

## AN INSIGHT INTO MATERNAL DEATH CAUSED BY POSTPARTUM HEMORRHAGE IN WESTERN TIMOR, INDONESIA

Kristiani Desimina Tauho\*, Ferry Fredy Karwur

Faculty of Health Sciences Universitas Kristen Satya Wacana, Salatiga 50711, Indonesia

\*E-mail: kristina.tauho@staff.uksw.edu

---

### Abstract

Maternal deaths in Timor Island, East Nusa Tenggara Province, are one of the contributors to the overall maternal mortality rate (MMR) of Indonesia. The MMR of Western Timor Island was 150/100,000 live births in 2015. The aim of this qualitative study was to explore the perceived causes of maternal death due to postpartum hemorrhage. Data were obtained from family members, traditional birth attendants, and Posyandu cadres, as well as health providers. Using the retrospective method, this study traced six out of nine postpartum hemorrhage cases in the four sub-districts with the highest maternal death rate in 2010. The research findings showed that most childbirth processes were done at home without any help from health workers. Postpartum hemorrhage happened among women ranging from 24-42 years old; five among them had been pregnant more than four times. Medically, five cases were caused by a prolonged third stage of labor due to a retained placenta. Non-medical factors causing postpartum hemorrhage were poor accessibility, lack of communication devices, and lack of infrastructure.

**Keywords:** maternal death, postpartum hemorrhage, Western Timor

### Abstrak

*Pengetahuan Tentang Kematian Maternal Karena Perdarahan Postpartum di Timor Barat, Indonesia. Kematian maternal di Pulau Timor, Provinsi Nusa Tenggara Timur, merupakan salah satu penyumbang Angka Kematian Ibu (AKI) di Indonesia. Tahun 2015, AKI di Pulau Timor bagian barat adalah sebesar 150/100.000 kelahiran hidup. Tujuan dari studi kualitatif ini adalah untuk mengeksplorasi persepsi para pihak yang paling mengetahui mengenai penyebab kematian maternal karena perdarahan postpartum. Data diberikan oleh anggota keluarga, dukun bersalin, dan kader Posyandu, serta penyedia layanan. Menggunakan metode retrospektif, penelitian ini menyusur enam dari sembilan kasus perdarahan postpartum yang terjadi di empat kecamatan yang memiliki angka kematian maternal tertinggi pada tahun 2010. Hasil penelitian menunjukkan bahwa sebagian besar prosedur persalinan dilakukan di rumah tanpa bantuan dari tenaga kesehatan. Perdarahan postpartum terjadi di antara wanita dengan rentang umur 24–42 tahun; empat di antara mereka sudah pernah hamil sebanyak lebih dari empat kali. Secara medis, lima kasus disebabkan oleh perpanjangan kala tiga persalinan berhubungan dengan retensi plasenta. Faktor-faktor non medis yang menyebabkan perdarahan postpartum adalah aksesibilitas yang buruk, ketiadaan piranti komunikasi, dan kurangnya infrastruktur.*

**Kata kunci:** kematian ibu, perdarahan postpartum, Timor Barat

---

### Introduction

Maternal death has always been a serious global problem. Between 1990 and 2015, there were 13.6 million women who died of obstetric causes. Most of those deaths happened in developing countries (WHO, 2015a). In Indonesia, for the last 25 years, the maternal death rate has decreased from 446/100,000

live births in 1990 to 126/100,000 live births in 2015 (MMEIG, 2015). However, Indonesia is in the fifth rank of maternal death in ASEAN countries, mainly caused by complications during pregnancy, and mostly during the birthing period (WHO, 2015b). One of the main causes is hemorrhage, either antepartum or postpartum (Kassebaum et al., 2014; Say et al., 2014). A number of research studies have shown that

in the regions with a high number of maternal deaths, the variability of local factors is very decisively linked to maternal death caused by obstetric hemorrhages, such as chronic illness before pregnancy, malaria infection or HIV/AIDS, and severe anemia during pregnancy (Combs et al., 2012). Regional factors (Calvert et al., 2012) and ethnic background are also influential (Harvey, et al., 2017).

