



Reducing Maternal and Neonatal Mortality in Indonesia: Saving Lives, Saving the Future

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REDUCING Maternal and Neonatal **MORTALITY IN INDONESIA**

Saving **Lives**, Saving **the Future**

**Joint Committee on Reducing Maternal and Neonatal Mortality
in Indonesia**

**Development, Security, and Cooperation
Policy and Global Affairs**

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Preface

The idea for a joint study by the U.S. National Academy of Sciences (NAS) and the Indonesian Academy of Sciences (AIPI) emerged from a series of discussions held in 2010 between Sangkot Marzuki, president of AIPI, and Bruce Alberts, former NAS president, who was visiting Indonesia in his capacity as a science envoy to the Muslim world on behalf of U.S. President Barack Obama. They were seeking ways in which the United States, through its aid arm, the U.S. Agency for International Development, could assist AIPI in developing its capacity to undertake quality scientific study of key issues and to provide sound, unbiased advice to the Indonesian government.

It was decided fairly early on to focus on issues surrounding achievement of the UN Millennium Development Goals (MDGs), and particularly goals 4 and 5 dealing with maternal and infant and child mortality. Maternal mortality reduction (goal 5) was viewed as an especially important concern because it is one area in which performance has been seen by many to be lagging and where the existing programs have not appeared to be having the desired effects. The performance in reducing infant and child mortality has been judged to be considerably better, but less than adequate results have been achieved in child deaths related to and just after birth (neonatal mortality). Because of the close relationship between neonatal mortality and the other issues surrounding childbirth, it was decided to include this problem as well.

These decisions meant that there could be two tangible benefits for AIPI from cooperation: first, the ability to provide the Indonesian government with sound policy advice on an important topic and, second, an opportunity to build the capacity of AIPI to develop and mount, on its own, major policy studies meeting international quality standards.

This cooperative effort has depended on the roles played by the study cochairs and by the joint study committee. Members of the committee, with substantive contributions from both Indonesian and U.S. experts, not only prepared the substantive material contained in the report, but also participated in various meetings to plan the scope of the work, refine the draft chapters, and compile the specific recommendations that appear at the end of the report. AIPI also benefited from opportunities to recruit and train two research staff members who were funded under the project.

Although, in accordance with NAS practice, the study did not include any primary research, it was able to draw on a range of expertise in areas such as health statistics, the causes and prevention of maternal mortality, organization of health systems and functions, health service delivery and quality of care, governance issues, and health finance. The joint nature of the study committee also ensured a strong international comparative perspective, along with more detailed knowledge of specific aspects of the Indonesian experience.

Because of the specific targets expressed in the MDGs, a major finding of this study is the lack of certainty (even within a fairly wide margin of error) of exactly what has happened to maternal mortality in Indonesia over the last few decades. In the absence of an adequate vital registration system, the various survey-based estimates differ so widely and often have such large margins of error that it is virtually impossible to determine exactly where the country was in the base year of 1990 and where it is today. Short of saying that maternal mortality has almost certainly declined because of lower numbers of higher-risk births as a result of family planning and improvements in prenatal screening and birth attendance, any definitive statement on the extent of that decline cannot be made.

The results and recommendations therefore tend to focus on the known successful interventions needed to bring maternal and neonatal mortality down to levels consistent with those in more developed countries and to help provide a framework for action by the Indonesian government. Key is ensuring that the maximum possible proportion of births occur in facilities with comprehensive health care delivery facilities, including access to skilled birth attendants and adequate emergency obstetric care. This is a long-term goal in a country as vast and varied as Indonesia, but one that needs to remain at the forefront of strategic planning. Moreover, it must be accompanied by concerted efforts to improve the overall organization and management of the health care

system and service delivery, the training and distribution of the relevant personnel, the collection and application of health information, and the setting of priorities in health finance.

The MDGs have clearly helped to establish objectives and targets for all countries in improving the lives and welfare of their people, and Indonesia is no exception. Although there is still clearly a way to go, we do hope that this study makes a contribution to Indonesia in its efforts to reduce maternal and neonatal mortality to acceptable levels and serves to demonstrate the benefits that can be obtained from this kind of collaborative work between the science academies of the United States and Indonesia.

Eli Adashi and Mayling Oey-Gardiner, *Co-chairs*
Joint Committee on Reducing Maternal and Neonatal Mortality in Indonesia
of the U.S. National Academy of Sciences and the Indonesian Academy of Sciences

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This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the National Academies' Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the process.

We wish to thank the following individuals for their review of this report: Mickey Chopra, UNICEF; Jennifer Dohrn, Columbia University; Elena Fuentes-Afflick, University of California, San Francisco; Tjahjono Gondhowiardjo, Jakarta Eye Center Corporate; Wendy Hartanto, National Population and Family Planning Agency; Soewarta Kosen, National Institute of Health Research and Development, Jakarta; Henry Mosley, Johns Hopkins University; Rulina Suradi, University of Indonesia; Norman Waitzman, University of Utah; and Broto Wasisto, Atma Jaya University.

Although the reviewers just listed provided many constructive comments and suggestions, they were not asked to endorse the conclusions or recommendations, nor did they see the final draft of the report before its release. The review of this report was overseen by Eileen Kennedy, Tufts University, and Elaine Larson, Columbia University. Appointed by the National Academies, they were responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authoring committee and the institution.

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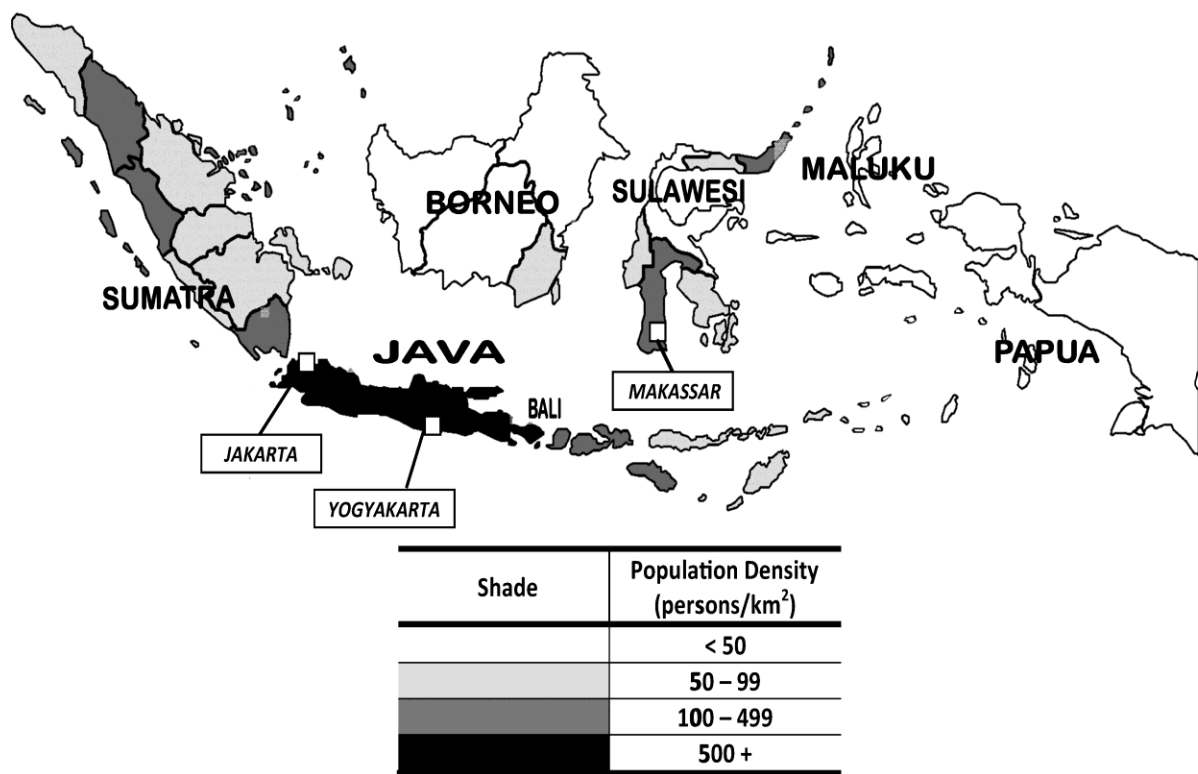
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Acronyms and Abbreviations

ASFR	age-specific fertility rate
ARR	annual reduction rate
ASEAN	Association of Southeast Asian Nations
AusAID	Australian Agency for International Development
BEmONC	basic emergency obstetric and newborn care
BPS	Statistics Indonesia (Badan Pusat Statistik)
CEmONC	comprehensive emergency obstetric and newborn care
CPM	Certified Professional Midwife
CRVS	civil registration and vital statistics
DHS	demographic and health survey
GFR	general fertility rate
HDI	UN Human Development Index
HIS	health information system
ICD	International Classification of Diseases
IDHS	Indonesia Demographic and Health Survey
IGME	UN Inter-agency Group for Child Mortality Estimation
IHME	Institute for Health Metrics and Evaluation
IMPRSSP	Indonesia Mortality Registration System Strengthening Project
IMR	infant mortality rate
KARS	Hospital Accreditation Commission (Komisi Akreditasi Rumah Sakit)
LTR	lifetime risk
MCH	maternal and child health
MDG	Millennium Development Goal
MMEIG	Maternal Mortality Estimation Interagency Group
MMR	maternal mortality ratio
MNCH	maternal, newborn, and child health
MNH	maternal and neonatal health
MSS	minimum service standard
MoH	Ministry of Health (Depkes Departemen Kesehatan)
NCTN	National Clinical Training Network (Jaringan Nasional Pelatihan Klinis)
NHA	national health account
NHHS	National Household Health Survey
NHS	National Health Survey (Surkesnas)
NIHRD	National Institute of Health Research and Development (Indonesia)
NMR	neonatal mortality rate
NSES	National Socio Economic Survey (Susenas)
ob-gyn	obstetrics and gynecology
Rp	rupiah
SBA	skilled birth attendant
TBA	traditional birth attendant

TFR	total fertility rate
U5MR	under-5 mortality rate
UNFPA	United Nations Population Fund
USAID	U.S. Agency for International Development
WHO	World Health Organization



SOURCE: Dillon Zufri, adapted from <http://siput.web.id/peta-buta-indonesia-degan-batas-provinsi/>.

Summary

The Republic of Indonesia, home to over 240 million people, is the world's fourth most populous nation. Ethnically, culturally, and economically diverse, the Indonesian people are broadly dispersed across an archipelago of more than 13,000 islands. Rapid urbanization has given rise to one megacity (Jakarta) and to 10 other major metropolitan areas. And yet about half of Indonesians make their homes in rural areas of the country.

Indonesia, a signatory to the United Nations Millennium Declaration,¹ has committed to achieving the Millennium Development Goals (MDGs). Moreover, the president of the Republic has been selected to play a key role in the design of the Post-2015 Development Agenda. However, recent estimates suggest that Indonesia will not achieve by the target date of 2015 MDG 4—reduction by two-thirds of the 1990 under-5 infant mortality rate (number of children under age 5 who die per 1,000 live births)—and MDG 5—reduction by three-quarters of the 1990 maternal mortality ratio (number of maternal deaths within 28 days of childbirth in a given year per 100,000 live births).² Although much has been achieved, complex and indeed difficult challenges will have to be overcome before maternal and infant mortality are brought into the MDG-prescribed range.

This study was conceived during a visit to Indonesia in 2010 by Professor Bruce Alberts in his capacity as a science envoy to the Muslim world on behalf of U.S. President Barack Obama. In this role, Professor Alberts visited several communities in Indonesia, meeting with national leaders, government officials, and scientists and their students to discuss the role of science in a developing country. As a former president of the U.S. National Academy of Sciences (NAS), Professor Alberts was particularly interested in working with the Indonesian Academy of Sciences (APII), to enhance its role in providing technical advice to the government and the nation. The two academies and the U.S. Agency for International Development (USAID) agreed to collaborate in a study of the long-standing problem of maternal and neonatal mortality that might help Indonesia attain the targets set by the MDGs.

The task of the academies in this project was to evaluate the quality and consistency of the existing data on maternal and neonatal mortality; devise a strategy to achieve the Millennium Development Goals related to maternal mortality, fetal mortality (stillbirths), and neonatal mortality; and identify the highest-priority interventions and propose steps toward development of an effective implementation plan. NAS and APII were also to use the study process to train APII staff so that they could independently carry out similar science policy studies in the future.

Although the defined tasks relate specifically to the MDGs and the maternal and newborn mortality ratios, the study committee recognized that efforts to regulate pregnancy through fertility control and family planning also played an important role in mitigating the mortality risk attending childbirth. For example, pregnancies among very young and older women or excessively shorter or longer intervals between births are known to carry higher risk of complications for both mother and baby. However, the committee decided to maintain its focus on the problems affecting women already pregnant, according to the MDG definition, and to the issues surrounding childbirth that cause the great majority of maternal deaths. That

¹ <http://www.unmillenniumproject.org/documents/ares552e.pdf>.

² Following common usage, we use the abbreviation MMR for maternal mortality *ratio*, the number of maternal deaths per 100,000 live births, and NMR for neonatal mortality *rate*, the number of newborn deaths per 1,000 live births. The analogous maternal mortality *rate* is obtained by dividing maternal deaths by person-years of exposure. The maternal mortality rate can be converted to the MMR and expressed per 100,000 live births by dividing the rate by the general fertility rate.

said, a brief review of the history of fertility control in Indonesia appears in the appendix to this report, and the desirability of continued support for family planning and prevention of unwanted pregnancies is included in the recommendations.

The under-5 mortality rate has three components: newborns (neonates), infants (< 1 year), and children 1–5 years of age. The clinical events that undergird maternal, fetal (stillbirth), and neonatal deaths are often the same and as such are closely linked—that is, increased risk of maternal death implies a high risk of both stillbirth and neonatal death. It follows, then, that interventions aimed at reducing the incidence of maternal mortality will also reduce the prevalence of stillbirths and of neonatal deaths. Common determinants of maternal, fetal, and neonatal mortality include but are not limited to poor access to care, the poor quality of that care, the lack of education of many women, and living in poverty. Older infants up to 5 years of age are also affected by malnutrition and infectious diseases such as malaria. Nevertheless, in Indonesia the mortality rate for older infants has improved faster than that for mothers and neonates. Given that constellation, the joint committee convened by the U.S. and Indonesian academies of sciences for this study resolved to focus on the complex of problems afflicting mothers and newborns.

Mortality rates at childbirth are also affected by the levels and age patterns of fertility. In Indonesia, a vigorous national family planning program coupled with social change (particularly in the promotion of basic education for girls) saw fertility as measured by the total fertility rate (TFR) decline by more than 50 percent from the late 1960s to the early 2000s, with the TFR reaching a level of 2.6 by 2002, according to the Indonesia Demographic and Health Survey (IDHS). This overall decline has included major declines in fertility among women at higher-risk ages, particularly those in their teens and over 40, as well as marked increases in the average intervals between births.

With little recorded change in fertility rates since 2000 and a consistent gap in the unmet need for contraception as measured by the 2007 and 2012 IDHS, there is scope for further declines in fertility that would likely have a positive impact on maternal health. These declines should be encouraged through a reinvigorated family planning program that would be an integral part of the safe childbirth services offered to Indonesian women.

The current Indonesian programs directed at reducing maternal and neonatal mortality have proven insufficient to meet the MDG targets, according to the commonly accepted data sources. Many of the actions needed must be implemented locally, in or near where people live. Because maternal and neonatal mortality and some of their major determinants vary considerably among districts and municipalities, designing locally appropriate solutions is all important for program success. One striking example is the disparity in mortality rates between the more densely populated areas of the country and those that are more sparsely populated and thus face far more substantial transport and communications challenges. Life-saving programs are generally more cost-effective where population density, personal wealth, and quality of facilities are highest, but cost-effectiveness and absolute impact must be balanced against equity in a country as geographically diverse as Indonesia. Moreover, in 2001 Indonesia adopted a decentralization policy that shifted political and budgetary power to the districts and municipalities, and so most decisions are now made at that level, which further increases the need for locally feasible and acceptable strategies.

In 1989 the Indonesian government launched a Midwifery Education Rapid Training Program to increase access to basic midwifery services in the villages. By 1998 this initiative had led to the establishment of midwifery academies with a three-year curriculum. The National Education System that followed in 2003 transferred all sectoral education programs, including health education, to the Ministry of Education. This resulted in a 15-fold increase in the number of midwifery academies. Concurrently, the number of midwives increased from 52,000 in 2006 to over 200,000 in 2012. This number of trainees exceeds the capacity of any academy to offer adequate hands-on childbirth training experience in the face of a relatively stable national birth cohort. Also, many of the midwives constituting the current workforce are products of the earlier one-year course that offered little in the way of hands-on experience with childbirth emergencies. Moreover, many of the village-bound midwives are relocating to the cities in search of patients, thereby diluting their presence in underserved rural districts. With recent statistics indicating the country's inability to effectively reduce its maternal mortality rate, the large midwife contin-

gent does not appear to be in a position to advance maternity care to the level needed to save maternal and newborn lives in Indonesia.

Most births in Indonesia still take place in the home of the mother or in a birthing room in the home of a village-based midwife. Regrettably, however, it is not usually possible to predict with high reliability when a pregnant woman will experience a life-threatening emergency during childbirth. Moreover, the system of referral and emergency transfer of the mother from home to hospital in many areas of Indonesia, especially those with a low population density, has not proven effective in saving lives.

Recommendations

The Joint Committee on Reducing Maternal and Neonatal Mortality in Indonesia of the U.S. National Academy of Sciences and the Indonesian Academy of Sciences has developed eight recommendations designed to guide future efforts to reduce maternal and neonatal mortality in Indonesia (these recommendations are described more fully in Chapter 8). The recommendations, tempered by the unique challenges of Indonesia, are based on established medical practice paradigms that have been shown to dramatically reduce mortality at childbirth in developed countries.

Recommendation 1—Facilities. Indonesia should seek to ensure that all births occur in a certified (i.e., independently accredited) facility with either basic or comprehensive emergency obstetric and newborn care (BEmONC or CEmONC) capabilities. As defined by the World Health Organization (WHO), CEmONC capabilities consist of trained doctors, nurses, and midwives who possess the abilities to perform a cesarean section, provide a blood transfusion, undertake vacuum delivery of a baby, administer magnesium sulfate and antibiotics, and render the other services necessary to remedy those conditions that most commonly cause maternal or neonatal mortality in Indonesia. BEmONC facilities, by contrast, lack the capability to perform a cesarean section and to administer a blood transfusion—the actions necessary to prevent the most common direct causes of maternal death in Indonesia. As an immediate first step toward realizing universal access to comprehensive emergency obstetric and newborn care when necessary, clear, rapid referral links should be established between certified BEmONC facilities and their CEmONC counterparts throughout Indonesia. Every effort should be made to ensure that every facility designated as a CEmONC facility has the necessary staff and equipment and that it is fully prepared to provide the required emergency obstetric and neonatal care 24 hours a day, seven days a week.

Meanwhile, some notable efforts are already under way. One is a program to upgrade the status of local health clinics (*puskesmas*) to BEmONC status. Another is a program of maternal health insurance (Jampersal). Among other things, it provides for universal free delivery services at public clinics and hospitals. These kinds of insurance schemes have been shown internationally to be instrumental in making it easier for women to give birth in health institutions rather than at home. In this regard, the latest (2012) Indonesia Demographic and Health Survey has revealed a marked increase in births occurring in health institutions. Although it may be too early to draw a definitive link between this and the current efforts, these findings could auger well for the future.

Even while actions are being taken toward achieving this goal, community health centers and midwives will continue to serve their patients. Thus the transition will be gradual and will occur only as CEmONC hospitals and BEmONC clinics, supported by effective health insurance programs, become available and gain the confidence of families. Meanwhile, ongoing mass efforts to train midwives for home delivery will create a larger number of midwives who are unable to treat the most common causes of maternal mortality and may eventually be displaced. Actions to upgrade hospitals and facilities should not be delayed because it is unlikely that further mortality reduction will be made before more women are able to give birth in accredited facilities.

The interventions needed to reduce maternal, fetal, and neonatal mortality are well known. But, with a few important exceptions, most complications leading to maternal and fetal deaths during childbirth cannot be predicted. Thus medical interventions for these complications must be readily available for all women and newborns. Because most maternal, fetal, and newborn deaths occur during labor, delivery, and the immediate postpartum period, the interventions for any complications that arise need to be readily available during labor and after delivery. Few of these interventions are available in the home, and, unfortunately, in most low-income countries many of these interventions are not available in clinics. For these reasons, this committee advocates a systems approach based on facilities with CEmONC capabilities in which all the required signal functions are available for all births.

The following recommendations deal with the major components of this system:

Recommendation 2—Strategies and Plans. Indonesia's districts vary widely in population density, personal wealth, and numbers of doctors and other health workers, as well as in unalterable features such as isolation, island geography, and transport difficulties. Within the resources of Indonesia, and probably those of any country, it is inevitable that technology and services-centered indicators such as maternal mortality ratio and neonatal mortality rates will vary. Technical strategies, implementation plans, and a road map to achieving high coverage with quality maternal and neonatal health (MNH) services should be developed across a range of Indonesia's diverse environments—all reflecting local conditions and feasible approaches over 5-, 10-, and 20-year time horizons.

Those responsible for creating an Indonesian plan to reduce maternal, fetal, and neonatal mortality should seek to reduce the disparities in pregnancy-related services and outcomes between east and west, rich and poor, and rural and urban Indonesia. A one-size-fits-all plan will not sufficiently address the significant regional and socioeconomic differences in the country. Indeed, several different strategies may be required. In allocating resources, choices will inevitably have to be made. However, these choices should be made openly, with local participation, and based on balancing the objectives of service equity and total lives saved.

The Indonesian health system was designed to be community-based. However, this approach has not reduced mortality at childbirth. At present, Indonesia has an overabundance of incompletely trained midwives who offer delivery services at home. They now face increased competition for their services and difficulty in accessing employment opportunities within the system. Because most complications cannot be reliably predicted before or during labor, they all too often go unrecognized in the home until it is too late. It follows, then, that the most promising future strategy for reducing the maternal mortality ratio (MMR) and neonatal mortality rate (NMR) in Indonesia is to ensure that most if not all deliveries are in BEmONC or CEmONC facilities. In principle, these facilities can be found in every district, and efforts must be directed at strengthening their capabilities and providing access, including transport, to all women.

Recommendation 3—System of Care. Organization of this system of care and standardization of the training and licensing of providers should be centralized under one Indonesian government agency that is represented within the central government and at the provincial, district or municipality, and community levels. Such a system should address population-based planning and the implementation of all services involved in childbirth.

Creation of a systems approach to obstetric and neonatal care would be greatly facilitated if there were greater coordination among organizations charged with training and licensing care providers, operating health care facilities, setting standards for quality of care, approving birth plans, and collecting data for monitoring performance.

Recommendation 4—Training. The system for training skilled birth attendants should be revised to include the training of physicians and nurses who specialize in emergency obstetric, neonatal, and

anesthesia services. The training of midwives should be strengthened to emphasize recognition of obstetric emergencies and the design and implementation of birth plans that include a planned birth at a BEmONC or CEmONC facility and early referral for complications.

WHO and other organizations recommend the use of skilled birth attendants for delivery. However, the training and skills of those labeled “skilled attendants” in Indonesia vary widely, and many cannot perform many interventions that are often necessary to save a life. Even the ability of the most skilled attendant to save a life is limited if no blood or antibiotics are available, or if the facilities needed for a cesarean section are not accessible. As an interim step, all midwives should be given training in neonatal resuscitation, and simple resuscitation equipment should be a standard item in the midwifery kit. In the end, however, the continued emphasis on training large numbers of birth attendants who cannot provide emergency obstetric and neonatal services and who attend deliveries at home or in non-BEmONC and non-CEmONC facilities will not result in substantial further reductions in maternal mortality in Indonesia.

Recommendation 5—Financing. Sufficient and effective financing mechanisms for obstetric and newborn services should be established under the supervision of the government of Indonesia to ensure universal access to quality MNH care and strengthen the organization of that care. These mechanisms should include sufficient overall funding for the needed services; the appropriate incentives for women to deliver at a certified facility capable of providing optimal care and for providers to reduce unnecessary or inappropriate care; and effective monitoring and accountability mechanisms to plan and track financing, including some mechanisms for peoples’ participation.

The government of Indonesia has made significant efforts in recent years to increase its spending on health and to focus more of that spending on the poor and on priority health needs. However, without greater efforts to reform reporting and accountability, the government will continue to find it difficult to identify and remedy the bottlenecks hindering the translation of increased spending into better birth outcomes.

Recommendation 6—Data. Making the appropriate decisions about programs likely to reduce maternal, fetal, and neonatal mortality rates in Indonesia and allocating resources appropriately will require the collection of high-quality data on the relevant rates and causes of mortality. These data must be routinely collected nationwide in a standardized manner and used routinely and frequently at the local level for improving the quality of programs and at the national level for planning programs and allocating resources.

Presently, Indonesia relies on data from periodic household surveys to obtain official measures of maternal-, neonatal-, and child health-related deaths. However, these surveys may lack the necessary sample sizes or the most reliable methods to determine mortality rates and must therefore rely on estimations and model-based adjustments that yield a wide range of values. Thus these surveys do not provide the precision and reliability needed to guide decisions optimally at the national and district levels. Nor can they provide the timely guidance needed to achieve rapid progress in programs and policies.

Ultimately, a comprehensive vital registration system, including registration of maternal and neonatal deaths, is the only way to fully provide the kinds of statistically valid data required for planning and monitoring, particularly at the regional and local levels. Initially, strong support should be offered to efforts such as the Indonesia Mortality Registration Strengthening Project under the Ministry of Health. This support might take the form of follow-up and training activities directed at local governments to build understanding and capacity. In the end, a broader commitment to and cooperation in building the system will be required from a range of key stakeholders, including the Ministry of Health, Ministry of Home Affairs, Ministry of Finance, Ministry of State Apparatus Utilization and Bureaucratic Reform, and Statistics Indonesia.

Recommendation 7—Community Involvement. Health care at the community level has many strengths, including the women's volunteer committees, *posyandus* (integrated health posts), and the

district health departments. These organizations could make a greater contribution to lowering maternal and infant mortality by supporting the creation and execution of certified birth plans. Such plans would include facilitating transportation and utilizing antenatal care services, immunization, and contraception optimization for all women and children and, most important, planning delivery in a certified BEmONC or CEmONC facility. These volunteer committees should be integrated into an overall system designed for the provision of services for women and newborns.

Maternal health insurance that provides for free or very low-cost birthing service at health facilities (particularly those with BEmONC or CEmONC capacity) should be encouraged and strengthened to support these community-based initiatives.

Recommendation 8—Education and Empowerment. Programs that encourage the education and empowerment of girls and young women in general and relating to childbirth issues in particular should be strengthened. This high-priority initiative must include clearly measurable and frequently assessed indicators of progress, with additional resources provided whenever needed. In addition, a reinvigorated family planning program should constitute an integral part of safe childbirth services offered to Indonesian women to reduce the number of high-risk pregnancies associated with unwanted births, the number of underage and overage mothers, and very short and very long birth intervals.

In Indonesia, over 60 percent of the women who die in childbirth have not had the benefit of a primary education. The desires, knowledge, and decision-making power of the mother are critical factors in family decisions regarding safe childbirth. Educating girls and young women saves lives by enabling a mother to make better decisions, by empowering her in her dealings with other family decision makers, and by giving her the knowledge she needs to effectively nourish and care for her infant.

The committee believes that the recommendations made offer Indonesia the greatest likelihood of practical success. The world is divided between countries with an MMR under 20 per 100,000 live births and those with an MMR over 200. Some developing countries are in the former group, such as Sri Lanka and Malaysia. What these countries have in common is that they have adopted a program that corresponds to recommendation 1: enabling all women to give birth in suitable facilities (CEmONC or BEmONC). Most of the latter group of countries, not unlike Indonesia, promote home births attended by midwives or traditional birth attendants. This approach has thus far failed to maintain the expected rate of improvement in Indonesia. Accordingly, this committee believes that Indonesia is likely to be best served by investing in the future in facility-based services, with the improvements suggested in the recommendations.

Chapter 1

Introduction

The United Nations Millennium Summit, held during the 55th session of the United Nations General Assembly in 2000, called for a coordinated global effort to reverse the poverty, hunger, and disease that affect billions of people (United Nations General Assembly, 2000). In 2002 the UN's secretary-general commissioned the United Nations Millennium Project with an eye toward developing a concrete action plan to achieve certain Millennium Development Goals (MDGs) by 2015. In 2005 a blueprint document, *Investing in Development: A Practical Plan to Achieve the Millennium Development Goals*, was approved by all member states and the leading development institutions (UN Millennium Project, 2005). The eight MDGs that emerged covered issues related to education, poverty, health, environmental sustainability, and international cooperation, and they were assigned quantitative targets to be achieved by the 2015 deadline. The MDGs were then adopted by nations and international development agencies as benchmarks for improving the human condition. The upcoming deadline of 2015 thus figures heavily in national planning efforts.

The MDGs and Indonesia

The Republic of Indonesia, home to over 240 million people, is the world's fourth most populous nation. According to the UN Human Development Index (HDI),¹ in 2012 Indonesia ranked 121st out of 185 countries in human development. However, over the last 20 years the rate of improvement in Indonesia's HDI ranking has exceeded the world average. This progress may be attributable in part to the fact that Indonesia has put considerable effort into meeting the MDGs, and especially MDGs 4 and 5, which target maternal and child health. This report is intended to be a contribution toward achieving these two Millennium Development Goals:

MDG Target 4.A: Reduce by two thirds, between 1990 and 2015, the under-five mortality rate, the number of children who die under the age of five per 1,000 live births per year.

MDG Target 5.A: Reduce by three quarters the maternal mortality ratio (MMR). The MMR is defined as the number of women who die during pregnancy and childbirth per 100,000 live births per year.

The definitions of the MDGs raise several methodological and policy issues for researchers and policy makers. Because the baseline is set at 1990, the data from that year should be as accurate as the data to be derived in 2015. Determining whether the MDGs have been achieved may therefore entail improving the reporting rate and precision of the data, which in itself is likely to produce a short-term increase in the ratios because of earlier undercounting, even as more lives were being saved. This possibility is suggested by the fact that figures for Indonesia publicly reported for the under-5 mortality ratio in 1990 ranged from

¹<http://hdr.undp.org/en/statistics/hdi/>.

71 (UN Inter-agency Group for Child Mortality Estimation, IGME) to 86 (Institute for Health Metrics and Evaluation, IHME), and for the maternal mortality ratio from 404 (IHME) to 600 (Maternal Mortality Estimation Interagency Group, MMEIG). The issue of data accuracy is discussed further in Chapter 2 (see Table 2.9).

Overall maternal and neonatal mortality depend on two factors, the mortality rates per live births and the number of births, based on population and the fertility rate. Since the late 1960s, Indonesia has seen fertility (as measured by the total fertility rate, TFR) decline by more than 50 percent, from 5.6 to 2.3, based on census and intercensal survey sources. This decline has stemmed in part from the implementation of a vigorous family planning program starting in the mid-1970s and to social and economic change, particularly massive improvements through the 1970s and 1980s in basic education for girls affecting the total number of births.

The family planning projects of the 1970s and 1980s also saw significant declines in fertility at the youngest and oldest ages and in the shortest birth intervals—conditions that coincide with the highest risk of mortality in childbirth. Those declines alone would have led to a reduction in the mortality rates, but fertility rates have been static since the mid-1990s, and changes in mortality must be attributed in large part to other factors entering into the calculation of mortality ratios. The challenge presented by the MDGs coincides with the focus needed to further reduce the tragic and avoidable loss of life. This is not to minimize, however, the importance of fertility reduction programs; they should be an integral part of the safe childbirth services offered to Indonesian women (see the appendix for more on fertility reduction and family planning).

For the policy maker, an interesting aspect is the timing. The United Nations Millennium Summit declaration was issued in 2000, which should have spurred new efforts to meet the MDGs. Consequently, the rate of improvement of the indexes after 2000 may well be assumed to be a measure of the effectiveness of new efforts aimed at meeting the MDGs. However, in Indonesia and some other countries the rate of improvement actually declined after 2000 (see Chapter 2, Figures 2-3A and 2-3B).

One reason may be the excessively high maternal mortality estimates in 1990, which were then refined in 2000. But, by definition, achievement of the MDGs by 2015 depends directly on the relative progress made since 1990. Agencies whose estimates of maternal mortality and under-5 mortality in 1990 are high tend to report more “progress,” and therefore more probability of achievement of the MDGs by 2015, even where there is little disagreement on the mortality rates in 2010. These realities, the quality of the 1990 data, and their refinement in 2000 all but preclude, then, a meaningful assessment of where Indonesia might be on the road to achieving MDGs 4 and 5.

The under-5 mortality rate is attributable to a diversity of causes that affect neonates, infants, and children from ages 1 to 5 in different ways. These causes include maternal and infant nutrition, accidents, childbirth emergencies, and infectious diseases such as malaria. Furthermore, between 1990 and 2010 in Indonesia greater relative progress toward MDG 4 was made for the under-5 and infant mortality rates, which improved by more than 50 percent, than for the neonatal mortality rate (NMR), which improved by less than 40 percent (see Table 2-6 in Chapter 2). The maternal mortality ratio also improved by about 40 percent, according to Indonesian government data.

The medical conditions that cause maternal, fetal (stillbirth), and neonatal deaths are often the same. An elevated risk of maternal death implies a high risk of both stillbirth and neonatal death. Thus interventions aimed at reducing maternal mortality will frequently reduce stillbirths and many neonatal deaths. Causes of increased maternal, fetal, and neonatal mortality include poor nutrition, living in poverty, poor access to care, and poor quality of care. As noted, the poor quality of care and unsafe conditions that jeopardize the life of the mother are more likely to jeopardize the fetus and newborn as well. In high-income countries, the availability and utilization of the appropriate medical care for mothers and newborns have in recent decades reduced maternal, fetal, and neonatal mortality each by 90 percent or more and have the potential to do the same in low- and middle-income countries. The joint study committee (described later in this chapter) decided to concentrate in this report on the lagging neonatal mortality rate, together with maternal mortality. Details of the medical causes of maternal and neonatal mortality,

both direct (complications of pregnancy and unsafe or inadequate obstetric practices) and indirect (preexisting or non-obstetric conditions), are presented in Chapter 3.

Indonesian Health Care System

Despite decades of governmental exhortations and programmatic support, a large number of births in Indonesia still take place at home. Most home births are attended by midwives or traditional birth attendants, but they frequently lack the skills and experience needed to save lives in the face of obstetrical emergencies. Patients who require emergency services encounter a hierarchy of community health facilities that refer highly complex cases to more capable facilities, thereby losing critical time in the process. Hospitals sometimes defend their poor records of maternal and neonatal fatalities by pointing out that many of the patients needing their services arrive too late to be saved. However, at times these very hospitals lack the staff, skills, medicines, or equipment required to save lives. The present Indonesian health system and factors related to choice of birth venue are described in Chapter 4, and quality of care issues are discussed in Chapter 5.

Indonesia is an island archipelago. The implications for the timely transport of patients to an emergency health facility are therefore self-evident and highly challenging. Maternal and neonatal mortality rates vary widely among Indonesia's provinces and districts, many of which are sparsely populated and unable to afford rapidly accessible care for the entire population. In this respect, Indonesia may always be at a disadvantage in meeting the MDGs when compared with smaller, more compact countries with more inclusive land communication. Going forward, the Indonesian government will likely face the difficult choice of whether to direct limited resources to highly populated provinces where more lives can be saved, or to sparsely populated—indeed remote— island-rich provinces where higher mortality rates may be the norm.

The impact of the geography of Indonesia was brought front and center in 2000 when the Indonesian government introduced decentralization reform that shifted the major responsibility for health care to the district governments. Nearly all purchasing power and staffing that had resided with the central government were placed in the hands of the roughly 500 districts and municipalities throughout the country. Decentralization has increased the difficulty of establishing coordinated national health programs and accounting for health funds. And yet it has provided Indonesia with an opportunity to redress issues of inequity between areas of high and low population density by shifting many health funding decisions to the local level. The consequences of the present system of governance are further described in Chapter 6.

Finally, there is the problem of financing and cost. The costs of training health care workers and of supporting hospitals and community health centers are paid through complex financing mechanisms involving central government ministries, district governments, and households. A national insurance program covers childbirth, but it does not yet serve all families. Hospitals complain that the decentralized system requires them to provide services, but with insufficient funds or for inadequate fees. Even families served by public health facilities that should be offering services at no cost find that payment is required, and often the necessary care is delayed. These financing challenges are described in more detail in Chapter 7.

Finally, the recommendations of the committee are presented and discussed in Chapter 8.

The Role of the Science Academies

Many agencies and institutions are helping the Indonesian government meet the MDGs. Some of these organizations are international in scope, such as the World Health Organization (WHO), Organisation for Economic Co-operation and Development (OECD), and World Bank. Others are bilateral development agencies, such as the U.S. Agency for International Development (USAID) and the Australian Agency for International Development (AusAID), or are nongovernmental organizations (NGOs), such as Save the Children. And some are private, such as John Snow International. In addition, researchers from

universities and research organizations, both Indonesian and foreign, are carrying out studies independently or in collaboration with one of these organizations. These researchers and organizations collect and analyze data, publish papers in peer-reviewed scientific journals, and actively provide resources and services directly to patients and health care facilities in Indonesia.

This study is of a different type. The two collaborating organizations are the national science academies of their respective countries. Both are nongovernmental scientific organizations whose members include the most distinguished researchers in the country and, in the case of the U.S. National Academy of Sciences, the world. Both publish peer-reviewed journals, as well as organize and publish the proceedings of important scientific meetings. The academies do not carry out original scientific research, but their members are usually best known for the research they conduct at their home institutions.

When requested, the academies advise governments and international organizations on science policy issues. This advice usually takes the form of formal published reports, such as this one, that have been prepared by a panel of experts who were selected for their knowledge of and experience in all aspects of the topic, for their independence, and for balance among those with potential biases based on employment or investment.

