



Mothers Matter

Using Behavioral Nudges to Reduce
Maternal Mortality in Indonesia

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Acronyms

ANC	Antenatal Care
DALY	Disability Adjusted Life Year
DHS	Demographic and Health Survey
JKN	Jaminan Kesehatan Nasional, the Indonesian national healthcare system
MDG	Millennium Development Goal
MMR	Maternal mortality rate
MoH	Ministry of Health
NGO	Non-governmental organization
PNC	Postnatal care
PONED	Pelayanan Obstetri dan Neonatal Esensial Dasar, a public reproductive healthcare center
TFR	Total fertility rate
UN	United Nations
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
WHO	World Health Organization



Key Terms

Antenatal care – Routine care administered throughout the gestation period of pregnancy. Services include height and weight measurement, blood pressure measurement, cervical examination, urine testing, etc. Typically measured by the percentage of women aged 15-49 years attending at least one antenatal visit (four recommended in total by WHO and the Indonesian MoH) during pregnancy by skilled health personnel such as doctors, nurses or midwives

Disability-Adjusted Life Year (DALY) – One lost year of "healthy" life. The sum of DALYs across a population can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability

Eclampsia/pre-eclampsia – Seizures that occur during a woman's pregnancy or shortly after giving birth due to high blood pressure and clotting; a condition that places women at elevated risk of eclampsia

The Grandmother Project – A community advocacy program piloted by World Vision and USAID in Senegal in 2004 that trained grandmothers in a locality to disseminate health information to women and girls

Maternal death – the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but nor from accident or incidental causes

Maternal mortality ratio – Annual number of deaths of women from pregnancy-related causes per 100,000 live births

Nudge – Any behavioral intervention that makes it easier for people to make a "smarter" choice without coercion

Post-partum hemorrhaging – the loss of more than 500 ml or 1,000 ml of blood within the first 24 hours following childbirth; usually accompanied by loss of strength/fainting, already low red blood cell count, and poor contraction of the uterus

Post-natal care – Routine care administered to a woman in the weeks following birth

Seclusion – the period after birth where some women prefer to limit public activity to recover

Skilled attendant at delivery – Percentage of births attended by skilled health personnel (doctors, nurses or midwives)



Executive Summary

In 2015, the maternal mortality rate (MMR) in Indonesia was 126 deaths per 100,000 live births, ranking it behind neighboring countries such as the Philippines (114), Malaysia (40), and Vietnam (54), and ahead of countries like Papua New Guinea (215). While Indonesia has made large gains in reducing the MMR, over the past decade progress has slowed down, posing a continuing challenge for Indonesian development. This Applied Policy Project examines the problem of maternal mortality, identifying disparities in access to healthcare based off region and socio-economic status. While 80% of all maternal deaths and complications are avoidable with proper healthcare and regular antenatal check-ins, one in five rural women are not getting all four recommended antenatal trips recommended by the World Health Organization (WHO) and the Indonesian Ministry of Health (MoH) (Mathai, 2006; Indonesian DHS, 2012). For the women who are, the quality of care varies widely, and an original regression analysis conducted in this research finds that one in three women experienced excessive bleeding after labor. These lapses in health access and preventative care prompt policy actors like UNICEF to consider intervening to prevent more women from needlessly dying.

This analysis makes the final recommendation of deploying community-based advocacy programs that involve pairing volunteers (such as grandmothers) to mentor and advise pregnant women throughout pregnancy. This policy option, based off a successful program run by World Vision and USAID called “The Grandmother Project” in Senegal, is the most cost-effective, politically feasible, culturally feasible, and best in terms of reach and equity. UNICEF should identify a strong city to pilot this program, and work with local community leaders to develop a curriculum with behavioral nudges to make it easier for pregnant women and new mothers to absorb health information.

Grandmothers and community volunteers will work with their pregnant partners to act on health guidelines established by UNICEF, WHO, and MoH. This health curriculum will have two primary objectives: promoting screenings for pre-eclampsia and boosting the number of women who exclusively breastfeed their babies for the first six months of life. Mother and grandmothers/advocates will also be encouraged to form peer support groups and networks to help them better navigate the childbearing and rearing process. Delivery of this educational content will involve material that is engaging and highly visual or aural, such as illustrated flipcharts and poetry or songs to reach non-literate populations and relay information in a memorable way.

Community-based advocacy programs are estimated to save 22.4 adult Disability Adjusted Life Years (DALYs) and 5.2 child DALYs with an increased breastfeeding rate covering at least 50% of the population, discounted over 5 years. This intervention could reduce maternal mortality and contributes to the growing need for more evidence-based practices in combatting global health issues.



Country Profile: Indonesia

Indonesia is the fourth most-populated nation in the world, with an estimated 255 million people living within its unique, wide-spread borders. The country is divided into roughly thirty-four provinces, and spans across over fourteen thousand individual islands. A highly diverse country with hundreds of ethnic groups and over three-hundred local languages, Indonesian lifestyles vary from “rural hunter-gatherers to a modern urban elite” (United Nations Statistics Division). In 2011, about half of Indonesia’s population lived in urban areas (50.7%), with an annual urbanization rate of 2.45% (The World Factbook, 2015). Major urban areas include the capitol city of Jakarta, Surabaya, Bandung, Medan, and Semarang. While migration to urban cities has grown rapidly in recent years, much of the poverty that remains in the country is concentrated in rural areas. The poverty rate is estimated to be about 11.7% nationwide.

Beginning in 2011, pregnant women had access to universal maternal healthcare in Indonesia. In January 2014, the country launched a strong effort to implement its national single payer, universal healthcare system called Jaminan Kesehatan Nasional (JKN). JKN’s goal is to provide health coverage for the entire country’s population by January 2019, with maternal health services fully financed under this program. Rollout of JKN has been beleaguered with administrative difficulties, and expanded healthcare has been slow to reach rural and disparate areas of the country.

The World Bank reports that in 2012, 40% of Indonesian regional hospitals lacked obstetricians and lacked standard policies that would address the leading causes of maternal death—hemorrhage, infection, and eclampsia (Webster, 2012). Hospital patients encountered barriers including denial of service, demand for payment prior to service and inadequate treatment. One targeted goal of JKN is to improve maternal healthcare facilities, as well as general access to medical professionals.



Figure 1: The fourth-most populated nation in the world, Indonesia has a population of about 255 million people across over fourteen thousand islands.



Current State Analysis: Maternal Mortality in Indonesia

A maternal death is defined as “the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but nor from accident or incidental causes” (Shah and Say, 2007).

In 2000, the United Nations (UN) set the Millennium Development Goals (MDG) with the aim of reducing Indonesia's MMR to 102 by the year 2015 (United Nations, 2015). Goals were set to reduce the MMR from 390 maternal deaths in 1991, to just 102 by 2015 (Lundine, Hadikusumah, and Sudrajat, 2013). Indonesia did not meet this benchmark goal, with an estimated 126 maternal deaths per 100,000 live births in 2015.¹ Maternal mortality in Indonesia is high compared to most south-east Asian countries such as the Philippines, Malaysia and Vietnam.