East Nusa Tenggara Province is one area in Indonesia with a very high rate of maternal death. MMR in this province is 169/100,000 live births. In Western Timor, the MMR is 150/100,000 live births (Dinkes NTT, 2015). This number is higher than the national rate, which is 126/100,000 live births (WHO, 2015b). The main cause of maternal death in this province is obstetric hemorrhage (Dinkes NTT, 2013).

Various efforts have been made by the government to reduce maternal death in East Nusa Tenggara, such as the *Safe Motherhood Program*, which has been going for about 26 years (AbouZahr, 2003), the National Declaration of Millennium Development Goals (Lundine, Hadikusumah, & Sudrajat, 2013), and the implementation of *Revolusi KIA* (Mother-Child's Health Revolution). KIA Revolution was regulated in the Governor's Regulation no. 42 in 2009. The regulation states that it is recommended that every woman gives birth in an adequate health facility (Dinkes NTT, 2009) and that the role of women in mothers' health should be institutionalized through the *Posyandu* organization. However, the maternal mortality level remains high. Therefore, the significant question is to determine the local factors that have caused a high level of maternal death by hemorrhage in East Nusa Tenggara, especially in Timor.

This research was conducted in South Central Timor District (Kabupaten Timor Tengah Selatan or TTS), East Nusa Tenggara. With a population of 459,310 people, its MMR is

327.1/100,000 live births (Dinkes Kab. TTS, 2016).

In 2010, the District Health Center identified six clinical categories of maternal death, which are hemorrhage, infection, eclampsia, abortion, complication, and other causes. However, most deaths are due to hemorrhage. Out of 46 maternal deaths, 36 (or 78.2%) were caused by hemorrhage. It is therefore important to see what and how local factors in West Timor influence this. The research examined six cases of maternal death caused by hemorrhage.

## Method

This qualitative research was conducted in four sub-districts in TTS: Fatumnasi, Amanuban Timur, Amanatun Selatan, and Oenino to explore the perceived causes of maternal death due to postpartum hemorrhage. The other causes during pregnancy, such as maternal nutrition and prior illnesses, were not examined. Permission to conduct research was provided by the TTS District Government (Kesbangpolinmas 18 02/464/VII/ TTS/, 2011). Gathering of data was permitted in the Health Community Center (*Puskesmas*) as the working area, which includes Fatumnasi, Oe Ekam, and Oinlasi dan Oenino. The research participants signed an informed consent form before data gathering began.

Selecting the cases was done purposively based on the reports of the District Health Service Office about the number of maternal deaths a year ago. The total cases were 46; 36 of these were caused by hemorrhage among 32 sub-districts. There were four sub-districts with the highest maternal death, in which nine cases were due to hemorrhage; six of those cases were selected.

Data gathering was done from July to August 2011 through an in-depth interview with the closest family member/s who had accompanied the woman before her death, the traditional

birth attendant (TBA), the *Posyandu* cadre, the doctor, and the midwife, with a total of 15 participants. The participants in each case were different based on the data saturation. Only one health worker was interviewed in each sub-district. The secondary data were taken from the woman's medical record in the *Puskesmas*. Most of the data are concerned with the mother's biodata, the reason for death, and the mother's health history.

Data analysis using the qualitative-verification strategy was applied by inductively analyzing the data. Content analysis was done based on verbatim in-depth interviews. Firstly, the data were coded and classified into categories. Units of meaning and identified category were analyzed and were determined to establish relationships and to find out the meaning and purpose of the communication's content. The result of the analyses was then described.

## Results

### **Mrs. MS's case (34 years old, Fatumnasi).**

Mrs. MS lived with her husband, a builder, in the capital city of the province during her pregnancy and never did antenatal care in *Puskesmas*. When she was about to deliver, she and her husband came to Fatumnasi so that her parents could help her during and after the delivery process. This time was her sixth childbirth.