The objective of this report is to provide the best possible recommendations for actions that might be taken to reduce maternal and neonatal mortality in Indonesia. These recommendations are based on the reported information, published data, available evidence, and knowledge gained in the course of the study from patients, families, midwives, government officials, scientists, and health care providers. They are derived by consensus of the authors of the report, identified as the members of the committee. For this reason, the academies refer to a document such as this one as a “consensus report.” When the data are unreliable or contradictory, or when populations, officials, and health providers disagree, a consensus report takes all such challenges into account and produces recommendations the committee believes will provide the best guidance available under the circumstances.

This joint study was carried out by the Indonesian Academy of Sciences (APII) and the U.S. National Academy of Sciences (NAS)—see the description on page iii of APII and of the three academies that compose the U.S. National Academies, together with the National Research Council, its operating arm for consensus studies. The National Academies of the United States have a mandate to serve as “Advisors to the Nation on Science, Engineering, and Medicine.” In this context, the National Academies publish about 250 study reports a year, nearly all financed by the U.S. government. A volunteer committee of experts selected by the Academies for the task at hand authors each consensus study. The members of the committee, who are approved by the president of NAS, are assisted by experienced, PhD-level staff. The draft report is reviewed by a different group of experts. The study committee is required to respond to all of the revisions suggested by the reviewers, although not necessarily to accept them (see the Acknowledgments section for the reviewers of this study). The resulting publications are widely respected and frequently serve as guides to action by Congress and the White House. Similarly, APII has access to the best scientific experts in Indonesia. During the course of this study, APII staff underwent training in producing consensus studies with National Academies staff in Jakarta and Washington.

Statement of Task

The statement of task adopted by the committee was as follows:

The United States National Research Council and the Indonesian Academy of Sciences will together form an expert study committee that will carry out the following tasks:

1. Compile and evaluate the quality and consistency of existing data relating to maternal and neonatal mortality. This will include time and space incidence of fatalities, causes of death, interventions implemented, their coverage and effectiveness, and identification of gaps.

2. Devise a strategy utilizing evidence-based decision-making to achieve the Millennium Development Goals relating to maternal, neonatal mortality, and stillbirth in Indonesia. Elements of the strategy may include facilities, technologies, human resources, finances, and quality assurance.
3. Identify the highest priority interventions and propose steps toward development of an effective implementation plan.
4. Use the study process and a special internship to train the staff of the Indonesian Academy of Sciences to enable it to independently carry out similar science policy studies in the future. An expert will design and assist staff to use a project accounting system for donor funded projects.

The resulting report will be externally reviewed in accordance with the procedures of the National Academies' Report Review Committee, and published in English and Indonesian. Once the report is published, members of the committee will be available to discuss the recommendations in public forums and to brief public officials.

Methodology

The full joint committee met in person three times, twice in Jakarta and once in Washington, and also convened via teleconferencing. Members met as well in smaller groups. During the full joint committee meetings, members heard presentations from Indonesian government officials, health service providers, academic experts, and representatives of international agencies and NGOs (see the Acknowledgments section for a list of the outside participants in the committee meetings). These presentations permitted the joint committee to hear the views of those responsible for the formulation and implementation of government policy and their international partners. The joint committee also visited hospitals and community health centers near Jakarta and Makassar, and spoke with patients, doctors, and midwives in order to learn more about the experiences of patients and providers.

In addition, joint committee members and consultants reviewed and evaluated the existing evidence, current knowledge, experience of other countries, published survey results, and other data. The committee also took into account the activities of other organizations working in Indonesia and their reports and recommendations for future action.

No primary data were collected for this study.

Recommendations

The eight recommendations of the joint committee appear in full in Chapter 8. (Other chapters include technical recommendations that seek to improve specific operational aspects of maternity and birth services.) In the joint committee's recommendations, maternal and neonatal care are treated together—situations unsafe for the mother put the newborn at risk, and actions to protect the mother's life will normally protect the infant as well. The recommendations fall into three categories: (1) accessibility to health care facilities; (2) improvements in the system of health care for pregnancy and delivery in Indonesia; and (3) the broader issues of an expanded role for existing women's volunteer organizations and district health departments and stronger programs for the education and empowerment of girls.

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Chapter 2

The Data Conundrum

In most countries, statistics on births, deaths, marriages, divorces, and fetal deaths are recorded by means of the government's civil registration system, which creates a permanent record of each event. The records derived from civil registration systems have two main uses: (1) as personal legal documents available to citizens as proof of facts; and (2) as the data basis of a country's vital statistics system. Vital statistics are used to derive the fundamental demographic and epidemiological measures needed for national planning across multiple sectors such as education, labor, and health. They are also critical to a wide range of government activities and commercial enterprises. In the health sector, vital statistics are the core of a country's health information system. Although civil registration records are the best source of vital statistics, such systems are often weak or incomplete in developing countries (WHO and SPH-UQ, 2010).

Data Sources for Estimating Mortality in Indonesia Health Information System and Civil Registration and Vital Statistics System

Indonesia has a health information system (HIS), but it is inadequate for policy formulation and allocation purposes (CDI and MoH, 2007). The civil registration and vital statistics (CRVS) systems in Indonesia are also weak and require substantial improvement in all areas (NIHRD, 2012). HIS is used for yearly budget and resource allocation, including the distribution of drug and health equipment. To the extent that the available information is inadequate or not utilized by health care providers, the health care system cannot be viewed as optimal.

Where the civil registration system is itself inadequate, it is sometimes necessary on an interim basis to use alternative data sources to generate vital statistics. Examples of such sources are population censuses, household sample surveys, demographic surveillance in sentinel sites, and sample registration systems. Information related to maternal and neonatal mortality in Indonesia still relies on alternative sources of data, mostly the sample household surveys.

Facility-Based and Community-Based Data Sources

The availability of measures related to maternal, newborn, and child health (MNCH), such as the maternal mortality ratio (MMRatio), maternal mortality rate (MMRate), neonatal mortality rate (NMR), and infant mortality rate (IMR),¹ should ideally be provided by the national health information system. Data for that system can be derived from both facility-based and community-based data sources.

¹The MMRatio is the number of maternal deaths per 100,000 live births in a year. The MMRate is the number of maternal deaths per 1,000 women of reproductive age (15-49) in a year. The NMR is defined as the probability of dying within the first month of life. The IMR is calculated as deaths between birth and the exact age of one year, per

Facility-Based Data for MNCH-Related Measures

The inadequate health information system in Indonesia is attributable, at least in part, to the limitations of facility-based data sources. These limitations may arise from the incomplete coverage of the system, the inadequate management of the system, or the uncritical use of limited data sources. Incomplete coverage of mortality related to MNCH as captured by health facilities translates into the lower than expected rates reported by surveys.² A Maternal Perinatal Audit Program³ and the implementation of PWSKIA⁴ as a surveillance tool may provide the basic data required to measure maternal and neonatal mortality rates. However, such measures derived from these data sources produce estimates lower than those generated by survey-based data.

Community-Based Data: Household Surveys

When service- or facility-based data are inadequate for policy and allocation purposes, alternative methods are needed to measure maternal and neonatal mortality. Often, data can be derived from sample-based household surveys. Examples of surveys used to obtain measures of mortality and cause of death are the Indonesia Demographic and Health Survey (IDHS), National Socio Economic Survey (NSES or Susenas), Population Census (Statistics Indonesia), National Household Health Survey (NHHS or SKRT), National Health Survey (NHS or Surkesnas), and Basic Health Survey (Riskesdas) by the Ministry of Health (MoH).

The IDHS has been conducted six times—in 1991, 1994, 1997, 2002-2003, 2007, and 2012 (CBS et al., 1992, 1995, 1998; Badan Pusat Statistik and ORC Macro, 2003; CBS and MI, 2008; Badan Pusat Statistik et al., 2012). IDHS data have been used by the government of Indonesia to report information on maternal and neonatal mortality.

Estimates of MNCH-Related Rates

Maternal Mortality Ratio

Officially, the maternal mortality ratio is derived from the IDHS by employing the sibling technique.⁵ The IDHS provides national estimates of the MMRatio and the MMRate over the five years preceding the survey. The IDHS is unable to provide regional estimates because of the small sample size of the survey and the limitations of the measuring method. The results indicate that the MMRatio declined from 390 deaths per 100,000 live births during 1989-1994 to 230 deaths per 100,000 live births during

1,000 live births and estimates the probability of dying the first year of life. These abbreviations differ from those used in the rest of the report to clarify the difference between rate and ratio.

²For example, the 4,662 maternal deaths reported to the Ministry of Health by district health offices and the 4,017,696 live births recorded in 2010 result in an MMRatio of 116 deaths per 100,000 live births. This measure is much lower than that based on surveys.

³The Maternal Perinatal Audit Program carefully reviews and evaluates the care received by pregnant women, their unborn babies, and their neonates, as well as maternal deaths.

⁴PWSKIA (Pemantauan Wilayah Setempat Kesehatan Ibu dan Anak) is the local area monitoring system for maternal and child health.

⁵This approach maximizes use of information on the age of surviving siblings, the age at death of siblings, and the number of years ago the sibling died. It allows the data to be aggregated in order to determine the number of person-years of exposure to a mortality risk and the number of sibling deaths occurring in defined calendar periods. The rate of maternal mortality is obtained by dividing maternal deaths by person-years of exposure. The MMRate can be converted to the maternal mortality ratio and expressed per 100,000 live births by dividing the rate by the general fertility rate (GFR). The approach measures only pregnancy-related mortality (with no realistic possibility for verbal autopsies), is based on a small number of cases and may underestimate overall mortality (and thus pregnancy-related mortality).

2002-2007, for an annual reduction rate (ARR) of about 4.1 percent (see Table 2-1). An average ARR of 5.5 percent is needed to meet the Millennium Development Goal (MDG) 5 target of a 75 percent reduction from 1990 to 2015.

Because IDHS calculations are based on a very small sample of maternal deaths (Table 2-1), the decline in the MMRatio provided by the IDHS should be interpreted with caution, as should the increase reported for 2012. Maternal mortality ratios (derived from the IDHS, 1994, 1997, 2002-2003, 2007, and 2012) are associated with high sampling errors and overlapping confidence intervals, thereby making it impossible to conclude that a decline in the MMRatio has in fact taken place.

Other methods of estimating the MMRatio have been developed by groups established by international organizations. Two groups recently published MMRatio estimates for Indonesia: the Institute for Health Metrics and Evaluation (IHME) and the Maternal Mortality Estimation Interagency Group (MMEIG). The two groups rely on their own methodologies, which include regression models.⁶ Both groups used similar data sources from each country to estimate the number of maternal deaths. However, they arrived at different estimates and consequently different conclusions (IHME, 2011; MMEIG, 2012).

Table 2-2 contrasts the two maternal measures reported by IHME (see Lozano et al., 2011) and MMEIG for Indonesia. For 2011, IHME imputed an MMRatio of 245 deaths per 100,000 live births, with a range of uncertainty of 189-311 per 100,000, and MMEIG reported an MMRatio of 220 deaths per 100,000 live births, with a range of uncertainty of 130-350 per 100,000. Based on an estimated MMRatio in 1990 of 600 deaths per 100,000 live births, MMEIG (2012) calculated an ARR of -4.9 percent in the MMRatio between 1990 and 2010 and concluded that Indonesia has made progress on maternal health, even though estimates of the MMRatio between 1990 and 2010 had a wide sampling error. By contrast, IHME concluded that it is unlikely, starting from a lower value in 1990 with an ARR of -2.4 percent, that Indonesia will achieve the MDG 5 target (Lozano et al., 2011).

TABLE 2-1 Estimated Maternal Mortality Ratio, Indonesia: IDHS, 1994-2012

IDHS	MMRatio	Time reference	ARR (%) ^a	Basis Number of Maternal Deaths for Estimate
1994	390	1989-1994	5.2	107
1997	330	1993-1997	2.6	Not reported
2002-2003	300	1997-2002	5.3	73
2007	230	2002-2007	-8.8	62
2012	360	2007-2012	—	92

^aCalculation for subsequent surveys.

NOTE: Based on the sibling approach (direct sisterhood method). ARR = annual reduction rate.

SOURCE: Indonesia Demographic and Health Survey (IDHS), 1994, 1997, 2002-2003, 2007, 2012.

⁶A comparison of the regression models employed by the IHME and MMEIG follows:

Model Dependent variable	IHME	MMEIG
	Linear + space time MMRate (ln) by age group	Multilevel Fraction of MM (log), all ages
Treatment of HIV	Model-based	Estimated deaths separately
<i>Covariates</i>		
GDP	Yes	Yes
Education	Yes	No
Total fertility rate	Yes	Yes
HIV	Yes	No
Health services	Neonatal mortality	Skilled birth attendant
Model validation	Yes	No
Uncertainty	Yes	Yes

TABLE 2-2 MMEIG versus IHME Estimates of Maternal Mortality Ratio: Indonesia, 1990-2010

Approach	Estimated MMRatio			Annual change in MMRatio (%)	MDG target attainment
	1990	2000	2010		
MMEIG	600	370	220 (130-350)	-4.9	Making progress ^a
IHME	404 (365-446)	333 (299-365)	245 ^b (189-311)	-2.4 ^c	No ^d

^aMDG target may or may not be achieved.

^b2011.

^c1990-2011.

^dUnlikely MDG target will be achieved.

NOTE: MMEIG = Maternal Mortality Estimation Interagency Group; IHME = Institute for Health Metrics and Evaluation; MDG = Millennium Development Goal.

SOURCES: MMEIG; IHME; Lozano et al. (2011).

Indonesia's population census, last conducted in 2010, also collected information on mortality in each household for the period January 2009-May 2010 (the census date). Information on mortality included gender and age at death of the deceased. If the deceased was a female and over 10 years old at death, further information was collected on whether the death occurred during a pregnancy, birth, or postpartum period. This information made it possible to identify pregnancy-related deaths that occurred over the period January 2009-May 2010.

Information on pregnancy-related deaths provided by the 2010 census can be used to directly estimate maternal mortality measures (MMRatio and MMRate), even though deaths were underreported in the census and should therefore be corrected. Use of the Brass Growth Balance Method (United Nations, 1983) for estimating data completeness revealed that a correction factor of 2.3 was needed to estimate the number of deaths of those aged 15 years and up (Soemantri, 2012). The correction factor of 2.3 was also used to correct the number of pregnancy-related deaths. Incorporating this correction, Table 2-3 provides estimates of the MMRatio and MMRate and the number of maternal deaths for all Indonesia and by region. The national MMRatio is 263 maternal deaths per 100,000 live births, ranging from the low of 222 per 100,000 for Java-Bali to the high, 430 per 100,000, for Sulawesi. The national estimate of the MMRatio using a different approach is a similar figure, 259 deaths per 100,000 live births (Hartanto, 2012). Hartanto also reports a wide variation in MMRatios by province, ranging from a low of 124 deaths per 100,000 live births for Bali and a high of 1,180 deaths per 100,000 live births for West Papua.

As part of their global progress report on MDGs 4 and 5, Lozano et al. (2011) have produced model-based estimates for Indonesia of the MMRatio and number of maternal deaths in 1990, 2000, and 2011, as well as annual reduction rates for the periods 1990-2000, 2000-2011, and 1990-2011 (Table 2-4). The most recent interval estimates (2011) of the MMRatio (189-311 deaths per 100,000 live births) and number of maternal deaths (8,200-13,500) are statistically not different from the corrected estimates based on the 2010 population census: MMRatio, 263 deaths per 100,000 live births; number of maternal deaths, 12,400. The figures of the 2010 population census are within the interval of model-based estimates.

TABLE 2-3 Direct Estimates of Number of Maternal Deaths, Maternal Mortality Rate, and Maternal Mortality Ratio by Region: Indonesia, 2010 Population Census

Maternal Measure	National	Region				
		Sumatra	Java-Bali	Kalimantan	Sulawesi	Eastern Indonesia
Total deaths	12,390	2,820	5,610	870	1,630	1,460
MMRate	19	21	14	23	35	36
MMRatio	263	251	222	290	430	382

SOURCE: Corrected calculation based on underreported pregnancy-related deaths of 2010 population census by S. Soemantri.

TABLE 2-4 Model-Based Estimates of Maternal Mortality Ratio, Number of Maternal Deaths, and Annual Reduction Rate: Indonesia, 1990-2011

MMRatio			Maternal deaths			ARR (%)		
1990	2000	2011	1990	2000	2011	1990-2000	2000-2011	1990-2011
404 (365-446)	333 (299-365)	245 (189-311)	19,300 (17,000-21,300)	15,200 (13,700-16,700)	10,600 (8,200-13,500)	1.9 (0.5-3.4)	2.9 (0.4-5.3)	2.4 (1.2-3.7)

SOURCE: Lozano et al. (2011).

Childhood Mortality Estimates

Maternal deaths are very rare events compared with childhood deaths. The MMRatio derived from the Indonesia Demographic and Health Survey relies on a very limited number of sample cases, thereby yielding a very wide range of estimates. However, childhood mortality estimates from the IDHS may provide a more stable estimate of neonatal, infant, and under-5 deaths. Table 2-5 shows direct estimates of the neonatal mortality rate (NMR), infant mortality rate (IMR), and under-5 mortality rate (U5MR) from the six IDHS surveys, employing the birth history approach. The IDHS provides estimations that refer to three periods: 0-4 years, 5-9 years, and 10-14 years preceding the survey. Table 2-5 also depicts the percentage contribution of the NMR to the IMR and U5MR. Figure 2-1 presents, in ln scale, the neonatal mortality rate, infant mortality rate, and under-5 mortality rate as derived from the six IDHS surveys. Figure 2-2 presents the percentage contribution of neonatal deaths to infant and under-5 deaths.

TABLE 2-5 Direct Estimates of Childhood Mortality and Percentage Contribution of Neonatal Mortality Rate to Infant Mortality Rate and Under-5 Mortality Rate, Indonesia: IDHS, 1991-2012

Year of IDHS	Time Period (number of years preceding survey)	Time Reference	Direct Estimates of Childhood Mortality (per 1,000 live births)			% Contribution of NMR to	
			NMR	IMR	U5MR	IMR	U5MR
1991	0-4	1988.5	32	68	97	46.8	32.5
	5-9	1983.5	36	80	116	44.5	30.7
	10-14	1978.5	41	82	123	50.4	33.6
1994	0-4	1991.5	30	57	81	53.3	37.4
	5-9	1986.5	34	75	103	45.8	33.3
	10-14	1981.5	37	75	110	49.5	33.9
1997	0-4	1994.5	22	46	58	47.7	37.5
	5-9	1989.5	28	59	83	48.4	34.3
	10-14	1984.5	28	65	95	43.4	30.0
2002-2003	0-4	1999.5	20	35	46	57.1	43.5
	5-9	1994.5	26	51	63	51.0	41.3
	10-14	1989.5	29	59	79	49.2	36.7
2007	0-4	2004.5	19	34	44	55.9	43.2
	5-9	1999.5	23	44	58	52.3	39.7
	10-14	1994.5	28	53	69	52.8	40.6
2012	0-4	2009.5	19	32	40	59.4	47.5
	5-9	2004.5	20	35	45	57.1	44.4
	10-14	1999.5	23	45	58	51.1	39.7

SOURCE: Indonesia Demographic and Health Survey (IDHS), 1991, 1994, 1997, 2002-2003, 2007, 2012.

It is apparent that during the last two decades lowering the NMR was more difficult than lowering the IMR or U5MR (Figure 2-1). The difficulty in lowering the NMR is also reflected in the increase in the percentage contribution of the NMR to the IMR from 47 percent (IDHS, 1991) to 59 percent (IDHS, 2012) and the percentage contribution of the NMR to the U5MR from 32 percent (IDHS, 1991) to 47 percent (IDHS, 2012). Overall, increases in the percentage contribution of the NMR to the IMR or the U5MR are also shown by the coefficient of the regression line of the percentage contribution (Figure 2-2).

Estimates of the NMR, IMR, and U5MR by time reference (Table 2-5) can be transformed into log scale and split into two time periods (before and after year 1999) as depicted in Figure 2-3. The figure contrasts trends of NMR, IMR, and U5MR before and after 1999. The coefficient of the log scale regression is the annual reduction rate (ARR), and one can compare the ARR before and after 1999 for the

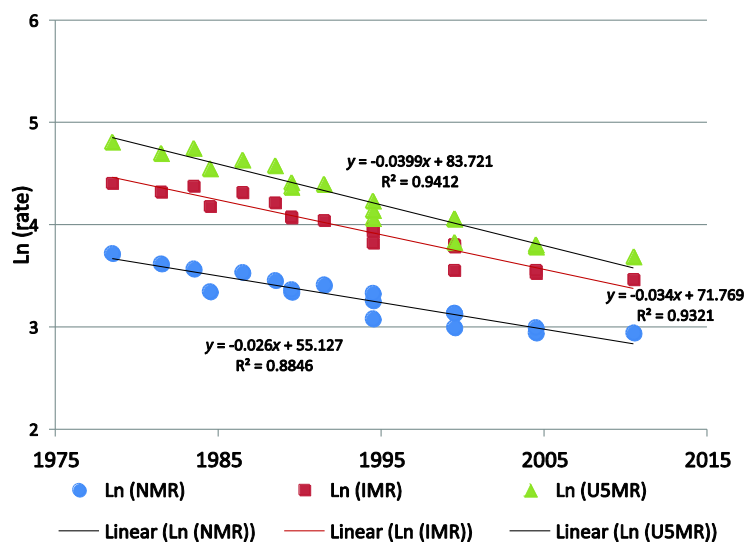


FIGURE 2-1 Direct Estimates of Neonatal, Infant, and Under-5 Mortality Rates, Indonesia: IDHS, 1991-2012. SOURCE: Indonesia Demographic and Health Survey (IDHS), 1991, 1994, 1997, 2002-2003, 2007, 2012.

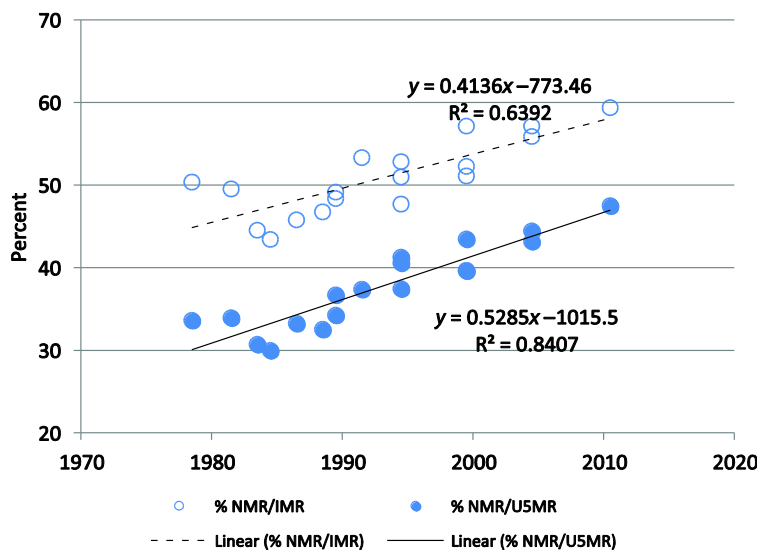


FIGURE 2-2 Percentage Contribution of Neonatal Deaths to Infant and Under-5 Deaths, Indonesia: IDHS, 1991-2012. SOURCE: Indonesia Demographic and Health Survey (IDHS), 1991, 1994, 1997, 2002-2003, 2007, 2012.

NMR, IMR, and U5MR. The ARR for the three measures decreases with time. The ARR before and after 1999 are 2.8 percent versus 1.5 percent, NMR; 3.3 percent versus 2.5 percent, IMR; and 4.3 percent versus 2.8 percent, U5MR. The ARR for the U5MR is higher than that for the IMR, and the ARR for the IMR is higher than that for the NMR. Figure 2-4 contrasts each of the three measures (NMR, IMR, U5MR) for the five-year period preceding the IDHS conducted in 2002-2003, 2007, and 2012. There are no statistically significant changes in the three measures, which likely indicates a stagnant condition.

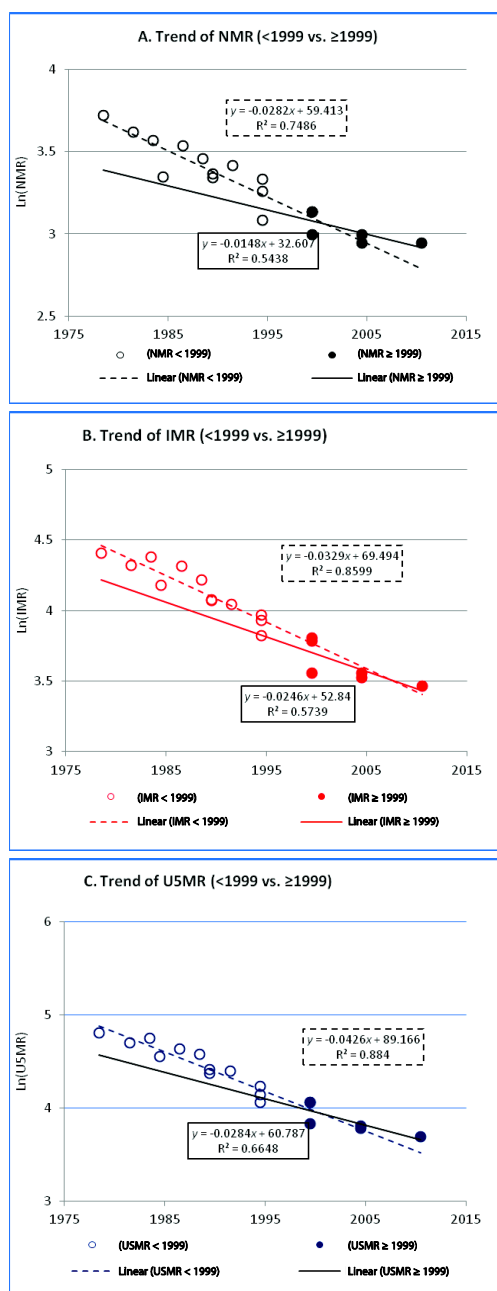


FIGURE 2-3 Change in Trends of Neonatal Mortality Rate (A), Infant Mortality Rate (B), and Under-5 Mortality Rate (C) by Time Period, Indonesia: IDHS, 1991-2012. This figure contrasts each of the three measures (NMR, IMR, U5MR) for the five-year period preceding the IDHSs conducted in 2002/2003, 2007, and 2012. There are no statistically significant changes in the three measures, which likely indicates a stagnant condition. SOURCE: Indonesia Demographic and Health Survey (IDHS), 1991, 1994, 1997, 2002-2003, 2007, 2012.

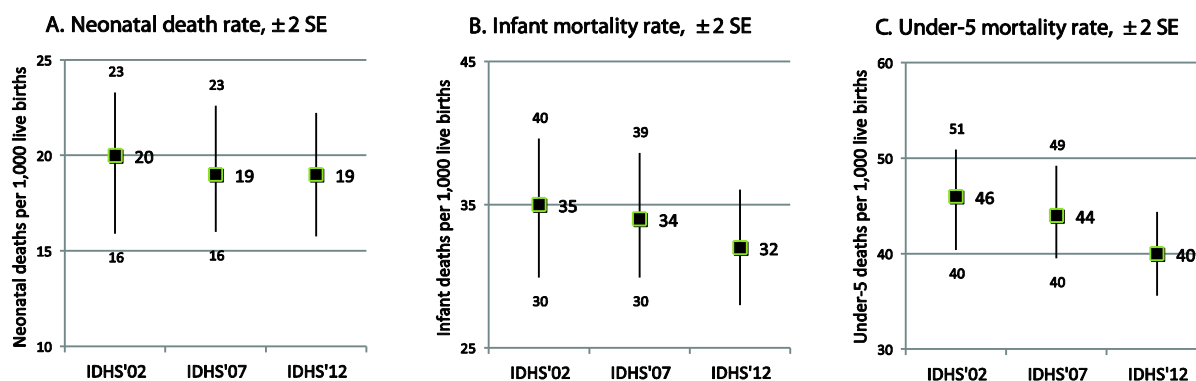


FIGURE 2-4 Comparison of Neonatal Mortality Rate (A), Infant Mortality Rate (B), and Under-5 Mortality Rate (C), Indonesia: IDHS, Selected Years. NOTE: SE = standard error; IDHS = Indonesia Demographic and Health Survey. SOURCE: Indonesia Demographic and Health Survey, 2002-2003, 2007, 2012.

Table 2-6 presents the estimates by Lozano et al. (2011) of the NMR, 17.3 deaths per 1,000 live births; IMR, 29.4 per 1,000; and U5MR, 37.6 per 1,000. It also shows the annual reduction rate for the periods 1990-2000, 2000-2011, and 1990-2011 for the U5MR. All three measures, compared with the estimates from IDHS 2012 for the five-year periods preceding the survey (NMR, 19 deaths per 1,000 live births; IMR, 32 per 1,000; and U5MR, 40 per 1,000) are lower. The differences, however, are not significant. Likewise, the Inter-agency Group for Child Mortality Estimation (IGME), established by the United Nations in 2004, estimated the levels and trends in child mortality for Indonesia, and they are shown in Table 2-7 (UNICEF, 2010).

Background Characteristics of Maternal Deaths in Indonesia Underlying Causes of Maternal Deaths

The 2010 population census reported that maternal (pregnancy-related) deaths were followed up by the National Institute of Health Research and Development (NIHRD), which defined the cause of death by employing the verbal autopsy method.⁷ Table 2-8 gives the percentage, by direct (underlying) cause, of maternal death (International Classification of Diseases-10) for each region (Badan Litbangkes Kemenkes RI, 2012). The two leading underlying causes are hypertensive disorders of pregnancy and postpartum hemorrhage. Table 2-8 also contrasts direct versus indirect causes of maternal deaths by region. Nationally, 77 percent of maternal deaths are due to direct obstetric causes (underlying cause or unsafe delivery practices) and 23 percent to indirect obstetric causes.⁸

⁷The Institute of Health Metrics and Evaluation defines a verbal autopsy as “a method of determining individuals’ causes of death and cause-specific mortality fractions in populations without a complete vital registration system. Verbal autopsies consist of a trained interviewer using a questionnaire to collect information about the signs, symptoms, and demographic characteristics of a recently deceased person from an individual familiar with the deceased” (<http://www.healthmetricsandevaluation.org/research/team/verbal-autopsy>).

⁸The underlying cause of death is based on death reports of which about 50 percent are incomplete, and so the pattern may differ from the true pattern in the population. According to Cross, Bell, and Graham (2009) writing in the *Bulletin of the World Health Organization*, “Direct obstetric deaths are those resulting from obstetric complications of the pregnant state (i.e. pregnancy, labour and the puerperium), from interventions, omissions or incorrect treatment, or from a chain of events resulting from any of the above. Indirect obstetric deaths are those resulting from a previously existing disease or a disease that developed during pregnancy and which was not due to direct obstetric causes but which was aggravated by the physiological effects of pregnancy.”

TABLE 2-6 Model-Based Estimates of Childhood Mortality Rates, Indonesia: Number of Under-5 Deaths and Annual Reduction Rate

Deaths per 1,000 live births, 2011			Number of under-5 deaths ('000)	ARR (%)		
NMR (0-28 days)	IMR (0-364 days)	U5MR (0-4 years)		1990-2000	2000-2011	1990-2011
17.3 (14.5-20.4)	29.4 (26.6-36.8)	37.6 (30.3-46.6)	161 (124-211)	3.9 (3.4-4.4)	2.8 (0.8-4.8)	3.3 (2.3-4.4)

SOURCE: Lozano et al. (2011).

TABLE 2-7 Model-Based Estimates of Under-5 and Infant Mortality Rate, and Annual Reduction Rate, Indonesia

U5MR			IMR		
1990	2009	ARR (%) 2000-2009	1990	2009	ARR (%) 2000-2009
86	39	4.2	56	30	3.3

SOURCE: UNICEF (2010).

TABLE 2-8 Percentage of Maternal Deaths by Underlying Cause (ICD-10) in Five Regions of Indonesia: 2010 Population Census

Underlying cause of death	ICD-10 code	Region (%)					Indonesia (%)
		Sumatra	Java-Bali	Kalimantan	Sulawesi	Eastern Indonesia	
1. Pregnancy with abortive outcome	O00-O08	3.7	4.2	2.7	5.6	4.2	4.1
2. Edema, proteinuria, and hypertensive disorder (HDK)	O10-O16	33.3	33.1	34.9	32.6	25.8	32.4
3. Placenta previa, premature separation of placenta, and antepartum hemorrhage	O44-O46	4.4	2.7	4.3	2.3	3.6	3.3
4. Problems related to fetus and amniotic cavity and possible delivery problems	O30-O43, O47-O48	3.0	1.7	0.0	0.8	0.1	1.6
5. Obstructed labor	O64-O66	0.5	1.1	0.0	0.6	1.0	0.8
6. Postpartum hemorrhage (PPH)	O72	16.4	16.8	28.1	26.3	29.8	20.3
7. Other complications of pregnancy and delivery	O20-O29, O60-O63, O67-O71, O73-O75, O81-O84	11.1	6.0	2.9	7.6	5.9	7.2
8. Complications predominantly related to puerperium and other conditions	O85-O99	27.6	34.3	27.1	23.9	29.7	30.2
Total		100.0 (N = 1,737)	100.0 (N = 3,334)	100.0 (N = 587)	100.0 (N = 979)	100.0 (N = 887)	100.0 (N = 7,524)
Direct obstetric death	O00-O95	81.5	73.8	80.9	80.2	75.7	77.2
Indirect obstetric death	O98-O99	18.5	26.2	19.1	19.8	24.3	22.8

NOTE: ICD = International Classification of Diseases.

SOURCE: Badan Litbangkes Kemenkes RI (2012).

Background Characteristics of Maternal Deaths

A follow-up study of the 2010 population census by NIHRD (Badan Litbangkes Kemenkes RI, 2012) provides some background characteristics of maternal deaths in Indonesia. Sixty-two percent of maternal deaths occurred during the postpartum (puerperium) period, 25 percent during pregnancy, and 13 percent at delivery. Sixty-five percent of maternal deaths were women aged 20-35 years; 96 percent, married women; 55 percent, women with 1-2 children; 28 percent, women with 3-4 children, 95 percent, women with a high school or lower education (34 percent, junior and senior high school, and 61 percent,

primary school or less); 64 percent, women who lived in rural areas; 58 percent, women who died in the hospital; and 29 percent, women who died at home.

For those who lived in an urban area, maternal deaths in a hospital were more prevalent (75 percent) than for those who lived in rural areas (48 percent). Maternal deaths at home were more prevalent for those who lived in rural areas (36 percent) than for those who lived in urban areas (18 percent). Many of those who died in a hospital were transferred there after emergency difficulties were encountered while giving birth at home.

Mortality Trends and Progress toward MDGs 4 and 5

Demographic and health surveys (DHSs), with principal support from the Macro Institute, have been widely applied in developing countries. Mortality measures (such as the MMRatio, IMR, or NMR) based on a DHS have influenced government policies related to maternal, newborn, and child health programs, including the MDG targets. Many developing countries, including Indonesia, have adopted strategies based on the DHS data without considering the limitations of the data sources.

The government of Indonesia adopted IDHS results in planning and measuring the achievements toward MDGs 4 and 5. Based on the IDHS-based trends in which the MMRatio declined from 390 deaths per 100,000 live births (IDHS, 1994) to 230 deaths per 100,000 live births (IDHS, 2007), the government targeted an MMRatio of 102 deaths per 100,000 live births by 2015. Likewise, based on IDHS-based trends for U5MR and IMR, the government targeted an U5MR of 32 deaths per 1,000 live births and an IMR of 23 deaths per 1,000 live births by 2015 (Bappenas, 2010).

Earlier in this chapter, it was revealed that the levels and trends of the MMRatio, U5MR, and IMR for Indonesia are dependent on the data sources and methods of estimation employed, and so they may produce a different conclusion on the attainment of MDGs 4 and 5. An average ARR of 4.4 percent is needed to meet the MDG 4 target of a two-thirds reduction in the U5MR from 1990 to 2015, and an average ARR of 5.5 percent is needed to meet the MDG 5 target of a three-fourths reduction in the MMRatio from 1990 to 2015.

Table 2-9 summarizes progress on the MDG 4 and 5 indicators reported for Indonesia by various data sources and the methods of estimation. The Maternal Mortality Estimation Interagency Group and UN Inter-agency Group for Child Mortality Estimation generally offer a positive appraisal of Indonesia's progress toward attaining MDGs 4 and 5. By contrast, the Institute for Health Metrics and Evaluation gives Indonesia a negative appraisal, asserting that the MDG 4 and 5 targets are unlikely to be attained (Rajaratnam et al., 2010; Lozano et al., 2011). Our appraisal of the likelihood of attaining MDGs 4 and 5 based on direct estimates of the MMRatio and childhood mortality rates derived from the IDHS and 2010 population census is in agreement with the IHME appraisal. Using the recent trends in the IMR and U5MR, reflected by their ARRs, the expected IMR by 2015 would be 27 deaths per 1,000 live births and the U5MR 34 deaths per 1,000 live births. These figures are higher than the targets set by Indonesia's National Development Planning Agency (Bappenas): IMR, 23 deaths per 1,000 live births, and U5MR, 32 per 1,000 live births. Likewise, using the recent levels and trends of the MMRatio, the expected MMRatio by 2015 would be 230 deaths per 100,000 live births, far above the target set by Bappenas, which is 102 deaths per 100,000 live births.