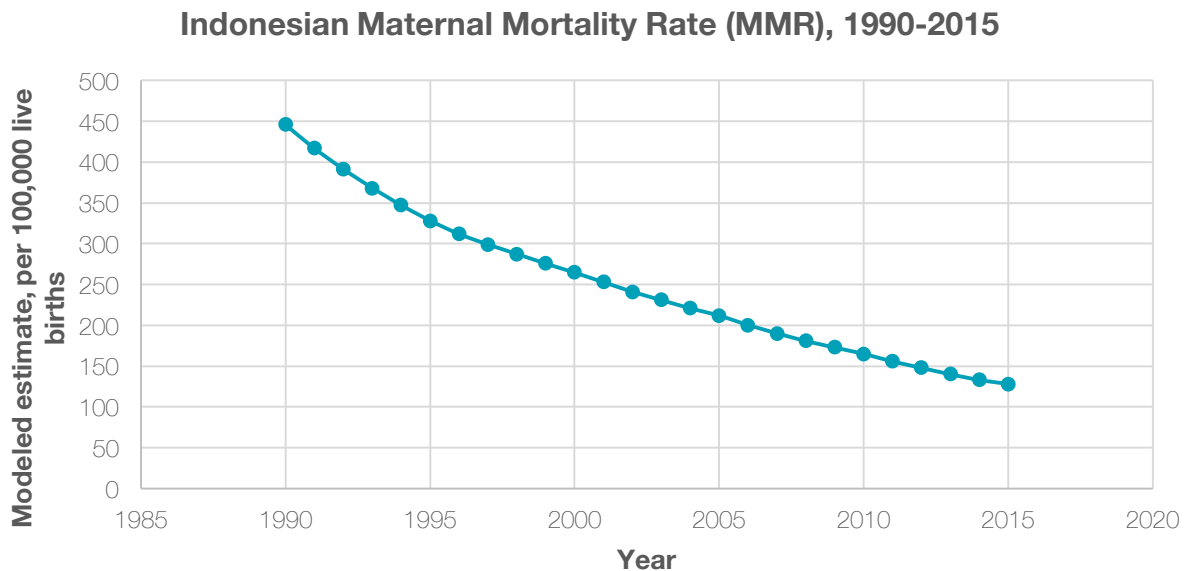


Figure 2: The MMR has steadily decreased over time, but progress has slowed down with the maternal mortality rate currently at 126 deaths per 100,000 live births. Source: World Bank, 2016.

¹ Indonesia certainly does not have the highest MMR in the world (South Sudan, Chad, Somalia, and Sierra Leone have some of the highest rates), but it is still alarmingly high for a middle-income nation. This APP chooses to focus in on Indonesia since progress is stagnating and gains are decreasing (World Bank 2015).



According to the 2012 Demographic and Health Survey (DHS), 88% of pregnant women saw their doctors for all four recommended antenatal visits (Indonesian DHS, 2007). However, the service coverage of the country was just 58%, meaning that the distribution of high-quality services in Indonesia is still highly fragmented (Guttmacher Institute, 2014). Critical services that should be administered as a part of regular antenatal check-ins such as abdominal exams, blood pressure measurement, tetanus vaccination, urine testing, counseling about danger signs, HIV counseling and testing, iron and folate supplementation, early antenatal care (prior to four months' gestation) and provision of at least two doses of medication to prevent malaria varies greatly within the country.

Experts on maternal mortality stress the danger in conflating high antenatal coverage rates and strong maternal health indicators. For example, in one study examining four countries — the Dominican Republic, Colombia, Peru and the Maldives — at least 87% of women had at least four antenatal visits yet only 34% of them received all measured services in the Dominican Republic and Colombia, with even lower proportions in the Maldives (28%) and Peru (7%) (Guttmacher Institute, 2014). Therefore, advocates in maternal health are not only working to improve take-up rates in general, but also to vastly improve the quality of care received.

Percentage of Women Experiencing Excessive Bleeding During or After Delivery

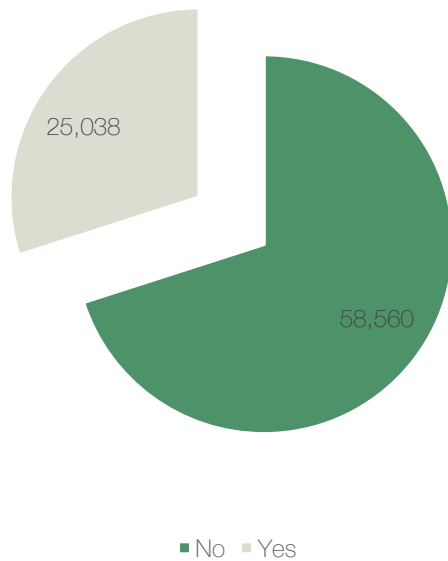


Figure 3: About one-third of all Indonesian women experienced excessive bleeding before or after delivery. Source: Author calculations from Indonesian DHS, 2012.

Causes of MMR

Approximately 80% of all maternal deaths and complications are avoidable with proper healthcare and regular antenatal check-ins (Mathai, 2006). Reports indicate that the most cited reason - at 50% - for maternal death is eclampsia, or post-delivery bleeding and seizing which can kill a new mother in just 10 minutes (Gokken, 2015). When bleeding is not the key issue, the MoH estimates that about 45% of maternal deaths are caused by malaria, heart failure, hypertension or respiratory problems (IRIN News, 2012).

The majority of deaths occur between the third trimester and



the first week after the end of pregnancy, and are concentrated on the first and second days after birth (Campbell and Graham, 1990). Still, women remain at increased risk of death up to 42 days postpartum, with new methods expanding the monitoring period up to six months or one year after birth.

It is critical to note that these major causes of maternal death are all preventable, and warning signs for eclampsia and heart conditions are detectable with regular check-ins with a health professional. Antenatal care, family planning services, safe and legal abortion, trained medical attendants at delivery, and emergency obstetric care can all save a mother's life before and after labor (Shiffman, 2000; Boerma, 1987). Preventative tasks that are part and parcel of regular check-ins such as measuring a woman's cervix, are fairly low-cost and can predict obstructed labor problems pre-emptively.

Pregnant women who complete four antenatal visits are at seven times lower risk of miscarriage/stillbirth, and patients who do not take iron pills double their likelihood of miscarrying (Masfiah, Anandari, and Hum, 2015). In addition, 83% of all births occurred with the assistance of a skilled attendant, and 80% of mothers received postnatal care (PNC) within two days following delivery. These higher healthcare use rates indicate that there are other positive externalities associated with antenatal use, such as increased delivery in facilities.

Indonesian Healthcare Facilities

A 2014 publication assessing the readiness of public health facilities to provide maternal healthcare in Indonesia found that eastern provinces were associated with lower utilization and public sector dominance, and that private sector facilities and higher take-up rates were associated with western provinces (The World Bank, 2014). Despite higher use rates in western provinces, the report found that all regions could benefit from bolstered Pelayanan Obstetri dan Neonatal Esensial Dasar (PONED), or health centers tasked specifically with providing basic emergency obstetric and neonatal care across the country. PONEDs around the country did not have the infrastructure or staff capacity to manage and treat postpartum hemorrhage and critical neonatal care.

Facility-based deliveries, in general remain relatively low: only about 63 percent of all deliveries occurred at a health facility (The World Bank, 2014). Additionally, a high MMR continues to disproportionately affect poor women: while nearly 70% of Indonesia's wealthiest women gave birth with a health professional, only 10% of the poorest quintile did (Webster 2012, p. 1981).

Due to traditional or religious beliefs, many women in rural areas are suspicious of professional healthcare facilities, and voluntarily choose to decline medical care when available due to these influences. A field study conducted in a rural area of West Sumatra found that women in focus groups (with an on average, elementary education) tended to believe that pregnancy was a normal cycle in a woman's life that did not require specialized medical care (Agus,



Horiuchi, and Porter). Researchers found women resistant to health care practices and advancements in technology due to strong beliefs grounded in religion and tradition, a trend that focus group facilitators noticed in the larger culture. This was a common reason why women who had access to care, refused it. The combination of the currently fragmented and under-resourced health network and lack of public trust in medical institutions poses a two-fold barrier in fostering a culture of maternal care, especially in rural areas.