In the middle of June 2010, around 7 am, there was a discharge from her vagina, as narrated by Mrs. MS's mother during the interview. According to her mother, Mrs. MS gave birth on a bed inside their traditional circle house by lying down and being assisted by her parents. The hemorrhage started right after the baby was born and when she tried to deliver the placenta.

The delivery process was estimated to occur at 8 am (according to the later testimony of Traditional Birth Attendant or TBA), but the placenta failed to deliver within 30 minutes of

the baby's birth. For one and a half hours (from 9.30 am to 11 am), Mrs. MS had kept pushing to deliver the placenta while the family members were unable to help. At 11 am, the TBA, who is the closest neighbor, and also the TBA in that area, came to visit because she heard the baby's crying. The TBA narrated that when she arrived, Mrs. MS's condition was no longer good (she made a comparison with another childbirth she helped before). She ran to the *Puskesmas*, which is about one kilometer away, and called the doctor.

At around 12 noon, the doctor and nurses arrived in an ambulance. They tried to install an intravenous (IV) catheter, but the doctor assessed that Mrs. MS's venous vessels were not palpable; all of the vessels collapsed and the blood pressure also could not be measured. The doctor then decided to bring her to the *Puskesmas*. The baby was put on her stomach, and they lifted her into the ambulance. According to the doctor, their clothes were full of blood at the time. The doctor estimated that "the blood volume reached two to three liters."

At 12.30 pm, Mrs. MS arrived at the *Puskesmas* and was attended to by the health workers. The doctor explained that the uterus contracted abnormally when they performed the physical assessment. The placenta should have been expelled within a few minutes, but the placental membrane was no longer intact. It was possible that there were efforts to pull out the placenta by the person who helped her. The midwife then cut the umbilical cord and observed her condition. The bleeding continued after the delivery of the placenta until she died at around 1 pm. No fluid resuscitation or blood transfusion was given because the blood vessels were collapsed.

### **Mrs. AT's case (42 years old, Amanatun Selatan).**

Mrs. AT lived in Fenun Village, about 10 kilometers from the sub-district *Puskesmas*. She had been pregnant seven times and had an abortion once. According to the *Posyandu* cadre, Mrs. AT frequently had check-

ups for her pregnancy, but for all of the previous childbirths, her aunt, who is a TBA, had assisted her.

The signs of labor began at around 6 pm in the first week of February 2010. The family described that she looked anxious and had discharge from the vagina. Then she went to the traditional circle house to sleep while the family called the TBA.

According to her father, Mrs. AT was giving birth in a squat position, leaning on a big stone, at around 7 pm. The TBA narrated that she did not give her any herbal medicine. In the Dawan language, “*ka fenu fua’es*” means “*no one candlenut*.” This term is used to explain that no traditional medicine was used to help the labor process. The placenta was delivered around 20 minutes after she gave birth.

According to her father, the bleeding began right after the labor process. The baby and the placenta were delivered easily, but there was continuous bleeding until 4 am. She was delirious because she was feeling weak, she shouted to the family to get her baby out so that the baby would not kick her. The TBA said that after the delivery process, she compressed Mrs. AT’s body using hot water about two to three times and “roasted” her using a bucket that was placed under the bed. “Roasting” the mother is believed to accelerate maternal recovery. The baby died before 4 am. The father of the mother said, “the baby just died [for] no reason.”

At 5 am, Mrs. AT said that she felt weak and saw spots. She was complaining about the smell of blood that came into the fire and made a bad smell. Her father then asked their neighbor to call the midwife, who lives in the sub-district center. At around 6 am the midwife, and the head of the village visited her, but she had already died around 12 hours after delivery.

The road from Fenun Village to the *Puskesmas* was rocky and not asphalted; a big river had to

be crossed without any bridge. It was the rainy season, and the river cannot be crossed due to the rising level of the water. Moreover, according to the participants, the alternate way was to go through the forest, which is prone to robbery cases, and motorbike is the only method of public transport available, but it needs to be booked in advance.