International Comparison

Of the countries in the ASEAN (Association of Southeast Asian Nations) group, Indonesia's MMRatio is in the range of those of Laos, Cambodia, and Myanmar, but far behind those of Singapore, Brunei Darussalam, Malaysia, and Thailand. The lifetime risk (LTR) of maternal death for Indonesia is 1 in 210, which is much higher than the LTR for Singapore (1 in 25,300) or the LTR for Brunei Darussalam (1 in 1,900). Of the ASEAN countries, Indonesia contributes the highest number of maternal deaths because of its high MMRatio and large population (see Table 2-10). Table 2-11 contrasts Indonesia's pro-

gress toward MDGs 4 and 5 with those of other ASEAN countries based on modeled estimates. Indonesia has been assessed as being on track for reaching the under-5 mortality ratio (MDG 4) target and on reaching the maternal mortality ratio (MDG 5) target. However, the numbers that appear in Tables 2-10 and 2-11 should be interpreted with caution because most estimates are based on models that have very wide confidence intervals. By comparing slopes of mortality decline between 1990 and 2000 and 2000 and 2010, Figures 2-5A and 2-5B indicate that the rates of mortality decline are lower after 2000, which means that the efforts to meet the MDG targets are becoming harder.⁹

TABLE 2-9 Trends for Maternal Mortality Ratio and Neonatal, Infant, and Under-5 Mortality Rates, Based on Model (MMEIG and IHME) versus Direct Estimate (IDHS/PC), Indonesia

Indicator	Source	Method of Estimation	1990	2010	ARR (%)	MDG Target Attainment
MMRatio	MMEIG	Model-based	600	220	4.9	Making progress
	IHME	Model-based	404	245 ^a	2.4	Insufficient progress
	IDHS, PC	Direct	390 ^b	260 ^c	2.3	Insufficient progress
NMR	IHME	Model-based	27.5	18	2.2	Insufficient progress
	IDHS	Direct	30 ^b	19	2.4	Insufficient progress
IMR	IGME	Model-based	56	30 ^c	3.3	Insufficient progress
	IHME	Model-based	53	30	2.8	Insufficient progress
	IDHS	Direct	57 ^b	32	3.2	Insufficient progress
U5MR	IGME	Model-based	86	39 ^c	4.2	Making progress
	IHME	Model-based	71.5	38	3.3	Insufficient progress
	IDHS	Direct	81 ^b	40	3.5	Insufficient progress

^a2011.

^b1991.

^c2010 Population Census direct estimate (after correction); refers to 2009.

NOTE: MMEIG = Maternal Mortality Estimation Interagency Group; IHME = Institute for Health Metrics and Evaluation; IDHS = Indonesia Demographic and Health Survey; PC = population census; IGME = Inter-agency Group for Child Mortality Estimation; ARR = annual reduction rate; MDG: Millennium Development Goal.

SOURCES: CBS et al. (1995); Rajaratnam et al. (2010); Lozano et al. (2011); MMEIG (2012); Badan Pusat Statistik (2012).

TABLE 2-10 Estimates of Maternal Mortality Ratio and Number of Maternal Deaths by Country in ASEAN Region, 2010

Country	MMRatio	Range of MMRatio Uncertainty		Lifetime Risk of Maternal Death: 1 in	Number of Maternal Deaths
		Lower Estimate	Upper Estimate		
Brunei Darussalam	24	15	40	1,900	2
Cambodia	250	160	390	150	790
Indonesia	220	130	350	210	9,600
Laos	470	260	840	74	670
Malaysia	29	12	64	1,300	170
Myanmar	200	120	330	250	1,600
Philippines	99	66	140	300	2,300
Singapore	3	2	7	25,300	2
Thailand	48	33	70	1,400	400
Vietnam	59	27	130	870	860

SOURCE: MMEIG (2012).

⁹For Indonesia, the slope of the decline in the U5MR for the period 1990-2000 is equal to an ARR of 4.5 percent, and for 2000-2010 is equal to an ARR of 4.3 percent. The slope of the decline in the MMRatio for the period 1990-2000 is equal to an ARR of 5.7 percent, and for 2000-2010 is equal to an ARR of 4.4 percent. A similar pattern of changes in the ARR for the U5MR between the two periods is shown in Figure 2-5B.

TABLE 2-11 Country Progress toward Millennium Development Goals 4 and 5, Indonesia

Country	Under-5 mortality rate					Maternal mortality ratio (modeled)				
	Deaths per 1,000 Live Births			Average ARR (%)	Assessment of Progress	Deaths per 100,000 Live Births			Average ARR (%)	Assessment of Progress
	1990	2000	2010	1990-2010		1990	2000	2010	1990-2010	
Cambodia	120	103	51	4.3	On track	830	510	250	5.8	On track
Indonesia	85	54	35	4.4 ^a	On track	600	340	220	4.9 ^b	Making progress
Laos	150	88	54	4.9	On track	1,600	870	470	5.9	On track
Myanmar	110	87	66	2.6	Insufficient progress	520	300	200	4.8	Making progress
Philippines	59	40	29	3.6	On track	170	120	99	2.8	Making progress
Vietnam	51	35	23	4.0	On track	240	100	59	6.9	On track

^aThe annual reduction rate (ARR) for Indonesia’s U5MR in declined from 4.5 percent (1990-2000) to 4.3 percent (2000-2010).

^bThe ARR for Indonesia’s MMRatio declined from 5.7 percent (1990-2000) to 4.4 percent (2000-2010).

SOURCE: MMEIG (2012).

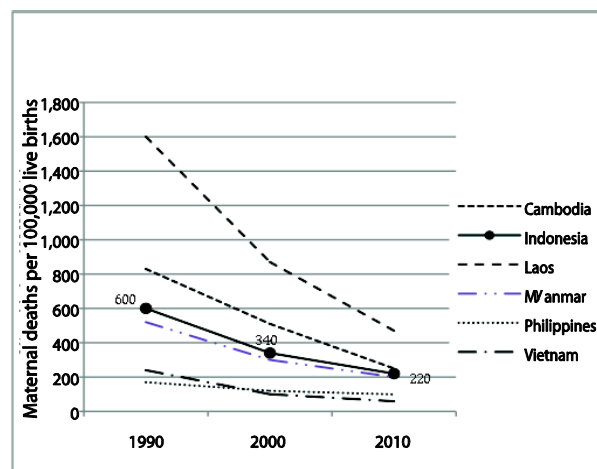


FIGURE 2-5A Maternal Mortality Ratio: Country Progress, Southeast Asia

SOURCE: MMEIG (2012).

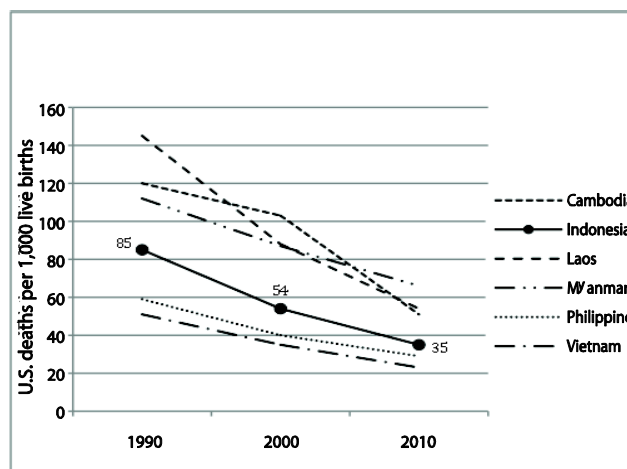


FIGURE 2-5B Under-5 Mortality Rate: Country Progress, Southeast Asia

Indonesia relies on survey-based data to obtain official measures of maternal, neonatal, and child health-related deaths, but these data largely yield a wide range of estimates. Different approaches to measuring mortality rates give different results and different assessments of the progress made. Estimates employing both the sibling technique and models based on the MMRatio and childhood mortality rates offer no conclusive assessment of trends and MDG achievements.

The 2010 population census has its limitations for estimating the MMRatio, whereas direct estimation of the MMRatio gives a more stable result. A rate of some 260 maternal deaths per 100,000 live births and an estimated 12,000 maternal deaths in 2009 are most likely the correct figures for Indonesia for recent years.

Indonesia is facing a high maternal mortality ratio, with wide disparity among regions. Java-Bali, with the largest population, contributes the largest number of maternal deaths, although its rate is the lowest. Eastern Indonesia, with a far smaller population, contributes a lower absolute number of deaths, although its rate is much higher.

The IDHS, which provides direct estimates of the NMR, IMR, and U5MR, could be better interpreted as the lowest limit of the measures. Trends in childhood mortality rates over time indicate that it is becoming increasingly difficult to further reduce these measures, and lowering the NMR is more difficult than lowering the IMR and U5MR.

Among ASEAN countries, Indonesia contributes the highest number of maternal deaths because of its large population and high maternal mortality ratio. The high maternal mortality ratio for Indonesia is comparable only with those of countries such as Laos, Myanmar, and Cambodia.

Recent levels and trends in the MMRatio, IMR, and U5MR indicate that it is unlikely that the MDG 4 and 5 targets will be achieved. Assessments of progress toward MDGs 4 and 5 are based on unreliable data, and model-based methods should be interpreted with caution. Policy documents that rely on unreliable survey data should also be revisited.

Issues related to inequity among the regions of Indonesia and revealed by comparisons of the absolute numbers of maternal deaths and maternal mortality rates should be taken into consideration in developing policies for reducing maternal mortality. Evidence-based planning requires reliable and timely information. A civil registration and vital statistics system and a health information system are urgently needed in Indonesia. This will require a commitment and cooperation of all parties involved in building the systems, such as the Ministry of Health, Ministry of Home Affairs, and Statistics Indonesia (BPS).

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Chapter 3

Maternal, Fetal, and Neonatal Mortality

In many low-income countries, the maternal mortality rate (defined as the death of the mother during pregnancy or within 42 days of the birth) is 100 times greater than in high-income countries. Rates of stillbirth (defined as death *in utero* after 28 weeks of pregnancy) and neonatal mortality (defined as the death of a live-born baby within 28 days of life) are often 10 times greater or more than in high-income countries (Goldenberg and McClure, 2011; Ronsmans and Graham, 2006).¹ The current rates in low-income countries are generally similar to the rates in high-income countries 80 years ago.

This chapter reviews the medical causes of maternal, fetal (stillbirth), and neonatal mortality in low-income countries; describes the similarities in these causes; and explores why the rates of each outcome have fallen in high-income countries. It then reviews the interventions proposed to reduce these mortalities.

Causes of Maternal, Fetal, and Neonatal Mortality in Low-Income Countries

In most developing countries, the major medical causes of *maternal mortality* are hemorrhage, the hypertensive diseases of pregnancy, and various types of maternal infections, among other things (IOM, 2003; Khan et al., 2006; Ronsmans and Graham, 2006; WHO and UNICEF, 2012)—see Figure 3-1. Hemorrhage (heavy bleeding), which is often categorized as antepartum (before delivery) or postpartum (after delivery), has many causes. The most common antenatal cause is premature placental separation (placental abruption), and the most common postpartum cause is failure of the uterus to contract after delivery—often called uterine atony. Women in their first pregnancy are more likely than those in subsequent pregnancies to develop a form of high blood pressure called preeclampsia. This condition may lead to a number of potentially deadly complications, including strokes and seizures (eclampsia). Women with obstructed or prolonged labor are more likely to die from hemorrhage and infection, as are women who undergo unsafe abortions.

Fetal mortality often occurs secondary to the hypertensive diseases of pregnancy, placental abruption associated with maternal hemorrhage, and various types of maternal infection, including syphilis and malaria (Black et al., 2010; Lawn et al., 2011)—see Figure 3-2. Most fetal deaths are due to asphyxia, or a reduction in the oxygen available to the fetus. Hypertensive diseases, abruption, prolonged labor, breech presentation (feet or buttocks presenting first), and umbilical cord accidents are often precursors of this type of mortality (Lawn et al., 2011).

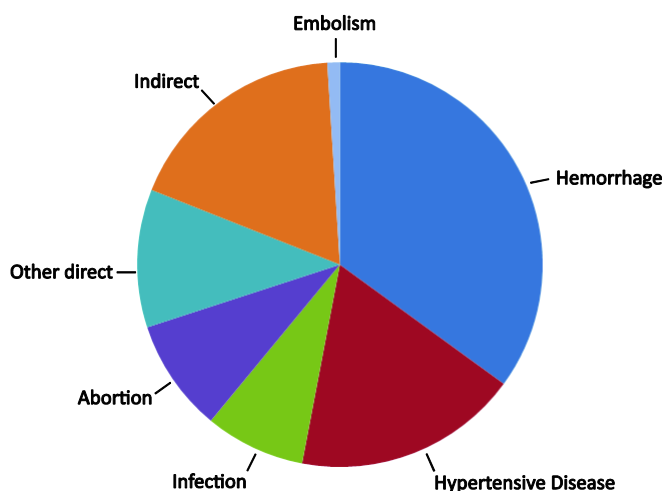
Neonatal mortality in low-income countries is typically attributed to one of three major causes: infection, asphyxia, or prematurity (birth prior to 37 weeks gestation out of 40 weeks)—see Figure 3-3 and Lawn, Cousens, and Zupan (2005); Lawn, Wilczynska-Ketende, and Cousens (2006); and Black et al. (2010). It is crucial to understand that many of these deaths are either caused by one of the maternal con-

¹Chapter 2 referred to maternal, infant, and neonatal mortality rates. This chapter refers to maternal, *fetal*, and neonatal mortality rates because, although fetal deaths are not referenced in the Millennium Development Goals, the lives of unborn fetuses can be saved with some of the same measures as mothers and newborns.

ditions just described or are preventable by a maternal treatment (Lawn, Cousens, and Zupan, 2005). For example, neonatal deaths due to syphilis are preventable by maternal screening and treatment, and neonatal tetanus is preventable by maternal immunization. Most cases of neonatal asphyxia are preventable by the appropriate intrapartum care, especially if the mother has hypertensive disease or suffers a hemorrhage. The conditions that cause maternal, fetal, and neonatal mortality are frequently the same, and, as will be shown later, interventions that reduce one type of mortality often reduce the others.

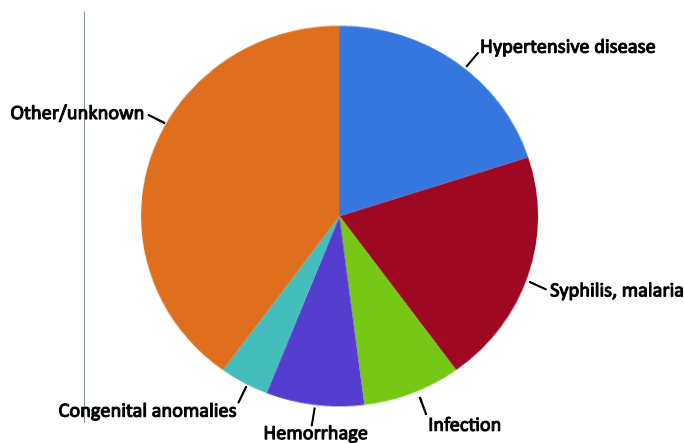
History of Outcome Improvements in High-Income Countries

The reductions in maternal, fetal, and neonatal mortality in high-income and many middle-income countries have been impressive (see Figures 3-4, 3-5, and 3-6).



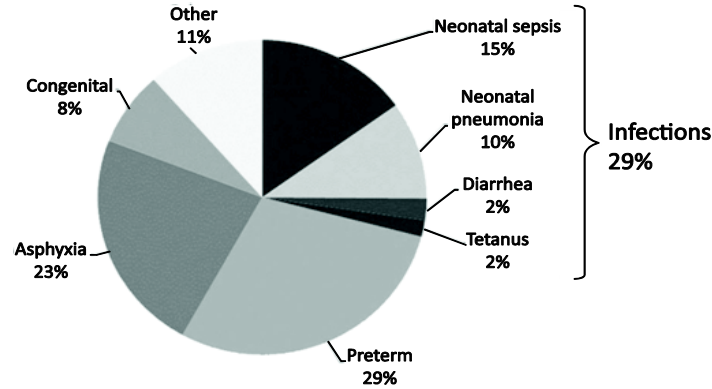
0.4 Million Maternal Deaths Each Year Worldwide

FIGURE 3-1 Main Causes of Maternal Mortality. SOURCE: Robert L. Goldenberg, as adapted from Khan et al. (2006).



2.7 Million Stillbirths Each Year

FIGURE 3-2 Main Causes of Fetal Mortality. SOURCE: Robert L. Goldenberg, as adapted from Lawn et al. (2009).



3.6 million neonatal deaths each year

FIGURE 3-3 Causes of 3.6 Million Neonatal Deaths, 192 Countries, Based on Cause-Specific Mortality Data and Multi-cause Modeled Estimates. SOURCE: Based on data from Child Health Epidemiology Reference Group and WHO in Black et al. (2010). Reprinted from Seminar in Perinatology 34(6):371-386. Lawn, J.E., Kerber, K., Enweronu-Laryea, C., and Cousens, C. Copyright(2010), with permission of Elsevier.

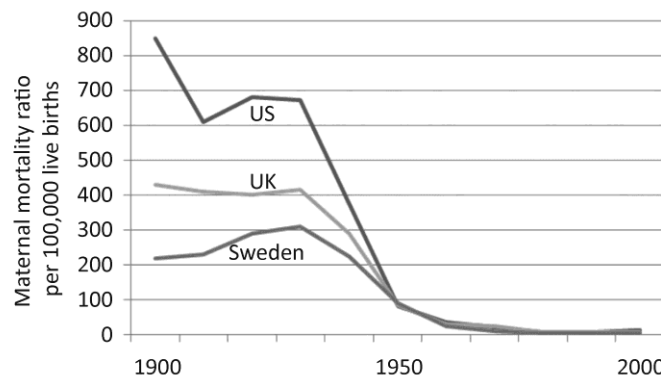


FIGURE 3-4 Maternal Mortality Ratios: United States, United Kingdom, and Sweden, 1900-2000. SOURCE: Goldenberg and McClure (2011). Reprinted from American Journal of Obstetrics & Gynecology 205(4):293-295, Goldenberg, R. L. and McClure, E.M., Copyright (2011), with permission of Elsevier.

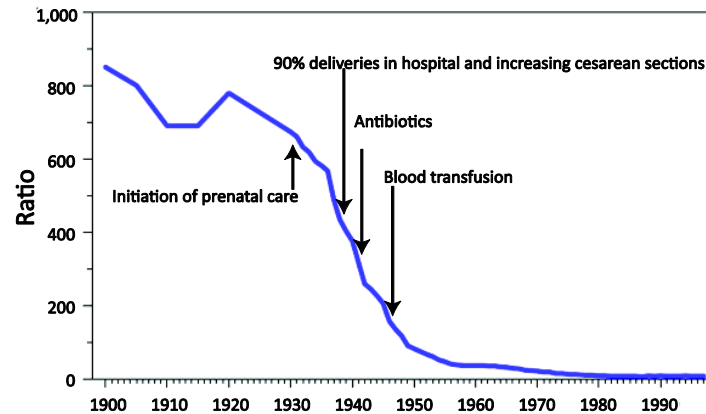


FIGURE 3-5 Maternal Mortality Ratio per 100,000 Live Births over Time and Interventions That Contributed to Decline, United States. SOURCE: Robert L. Goldenberg, adapted from Johnson (2001).

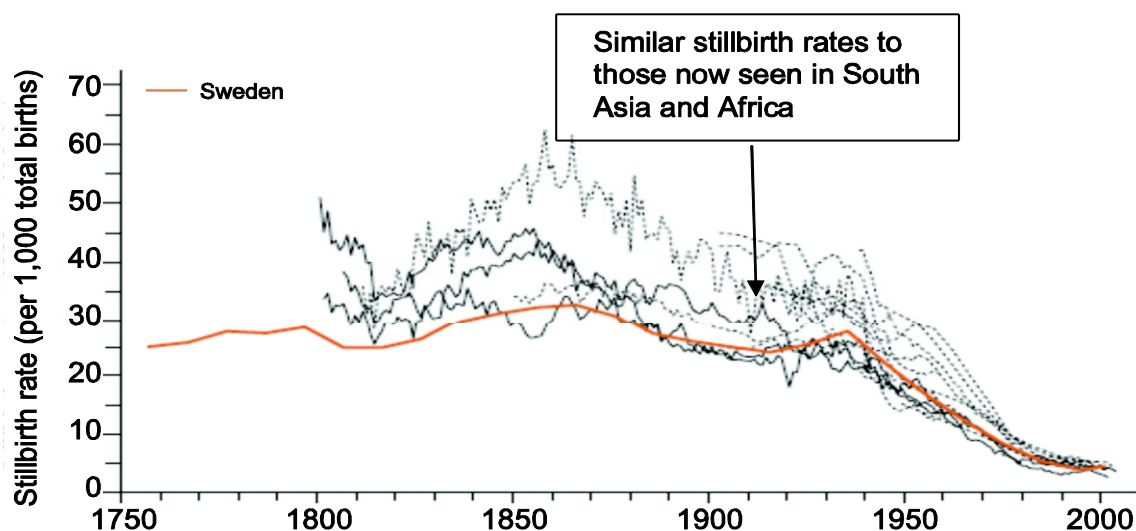


FIGURE 3-6 Long-Term Trends for Stillbirth Rates in 11 High-Income Countries, 1750-2000. SOURCE: Goldenberg et al. (2011). Reprinted from *The Lancet* 377(9779):1798-1805, Goldenberg, R.L., et al. Copyright (2011), with permission of Elsevier.

Maternal Mortality

In these countries, until about 1935 maternal mortality was frequently in the range of 500-1,000 deaths per 100,000 live births—that is, nearly 1 percent of mothers died with each pregnancy (Goldenberg and McClure, 2011). This situation had remained essentially unchanged for hundreds of years. In recent years, many high-income countries have reported maternal mortality ratios of about 10 per 100,000 live births, or a reduction of 99 percent (UNFPA et al., 2012). Several scholars have explored the history of this reduction, which in nearly all high-income countries began in about 1935 and was mostly completed by 1970-1980 (Figure 3-4)—see Goldenberg and McClure (2011) and Loudon (2000). The interventions responsible for the reductions in maternal mortality include the introduction of prenatal care and hospitalization for delivery, beginning in the 1930s; the availability of antibiotics to treat infection, beginning in the late 1930s and 1940s; uterotonics (drugs that cause the uterus to contract) in the late 1930s; and blood transfusion, beginning in the early 1940s (Figure 3-5).

The management of preeclampsia/eclampsia steadily improved with prenatal care to diagnose the condition, hospitalization to manage the condition, and, in 1940-1950 a change in management from watchful waiting to rapid delivery for severe or progressing disease. With antibiotics, blood availability, and improvements in anesthesia, cesarean sections became safer and were used more frequently to terminate pregnancies that threatened the life of the mother and fetus/neonate, such as those with prolonged labor or eclampsia. Thus new and effective interventions were introduced, first in high-income countries and later in some middle-income countries, and they were responsible for the nearly 99 percent reduction in maternal mortality. If these interventions were used widely and appropriately in low-income countries, there is no reason to believe that the results would not be similar to those in high-income countries.

Fetal Mortality

Until about 80 years ago in the United States and other high-income countries, fetal mortality rates generally ranged from 35 to 50 per 1,000 live births. In the 2011 *Lancet* series on stillbirths, nearly all high-income countries reported stillbirth rates of less than 5 per 1,000 live births, with several countries reporting rates as low as 2 per 1,000 live births, representing a reduction of approximately 95 percent (Flenady et al., 2011; Goldenberg et al., 2011). Like that for maternal mortality, the reduction in stillbirths

began about 1935, continued relatively rapidly until about 1980, and has continued more slowly until the present (Figure 3-6). Because the cause of a stillbirth is often less clear than that of a maternal death, it is somewhat more difficult to define the interventions responsible for most of the reduction. However, some of these interventions are clear. For example, in the 1920s syphilis was thought to be responsible for about 20 percent of U.S. stillbirths. Today in high-income countries, it is extremely rare for syphilis to cause a stillbirth. Eighty years ago, preeclampsia and eclampsia were the major killers of fetuses, but today they account for only a small percentage of a much smaller number of stillbirths. Stillbirths associated with placental abruption have also been much reduced. Monitoring the fetus for signs of asphyxia prenatally and during delivery and using various techniques such as fetal heart rate monitoring during delivery for signs of distress have reduced much of the asphyxia-related fetal mortality. The high rates of cesarean section and labor induction in many high-income countries are attributable in part to physicians' concerns about stillbirth and their attempts to reduce this outcome. With appropriate care for the mother, it is possible to reduce stillbirth rates by as much as 90 percent. Overall, it is important to understand that the conditions that cause stillbirths are similar to those that cause maternal mortality, and the interventions needed to reduce stillbirths are the same as those that reduce maternal mortality.

Neonatal Mortality

Neonatal mortality in developed countries has also fallen substantially in the last 80 years. The reasons for the decline are related to the decreasing prevalence of some conditions and better treatment of others. About one-third of neonatal mortality is associated with preterm birth. In developed countries, the incidence of prematurity has, if anything, increased over the last decades, and so falling rates of preterm birth cannot be given credit for the lower mortality.

Preterm infants die from (1) respiratory distress syndrome (RDS), a condition caused by a lack of lung surfactant; (2) intraventricular hemorrhage (IVH), or bleeding into the newborn's brain; (3) necrotizing enterocolitis, or breakdown of the infant's bowel; and (4) many different types of infection. Beginning in about 1960, treatment of RDS with oxygen, and later with various types of ventilation, including with continuous positive airway pressure (CPAP) and, still later, with artificial surfactant used as either a prevention or a treatment, substantially lowered the death rate from RDS. Beginning in the 1990s in high-income countries, the increasing use of maternal corticosteroids prior to delivery substantially lowered the incidence of RDS. The incidence of preterm as well as term newborn infection was also reduced with better attention to clean care and the use of antibiotics prophylactically. Treatment with antibiotics for those newborns that did become infected saved many lives. Maternal treatment for syphilis and vaccination for tetanus contributed to the reduction of newborn infection-related mortality.

The incidence of newborn asphyxia was substantially reduced with better obstetric care, including monitoring for hypoxia prenatally and during labor, and the willingness to perform cesarean sections for signs of fetal distress. Newborn resuscitation techniques improved, and treatment of newborns with birth-related asphyxia also reduced mortality. Thus, as for maternal and fetal mortality, there were substantial reductions in neonatal mortality from about 1940 onward. Many of the interventions are the same or similar to those that reduce maternal and fetal mortality, and many are appropriate for use in low-income countries.

Interventions to Reduce Mortality

The interventions needed to reduce maternal, fetal, and neonatal mortality are thus well known, and if these were made available to pregnant women and their newborns in low-income countries, the pregnancy-related mortality rates in those countries would likely approach those in high-income countries. New interventions or technologies should not generally be necessary to achieve substantial reductions in these mortality rates in low- and middle-income countries. The question that arises instead is not what needs to be done, but how to make these interventions widely available and performed in an appropriate manner. All too often it is observed that an intervention is available but performed on the wrong patients

or performed poorly or too late. Thus, in addition to increasing the coverage of an intervention, ensuring quality performance is crucial. Finally, it has become clear that introducing one intervention at a time rarely results in a reduction in mortality. Instead, developing an understanding of the population that needs to be served and the capabilities within the system to provide care to that population is an appropriate starting point in any geographic area. Indeed, there is substantial evidence that the so-called systems approach—defining the population needing care, the goals of that care, and the resources and personnel available in clinics, hospitals, and homes, and then creating a system of care—is conducive to the most success in reducing maternal, fetal, and neonatal mortality.

This section reviews the conditions causing maternal, fetal, and neonatal mortality in low-income countries, and the section that follows describes the interventions that many experts believe should be directed at reducing maternal, fetal, and neonatal mortality in low-income countries.

Maternal Mortality

To forestall any particular condition that would threaten the life of a mother, fetus, or neonate, one must either prevent onset of the condition or diagnose and treat it in an appropriate and timely manner. Knowing the conditions from which mothers, fetuses, and newborns die and when they die is therefore crucial. For maternal mortality, the major causes of death in low- and middle-income countries are hemorrhage, preeclampsia/eclampsia, and infection (see Table 3-2 at the end of this chapter).

Prolonged labor and unsafe abortion are often precursors to infection and hemorrhage. Hemorrhage can therefore be prevented through a cesarean section for prolonged labor and the performance of safe compared with unsafe abortions. For abortion complications, uterine suction or a D&C (dilation and curettage), antibiotics, blood transfusion, and sometimes hysterectomy are necessary to save the woman's life. The use of uterotonics such as misoprostol or oxytocin at delivery can prevent many of the postpartum hemorrhages associated with an atonic uterus. The case fatality rate associated with hemorrhage could be reduced by lowering the incidence of anemia, which is usually accomplished prenatally through iron and vitamin supplementation. However, major reductions in mortality from hemorrhage usually stem from the appropriate treatment of hemorrhage once it occurs. Treatment varies with the cause of the hemorrhage and may include surgery for lacerations or a ruptured uterus, manual placental removal or a D&C for a retained placenta or placental fragments, or uterotonics to treat hemorrhage from an atonic uterus. An antepartum hemorrhage due to placental abruption or previa calls for a cesarean section. A hysterectomy (surgical removal of the uterus) is the surgery of last resort for many types of hemorrhage. Also for a hemorrhage of any type, blood products are usually life-saving. Within the single condition of hemorrhage, then, there are many causes of hemorrhage, requiring many different types of prevention and treatment and substantial provider skills. No single intervention is likely to have a large impact on hemorrhage-related maternal mortality.

After hemorrhage, the major cause of maternal mortality is hypertension, particularly preeclampsia and eclampsia. Prevention may be possible by treating pregnant women with calcium and aspirin, but the effectiveness of these interventions remains uncertain. Women die from many complications of preeclampsia/eclampsia, including asphyxia during seizures, aspiration pneumonia, strokes, and cardiac, liver, or kidney failure, as well as hemorrhage secondary to clotting disorders and abruption. Because preeclampsia is often asymptomatic until late in its course, diagnosing this condition early is key to saving maternal lives. The condition is defined by hypertension and proteinuria (protein in the urine), and so tests for both, repeated in prenatal care throughout the pregnancy, are required to effectively diagnose this condition. Once preeclampsia is diagnosed, close observation, with delivery for worsening disease, is often life-saving. Induction of labor or a cesarean section is thus often necessary to substantially reduce mortality. Magnesium sulfate reduces initial and repeat seizures and may provide time to effect delivery prior to new or recurrent seizures. A combination of prenatal care to diagnose the condition and care in a facility with labor induction and cesarean section capabilities is necessary to reduce maternal mortality from this condition.

Infection is the third major killer of mothers. Malaria is important in endemic areas, and can be responsible for maternal deaths both during acute malarial episodes and afterward because of the effects of the disease on maternal anemia. Most important, however, are bacterial infections of the uterus. During and immediately after delivery, the uterus provides an excellent culture medium for bacteria, and uterine infections are very common. The use of nonsterile delivery techniques, prolonged labor, and instrumentation, including cesarean section, all increase the risk of infection. Prevention includes providing clean delivery sites, ensuring provider hand-washing, and avoiding prolonged labor and instrumentation whenever possible. Treatment generally consists of the timely administration of the appropriate antibiotics.

In summary, most maternal deaths can be prevented by reducing the prevalence of the conditions that cause the deaths or providing the appropriate treatment for those conditions. Because, with a few important exceptions, most complications leading to maternal death cannot be predicted or prevented, care for these conditions must be readily available to all women. Most maternal deaths occur during labor, delivery, and the immediate postpartum period. When the conditions causing maternal death are considered, it becomes clear that the treatments for these conditions need to be readily available during labor and after delivery. Few of these interventions are available in the home, and unfortunately in most low-income countries many of these interventions are not available in health clinics. For these reasons, this committee advocates having all births occur in facilities with all these interventions available.

Fetal Mortality

Most stillbirths can be attributed to intrauterine asphyxia, with a smaller percentage due to infection (Goldenberg et al., 2011). Many of the maternal conditions just described lead to fetal asphyxia, including prolonged labor, preeclampsia/eclampsia, and placental abruption. Pregnancy complications such as growth retardation, abnormal presentations, multiple fetuses, and cord complications also kill fetuses by way of asphyxia. The appropriate obstetric care for these conditions, plus monitoring of the fetus for signs of asphyxia, often with delivery by cesarean section for fetal distress, can prevent many stillbirths (WHO and UNICEF, 2012). Fetal deaths due to infection can at times be prevented. For example, diagnosing and treating maternal syphilis, preventing maternal malaria through the use of bednets and intermittent prophylaxis, and eliminating prolonged labor to reduce bacterial chorioamnionitis all have a role to play in reducing stillbirths (Goldenberg et al., 2011). With the possible exception of their use to treat group B streptococcus or membrane rupture, antibiotics have a smaller role than other interventions in preventing intrapartum stillbirths.

Neonatal Mortality

Neonates predominantly die from three major causes: asphyxia, infection, and preterm birth (Lawn, Wilczynska-Ketende, and Cousens, 2006). Asphyxia is best prevented, and the same interventions that reduce stillbirth also reduce the prevalence of neonatal asphyxia. Thus appropriate care for women with prolonged labor, placental abruption, preeclampsia/eclampsia, fetal growth retardation, etc. will reduce neonatal asphyxia and neonatal mortality as well. Neonatal resuscitation is important in reducing the deaths of infants born with mild asphyxia. Care for newborns with significant asphyxia, including respiratory, temperature, and nutritional support, can save some additional lives. Treatment of maternal conditions can have a profound impact on neonatal deaths from asphyxia.

Preventing deaths from neonatal infection also involves multiple approaches, some directed at the mother and some at the neonate. For example, preventing prolonged labor, treating the mother's syphilis, immunizing her against tetanus, and administering antibiotics in the face of maternal infection with group B streptococcus or ruptured membranes will all likely reduce neonatal sepsis and mortality. Sterile/clean

techniques, including hand-washing at the time of delivery and in the newborn period, prophylactic antibiotics, especially in preterm infants, and the appropriate cord care—now often with chlorhexidine for home births—also reduce neonatal infections and mortality. For infections, antibiotic treatment frequently proves life-saving. Thus reductions in neonatal infection-related mortality depend on a wide variety of maternal and newborn interventions.

The predominant cause of preterm neonatal mortality is respiratory distress syndrome, but preterm infants also die from other causes, including necrotizing enterocolitis, intraventricular hemorrhage, and bacterial infection. Although few if any interventions effectively prevent preterm births, prevention of some of the conditions associated with preterm birth is possible. Giving the mother corticosteroids in the days prior to delivery may prevent up to 50 percent of RDS, as well as necrotizing enterocolitis, IVH, and neonatal mortality. For those neonates with RDS, oxygen, ventilatory support, and surfactant can substantially reduce mortality. Thus a program for reducing mortality from preterm birth also has maternal and neonatal components, and when they are applied appropriately, most preterm neonatal mortality can be eliminated.

Saving Lives

A number of publications and organizations have proposed lists of interventions appropriate for use in low- and middle-income countries to reduce maternal, fetal, and neonatal mortality; these lists are often accompanied by estimates of the lives potentially saved. Figure 3-7, from a recent *Lancet* issue, shows estimates of the number of maternal, fetal, and neonatal lives saved by using various interventions, thereby illustrating the importance of basic and emergency care during labor and delivery (Pattinson et al., 2011). Because most deaths occur around the time of delivery, the United Nations promotes two strategies to reduce intrapartum maternal mortality: ensuring the presence of a skilled birth attendant at delivery and ensuring prompt access to emergency obstetric care. Ideally, skilled obstetric care should be available to all women. This must include intrapartum monitoring to enable early detection and management of complications, with referral where required (Table 3-1). In Table 3-1, *basic essential emergency obstetric care* comprises six nonsurgical functions: parenteral antibiotics, parenteral oxytocic drugs, parenteral anticonvulsants, manual removal of the placenta, removal of retained products of conception, and assisted vaginal delivery by forceps or vacuum. Neonatal resuscitation is often included in this proposed package. *Comprehensive emergency obstetric care* would add blood transfusions and cesarean sections to the list. Staffing for basic emergency obstetric care would include at least two skilled birth attendants available 24 hours a day, seven days a week, and assisted by trained staff. Comprehensive emergency obstetric care would require staff trained to provide a blood transfusion and perform a cesarean section. Because saving many maternal, fetal, and newborn lives requires a cesarean section, timely access to this intervention is crucial to achieving mortality rates comparable to those in high-income countries.

TABLE 3-1 Components of Basic and Comprehensive Obstetric Care

Basic ^a	Comprehensive
Parenteral antibiotics	All components of basic care
Parenteral oxytocic drugs	Blood transfusion
Parenteral anticonvulsants	Cesarean section
Manual removal of placenta	
Removal of retained products of conception	
Assisted vaginal delivery by forceps or vacuum	

^aNeonatal resuscitation is often included in this proposed package.

SOURCE: Robert L. Goldenberg, adapted from Hofmeyr et al. (2009) and UNICEF, WHO, and UNFPA, (1997).

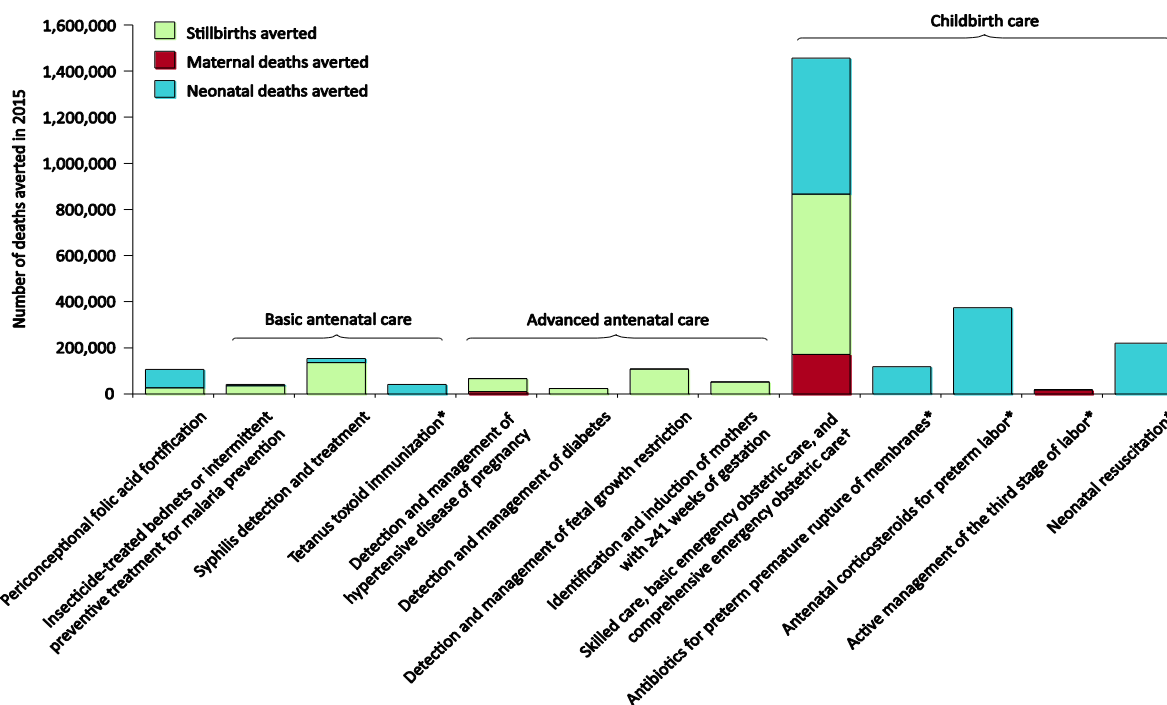


FIGURE 3-7 Various Interventions Appropriate to Reduce Maternal, Fetal, and Neonatal Mortality, with Estimates of Number of Lives Saved by 2015 at Full (99 percent) Coverage by Package. * Interventions specific to maternal and neonatal health and without an estimated direct effect on stillbirths. † Women receiving comprehensive emergency obstetric care are assumed to have access to the highest level of care during childbirth, including skilled care and basic emergency obstetric care if needed. SOURCE: Pattinson et al. (2011). Reprinted from *The Lancet* 377 9777:1610-1623. Copyright (2011), with permission from Elsevier.