A Data Dearth and Insufficient Collection Methods

Indonesian record-keeping is sometimes erroneous, misidentifying maternal deaths missed from routine hospital reports. One study found that “routine methods of identifying maternal deaths underestimate the number by one-half to two-thirds with the main problem being the misclassification of indirect maternal deaths as non-maternal” (Qomariyah et al., 2009). This underreporting was attributed to inadequacies in the coverage of the routine reporting system, which only collected maternal deaths from the delivery room, the obstetric and ICU wards, missing up to 14% of deaths that were reported in non-obstetric wards due to some confusion by hospital staff that deaths are related to deliveries.²

In addition, existing data is limited to capturing deaths in institutions, missing the entire population of women who give birth at home. Since midwives are not always trained to collect this kind of information, current data sources – include the DHS data source used in this analysis – may not be telling the entire story of maternal mortality in Indonesia.

Costs to Society

The literature suggests that maternal mortality affects society in several different ways: health promotion affects the economic productivity and quality of life for pregnant women, their dependents, families and communities (Shiffman, 2000). When women have pregnancy complications, this impacts their ability to contribute to the workforce, complete domestic tasks, and participate in civic society. Financial instability can result from lost household income earned by mothers and can also undercut a family’s ability to pay for basic needs such as food and rent. Funerals can often deplete all of a family’s savings (World Health Organization, 2014). Older children – usually girls – have to drop out of school to resume caretaking roles in the home such as taking over domestic affairs and being the primary guardian of their siblings.

An increased MMR - or MMR that continues to decline at a lagging rate - means higher healthcare costs associated with attempts at saving the mother’s life, and possible social costs if there is no one available to care for the child.

² The under-reporting of maternal deaths is common in both developing and developed countries.



In addition, other externalities include great effects on neonatal health, as the probability that an infant will survive decreases (Sutan and Berkat, 2014). Research finds that newborns whose mothers died in childbirth are far less likely to reach their first birthday than those whose mothers do not die (Tulloch, 2015).

Previous Interventions

Previous policy interventions have jumped to merely increasing the number of healthcare facilities without necessarily actively involving women in taking ownership of antenatal services. These interventions have produced little measureable impact. For example, one study found that the distance between a patient's home and a health provider or facility did not appear to have a significant influence on MMR, nor did transport problems (Supratikto et. al., 2002). The mere presence of reproductive health facilities did not have statistically significant effects either. The presence of a health professional also did not significantly increase the survival rate for mothers facing complications during delivery. One study conducted in 2009 in two Indonesian districts found that most births (83%) in the two districts took place at home, and only one-third of births (32.8%) were attended by a health professional (90.4% by a midwife, 7.0% by both a midwife and doctor, and 2.7% by a doctor. Nearly half (47.6%) of the women who died had been managed by a health professional before death. This suggests that simply boosting the number of health facilities does not

directly decrease maternal mortality in an Indonesian context.³



Figure 4: Midwives are trained in Indonesia by the Ministry of Health with financial support from the Global Fund (Rae).

Another previously deployed option involves expanding midwifery. A 2009 study found that “regardless of a woman's educational level, the placement of village midwives in communities [was] associated with significant increases in women's receipt of iron tablets and in their choices about care during delivery—changes that reflect a move away from reliance on traditional birth attendants. For women with relatively low levels of education, the presence of village midwives had the additional benefit of

³ This is likely due to the fact that when the study was conducted, most women were delivering at home. They chose to see a doctor or medical professional only after the home birth had gone dangerously awry, leaving women in labor vulnerable to complications that could occur during the actual birth. Encouraging women to give birth in a health facility itself may help with this problem of intervening too late.



increasing use of antenatal care during the first trimester of pregnancy” (Frankeberg et al., 2009).

Attempting to capitalize on this knowledge, the Indonesian government launched a very ambitious national midwife program in the late 1980s, and trained and placed 60,000 midwives in rural villages. Evidence from this program suggested that basic incentives “faded in the face of apathy, greed, and corruption” (Webster, 2012). Ronsmans et al. (2009) found that midwives that worked for private clinics were able to earn income tied to their competence and experience, and that non-financial compensation such as public recognition were not enough to persuade them to serve rural communities (Reproductive Health Matters, 2009; Webster, 2013). Still, seven years after the program, even with high attrition, 54,000 midwives were placed, and the proportion of births managed by a midwife or other health professional had nearly doubled from 35% in the late 1980s to 69% in 2000 (Ronsmans et al. 2009).

The MoH is currently running a midwife program that offers cash incentives to encourage 72,000 traditional birth attendants to work with midwives in the remote villages where they live (Webster, 2012). In addition, the government is opening 2800 “waiting homes” where rural women can stay under supervision from midwives near medical clinics (Webster, 2012).



Issue Diagnosis: Attitudes Contributing to MMR

The 2012 Indonesian DHS collected data on topics on a variety of topics (such as wealth, location, and education) that inform maternal healthcare utilization.⁴ With a sample of roughly 84,000 Indonesians, this data captured general attitudes about maternal healthcare and provides insights into what contributes to the current MMR.

Troubleshooting Post-Delivery Problems

First, when the sample population was asked what they would do if they experienced a problem after birth or during seclusion (the period after birth where some women prefer to limit public activity to recover and rest), a very low percentage of women reported that they would seek the counsel of a midwife or doctor. Just about 13% of women said they would go to health facility.

“What should you do if you experience a problem after giving birth/during seclusion?”

Response	Mean	Std. Deviation
Nothing	0.90%	9.42%
Rest	5.92%	23.60%
Take Medication	4.21%	20.07%
Take Herbs	1.98%	13.94%
See Traditional Birth Attendant	2.15%	14.50%
See Midwife	12.77%	33.37%
See Doctor	12.79%	33.40%
Go to Health Facility	13.29%	33.95%
Other	1.90%	13.64%
Don't Know	0.40%	6.31%

n=83,484

Figure 5: While women generally do not decide to do nothing when experiencing a problem after birth, the data suggest that they do not immediately seek professional help either. Source: Author calculation from Indonesian DHS, 2012.

⁴ A fair caveat to consider is the DHS survey polls only living household members, and does not ask them if anyone in their family died shortly after childbirth. Therefore, this data will be used to extrapolate what normal birthing conditions are like, since data on actual maternal deaths is unavailable.



It is worth commenting that the standard deviation/variance on many of these responses is large, especially questions asking women if they would seek professional help. This suggests that among the sample population, women's perspectives tended to differ in larger magnitudes, with some women feeling very strongly about certain responses.

When looking at the real problems women experienced after giving birth, one in three women excessively bled, and one in twenty had a fever. This suggests that the number of women suffering from potentially serious side effects such as fainting or convulsions is relatively low, but is still significant.

Problems Experienced After Giving Birth

Reported Problem	Mean	Std. Deviation
Excessive Bleeding	29.95%	40.30%
Faint	1.70%	12.92%
Convulsions	1.72%	13.01%
Fever	5.43%	22.65%
Foul-Smelling Discharge	1.63%	12.65%
Sore Breast	3.21%	17.64%
Sadness/Depression	0.90%	9.43%
Other	12.17%	32.69%
Don't Know	63.55%	48.13%

n= 83,591

Figure 6: Most women did not experience a problem after giving birth, but for those that did, excessive bleeding or "other" were the most common. The majority of women said they did not know whether or not they experienced a problem. Source: Author calculation from Indonesian DHS, 2012.