**Mrs. MT’s case (35 years old, Amanatun Selatan).** Mrs. MT also lived in Fenun Village. She had five children before this pregnancy. According to her family, she often had check-ups for her pregnancy in the *Puskesmas*.

At around 10 pm in the third week of October 2010, she told her husband that her stomach was painful. At around 11 pm, she informed her husband that she was about to deliver, so he went to the TBA’s house, which was about 100 meters away, to seek help from her. When he left, Mrs. MT gave birth by herself by squatting on the ground. Around 15 minutes later, the TBA and her husband came and put her on a mat. The TBA massaged her stomach, but the placenta was unable to be expelled. There was much heavier bleeding compared to her previous deliveries.

The TBA then looked for some leaves to make herbal medicine, which is believed to expel the placenta. The potion was given to her to drink while the pulp was smeared on her stomach. Led by the TBA, Mrs. MT continued to push. At around 1 am, Mrs. MT was struggling and kicking for a while, and the placenta finally came out. However, she passed away.

Her husband said that he could not take his wife to the *Puskesmas* because she gave birth at night time. No transport facility that could take them to the *Puskesmas* or help them to call the *Puskesmas*. He felt shy and uncomfortable to wake up the motorcycle driver in the middle of the night.

**Mrs. YA’s case (24 years old, Amanuban Timur).** Mrs. YA was a member of Mauleum

Village. It was her first pregnancy. She and her husband (who is also 24 years old) stayed together with her mother-in-law because they did not have their own house yet. The distance from their house to the *Puskesmas* is about three kilometers.

On the 23<sup>rd</sup> of July 2010, she complained that her stomach was painful, so her husband and family brought her to the *Puskesmas*. After being cared for two days, she was allowed to go home because it was declared to be false contractions. It was suggested that she should come back to the *Puskesmas* if she got clear signs of labor.

Two weeks after, around 9 pm, Mrs. YA said her back was very painful. At 10 pm, she felt like she wanted to urinate. Her husband escorted her to the side of their kitchen under a tamarind tree. While she was urinating, the baby was delivered. She said that she was thirsty, so her mother-in-law gave her a glass of water; she only drank a gulp. According to her mother-in-law, the blood she stepped in splattered and flowed on the ground, which indicated how heavy the bleeding was.

At around 10.15 pm, the sister-in-law, who lived opposite them, came to help because she heard the baby crying. She put a big stone on Mrs. YA's back and held her. The husband went to call the midwife in the *Puskesmas*, about three kilometers away. At 11 pm, Mrs. YA died. The midwife arrived around 15 minutes after she had died, then cut the umbilical cord and handed the baby to Mrs. YA's sister-in-law.

**Mrs. RI's case (31 years old, Amanuban Timur).** Mrs. RI came from West Java and was married to a Timorese. She had regular check-ups for her pregnancy in an auxiliary health care facility (*Pustu*) because it was near to her house (about 100 meters). Before this pregnancy, she had been pregnant and had delivered four times.

The death of Mrs. RI happened in the first week of August 2010. At 10 am, she told her husband that she had signs of labor, which was the discharge of mucus mixed with blood from her vagina. Her husband then called a midwife from the *Pustu*, but the midwife could not come to visit directly because she still had some patients to care for Mrs. RI's husband then called the TBA, who stayed about 200 meters away from their house.

At 11 am, the midwife arrived at Mrs. RI's house. She checked the maternal and fetal conditions, including blood pressure, which was 140/90 mmHg. The husband narrated that at 11 am, Mrs. RI, assisted by the midwife, delivered a baby boy. After the delivery, she fell unconscious, and her face turned pale. The husband then helped the midwife remove the mother's feces and put it into the toilet. Returning from the toilet, the husband saw the midwife giving his baby to his sister-in-law; he said he was very disappointed because he had not whispered the 'adzan' call into his baby's ear since they are a Muslim family.