Birth Attendant Capacity

Within any system of care, the capability of the birth attendant is considered crucial. In low-income countries, historically most often the birth attendant has been an unskilled or traditional birth attendant (TBA). For the most part, studies have shown that even with additional TBA training, maternal mortality rates do not decline, although with training in resuscitation there may be some reduction in stillbirths and neonatal mortality. For this reason, the World Health Organization and other groups have recommended the use of skilled birth attendants for delivery. However, the training and competencies of these “skilled attendants” vary widely, and most do not have the training necessary to perform a cesarean section, give blood, or administer antibiotics—interventions often necessary to save a life. Even the ability of the most skilled physician to save a life is limited if there is no blood or antibiotics, or if the facilities needed for a cesarean section are not available. Although this issue cannot be fully reviewed here, it should be obvious that those creating an effective system of care should pay great attention to the skill level of the birth attendant and the circumstances in which that attendant will attempt to provide life-saving care to the mother, fetus, and newborn.

Data

In low-income countries, one of the major obstacles to program development aimed at improving pregnancy-related outcomes is lack of reliable data on these outcomes, the causes of these outcomes, and

TABLE 3-2 Major Killers of Mothers, Fetuses, and Newborns in Low-Income Countries

Condition	Mother	Fetus	Newborn
Hemorrhage	X	X	X
Preeclampsia/eclampsia	X	X	X
Intrauterine infection	X	X	X
Obstructed labor	X	X	X
Fetal Asphyxia	-	X	X
Preterm labor/birth	-	X	X
Syphilis	-	X	X
Malaria	X	X	-

SOURCE: Goldenberg et al. (2011).

the coverage of the interventions that might improve these outcomes. Without these types of data and the ability of a hospital or clinic, a geographic area, or a political district to compare their outcomes with those of similar entities, the likelihood of improvements is much reduced. Without the ability of these entities to compare current outcomes with those achieved historically, the impacts of newly introduced programs or interventions will not be understood. Only when reliable data can be used to focus attention on the continuous quality of care improvement is it likely that sustained improvement will occur. In virtually every geographic area in which maternal, fetal, and neonatal mortality have been reduced, improvements in care and outcomes have gone hand in hand with the development of data systems that capture outcomes, the causes of poor outcomes, and intervention coverage.

Summary

If used widely and correctly, the substantial information available on medical interventions would save many maternal, fetal, and neonatal lives. However, this review of these interventions has emphasized that there is no magic bullet to saving lives. Instead, multiple interventions applied at various times during the pregnancy—including during prenatal care but especially at delivery—or even before (family planning) are needed to save lives. No single intervention by itself is likely to have much of an impact.

The causes of maternal, fetal, and neonatal deaths are often the same (Table 3-2), as are the treatments that prevent them. Thus it would be most efficient to have programs that focus on improving pregnancy outcomes rather than separate programs that focus on maternal mortality, stillbirth, or neonatal mortality reduction. Because many of the conditions that kill mothers, fetuses, and newborns cannot be predicted or prevented, ideally all women and newborns should have immediate or rapid access to the interventions that save lives, which for the most part are hospital-based. Creating a system by which these interventions can be appropriately applied to all women and newborns in a timely fashion is the challenge if any low-income country is to achieve substantial reductions in maternal, fetal, and neonatal mortality.

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Chapter 4

The Indonesian Health Care System

Maternal and newborn care practices in Indonesia are strongly influenced by diverse local belief systems. Central among these beliefs is the role of fate or God's will in the outcomes of pregnancy and delivery. Indeed, multiple anthropological studies in Indonesia have revealed deep-rooted belief systems in which maternal and child deaths are influenced by magic, fate, and God's will. Several inquiries into maternal deaths have uncovered community-held beliefs that little can be done to save the life of a pregnant woman or newborn (UNFPA, 2008; Agus, Horiuchi, and Porter, 2012). In some cases, the use of traditional birth attendants (TBAs) is still dominant because women believe that following traditional beliefs and relatives' suggestions will lead to a healthy pregnancy and birth (Agus, Horiuchi, and Porter, 2012).

Nevertheless, there has been growing recognition of the benefits of skilled medical care, and yet persistent barriers affect perceptions of quality, cost, and access. Family members of deceased women or children cite problems with health care access, fees, and inattentive medical personnel as factors contributing to deaths. These views suggest that there is recognition that some deaths are indeed preventable and are consistent with pregnant women seeking improved care and resources when barriers are removed.

Despite progress in reducing maternal deaths in Indonesia, pregnancy still puts the health of women at risk. This chapter describes Indonesia's health system, whose primary purpose is to promote, restore, and maintain health, including maternal and neonatal health. The system includes all public and private health services, professional medical attention, traditional healers and birth attendants, and all public health activities (WHO, 2000).

Overview of Indonesia's Health Care System for Maternal and Child Health

Any description of Indonesia's health care system must be prefaced by a physical description of the country itself. Consisting of more than 13,000 islands spread over 1.9 million square kilometers and home to some 240 million people, Indonesia is the second most populous country in Asia and the fourth largest in the world. Its population is characterized by its wide diversity: demographic, economic, social, political, and cultural. About 56 percent of the population lives in rural areas. The country is divided into 34 provinces, each of which has a legislative council headed by a governor. The provinces comprise some 500 districts, divided into nearly 7,000 subdistricts in which there are almost 80,000 villages (Badan Pusat Statistik, 2012).

The Indonesian National Health Development Program is based on a primary health care concept: the community health center is the basic health care facility, supported by hospitals and other community-based health care facilities. The Ministry of Health (MoH) has overall responsibility for the nation's health care policy. It manages and operates health care programs, including staffing, education and training, and health services.

Community-based health care has been a cornerstone of the public health system in Indonesia since its inception. Early initiatives in maternal and newborn care focused on the provision of care through community health care centers (*puskesmas*) and village health posts (*pustu*), all aimed at supplanting the widespread use of traditional birth attendants (*dukun*) who, though unskilled, were part of the cultural fabric of pregnancy and childbirth throughout the country. However, it was quickly evident that more direct access was needed between trained health providers and the community for better maternal and newborn care. This led to the creation in 1989 of the village midwife program (*Bidan di Desa*) in which a trained midwife was placed in each village along with a village birth facility (*polindes*). The village midwife program also became an integrated part of the monthly community health extension post (*posyandu*) held in each village, thereby offering antenatal care and reproductive health consultations at the village level. These steps were accompanied by the engagement of community health volunteers (*kaders*)—a measure intended to facilitate outreach to the community and mobilization to promote the utilization of health care services. Since the establishment of integrated health services, several initiatives have been adopted in attempts to enhance this core system of community health care centers, village health posts, village midwives and birth facilities, community health extension posts, and community health volunteers. In addition, efforts have been made to overcome the traditional and sometimes deleterious practices fostered by local tradition and the use of the traditional birth attendants. This system is described in detail in this chapter.

Continuum of Care: From Primary Care (Health Centers) to Hospitals

The lowest level of primary care is found in the villages, where most facilities are community-based and provide service for primary health care and prevention programs. In each subdistrict, at least one health center is supposed to be headed by a doctor, supported by two or three subcenters of which the majority are headed by nurses. Health centers focus on health promotion, sanitation, mother and child health and family planning, community nutrition, disease prevention, and minor emergencies (Ministry of Health, 2004). Some health care centers, especially those in rural areas, have not succeeded in carrying out both curative and preventive tasks because the doctors who are supposed to work in these centers do not stay in rural areas. Large numbers of nurses posted to rural areas also open private practices in villages or cities (Webster, 2012). Few training centers for midwives are located in villages, and only 70 percent of midwives remain in villages; others migrate to cities (WHO, 2012).

Table 4-1 shows the organization of health service delivery in Indonesia at five levels: village, subdistrict, district, province, and central. The services and ratings listed are those required by government, but, as described later, not all levels of government comply with the requirements. Box 4-1 describes the facilities mentioned in Table 4-1.

Standards of emergency obstetric and newborn care were set forth in the early 1990s by the World Health Organization, UNICEF, and United Nations Population Fund. These are the interventions that must be undertaken at the time of birth in order to address the sometimes unpredictable causes of maternal and neonatal mortality. These “signal functions” define the capabilities of facilities that must be available to birthing mothers to save lives in the event of common birthplace medical emergencies (Table 4-2).

The lack of basic and comprehensive emergency obstetric and newborn care came to the public’s notice in February 2013 in the press reports of baby Dera (Box 4-2).

Aside from the lack of beds, few hospitals can provide the skilled health care workers, medicines, and equipment needed to meet the minimum standards of the World Health Organization (WHO) for emergency care. BEmONC health centers do not provide blood transfusions or cesarean sections, and patients requiring them must be referred to a hospital with CEmONC capabilities. Table 4-3 shows the readiness of public hospitals to provide CEmONC services.

TABLE 4-1 Health Facilities at Different Levels of Service Delivery, Indonesia

Administrative level	Facilities	Schedule of service	Function
Village	Community based-facilities: Integrated health post (<i>pos pelayanan terpadu—posyandu</i>)	1 day per month	All facilities in villages (<i>posyandu, polindes, pustu, pusling</i>) focus on primary care (promotion and prevention). <i>Posyandus</i> are volunteer-based.
	Maternity hut (<i>pondok bersalin desa—polindes</i>)	Daily office hours	Monitoring growth charts; health education and immunization.
	Sub-health centers (<i>puskesmas pembantu—pustu</i>)	Daily office hours	<i>Pustus</i> extend the services of the <i>puskesmas</i> (health centers) to remote areas. They provide services similar to those of the <i>puskesmas</i> , except for dental. There are no inpatient facilities.
	Mobile service units (<i>puskesmas keliling—pusling</i>)	1-4 times per month	A <i>pusling</i> is a mobile unit (car) that visits villages, usually on market day. It often stops in a big field (soccer pitch) where it offers routine services similar to those offered by <i>puskesmas</i> .
	Private clinics (physicians and midwives)	Daily services, usually open after working hours	Private health services where patients consult doctors or midwives for a fee.
Subdistrict (<i>kecamatan</i>)	Health centers (<i>puskesmas</i>) with or without an inpatient facility (including simple laboratory facility)	Daily office hours	There are two types of health centers: <ul style="list-style-type: none"> • Inpatient facility <ul style="list-style-type: none"> ○ Open 24 hours ○ Specialist team ○ Simple surgery • Outpatient facility <ul style="list-style-type: none"> ○ Daily clinic, open during office hours. These provide promotion and prevention for primary health care and a simple laboratory facility. Some <i>puskesmas</i> (especially with inpatient facilities) are designated BEmONCs for maternity services.
	Private clinics (physicians and midwives)	Daily services, usually open after working hours	Services for a fee.
District	First-referral hospitals (CEmONC)	Daily office hours for consultation with doctors	24-hour emergency unit. Focus on clinical services (surgery, etc.); provide daily consultation with specialist doctors, laboratory facilities, emergency maternity services.
	Private hospitals (some are designated CEmONC)	Daily	Usually exist in a big district. Some private hospitals are built only for mother and child (<i>rumah sakit bersalin dan anak</i> , women's and children's hospital).
	Private clinics (physicians and midwives)	Weekdays, after working hours	Services for a fee.
Province	Second-referral hospitals (CEmONC)	24 hours a day, seven days a week	24-hour emergency unit. Focus on clinical services with more advanced medical equipment than hospitals at the district level.
	Private hospitals (CEmONC)		More specialist doctors.
Central	Tertiary or top-referral hospitals Hospital as center of excellence (CEmONC)	24 hours a day, seven days a week	24-hour emergency unit. Advanced medical technology with complete team of specialists.

NOTE: BEmONC = basic emergency obstetric and newborn care; CEmONC = comprehensive emergency obstetric and newborn care, which includes cesarean section and blood transfusion.

SOURCES: Ministry of Health (2003, 2010b).

BOX 4-1 Indonesian Health Care Facilities: Health Posts, Health Centers, and Hospitals Integrated Health Posts (*Posyandus*)

At the village level, the integrated health post serves as the first line of care, followed by basic professional care at health centers and clinics, and then higher referrals to district and advanced hospitals. The concept of such a center was part of the fourth five-year development plan issued in the early 1980s. About 270,000 *posyandus* are in place across Indonesia (Ministry of Health, 2010a). Among other things, they register births, weigh babies, maintain growth charts, and provide nutrition education and immunizations. Open once a month and serviced by a skilled health worker, these centers, it is hoped, are helping the women and children of Indonesia overcome major health problems. Indeed, the *posyandu* was a critical component of the Health for All 2000 initiative because it brought an integrated program of maternal and child health, family planning, nutrition, immunization, and diarrheal control to the village level.

Health Centers (*Puskesmas*)

Since the 1970s, basic health services, especially primary care, have been centered on the *puskesmas*, or community health centers. Most health centers are equipped with four-wheel-drive vehicles or motorboats so that they can serve as mobile health centers and provide transportation to underserved populations in urban and remote rural areas. Several midwives are typically stationed at the *puskesmas*, and obstetrical exam and birthing rooms equipped with the basic equipment are available. Antenatal care at the *puskesmas* typically includes pregnancy testing, counseling, monitoring of weight gain and fetal development via palpation and a Pinard stethoscope, assessments of maternal hemoglobin levels, blood pressure monitoring, and biochemical tests for proteinuria, although the latter is not consistently available. Birthing facilities include a clean delivery room and basic equipment and supplies such as oxytocin, but they do not fulfill the requirements for basic emergency obstetric and newborn care (BEmONC). Patients with complications are referred to either the district hospital or another facility, possibly a more fully equipped *puskesmas* for BEmONC or comprehensive emergency obstetric and newborn care (CEmONC). Regulations in Indonesia require a minimum of four BEmONC health centers (designated *puskesmas*) in each district. Based on the 2011 Health Facility Survey (Rifaskes), only 61 percent of districts in Indonesia have at least four BEmONC facilities, and the majority of these facilities are on Java or Bali (Ministry of Health, 2011b). Only 42 percent of the districts located in the eastern part of Indonesia (excluding Sulawesi) have at least four BEmONC-designated health centers. The figures for other regions are Kalimantan, 54 percent; Sumatra, 55 percent; Sulawesi, 66 percent; and Java-Bali, 75 percent (Ministry of Health and UNFPA, 2012).

The 2011 Health Facility Survey also reported that 28 percent of BEmONC-designated facilities do not operate 24 hours a day, and those facilities are located mostly in eastern Indonesia (Ministry of Health, 2011b; WHO, 2012). In Indonesia, only 45 percent of BEmONC facilities meet the personnel requirement, and only 12 percent have the required equipment. Finally, only 3 percent of BEmONC facilities have all the medications required (Ministry of Health and UNFPA, 2012). Eastern Indonesia (excluding Sulawesi) falls at the lower end.

Hospitals

Hospitals are the main providers of curative care. Indonesia has four types of hospitals, ranging from teaching hospitals in the country's major cities to district-level hospitals, where all basic services are provided and the more complicated cases are referred to the higher-level hospitals. Hospitals are open 24 hours a day. However, admission of all patients to a facility is not guaranteed, especially if the patient lacks the ability to pay. In an article published in *The Lancet*, the director of Indonesia's oldest maternity hospital, Budi Kemulyaan, admitted that, even in Jakarta, there are not enough hospital beds and not enough financial support for women facing catastrophic health costs (Webster, 2012).

TABLE 4-2 Signal Functions for Emergency Obstetric and Newborn Care

SIGNAL FUNCTIONS FOR EMERGENCY OBSTETRIC AND NEWBORN CARE	
<p>Basic Emergency Obstetric and Newborn Care (BEmONC):</p> <ul style="list-style-type: none"> • Parenteral treatment of infection (antibiotics) • Parental treatment of pre-eclampsia/eclampsia (anticonvulsants) • Parental treatment of postpartum hemorrhage (uterotonics) • Manual vacuum aspiration of retained products of conception • Vacuum-assisted delivery • Manual removal of the placenta • Newborn resuscitation 	<p>Comprehensive Emergency Obstetric and Newborn Care (CEmONC):</p> <ul style="list-style-type: none"> • All components of BEmONC • Surgical capability • Blood transfusion

SOURCE: Jhpiego (2012).

BOX 4-2 The Case of Baby Dera

In February 2013, a baby named Dera, less than one month old, died after being refused admission to 10 hospitals in Jakarta. The reasons given were that the hospitals were full and that there were not enough neonatal intensive care units. This case, which was covered widely in the press (BBC, 2013; *Jakarta Globe*, 2013; www.news.com.au, 2013), raised awareness of the need to improve health facilities and coverage for the community. But the introduction of health insurance alone, if not supported by a good referral system and the availability of skilled personnel, will not prevent deaths.

In Jakarta, all low-income families receive health cards that give them access to free health services. Since the introduction of health cards in Jakarta in November 2012, there has been a 70 percent increase in the demand for hospital services. However, this initiative was not followed by an increase in the number of health personnel or beds. Jakarta has only 143 neonatal intensive care beds for a population of about 10 million (*Tempo*, 2013). After the media reported the death of baby Dera, the Jakarta government began to take action by changing class 3 wards towards designated for patients with health cards. Hospitals, with assistance from the Ministry of Health, are also devoting more resources to neonatal intensive care units. And additional health workers are being deployed by means of collaboration among hospitals, the Ministry of Health, and the Faculty of Medicine of the University of Indonesia.

SOURCE: *Jakarta Globe* (2013).

TABLE 4-3 Readiness of Public Hospitals to Provide Comprehensive Emergency Obstetric and Newborn Care (CEmONC)

Indicator	Coverage (%)
Public hospitals that meet the nine criteria for CEmONC	21.0
Public hospitals with obstetrician	82.9
Public hospitals with pediatrician	75.5
Public hospitals with anesthesiologist	48.8
Public hospitals ready for obstetric operation in less than 30 minutes	59.1
Public hospitals with 24-hour blood service	54.2
Public hospitals with 24-hour laboratory service	63.9

SOURCE: WHO (2012).

Community Involvement

Community involvement has a long history in maternal health in Indonesia. That involvement includes family, community, and midwives, as well as the traditional birth attendants. The integrated health post (*posyandu*) was introduced to facilitate access to services in the villages. Its primary health care workers are volunteers, *kaders*, who are selected by the head of the village or a village committee. They are typically literate and have completed primary school, but few have a secondary school education. They are supervised at the *posyandu* by staff from the health centers (*puskesmas*), who are in turn guided by a working group composed of representatives of the Ministry of Home Affairs, Ministry of Health, National Development and Planning Bureau, local government, Family Planning Coordination Board, and Women's Empowerment Movement (PKK). The *kaders'* primary task is to make it easier for villagers to visit the *posyandu*, to mobilize campaigns for immunization or vitamin A distribution, and to promote and educate the community about the importance of antenatal care and skilled attendance at birth. In many cases, *kaders* may be hired by nongovernmental organizations (NGOs) or receive short-term government stipends for specific health promotion programs or activities at the village level. Current evidence suggests that *kaders* are generally ineffective in fulfilling their roles in the community because they are not professionals and they serve as volunteers with little accountability. Several studies in Indonesia and elsewhere have indicated that well-trained community health promoters can have a substantial impact on maternal and newborn health. These findings thus emphasize another recurring theme: investment in human resources at all levels has been suboptimal in Indonesia.

During the joint committee's visit in September 2012 to one *posyandu* in Makassar, South Sulawesi, some volunteers related how they record all pregnant women in their area, taking specific note of high-risk pregnancies. One volunteer usually covers 10 households. The volunteers encourage women with high-risk pregnancies to seek prenatal care in due time, and they help these women to arrange transportation to a health facility. The volunteers are essential to the operations of the *posyandus*. Even so, some *posyandus* cannot recruit enough volunteers to serve the community, and in some places and cases the services provided are inadequate.

Since 1989, the Bidan di Desa (BDD) program has been the focus of the Indonesian effort to improve maternal and child health and offer family planning services. The plan was to put a midwife and village birth center (*polindes*) in every village. However, in many areas this has not yet been achieved. In this program, the existing trained nurses were given an additional year of training in midwifery skills, with the expectation that they would significantly improve the quality and quantity of antenatal, obstetric, postnatal, and contraceptive services in the villages, thereby reducing the morbidity and mortality rates for mothers and infants. Midwives employed in the public sector would be contracted by central, provincial, or district governments, or directly by health facilities. Most midwives work in hospitals, health centers, and village birth centers. They may also offer services in a home or in a structure that is the property of or was built by the village government for the specific purpose of serving as a birth center (*polindes*)—see Rokx et al. (2010). Although midwives are expected to use the village birth centers to provide services, many of these centers are poorly constructed, substandard structures that are poorly equipped (Hull, Rusman, and Hayes, 1998).

The role of the traditional birth attendant (*dukun*) continues to be an important one at the community level. Qualitative studies indicate that for many women the *dukun* is the preferred community-based provider to consult for assistance during delivery. This preference stems from both the perception that the majority of birth outcomes are positive and the role of the *dukun* in providing support services for household chores in the week after delivery. The role of the *dukun* in invoking the blessing of the spiritual ancestors of the community and family is also thought to be important. Though initially discouraged by the Ministry of Health, joint engagement of both a *dukun* and midwife is now gaining acceptance among midwives and the Ministry of Health, who recognize that these figures may provide a path toward facility-based deliveries and more extensive postnatal care.

Public versus Private

A main feature of the health care situation in Indonesia is the inequity between rich and poor and urban and rural. A 2010 study by the World Bank reported that the richest people, and those living in urban settings, are seven times more likely to access health facilities, public or private, than their poorest counterparts (World Bank, 2010).

In Indonesia, public health facilities such as public hospitals and health centers (*puskesmas*) are meant to be sources of revenue for local governments. These facilities receive subsidies from the central government for salaries and operational costs, but they are required to adopt the self-supporting (*swadana*) principle, which means relying on user fees to finance the nonsalary costs of medical care. However, they have never been allocated the resources they need to manage themselves profitably. The *swadana* principle forces local governments to raise revenue by any means, including contracting out services to the private sector. The system has led to growth in the number of private sector health institutions, and two-thirds of the financing and more than half of the services are now in private hands (Heywood and Choi, 2010).

Of the 1,800 hospitals in Indonesia, some 650 are private. Only about 50 percent of the private hospitals are accredited by the Ministry of Health, and only five hospitals have received international accreditation (Ministry of Health, 2012). Of the five, three hospitals are affiliated with internationally branded organizations: Siloam, Gleneagles, and Mount Elizabeth's.

The Ministry of Health does not regularly supervise the operational activities of hospitals or the quality of care offered by hospitals. In general, the private hospitals are profit-based medical institutions and are usually not considered agents for carrying out community health programs, including those aimed at reducing maternal and neonatal mortality.

Only 300 of the 650 private hospitals participate in the government-based health insurance (Jamkesmas). In Jakarta, where the municipality provides health insurance to the poor through the distribution of health cards, private hospitals are only required to offer 10 percent of their beds to health card holders, compared with 60 percent of public hospitals (Ministry of Health, 2011a). Some private hospitals have an associated midwifery school, but the quality of the training depends on the quality of the hospital and the organization or the owners behind it. The private midwifery school graduates can work in public hospitals or health centers after graduating, in the same way that the public midwifery school graduates can work in private hospitals or health centers. At public medical institutions such as health centers and hospitals, all midwives, either publicly or privately trained, must enter the government employment system. Similarly, both public and private midwifery school graduates must pass the private medical institution exam to work in the private sector.

To supplement their low government salaries, doctors, nurses, and midwives deployed at the local level are encouraged to open their own private practices in the areas in which they work. However, most of them leave the rural areas where they supposed to work on a daily basis and move to nearby urban areas for better private practice. Thereafter, they only occasionally visit their workplaces in rural areas.

Health Personnel

Since the mid-1970s, the windfall profits of the oil boom have allowed the Indonesian government to build health centers (*puskesmas*) with the goal of providing at least one per subdistrict. Many of these health centers were (and some still are) located in relatively isolated areas with limited infrastructure and access. Such health facilities are not considered ideal places to begin a professional career, especially for doctors who have already spent many years completing their studies and much money on their education. To staff these centers, the government turned to Law No. 8 (1961), Compulsory Labor for University Graduates (*Wajib Kerja Sarjana*), and applied it to a number of professions, including health personnel. In 1991 the government introduced Presidential Decree No. 37, which forced new medical school graduates to spend three years in a rural post as a *dokter PTT* (nonpermanent or contract staff doctor) as a condition

for eligibility to earn their license to practice, most of them in the city, or to return to school to specialize. However, the program suffered from a variety of design problems.

This forced labor for doctors was discontinued when Indonesia ratified ILO Convention No. 105, Abolition of Forced Labor, as Law No. 19 on May 7, 1999. Since then, recruitment of doctors for placement in remote areas has been on a voluntary basis with reasonably attractive, and expensive, benefits. This change places greater pressure on local budgets, especially since decentralization when the recruitment and placement of doctors in community health centers became the responsibility of local governments with limited revenue.

The village midwives program (*Bidan di Desa*) was initiated in 1989 when the government was still highly centralized and only one policy decision was needed for the nation. At the time, it was regarded as an imaginative and successful program because over 50,000 midwives were placed in villages throughout the archipelago in less than a decade (Shankar et al., 2008). The midwives were under contract to the central government as nonpermanent staff (Heywood and Choi, 2010).

When decentralization was adopted, the central government was no longer required to provide health staff for local communities, and delivery of services became the responsibility of local governments. However, not all local governments consider midwives a priority (Heywood and Choi, 2010). Many village midwives have therefore left for urban centers, where opportunities in private practice are far greater.

Regional Variation in Health Services

As in most countries, in Indonesia doctors tend to be concentrated in the cities, and midwives tend to follow a similar path, seeking more urbanized areas to practice their profession. In terms of number of doctors per unit of population, Jakarta's position with respect to that of less densely populated provinces is not clear.¹ Jakarta covers only some 660 square kilometers, and yet it is home to almost 10 million people, according to the population census of 2010. On the basis of population, Jakarta is not overly supplied with health services providers and facilities; it has 39 medical staff, 87 nurses and midwives, and 4 community health centers per 100,000 population. Some other provinces are better served, such as Yogyakarta, which has 68 medical staff, 182 nurses and midwives, and 3 community health centers per 100,000 population. However, in terms of geographic density, Jakarta has more than 5,000 doctors, more than 12,000 nurses and midwives, and more than 500 *puskesmas* per 1,000 square kilometers, implying a well-developed demand for health services. The second-highest density of health services is found in Yogyakarta, and the third-highest in Bali. Both of these provinces are small and relatively well developed. Yogyakarta is known as an educational center, and Bali is world renown as a tourist destination, where availability of quality health care is important. Most other provinces fall far below, especially the rural provinces in Eastern Indonesia (Table 4-4).

These data show that the nature of the regional imbalance in health care delivery in Indonesia is not simply a matter of distribution of facilities among provinces and districts, but of geography. The provinces are much larger than Jakarta, and although they may have a comparable number of health providers per capita, those providers are sparsely distributed, and, for women, reaching the necessary facilities during childbirth may be extremely difficult in many areas. Reducing the practical effects of this imbalance would require more than simply adding health providers to existing facilities, because many of the facilities themselves are inaccessible to many families. This problem is inherent in a country with more than 13,000 islands, and it must be addressed with commensurate actions.

¹ Jakarta has special status (like Washington, DC). Even though in terms of geography it is more resembles a municipality, it is treated more like a province.

TABLE 4-4 Number of Health Providers and Facilities per 100,000 Population and per 1,000 Square Kilometers, Indonesia

Province	Number of Health Providers and Facilities			Per 100,000 Population			Per 1,000 square kilometers		
	MS	N&M	CHC	MS	N&M	CHC	MS	N&M	CHC
Aceh	1,600	16,000	310	38	370	7	29	280	5
North Sumatra	4,400	16,000	500	33	120	4	60	220	7
West Sumatra	1,700	9,300	240	36	190	5	41	220	6
Riau	1,600	9,600	180	30	180	3	18	110	2
Riau Islands	770	4,900	61	51	320	4	94	600	7
Jambi	780	5,800	160	27	200	6	16	120	3
South Sumatra	370	4,900	280	5	68	4	4	53	3
Bangka-Belitung	300	2,500	55	26	220	5	18	150	3
Bengkulu	500	4,700	170	30	280	10	25	240	8
Lampung	1,200	5,200	260	16	70	4	35	150	8
Sumatra	13,300	79,400	2,200	27	160	4	28	160	5
Jakarta	3,600	8,000	340	39	87	4	5,400	12,100	510
West Java	5,100	24,600	1,000	12	59	2	140	700	28
Banten	840	9,600	200	9	98	2	87	990	20
Central Java	6,200	35,400	850	19	100	3	190	1,100	26
Yogyakarta	2,400	6,400	120	68	180	3	7603	2,0008	38
East Java	8,200	33,800	940	22	91	3	170	700	20
Java	26,400	117,900	3,500	20	88	3	200	910	27
Bali	2,000	8,900	110	56	250	3	340	1,500	20
West Nusa Tenggara	710	4,500	140	16	100	3	38	240	8
East Nusa Tenggara	710	8,900	290	15	190	6	15	180	6
Bali + Nusa Tenggara	3,400	22,200	550	27	180	4	47	300	7
West Kalimantan	900	6,500	230	21	150	5	6	44	2
Central Kalimantan	600	4,800	170	29	230	8	4	31	1
South Kalimantan	820	6,100	210	24	170	6	21	160	5
East Kalimantan	1,400	7,000	200	44	220	7	7	34	1
Kalimantan	3,700	24,500	820	29	190	6	7	45	2
North Sulawesi	740	5,200	160	33	230	7	53	370	11
Gorontalo	230	1,60	75	24	160	8	21	140	7
Central Sulawesi	500	3,000	160	20	120	7	8	49	3
South Sulawesi	1,500	5,000	400	20	64	5	33	100	8
West Sulawesi	270	1,300	77	26	120	7	16	75	5
Southeast Sulawesi	320	4,300	220	15	200	11	8	110	6
Sulawesi	3,600	20,400	1,100	22	120	7	19	110	6
Maluku	480	3,900	130	36	290	10	10	83	3
North Maluku	280	2,900	96	29	290	10	9	90	3
Papua	300	4,100	270	14	190	13	1	13	1
West Papua	270	3,000	100	32	350	12	3	31	1
Maluku + Papua	1,300	13,900	600	25	260	11	3	28	1
Indonesia	51,800	278,000	8,700	22	120	4	27	150	5

NOTE: MS = medical staff; N&M = nurses and midwives; CHC = community health center.

SOURCES: Badan Pusat Statistik (2011); Ministry of Health, <http://www.depkes.go.id>.

Demand for Maternal Health Services

Demand for maternal health services, particularly for services more commonly associated with safe and secure delivery remains an issue in much of Indonesia. According to the 2012 Indonesia Demographic and Health Survey, or IDHS (Badan Pusat Statistik et al., 2012), about 37 percent of births in the five years preceding the survey occurred “outside of a medical facility, almost all of these being within the woman’s own home” (Table 4-5). This figure represents a significant improvement over the 2002 IDHS when closer to 60 percent of births were recorded as taking place outside a medical facility and the level recorded in the 2007 IDHS of about 54 percent. However, even these figures need to be treated with caution because, as in Table 4-5, the term *medical facilities* includes not just organized hospitals or clinics but also places such as the home of a nurse or qualified midwife. Changes in classification of birth location also make comparison to earlier rounds of the IDHS difficult, although it is worth noting that surveys in the 1990s in which the homes of local midwives were in the same classification as those of the pregnant women seeking their services showed closer to three-quarters of births occurring “at home.”

Attendance at birth is also an issue, with only a small proportion of births attended by doctors or obstetrician/gynecologists. The latter, in particular, are mainly confined to urban areas (Table 4-6).

There has been a fairly steady shift over the years from use of traditional birth attendants to midwives, but the use of TBAs remains strong among less educated women and those in rural areas. As well, it should be noted that here midwives include village midwives, many of whom are unable to offer much in terms of service when any significant complications occur. Although dealing more with neonatal mortality than with maternal mortality, a 2009 study by Hatt et al. (2009) using pooled IDHS data between 1991 and 2002 concluded that they could find no measurable relationship between overall declines in neonatal mortality and the increased availability of health personnel, notably through the village midwife program that got under way in 1989 and in theory provided for replacements for less trained birth attendants for deliveries in the home elsewhere in the village.

Interestingly, this situation can be contrasted with the demand for antenatal care, which has apparently benefitted from long-standing public programs to encourage at least four check-ups during pregnancy. According to the just released 2012 IDHS (Badan Pusat Statistik et al., 2012), during the five years preceding the IDHS more than 95 percent of women received at least one check-up from doctors, nurses, or trained midwives (Table 4-7). The same survey also found that nearly three-quarters reported the requisite four visits or more.

TABLE 4-5 Percent Distribution of Live Births in the Five Years Preceding the IDHS by Place of Delivery and Place of Residence, Indonesia: IDHS, 2002, 2007, 2012

Place of Residence	Year of IDHS	Health Facility		House	Other	Not Stated
		Government	Private			
Urban	2002	13.1	46.5	39.5	0.3	0.6
	2007	12.9	57.4	28.6	0.7	0.4
	2012	20.4	59.5	19.3	0.0	0.6
Rural	2002	5.9	16.6	76.1	0.5	1.0
	2007	7.4	21.5	69.6	0.6	0.8
	2012	14.2	32.5	52.4	0.3	0.6
Total	2002	9.2	30.5	59.0	0.4	0.8
	2007	9.7	36.4	52.7	0.7	0.6
	2012	17.3	45.9	36.0	0.2	0.6

SOURCE: Indonesia Demographic and Health Survey (IDHS), 2002, 2007, 2012.

TABLE 4-6 Percent Distribution of Live Births in the Five Years Preceding the IDHS by Type of Assistance at Birth and Place of Residence, Indonesia: IDHS, 2002, 2007, 2012

Place of residence	Year of IDHS	General practitioner	Ob-gyn	Nurse/midwife	Traditional birth attendant	Relative/other	No one/missing
Most qualified attendant							
Urban	2002	0.6	16.6	61.8	19.9	0.5	0.6
	2007	1.0	20.8	65.7	11.3	0.8	0.3
	2012	1.3	27.7	62.8	6.7	0.8	0.8
Rural	2002	0.9	4.6	49.7	41.6	1.9	1.4
	2007	1.0	6.8	54.9	33.1	3.3	0.9
	2012	0.7	12.4	61.5	20.2	4.1	1.1
Total	2002	0.8	10.2	55.3	31.5	1.3	1.1
	2007	1.0	12.6	59.4	24.0	2.3	0.7
	2012	1.0	20.0	62.2	13.5	2.5	1.0

NOTE: Following the IDHS format, the table includes data on the most qualified attendant at the birth.

SOURCE: Indonesia Demographic and Health Survey (IDHS), 2002, 2007, 2012.

TABLE 4-7 Percent Distribution of Live Births in the Five Years Preceding the IDHS by Antenatal Care Provider during Pregnancy for the Most Recent Birth and Place of Residence, Indonesia: IDHS, 2002, 2007, 2012

Place of residence	Year of IDHS	General practitioner	Ob-gyn	Nurse/midwife	Traditional birth attendant/other	No one/missing
Urban	2002	1.7	16.0	79.0	0.9	2.4
	2007	2.0	20.8	74.9	0.8	1.5
	2012	1.2	27.9	69.1	0.4	1.4
Rural	2002	1.2	3.9	81.9	6.5	6.9
	2007	1.9	5.7	82.5	3.8	6.1
	2012	1.7	10.2	81.3	1.9	4.9
Total	2002	1.4	9.6	80.5	3.9	4.6
	2007	1.9	12.0	79.3	2.5	4.2
	2012	1.4	19.0	75.3	1.2	3.1

NOTE: If more than one source of care is provided only the most qualified provider is considered in the table.

SOURCE: Indonesia Demographic and Health Survey (IDHS), 2002, 2007, 2012.

Cost and distance are among the most obvious factors affecting the use of trained attendance and institutional deliveries (Titaley et al., 2010). Particularly in more isolated regions and among poorer and less educated women, even carrying out an effective referral for difficult deliveries is far from easy. As shown in Table 4-6, the change in the most qualified attendant in rural areas is largely reflected in shifts from TBAs to trained midwives—still largely in a community setting. In urban areas, the shift is more from midwives toward doctors and ob-gyn's, which is one indication, among others, of the much easier access to health personnel and particularly to more professional care when it is needed.

Some recent initiatives designed to increase the use of health institutions include the maternity insurance scheme, Jampersal. It is specifically designed to ameliorate the cost implications of institutional deliveries as well as encourage an increase in the number of community health centers with a capacity for basic emergency services in neonatal obstetrics (BEmONC)—see Faizal (2011). The data in Table 4-5 are supportive of these initiatives, showing a recent marked increase in the demand for institutional deliveries, along with a more moderate increase in the use of highly qualified providers such as ob-gyn's (Table 4-6). The results also tie in with international experience in the positive impact of some of these supply-side initiatives, particularly in the use of health insurance.