One point of concern for policymakers is that about 64% of the sample population reported not knowing if they experienced a problem after giving birth. This suggests that women do not have an anchored understanding of what kinds of experiences are normal after giving birth and which are not, demonstrating a possible information asymmetry.

Predicting Hemorrhaging and Eclampsia

Since the most highly cited cause of death for new moms is excessive bleeding or eclampsia, a regression analysis can demonstrate what other factors increase the likelihood of hemorrhaging during labor. For this, we can use a probit regression to see how different variables effect the probability that a woman experiences hemorrhaging during birth.



Covariates include: highest level of education completed, wealth quintiles, whether or not the respondent is literate, the number of children they currently have, and their marital status.

Regression Equation	
Probability of excessive bleeding during labor = $\beta_0 + \beta_1 \text{Education} + \beta_2 \text{Wealth} + \beta_3 \text{Literate}$	
+ $\beta_4 \text{Kids} + \beta_5 \text{Marital Status}$	

Using Stata, the results of the regression analysis are as follows:

Regression Analysis: Contributors of Hemorrhaging during Labor

Variable	Coefficient and Robust Std. Error
<i>Education</i>	
Junior High	0.302 (15.89)**
Senior High	0.542 (28.50)**
Academy	0.806 (19.25)**
University	0.681 (20.85)**
<i>Wealth</i>	
Poorer	0.069 (3.40)**
Middle	0.179 (8.42)**
Richer	0.17 (7.73)**
Richest	0.197 (8.46)**
<i>Literacy</i>	
Literate	0.253 (7.94)**
<i>Marital Status</i>	
Marital Status	0.037 (1.29)
<i>Birth Experience</i>	
Previous No. of Children	-0.009 (2.59)**
<i>Regression Constant</i>	
Constant	-1.129 (25.46)**

*p<0.05; **p<0.10, n= 76,944

Figure 7: Of the sample population, education, wealth, previous number of children, and literacy rates impacted the probability of excessive bleeding during labor. Source: Author calculation from Indonesian DHS, 2012.



The regression results reveal an interesting set of patterns, such as the fact that while general risk of hemorrhaging is low and unlikely (as demonstrated by the negative constant and small coefficients), incidence did not vary too greatly among wealth quintiles and was not affected by marital status. The higher educated an individual was, along with whether or not they could read, tended to increase the probability of bleeding slightly.⁵ The only covariate that decreased the likelihood of excessive bleeding during delivery was the previous number of children.

The results of this regression analysis indicate that maternal bleeding does not heavily discriminate against class or education. Other health indicators such as the mother's health prior to birth, dietary consumption, and exercise routines are probably stronger predictors of maternal bleeding.

While the incidence of bleeding is relatively random, access to healthcare is not. Wealthier women are more likely to live in urban cities where access to a hospital or emergency room is less fragmented (DHS, 2012). The focus of this analysis therefore should consider how poorer populations can gain access to lifesaving care that their wealthier counterparts have access to.

⁵ While it is unclear why higher education is related to increased risk of bleeding, it is possible that the other underlying variables explain this connection. It is also possible that this is a finding unique only to the 2012 DHS sample population.



Stakeholder Identification

The following groups are key stakeholders with critical interests to consider and leverage in regard to lowering the national MMR:

Pregnant women, including female population of child-bearing age

Primary Interest: *Reducing the risk of complications during pregnancy or delivery*

Naturally, the group of people most directly effected by a policy targeted at reducing the MMR is pregnant women and women who may become pregnant in the future. This stakeholder faction is diversely composed in terms of race and socioeconomic status, although those most likely to be impacted by such programming are poorer women living in rural areas. Women who are currently pregnant are the exclusive population at risk of dying during childbirth, and women who may become pregnant are those that would most likely benefit most from a policy alternative that promotes more comprehensive antenatal care.



Figure 8: A pregnant woman gets her blood pressure checked at an antenatal clinic in Makassar, Sulawesi, Indonesia (Oldfield 2011).

The national median age of first pregnancy (target group) is 22.8 years old country-wide (The World Factbook, 2015). The population of 15-29 year-old women (childbearing age) is approximately 30 million women across Indonesia.

Families of pregnant women, including women who may become pregnant

Primary Interest: *Reducing the risk of complications during pregnancy or delivery for their loved ones*

Other stakeholders involve partners and family members actively engaged during pregnancy and the childbearing and rearing processes. This group of people is arguably most effected after a mother dies during or shortly after-birth. This stakeholder group also can be very influential in keeping pregnant women on track with taking any supplements provided by a healthcare provider, or adopting any preemptive measures to minimize any predicted risks associated with the pregnancy.



The Indonesian government and healthcare system

Primary Interest: *Keeping healthcare costs low and reducing administrative inefficiency*

The MoH and National Health Development Program places the community health center (puskesmas) as the primary point-of-care for most Indonesian citizens (Joint Committee on Reducing Maternal and Neonatal Mortality in Indonesia et al., 2013). In 2014, the Indonesian government passed national law that would ensure universal healthcare coverage by 2019, financing prenatal and antenatal care. This stakeholder group will be interested in expanding access and keeping financing costs low.

Medical professionals, including midwives and rural health clinics

Primary Interest: *Receiving competitive compensation for the work they do*

Healthcare workers including doctors, nurses, midwives and traditional birth attendants must be engaged since they are the medical authority for pregnant women and are the primary caregivers at point-of-service health clinics. Options heavily rely on people in these professions and count on them to actively contribute their expertise and experience in optimizing antenatal care for pregnant women. Midwives and rural health clinics are especially crucial since they hold a high amount of social capital and work with their clients on a one-to-one basis. This group will be most interested in how their work will be valued economically in terms of financial compensation, benefits, and social recognition.

Community and religious leaders

Primary Interest: *Balancing community-wide needs in a tempered and socially acceptable manner*

Because delivery issues are likely to be concentrated in rural areas where local (usually religious) leaders carry high clout, engaging community leaders is important in the successful promotion and implementation of any policy option. Without buy-in or engagement of this group (or more detrimentally, outright opposition and rejection of a policy option), interventions will not be effective. Working with this group could also draw in a pull to get MMR on the local agenda of health priorities.



Policy Alternatives

In addressing the stagnating MMR in Indonesia, and rectifying the disparities between urban and rural areas, UNICEF, in partnership with the national Indonesian government has a number of policy options to consider.

All policy alternatives should prioritize and invest in electronic health recordkeeping and involve training medical professionals on how to properly classify causes of death.

I. *Status Quo*

This policy option involves letting present trends continue, and waiting for the expansion of maternal healthcare to occur on its own without any additional policy levers. Under this alternative, JKN would steadily increase its reach to rural communities, bolstering antenatal care as a process of improving access to all general healthcare in the country.

II. *Expand healthcare infrastructure and access to health professionals*

Research shows that previous policy interventions most frequently look to building healthcare facilities as the “commonsense solution” to prevent maternal morbidity. Under this first policy option, access to hospitals, health professionals, and clinics would be expanded to increase the number of women under care by a health professional before, during, and after pregnancy.

Expected benefits would include an increased number of supervised births and potentially saving numerous mothers and infants during a risky delivery. It would also mean that healthcare facilities would be available to all people, expanding healthcare access in a locality not merely restricted to pregnant women.