By 12 noon, Mrs. RI had not delivered the placenta, and bleeding began. According to the midwife, bleeding was due to the prolonged release of the placenta. The midwife sought for an IV in the *Pustu*. The husband said that the mother rebelled despite being hugged by her husband and neighbors until the clamp released the baby's umbilical cord. About 15 minutes later, the midwife returned and tried to install an IV catheter, but the existing intravenous catheter was not able to be used because the only size available was number 18, which was larger than the blood vessels.

At around 1 pm, the midwife called a doctor, who at that time was in another village, to come and help while she monitored the mother's blood pressure, which was 100/80 mmHg. While the midwife helped the mother, the husband went to seek help from the prayer team (a group of people who can help them in prayer).

According to the midwife, the husband was not beside the mother while she was dying. The husband only took a glance from afar and then disappeared again.

The husband then went to pick up the doctor and nurse who were on their way to his house at around 3 pm. The mother was dying when the doctor and nurses arrived. The midwife checked the maternal blood pressure, with a result of 60 mmHg, by palpation. Moments later, the mother died before being taken to the *Puskesmas*.

**Mrs. OS's case (30 years old, Oenino).** Mrs. OS lived in Pene Utara Village, about 11 kilometers from the district center. Previously, she had given birth to two sons and a daughter. This time was her fourth pregnancy. She always availed herself of a prenatal checkup at Oenino *Puskesmas*, which is about three kilometers from her house.

Mrs. OS noticed birth signs in the second week of January 2011, at around 6 pm, but the family could not take her to the *Puskesmas* because there were no public transport facilities. At around 11 pm, the mother, who was assisted by only her husband, delivered her fourth baby. Her husband narrated that Mrs. OS had heavier bleeding than with her previous deliveries.

While she was trying to deliver the placenta, the husband called the community health cadre to ask for the midwife's telephone number. He then called the midwife to ask for help, but the midwife was on the other side of the river, which was flooded due to the heavy rain. So the midwife had to travel through the capital of the sub-district, which is about seven kilometers away from Mrs. OS's house.

According to the husband, the midwife had estimated that the birth would happen in the morning, so he had planned to take his wife to the health center the next day. At around 3 am, Mrs. OS passed away. Until her death, the placenta could not be removed from the mother's

womb. The husband and the family accompanied the mother and accepted the difficult situation they faced. After Mrs. OS died, the midwife cut the baby's umbilical cord and handed it to the family.

## Discussion

From these six cases of maternal death from postpartum hemorrhage in the TTS District, it can be observed that the deaths were related to the following factors: the inherent factors of the mother and the processes that occurred at each stage of labor, physical barriers of the region, and lack of infrastructure and access to health services.

**Characteristics of the Mothers.** Five of the six mothers who experienced maternal deaths were in the non-risk age group, which is below 35 years old. However, based on the parity status, three of them had high-risk status because they had given birth more than four times previously. This result proves that post-partum hemorrhage cannot be predicted from age or the number of labor experiences (see Table 1).

**Characteristics of the Region.** All mothers who experienced maternal death lived in an area where it is difficult to access an adequate health facility. The furthest distance from home to the *Puskesmas* is 10 kilometers, but in the case of Mrs. MS, she was late in getting medical help even though the distance is only 1 kilometer. Other things that affected access were the rocky road conditions and the lack of transport facilities. All of these cases occurred at night time, which made it difficult for the family to find transport, coupled with the lack of communication devices. In the case of Mrs. MS, AT, and OS, they had to pass through the forest and cross the river without any bridges. In this area, the family had to walk or use a motorcycle to contact the village midwife, who would visit the mother and then ask the ambulance to pick her up and take her to the hospital, hence it might have been too late in getting

