Journal of Community Engagement in Health
https://jceh.org/ https://doi.org/10.30994/jceh.v6i2.448
ISSN: 2620-3758 (print); 2620-3766 (online) Vol. 6 No 2. September 2023. Page. 231 - 240

Epidemiological Identification of Maternal Mortality Rates in Tuban Regency in 2021

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ABSTRACT
The maternal mortality rate is an important indicator in determining the level of public health. Identifying the maternal mortality rate will make it easier for regional governments and the Health Service to determine policies to reduce the mortality rate in the coming year and make it easier to plan programs and activities that focus on reducing the maternal mortality rate in an integrated manner. This epidemiological identification is useful for providing epidemiological information and advice for decision makers at the central and regional levels in order to identify, prioritize and plan programs to overcome public health problems and assess the success of existing health programs.

Keywords: Epidemiological, identification, maternal mortality rate

Received: June 8, 2023
Revised: July 11, 2023
Accepted: August 21, 2023

INTRODUCTION

Maternal death or maternal death according to the limits of *The Tenth Revision of International Classification of Diseases* (ICD-10) is the death of a woman that occurs during pregnancy or within 42 days after pregnancy, regardless of the length and location of the pregnancy, caused by anything related to the pregnancy, or aggravated by the pregnancy, or its treatment, but not death caused by accident or coincidence (WHO, 2018).
Pregnancy-related death is the death of a woman during pregnancy or 42 days after termination of pregnancy, regardless of the cause of death.
Late maternal death is Death of a woman due to direct or indirect causes more than 42 days, but less than a year after termination of pregnancy. *Source: WHO*, UNICEF, UNFPA and The World Bank.
According to WHO, around 830 women die from complications of pregnancy or childbirth worldwide every day. It is estimated that in 2015, around 303,000 women died during and after pregnancy and childbirth, of which the majority of deaths were preventable (WHO, 2018).
The high number of maternal deaths in some regions of the world reflects inequities in access to health services, and highlights the gap between rich and poor. Maternal deaths (99%) occur in developing countries. The maternal mortality ratio in developing countries in 2015 was 239 per 100,000 live births compared to 12 per 100,000 live births in developed countries. There are large differences between countries, but also within countries, and between women with high and low incomes and women living in rural versus urban areas (WHO, 2018).

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The highest risk of maternal death occurs in adolescent girls under 15 years of age and complications in pregnancy and childbirth are the main causes of death among adolescent girls in developing countries (WHO, 2018).

In the Southeast Asia region, it is estimated that there are 240,000 maternal deaths each year, resulting in a maternal mortality rate of 210 per 100,000 KH. This maternal mortality rate is a measure that reflects the obstetric risks faced by a woman every time she becomes pregnant. This risk increases as the number of pregnancies experienced increases (WHO in Fibriana, 2007).

Seeing the possibility of accelerating the reduction in maternal mortality, countries have now committed to new targets.

To reduce maternal mortality even further. One of the goals *Sustainable Development Goal (SDGs)* 3 is to reduce the maternal mortality ratio to less than 70 per 100,000 births (WHO, 2018).

The decline in MMR in Indonesia occurred from 1991 to 2007, namely from 390 to 228. The 2012 IDHS showed a significant increase in MMR, namely to 359 maternal deaths per 100,000 live births. MMR again showed a decline to 305 maternal deaths per 100,000 live births based on the results of the 2015 Inter-Census Population Survey (SUPAS) (Indonesian Health Profile, 2016).

Maternal mortality is a major health problem in Indonesia. Based on figures from national surveys up to 2012, the Maternal Mortality Rate (MMR) has not shown any improvement (GKIA, 2016).

This figure of 359 maternal deaths per 100,000 live births is equivalent to 17 thousand maternal deaths every year. The results of analysis and follow-up studies of the 2010 Population Census (SP) show that the largest proportion of maternal deaths occurred during childbirth and the first 48 hours afterward. Deaths that occur during pregnancy mostly occur when the mother's pregnancy is less than 20 weeks old (GKIA, 2016).

In Indonesia, 1 in 10 pregnancies occur in teenagers aged 15-19 years. Pregnancy among teenagers under 18 years of age has a negative impact on health. The risk of morbidity and death is 1.5 times higher compared to pregnancies at a more mature age (WHO. 2018 and GKIA, 2016).