Costs would include steep price tags to cover infrastructure costs, and also machinery such as ultrasound equipment and supplements to keep patient care operational. Potential risks include high barriers of consumption on the consumer side (i.e. high fees and copays) and a scenario where facilities are primarily used to treat other health conditions besides pregnancy because women choose not to go to these professional centers.



Figure 9: A pregnant woman receives a sonogram at an antenatal clinic in Makassar, Sulawesi, Indonesia (Oldfield 2011).



Cost-effectiveness for this measure will be calculated by the DALYs saved from building neonatal ICU units that can field emergency maternal care during birth, and also by increasing the number of referrals for hemorrhaging after delivery.

III. Create Stronger Incentives for Midwives

A policy option of building strong incentives for individuals to pursue midwifery as a career would capitalize on the growing trend of women preferring midwives during delivery, and dramatically raise the supply of public midwives.

National pilot programs have shown that current initiatives meant to increase midwifery usage have created perverse incentives that have led to wide attrition of midwives in rural areas (Swanubatgab, et al., 2010). As described in the aforementioned literature, pilot programs established in the 1980s lost efficacy when midwives trained with public dollars left the program to pursue higher paying positions in the private sector. Although such programs increased the number of midwives per capita more than tenfold from 0.2 per 1,000 women to 2.6 per 1,000, it suffered from low quality of midwife training, lack of financing and access to hospitals when needed, shortages of materials and equipment, and transport/communication problems.

A redesigned program should work to provide a stronger curriculum and support system for midwives, while also demonstrating a commitment to providing professional development opportunities for midwives. This should include non-monetary incentives such as official government service designation to add prestige to the work that midwives do. Other structures such as contractually obligating all trained midwives to stay with the program for a certain number of years could assist in reducing attrition.

Benefits of this option include increased preventative care for mothers and supervision during delivery. It also means that women in local communities have a point of contact they can reach out to troubleshoot different needs as they arise during pregnancy, such as reoccurring abdominal pain or intensive fatigue. Midwives are less costly than building healthcare infrastructure, and are also very mobile and flexible for their patients.

Costs include high costs for training midwives and the potential that measures meant to reduce attrition require much administrative work. If enforcement power is low, this policy option may reproduce the subpar results from other programs.

Cost effectiveness for this alternative will be measured by the number of DALYs saved from having a skilled birthing attendant during delivery who also monitors for bleeding.



IV. Implement Community-based Advocacy Programs

In 2015, one study found that grandparental help in Indonesia is correlated with positive health outcomes for children, including smoother economic and social transitions (Snopkowski and Sear, 2015). In lower-income contexts, the study found that grandparents wielded higher influence and contributed more to helping mothers and children.

This policy option would expound on the social capital of grandmothers, mothers, mother-in-laws and peer moms to provide a support network to

help provide antenatal advising throughout a pregnancy. This is based off a similar program conducted in Senegal called The Grandmother Project which trained and deployed a number of grandmothers to be advocates within the community to speak about maternal/child nutrition and health, reproductive health, teenage pregnancy, HIV/AIDS, hygiene, etc. Programs launched in Ghana, Malawi, and British Columbia yielded similarly positive results, with grandmother advocates linked to “positive and sustainable changes in nutrition, health, and education practices while at the same time curbing the spread of consumerism and strengthening the cultural identities and social cohesion of families and communities (Aubel 2010, p. 46).

Benefits include a low financial cost and leveraging an already established group of trusted women (such as grandmothers) to reach the community of pregnant women and new moms. Costs including developing a curriculum, training these women, and program monitoring/evaluation costs. There is also the risk that community advocates may incorrectly proliferate health material, or misinterpret or forget what was taught in training sessions.

Cost-effectiveness will be measured through the number of DALYs averted from increased pre-eclampsia screenings, and number of infant DALYs averted from encouraging at least 50% of the maternal population to continue breastfeeding.



Figure 10: Grandmothers play with children in *The Grandmother Project's* trial run Senegal (Global Grandmother Power, 2013).



Evaluative Criteria

The following criteria will serve as evaluative measures assessing each proposed alternative. Each option will be discounted for a period of five years, discounted in 2005 USD.

I. Cost-Effectiveness

This criterion will gauge the return on investment for each option. Cost-effectiveness is important to consider since budgets - both at the government level and within UNICEF - are likely to be constrained and program funding may not be renewable. Cost-effectiveness will be measured through Disability Adjusted Life Years – DALYs. According to the World Health Organization, a DALY is one lost year of "healthy" life; "the sum of DALYs across the population, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability" (World Health Organization, 2016). The most cost-effective option will yield the greatest amount of benefits for pregnant women, for the lowest relative cost. Cost-effective interventions will also not be heavily dependent on program funding renewal, and will place emphasis on local communities claiming ownership of initiatives.

II. Political Feasibility

Perhaps one of the most important considerations to make will be how feasible and practical each policy option is in realistically being implemented on a national level. If infrastructure needs are high and require complex contracting, feasibility becomes a major road block to smooth implementation. This criterion will be measured on a subjective scale of low to high.

III. Cultural Adoption Feasibility

Cultural feasibility will consider social reception, including the likelihood that local governments and municipalities will cooperate in promoting the policy, along with public acceptance or rejection of this type of care. This criterion will also measure the probability that pregnant women, their families, and their communities will actively involve themselves in establishing new normative stances on maternal health take-up. This will be measured from low to high.

IV. Equity

Equity will look at how this policy option may disproportionately benefit some pregnant women while excluding (or maybe even at the expense of) other pregnant women. Since major MMR spikes are concentrated in rural areas, policy options should work specifically to meet the needs of women in these areas. Equity concerns should focus on equalizing access and quality of care across the board for pregnant women regardless of race, ethnicity, socio-economic status, religion, or locality. This criterion will be measured qualitatively on a scale of low to high.



Discussion of Alternatives

The aforementioned criteria can now be applied to each of the four offered policy recommendations:

Criteria	#1: Status Quo	#2: Expand Health Infrastructure	#3: Midwife Incentives	#4: Community Advocacy
Cost-effectiveness discounted over five-year period⁶	–	<p>Emergency neonatal units save 23.16 DALYs and cost \$742 million</p> <p>Referrals for postpartum hemorrhage to a specialist saves 23.16 DALYs for a cost of \$413 million</p>	<p>Normal delivery by skilled midwife, active management and initial treatment of postpartum hemorrhage saves 22.44 DALYs for a cost of \$308.38 million</p>	<p>Increased screening for pre-eclampsia supported by a community advocate group would save 22.44 DALYs for a cost of \$344.58 million</p> <p>Increased community support for breastfeeding mothers (up to 50% of maternal population) would save 5.18 DALYs for a cost of \$31.74 million</p>
Political feasibility	High	Medium	Medium	Medium
Cultural feasibility	High	Medium	Medium	High
Equity	Low	Medium	High	High

⁶ Calculated using plug-in disability adjust life years (DALYs) from Adams et al. 2005, with a 7% discount rate in 2005 USD.



For the status quo, political feasibility is rated high, because maintaining the current agreement means that no extra funding or attention needs to be paid towards women's health issues, a political interest the current government may have a preference for to focus on other issues. On cultural feasibility, since this health issue affects a niche subset of the population (fertile, child-bearing women), the general public would not resist letting current trends continue since direct effects impact a smaller population. Equity is low because the status quo does not representatively serve the population and benefits the wealthy and those with access to private doctors and personalized birthing plans offered by more expensive midwives.



Figure 11: A picture of a local PONED facility in Demunglandung in West Java (DTP Puskemas Sukaraja).