Table 1. Characteristic of Mothers and Region

Mother's Characteristic			Region's Characteristics		
Case of Mrs.	Age	Parity	Distance (in kilometers)		Road Conditions
			Sub district to District	House to Puskesmas	
MS	34	P6A0	32	±1	Rocky, non-asphalted, no transportation
AT	42	P7A1	49	±10	Rocky, non-asphalted, there are some motorbikes but the labor happened in the night time and the road is prone of robbery
MT	35	P6A0	49	±10	Rocky, non-asphalted, there are some motorbikes but the husband felt shy to ask the driver at midnight
YA	24	P2A0	57	±3	A half is asphalted, there are some motorbikes
RI	31	P5A0	57	±3	Rocky, non-asphalted, there are some motorbikes
OS	30	P4A0	42	±3	Rocky, non-asphalted, no public transportation, there is a river without any bridges which was flooded

Table 2. The Chronology of Labor and Family's Responses

Mother's Initial	Stage				Mother's Condition	Family's Responses
	I	II	III	IV		
MS	7am	8am	12.30pm	1pm†	Continuing pushing	Accompanying mother
AT	6pm	7pm	9.20pm	5.30am†	Seeing spots, feeling weak	Compressing mother using hot water 2 to 3 times
MT	10pm	11pm	12am†	-	Continuing pushing assisted by TBA	Calling TBA
YA	9pm	10.15pm	11pm†	-	Tired	Calling midwife
RI	10am	11.26am	3pm†	-	Looking pale, unconscious, rebel	Seeking for prayer support
OS	6pm	11pm	3am†	-	Continuing pushing	Calling midwife

† Mother died

help for the mother (Belton, Myers, & Ngana, 2014; Myers et al., 2015) (see Table 1).

**Stage I of Labor.** Stage I started when the mother began to experience signs of labor until a full opening of 10cm. At this stage, the mother informed the family about the signs of labor, such as the discharge of amniotic fluid, mucus, blood, and also contractions that caused pain in the stomach and the back. The families' responses varied. There were three cases in which the family did not seek help because they were not able to find the transport to pick up the midwife or to take the mother to the midwife. Meanwhile the family of the other two mothers did not seek help at all because, according to them, this labor was not the same as with the previous deliveries; it was not the estimated parturition and was not the time expected to give birth. There was only

one case in which the family called the midwife. This finding further validates the observation that the main delay in finding help was in not being aware of the emergency conditions experienced by the mother and also in deciding to seek help (Belton et al., 2014) (see Table 2).

**Stage II of Labor.** Stage II (complete opening of the cervix until the baby is born) occurred at an average of one to one-and-a-half hours after the mother reported signs of labor, except for one mother who gave birth five hours after Stage I was reported. However, in the theory of infant delivery for multipara mothers, it is an average of seven hours after the signs of childbirth, while for the primipara mother the average is nine hours (Larosa, 2009; Lowdermilk, 2012). Hence, this leads to two questions: Is it possible for these mothers to have a period of

only one hour? and do they not understand the signs of childbirth?

In this stage, labor was carried out in a round-house, a box house and a yard. There were two modes of delivery, which were sleeping on the back and squatting while leaning on a big stone. The midwife, the husband, and the family assisted the labors; only Mrs. MT gave birth without any helpers (see Table 2).

**Stage III of Labor.** At the stage of placental removal, only one managed to remove the placenta in less than 30 minutes; three mothers experienced an extension of Stage III, and the other two mothers could not deliver. At this stage, mothers who were attended by health workers (Mrs. MS and RI) experienced shock, even though medical assistance had been attempted (see Table 2).

Most of the maternal deaths occurred during the third stage of labor, with the placenta unable to be expelled after 30 minutes of Stage II (retention of the placenta). Although the amount of bleeding was not measured, the testimony of the person accompanying the mother to death indicates that the bleeding occurred in a large amount. There was one case in which the mother said she saw spots, which can be associated with a lack of blood volume.

The families' responses when bleeding occurred were varied, such as sitting with the mother without doing anything, picking up the midwife, and picking up a TBA who compressed the mother's body using hot water or providing traditional ingredients. These responses of the families validate previous research, which shows that maternal sensitivity in recognizing signs and symptoms of bleeding during labor is still lacking (Ronsmans et al., 1997). It is important that the family can recognize the signs and symptoms of postpartum hemorrhage because the decision to seek help depends on them.

