidable factors in maternal and perinatal deaths in low resource settings: a systematic review. *BMC Pregnancy and Childbirth*. 2014;1-12.
 8. The lancet. Ending preventable stillbirths. *The Lancet*. 2016:[8screens].
 9. Engmann C, Garces A, Jehan I, Ditekemena J, Phiri M, Mazariegos M, et al. Causes of Community stillbirths and early neonatal deaths in low-income countries using verbal autopsy: an international, multicenter study. *J Perinatol*. 2012;32(8):585–92.
 10. Jahja R. Perinatal mortality in Indonesia: an unfinished agenda. *Journal Health, Culture and Society*. 2011;1:1:147–65.
 11. Rahman FS, Martiana T. Pregnancy disorders in female workers at the industrial area of Sidoarjo, Indonesia. *Journal of Public Health Research*. 2020 Jul 3;9(2).
 12. Rahman FS, Martiana T. Analysis of factors related to maternal health in female workers in the industrial area of Sidoarjo, Indonesia. *Journal of Public Health in Africa*. 2019 Jan 2;10.
 13. Bangal BV, Shinde KK, Khanwelkar KG, Patil AN. A study of risk factors and perinatal outcome in preterm labour at tertiary care hospital. *International Journal of Biomedical Research*. 2012;3(3):147–50.
 14. Behal M, Vinayak R. Maternal risk factors for perinatal mortality. *Indian Journal of Obstetrics and Gynecology Research*. 2015;2(2):92–6.
 15. Merali HS, Lipsitz S, Hevelone N, Gawande AA, Lashoher A, Agrawal P, et al. Audit-identified avoidable factors in maternal and perinatal deaths in low resource settings: a systematic review. *BMC Pregnancy and Childbirth*. 2014:1-12.
 16. Lancet T. Ending preventable stillbirths. An executive summary for the lancet’s series. 2016.
 17. Engmann C, Garces A, Jehan I, Ditekemena J, Phiri M, Mazariegos M, et al. Causes of Community stillbirths and early neonatal deaths in low-income countries using verbal autopsy: an international, multicenter study. *J Perinatol*. 2012;32(8):585–92.
 18. Bayou G, Berhan Y. Perinatal mortality and associated risk factors: a case control study. *Ethiop J HealthSci*. 2012;22(3):153–62.
 19. Martiana T, Rochmah TN, Alayyannur PA, Rahman FS. Characteristics of the Maternal and Child Health Service of Female Workers with Maternal and Child Health Status in Indonesia. *Indian Journal of Public Health Research & Development*. 2019;10(5):1499-503.
 20. Adegoke A, Utz B, Msuya ES, Broek N. Skilled Birth Attendants: Who is Who? A Descriptive Study of Definitions and Roles from Nine Sub Saharan African Countries. *Plos one*. 2012;7:11[Screen].
 21. Yared M, Biruk T, Tedbage D, Adeba B. Neonatal mortality in Ethiopia: trends and determinants. *BMC Public Health*. 2013;13:483.
 22. Montagu D, Yamey G, Visconti A, Harding A, Yoong J. Where do poor women in developing countries give birth? A multi-country analysis of demographic and health survey data. *PloS one*. 2011 Feb 28;6(2):e17155.
 23. Fadlyana E. Pernikahan usia dini dan permasalahannya. *Sari Pediatri*. 2009;11(2):136–42.
 24. Eskes M, Waelput MJA, Erwich MHJJ, Brouwers AAH, Ravelli JCA, Wachterberg P, et al. Term perinatal mortality audit in the Netherlands 2010–2012: a population-based cohort study. *BMJ Open*. 2014;4:1–10.
 25. Ananth CV, Basso O. Impact of Pregnancy-Induced Hypertension on Stillbirth and Neonatal Mortality in First and Higher Order Births: A PopulationBased Study. *Epidemiology*. 2010;21(1):118–23.
 26. Mustafa R, Ahmed S, Gupta A, Venuto RC. A Comprehensive Review of Hypertension in Pregnancy. *Journal Of Pregnancy*. 2012;2012
 27. Mathiesen ER, Ringholm L, Damm P. Stillbirth in diabetic pregnancies. *Best Practice & Research Clinical Obstetrics and Gynaecology*. 2011;25:105–11.
 28. Martiana T, Rahman FS, Mahdang P, Rahmawati T, Jalaludin J. The Influence of Work Factors on Reproductive Health of Female Workers in Sidoarjo Industrial Area, Indonesia. *MJMHS*. 2019

29. Dube L, Taha M, Asefa H. Determinant of infant mortality in community of Gilgel Gibe Field Research Center Southwest Ethiopia: a matched case control study. *BMC Public Health*. 2013;13:401 [8screens].
30. Yared M, Biruk T, Tedbage D, Adeba B. Neonatal mortality in Ethiopia: trends and determinants. *BMC Public Health*. 2013;13:483.
31. Berhan Y, A B. Perinatal mortality trends in Ethiopia. *Ethiop J HealthSci*. 2014:29–