As for expanding health infrastructure, building new hospitals and hiring more doctors and nurses will have political favor among constituents, but may be unpopular among the medical industry since other health issues such as HIV and cancer also need specialty facilities. Cultural feasibility is medium because increasing health infrastructure may improve the take-up of quality antenatal care in urban areas, but still faces challenges in rural areas where there is high skepticism about the necessity of high-tech medical facilities (Agus, 2012). Equity is medium because the increased number of healthcare facilities will indeed increase the availability of care – at the same time, the increased

presence alone does not necessarily reach all populations equally – low educated and poor women are still likely to choose more traditional birthing methods (Shiffman, 2000).

For the option of midwives, political feasibility is medium; although national programs geared towards training and mobilizing midwives produced high attrition in the 1980s, rural and poor women are still more likely to seek midwifery for assistance today and programs could be restructured from lessons learned (Swanubatgab et al., 2010). Cultural feasibility is medium because many pregnant Indonesian women are already used to working with midwives and often prefer them over doctors and hospitals due to cost and convenience (Sutan and Berkat, 2014). Equity is high; midwives have the flexibility to reach areas that institutional medicine cannot, therefore potentially reaching a broader base of pregnant women who need access to care the most (Webster, 2013).



Community advocacy programs are a smart choice because this option is attractive from a political standpoint and requires limited funding. It may be unpopular because it may be interpreted that the government is not doing enough explicitly to address high maternal mortality and high hemorrhaging rates (White et al.). Cultural feasibility is high; previous programs implemented in other countries like Senegal have found these programs to be very effective since they tap in to the labor and human capital of highly respected grandmothers and women in communities (Aubel, 2010). Equity is also high as the reach of these programs is based out of local communities. This program has the highest quality of reach in terms of depth of potential relationships and breadth of services that could be offered (McPake et al.).



Policy Recommendation

Given the spread of various policy options, it is recommended that UNICEF pursue community advocacy program to lower the long-term maternal mortality rate. This option is the most politically and culturally feasible, and also yields the highest gains in terms of DALYs averted.

Community advocacy programs meant to promote maternal health have the flexibility to be culturally sensitive/appropriate for each town, village, or city. Mentorship and advocacy programs such as the Grandmother Project are a strong alternative for UNICEF to sponsor because they allow the local community to take ownership of program elements. Allowing local residents and community members themselves feel invested in the well-being of pregnant women of their villages and cities is more sustainable than an artificial influx of development dollars in the form of additional hospitals built or injecting a number of midwives into a locality. This option allows for communities to adjust to awareness campaigns as they see fit, while also encouraging communities to pave their own way for decreasing maternal illness and death.

In addition, this policy option invites a resource group that has often been underutilized despite high experience and expertise – grandmothers. Grandmothers in Indonesia already have local access and are highly respected among communities. Older women are likely to have high social capital because Indonesian culture (like many South-Asian countries) places special respect and reverence for the elderly. For Indonesia specifically, it appears that grandmothers tend to live with their children, which increases the likelihood that they themselves are not working and have access to other young mothers and families in the area. Local data suggest that grandmothers are a good resource pool to tap into because many Indonesian grandmothers live with their families and are likely to be around when their children or in-laws have children.

Another benefit from having grandmothers participate in community advocacy programs is that they are highly localized and may be available to help their own children raise a child. This means that they may not only be able to help their daughters recover after birth, but could also play a key monitoring role in monitoring risk for excessive bleeding or infection after labor.



Sample Characteristics and Living Arrangements of Dyads of Grandmothers and Young Mothers

Average Age	
Grandmother	52.7
Mother	28
Average Years of Schooling	
Grandmother	7.9
Mother	13
Number of Siblings	
Grandmother	5.7
Mother	6.1
Lives with Children	
Grandmother	93
Lives with Parents and/or In Laws	
Mother	40

Figure 12: The majority of grandmothers live with their children, are less educated than their children, and had more children than siblings they grew up with. Source: Nuack & Sucklow 2006.

This policy option will entail two primary tenants in its curriculum, as these two program components are where measurable benefits can be captured:

- Increasing the number of women who are screened for pre-eclampsia, which could be critical in identifying which maternal populations may be at high risk for excessive bleeding during or after delivery;
- Encouraging at least 50% of the maternal population to exclusively breastfeed their babies for at least the first six-months of life



Implementation Strategy

This report recommends that UNICEF begin program implementation of community advocate programs by running an initial pilot program in a target city. A pilot program allows UNICEF to determine whether or not these types of advocacy programs could make a good investment, while also imposing minimal risk by testing the intervention in just one or two towns or villages. These pilot programs should plan to stay in a community for five years to steadily collect data on the impacts of this intervention.

Implementing this type of intervention will take careful planning, and UNICEF should prepare by walking through the process offered below.

- 1** Conduct current state analysis on existing healthcare infrastructure
- 2** Identify influential community leaders and build a coalition to secure trust & buy-in
- 3** Instruct grandmothers and volunteer advocates in health strategies and breastfeeding promotion
- 4** Randomly assign mentor relationships with pregnant women and establish bi-weekly check-ins
- 5** Evaluation of health indicators, including antenatal take-up rates, hemorrhaging rate, and long-term change in MMR

Figure 13: UNICEF should consider a five-step implementation model.

From an overhead stance, the program will involve learning about communities and their specific health needs, and then randomly pairing pregnant women (regardless of number of pregnancies) with grandmothers/volunteer advocates to relay health information. Grandmothers will be trained by UNICEF staff to learn the content themselves and will be given two sets of materials – one for themselves, and one for their mentees with whom they should meet regularly on a bi-weekly basis. Once a month (one of the bi-weekly meet-ups) will involve a community-wide meeting run by a UNICEF staff member or midwife who will lead a session on various pregnancy tips and will also take basic health information such as the mother's height/weight, blood pressure, etc. During these meetings, they will also check-in with women to see if they have gotten their antenatal appointments and conducted their pre-eclampsia screening. Program coordinators will encourage building long-term support



systems by fostering bonding activities between pregnant women and their partnered advisors, and also by promoting continued contact even after the baby is born.

Planning Community Advocacy Programs

UNICEF should begin by making the following key identifications during the planning process:

- **Research Team within UNICEF and possible partners:** UNICEF should evaluate its field offices to determine what localities make most logistical sense for them to run a pilot program. UNICEF has five offices in Banda Aceh, Surabaya, Kupang, Makassar, and Jayapura; program coordinators should select a primary support office based on the availability of research assistants, other resources, and the speed at which staff and resources can be mobilized to experimental sites. UNICEF should also appoint a project manager on the field and a core team of analysts who will execute and continually evaluate the program.
- **Experimental Sites:** Next, UNICEF should work with domestic data sources from the MoH to identify which regions in the country would make prime locations for the experimental study. To begin, UNICEF may consider communities in Java, Bali, Lombok, or Sumatra, where it is largely rural. For the pilot program, UNICEF should identify one or two areas with populations between 75,000-250,000 total residents.
- **Community leaders and local health professionals:** After the sites are identified, UNICEF staff should visit the community with an ethnographer who is well acquainted with the local culture (or who is willing to spend time on-the-ground to report observations). UNICEF staff should meet with community leaders and estimate the population size and run small focus groups to gain a better understanding of what specific maternal health issues the community faces.⁷ Questions may revolve around what the local status quo looks like in terms of where people deliver their babies and for what cost, information about diet during pregnancy, post-birth rituals, where new mothers go when they need help, etc. Program managers should network with local health clinics and PONADs to learn about the overall health climate, fertility, and community norms for going about a pregnancy.
- **Population of Pregnant Women:** Next, program coordinators should work with community leaders to identify the population of pregnant women who may be interested in participating in this pilot program. They should advertise participation in

⁷ UNICEF may find that many community leaders are men. They should work with local leaders to identify female leaders with clout in the community since maternal health effects women much more directly.



the program as “a limited opportunity for free health-services” to create the perception that selection is an exclusive privilege for those selected.