**Stage IV of Labor.** Two mothers made it to the fourth stage of labor. Mrs. MS was helped

by the health worker but died an hour later, from a suspected lack of fluid volume. Mrs. AT, who was attended by a TBA, might have also experienced hypovolemic shock; she had decreased consciousness (see Table 2).

Postpartum hemorrhage can be prevented and can be treated; a quick response time can prevent the mother from suffering more severe complications (Astuti, Hakimi, & Prawitasari, 2014). Ideally, professional health workers should assist childbirth. Hence, the lack of health workers in the village is one of the factors that influence maternal health services.

Five of the six cases showed that it was difficult to contact or reach health workers when there were danger signs during childbirth. Ineffectiveness of emergency transport also proves the disruption of the health system in this area (Myers et al., 2015). Inadequate support facilities, such as in the case of Mrs. RI, are factors that obstruct the implementation of active management at the third stage.

## Conclusion

The postpartum hemorrhage cases of the six mothers in 2010 at four sub-districts occurred in the age range of 24 to 42 years old. Five of them had given birth more than four times previously. Medically, bleeding occurs in the third stage of labor due to placental retention. Non-medical factors include lack of transport and communication, the presence of physical barriers such as long distances, rocky roads, and rivers without any bridges that are often flooded in the rainy season. Besides, at the first sign of labor, the mother was unaware of the signs of labor. The treatment given by the TBA was following the tradition and experience, namely "roasting" and compressing the mother using hot water, as well as providing traditional ingredients per mouth or applying them to the mother's stomach. Moreover, the lack of health facilities and infrastructure in the village is another non-medical factor to be considered (EU, HP, AR).



## Acknowledgments

The authors would like to thank the TTS District Government, the Head of the TTS District Health Office, the Head of *Puskesmas* Fatumnasi, Oe Ekam, Oinlasi and Kuanfatu, and the Faculty of Medicine and Health Sciences of Satya Wacana Christian University, Salatiga.