The maternal mortality rate in East Java has increased in 2021. This is because there are restrictions on prenatal check-up visits so that high-risk pregnant women are less than optimal, there are several districts/cities where the number of births attended by shamans has increased compared to the previous year, many pregnant women should have given birth in referral health facilities, but have done so in primary health facilities because limited beds in hospitals, the Covid-19 pandemic so that other causes of maternal death contribute a lot to maternal death cases in 2021. East Java's death rate in 2021 is 234.7 per 100,000 live births, this is an increase in the MMR from 2020 98 .39 per 100,000 and in 2019 89.81 per 100,000.

The number of maternal deaths in Tuban Regency in 2021 reached 26 mothers from the target of <14 maternal deaths, compared to 2020, there has been an increase. Meanwhile, the maternal mortality rate in Tuban Regency reached 236 per 100,000 births. This figure has increased compared to 2020, namely 136 per 100,000 live births.

The direct causes of maternal death in Indonesia are dominated by postpartum hemorrhage, hypertension/eclampsia, and infection. The indirect cause of maternal death is that there are still many cases of 3 too late and 4 too (GKIA, 2016).

The pre-pregnant mother's condition can affect her pregnancy. Indirect causes of maternal death include anemia, chronic lack of energy (KEK) and being too young (too young/old, too often and too much) (Saifudin, 2009).

In 1992 McGarthy and Maine developed a conceptual framework for maternal mortality. There

are 3 components in the process of maternal death, the ones closest to death and morbidity are pregnancy, childbirth or its complications. The complete components of pregnancy, complications or death are influenced by 5 intermediate determinants, namely health status, reproductive status, access to health services, health behavior and other unknown factors. Intermediate determinants are influenced by distant determinants which are classified as socioeconomic and cultural components (Saifudin, 2010).

The government in Indonesia is planning a program to reduce MMR by improving basic and referral health service infrastructure, increasing the competency of health human resources in maternal health services, integrated ANC and PNC programs by all types of health workers at the Public health center and referral levels. By identifying the maternal mortality rate in Tuban Regency, it is hoped that family health program interventions will be more optimal and targeted and have appropriate facilities by optimizing human resources, infrastructure and budget resources that have been provided by both the central and regional governments.

METHOD

This identification was carried out descriptively on secondary data available in the 2021 Health Service.

RESULT

From the results of identifying the Maternal Mortality Rate in Tuban Regency in 2021, it can be seen in table 1 the distribution of maternal deaths in 33 Community Health Centers in Tuban Regency.

Table 1 Distribution of Maternal Mortality by Community Health Center in 2021

NO	PUBLIC HEALTH CENTER	THE NUMBER OF MATERNAL DEATHS IN 2021 BASED ON THE DISTRIBUTION OF HEALTH CENTERS	%
1	Sleepiness	3	8,3
2	Bangilan	1	2,8
3	Senori	1	2,8
4	Stopover	2	5,6
5	Cut out	0	0,0
6	Jetak	1	2,8
7	Parangan	3	8,3
8	Poncho	1	2,8
9	Market	0	0,0
10	Prambon Tergayang	0	0,0
11	Rengel	0	0,0
12	The East Manager	0	0,0

13	Graban	0	0,0
14	Plumpang	1	2,8
15	Klotok	3	8,3
16	the field	0	0,0
17	Compreh	0	0,0
18	Palang	6	16,7
19	Sumurgung	1	2,8
20	Semanding	2	5,6
21	Wire	1	2,8
22	Tuban	1	2,8
23	Good luck	0	0,0
24	Yen	2	5,6
25	Merakurak	2	5,6
26	Kick off	0	0,0
27	Wheel	0	0,0
28	Salary	1	2,8
29	Tambakboyo	2	5,6
30	Jatirogo	0	0,0
31	Kebonharjo	2	5,6
32	Hair	0	0,0
33	Banking	0	0,0
	TOTAL	36	100,0

Source of data for 2021 Health Department Profile

From the table above, it was found that the most deaths occurred at the Palang Community Health Center, as many as 6 mothers (16.7%) out of a total of 36 deaths that occurred.
Maternal deaths are divided into direct and indirect deaths. Immediate maternal death is as a result of complications pregnancy, childbirth, or the postpartum period, and any intervention or inappropriate treatment of these complications. Indirect maternal death is a result of existing diseases or diseases that arise during pregnancy that affect pregnancy, for example malaria, anemia, HIV/AIDS and cardiovascular disease (Saifudin, 2010).
The causes of direct maternal death in Indonesia are dominated by postpartum hemorrhage, hypertension/eclampsia, and infection. The indirect cause of maternal death is that there are still many cases of 3 too late and 4 too (GKIA, 2016).
Case 3 is late, includes:

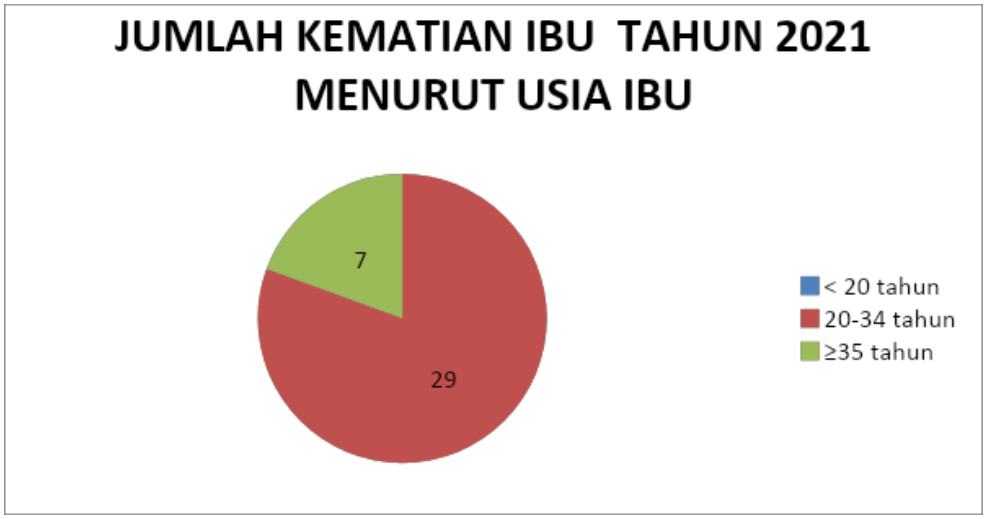
1. Too late to recognize mark danger labor and make decision.
2. Late referral to a health facility.
3. Late treatment by health workers at health service facilities.

The distribution of maternal deaths according to age is as follows:
Table 2 Distribution of Maternal Mortality by Age in 2021

NO	MOTHER'S AGE	NUMBER OF MATERNAL DEATHS IN 2021 BY MOTHER'S AGE	%
1	< 20 years	0	0,0
2	20-34 years old	29	80,6
3	≥35 years	7	19,4

Source of data for 2021 Health Department Profile

Graph 1 Distribution of Maternal Mortality by Age in 2021



Source of data for 2021 Health Department Profile

Based on table 2 and graph 1, it can be concluded that the most deaths were at the age of 20-34 years as many as 29 mothers (80.6%), 7 mothers (19.4%) died at the age of > 35 years and o% at the age of 20 years.
Case 4 too, covering:

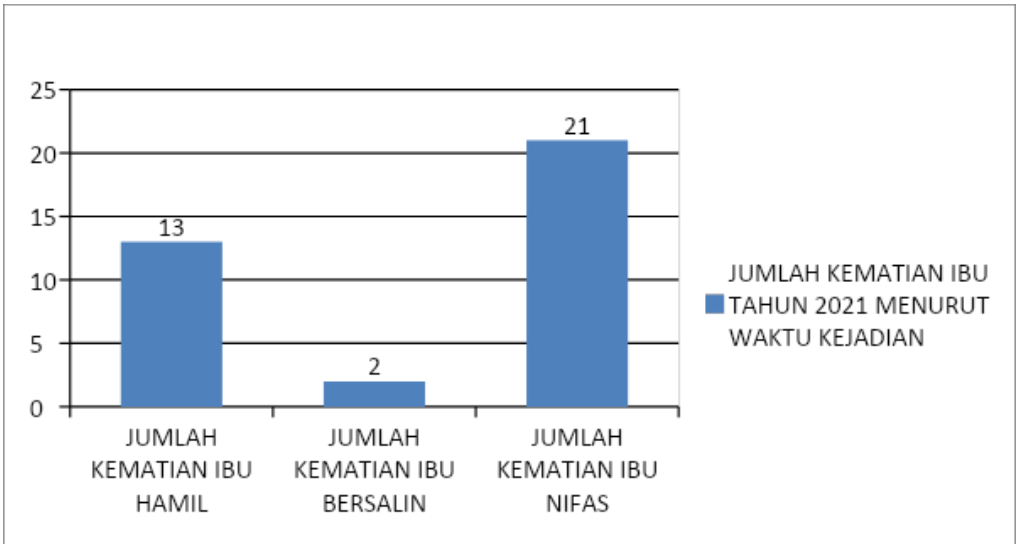
1. Too old to be pregnant (over 35 years of age)
2. Getting pregnant too young (under 20 years of age)
3. Too many (more than 4 children)
4. Too close a gap between births (less than 2 years)