Once a list of women has been gathered, program coordinators should collect the following information from each of the participants who can commit to working with UNICEF for the remainder of their pregnancies to the point of delivery. This will allow them to establish a baseline to calculate the program's reach and effectiveness:

Baseline Data Points to Collect from Program Participants – Pregnant Women

Variable	Units
Respondent ID No.	Assigned
Age	Years
Education Level	Number of completed school years
Marital Status	Single/Married/Divorced/Widowed
Income	Monthly, in \$
Length of Pregnancy	Weeks
Total # of previous births	# of times delivered over lifespan
Total # of pregnancies	# of pregnancies (including abortions and miscarriages) over lifespan
# of children	# of living children currently with them

- Population of Grandmothers/Advocates:** UNICEF should then work to identify grandmothers and other individuals who would be willing to volunteer their time to mentor and advise pregnant women. While the outreach campaigns should attempt to reach the population of non-employed grandmothers first, they should open the call to other potential advocates, including women highly experienced with birth, midwives, medical students and even men if culturally acceptable. They should attempt to recruit as many volunteers as possible, collecting the following information from them:



Baseline Data Points to Collect from Program Participants – Grandmothers/Advocates

Variable	Units
Respondent ID No.	Assigned
Age	Years
Education Level	Number of completed school years
Marital Status	Single/Married/Divorced/Widowed
Income	Monthly, in \$
Gender	Male, Female, other
Total # of previous births	# of times delivered over lifespan
Total # of pregnancies	# of pregnancies (including abortions and miscarriages) over lifespan
# of children	# of living children currently with them

While UNICEF is still in the planning phase of program implementation, they should also identify which variables they will track over time to determine whether or not the program was a success or not. This list will include follow-up data points in regards to the baseline information collected above, and will most likely include the following new variables:

Data Points to Monitor and Evaluate Program Effectiveness

Variable	Units
DALYs Averted	Disability Adjusted Life Years for both mothers and infants
Antenatal Care Take-up Rate	# of completed antenatal visits throughout gestation period
Hemorrhaging Rate	% of women who experienced excessive bleeding
Premature births	Length of pregnancy in # of weeks
Baby birth weight	Kilograms
Breastfeeding rate	% of mothers who exclusively breastfeed for the first 6 months of life
Reductions in Maternal Mortality	# of maternal deaths per 100,000 live births

A “Nudge” Approach to Program Design

In line with many other multi-national NGOs (such as the World Bank) working in the development space, behavioral “nudges” can often make it easier for time and mental-bandwidth constrained individuals to make smarter choices.



According to the two authors who coined the phrase, a “nudge” is “any aspect of the choice architecture that alters people’s behaviors in a predictable way without forbidding any options or significantly changing their economic incentive... To count as a mere nudge, the intervention must be easy and cheap to avoid. Nudges are not mandates” (Thaler and Sunstein, 2008). Choice architecture is the organizational context in which people make decisions. Simply put, a nudge is a device policymakers can consider using in influencing human behavior without coercing people to make a specific choice. It is any behavioral push that requires minimal effort and make it easier to make a “smarter” choice.

Nudges center around the idea that “everything matters” in a decision-making environment, and integrate observations social psychologists and behavioral economists have been collecting data on for years regarding the not-always-rational human mind. Development agencies are beginning to expend more investment into researching behavioral insights, and this is a trend we are seeing with organizations like the World Bank taking the lead.

An excerpt from the 2015 World Development Report titled: *Mind, Society and Behavior* reads: “Since people may be powerfully influenced by the way that options are described, simple changes in descriptions of options can some- times change behavior. Policies that make it easier to reach the right decisions can sometimes boost welfare substantially and at low cost” (The World Development Report: Mind, Society, and Behavior, 2015). Nudges provide an innovative and experiment-informed mechanism for improving existing development interventions and creating new ones.

The following concepts of psychology will inform the weaving of nudges into a maternal health and breastfeeding promotion curriculum:

- **Loss Aversion:** The idea that people are more sensitive to losses than gains, even if they are in the same magnitude (Tversky and Kahneman 1991).
- **Framing Effects:** “is observed when the description of options in terms of gains (positive frame) rather than losses (negative frame) elicits systematically different choices” (Gonzalez et al. 2005).
- **Social Validation and Group Norms:** People are more likely to adhere to a certain norm if they believe their peers are also following this social rule.
- **Shifting Defaults:** People are averse to change, and inertia can be deterministic in predicting outcomes. Default options are those that are merely given and will be taken if no further action is taken by the decision maker (Thaler and Sunstein 2008).



These psychological principles will shape the way the curriculum materials offered below will be packaged and delivered to program participants – first by training grandmothers and advocates to learn this material, and then for them to relay it to their partnered advisees in a way that mentally sticks.

Developing a Maternal Health Curriculum

Using resources and curriculum already available and circulating in UNICEF offices, program coordinators should use the information extracted from local focus groups to develop a curriculum to train grandmothers and advocates. Curriculum components should include the following material:

Maternal Health Curriculum Content
<ul style="list-style-type: none">• Instructions advising what to do in certain situations, such as if the pregnant woman experiences sudden bleeding, or what to do when one’s water breaks• An explanation of the dangers of delivering at home without medical supervision<ul style="list-style-type: none">◦ A brief summary of how the national healthcare system works and the type of care they can receive for free under this health system• Promotion of healthy habits such as: exercise balanced with proper rest to reduce strain, consuming daily iron supplements and prenatal vitamins, understanding what foods are safe and which are not to consume while pregnant• Information about breastfeeding, its benefits, and latch techniques• Information about health seclusion, and warning signs that medical attention is necessary post-delivery

Delivering Health Information: Nudge Theory Applied

Taking the outlined curriculum, UNICEF should carefully consider how behavioral nudges can be applied in the context of community advocacy programs. These components should then be translated onto easily digestible, highly visual mediums such as illustrated workbooks or flipbooks. Similar to the Grandmother Project, program coordinators should produce culturally-sensitive graphics that are portable and durable (water-resistant if possible). UNICEF coordinators should also use colloquial language that does not require a high education to understand. Lastly, UNICEF should work with local leaders to, if possible, produce songs and mnemonic devices that make content easier to recall.⁸

This report offers five sample nudges to incorporate in program implementation:

⁸ UNICEF should work with the Grandmother Project to extract best practices in regards to the culture-specific content they produced for their pilots.



- 1.) Daily SMS reminders to remind women when it is time to take their iron supplements; additional reminders when it is time for an antenatal check-in/pre-eclampsia screening
- 2.) An information pamphlet given immediately after a woman learns she is pregnant (will include best practices and information encouraging women to breastfeed exclusively for one year)
- 3.) A care package given immediately after birth that includes contact information for all local health clinics, their hours, and their locations (will include FAQs for post-partum problems and identify which issues need immediate medical attention)
- 4.) Monthly community gatherings that impart trimester-specific knowledge to women and their families, while also providing basic health services in a “one-stop-shop”
- 5.) And more generally, an industry-wide shift in language to build the expectation that women will deliver in hospitals/clinics and not at home



Figure 14: A group of female midwives brandishing their mobile phones in Lombok (Hasan, 2013).