## References

- AbouZahr, C. (2003). Safe motherhood: A brief history of the global movement 1947-2002. *British Medical Bulletin*, 67 (March),13–25. doi: 10.1093/bmb/ldg014.
- Astuti, D.P., Hakimi, M., & Prawitasari, S. (2014). Hubungan response time dengan luaran keberhasilan penanganan perdarahn postpartum di RSUD Margono Soekardjo Purwokerto. *Jurnal Ilmiah Kesehatan*, 10 (2), 100–107.
- Belton, S., Myers, B., & Ngana, F.R. (2014). Maternal deaths in eastern Indonesia: 20 years and still walking: An ethnographic study. *BMC Pregnancy and Childbirth*, 14 (1). doi: 10.1186/1471-2393-14-39.
- BPS NTT. (2014) *Nusa Tenggara Timur dalam angka 2014*. Kupang: BPS Provinsi Nusa Tenggara TImur.
- Calvert, C., Thomas, S.L., Ronsmans, C., Wagner K.S., Adler, A.J., & Filippi, V. (2012). Identifying regional variation in the prevalence of postpartum haemorrhage: A systematic review and meta-analysis. *PLoS ONE*, 7 (7), p. e41114. doi: 10.1371/journal.pone.0041114.
- Combs, T.V., Sundby, J., & Malata, A. (2012). Piecing Together the Maternal Death Puzzle through Narratives: The Three Delays Model Revisited. *PLoS ONE*, 7(12), p. e52090. doi: 10.1371/journal.pone.0052090.
- Dinkes Kab. TTS. (2016). *Profil Dinas Kesehatan Kabupaten Timor Tengah Selatan Tahun 2015*. Soe: Dinas Kesehatan Kab. TTS.
- Dinkes NTT. (2009). *Pedoman Revolusi KIA*. Kupang: Dinas Kesehatan Provinsi NTT.
- Dinkes NTT. (2013). *Profil Kesehatan Nusa Tenggara Timur*. Kupang: Dinas Kesehatan Provinsi NTT.
- Dinkes NTT. (2015). *Profil Kesehatan Provinsi Nusa Tenggara TImur Tahun 2014*. Kupang: Dinas Kesehatan Provinsi NTT.
- Harvey, S., Lim, E., Gandhi, K.R., Miyamura, J., & Nakagawa, K. (2017). Racial-ethnic disparities in postpartum hemorrhage in Native Hawaiians, Pacific Islanders, and Asians. *Hawa'i Journal of Medicine & Public Health*, 76(5), 128–132.
- Kassebaum, N., Bertozzi-Villa, A., Coggeshall, M.S., Shackelford, K.A., Steiner, C., Heuton K.R., Gonzalez-Medina, D., Barber, R. . . . Lozano, R. (2014). Global, regional, and national levels and causes of maternal mortality during 1990–2013: A systematic analysis for the Global Burden of Disease Study 2013. *Lancet*, 384(9947), 980–1004. doi: 10.1016/S0140-6736(14)60696-6.
- Khan, R.U., & El-Refaey, H. (2006). Pathophysiology of postpartum hemorrhage and third stage of labor. *Postpartum Hemorrhage*, 93(3), 243–253.
- Larosa, P. (2009). *Perbedaan Lama Persalinan antara Primipara dengan Multipara di RSUD Dr. Moewardi Surakarta*. Surakarta: Universitas Sebelas Maret Surakarta.
- Lowdermilk, D.L. (2012). Postpartum complications. In D.L. Lowdermilk, D.E. Shannon, K. Perry, & K.R.A. Cashion (Eds.), *Maternity & women's health care* (10th ed.) (pp. 824-834). New York: Mosby Elsevier.
- Lundine, J., Hadikusumah, R.Y., & Sudrajat, T. (2013). Indonesia's progress on the 2015 Millenium Development Goals. *Indonesia* 360, 3(3), 54–66.
- MMEIG. (2015). Indonesia: Maternal mortality in 1990-2015. *WHO, UNICEF, UNFPA, World Bank Group, and United Nations Population*

- Division Maternal Mortality Estimation Inter-Agency Group*, pp. 1–5. doi: [http://www.who.int/gho/maternal\\_health/countries/sle.pdf](http://www.who.int/gho/maternal_health/countries/sle.pdf)
- Myers, B.A., Fisher, R.P., Nelson, N., & Belton, S. (2015). Defining remoteness from health care: Integrated research on accessing emergency maternal care in Indonesia. *AIMS Public Health*, 2(3), 256–273. doi: 10.3934/publichealth.2015.3.256
- Ronsmans, C., Achadi, E., Cohen, S., & Zazri, A. (1997). Women's recall of obstetric complications in South Kalimantan, Indonesia. *Studies in Family Planning*, 28(3), 203–214.
- Say, L., Chou, D., Gemmill, A., Tunçalp, Ö., Moller, A.B., Daniels, J., Gülmezoglu, A.M., Temmerman, M., & Alkema, L. (2014). Global causes of maternal death: A WHO systematic analysis. *The Lancet Global Health*, 2(6), 323–333. doi: 10.1016/S2214-109X(14)70227-X.
- Susiloningtyas, I., & Purwanti, Y. (2012). Kajian Pengaruh Manajemen Aktif Kala III Terhadap Pencegahan Perdarahan Postpartum. *Majalah Ilmiah Sultan Agung*, 50(128), 63–72.
- WHO. (2015a). *Maternal mortality fact sheet*. Geneva: World Health Organization.
- WHO. (2015b). *Trends in maternal mortality: 1990 to 2015*. Geneva: World Health Organization.
- WHO, UNICEF, UNFPA. (n.d.). *The World Bank and the United Nations Population Divisions, Who /Rhr/15.23*. Geneva: World Health Organization.