However, another factor noted by Titaley et al. (2010) and others as well (e.g., Faizel, 2011) is simply the preference of women who have a normal pregnancy to give birth in more familiar surroundings. According to this view, trained attendants and institutional deliveries are in effect aimed primarily at women experiencing obstetric complications. This finding is in some ways of greater concern because it suggests that purely supply-side measures may not be sufficient in and of themselves to bring all deliveries into fully safe and secure surroundings. It is also of interest that, although public efforts appear to have been largely successful in convincing women of the importance of regular antenatal check-ups more or less irrespective of how they feel, the same cannot be said of institutional deliveries, even where they involve institutions such as health clinics where the quality of service may still be relatively low.

Thus, although the emphasis on supply-side interventions designed to address concerns related to access and cost remain critical, there also appears to be a need for a greater focus on the demand side, particularly at the community level. It should include efforts to educate families about the importance of giving birth under safe conditions and to inform them that a normal pregnancy without obstetric issues is no guarantee that a medical emergency during childbirth affecting the health of either the mother or the newborn child will not arise.²

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²The 2012 IDHS noted, for example, that while nearly all women who undertook antenatal check-ups received basic checks such as weight, blood pressure, stomach exam and consultation, only about half said they had received any specific information on symptoms of pregnancy complications or about the dangers of childbirth outside of surroundings where basic emergency services are not available (Badan Pusat Statistik et al., 2012).

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Chapter 5

The Quality of Care

Quality of care is at the heart of any health care program, and yet it is defined in different ways and is difficult to measure. It is determined not only by the capabilities of health facilities and health providers but also by many other variables. Even among formal research studies, the variables measured differ from study to study. The following are the attributes of quality of health care listed in *Crossing the Quality Chasm: A New Health System for the 21st Century*, a report issued by the U.S. Institute of Medicine (IOM, 2001):

- *Safe*—avoiding injuries to patients from procedures that are intended to help them
- *Effective*—providing scientific-based services for all who may benefit and refraining from providing services to those not likely to benefit
- *Patient-centered*—providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions
- *Timely*—reducing waiting time and harmful delays for both care receivers and caregivers
- *Efficient*—avoiding waste, including waste of equipment, supplies, ideas, and energy
- *Equitable*—providing care that does not vary in quality because of personal reasons such as gender, ethnicity, geographic location, and socioeconomic status.

Even in the most developed countries, however, quality of care as just defined is received by barely more than 50 percent of the patients who actually need it (Hayder and Dowson, 2005).

Information on many aspects of the quality of care is not readily available in Indonesia. In this chapter, we review those variables that affect the quality of care as it is delivered in Indonesia. Using the limited data available, we draw conclusions and offer some technical recommendations. We start with the human resources available and their abilities to meet current needs. We then discuss those programs available for the training of physicians and midwives and for their certification and skill maintenance. In this context, special attention is paid to accreditation and standards of care as determinants of the quality of care in Indonesia.

Human Resources Availability

According to Global Health Facts,¹ Indonesia ranks 112 out of 144 countries in number of physicians. Over the period 2005-2010, the physician ratio in Indonesia was 3 per 10,000 population, which was the lowest for the Association of Southeast Asian Nations (ASEAN) region. Indonesia lagged behind Singapore (18 physicians per 10,000), Brunei (14), Vietnam (12), Malaysia (9), and even Myanmar (5). Currently, the Indonesian physician ratio is 4 per 10,000 population (WHO, 2012b).

¹Global Health Facts, <http://globalhealthfacts.org>.

Similarly, the number of specialists, especially pediatricians and obstetricians, remains very limited. At present, the pediatrician ratio is 3 per 100,000 children (≤ 18 years). The corresponding 2011 pediatrician ratio for the United States was 49 per 100,000 children (≤ 18 years). In 2009 the number of obstetricians in Indonesia was about 2,600, which was far below the goal of 35,000 proposed by the Ministry of Health (WHO, 2012b).

In 2007 Indonesian midwives numbered 54,000, or about 30 per 100,000 population. However, by 2012 implementation of the village midwifery program described in this chapter had all but quadrupled the number of Indonesian midwives, to 200,000.²

All told, the figures indicate that the number of health care professionals in Indonesia responsible for reducing maternal and neonatal mortality is very limited. Although there is no exact correlation between the number of health care workers and the quality of care (something influenced by many other factors), the number of health care providers plays an important role in determining the overall quality of care.

The impact of the low number of health care professionals is further compounded by their drastically uneven distribution. For example, most specialists work in the larger cities. Indeed, 20-25 percent of all specialists work in Jakarta, which accounts for no more than 4 percent of the total population. Many districts still lack pediatricians, obstetricians, surgeons, and internists—the four specialists most important for reducing maternal and neonatal mortality (Ministry of Health, Data and Information Center, 2011).

Training

Midwives

Prior to 1984, the training of midwives entailed a three-year course of study in a midwifery school, which students entered at the end of junior high school. However, this course was terminated in 1984. No new midwives were trained for five years, until 1989 when the government launched the Midwifery Education Rapid Training Program in response to the international safe motherhood conference in Nairobi (Shiffman, 2003). Entrants to this program were graduates of health programs who had a basic nursing qualification. In 1998 the Rapid Training Program was replaced by the current midwifery schools,³ a three-year program that students enter at the end of their senior year in high school. But even in this program, only 10 of 30 topics in the curriculum emphasize clinical competency. The current workforce is composed of midwives trained in all three programs. However, the relative proportion contributed by the most recent midwifery school program has been increasing over time (Ministry of Health, Data and Information Center, 2011; Ikatan Bidan Indonesia, 2012).

In 2007 the Ministry of Health's Center for Human Resources Development and the Indonesian Midwives' Association (Ikatan Bidan Indonesia, IBI) developed a standardized examination system leading to the credential Certified Professional Midwife (CPM). The examination system was intended to define the standards for the CPM credential, describe the certification and examination process and requirements for application, maintain a registry of those individuals who had passed the examination and received certification, and manage the process of recertification or renewal. In addition, the examination system was to work in multiple related arenas to promote and improve the role of midwives in the delivery of maternity care to women and their newborns (Ikatan Bidan Indonesia, 2012; *Ministry of Health, Center for Health Education and Training, 2007*).

The mission just described was not fully accomplished until passage of National Education Law No. 20/2003, which established the National Education System in 2005-2006. In doing so, the law transferred responsibility for health education, including the midwifery schools, from the Ministry of Health to the

²Ikatan Bidan Indonesia (*Indonesian Midwives' Association*), <http://www.bidanindonesia.org>.

³Postsecondary schools.

Ministry of Education. The resulting 15-fold increase (from 50 to 750) in midwifery schools from 2006 to 2011, combined with the different perceptions in the two ministries of a certification-based platform and a competency-based platform, led to confusion about the skills and experience expected of a certified midwife and in the definition of a skilled birth attendant (Ministry of Health, 2007).

Concurrently, the membership of IBI increased from about 50,000 in 2006 to about 200,000 in 2012. However, IBI's internal validation procedures revealed the inadequate knowledge, skills, and clinical experience of many of the new members. IBI concluded that the management and quality of learning in the program that lead to the CPM credential are stagnant or deteriorating. The internal review evaluated the multiple educational routes of entry, including apprenticeship, private midwifery schools, and college- and university-based midwifery programs. So far, these findings have elicited no response from the Ministry of Education and local health authorities (*Ministry of Health, Directorate General of Medical Services, 2011; Ikatan Bidan Indonesia, 2012; AusAid-PMPK Gama-HOGSI, 2012*). Subsequently, the Indonesian Competency Assessment Board examined fresh graduates of midwifery schools and permanent or contract staff (PTT) midwives and reported their competency levels as substandard (Ministry of Health, Center for Health Resources Development, 2011).

Because competency is a primary prerequisite for health personnel working in the health delivery system, midwifery schools must supplement their curricula with in-service training either before or soon after the graduation of their students. Some midwifery schools collaborate with the National Clinical Training Network for Indonesia (Jaringan Nasional Pelatihan Klinis, JNPK)—the clinical training institution endorsed by the Ministry of Health since 1998—to improve health provider performance in Indonesia (JNPK, 2012).

In-service training for students of midwifery schools has not lacked internal and external critics. Sources of internal resistance have been the midwifery academy instructors and the Indonesian Midwives' Association itself. Although the controversy has not been resolved, there is agreement that clinical training does provide a valuable opportunity to improve professional competency, standards of care, and practice with real clients (JNPK, 2010).

Both public and private sector midwives have the right to engage in private practice, and most do so after formal working hours (Ministry of Health, 2010b).

Nurses

The midwife certification process might benefit from linkage to the nurse certification model. Before 1979, nursing schools recruited junior high school graduates for admission, but after 2000 the nursing schools recruited only secondary school graduates. Although the curriculum for nurses includes basic delivery care, a graduate is not authorized to assist in labor or delivery. Ministry of Health Decree No. 369/Menkes/III/2007 and Decree No. 1464/Menkes/X/2010, which authorize a midwife to assist in labor, including management of early complications, and in family planning, do not apply to nurses. Even if a nurse has earned a master's degree in maternity care, he or she does not have authority to assist in labor or delivery. This situation is unusual because this authority is not related to competency, as is common for other health professionals. Overall, it serves not only to limit effective utilization of health resources, but also to generate unproductive and unfair competition among health professionals. For example, midwives usually use the JNPK for improving their basic competencies, but this service is not available to nurses. They may use the JNPK only if they lack basic competencies for conducting government maternal, newborn, and child health programs (such as neonatal resuscitation skills) that might not have been included in their study (JNPK, 2012; Ministry of Health, 2010b).

Midwifery education is integrated into the nursing program in most countries. In some countries such as Bangladesh and Sri Lanka, midwifery education is offered to those who have already completed a diploma in nursing. Only a few countries, such as Indonesia and Myanmar, offer a separate program in midwifery training (Ikatan Bidan Indonesia, 2012). As in most countries in Asia, midwifery schools in Indonesia can integrate nursing and midwifery education, or they can run the schools separately.

In Indonesia, nurses are considered competent in neonatal care only when it is connected to the Ministry of Health program and training. In basic delivery care, the delivery and neonatal resuscitation caregiver is the midwife. The midwife could have learned neonatal resuscitation in a midwifery school and trained to be competent in the anatomic model in basic delivery care or basic emergency neonatal care with the JNPK (*JNPK*, 2010, 2012; Ikatan Bidan Indonesia, 2012).

The basic emergency obstetric and newborn care (BEmONC) concept is not included in the curriculum of the school of nursing or of the midwifery academies. It is a Ministry of Health program, and the nurse or midwife must attend a BEmONC training program to have this competency. At a BEmONC health center, the health care team consists of a general practitioner, a midwife, and a nurse. But they do not have equal roles in providing services because the birth attendant must be the midwife while the nurse serves as the provider of neonatal resuscitation (Ikatan Bidan Indonesia, 2012).

General Practitioners

In Indonesia, senior high school graduates must attend a five-year or 10-semester course of study to attain a degree as a medical doctor. These requirements were expanded in 2011 to include completion of a one-year internship before qualifying for licensure as a general practitioner (Konsil Kedokteran Indonesia, 2005).

Although the system has gradually been improved, the qualifications of the current graduates are not on a par with those associated with the medical education system before 1979. The 1995 list of medical doctor competencies has been reduced in both number and competency level required. In 1995 the level of skills needed to manage a normal delivery was “competency level.” In 2010 it was reduced to “acquisition level.” This level is lower than that required for professional midwives, who must be “competent” to attend a normal delivery (Konsil Kedokteran Indonesia, 2005; Ikatan Dokter Indonesia, 2007).

The mandatory postgraduate internships and lower grade of competencies required reflect a distortion of the learning process for medical students. A medical faculty considers the completion of a one-semester unit equal to one level of competency. This assumption is incorrect, however, because the topic in a curriculum relates only to the theoretical aspect, whereas competency in a skill requires a psychomotor aspect that builds only after practice and frequent repetition of a procedure related to several topics in the curricula (Konsil Kedokteran Indonesia, 2005; Ikatan Dokter Indonesia, 2007; JNPK, 2010). Some medical faculty graduates improve their competency through in-service training for subdistrict deployment, self-preparation, or participation in an obstetrics-gynecology (ob-gyn) specialist training program. The clinical training provides more opportunities for intensive coaching and practice with real obstetric patients, which is not possible in the medical education setting. Thus many general practitioners do not appear to have as much experience or skill in managing labor as a midwife (Ministry of Health, 2010a).

Specialists in Obstetrics and Gynecology

In Indonesia, to become a specialist in obstetrics and gynecology a graduate of a medical faculty must complete 10 semesters or five years of training. Before 2008, ob-gyn training was conducted in nine different training centers with no standard curriculum. In 2009 the Directorate General of Medical Services in the Ministry of Health asked the Indonesian College of Obstetrics and Gynecology (Kolegium Obstetri Ginekologi) to standardize the curricula and create modules in order to improve learning efficacy, budgeting efficiency, and timely graduation of trainees. From 2010 to 2012, 80 ob-gyn's were produced each year by 15 training centers (Kolegium Obstetri Ginekologi, 2009).

The specialist training program is conducted by the Indonesian College of Obstetrics and Gynecology, which uses a competency-based training principle. The Competency-based Education Program for Medical Specialists (PPDSBK) was launched with an eye toward reducing the number of district hospitals without specialists. The Directorate General of Medical Services and the Indonesian Medical College deploy the fifth-semester resident ob-gyn's, pediatricians, and anesthetists (those considered to have ade-

quate competencies to perform comprehensive emergency obstetric and newborn care, CEmONC) to remote district hospitals without waiting for them to graduate. This step is taken to avoid the administrative complications associated with employing graduates of specialist training centers. After six months of fulfilling this mandatory duty, the residents return to the training centers and complete their specialist training program (Kolegium Obstetri Ginekologi, 2009; Ministry of Health, Directorate General of Medical Services, 2009).

Although the standardization of curricula, basic clinical competencies, training modules, and preparation of classroom preceptors and clinical instructors were completed in 2007, only 3 of the 15 training centers have applied the learning standard appropriately. As of 2012, seven centers were approaching 80 percent of the standard, and five centers were below 80 percent. The average number of annual baby deliveries in each center was 2,500, or six to seven deliveries per day for all trainees. That figure is considered too low for developing clinical skills or achieving a level of competency (Kolegium Obstetri Ginekologi, 2012).

Pediatricians

Fifteen public medical schools offer pediatric training in Indonesia. Very similar to obstetric and gynecological training, pediatric training is competence-based, and the curriculum is developed and continually revised by the Indonesian College of Pediatrics (Kolegium Ilmu Kesehatan Anak). The training spans nine semesters, or 4.5 years. At the University of Indonesia, the first six months are dedicated to courses in research methods, statistics, evidence-based medicine, general pharmacology, and philosophy of science. The residents then begin clinical work, which includes a two- to three-month rotation among 15 subspecialties or divisions. The longest rotations are in the outpatient clinic and in perinatology (Kolegium Ilmu Kesehatan Anak, 2009).

Residents are trained to treat patients across the divisions under the supervision of staff. The training they receive depends on their level of residency (junior, medium, or senior). Residents at all levels participate in on-call duties, ward rounds, journal clubs, case presentations, and an outpatient clinic for general pediatrics (Kolegium Ilmu Kesehatan Anak, 2009).

Residents are also obliged to undertake a research project and write a formal thesis adhering to strict requirements (proposal development and examination, data collection and management, analysis, pre-seminar presentation, and formal examination). The results are to be published in a national or international journal—one of the requirements of the National Examination Board for pediatrician. Some observers consider this thesis project to be unnecessary because in many countries a formal thesis is an elective topic. In fact, many residents have to prolong their residencies to complete the thesis. Replacing the thesis requirement with a publishable evidence-based case report could reduce the duration and cost of residency, consistent with evidence-based practice (Kolegium Ilmu Kesehatan Anak, 2009).

The curriculum for pediatric training has been implemented in all specialist training programs in the 15 centers, with some modifications for variations among teaching hospitals in qualifications and facilities. For example, pediatric cardiac surgery and postoperative care can only be performed in six centers (with different capacities). Similarly, not all centers have the capacity to perform the molecular biology studies required to manage certain genetic syndromes. Implementation of evidence-based practice is also being employed in some centers.

In the area of neonatal health, residents are considered able to deal with normal and abnormal neonates with problems common in the neonatal period such as prematurity, asphyxia, management of respiratory distress syndrome, and neonatal infection. Pediatricians who are interested in becoming neonatologists can pursue two more years of training in perinatology. Most of them work in teaching hospitals, large district hospitals, and private hospitals.

Currently, some 100 pediatricians and 10 consultants in perinatology are produced each year. Pediatricians interested in a fellowship in neonatology receive six months of intensive training in a large neonatal unit, but this program is currently available only in Jakarta. The number of the fellows is presently

about 12-15 per semester. After completing the program, they are expected to be capable of managing most neonatal problems; however, no formal examination or certification is provided.

Accreditation and Licensing of Hospitals and Health Care Providers

Accreditation, especially of hospitals, has been introduced as a means of maintaining quality of care. The main challenge in measuring the variables determining the quality of care has been the limited resources available to carry out the process. One of the parameters used to judge quality of care is outcome, which, in this context, is measured by the infant mortality rate (IMR) and maternal mortality ratio (MMR). According to the 2012 Indonesia Demographic and Health Survey (IDHS), the reported infant mortality rate in Indonesia was 32 per 1,000 live births, and the maternal mortality ratio was 360 per 100,000 live births.

Indonesia's accreditation system is run by the Ministry of Health (MoH), and inspections are carried out in all public and private hospitals every three years. The MoH accreditation outline generally compares with that enunciated by the Joint Commission International (JCI), including assessment of patient safety. Some of the private hospitals choose to forgo the MoH accreditation, relying instead on the International Organization for Standardization (ISO) applied by private companies (Ministry of Health, Committee for Hospital Accreditation, 2002). There is no accreditation process for outpatient programs, especially for villages and remote areas, including the village midwifery program.

Hospital accreditation is conducted by KARS, the Hospital Accreditation Commission. KARS accredits both public and private hospitals, but does not regulate the private practices of physicians and midwives. The accreditation commission examines five key hospital activities: management and administration, medical services, emergency services, nursing, and medical records.

According to Indonesia's health minister, as of 2012 only five of Indonesia's 1,800 hospitals were accredited internationally, and all five were privately owned. As of the same year, 65-66 percent of the 1,800 hospitals were nationally accredited, and one-third of those were privately owned (*Jakarta Globe*, 2012).

The Ministry of Health does have a system for registering and licensing health care providers. However, providers only need to fulfill a series of administrative criteria rather than demonstrate the minimum competence required to perform professional work. This system is contributing to significant variation in the quality of care among providers. Since 2007, physicians have had to take a mandatory competency test in order to get their license (Wang et al., 2009). For eligibility for license renewal, physicians are required to earn 250 continuing education units within a five-year period. However, no penalties or sanctions are in place for practicing at substandard levels, although the local health authorities, in collaboration with the Indonesian Medical Association or health professional organizations, can pull the licenses of physicians and midwives for cause (Government of Indonesia, 2004; Ministry of Health, 2010b).

Guidelines

Standards of care in hospitals are usually indicated by the guidelines they follow. Our observation indicates, however, that the guidelines are often not developed and implemented properly. And it is not unusual for guidelines to remain unrevised for a long time. In many situations, health professionals ignore the guidelines, and evidence-based practice is in fact not yet established.

In 2010 the Ministry of Health announced Health Regulation No. 1439 on Standards of Medical Care, which sets forth the National Clinical Practice Guidelines for diseases or conditions that have high prevalence, high risk, high cost, or high variability among patients. These guidelines must be adopted by every hospital in keeping with its capabilities. For example, a Class A hospital may be able to diagnose as well as treat infants with congenital heart disease (CHD). Another hospital of the same rank may be able to diagnose but not treat CHD. It follows that these two Class A hospitals likely subscribe to different clinical practice guidelines for the management of infants with CHD.

The guidelines are usually useful for patients with common characteristics. Deviations arise when a specific characteristic (e.g., allergy to a commonly used antibiotic) prevents the application of regular management. In almost all sets of guidelines, there is a disclaimer stating that the guideline is not a standard of care for every patient with the same diagnosis; rather, it is a recommendation that should be implemented in accordance with the individual patient's characteristics. The health professional must state the reason he or she could not follow the guideline. However, the National Clinical Practice Guidelines and notifications of deviations from the guidelines have not been properly implemented in Indonesia (Ministry of Health, Directorate General of Medical Services, 2011; AusAid-PMPK Gama-HOGSI, 2012; JNPK, 2012).

Assessing the Factors Affecting Quality of Care Offered by Birth Attendants

Of those women who receive antenatal care in Indonesia, 71 percent will first visit a midwife, 20 percent an ob-gyn, 3 percent a traditional birth attendant (TBA), and 2 percent a general practitioner (Ministry of Health, Data and Information Center, 2011). However, as shown in Figure 5-1, more than 90 percent of births are overseen by midwives and TBAs (Indonesian Basic Health Survey, 2010).

The World Health Organization (WHO) defines a skilled birth attendant (SBA) as an accredited health professional—a midwife, doctor, or nurse—who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth, and the immediate postnatal period, and in the identification, management, and referral of complications in women and newborns. However, only a small fraction of graduates of Indonesian midwifery training programs could meet the WHO definition of an SBA (Ministry of Health, Center for Health Education and Training, 2007; Ministry of Health, 2007; Ministry of Health, Center for Health Resources Development, 2011). In other words, the quality of training they receive is not sufficient to produce qualified midwives who are competent to provide the required midwifery services when they are deployed in community-based maternity clinics or health centers in both rural and urban settings. For example, 28-52 percent of midwives are unable to administer intrapartum care using a partograph (a tool for monitoring the first stage of labor), identify the presenting part of the fetus, estimate fetal weight, actively manage the third stage of labor, measure blood pressure, and provide clean and safe delivery care. They also lack other basic midwifery competencies (JNPK, 2010, 2012).

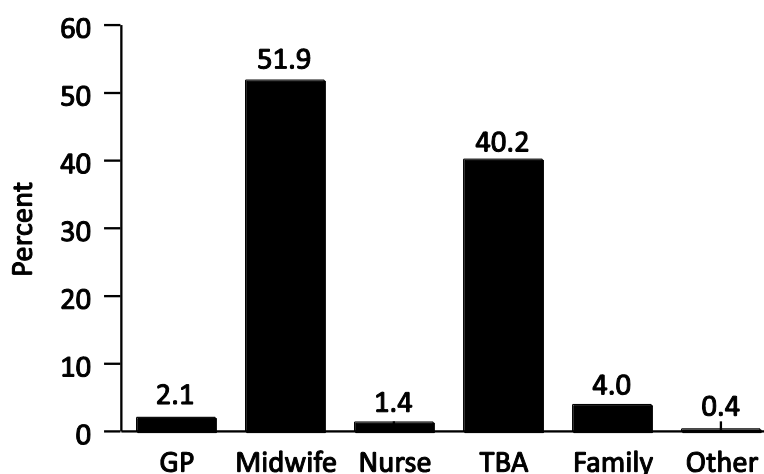


FIGURE 5-1 Birth Attendants at Delivery: Indonesia, 2010. NOTE: GP = general practitioner; TBA = traditional birth attendant. SOURCE: Indonesian Basic Health Survey (Riskesdas), 2010.

The goal of the Bidan di Dasa program was to place midwives in every village. This goal was largely achieved in the mid-1990s, but it could not be sustained despite the rapid growth in the number of midwives—in 2012 there were approximately 200,000, but only 40 percent of villages currently have a midwife. The other midwives moved to nearby urban areas in order to establish private practices while retaining a nominal village presence. The system also still suffers from a questionable quality of service because pre-service training is often weak and lacks opportunities to practice skills (Heywood and Harahap, 2009).

It is therefore not surprising to see some impact on maternal mortality, but not the full impact that might be expected from such a large-scale program. Indonesia has consistently relied on midwives in villages as the primary providers of maternal health services at the community level, whereas referral, promotion of facility-based delivery, and improvements in quality of care, which have a greater impact on maternal mortality, have only recently been placed on the policy agenda (Government of Indonesia, 2004; Ministry of Health, Directorate General of Medical Services, 2009; Ministry of Health, 2010a).

Although doctors can potentially offer more effective emergency management of complications than midwives, gains in effectiveness are limited if births are in health centers that do not have surgical and blood transfusion capabilities. If high coverage is to be attained, it should not be expected that all normal births would be attended by a doctor because deployment and retention might be more difficult and because of higher salary and training costs. Moreover, some hospitals have been shown to overtreat childbirth and have proven difficult to hold to account. Unnecessary interventions for normal births are likely to be more common in hospitals, as are the costs of care (Campbell and Graham, 2006).

Effects of Location on Quality of Care

In remote areas, a home birth with a skilled attendant may respond to a woman's demand for home-based care, but home conditions can be extremely variable and inefficient in terms of the skilled attendant's time and ability to cope with emergencies. The skilled attendant must be able to deal with first-aid for complications with assistance only from the family and to arrange transport for referral when necessary (McDermott et al., 2001). Furthermore, the attendant may not be skilled enough at managing home delivery complications, even when a woman seeks help early. At present, there are more maternal deaths in hospitals than in homes. This difference is attributed to the delays in transport to the hospital of women requiring emergency care. In a home delivery, the decision to transfer and arrange for transport are the responsibility of the midwife and family, and often action is taken too late for financial reasons, clinical errors, or even religious reasons. Hospitals claim that most mothers requiring emergency care arrive at the hospital in terminal condition (Olsen and Jewell, 2009). Most maternal deaths occur during labor, delivery, or the first 24 hours postpartum, and most of the relevant complications cannot be predicted or prevented. Fortunately, individual complications are quite rare, but timely diagnosis and treatment require considerable skills. The critical elements that determine the interventions needed and accessible, and ultimately the outcome, are a woman's location at delivery, the attendant, and the availability and timeliness of transport (Iskandar, 1997; McDermott et al., 2001).

In Indonesia as a whole, 50 percent of the population lives in urban areas and 50 percent in rural areas.⁴ However, thirty-six percent of maternal deaths occur in urban areas and 64 percent in rural areas. Forty-two percent of deaths occur in public hospitals, 16 percent in private hospitals, and 30 percent in the home of the mother (UNFPA, 2012). A study of health disparities in access and quality in Indonesia's five regions has shown that 76 percent of maternal mortality in urban areas occurs in public hospitals and 34 percent in rural areas. In Eastern Indonesia, the disparity occurs because of problems associated with emergency transportation to public hospitals (Olsen and Jewell, 2009).

⁴2010 population census.

Ideally, all women would have immediate access to obstetric care, which would include intrapartum monitoring, as well as early detection and timely referral for complications (Hofmeyr et al., 2009). As noted in Chapter 3, basic emergency obstetric and newborn care comprises a series of interventions, including parenteral antibiotics, oxytocic drugs, anticonvulsants, manual removal of the placenta, postabortion care, forceps or vacuum delivery, and neonatal resuscitation. Comprehensive emergency obstetric and newborn care would add blood transfusion and cesarean section to the list. Staffing for basic emergency obstetric care would include the availability of at least two skilled birth attendants 24 hours a day, seven days a week. A skilled birth attendant should be capable of providing clean and safe delivery and immediate complication management and of recognizing conditions that require CEmONC services (Ministry of Health, Center for Health Education and Training, 2007; Ministry of Health, Directorate General of Medical Services, 2011; JNPK-PPSDM, 2012; JNPK-Dit Yanmed Spesialistik, 2012).

Nationally, of the 1,674 BEmONC health centers, 57.2 percent provide 24-hour services. When viewed regionally, the percentage of 24-hour BEmONC health centers in Eastern Indonesia is close to the national average at 71 percent. This finding suggests that, although these services may be available 24 hours a day, they are difficult to reach, and equipment and drugs are sometimes not accessible. Thus the risk of death remains high. In other words, facilities exist, but access to them may be especially difficult in remote and isolated parts of Indonesia (Olsen and Jewell, 2009).

Nationally, over 50 percent of public hospitals claim to have staff trained and equipped to offer CEmONC services 24 hours a day, seven days a week (Olsen and Jewell, 2009; Ministry of Health, Center for Health Research and Development, 2012). But in 2011, among the CEmONC hospitals, only 35 percent were found to have a complete clinical team available to offer adequate services all day every day. Regionally, there appear to be gaps in CEmONC services among the five regions. The Java-Bali region better fulfills CEmONC criteria than other regions, and hospital maternal mortality ratios and emergency response times are better in the western region than the eastern region (Olsen and Jewell, 2009; Ministry of Health, Directorate General of Medical Services, 2011; Ministry of Health, Center for Health Research and Development, 2012).

Some interventions are possible only in a CEmONC facility such as cesarean section and blood transfusions. However, other actions also can save many maternal and newborn lives if birth attendants are properly trained. It is important to ensure that life-threatening complications, particularly antepartum bleeding, which can be managed only by a CEmONC facility, are recognized early and referred before complications develop.

Technical Recommendations: Improving Quality of Care

In the implementation of a health program, priority should be given to preventing maternal deaths from direct obstetric causes and unsafe procedures. Training should emphasize rapid recognition of a high-risk pregnancy and labor, resuscitation and stabilization, timely and optimum referral, proper emergency responses and treatment, and effective post-treatment care in BEmONC or CEmONC facilities. Reporting practices should enable further studies of maternal death.

The following five technical recommendations pertain specifically to improving the quality of care. They are independent of this report's general recommendations (see Chapter 8), and many of them can be implemented by the service organizations themselves.

1. *Improve training quality within the certification system.* Pre-service training and in-service competency-based workshops should be long enough and of sufficient quality to allow trainees to exhibit their knowledge and competency in essential skills, especially for emergency lifesaving. In other steps, (1) have professional organizations or other third parties conduct regular licensing and competency-based certification at prespecified intervals; (2) build regular supervision and mentoring into the program from inception, and train supervisors in motivational and support strategies (avoid punitive approaches); (3) design and incorporate integrated, pervasive

- monitoring and evaluation processes into routine program implementation; and (4) carry out analysis and reporting across the full spectrum of implementation, from staff recruitment to health outcomes.
2. *Give health care providers clear responsibilities and assignments.* Although the Ministry of Health decree might be used as a legal foundation, the ministry itself must clearly set forth the scope of work for skilled birth attendants, including delegation of authority to perform lifesaving functions and assurance that additional duties do not distract from the mission of maternal and neonatal care. A formal community participation strategy should engage the community in the monitoring and evaluation of services.
 3. *Change the national education system from a certification-based system to a competency-based system.* It should ensure that graduates have the skills needed to fulfill WHO's definition of a skilled birth attendant. The system should include comprehensive strategic planning for creating and utilizing birth plans and nursing and midwifery services, and should involve all the relevant stakeholders in government, civil society, service delivery, and educational and professional organizations. Policies must focus on regulating practitioners, standardizing educational programs, providing support for nursing and midwifery, and promoting research within and outside the health sector to address significant gaps in policy development (WHO, 2012a).
 4. *Shift home-based deliveries to institution-based deliveries, attended by WHO-defined SBAs.* All women should have immediate, full-time access to emergency care. The midwifery workforce should be capable of consistently meeting established standards of care and the expectations of the public. Strategies can draw on evidence-based recommendations and technical support to enhance midwives' skills mix, performance, and mobility. National Human Resources in Health plans must cover the costs of nursing and midwifery personnel at every level, manage migration, and remain consistent with approaches to internal and interprofessional task sharing.
 5. *Reduce the inequity in the distribution of specialists and skilled birth attendants.* Planning must take into account local health needs, the current state of health services, the provider mix, the available resources, and the local production and training capacity for health providers.

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Chapter 6

Governance Issues

It was only after 2001 when Indonesia shifted from a highly centralized system of government to a decentralized one that governance became an issue of public debate. The public no longer remained a passive recipient of public sector development activities under the authoritarian regime; instead, it began to demand accountability from the executive and the legislature. These changes grew out of democratization and decentralization, but soon it became clear that these values themselves had become issues and even obstacles to the practice of good government.

This chapter looks at the impact of decentralization on public services in general, and on services related to maternal and neonatal health in particular, in the context of regional inequality and local politics in search of accountability. Although decentralization has allowed rapid expansion of the civil service, access to health services has not improved as expected. Indeed, public health services are even more difficult to access, forcing not just better-off but also poor mothers to turn to the private sector when giving birth. And thus the search for accountability has led the central government to develop guidelines for setting minimum service standards (MSS), which are supposed to be adjusted to local conditions by regional governments. However, the standards are outcome indicators for program evaluation without the meaningful measurements that would allow civil society and consumers of public health services and facilities to monitor and evaluate government responses to the needs and demands of its citizenry.

Decentralization

In 2001 Indonesia moved from a highly centralized government to a decentralized one; provinces, districts, and municipalities were extended the autonomy to choose and then plan their respective development paths. At the time, the demand for decentralization was widespread. It held the promise of hastening the development process, particularly for the poor, because of the greater proximity between policy makers and the people and the assumption that local governments know best the needs of their constituents (Conyers, 1984; Bird, 1993; Oates, 1999; Braun and Grote, 2000; Katsiaouni, 2003).

When implemented in 2001, the decentralization laws took effect nationwide, regardless of local conditions, the state of preparation of local institutions to deal with the responsibilities and consequences of the change, and the new public expectations of good governance practices. The “big bang” approach ignored not only the nation’s various levels of general development but also the differences in the quality of and access to public services (Hofman and Kaiser, 2002). Dissatisfaction with the initial results of decentralization led to amendments in 2004 to the original law that further extended authority to the provinces as extensions of the central government. For example, the Ministry of Health can earmark resources for specially designed programs for mothers and infants at the grassroots level through the mediation of the provincial and district/municipality health services offices.

Local Governments and Civil Servants

Decentralization applies not just to rights but also to responsibilities. Although rights are popular, the responsibilities for ensuring the well-being of constituents have not been embraced in all cases. The benefits

of decentralization have been enjoyed mostly by the local elites at both the province and the district/municipality levels,¹ whereas general access to public services, including health services for mothers and infants, have not much improved.

Instead, implementation of the laws has resulted in extending to the local political elites the power and authority to recruit and hire civil servants² and to allocate and spend more government funds locally. It did not take long for local governments to recognize and employ the power implicit in regional autonomy to ignore with impunity instructions from the central and provincial governments.

As a result, decentralization has been accompanied by the growth of public sector employment in the regions. In fact, most of the growth in the civil service can be attributed to the creation of new autonomous regions. Until 1998, when the centralized New Order government fell, there were 26 provinces and 299 districts and municipalities. Discontent with the central government and the promise of a better future under local government and governance fueled the drive to create new autonomous regions. Between 1999 and 2009, seven provinces and 198 new districts/municipalities were added (Direktorat Jenderal Otonomi Daerah, Kementerian Dalam Negeri, 2010), all requiring new offices with mostly new staff, recruited locally and often not qualified. In 2010 a moratorium was introduced to delay the formation of new autonomous regions and curtail growth in the size of the civil service. However, since the moratorium was lifted in late 2012 one province and at least seven new districts have been created, with more requests under consideration.

The new civil service positions are highly valued, particularly in those regions where formal sector jobs with regular salaries are few and hard to find. Moreover, the private sector in those regions remains less developed, operating mostly in the informal, peasant economy, which is still largely dependent on agriculture.

Since 2003, there has been a major transfer of civil service jobs to the districts, and the sharp increase in the size of the overall civil service has become a concern of the central government (Figure 6-1). Of the 3.5 million civil servants after decentralization in 2003, 2.7 million were employed at the regional level. Of this number, only 0.3 million were located at the provincial level, and the remaining 2.4 million were in the district and municipality governments. Between 2006 and 2010, the civil service grew from 3.7 million in 2006 to 4.1 million in 2007 to 4.5 million in 2009, with further slight growth to 4.6 million by 2010. In this period, central government employees expanded by only 0.1 million, to 0.9 million civil servants, and those at the provincial level remained relatively stable, at 0.3 million. By contrast, the civil service at the district and municipality levels increased by almost 1 million, from 2.6 million to 3.4 million local bureaucrats.

Unequal Access to Health Services

In spite of the rapid growth in the overall size of the civil service, public services, including health services, have little improved, and many Indonesians still cannot afford them. In many regions of the country, Indonesian women, especially poor ones, do not have access to the health services they need when giving birth. Health facilities and providers are largely concentrated in urban areas, and thus they are not easily accessible to the poor living in remote rural areas. As described in Chapter 5 (Figure 5-1), in 2010 only a very small percentage of births in Indonesia were attended by trained health staff (general practitioners or specialists). According to the 2010 Indonesian Basic Health Survey (Riskesdas), the majority were attended by nurses or trained midwives, and the rest by traditional birth attendants (TBAs) and others. On every count, Indonesia has been and continues to be characterized by significant regional variation, and the same is true for health services and providers. In some provinces, substantially higher pro-

¹Maintaining the practice of “level skipping” embraced by the centralized New Order government of Indonesia (1966–1998), the decentralizing government extended autonomy to the district/city while bypassing the province.

²In most regions beyond the major urban centers, there are few salaried employment opportunities in the formal sector; civil servants hold tenured posts.

portions of births are attended by doctors than the national average. Most of these provinces are located in the western part of the country on the major islands of Java and Sumatra. They include the province of Yogyakarta, which is known as a center of higher education; the capital city of Jakarta; the dynamic industrial province of Riau Islands; and the global tourist destination of Bali. At the other end of the spectrum are the underserved provinces where relatively few births are attended by trained health services providers. These provinces are mostly located in Eastern Indonesia, where poverty is also more widespread and trained health staff are highly underrepresented. According to Table 6-1, in recent years women with limited education and those from poorer households have been much less likely to give birth in health facilities. Among those with less than a primary school education or from the lowest wealth quintile, more than three-quarters have given birth at home.