The feasibility of each of these cheap and easy-to-incorporate nudges are what make them simple additions to the larger policy intervention. For example, mobile phone penetration has increased exponentially over the past 5 years in Indonesia. In 2013, around 68 percent of the Indonesian population owned a mobile phone, and this number is predicted to have grown substantially since then (Statista, 2013). Since many women in rural communities have access to basic SMS capabilities, **sending reminder texts** to women about critical alerts such as when it is time for the next antenatal appointment could increase the number of women

who show up for all four recommended trips. Daily SMS reminders work well because they make the need to take daily supplements highly salient to women who may forget while going through the day.

The circulation of various information packets is a very traditional method of distributing health information that could lead to healthier pregnancies. UNICEF program coordinators could increase the effectiveness of such literature by **carefully considering the timing** of when such information is given out. By providing pertinent information right when women learn they



are pregnant and immediately after they deliver, healthcare providers have a better probability of reaching this target audience at the proper time. Given too early before a woman gets pregnant or too late after a woman has delivered, information may not be absorbed and quickly discarded/forgotten about.

As an added feature, these information packets should deploy language that is more likely to capture and keep a pregnant woman's attention. For example, behavioral psychology informs us that **people tend to be much more averse to loss than to gain** (Kahneman, 2013). Instead of instructing women that they will gain and improve the health of themselves and their babies, literature should instruct women that they will lose the health of their babies (i.e. "by choosing not to conduct an antenatal visit, you increase the probability that you will hemorrhage during labor, risking birth defects for the baby"). By framing the issue as losing health rather than gaining it, women will feel more obligated to act, to prevent these losses. If they feel that they already possess good health and would only gain incrementally beneficial treatment, they may not feel motivated enough to seek all of the recommended sessions of antenatal care.

The same **framing technique** should be applied to the promotion of breastfeeding; instead of listing out all of the added benefits of exclusively breastfeeding your child, informational literature should tell women they are losing the baseline of health when they choose not to breastfeed. By distributing this kind of material at the very beginning of the pregnancy, grandmothers/advocates have a higher probability of effectively instilling healthy habits from the start.

The next nudge involving bi-weekly check-ins and monthly community groups expound on the insight that **social validation is a force that can change behavior**. Depending on the number of program participants, program coordinators should try to splinter pregnant women in the community to cohort clusters based on due date. Women should network with each other during the monthly all-group meetings, and discussion facilitators should direct conversation to steer towards socially validating conversations. By speaking to other women, program participants can learn from and support each other, establishing a peer-network (if one does not already exist) in the process. UNICEF should work with local medical professionals and midwives in a rotation style to impart trimester specific information for women in the community as well, as people are more likely to remember content if it is delivered at the time it is relevant.

Lastly, UNICEF staff should work with the local medical community **to transform social norms and establish a culture** of delivering babies at hospitals or clinics and not at home. Since up to one third of young mothers in their twenties are delivering at home, this is a trend that needs to be reversed in reducing maternal mortality. By using language that implies that **all** mothers will deliver at hospitals, expectant mothers may adjust their plans accordingly in the fear of missing a social standard and non-conformity.



Conclusion

Maternal mortality is a pressing issue that not only affects the health outcomes of the child-bearing population of Indonesia, but has devastating externalities with high social and economic costs. As Indonesia's progress in cutting the maternal mortality rate has slowed down, UNICEF has a critical role in reenergizing the movement to make childbearing a less dangerous endeavor in Indonesia. This report has demonstrated that real issues such as regional disparities in access and stratification by socio-economic status have hindered the efforts of previous policy interventions. It has also shown that most causes of maternal mortality are preventable, and that inaction and the status quo are no longer feasible options to pursue if policy actors know they could avert such deaths.

Community advocacy programs are the strongest policy alternative for UNICEF to pursue because they come with great flexibility to ensure that pregnant women are receiving information in a culturally sensitive and palatable way. Such programs also increase community involvement as maternal health becomes a concern of more than just a woman and her partner, but also her neighbors and friends. This option has the potential to save lives, contribute to Indonesia's data dearth related to maternal mortality, and also add evidence-based knowledge to the larger pool of policy interventions other actors could use in different UNICEF-host countries.

In line with many other multi-national NGOs working in the development space, behavioral “nudges” can often make it easier for time and mental-bandwidth constrained individuals to make smarter choices. Adding these bonus nudges to community advocacy programs bring a refreshing twist to previously tried interventions, and could for a very low cost, dramatically increase the number of antenatal trips completed and reduce the number of women who experience excessive bleeding merely because it makes prevention that much more salient in the minds of bandwidth-constrained women.

The pilot format of this type of intervention is relatively low-risk and could accomplish great good for mothers not just in Indonesia, but around the world. UNICEF has always upheld its obligation to put children first, and by investing in maternal health outcomes, they become one step closer to solving global poverty.



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Appendix: Cost Effectiveness Discounting

Cost of Program Components of Various Policy Alternatives in 2005 USD

Intervention package	Description (coverage)	Yearly DALYs averted (millions)	Yearly cost (\$, millions)
Status Quo	–	–	–
Healthcare infrastructure	Emergency Neonatal	32	1039
Healthcare infrastructure	Referral for Hemorrhage	32	571
Improve Incentives for Midwives	Normal delivery by skilled attendant and active management and initial treatment of postpartum hemorrhage (95%)	31	426
Community Advocacy Programs	Screening for pre-eclampsia and screening for and treatment of asymptomatic bacteria (95%)	31	476
Community Advocacy Programs	Breastfeeding support (50% coverage)	8	49

Cost-Effectiveness at a Discount Rate of 7%

Option 2A: Build Health Infrastructure in the form of Emergency Neonatal Units

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Discount Factor	5.28	4.93	4.61	4.31	4.03	23.16
DALY Value	1.00	0.93	0.87	0.82	0.76	1.00
Cost (millions, USD)	5.28	4.93	4.61	4.31	4.03	23.16



NPV	-728.96
Ratio	0.03

Option 2B: Increase the number of Referrals for Emergency Hemorrhaging

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Discount Factor	1.00	0.93	0.87	0.82	0.76	1.00
DALY Value	5.28	4.93	4.61	4.31	4.03	23.16
Cost (millions, USD)	94.22	88.05	82.29	76.91	71.88	413.34
NPV	-390.18					
Ratio	0.06					

Option 3: Increase Normal Delivery by Skilled Birthing Attendant

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Discount Factor	1.00	0.93	0.87	0.82	0.76	1.00
DALY Value	5.12	4.78	4.47	4.18	3.90	22.44
Cost (millions, USD)	70.29	65.69	61.39	57.38	53.62	308.38
NPV	-285.94					
Ratio	0.07					

Option 4A: Increase Screening for Pre-eclampsia through Community Advocate Programs

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Discount Factor	1.00	0.93	0.87	0.82	0.76	1.00
DALY Value	5.12	4.78	4.47	4.18	3.90	22.44
Cost (millions, USD)	78.54	73.40	68.60	64.11	59.92	344.57
NPV	-322.13					
Ratio	0.07					



Option 4B: Increase Screening for Pre-eclampsia through Community Advocate Programs

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Discount Factor	1.00	0.93	0.87	0.82	0.76	1.00
DALY Value	1.32	1.23	1.08	0.88	0.67	5.18
Cost (millions, USD)	8.09	7.56	6.60	5.39	4.11	31.74
NPV	-26.56					
Ratio	0.16					