Table 3 Distribution of Maternal Deaths by Time of Event in 2021

No	TIME OF EVENT	NUMBER OF MATERNAL DEATHS IN 2021 BY TIME OF INCIDENT	%
1	NUMBER OF DEATHS OF PREGNANT WOMEN	13	36,1
2	TOTAL MOTHER DEATHS	2	5,6
3	NUMBER OF DEATHS OF PUBLIC MOTHERS	21	58,3
	TOTAL	36	100,0

Source of data for 2021 Health Department Profile

Graph 3 Distribution of Maternal Deaths by Time of Event in 2021



Source of data for 2021 Health Department Profile

Table 4 Distribution of Maternal Mortality by Cause of Death in 2021

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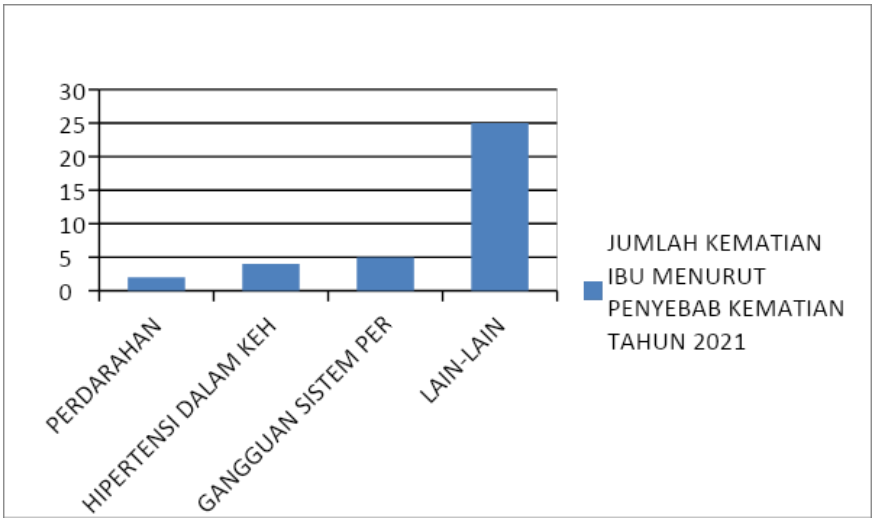
CAUSES OF MOTHER DEATH IN 2021	NUMBER OF MATERNAL DEATHS BY CAUSE OF DEATH IN 2021	%
BLEEDING	**2**	5,6
HYPERTENSION IN PREGNANCY	**4**	11,1
BLOOD CIRCULATION SYSTEM DISORDERS *	**5**	13,9
OTHER	**25**	69,4
TOTAL	36	**100,0**

Source of data for 2021 Health Department Profile

Graph 4 Distribution of Maternal Mortality by Cause of Death in 2021



According to McCarthy and Maine (1992) maternal mortality is influenced by 3 determinants, namely close determinants, intermediate determinants and distant determinants. Near determinants are the causes of maternal death, namely pregnancy itself and obstetric disorders in the form of bleeding, infection, eclampsia/preeclampsia, and others. Near determinants are directly influenced by intermediate determinants, namely health status, reproductive status, access to health services, and health service use behavior. Distant determinants are determinants that are related to demographic and sociocultural factors, namely the status of women in the family and society, the status of the family in society, and the status of society.

1. Near Determinants

Near determinants are the processes that are closest to the occurrence of maternal death, which include the pregnancy itself and complications during pregnancy, childbirth and the postpartum period. Each pregnant woman has a different risk of complications, divided into low risk pregnant women and high risk pregnant women. Complications that can occur include:

a. Bleeding

Bleeding that can cause maternal death includes bleeding due to abortion, disturbed ectopic bleeding, antepartum bleeding, and postpartum bleeding.

Bleeding due to abortion can be caused by incomplete abortion or injury to the pelvic organs or intestines. Abortion itself is the ending of a pregnancy (due to certain consequences) at or before the pregnancy is 22 weeks old or the fruit of the pregnancy is not yet able to survive outside the womb (Saifudin et al, 2009).