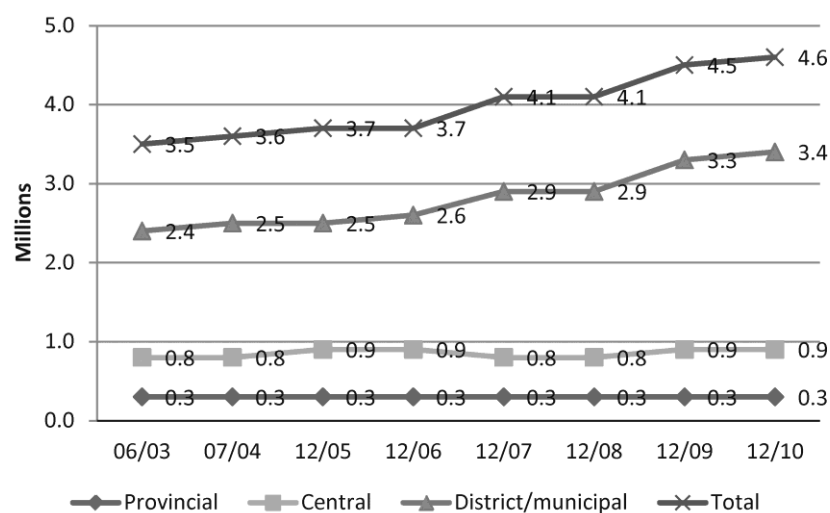


FIGURE 6-1 Number of Civil Servants by Level of Government: Indonesia, 2003–2010. SOURCE: Badan Pusat Statistik, *Statistical Yearbook of Indonesia* (various years).

TABLE 6-1 Percent Distribution of Place of Birth by Education of Mothers and Welfare Quintile: Indonesia, 2007

Education and Wealth Quintile	Health facility		Home	Other	Not specified	Sum
	Public	Private				
<i>Education</i>						
No schooling	5.9	9.5	81.4	1.4	1.8	100.0
Less than primary school	5.8	16.1	76.6	1.0	0.5	100.0
Primary school	7.1	23.8	67.2	0.9	0.9	100.0
Less than secondary school	9.6	39.1	50.2	0.5	0.7	100.0
Secondary school +	14.2	57.1	28.2	0.3	0.3	100.0
<i>Wealth quintile</i>						
Poorest Q	5.2	8.4	84.8	0.9	0.7	100.0
Q2	8.3	23.4	66.8	0.5	1.0	100.0
Q3	11.4	36.5	51.1	0.6	0.4	100.0
Q4	12.2	49.5	37.1	0.7	0.5	100.0
Wealthiest Q	12.3	71.0	15.5	0.6	0.6	100.0
Total	9.7	36.4	52.7	0.7	0.6	100.0

SOURCE: Badan Pusat Statistik and Macro International (2007: 138).

Local Politics

Before implementation of the decentralization laws that extended autonomy to regional governments, Indonesia's great diversity was largely ignored in the government's pursuit of a one-size-fits-all approach to programming and project design, despite clear differences among regions in environment, infrastructure, and natural and human resources. Public policies were determined nationally, and local governments—from the provinces and districts or municipalities to subdistricts and villages³—implemented decisions made in Jakarta.

Central-Regional Relations

Central-regional relations have changed dramatically under decentralization. In most sectors, including health, the vertical lines of authority from the central to local governments have been eliminated, and many of these local governments have wide discretion to prioritize services and determine local administrative organization. Certain services, however, including health services, are defined as obligatory functions, and local governments are required to have a common structure of facilities and to maintain separate health services offices (*dinas kesehatan*).⁴ Maternal and child health services are not mandatory, but, because of their importance, nearly all local health services have a unit for these services (Ministry of Health, 2008a). In an exceptional crisis such as an epidemic outbreak, the Ministry of Health can also mobilize the Health Crisis Center, a vertical organization under its authority that reaches down to the district or municipality level to offer human and monetary resources that have been earmarked for such use by the central government.

An exception to decentralization is international agreements; these are made only in the name of the central government. This situation applies to Millennium Development Goals (MDGs) 4 and 5, which are aimed at reducing maternal and child mortality. For such initiatives, the central government uses its own departmental funds to support the relevant programs and projects throughout the country, and funds are earmarked for particular activities for implementation by local governments. These earmarked resources, *dekon*, go first to the provincial governments and then for implementation to the district or municipality level.⁵ Another model is described in Box 6-1.

Besides these earmarked departmental funds, local governments also receive substantial support through general transfers known as DAU or *dana alokasi umum* (general allocated funds)⁶ as well as special earmarked sector-specific grants known as DAK or *dana alokasi khusus* (special allocated funds), one of which is for health. However, often the great bulk of DAU goes to cover PNS (*pegawai negeri sipil*) or civil servants' salaries, which account for 70-80 percent of most regional budgets, leaving little available to carry out locally designed programs and projects. DAK is also limited to centrally defined activities, including the rehabilitation of facilities and selected operational expenses. Under these conditions, central government programs and projects are generally welcomed by local governments because they reduce the pressure to use their own funds for general purposes. This is particularly true of those lo-

³In Indonesia, the village is the lowest public administration unit.

⁴The availability and structure of the government for nonobligatory functions are determined by local governments. Some services are considered important by some governments but not by others, and some services are combined one way in one district and a different way in a neighboring district. For example, although the central government has a Ministry for Fishery, inland regions have no need for this service, or a municipality may consider forestry services unnecessary.

⁵In most cases, program or project content is vertically defined, whereas local governments have the discretion to decide exactly where implementation will take place.

⁶DAU has two major components: basic allocation and fiscal gap. The basic allocation mainly covers personnel and administration; the fiscal gap provides additional program funding for local needs and favors poorer regions with less local revenue-raising capacity.

cal governments with extremely limited locally derived revenues that constrain the availability and delivery of public services, including health services.

Consequences of Direct Elections

Regional diversity in the quality of public services and delivery is further exacerbated by another consequence of decentralization. Today, all heads of regions and officials down to the district and municipal levels are directly elected. Thus regents and mayors are responsible only to their constituents—or more likely to those close to them, including party members who were part of their successful election campaign teams—and so they are less answerable to their “superiors” in government and able to exercise sanctions or withhold budget allocations.

As in other countries, the party winning a local election is often rewarded with government jobs for putting its candidate in office. As just described, a government position is a highly prized reward, especially in those regions where the private sector is weak and where salaried employment opportunities are few. Thus when new people are elected, the game “musical chairs” begins anew, resulting in frequent staff turnover.

Not surprising, local officials are often insufficiently informed of the conditions in their particular regions and the responsibilities of the positions they hold. Moreover, not just local governments but also local decision-making bodies are often uninformed of the commitments these bodies have to the needs of their citizens, including public social services, such as those related to maternal and neonatal health. Furthermore, the changing of the guard does not happen only once every five years when local heads are elected; rather, it happens far more frequently at the lower levels when those in power have to repay a favor. The result is that some local government officials are insufficiently informed about their jobs, having occupied their positions for only a short time.

So far, then, the promises of decentralization for improved access by the poor to better public services for mother and child health have not materialized. And the advantages attributed to proximity between local politicians and the needs of their constituents resulting in better needs assessments and services have not yet been borne out. Instead, a large proportion of those living in isolated rural areas, including the poor, often turn to private sector facilities for delivery, or they avoid facilities altogether (see Tables 6-1 and 6-2). Indeed, often there is no alternative because health service providers tend to concentrate in urban centers where there are better opportunities to receive monetary payments for services.

BOX 6-1 Decentralization and Argentina

Indonesia is not alone among countries dealing with decentralization and the MDGs at the same time. Argentina has faced a similar situation. A country with a history of authoritarian governments, it, like Indonesia, adopted a decentralized system of government upon the rise of a new democratic order. Political power moved to the provinces, some of which are in remote and hostile terrain. Despite high health expenditures nationwide during the first decade of the 21st century, one-third of the population had no access to health care, and the poor were excluded from health insurance. As a result, Argentina appeared unable to achieve the MDGs. In 2004 Argentina instituted a social insurance program, Plan Nacer, that provided women and children in the poorest provinces with basic health services (World Bank, 2009). It was based on an incentive mechanism between the Ministry of Health and the provinces, which were required to establish contracts containing quality of care provisions with local health care providers. The program was initially funded through a World Bank loan. In 2006 it was expanded to other provinces, and reached its program goals by 2009.

TABLE 6-2 Percent Distribution of Live Births during Five Years Prior to 2007 Indonesia Demographic and Health Survey by Place of Birth and Province, Indonesia

Province	Health Facility		Home	Other	Not Specified	Total	No. of Births
	Public	Private					
Aceh	7.7	17.1	74.5	—	0.6	100.0	324
North Sumatra	5.1	29.9	64.4	0.4	0.2	100.0	1,197
West Sumatra	18.5	45.0	34.7	1.5	0.4	100.0	383
Riau	4.9	38.7	55.4	0.2	0.8	100.0	290
Jambi	5.6	20.5	72.9	—	0.1	100.0	186
South Sumatra	7.6	25.8	64.9	0.2	1.5	100.0	491
Bengkulu	6.3	5.8	87.9	—	—	100.0	111
Lampung	2.5	42.2	54.9	—	0.5	100.0	452
Babel	10.1	33.1	54.4	1.5	0.9	100.0	103
Riau Islands	11.0	65.3	23.1	—	0.6	100.0	93
Jakarta	14.8	73.7	11.2	0.2	0.2	100.0	741
West Java	6.0	38.6	54.5	0.1	0.8	100.0	2,600
Central Java	7.6	45.5	46.4	0.2	0.3	100.0	2,308
Yogyakarta	16.9	69.9	12.7	0.3	0.2	100.0	201
East Java	8.5	57.0	32.0	1.6	0.9	100.0	2,178
Banten	3.7	34.4	61.6	0.1	0.2	100.0	695
Bali	24.6	66.2	8.5	—	0.7	100.0	253
West Nusa Tenggara	25.9	6.3	58.4	8.9	0.6	100.0	412
East Nusa Tenggara	16.1	4.5	77.5	0.5	1.4	100.0	507
West Kalimantan	8.8	24.9	65.2	0.4	0.7	100.0	374
Central Kalimantan	5.2	8.9	84.9	0.4	0.6	100.0	160
South Kalimantan	8.8	10.5	79.8	—	0.8	100.0	289
East Kalimantan	21.2	24.6	53.5	0.4	0.2	100.0	262
North Sulawesi	26.6	28.4	43.0	0.5	1.5	100.0	191
Central Sulawesi	11.7	7.3	80.2	0.4	0.4	100.0	243
South Sulawesi	16.0	14.6	68.9	—	0.5	100.0	631
Southeast Sulawesi	6.3	2.0	90.5	0.6	0.5	100.0	192
Gorontalo	13.7	8.0	74.8	2.6	0.9	100.0	82
West Sulawesi	8.9	3.7	87.0	—	0.4	100.0	103
Maluku	8.4	4.0	87.1	0.2	0.2	100.0	143
North Maluku	10.7	7.3	80.5	0.4	1.0	100.0	93
Papua	18.9	7.4	70.8	1.2	1.7	100.0	152
West Papua	32.5	6.5	55.7	1.4	3.9	100.0	62
Indonesia	9.7	36.4	52.7	0.7	0.6	100.1	16,502

SOURCE: Badan Pusat Statistik and Macro International (2007: 289).

Although numerous programs and projects are aimed at improving the quality and accessibility of health services, including those for mothers and children, the perception that many of these services continue to be of poor quality remains. As shown in Table 6-3, this perception is reflected in the relatively low reliance on public health facilities, even among the poor. The causes of dissatisfaction are such things as administrative fees, slow or poor service delivery, ponderous bureaucratic procedures, and unskilled or,

even worse, unavailable service providers. It was in response to such challenges that the government introduced minimum service standards (MSS) in 2003. These standards were designed to serve as an instrument that would allow the central government to ensure that local governments were providing “affordable” basic standardized services to all who required them (Ismail Mohamad, n.d.).

In the health area, the standards have undergone an evolution. They initially encompassed some 54 output indicators for all available services (1458 Menkes/SK/X/2003). In 2008, however, a ministerial decree (741/Menkes/PER/ VII/2008 Tentang Standar Pelayanan Minimal Bidang Kesehatan di Kabupaten/Kota) reduced the number of covered services to 18, six of which refer directly to aspects of maternal and infant health (see Table 6-3). These services are presented in terms of target coverage rates (for 2010 or 2015) and include coverage of the following: visits by pregnant women to medical facilities, treatment of birth complications, birth attendance by trained personnel, postpartum services, and visits to medical facilities for infants from assisted births with neonatal complications.

TABLE 6-3 Current District/Municipality Health Services Subjected to Minimum Service Standards in Ministry of Health Regulation No. 741, 2008, Indonesia (targets for percentage of coverage, 2010 and 2015)

Type of service		2010	2015
a.	Basic health services		
	1 Coverage of four visits by pregnant women		95
	2 Coverage of treatment of birth complications		80
	3 Coverage of births attended by health staff with midwifery competence		90
	4 Coverage of postpartum services		90
	5 Coverage of assisted births with neonatal complications	80	
	6 Coverage of infant visits	90	
	7 Universal village coverage with child immunization	100	
	8 Coverage of under-5 services	90	
	9 Coverage of supplementary feeding for children 6-24 months of age in poor families	100	
	10 Coverage of care for children under age 5 suffering from malnutrition	100	
	11 Coverage of health of elementary school students	100	
	12 Coverage of active family planning participants	100	
	13 Coverage of finding and taking care of the sick	70	100
	14 Coverage of basic health services provision to the poor		100
b.	Referral health services		
	1 Coverage of poor patients' health referral services		100
	2 Coverage of first-level emergency assistance by district/municipality hospital facilities		100
c.	Epidemiological investigation and handling of extraordinary events		
	1 Coverage of epidemiological investigations in less than 24 hours in villages experiencing extraordinary events		100
d.	Health promotion and community empowerment		
	1 Coverage of active Alert Villages		80

SOURCE: Ministry of Health (2008b).

Although the notion of providing benchmarks and performance objectives is highly relevant to improving conditions, implementation of the MSS as they currently stand has been somewhat problematic. For example, the ministerial decree of 2008 includes detailed guidelines on data requirements, sources, and calculation of various indicators,⁷ but the system continues to rely on often incomplete records compiled by inadequately trained or motivated local personnel, and often it relies mainly on information provided by public health facilities (public hospitals or community health centers) that present only a partial picture of who is actually being served. In addition, base data on target populations are generally provided by sources—notably, the local offices of the national statistics agency (Badan Pusat Statistik, BPS)—that themselves lack reliable up-to-date information. This deficiency is particularly noticeable in local service areas where figures are usually estimates from surveys or projections. This problem, along with a general lack of attention at all levels to data quality control, frequently results in information with limited reliability or validity and thus of limited use for monitoring. Finally, and perhaps most critically, the existing standards also lack any locally meaningful monitoring measures such as those related to ease of access, availability of trained medical staff, and patient waiting times. Such measures would be designed to ensure the accountability of government entities in delivering quality health services that are relevant to the local people.

Conclusion

In Indonesia, regional inequities were further exacerbated by decentralization when the provision of public services became the responsibility of local governments in 2001. The resolution to achieve MDGs 4 and 5 was issued by the central government, but local governments have to shoulder the burden, and they are not prepared to do so. Some 70–80 percent of local government budgets are allocated to public sector wages and salaries, leaving little for locally designed social services. Just as before decentralization, many local governments continue to rely on the central government to provide social services. However, the central government can no longer place doctors in isolated areas on the basis of Law No. 8 (1961);⁸ today such placements are on a “voluntary” basis but are a requirement for doctors to earn their private practice license (SKTP). As recently as 2011, the central government placed on a voluntary basis 1,080 doctors for one year in remote and very isolated *puskesmas* (Pusat Komunikasi Publik, 2011). In a free market, doctors, nurses, and midwives tend to gravitate toward urban centers where earning opportunities in the private sector are greater.

At the local government level, local officials are often insufficiently informed about the conditions in their particular regions and about the responsibilities of the positions they hold. And local decision-making bodies are often uninformed about the commitments that they have to the needs of their citizens, including public social services, such as those related to maternal and neonatal health. Although the central government has introduced accountability measures to monitor service delivery, particularly through the introduction of minimum service standards, implementation has been inhibited by a lack of data and the inadequate human resource capacities of local governments. Outcome indicators produced under the MSS have little meaning to local government bureaucrats because no incentives are attached to any “achievements,” and the indicators generally fail to deal with issues of service quality, which are at the core of customer dissatisfaction with public services.

⁷These include details on (1) definition, (2) operational definition, (3) formula calculation, (4) data source, (5) reference, (6) target, (7) activity steps, and (8) human resource requirements.

⁸Law No. 8 (1961), *Wajib Kerja Sarjana*, compelled university graduates to accept job placements in “isolated areas.” However, implementation of this law was considered discriminatory because it applied only to doctors and dentists, who therefore called for its elimination.

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Chapter 7

Strengthening the Financing of Maternal and Neonatal Health

As earlier chapters have pointed out, understanding the epidemiological and social dimensions of Indonesia's maternal and neonatal health (MNH) problem and choosing the right interventions are critical steps in accelerating progress on reducing maternal and newborn mortality in that country.¹ Indonesia also needs to strengthen the capacities of its health system to finance, effectively purchase, and deliver the requisite services to those who need them. This effort includes removing the barriers to effective use of the system, such as those related to financial cost.

This chapter reviews the evidence on how Indonesia finances its MNH services today and recommends steps to strengthen financing for better MNH outcomes. Overall, it calls for Indonesia's public spending on MNH to rise in order to achieve the desired goals. However, it also points out that impediments to the effective use of the available funds in the current complex and highly variable financing system could be reduced to achieve better outcomes, even in the absence of additional funds. It notes as well that the information available for monitoring financing and ensuring accountability for positive change needs to be strengthened as part of future efforts to improve MNH financing.

Data Sources and Methods

Various data sources were identified for this chapter on the financing arrangements for and expenditures on maternal and neonatal health in Indonesia. The evidence collected was assessed for relevance and quality. The sources included:

- government budget and expenditure accounts;
- relevant household survey results such as those from the Indonesia Demographic and Health Survey (IDHS) and national household health and expenditure surveys;
- available studies and analysis of MNH expenditures such as reproductive health subaccounts;
- provincial- and district-level health accounting studies; and
- other studies and reports deemed relevant.

A variety of publicly available reports, documents, published articles, and presentations from January 2005 to August 2012 were also collected as part of this review project. The data sources were reviewed in August and September 2012.

In assessing Indonesia's MNH spending, we used as a reference point the definition of "MNH expenditure" in the World Health Organization's "Guidelines for RMNCH-GET: A Reproductive, Maternal, Newborn, and Child Health Government Expenditure (and Budget) Tool" (WHO, 2011: 53-54). This definition includes all expenditures associated with prenatal and postnatal care and delivery. Prenatal and

¹This chapter is based on a background paper by Hasbullah and Brooks (2012) prepared for the U.S. National Academy of Sciences-Indonesian Academy of Sciences joint working group.

postnatal care includes the provision of micronutrients and food supplements to mothers before, during, and after pregnancy. Postnatal care refers to services rendered up to six weeks after delivery for the mother and 28 days after birth for routine care of the infant. Delivery includes emergency obstetric care to deal with complications and transport for emergency obstetric care.

No primary data were collected for this review project. All reviewed data sources associated with MNH financing and expenditure, in addition to the relevant national and district health expenditure, are listed in the references.

Total Health Expenditure

Indonesia's total health expenditure is relatively low compared with that of other East and Southeast Asia countries. Indonesia spent 3 percent of its gross domestic product (GDP) on health in 2010; by contrast, the regional (East Asia and Pacific) average was 7 percent, and the global average was 10 percent (World Bank, 2012). In 2010 Indonesia spent US\$18 billion on health care, almost all (99 percent) of which came from domestic funding sources (WHO, 2012). From 1995 to 2010, both government and household out-of-pocket spending on health increased (Figure 7-1). Of the total health expenditure of \$77 per capita in 2010, the government accounted for 49 percent and household out-of-pocket spending for 38 percent (WHO, 2012). The remainder came mostly from other private sources.

Government health spending in Indonesia accelerated substantially during the 2000s with the introduction of several new initiatives in health insurance and decentralized financing. During the same time, household out-of-pocket spending also continued to increase.

Complex Financial Flows in Government Financing of Health Care

The flow of government health resources is a complicated process in Indonesia as shown in Figure 7-2. This complexity is only exacerbated by Indonesia's strong decentralization policies, which result in substantial resource transfers directly to districts.

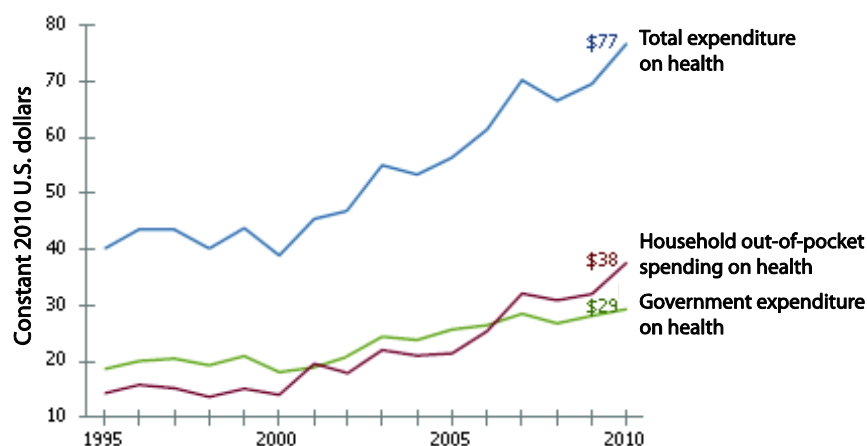


FIGURE 7-1 Per Capita Expenditure on Health: Indonesia, 1995-2010 (constant 2010 U.S. dollars). SOURCE: WHO (2012).

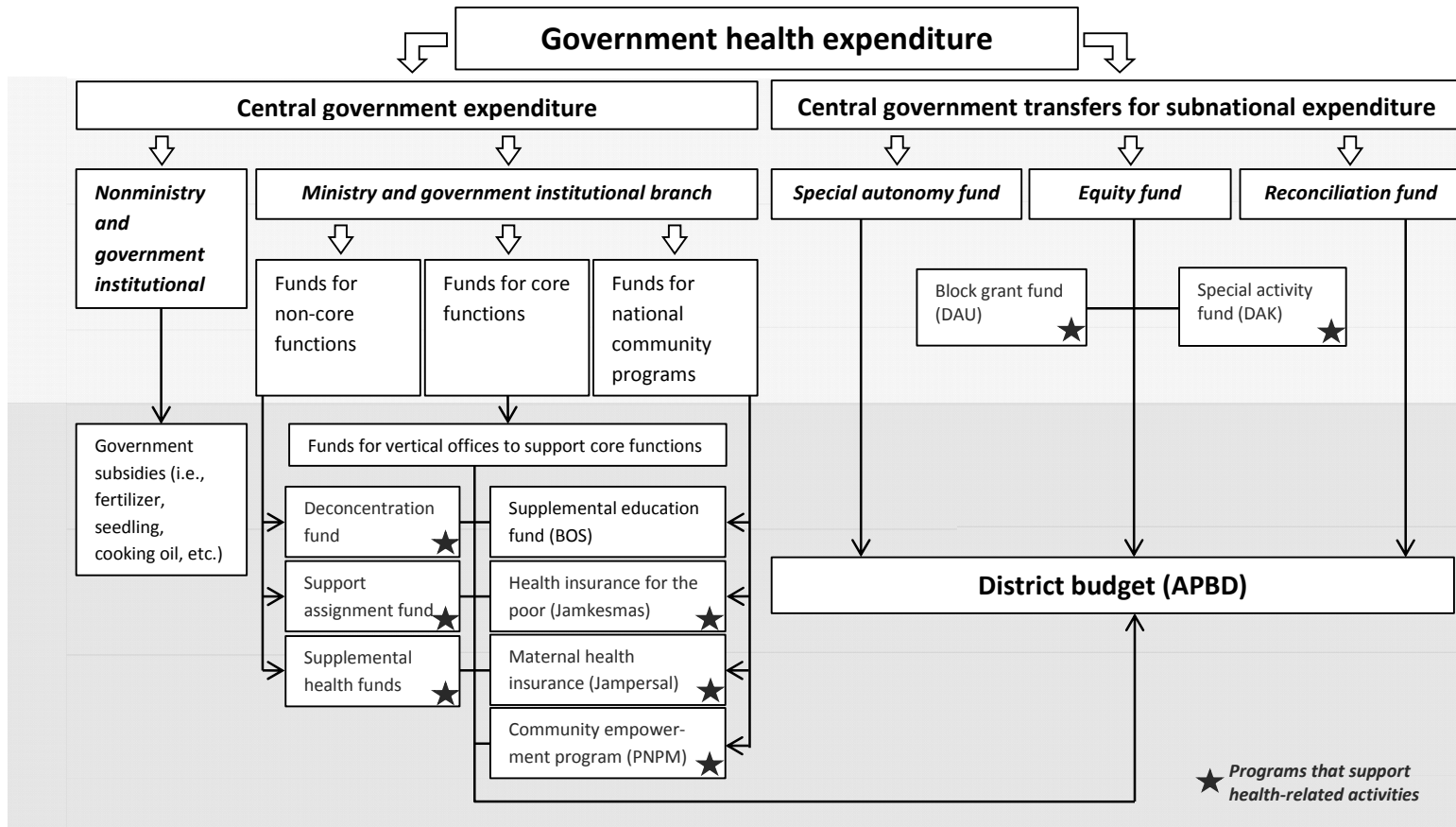


FIGURE 7-2 Overview of Government Health Resource Flows. NOTE: Core functions are foreign affairs, defense, security, justice, financial affairs, and religion. SOURCE: Center for Health Services Management, Faculty of Medicine, University of Gadjah Mada, <http://manajemen-jaminankesehatan.net/index.php/80-sumber-dana/154-alur-belanja-apbn-ke-daerah>.

Legally, the authority of the central and provincial governments to regulate and even monitor district-level expenditures is quite limited. As a result, to an unknown degree districts may allocate funds earmarked for MNH to other purposes and vice versa.

As illustrated in Figure 7-2, the national government's health spending is split into two main pathways: direct central government expenditure and transfers for subnational expenditures. For the direct central government expenditure, health resources can flow through two main funding channels: (1) ministries and other government institutions and (2) other channels. Those that flow through the second category are mainly used to finance subsidies on basic goods and are not related to maternal and neonatal health.

Funds that flow through ministries and other government institutions can be further divided into funds for core functions, noncore functions, and national community programs. Funds for core functions support the administrative structures of government, such as those of the Ministry of Health (MoH), which in part indirectly support MNH services as well.

For the noncore functions funding channel, the central government has three categories of financing that can be used to support the direct and indirect costs of various health programs, including MNH at the provincial and district levels:

- *Deconcentration fund (Dekon)*. Grants from the Ministry of Health used for central government-sponsored activities. District proposals that utilize these funds are approved at the provincial level.
- *Support assignment fund (Tugas Pembantuan)*. Fund flows directed to district hospitals for physical assets, infrastructure, and equipment. The allocation and use of these funds are approved by the central Ministry of Health.
- *Assistance Fund for Operational Costs at Health Center Level (Bantuan Operasional Kesehatan, BOK)*. Supplemental resources directed to community health centers (*puskesmas*) for health protection and promotional activities. These funds, which are allocated by the Ministry of Health, cannot be used to support personnel costs.

The other relevant central government funding channel, “funds for national community programs” (Mendanai Program Nasional Kewenangan Bersama), provides health resources to the district through several social assistance programs:

- *Health insurance for the poor (Jamkesmas)*. This insurance provides free primary health care services for the poor, including maternity care, at community health centers (*puskesmas*) and inpatient services in hospital wards (third-class). Funds are approved by the Ministry of Health.
- *Maternal health insurance (Jampersal)*. This insurance finances antenatal, postnatal, and family planning services for all pregnant women not covered by any insurance scheme at community health centers and hospitals. It also finances services at private facilities that have a memorandum of understanding (MoU) with the district health office. Funds are approved by the Ministry of Health.
- *National Program for Community Empowerment (PNPM)*. These central government grants are used for community empowerment activities such as building and rebuilding village sanitation units and community health posts and constructing and reconstructing roads. Community proposals for these funds are approved by the district administration.

A separate channel of national funding is that transferred directly to district budgets (Anggaran Pendapatan dan Belanja Daerah, APBD) as funding support. As part of these transfers, two channels of central government financing are used to support various health programs, including MNH, at the district level:

- *Block grant fund (dana alokasi umum, DAU)*. Grants from the central government to district governments to pay primarily civil servants' salaries (e.g., doctors, nurses) and activities approved by the district parliament.
- *Special activity fund (dana alokasi khusus, DAK)*. Specific sectoral grants from the central government that can be used for construction, rehabilitation, and equipment for primary care facilities.

Districts receive other fiscal transfers from the central government as well, and they have considerable discretion in how they use these funds. For example, in recent years district-based health insurance schemes (Jamkesda) have received greater attention; they may be funding MNH-related expenditures.

In addition to the funding sources just described, districts have their own directly raised and controlled revenue sources. This includes local taxes (*pajak*) and excise taxes and fees on natural resources. Districts may choose to allocate some of these funds to MNH-related activities. In addition, districts earn revenues directly from the user fees and other revenues received at district hospitals and health centers, some of which could be financed from transfers from the central government for health insurance. This latter flow is important for MNH because the districts have an incentive to collect revenue from users of government health facilities and health insurance schemes. The degree to which such revenue is “recycled” for MNH is unknown.

Overall, then, maternal and neonatal health care in Indonesia is characterized by fiscal complexity and limited information. It is known, however, that multiple channels of central and local funding can and do support MNH. Districts have substantial autonomy in deciding what to spend on specific health activities as well as incentives to increase their own revenue from some of these activities. It is hard to say with any precision how much is actually spent and from what sources. The discussion that follows on district health accounts provides further details.

Ministry of Health Financing of MNH Services

In 2010 Indonesia's Ministry of Health had a budget of Rp 23.8 trillion (US\$2.6 billion or about \$12 per capita). Of those funds, 71 percent was allocated to patient services, comprising social health insurance, 30.4 percent; medical services, 29.4 percent; public health services, 6.7 percent; and pharmacy and medical supplies, 4.4 percent (Ministry of Finance, 2011). It is likely that both the patient services and nonpatient services categories of the MoH budget contribute to MNH services in an accounting sense, including both direct and indirect costs. For example, the MoH budget allocated to patient services, totaling US\$1.8 billion, includes MNH expenditures such as the cost of deliveries and prenatal and postnatal care. The national budget does not provide a detailed function or service-level breakdown to allow a full accounting. Nor has a specific MNH “subaccounts” analysis been undertaken to provide such a breakdown.

What is important to understand is that MNH services are funded through different departments and programs under the overall ministry. For example, delivery services might be funded through hospital financing (medical services) for hospital-based deliveries or through nonhospital health facilities (public health services) for health center-based deliveries. Budgets for drugs and supplies may support both. Funds from government community social health insurance (Jamkesmas) are linked to maternal health as well. Table 7-1 provides examples of where expenditures associated with MNH activities can be found in the MoH budget.

Indonesia has been compiling a national health account (NHA) since 2004 (see, for example, Soewondo, Nadjib, and Soeharno, 2009). The NHA is a financial tracking system and accountability tool that provides the evidence needed to monitor trends in health spending for all sectors (public and private), health care activities, providers, diseases, population groups, and regions of a country. A standard methodology allows the complex tracking of a country's health expenditures (WHO, World Bank, and USAID, 2003). Furthermore, subanalyses of the NHA allow one to track specific health programs, or so-

called subaccounts. Subaccounts associated with HIV, child health, and reproductive health provide detailed financial analysis in these specific areas.

The latest Indonesian national health account contains expenditure data up to 2010. It contains an HIV subaccount, but focuses mainly on sources of funding. As of September 2012, Indonesia did not have a reproductive, maternal, newborn, and child health (RMNCH) subaccount to track MNH-related expenditures, which would allow full measurement of MoH expenditures related to MNH.

Financing of MNH Health Insurance Programs

Indonesia's current health insurance programs are summarized in Table 7-2. It is estimated that they cover less than half of the population, according to the figures available for this report. (However, the government of Indonesia is seeking to achieve "universal health coverage" by 2014, and so these figures may be changing.) The largest of these is the community health insurance program (Jaminan Kesehatan Masyarakat, Jamkesmas) targeting the poor.

In 2004 Indonesia created a platform for expanding health insurance coverage with the introduction of the Askeskin (Asuransi Kesehatan Keluarga Miskin) program, designed to increase access for the poor. The tax-financed targeted scheme for the poor and near-poor provided capitation payments to community health centers (*puskesmas*) and a fee-for-service health insurance scheme in third-class hospitals. In 2008 the program was expanded to include 76 million people under the current Jamkesmas program.

Since the introduction of Jamkesmas, district governments have also established complementary community-based health insurance schemes for the near-poor (Jaminan Kesehatan Daerah, Jamkesda) that provide basic health coverage for those who do not have Jamkesmas. With the lack of coordinated regulations and responsibilities between central and local governments, Jamkesda schemes have increased considerably over the last few years; an estimated 27 million households were covered through this insurance program in 2012 (World Bank, 2012). However, these schemes vary considerably in terms of the population groups they cover, benefit packages offered, member contributions, and the ways in which they are managed and organized.

TABLE 7-1 Examples of Maternal and Neonatal Health-Related Activities in Different Parts of the Budget of the Ministry of Health: Indonesia, 2010 (U.S. dollars)

Budget, Ministry of Health, 2010—\$2.6 billion
Social health insurance—\$0.79 billion
<ul style="list-style-type: none"> • Social health insurance for the poor (Jamkesmas)—funding provided for MNH services such as antenatal, delivery, and postnatal care for pregnant women
Medical services—\$0.76 billion
<ul style="list-style-type: none"> • Payment for health staff and facilities that provide MNH services in hospitals
Human resource development and training—\$0.29 billion
<ul style="list-style-type: none"> • Training for health workers who provide MNH services
Secretary general—\$0.28 billion
<ul style="list-style-type: none"> • Indirect costs for policy analysis and support
Public Health Service—\$0.17 billion
<ul style="list-style-type: none"> • Immunization programs for newborn babies • Nonhospital clinical services for deliveries, newborns
Center for Disease Control and Environmental Health—\$0.16 billion
<ul style="list-style-type: none"> • Research and surveillance relevant to MNH
Pharmacy and medical supplies—\$0.11 billion
<ul style="list-style-type: none"> • Drugs, medical supplies, and equipment related to MNH
Health Research Center—\$0.03 billion
<ul style="list-style-type: none"> • Evaluation of MNH funding initiatives such as the BOK program
Inspector general—\$0.01 billion
<ul style="list-style-type: none"> • Indirect costs associated with accountability of funding

SOURCE: Ministry of Finance (2011).

TABLE 7-2 Health Insurance Programs: Indonesia, 2013

Program	Model	Population	Coverage (Susenas)	Ambulatory services	Inpatient services	Maternity benefits
Askes	Social health insurance	Civil servants and their dependents, military	14 million (2007)	Public only	Public only	Yes
Jamsostek	Social health insurance	Private formal sector employees and their dependents	4.1 million (2009)	Public or private	Public or private	Yes
Jamkesmas	Social health insurance	Identified poor and near poor	76.4 million (2009)	Mostly public	Mostly public	Yes
JPKM	Managed-care model	Informal sector, civil servants, military for their uncovered dependents	0.5 million (2009)	Mostly public	Mostly public	Yes
Jamkesda	Various community-based health insurance schemes	Informal sector	27 million (2010)	Public only	Usually not covered	Yes
Private health insurance	Private voluntary health insurance	Private formal sector employees and their dependents	6.6 million (2006)	Private	Private	Yes

NOTE: JPKM = Jaminan Pemeliharaan Kesehatan Masyarakat.

SOURCE: Rokx et al. (2009).

As Table 7-2 shows, all of these schemes cover maternity care to some degree, although for some schemes this care may be limited to exemption from user charges in public facilities. To further improve the maternal health care situation and help achieve Millennium Development Goal 5 in Indonesia, the government launched a maternity coverage scheme (Jaminan Persalinan, Jampersal) in January 2011. Jampersal is directed at all pregnant women who are not covered by any insurance schemes. Services covered by Jampersal include antenatal care, delivery, postnatal care, and family planning. These services are offered in health centers and hospitals, both public and private, that have a memorandum of understanding with the district health office.

This program was designed as part of an effort to help reduce maternal mortality by reaching out to women who were not already covered for pregnancy and delivery-related services under other insurance schemes, particularly the insurance program Jamkesmas that was initiated in 2008 and aimed at the poor and near-poor,² as well as older programs serving public sector employees, formal sector workers, and individually purchased schemes aimed mainly at the better-off. Jampersal is intended to be comprehensive, including coverage for health services during pregnancy and delivery as well as postpartum services for mothers (up to 42 days after delivery) and for their newborns (up to 28 days of age). Specific coverage is provided for health checks for pregnant women, aid delivery, childbirth services, postpartum family planning services, and newborn care.³

The program covers basic maternal health services at local health centers (Puskesmas and related local facilities), including services at private health facilities that have cooperation agreements (MCC) with

²Jamkesmas was a follow-on to programs initiated closer to the start of century aimed at providing free or inexpensive health care to Indonesia's poorest households. These included a system of "poor-cards" issued by local officials and entitling holders to free services and an initial national program (from 2004) known as Askeskin that formalized this process for the poor. A main innovation of Jamkesmas was expansion of coverage to include the near-poor (a total of 76.4 million eligible participants) and the use of national survey data to define and target the potential recipients.

³See <http://www.jamsosindonesia.com/prasjsn/jamkesmas/jampersal>.

the district Jampersal management teams. Women can also receive more advanced services at the Class III level either indirectly through referral or directly in emergency cases at public and private hospitals having similar district-level cooperation agreements. Financial support is also available at the level of the health center through centrally provided operational funding (BOK program).

In theory, the program should help fill a gap and ensure that nearly all women willing to accept the standards of service provided have access to maternal care. However, although national surveys⁴ have included questions on access to health insurance, Jampersal has not yet been treated as a separate category, making it difficult to assess any impact.⁵ And because roughly the poorest third of the population (76.4 million) are supposed to be covered under Jamkesmas, it is not clear how this program by itself will affect the group of women who are most likely to have births at home and under less qualified medical supervision.

There may also be changes in the future stemming from the overall system management consolidation planned under the new government Health Insurance Implementation Board (Badan Penyelenggara Jaminan Sosial Bidang Kesehatan, BPJS) that will become effective in 2014. Even so, the availability of this kind of social insurance remains a potentially positive motivation for women to seek better care, and it remains one of a multitude of efforts that should be made available to help address the social and economic issues affecting the choices women and communities make about maternal health care.

As for the general extent of coverage itself, a 2009 national household survey reported that 43.6 percent of households had some sort of health insurance (Badan Pusat Statistik, 2010). For households that had health insurance, the different types are shown in Figure 7-3. Urban households had higher percentages of most types of health insurance programs, with the exception of health insurance for the poor, where higher percentages are found for rural households.

As discussed further in the next section, the linkage between what some government-financed insurance schemes cover (in the sense of providing a formal entitlement as part of a benefits package) and what their resources actually finance (i.e., what is actually paid for with health insurance rupiah) is difficult to determine because the largest schemes send their funds to the district administration and do not track the actual benefits received by enrollees. Thus figures on the share of health insurance funds financing MNH services are not available.

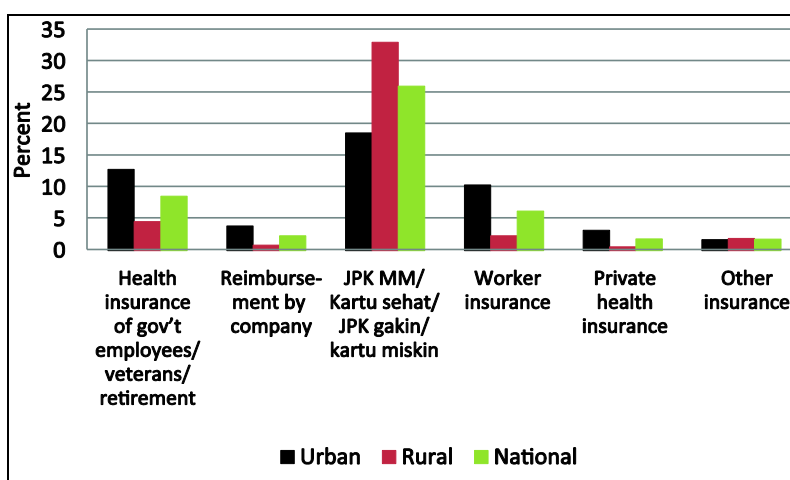


FIGURE 7-3 Percentage of Households with Health Insurance by Type: Indonesia, 2009. SOURCE: Badan Pusat Statistik (2010).

⁴Notably, the annual National Socio Economic Survey (Susenas).

⁵A few smaller-scale, largely qualitative evaluation studies are discussed later in the chapter. In addition, the latest (2012) Indonesian Demographic and Health Survey has shown a marked increase in births occurring in health institutions, which may provide at least some grounds for optimism.

District Health Expenditures on MNH Services

Districts are responsible for implementing government-provided health care. However, the complex flow of resources through the intergovernmental financial system and the varying capacities of district governments to generate health revenue on their own and through external revenue sources reportedly result in inequitable, inefficient, and fragmented financing across districts (Rokx et al., 2009).

Tracking the actual use of funds is also difficult. Most intergovernmental funds (such as those provided by the Ministry of Health and Jamkesmas) are passed from the central government to the district as a lump sum budget transfer and not for payment of specific health services. Because the decentralization policies enacted in Law No. 22/1999 and Law No. 32/2004 do not require specific financial reporting, the districts do not report to the central government how resources have been used from the various funding streams. As a result, the central government records only aggregated funding stream transfers without any detailed information on expenditures at the district level. Regulations have been developed by the Ministry of Home Affairs and the Ministry of Finance to achieve more accountability and transparency at the district level. However, the debates continue on the appropriate level of financial reporting that districts should undertake to the central government.

To make up for this lack of data, several studies conducted recently in Indonesia have sought to determine how resources are actually used at the district level (Mahlil, 2009; Gani et al., 2010; Seknas-Fitra, 2012). These studies of district health accounts (DHAs) required detailed work in specific districts to analyze the local expenditure accounts. Consequently, their coverage is limited.

In addition, these studies do not provide the detailed analysis needed to capture the entire government MNH expenditure. All the district health expenditure studies report the maternal and *child* health (MCH) expenditure and not the maternal and *neonatal* health expenditure. Any attempts to estimate the MNH expenditure from these data face two significant limitations. First, the MCH expenditure definition includes all health-related expenditure for mothers and children under age 5 and does not break out expenditures related only to maternal and newborn health. Second, the government MCH expenditure reported is usually only for services provided through the “public health” line of the budget, which covers mainly services for health promotion and prevention of illness (such as antenatal care or well-child services) and does not include expenditures on many MNH-related general clinical services in nonhospital facilities or hospital-based services. Thus these figures are a poor proxy for the total MNH expenditure.

Several studies have reported that the National Development Planning Agency (Badan Perencanaan Pembangunan Nasional, Bappenas) has recommended an MCH expenditure of Rp 65,000 (about US\$7) per capita, although the source of that figure is not clear. All district health expenditure studies discovered in the course of preparing this report present MCH expenditures per capita that fall well below the recommended target, but again these do not include many MCH-related services. It is also not clear whether the recommended figure is intended to include all MCH-related clinical services or only the main promotional and preventive ones.

Mahlil (2009) analyzed district budgets (not actual expenditures) from 2007 to 2009 in 20 districts in five provinces. District budgets allocated 2.8-9.1 percent of their total health budgets to public health activities, with MCH services accounting for 17 percent of those public health budgets. On average, districts allocated Rp 3,250 per capita to the MCH expenditure per capita (5 percent of the Bappenas target), and Siantar was the district with the highest MCH expenditure per capita at Rp 7,400 (11 percent of the Bappenas target). Similar results are found in a study by Seknas-Fitra (National Secretariat—Indonesian Forum for Budget Transparency). This study analyzed district budgets for 2008-2011 in 20 districts in four provinces (Seknas-Fitra, 2012). According to its findings, districts allocated from 7.5 to 13.5 percent of total health budgets to public health programs, with MCH services accounting for about 5 percent of district public health budgets. Districts on average allocated Rp 9,000 per capita (approximately one U.S. dollar) to the MCH expenditure per capita (12 percent of the Bappenas target). The district Aceh Singkil had the highest MCH expenditure per capita at Rp 25,000 (34 percent of the Bappenas target).

Similar findings emerge from the district health account analysis conducted by Gani et al. (2010). The DHA methodology was developed by a team of researchers at the University of Indonesia’s Center

for Health Economics and Policy Analysis (CHEPA), and it follows the methodology developed for the national health account work by the World Health Organization (WHO), World Bank, and U.S. Agency for International Development (Gani et al., 2010). This methodology includes both government and non-government spending. Analysis of DHA data from 21 districts in Nusa Tenggara Timur (NTT) province show the high contribution of government sources of health funding (approximately two-thirds) to NTT province, a relatively poor area. About one-third of total health spending is from private sources, and 86 percent of that is from out-of-pocket spending. Personnel expenditures (28 percent) and drugs (22 percent) make up half of the total district health expenditure. Allocations of funds to MCH programs are minuscule, averaging 1.75 percent of total district health funding. The average MCH expenditure per capita is Rp 7,420, with the highest district, Lembata, spending Rp 25,866 per capita—only 40 percent of the Bappenas target.

The district health account study by Gani et al. (2010) provides several ways in which to understand the uses of health funds at the district level. When DHA data were organized by “program,” three categories were reported: public health, individual health, and capacity building. A separate MCH category was calculated within the public health category, which is the source used to calculate the percentage of health funds allocated to MCH programs. However, the costs associated with MCH services can also be found in other line item categories such as outpatient care, general treatment, and health insurance. As a result, the actual MCH expenditure may be higher than the numbers reported by the DHA because other MCH activities may be found in other line items. Gani et al. (2010) also report district budget allocations and not actual expenditures, which may be lower, or higher, than what was budgeted.

Impact of Government Financing Initiatives on MNH Services

Information on the effectiveness and impact of various MNH funding initiatives in Indonesia is limited because it is very difficult to link specific sources of funding to specific services. Another study by Gani et al. (2011) evaluated in 2011 the Bantuan Operasi Kesehatan (BOK) program in 39 districts in 13 provinces. The BOK program was implemented in 2010 to send supplemental funds from the Ministry of Health directly to *puskesmas* for the purposes of health protection and promotional activities (nonpersonnel). According to the findings, BOK on average added Rp 74.6 million per *puskesmas*. About 27 percent of BOK funds (Rp 20.3 million) were allocated to MCH programs, and from this amount the majority (85 percent) of resources for MCH were used for transportation costs (Rp 17.2 million). A pre-post analysis using a linear regression of composite indicators indicated that BOK funds had no impact on MCH performance. The lack of any significant impact on MCH is most likely a result of the implementation issues at the district level stemming from this newly implemented program.

As of August 2012, three studies had evaluated the Jampersal insurance program, which was implemented in January 2011: Trisnantoro, Riyarto, and Tudiono (2011)—from the University of Gajah Mada—in three provinces and six districts; Febriani (2011)—from Johns Hopkins University—in three provinces and six districts; and Rachmawati (2012)—from Health Research and Development (Litbangkes)/Ministry of Health—in seven provinces and 14 districts. The studies are mainly qualitative in nature with several quantitative analyses of utilization data over time. The results indicate a trend toward an increasing number of deliveries at district hospitals, but not at community health centers (*puskesmas*). Furthermore, the studies suggest limited understanding and awareness of the Jampersal program at the community level. Issues associated with funding were also noted by key informants—for example, the slow disbursement of funds and the overall low level of funds for the Jampersal program. Finally, the studies report concern about the inability of facilities to provide basic maternal services. In a program that tries to increase access to facility-based maternal health services, it is critical to ensure that these services have the personnel and equipment needed to provide good services.

Several recent reports from the World Bank (2008a, 2008b, 2010a, 2010b) and Rokx et al. (2009) discuss the effects of the central government’s increased support of MNH funding. Although the central government, recognizing the low level of funding to MNH, has tried to increase maternal health funding

through special programs and resources flows (i.e., BOK, Jampersal), these studies report there is evidence that districts may in turn decrease their own MNH funding allocation, resulting in little overall effect on the MNH expenditure (World Bank, 2010a).

District health funding from the central government is also associated with inefficiencies in financial management and accountability. The central government disburses funds to the district governments through lump sum budget transfers several times each year. However, disbursement is contingent on the submission of financial and programmatic reports by the district governments. Poorly staffed district health administrations or delays in collecting data from the local community health centers (*puskesmas*) can result in delays in submitting these monthly reports. As a result, funds are often sent late to the field, resulting in low absorption of health resources at the provincial and district levels. When funds are late, districts do not have enough time to spend allocated funds or implement planned programs. For example, Ministry of Health data revealed that West Papua, one of the poorer provinces in Indonesia, spent only 46.3 percent of its allocated health budget in 2006 (World Bank, 2010a). This situation suggests that simply increasing the resources available for MNH services (in budgets, for example) may not be sufficient to achieve rapid improvements in actual spending, especially in more remote areas.

Private Financing of MNH Services

Private financing still accounts for about half of Indonesia's total health expenditure, and it is likely that this kind of financing is a significant source of overall funding for MNH services. Figure 7-4 is a recent representation of the complexity of private financial flows for health overall.

Although many of these flows are essentially “private to private,” such as when patients pay out of pocket for services from private providers, some of these private resources also flow into the public system in the form of user charges. As noted earlier, these charges can be an important source of revenue for district governments. Out-of-pocket spending also supports those “dual practice” private providers who may also be public sector employees.

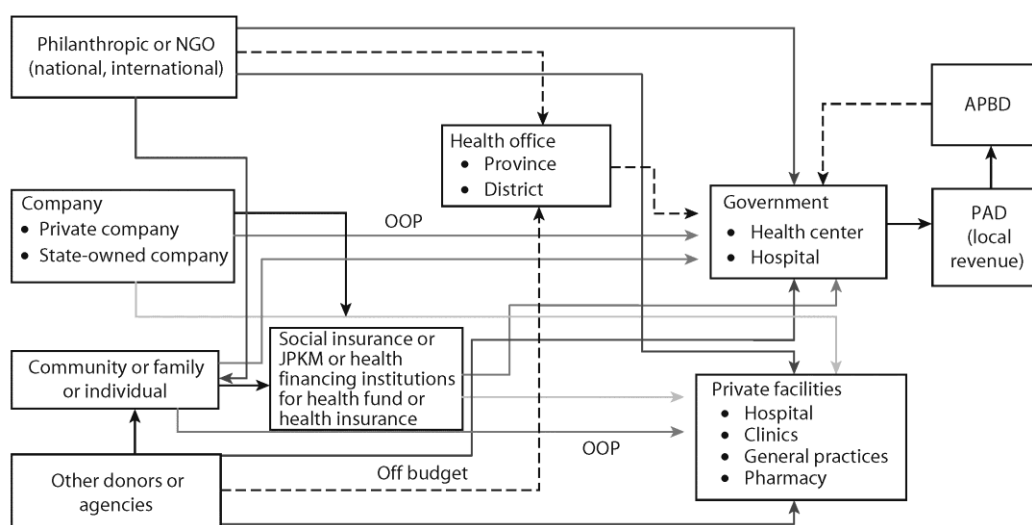


FIGURE 7-4 Overview of Private Health Resource Flows, Indonesia. NOTE: NGO = nongovernmental organization; APBD = regional government budget (Anggaran Pendapatan dan Belanja Daerah); JPKM = public health care insurance (Jaminan Pemeliharaan Kesehatan Masyarakat); OOP = out of pocket; PAD = local-owned revenue (Pendapatan Asli Daerah). SOURCE: Rokx et al. (2009).

For this report, it was not possible to obtain any information on the MNH expenditures of private companies or private insurers, both of which must be included in a comprehensive MNH subaccount. However, attempts were made to assess household out-of-pocket spending on maternal and neonatal health. Unfortunately, it was not possible to obtain the specific breakdowns of household spending that would allow a more detailed analysis. Nor was it possible to obtain information that would illuminate how much of private health spending supports private MNH providers, such as the private maternity hospitals that are widely present in Indonesian towns and cities.

The 2009 National Socio Economic Survey (Badan Pusat Statistik, 2010) indicated that households spent 4.5 percent of the total expenditure on health during the last month, with urban households (4.7 percent) spending a little more than their rural counterparts (4.2 percent).

Several recent national household surveys have collected more detailed information on health expenditures. Unfortunately, it was not possible to obtain from any of them the specifics on the MNH expenditure that are needed to better understand the totals or breakdowns of what households spend on MNH activities. Household spending information associated with major MNH-related health events (e.g., deliveries) are not collected as part of any routine national surveys conducted by the central government. Some limited information of this kind can be found in studies conducted by academic institutions, but these studies have limited geographic coverage.

One such costing study by Quayyum et al. in 2006 looked at the expenditure for different types of obstetric care in three government hospitals in Banten province (Quayyum et al., 2010). The study reported that the expenditure for obstetric care can be a significant financial burden for families (Figure 7-5). About half (51 percent) of women who delivered used an insurance scheme for the poor. However, a sizable proportion of women (41 percent) paid out of pocket. The main conclusion of the study was that insurance schemes for the poor appear to be effective in protecting households from catastrophic expenditure. However, the costing results from this study cannot be generalized because they are based on data from three government hospitals in a province in western Java. Nonetheless, they do provide important information on the approximate cost of obstetric care to families in Indonesia that cannot be found in any of the national household surveys conducted by Indonesia.

In 2007 the Ministry of Health instigated a system of Indonesian Diagnostic Related Groupings (I-DRG) that provided parameters for charges at all facilities in order to standardize fees related to maternal health services across provinces and classes of services (Pujianto, 2009). For example, the allowable costs of a normal delivery range from US\$70 at a Class C hospital to US\$154 at a Class A hospital (average = US\$112). For a cesarean section, the costs range from US\$128 at a Class C hospital to US\$282 at a Class A hospital (average = US\$205). A comparison of the I-DRG fees set for Class C hospitals (the class of service utilized by the poor) with the household spending data from Quayyum et al. (2010) suggests a gap between the actual price of services and the total amount the government is willing to pay. For example, the reported price of a basic normal delivery is \$15 more than what the government is willing to pay for such a delivery. This discrepancy is further highlighted for cesarean sections, where there is a sizable gap of \$214 between the government payment and the actual cost of services.

In summary, the available evidence suggests that people can potentially be charged significantly more than the central government is willing to pay facilities for different types of obstetric care. This gap could have several consequences. Hospitals may be unwilling to accept insurance payments as sufficient for insured patients. Households may have to bear the burden of this difference through out-of-pocket payments, which could discourage even those with health insurance from using higher-level facilities. Facilities may perceive that serving insured patients causes them to “lose” money (reimbursements less than prices), and so they do not encourage access by poor insured patients. It was not possible to find any evidence on the presence or relative strength of these effects.

As health insurance coverage for MNH services expands, it is important that payments are sufficient to ensure the availability of services for the poor and that those covered do not incur substantial additional payments out of pocket, which could discourage the use of essential services.

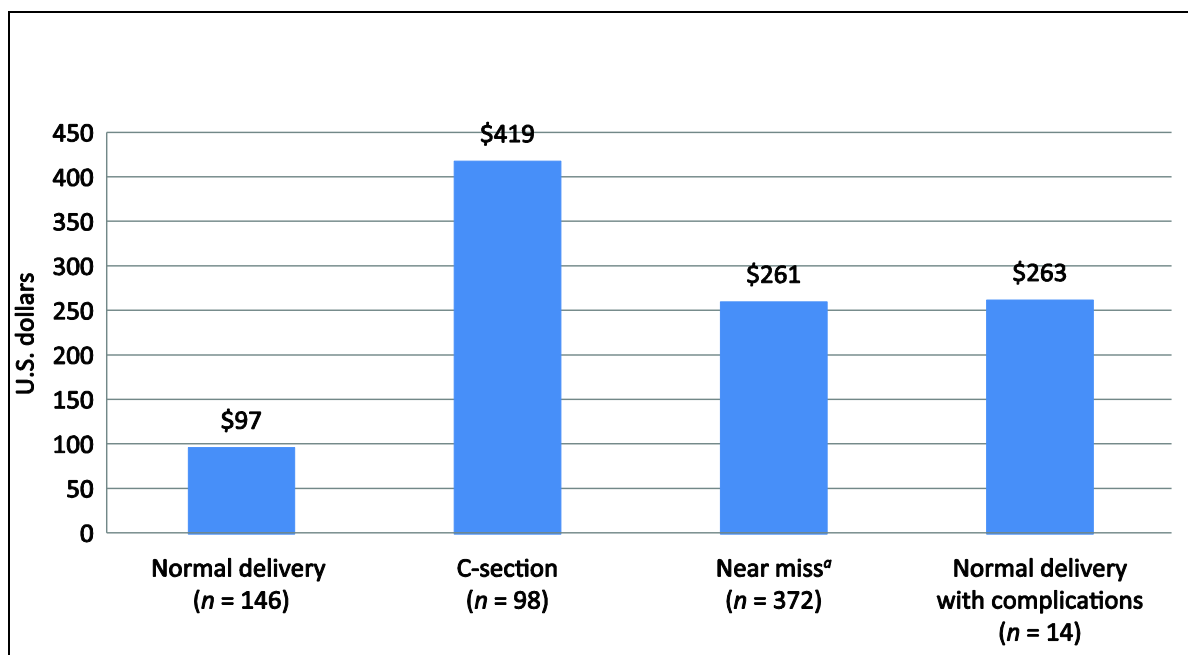


FIGURE 7-5 Mean Expenditure for Different Types of Obstetric Care in Government Hospitals in Banten Province, 2006 (U.S. dollars). ^a“Near miss” refers to pregnant women with severe life-threatening conditions who nearly die. SOURCE: Quayyum et al. (2010).

Discussion and Recommendations

Despite major gaps in evidence, the overall picture of MNH financing in Indonesia that does emerge from this report has important implications for future efforts to reduce maternal and newborn mortality.

Spending on health care recently increased, but Indonesia is still spending relatively little, through both government and private sources, on health overall in comparison with other countries. Although spending on MNH services cannot be estimated reliably from the available data, it is likely that it is also quite low and insufficient to achieve the high levels of coverage and quality services needed to lower maternal and newborn mortality rates more rapidly. Unlike in some of its better-performing neighbors such as Sri Lanka and Malaysia, in Indonesia lagging MNH outcomes appear to stem not from inefficient spending but rather from underinvestment and insufficient allocation of resources to address priorities. *Indonesia needs to spend more on this priority problem if it wants to see better results quickly.*

The government of Indonesia has made significant efforts in recent years to increase its health spending and to focus on spending more on the poor and on priority health needs, which include reducing maternal and newborn mortality and improving maternal and child health. These efforts are evident from the growing government health spending relative to private spending and also from the number of new programs such as Jamkesmas and Jampersal that are intended to increase access to MNH services. However, significant governance and institutional issues are preventing these efforts from being more effective. Also, the gaps in the evidence available indicate that without significant efforts to reform reporting and accountability, it will remain difficult to identify and remedy the bottlenecks to translating increased spending on MNH into better MNH outcomes. Some key findings and recommendations are as follows:

- Indonesia’s complex and decentralized funding mechanisms are a significant impediment to any efforts to mobilize and target government funds to improve MNH-related service delivery in government health facilities. *Districts need to set priorities in investment and health care operations and plan more explicitly how to finance these priorities using the existing financial channels. A*

district MNH investment and financing plan linked to coverage targets would help provide guidance on financing the government supply of services. District plans should inform the development of national plans and budgets.

- The potential benefits of health insurance plans in increasing access to and use of health services and giving providers the incentive to deliver MNH services are largely lost when these funds are transferred as block grants to districts. Insurance could be much better targeted to increase both demand- and supply-side incentives to expand deliveries at qualified facilities as well as post-delivery follow-up. *Insurance funds should be used to finance a payment and purchasing mechanism for MNH services that links eligibility for coverage with a financial entitlement that gives providers the incentive to deliver covered services to those that need them. This mechanism could be operated at the district level, but must have some level of financial accountability to the sources of insurance funds at both the district and national levels.*
- In Indonesia, a country of great physical diversity, there are significant disparities in levels of spending on maternal and neonatal health across districts and regions. These disparities are inversely correlated with MNH needs and the likely cost of providing coverage with life-saving services of good quality. Differences in funding allocations across districts may also be related to districts' willingness to spend on MNH—the poorer, more remote districts may have fewer resources, greater demands across other development sectors, and weaker governance, thereby crippling efforts to ensure effective spending. *The financing strategy for MNH should include explicit efforts to direct more resources to areas with greater needs and also assistance to strengthen financial management and monitoring to ensure better use of funds. Mechanisms that give local governments the incentive to deliver on MNH targets and commitments should be developed as part of this strategy.*
- The information available on MNH spending levels and the effectiveness of spending is insufficient for monitoring resource flows for MNH and ensuring efficient spending and accountability. *Indonesia should develop a functional system for tracking the resources that are allocated and spent on MNH services from the national level down to the district level. This system should integrate data on budgets and expenditures from the different channels of spending, including those at the district level. Resource tracking for MNH should be linked to monitoring of coverage and quality levels and changes, and the monitoring outcomes should be used to develop evidence on program cost and results that can be used to improve program performance.*
- The aggregated data indicate that the private sector plays a significant role in both the financing and delivery of health care in Indonesia. It is likely that a large part of MNH expenditures are financed by out-of-pocket payments, even though health insurance coverage is expanding. MNH services are provided widely on a private basis, including through midwives and physicians in private practice as well as private maternity hospitals (*rumah sakit bersalin*). It was not possible to obtain sufficient evidence on the financing and costs of private MNH services. *In developing policies to accelerate the achievement of MNH outcomes, Indonesia should consider how to better engage private providers to contribute to increasing coverage with quality services. Such a step could involve channeling some financing to private maternity hospitals where these would increase access to safe delivery services equivalent to that provided by comprehensive emergency obstetric and newborn care (CEmONC) facilities or where government and private facilities could share the costs of essential inputs such as blood banks, anesthesia services, and specialist obstetric care.*

Currently, Indonesia's health financing policies are not sufficiently well designed and focused to support national strategies to rapidly improve MNH outcomes. It is recommended that enhanced national efforts include provisions for additional spending, better use of purchasing and payment methods to improve spending efficiency, and more and better information on planning, monitoring, and accountability, including around the role of the private sector. A strong health financing component should be built into national policies going forward.

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Chapter 8

Recommendations

This report describes a study undertaken by the Joint Committee on the Reduction of Maternal and Neonatal Mortality in Indonesia of the U.S. National Academy of Sciences and the Indonesian Academy of Sciences. This study was conducted in the context of the UN Millennium Development Goals (MDGs), examining Indonesia's attempts to fulfill MDGs 4 and 5 dealing with maternal and infant and child mortality.

This chapter presents eight general recommendations designed to guide future efforts to reduce maternal and neonatal mortality in Indonesia. Other chapters of this report contain complementary recommendations more technical in nature that do not depend on adoption of the principal recommendations but that, individually, might improve the treatment and survival probability when mothers and newborns confront medical emergencies.

The joint committee believes that the maternal mortality ratio in Indonesia can be reduced to the best achievable through modern medicine only if all births take place in facilities with rapid access to comprehensive emergency obstetric and neonatal care (CEmONC) capabilities. As defined by the World Health Organization, a CEmONC facility must be staffed by trained doctors, nurses, and midwives and must be able to perform cesarean sections, provide blood transfusions, undertake vacuum delivery of the baby, administer magnesium sulfate and antibiotics, and render the other services necessary to remedy those conditions that most commonly cause maternal or neonatal mortality in Indonesia. The joint committee recognizes that in Indonesia, as in other countries, most births occur without problems. The difficulty (which has political ramifications) is that it is not always possible, even in a well-equipped hospital, to predict with certainty which pregnant woman or newborns will require emergency care. Only if all women give birth in a facility with ready and rapid access to comprehensive emergency obstetric and neonatal care can all cases in need receive the necessary care. This is the solution adopted by nearly all countries that have succeeded in minimizing mortality in childbirth.

Ideally, all women in Indonesia should be able to give birth in facilities capable of basic emergency obstetric and newborn care (BEmONC), which includes intrapartum monitoring, parenteral antibiotics, oxytocic drugs, anticonvulsants, manual removal of the placenta, postabortion care, forceps or vacuum delivery, and neonatal resuscitation. If a blood transfusion or cesarean section is required, timely transfer to a CEmONC facility is a necessity.

Recommendation 1—Facilities. Indonesia should seek to ensure that all births occur in a certified (i.e., independently accredited) facility with either basic or comprehensive emergency obstetric and newborn care (BEmONC or CEmONC) capabilities. As an immediate first step toward realizing universal access to comprehensive emergency obstetric and neonatal care when necessary, clear referral links should be established between certified BEmONC facilities and their CEmONC counterparts throughout Indonesia. Every effort should be made to ensure that every facility designated as a CEmONC facility has the necessary staff, supplies, and equipment and is fully prepared to provide the required emergency obstetric and neonatal care 24 hours a day. To that end, a system of accreditation and monitoring of such facilities must be put in place and repeated periodically.

With a few important exceptions, most complications leading to maternal and fetal deaths during childbirth cannot be predicted. Thus medical interventions for these complications must be readily available for all women and newborns. Because most maternal, fetal, and newborn deaths occur during labor, delivery, and the immediate postpartum period, the interventions for any complications that arise need to be easily accessible during labor and after delivery. Few of these interventions are available in the home, and, unfortunately, in most low-income countries many of these interventions are not provided by clinics. For these reasons, this committee advocates the use of hospitals with CEmONC capabilities in which all the required signal functions are available for all births.

In Indonesia, about one-third of maternal deaths in childbirth are attributable to hypertensive disorders of pregnancy and another 20 percent to postpartum hemorrhage (see Table 2-8 in Chapter 2). In this context, a sound prenatal care program may facilitate identifying those women at risk for these potentially fatal conditions and the arrangements needed for childbirth in a CEmONC-rated hospital prepared to administer the necessary treatments. The interventions needed to reduce maternal, fetal, and neonatal mortality are well known, and there is every expectation that if these interventions were made available to pregnant women and their newborns, pregnancy-related mortality rates in Indonesia would approach those in high-income countries.

The question that arises, then, is not what needs to be done, but how to make these interventions widely available and ensure they are performed in an appropriate and timely manner. Treatment of maternal conditions can have a profound impact on fetal and neonatal deaths, and when they are applied appropriately, most fetal and many neonatal deaths can be eliminated. Quality performance is crucial. But because the required intervention in each case is usually not apparent in advance, a systems approach that provides the resources and personnel required at the moment of need will offer the best chance of success. This approach involves defining the population needing care, the goals of that care, and the necessary facilities, personnel, and cost (taking into account the resources and personnel available in clinics, hospitals, and homes), and then creating a system of care commensurate with the resources. Such an approach is conducive to the most success in reducing maternal, fetal, and neonatal mortality.

Another benefit would be a reduction in the morbidity that affects many mothers who survive complications of childbirth. Often these complications result in long labor, which a CEmONC hospital can halt with a cesarean section. In other settings, it may result in an obstetric fistula or other impairment to the mother.

Such changes do not occur overnight, however. At present, very few hospitals in Indonesia are internationally accredited, and most are not accredited domestically. In 2012 the Ministry of Health mandated that public and private hospitals be accredited by the U.S.-based Joint Commission International (JCI), but few have completed the process. Accreditation is likely to have a salutary effect on quality of care, especially if the associated inspections are repeated periodically. The government should provide incentives for rapid compliance with the requirements of international accreditation for all CEmONC and BEmONC facilities. A special effort must be made to direct women identified as high risk to the hospitals able to care for them, and they should have access to insurance to cover the cost.

Some recent efforts merit attention. One is a program to upgrade the status of local health clinics (*puskesmas*) to BEmONC status. Another is a program of maternal health insurance (Jampersal). Among other things, it provides for universal free delivery services at public clinics and hospitals. These kinds of insurance schemes have been shown internationally to be instrumental in making it easier for women to give birth in health institutions rather than at home. In this regard, the latest (2012) Indonesia Demographic and Health Survey has revealed a marked increase in births occurring in health institutions. Although it may be too early to draw a definitive link between this and the current efforts, these findings could auger well for the future.

In the meantime, community health centers and midwives must continue to serve their patients. The transition will occur as BEmONC and CEmONC facilities, supported by effective health insurance plans, begin to provide adequate services and gain the confidence of patients and their families. At that point, midwives will provide the essential complementary services by assisting in the preparation of birth plans, arranging transport where required, providing normal prenatal, perinatal, and postpartum care, and super-

vising the volunteers at the *posyandus*. Midwives should have access to limited training or retraining. At the same time, substantial investment must be made in professionally run, well-equipped safe delivery facilities able to provide 24-hour service. Such facilities would not necessarily be hospitals. The BEmONC clinics now found in all districts could be brought up to accreditation level and linked with CEmONC facilities when blood transfusions and cesarean sections are required.

Table 4-5 in Chapter 4 reveals that in parts of Indonesia private hospital services have become much more significant over the last decade and may be able to play an important role in increasing access to good-quality maternity care. These institutions would include both general hospitals and small maternity hospitals (*rumah sakit bersalin*). Although the joint committee was unable to obtain sufficient data to assess the role of these institutions, under proper regimes of regulation, certification, and financing they could also contribute to accelerating reductions in maternal mortality. They should be considered part of strategies to expand access, where relevant.

Some observers believe Indonesia should look to other middle- and low-income countries for examples of community services and at-home delivery. Indonesia is a large country, and some regions have much in common with the low-income countries, although the majority of maternal deaths occur in the richest and most populous regions. The community-based childbirth system common to low-income countries has not proven successful in achieving continued reductions in the maternal mortality ratio (MMR) or neonatal mortality rate (NMR) throughout Indonesia. Meanwhile, the hospital system is understaffed and underequipped, and insurance plans that would give poor people access to health care are not yet permanently in place. And yet facility-based systems have been a big factor in greatly reducing the MMR in other countries. Either path would require significant resources, time, and commitment. Pursuing both paths at the same time might well create future conflicts, confusion, competition for funds, and ultimately, competition for patients between new and strengthened CEmONC facilities and newly retrained midwives. In any case, it does not appear possible to enable midwives to deal with the most common causes of maternal mortality in the home without the capacity to carry out cesarean sections and blood transfusions. It is unlikely, then, that further progress will be made before more women are able to give birth in accredited facilities.

The following recommendations deal with the major components of the system described in recommendation 1.

Recommendation 2—Strategies and Plans. Technical strategies, implementation plans, and a road map to achieving high coverage with quality maternal and neonatal health (MNH) services should be developed across a range of Indonesia's diverse environments—all reflecting local conditions and feasible approaches over 5-, 10-, and 20-year time horizons.

Those creating an Indonesian plan to reduce maternal, fetal, and neonatal mortality should seek to reduce the disparities in pregnancy-related services and outcomes between east and west, rich and poor, and rural and urban Indonesia. A one-size-fits-all plan will not sufficiently address the significant regional and socioeconomic differences characterizing Indonesia, and thus several different strategies may be required. In allocating resources, choices will inevitably have to be made. However, they should be made openly, with local participation, and based on balancing the objectives of service equity and total lives saved.

Indonesia's districts vary widely in population density, personal wealth, and numbers of doctors and other health workers, as well as in unalterable features such as isolation, island geography, and transport difficulties. Within the resources of Indonesia, and probably those of any country, it is inevitable that technology and service-centered indicators such as maternal mortality ratios and neonatal mortality rates will vary. About 50 percent of the population of Indonesia resides in rural areas, which account for 64 percent of childbirth deaths, and about 50 percent live in urban areas, which account for 36 percent of childbirth deaths. Highly populated Java, Bali, and Sumatra, containing both urban and rural areas, account for 68 percent of deaths, whereas predominantly rural Kalimantan, Sulawesi, and Eastern Indonesia account for 22 percent. Seventy-four percent of childbirth deaths in urban areas occur in hospitals, com-

pared with 48 percent of those in rural areas. About 29 percent of deaths occur at home. This does not mean that hospitals in rural areas are better prepared, but probably reflects the fact that more frequently in urban areas many women attempting childbirth at home and encountering difficulties are brought to nearby hospitals too late to be saved. In rural areas, the hospitals are often too far away to attempt transfer without prior arrangement. Alternative strategies must be found for the rural and eastern parts of the country to ensure that recommendation 1 and others are achieved.

The nature of the regional imbalance in Indonesia is not just a matter of distribution of resources and facilities among provinces and districts, but also of geography. The provinces are much larger than the Jakarta area, and although they may have a comparable number of health providers per capita, those providers are sparsely distributed, and reaching the necessary facilities during childbirth may be extremely difficult. Reducing the practical effect of this imbalance would require more than adding health providers to the existing facilities because many of the facilities themselves are inaccessible to many families. This problem is inherent in a country with more than 13,000 islands, and must be addressed with commensurate actions. In rural areas, more people use private facilities—hospitals, clinics, or doctors' offices—where government control is lighter and fees may be lower. Applying national standards to private hospitals and implementing funding mechanisms that cover childbirth might lower the mortality rate, but the bills are paid and choices are made by local elected officials, and ultimately by families.

The Indonesian health system was designed to be community-based. However, this approach has not resulted in reduced mortality at childbirth. At present, Indonesia has an overabundance of incompletely trained midwives who offer delivery services at home. They now face increased competition for their services and difficulty in accessing employment opportunities within the system (Ministry of Health, 2007; Ministry of Health, Center for Health Resources Development, 2011; Heywood and Harahop, 2009; Shankar et al., 2008). Because most complications cannot be reliably predicted before or during labor, they all too often go unrecognized in the home until it is too late. It follows that the most promising future strategy for reducing the MMR and MNR in Indonesia is to ensure that most if not all deliveries take place in BEmONC or CEmONC facilities.

Although midwives are the most qualified attendant at about 60 percent of births in both rural and urban Indonesia, in the last decade the number of births attended by ob-gyn's increased from 17 percent to 28 percent in urban areas and from 5 percent to 12 percent in rural areas. Over the same period, the number of births presided over by traditional birth attendants dropped from 20 percent to 7 percent in urban areas and from 42 percent to 20 percent in rural areas (see Table 4-6). This movement indicates an increase in demand for quality childbirth care that must be nurtured and directed toward capable facilities.

Some interventions such as cesarean sections and blood transfusions are possible only in a CEmONC facility. For emergency conditions that must be treated at such a facility, any emergency transportation mode owned by public or private organizations, including the military, should be used to convey the emergency cases to those facilities.

Recommendation 3—System of Care. Organization of the system of care and standardization of the training and licensing of providers should be centralized under one Indonesian government agency that is represented within the central government as well as at the provincial, district or municipality, and community levels. It should address population-based planning and implementation of all the services involved in childbirth.

Unfortunately, community leaders are under little pressure to take action on maternal and child health. Maternal mortality is relatively rare and newborn mortality is frequently not reported. Locally, there are many competing uses for the funds required and little accountability. Only strong leadership from the central government can effect the changes required to reduce mortality at childbirth.

Creation of a systems approach to obstetric and neonatal care would be greatly facilitated if there were greater coordination among organizations charged with training and licensing care providers, operating health care facilities, setting standards for quality of care, approving birth plans, and collecting data for monitoring performance. At present, these responsibilities are divided among the Ministry of Health,

Ministry of Education, Statistics Indonesia, Indonesian Midwives' Association, and other agencies. The responsibilities of the government agency should include creating monitoring instruments to evaluate local health centers and local public and private hospital services.

Hospital accreditation is conducted by the Hospital Accreditation Commission (Komisi Akreditasi Rumah Sakit, KARS.). KARS accredits both public and private hospitals, but does not regulate the private practices of physicians and midwives. It examines five key hospital activities: (1) management and administration, (2) medical services, (3) emergency services, (4) nursing, and (5) medical records. Hospital accreditation probably should be left in the hands of this independent agency, and it should be associated with international standards. According to Indonesia's health minister, as of 2012 only five of Indonesia's 1,800 hospitals were accredited internationally, and all five were privately owned. As of the same year, 65 percent of the 1,800 hospitals were nationally accredited, and one-third of those were privately owned (*Jakarta Globe*, 2012).