Ectopic pregnancy is a pregnancy where after fertilization, implantation occurs outside the endometrium of the uterine cavity. An ectopic pregnancy can result in abortion or rupture if The pregnancy progresses beyond the capacity of the implantation space and this event is referred to as a disrupted ectopic pregnancy (Saifudin, 2009). An ectopic pregnancy that is complicated or ruptures in the tube where the pregnancy is located will give typical symptoms and signs, namely sudden abdominal pain which is then followed by shock or fainting.

Antepartum bleeding is vaginal bleeding in pregnancies over 28 weeks or more. Antepartum bleeding occurs at a gestational age of more than 28 weeks, so it is often called or classified as bleeding in the third trimester. Antepartum bleeding is generally caused by placental implantation abnormalities (low lying and previa), and placental separation before the baby is born. Factors that increase the incidence of placenta previa are the patient's young age or over

35 years, high patient parity and defective endometrium (Manuaba, 2010).
Postpartum hemorrhage is the loss of 500 ml or more of blood from the reproductive organs after the completion of the third stage of labor (after the placenta is delivered). Postpartum hemorrhage is divided into two, namely, primary postpartum hemorrhage, namely postpartum hemorrhage that occurs within the first 24 hours of birth, the main causes of which are uterine atony, placental retention, birth canal tear and uterine inversion. Secondary postpartum hemorrhage is postpartum bleeding that occurs after the first 24 hours of birth. The main cause of secondary postpartum hemorrhage is infection, poor contraction of the uterus or retained placental remains (Astuti et al, 2015).

b. Infection

Infection is the invasion of tissue by pathogenic microorganisms, causing illness due to the virulence and number of pathogenic microorganisms. Infection can occur during pregnancy, during labor (inpartum) and the postpartum period. Infection in pregnancy is an infection of the birth canal during pregnancy, both young and old pregnancies. This infection situation is dangerous because it can result in sepsis, which may cause maternal death (Leveno et al. 2013).
Postpartum infection is a bacterial infection that originates from the reproductive tract during childbirth. The biggest cause of postpartum infections is birth attendants who carry germs into the mother's womb by carrying germs that are already in the vagina upwards (Astuti et al, 2015).

c. Pre-eclampsia and eclampsia

Which is accompanied by proteinuria (protein in the urine) or edema (fluid accumulation) that occurs at 20 weeks of pregnancy until the end of the first week after delivery. Severe pre-eclampsia progresses to eclampsia with additional symptoms of seizures and/or coma (Astuti et al, 2015 and Manuaba, 2010).
Pregnancy can cause hypertension in women who had normal blood pressure before pregnancy (normotension) or can exacerbate pre-existing hypertension. Hypertension in pregnancy, also known as pre-eclampsia, and if this hypertension is accompanied by seizures, it is known as eclampsia, is one of the highest causes of death in Indonesia. Pre-eclampsia and eclampsia can also occur during the postpartum period (Astuti et al, 2015).
Hypertension is diagnosed if blood pressure reaches 140/90 mmHg or more. Edema is no longer used as a diagnostic criterion because it also occurs in many normal pregnant women. Previously, it was recommended that the parameter of increasing systolic blood pressure of 30 mmHg or diastolic 15 mmHg be used as a diagnostic, even though the absolute value was still below 140/90 mmHg. This criterion is no longer recommended because evidence shows that women in this group are less likely to experience adverse pregnancy outcomes. However, women who experience an increase in systolic blood pressure of 30 mmHg or diastolic blood pressure of 15 mmHg need to be closely monitored (Leveno et al, 2013).
Pre-eclampsia and eclampsia are causes of high maternal and perinatal mortality, especially in developing countries. Deaths from eclampsia increased more sharply than in
degree of severe pre-eclampsia. The incidence of pre-eclampsia and eclampsia varies in each country and even in each region. Several influencing factors were found, including the number of primigravida, especially young primigravida, excessive pregnancy distension, diseases accompanying pregnancy and the number of mothers aged more than 35 years (Manuaba, 2010

CONCLUSION

In identifying the maternal mortality rate in Tuban Regency, it was found that there would be an increase in deaths in 2021 reaching 236 per 100,000 live births (36 mothers) with the highest causes of death respectively being other cases in the number of 25 mothers, circulatory system disorders in 5 mothers, hypertension in pregnancy. 4 mothers and 2 mothers bleeding.

The suggestions from this research are:
The importance of collaboration and coordination across programs, across agencies, community leaders, religious leaders and health cadres to jointly commit to reducing maternal mortality rates in stages and providing fast and appropriate services to mothers

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