The training of midwives is carried out by the Ministry of Education, whereas most medical services, including those certifying and employing midwives, are governed by the Ministry of Health. This arrangement limits opportunities for integrated in-service training to complement coursework, especially where an increasing number of midwives are competing for training opportunities with a relatively static number of births. Similarly, a registry of births and deaths (see recommendation 6) could be integrated into service, evaluation, and planning programs if it were carried out by the unique responsible agency.

Finally, it may be useful to consider further work on the minimum service standards (MSS), particularly looking at ways to develop measures and measurement systems that reflect the accountability of service providers to the public and that are relevant, understood, and meaningful to local people (see Chapter 6). To this end, the central government should recognize the limitations of the existing data and data collection when demanding accountability from lower-level governments. It could provide assistance in developing the instruments by which local communities can demand accountability of local health services providers, such as local health centers at the subdistrict level and regional hospitals at the district and provincial levels. Further work on the MSS could allow for greater "standardization" of the quality of public health services that can be expected by local communities.

Recommendation 4—Training. The system for training skilled birth attendants should be revised to include the training of physicians and nurses who specialize in emergency obstetric, neonatal, and anesthesia services. Training of midwives should emphasize recognition of obstetric emergencies and the design and implementation of birth plans that include prenatal care and evaluation and early referral for complications, as well as, most important, a clear plan for the birth to take place in a BEmONC or CEmONC facility.

The World Health Organization (WHO) and other groups recommend the use of skilled birth attendants for delivery. However, the training and skills of those labeled "skilled attendants" in Indonesia vary widely, and many cannot perform a cesarean section, give blood transfusions, or administer antibiotics—interventions that are often necessary to save a life. Even the ability of the most skilled attendant to save a life is limited if no blood or antibiotics are available, or if the facilities needed for a cesarean section are not accessible.

Standards for the certification and qualification of midwives should be set by the Ministry of Health and reinforced by rigorous examination, accreditation, and re-accreditation. Those creating an effective system of care should pay great attention to the skill level of the birth attendant and the circumstances in which that attendant will attempt to provide life-saving care to the mother, fetus, or newborn. Within any system of care, the capability of the birth attendant is considered crucial. In low-income countries, historically most often the birth attendant has been an unskilled or traditional birth attendant (TBA). For the most part, studies have shown that even with additional TBA training, maternal mortality rates do not decline. Although training in resuscitation may result in some reduction in stillbirths and neonatal mortality, a clear gap remains that warrants a much higher-level skilled birth attendant.

There are 200,000 midwives in Indonesia. It would be a major undertaking to retrain this workforce. Funding for such an undertaking is obviously not available at present. The joint committee believes that at this stage the best investments would be in birthing facilities, along with the associated infrastructure such as transport and health insurance. It is the committee's opinion that more lives would be saved by facilities that can do cesarean sections, give blood, etc. Training midwives for home delivery or non-BEmONC or CEmONC facilities without these types of skills or resources is unlikely to save many lives in the short or long term.

Midwives will likely have a larger impact on maternal and neonatal survival by focusing on implementation of a certified safe birth plan for each woman and providing other routine services such as family planning, immunizations, and integrated management for childhood illnesses such as diarrhea and pneumonia rather than by managing or treating obstetric emergencies, which generally require a higher skill level. However, training might include some critical childbirth interventions such as administration of misoprostol, treatment of neonatal sepsis or asphyxia, or kangaroo mother care,¹ especially in the more remote regions where other services might be unavailable. Still, this approach should not preempt or replace precise planning for safe delivery at an accredited facility. A major review and restructuring of the approach to training for maternal and neonatal care would be necessary to ensure adequate skills in the right numbers, time, and place.

Trained midwives should be formally brought into the health care system; for now, they remain a major provider for births, although many of them lack training in basic emergency care. (As an interim step, all midwives should be given training in neonatal resuscitation, and simple resuscitation equipment should be standard equipment of the midwifery kit.) The goal would be to have them serve as links to referrals to the facility level and therefore gatekeepers for the community and as central players to raise the population's consciousness that maternal mortality can be prevented with sound antenatal care. In those roles, they can emphasize the importance of antenatal care as central to a healthy delivery and play a bigger part in detecting complications during pregnancy and arranging the required treatment in advance. This process will foster professionalization of care at the community level through a practical approach that leverages the existing village-based midwives whose responsibilities in the area of deliveries will shrink.

Recommendation 5—Financing. Sufficient and effective financing mechanisms for obstetric and newborn services should be established under the supervision of the government of Indonesia to ensure universal access to quality MNH care and strengthen the organization of that care. These mechanisms should include sufficient overall funding for needed services; the appropriate incentives for providers and for women to deliver at a certified facility capable of providing optimal care and to reduce unnecessary or inappropriate care; and effective monitoring and accountability mechanisms to plan and track financing, including some mechanisms for people's participation.

The government of Indonesia has made significant efforts in recent years to increase its spending on health and to focus that spending more on the poor and on priority health needs. Those needs include reducing maternal and newborn mortality and improving maternal and child health (MCH). These efforts are evident from growing government health spending relative to private spending and also in a number of new insurance programs intended to increase access to maternal and neonatal health services. However, weaknesses in current financing and governance approaches are reducing the effectiveness of these efforts. Also, the gaps in the evidence available indicate that without significant efforts to reform reporting and accountability, it will remain difficult to identify and remedy the bottlenecks hindering the translation of higher spending into better birth outcomes.

Although it is not possible with the data available today to calculate the total spending on maternal and neonatal care, it appears that the amount is insufficient to redress the slow progress in attaining

¹ According to WHO, kangaroo mother care is a method of caring for preterm infants in which the infants are carried, usually by the mother, with skin-to-skin contact.

MDGs 4 and 5, and may be below the government of Indonesia's own targets for spending. Greater resource mobilization and better allocation of existing resources to effective and equitable interventions are needed. Another issue is the complex system of fragmented government funding streams that makes it difficult to determine how much is being spent for what purpose and to coordinate financing for essential inputs such as staff, physical facilities, drugs, supplies, and equipment.

Even taking into account both government and private sources of funding and the recent increases, Indonesia is still spending relatively little overall on health compared with other countries. However, a comparison with some of Indonesia's better-performing neighbors such as Sri Lanka and Malaysia suggests that the lagging childbirth outcomes in Indonesia do not stem entirely from insufficient current spending but also from underinvestment and insufficient allocation of resources to address priorities.

A maternal and neonatal health financing strategy should explicitly consider the differentials in financing support that may be needed in different physical environments in Indonesia. The total costs of delivering access to good-quality MNH services is likely to be very different in more remote areas (in Eastern Indonesia, for example) than in the densely populated areas of Java and Bali with their better transport infrastructures.

Presently, substantial funds are being transferred to the districts, but with little accountability on how those funds are actually being used. District administrations have economic incentives to use funds in ways that enable them to gather more revenue, and they have political incentives to invest more in health activities that have popular appeal. Both kinds of incentives may conflict with goals aimed at the poor and less powerful groups, such as reducing maternal and neonatal mortality. Similarly, funding mechanisms such as health insurance that encourage better purchasing practices and accountability lose this feature when transferred as block grants to districts. Although some health insurance funds are earmarked to pay for MNH services, at present it is not known to what extent they do so. Thus it is impossible to gauge the benefits of continued or additional support for such mechanisms. Funding differentials for districts are also likely to reinforce health care inequities, including those for maternal and neonatal health, the outcomes of which are much worse in Indonesia's more remote regions.

Currently, district expenditures on maternal and child health (children under 5) average 12 percent of the Bappenas-targeted expenditure; the fraction spent on maternal and neonatal health is not reported. Some increases in dedicated central government spending on maternal and neonatal health are reportedly nullified by reductions in districts' own allocations to MNH or local redirection of funds. Furthermore, many districts do not spend their entire allocated health budgets because of inefficiencies in the budget delivery process.

New programs that provide health insurance coverage for childbirth-related services are possibly increasing overall funding. These programs should make full use of the potential of both demand-side and supply-side payment methods to align with efforts to improve service access and quality, especially for poor women. The inclusion of nongovernment providers of clinical and ancillary services, certified for quality, could help support overall access and coverage objectives.

The Ministry of Health has developed costs and fees related to maternal health services nationwide for different classes of hospitals. However, there is a discrepancy between the cost of childbirth services at Class C hospitals used by the poor and the amount the government will reimburse the hospital, ranging from \$27 for a normal delivery to \$291 for a cesarean section, and this difference may be charged to the patient.

Recommendation 6—Data. Making the appropriate decisions about programs likely to reduce maternal, fetal, and neonatal mortality rates in Indonesia and allocating resources appropriately will require collecting high-quality data on those rates and the causes of mortality. These data must be collected locally and nationwide in a routine and standardized manner and used routinely and frequently at the local level for improving the quality of programs and nationally for planning programs and allocating resources.

In many low-income countries, one of the major obstacles to program development aimed at improving pregnancy-related outcomes is the lack of timely and reliable data on these outcomes and their direct and indirect causes and on the impacts of interventions that attempt to improve these outcomes. Without the availability of these data on a national basis and in a timely and frequent manner, the ability of a hospital, geographic area, or political district to compare its outcomes with those of similar entities is limited and the supposed improvements are more difficult to verify. Without data that compare these entities' current outcomes with those achieved historically, the impacts of newly introduced programs or interventions cannot be evaluated, and sustained improvement will prove elusive. The data should reflect the accountability of service providers to the public and be relevant, understood, and meaningful to the local people.

Presently, Indonesia relies on survey-based data to obtain official measures of maternal-, neonatal-, and child health-related deaths, but these data employ relatively small sample sizes and model-based adjustments, and they yield a wide range of estimates. They are also collected too infrequently to inform programs. Different approaches to measuring mortality rates yield different results and different assessments of the progress made. Estimates employing both the sibling technique and models based on the maternal mortality ratio and childhood mortality rates offer no conclusive assessment of trends and MDG achievements.

Since 2006, the National Institute of Health Research and Development (NIHRD) in the Ministry of Health has collaborated with the Ministry of Home Affairs and local governments (civil registry offices) in the Indonesia Mortality Registration System Strengthening Project (IMRSSP). This project has established a mortality registration system to ascertain the causes (based on the International Classification of Diseases, ICD-10) of all deaths at all ages. The project is supported by WHO Indonesia, the School of Population Health at the University of Queensland, and the Australian Agency for International Development (AusAID). This project should be strengthened through project follow-up and innovative activities involving local governments in line with the era of decentralization. Strengthening might include following steps:

- Follow up the January 2010 joint decree by the ministers of home affairs and of health on reporting of deaths and multiple causes of death to facilitate the recording of events and cooperation between the two sectors at the grassroots level.
- Ensure that efforts by the Ministry of Health to improve the health information system on births, deaths, and multiple causes of death are in line with the Ministry of Home Affairs program aimed at strengthening civil registration and vital statistics based on the existing law on population administration (No. 23/2006).
- Enforce the compulsory registration of vital events, based on the population administration law.
- Encourage close collaboration between local government officials and the Directorate General of Population Administration (AdMinDuk).
- Designate the city or district health officer as the responsible official and the subdistrict health center (*puskesmas*) as the responsible health institution.
- Continue to apply the IMRSSP methods and procedures as well as training modules and data collection framework in the Sample Registration System (SRS) area.
- Establish networking of NIHRD with local universities, schools of medicine, and schools of public health.
- In addition to strengthening civil registration and vital statistics (CRVS), strengthen the survey-based data sources already established for maternal and neonatal health, such as the Indonesia Demographic and Health Survey (IDHS), Basic Health Survey (Riskesdas), and National Socio Economic Survey (NSES or Susenas), as well as the program-based data management systems such as the Maternal Perinatal Audit Program and PWSKIA (Pemantauan Wilayah Setempat Kesehatan Ibu dan Anak, the local area monitoring system for maternal and child health). The benefits of using data from multiple data sources would be enhanced by improving the capacity of decision makers at the central and regional levels to understand the data produced. In the end,

it will require a broader commitment and cooperation in building the system among a range of key stakeholders, including the Ministry of Health, Ministry of Home Affairs, Ministry of Finance, Ministry of State Apparatus Utilization and Bureaucratic Reform, and Statistics Indonesia (Badan Pusat Statistik, BPS).

Recommendation 7—Community Involvement. Health care at the community level has many strengths, including the women's volunteer committees, *posyandus* (integrated health posts), and the district health departments. These organizations could make a greater contribution to lowering maternal and infant mortality by supporting the creation and execution of certified birth plans. Such plans would include facilitating transportation and utilizing antenatal care services, immunization, and contraception optimization for all women and children and, most important, planning delivery in a certified BEmONC or CEmONC facility. These volunteer committees should be integrated into an overall system for the provision of services for women and newborns.

Community involvement, including family, community, and midwife, has a long history in maternal health in Indonesia. The *posyandu*, a community-based volunteer organization, operates once a month to register births, weigh and measure babies, provide nutrition and health information, and immunize infants. Volunteers encourage women with high-risk pregnancies to seek prenatal care in due time and help the women to arrange transportation to a health facility. As part of a multi-tiered system, the *posyandu* serves as the first line of care, followed by basic professional care at health centers and clinics, and then higher referrals to district and advanced hospitals.

Consistent with recommendation 4 on the role and training of midwives, the current village-based midwives would also focus on community-based activities in support of safe childbirth, including provision of antenatal care and more active development of a birth plan ensuring delivery in a certified facility. The village-based midwife would therefore give her full attention to providing higher coverage and quality of community-based care in cooperation with the work of the *posyandu* and less to attending deliveries.

Maternal health insurance, particularly for lower-income households, that provides for free or very low-cost birthing services at health facilities (particularly those with BEmONC or CEmONC capacity) should be encouraged and strengthened to support these community-based initiatives.

Recommendation 8—Education and Empowerment. Programs that encourage the education and empowerment of girls and young women in general and are related to childbirth issues in particular should be strengthened. This high-priority action must include clearly measurable and frequently assessed indicators of progress toward these goals, with additional resources provided whenever needed.

Many anthropological studies of Indonesia have revealed a deep-rooted belief system in which maternal and child deaths are influenced by magic, fate, and God's will. Inquiries into the causes of maternal deaths have uncovered community-held beliefs that little can be done to save the life of a pregnant woman or newborn. Some pregnant women continue to rely on the use of traditional birth attendants instead of skilled experts because these women believe that following traditional beliefs and traditional family practices will lead to a healthy pregnancy and birth.

Over 60 percent of the Indonesian women who die in childbirth have had a primary school education or less. The desires, knowledge, and decision-making power of the mother are critical factors in family decisions on safe childbirth. Educating girls and young women saves lives by enabling a mother to make better decisions, by empowering her in her dealings with other family decision makers, and by giving her the knowledge she needs to effectively nourish and care for her infant.

In Indonesia, a vigorous national family planning program coupled with social change (particularly in the promotion of basic education and increased formal sector employment opportunities for girls) saw fertility, as measured by the total fertility rate (TFR), decline by more than 50 from the late 1960s to the early 2000s, with the TFR reaching a level of 2.6 by around 2002 based on the results of the Indonesia

Demographic and Health Survey (IDHS)—See Table A-2 in the appendix) This development included major declines in fertility among women whose age placed them at higher risk, such as those in their teens and those over 40. Concurrently, there were marked increases in the average intervals between births, and a decline in the percentage of births with intervals under 24 or even under 36 months.

However, with little recorded change in fertility rates since 2000 and a consistent gap in unmet need for contraception as measured by subsequent IDHS reports in 2007 and 2012, there is room for further decrements in fertility that would likely have a positive impact on maternal health. These decrements need to be encouraged by means of a reinvigorated family planning program that should constitute an integral part of safe childbirth services offered to Indonesian women.

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Appendix

Fertility Decline in Indonesia and Its Relationship to Maternal Mortality

Peter Gardiner

PT Insan Hitawasana Sejahtera (IHS)

High fertility, particularly when it involves conception either too early or too late in the fertility cycle or when short birth intervals are involved, is known to pose higher risks for both mothers and infants. High fertility also is generally associated with a larger proportion of births at higher parities that lead to increased risk. In general, teenage pregnancies and those among women over age 40, as well as birth intervals under 24 months, are considered to represent higher risks. Birth intervals of between 36 and 60 months are the most preferred (Rutstein, 2011).

Since the late 1960s, Indonesia has seen fertility, as measured by the total fertility rate (TFR), decline by more than 50 percent, from around 5.6 to 2.3 based on census and intercensal survey sources. This decline has stemmed in part from the launch of a vigorous family planning program in the mid-1970s and from social and economic change, particularly massive improvements through the 1970s and 1980s in basic education for girls. These developments resulted in significant declines in fertility at the youngest and oldest ages in the reproductive span, which are the riskiest. At the same time, there were marked increases in the average intervals between births, and a decline in the percentage of births with intervals under 24 or even under 36 months.

In fact, by the late 1990s Indonesia had reached levels and patterns of fertility and levels of application of family planning that, if not entirely meeting unmet needs, (1) were quite favorable when compared with levels in other countries in the region and (2) were at a stage at which further reductions would likely have only a small independent impact on levels of maternal and neonatal mortality.

A Note on Family Planning

Family planning programs that seek to provide contraceptive services to women (and sometimes to men) to allow couples to better regulate the overall number and timing of pregnancies (and thus also reduce the number of unwanted pregnancies) can be an important adjunct to other, largely service-based efforts to reduce maternal and newborn mortality ratios. Impacts can be even further enhanced where family planning programs (as in Indonesia) have actively sought to address the needs of pregnant women, particularly at the community level.

Although there were a few largely private initiatives in the 1950s and early to mid-1960s during the post-independence, pro-natalist regime of President Sukarno, family planning did not take off until the late 1960s and early 1970s, when it was embraced as a national priority by the New Order government of President Suharto. An independent National Family Planning Coordinating Board (BKKBN) was established under the Second Five-Year Development Plan in 1973. Benefitting from strong leadership and active international support, BKKBN was able to build a national network of user groups extending down

to village level (starting in Java and Bali and gradually moving outward from there). It included extensive logistical and monitoring support structures.

Decentralization, starting in 2001, severely disrupted the largely vertical, centrally driven structures set up by BKKBN by placing responsibility for family planning services solely in the hands of local (district-level) governments and, like other aspects of basic health services delivery, outside of direct central government control. It appears that this approach has had mixed results, with some programs suffering in some areas, while others have tried to maintain the relevant institutions and activities.

Although it is important to recognize the critical role played by family planning and the national program in Indonesia, it is actually the mechanism of reducing the incidence of high-risk pregnancies that ultimately lowers maternal and neonatal mortality. Thus what follows deals not with Indonesia's family planning program per se (e.g., contraceptive use rates) but rather with overall trends in age-specific fertility, birth spacing, high-parity pregnancies, and unwanted fertility, as well as the implications of further improvements for future reductions in mortality.

Fertility Trends

Time series of age-specific fertility rates (ASFRs)¹ for Indonesia have been calculated based on census and major intercensal survey data since 1971 and on various rounds of the Indonesia Demographic and Health Survey (IDHS) since 1987.² These sources depend on different methods to calculate fertility—the censuses use the own-child methodology and the IDHS uses birth histories. Thus the data are not directly comparable. However, they provide a consistent story about fertility dynamics over the period covered. Table A-1, which is based on census data, shows that declines in fertility since the late 1960s have led to a significant reduction in younger- and older-age fertility. However, the bulk of these declines occurred before the 1990 base year being used for the measurement of trends in maternal and neonatal mortality. The data also show the virtual stagnation in fertility decline by both age group and overall since the late 1990s, a period also synonymous with decentralization and a marked reduction in central control over family planning services and activities.

Results for various years of the Indonesia Demographic and Health Survey are shown in Table A-2. Although they show overall slightly higher levels of fertility,³ the trends are consistent. The trends also confirm the significant declines through the mid-1990s and the ensuing relative stabilization at levels that suggest that, while still significant, pregnancies too early or too late are unlikely to be a major factor in the current unacceptably high levels of maternal mortality in the country.

TABLE A-1 Estimated Age-Specific Fertility Rate (ASFR) and Total Fertility Rate (TFR) per 1,000 Women by Age Group and Source of Data, Indonesia

Source of Data	Reference Period	Age-Specific Fertility Rate							Total Fertility Rate
		15-19	20-24	25-29	30-34	35-39	40-44	45-49	
1971 census	1967-1970	155	286	273	211	124	55	17	5.6
1980 census	1976-1979	116	248	232	177	104	46	13	4.7
1990 census	1986-1989	71	179	171	129	75	31	9	3.3
1995 intercensal survey	1991-1994	61	151	146	105	63	27	8	2.8
2000 census	1996-1999	44	114	122	95	56	26	12	2.3
2010 census	2006-2009	41	117	130	105	61	22	6	2.4

SOURCES: Badan Pusat Statistik (2007); data for 2010 from Badan Pusat Statistik (2011).

¹Estimated annual births per 1,000 women by five-year age group between the ages of 15 and 49.

²These data include the precursor to the IDHS, the National Contraceptive Prevalence Survey (NCPS), conducted in 1987.

³Hull and Hartanto (2009) argue that this is partly due to the tendency of the IDHS surveys to underestimate the number of never-married women and therefore to overestimate fertility rates, particularly at younger ages.

TABLE A-2 Estimated Age-Specific Fertility Rate (ASFR) and Total Fertility Rate (TFR) per 1,000 Women by Age Group and Source of Data, Indonesia

Source of Data	Age-specific Fertility Rate							Total Fertility Rate
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
1987 NCPS	78	188	172	126	75	29	10	3.4
1991 IDHS	67	162	157	117	73	23	7	3.0
1994 IDHS	61	147	150	109	68	31	4	2.9
1997 IDHS	62	143	149	108	66	24	6	2.8
2002-2003 IDHS	51	131	143	99	66	19	4	2.6
2007 IDHS	51	135	134	108	65	19	6	2.6
2012 IDHS	48	138	143	103	62	21	4	2.6

NOTE: NCPS = National Contraceptive Prevalence Survey; IDHS = Indonesia Demographic and Health Survey. Estimates are based on birth histories and refer to a period of 1-36 months before the survey.

SOURCES: National Contraceptive Prevalence Survey, 1987; Indonesia Demographic and Health Survey, 1991, 1994, 1997, 2002-2003, 2007, 2012.

Birth Intervals

Similar arguments can be made for birth spacing. Although census data are not suitable for this purpose, the birth histories collected in the IDHS series allow such analysis. Table A-3 shows birth intervals from IDHS surveys conducted in Indonesia from 1991 to 2012. The relatively rapid decline in shorter birth intervals, particularly those between 18 and 23 months and even up to 35 months, is clearly evident. Most of these declines occurred up to the late 1990s. More recently, change has been much slower, in line with the stagnation in fertility decline that occurred after decentralization.

A recent paper by Rutstein (2011) compares Indonesia with other South and Southeast Asian countries where demographic and health surveys have been conducted since 2000. Table A-4 reveals that Indonesia has a relatively low percentage of women experiencing either very short birth intervals (< 24 months) or moderately short intervals (< 36 months). What is interesting, however, is the relatively high percentage experiencing long birth intervals (> 60 months), particularly since, similar to short intervals, excessively long intervals also carry an increased risk of birth complications and perinatal and neonatal mortality.

Also based on Rutstein (2011), Table A-5 shows a comparison of preferred birth intervals that again places Indonesia among those countries in which the more dangerously short intervals are clearly not preferred. Taken together, Tables A-4 and A-5 indicate the degree to which Indonesian women are meeting their spacing preferences—not completely, but to a considerable degree.

Higher-Parity Births

Indications of trends in high-parity births can be gained from the IDHS data on children ever born, particularly those born to older women who have completed or nearly completed childbearing. Table A-6 shows trends in numbers of children ever born to all women and currently married women aged 15-49 and to all and currently married women in the oldest recorded age group, 45-49—an age group in which virtually all childbearing has been completed. The mean number of children ever born, a useful summary measure, is also included.

The data clearly show the consistent pace of decline in both average numbers and the percentage of high-parity births (particularly at parity 6.0 and over). Even among women currently at the end of childbearing, the declines have been significant and are likely to decline even further because these women (even in 2012) did much of their childbearing 15 or more years earlier during an overall higher-fertility regime.

TABLE A-3 Percent Distribution of Non-First Births in the Five Years Preceding IDHS by Number of Months since Previous Birth, Indonesia: IDHS, 1991-2012

Year of IDHS	Number of Months Since Previous Birth					Total	Median Months Since Previous Birth
	7-17	18-23	24-35	36-47	48+		
1991	7.6	12.0	28.4	16.0	36.1	100.0	38.2
1994	6.4	10.3	24.1	16.8	42.3	100.0	41.8
1997	6.1	9.3	20.9	16.7	47.1	100.0	45.3
2002-2003	5.6	7.1	16.3	14.3	56.6	100.0	54.2
2007	6.2	6.6	16.7	13.0	57.4	100.0	54.6
2012	4.6	6.1	14.2	13.2	60.9	100.0	60.2

SOURCE: Indonesia Demographic and Health Survey (IDHS), 1991, 1994, 1997, 2002-2003, 2007, 2012.

TABLE A-4 Percent Distribution of Births by Length of Actual Birth Intervals, Selected Countries in South and Southeast Asia: Most Recent Demographic and Health Survey

Country	Year of Survey	Length of actual birth interval				Median Interval
		< 24 months	< 36 months	36-59 months	60+ months	
Indonesia	2007	16.3	37.7	32.7	29.6	43.7
Bangladesh	2007	16.7	40.8	39.6	19.6	39.4
Vietnam	2002	18.9	46.2	30.4	23.4	37.6
Cambodia	2005	19.7	51.9	34.2	13.9	34.2
Nepal	2006	22.8	57.9	33.1	9.0	31.8
Philippines	2008	32.3	60.8	26.7	12.5	29.6
India	2006	28.7	63.4	29.1	7.5	29.4
Pakistan	2006	34.5	68.7	24.7	6.6	27.4

NOTE: Table shows by country the percentage of birth intervals less than 24 months, less than 36 months, 36-59 months, and 60 months or more, and the median length of birth intervals, for intervals ending in the five years prior to the survey.

SOURCE: Rutstein (2011).

TABLE A-5 Percent Distribution of Births by Length of Preferred Birth Intervals, Selected Countries in South and Southeast Asia: Most Recent Demographic and Health Survey

Country	Year of survey	Length of preferred birth interval			Median interval
		< 24 months	< 36 months	60+ months	
Indonesia	2007	10.8	23.2	54.8	61.3
Bangladesh	2007	14.4	31.1	42.2	49.6
Vietnam	2002	11.7	19.8	56.0	60.8
Cambodia	2005	15.2	37.3	32.5	42.3
Nepal	2006	21.1	49.7	15.8	35.1
Philippines	2008	25.3	45.0	30.7	37.8
India	2006	27.3	58.5	9.7	30.9
Pakistan	2006	31.9	62.8	8.3	28.6

NOTE: Table shows by country the percentage of preferred birth intervals less than 24 months, less than 36 months, and 60 months or more, and the median length of birth intervals, for intervals ending in the five years prior to the survey.

SOURCE: Rutstein (2011).

TABLE A-6 Percent Distribution of All Women and Currently Married Women by Number of Children Ever Born and Mean Number of Children Ever Born, Indonesia: IDHS, 1991-2012

Year of IDHS	Number of Children Ever Born					Mean Number of Children Ever Born
	0	1-3	4	5	6+	
	All women aged 15-49					
1991	32.5	40.4	9.3	6.3	11.5	2.31
1994	32.2	43.1	8.4	5.6	10.7	2.24
1997	31.4	46.3	8.5	5.3	8.4	2.11
2002-2003	30.8	50.0	8.0	4.7	6.6	1.99
2007	29.3	54.4	7.5	3.9	4.9	1.73
2012	27.9	58.7	6.9	3.1	3.4	1.78
	Currently married women aged 15-49					
1991	8.3	55.2	12.5	8.5	15.5	3.14
1994	7.5	58.9	11.5	7.6	14.4	3.06
1997	8.0	62.3	11.4	7.1	11.2	2.82
2002-2003	7.4	67.0	10.5	6.2	8.8	2.66
2007	7.6	71.0	9.8	5.1	6.4	2.47
2012	7.7	75.4	8.7	3.9	4.3	2.27
	All women aged 45-49					
1991	4.9	25.5	13.1	11.7	44.9	5.14
1994	4.7	26.9	13.5	12.2	42.6	5.04
1997	4.5	31.6	15.5	13.7	34.8	4.67
2002-2003	4.9	34.4	18.9	15.5	26.2	4.30
2007	4.9	47.1	16.5	11.3	20.3	3.82
2012	4.7	55.5	16.6	9.0	14.2	3.44
	Currently married women aged 45-49					
1991	3.1	24.2	12.8	12.0	47.9	5.37
1994	2.8	25.2	13.5	12.6	45.8	5.31
1997	2.6	31.2	15.6	14.2	36.6	4.84
2002-2003	2.6	35.1	18.5	16.0	27.8	4.44
2007	3.0	47.1	16.6	12.0	21.4	3.97
2012	2.4	56.4	17.3	9.1	14.7	3.55

SOURCE: Indonesia Demographic and Health Survey (IDHS), 1991, 1994, 1997, 2002-2003, 2007, 2012.

Unmet Need for Family Planning

IDHS surveys also include calculations of the unmet need for family planning in the areas of both spacing and an outright limitation on the number of children. Table A-7 shows that a residual unmet need for family planning of slightly less than 10 percent was reached by the mid-1990s and has remained close to that level ever since. It also shows that satisfaction of the total demand for family planning is high.

TABLE A-7 Percentage of Currently Married Women Having Unmet and Met Needs for Family Planning and Total Demand for Family Planning, Indonesia: IDHS, 1991-2012

Year of IDHS	Unmet need for family planning (1)			Met need for family planning (current users) (2)			Total demand for family planning (3)			Percentage of demand satisfied
	Spacing	Limiting	Total	Spacing	Limiting	Total	Spacing	Limiting	Total	
1991	6.3	6.4	12.7	18.7	31.0	49.7	25.4	37.9	63.3	79.9
1994	4.8	5.8	10.6	22.6	32.2	54.7	28.1	38.3	66.3	84.0
1997	4.2	5.0	9.2	25.2	32.1	57.4	30.0	37.4	67.4	86.4
2002-2003	4.0	4.6	8.6	24.2	36.2	60.3	28.8	41.0	69.7	87.6
2007	4.3	4.7	9.1	25.1	36.3	61.4	29.5	41.1	70.6	87.2
2012	3.9	4.6	8.5	26.7	35.2	61.9	30.6	39.8	70.4	87.9
2012a	4.5	6.9	11.4	26.7	35.2	61.9	31.1	42.1	73.2	84.5

NOTE: (1) Unmet need for spacing includes pregnant women whose pregnancy was mistimed and amenorrheic women who are not using family planning and whose pregnancy was mistimed. It also includes fecund women who are neither pregnant nor amenorrheic and who are not using any method of family planning and say they are unsure whether they want another child or who want another child but are unsure when they want to give birth, unless they say it would be no problem if within the next few weeks they discovered they were pregnant. The unmet need for limiting refers to pregnant women whose pregnancy was unwanted, amenorrheic women whose last child was unwanted, and fecund women who are neither pregnant nor amenorrheic and who are not using any method of family planning and who want no more children. Excluded from the unmet need category are pregnant women and amenorrheic women who became pregnant while using a method of contraception (these women are in need of a better method of contraception).

(2) The use of family planning for spacing is defined as an instance in which women who are using some method of family planning and who want to have another child or are undecided about whether to have another. Family planning for limiting is defined as an instance in which women who are using family planning and want no more children. The specific methods used are not taken into account here.

(3) Nonusers of family planning who are pregnant or amenorrheic and women whose pregnancy was the result of contraceptive failure are not included in the category of unmet need but are included in the total demand for contraception because they would have been using family planning had their method not failed.

SOURCE: Indonesia Demographic and Health Survey (IDHS), 1991, 1994, 1997, 2002-2003, 2007, 2012.

A new (simpler) method of calculating unmet need was introduced in 2012 by Bradley et al. (2012). The finding produced using this method is shown in Table A-7 for the survey year 2012a. This method resulted in a slightly higher estimate of unmet need and total demand and a lower estimate of satisfied demand.⁴ The relevant point here, however, is that the figures on total demand and the percentage of that demand satisfied provide an indicator of the scope for increased contraceptive use. For the revised 2012 figures, if all demand were satisfied, the contraceptive prevalence among currently married women in Indonesia would be 73 percent as opposed to the actual level of 62 percent recorded in the 2012 IDHS (Statistics Indonesia et al., 2012).

⁴Bradley et al. (2012) also show recalculated estimates of unmet need, total demand, and percentage of demand satisfied for family planning dating back to 1991. These data (shown here) reveal patterns consistent with the 2012 data in Table A-7.

Year of IDHS survey	Unmet need for family planning			Met need for family planning	Total demand for family planning	Percentage of demand satisfied
	Spacing	Limiting	Total			
1991	8.6	8.4	17.0	49.7	66.7	74.5
1994	6.6	8.7	15.3	54.7	70.1	78.1
1997	5.9	7.7	13.6	57.4	71.0	80.9
2002-2003	4.7	8.5	13.2	60.3	73.6	82.0
2007	4.8	8.3	13.1	61.4	74.5	82.4

Complimentary calculations of births by fertility planning status and wanted total fertility rates are shown in Tables A-8 and A-9. These tables also indicate the potential for further reductions in fertility based on the desires and behavior of the women covered in the surveys.

Finally, Table A-10, based on Rutstein (2011), compares the need for family planning related to birth spacing in countries in South and Southeast Asia that conducted a demographic and health survey after 2000. Again, the relatively strong position of Indonesia among the countries covered in meeting the demand for family planning is clearly evident.

TABLE A-8 Percent Distribution of Births in the Five Years Preceding IDHS (Including Current Pregnancies) by Fertility Planning Status, Indonesia: IDHS, 1991-2012

Year of IDHS	Planning status of birth			Missing	Total
	Wanted now	Wanted later	Not wanted		
1991	77.4	15.8	6.5	0.3	100.0
1994	82.1	9.5	8.2	0.2	100.0
1997	82.9	8.8	8.3	0.0	100.0
2002-2003	82.4	9.6	7.2	0.0	100.0
2007	79.6	12.3	7.4	0.7	100.0
2012	85.7	6.5	7.1	0.7	100.0

SOURCE: Indonesia Demographic and Health Survey (IDHS), 1991, 1994, 1997, 2002-2003, 2007, 2012.

TABLE A-9 Total Wanted Fertility Rate and Total Fertility Rate in the Three Years Preceding IDHS, Indonesia: IDHS, 1991-2012

Year of IDHS	Total wanted fertility rate	Total fertility rate
1991	2.5	3.0
1994	2.4	2.9
1997	2.4	2.8
2002-2003	2.2	2.6
2007	2.2	2.6
2012	2.0	2.6

NOTE: Rates are calculated on the basis of births to women aged 15-49 in the period 1-36 months before the survey.
SOURCE: Indonesia Demographic and Health Survey (IDHS), 1991, 1994, 1997, 2002-2003, 2007, 2012.

TABLE A-10 Need for Birth Spacing, Selected Countries in South and Southeast Asia: Most Recent Demographic and Health Survey

Country	Year of Survey	Need for family planning (%)			Percentage demand for spacing unsatisfied
		Unmet need for spacing	Using to space	Demand for spacing	
Indonesia	2007	4.3	25.1	29.5	14.6
Bangladesh	2007	6.6	15.0	21.6	30.6
Vietnam	2002	2.0	13.9	16.4	12.2
Cambodia	2005	8.9	12.9	21.8	40.8
Nepal	2006	9.4	4.8	14.1	66.7
Philippines	2008	9.0	14.7	23.6	38.1
India	2006	6.0	4.8	11.2	53.6
Pakistan	2006	10.9	6.5	17.4	62.6

NOTE: The table shows by country, among currently married women, the percentage with an unmet need for family planning to space births, the percentage using contraception to space births, the total demand for contraception to space births, and the percentage of demand for spacing births that is unsatisfied. Table includes failure to space where available in surveys.

SOURCE: Rutstein (2011).

Contribution of Family Planning Programs to the Millennium Development Goals

The data clearly show the progress of the fertility transition in Indonesia and the movement in levels and patterns of fertility more conducive to safer pregnancies and childbirth. Although it is impossible to quantify precisely, family planning has played a significant role in Indonesia in providing access to methods (particularly modern methods) of controlling fertility across virtually all parts of the country. The current contraceptive prevalence as recorded in the 2012 IDHS is about 62 percent, and this number, as shown earlier, could rise to as much as 73 percent if the total demand for contraception could be met.

As a matter of history, one of the factors in the stagnation that has characterized fertility decline and family planning performance since 2000 has almost certainly been decentralization, which removed the high level of central control under the National Family Planning Coordinating Board and transferred responsibility for family planning to local (district-level) governments. Although some governments may have tried to maintain the extensive and previously vertical networks of user groups extending down to the community level, there has almost certainly been significant deterioration. It is interesting that not only desires but also performances in regulating fertility have remained relatively constant and have not deteriorated as well. Some potentially serious efforts (and the political will) to revitalize the national program are currently under way with the recent appointment of a new head of BBKBN. The intention is to ensure that any influence of high-risk pregnancies on maternal and neonatal mortality is further reduced and not exacerbated.

To summarize, there is the potential for at least a moderate further decline in fertility by meeting the unmet needs for family planning (as is shown in the tables). Furthermore, within the context of the already heavily moderated levels of fertility and higher-risk ages and past achievements in reducing the proportion of dangerously short birth intervals, additional efforts to reduce fertility and meet the underlying demand for family planning would be supportive of a program to reduce maternal and neonatal mortality. However, it seems unlikely that further increases in contraceptive use and the resulting declines in fertility at the levels suggested in the IDHS would alone make a major dent in levels of maternal mortality.

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Glossary

antenatal care The regular medical and nursing care recommended for women during pregnancy.

APBD (Anggaran Pendapatan dan Belanja Daerah) A separate channel of national funding that is transferred directly to district budgets,

Askes (Asuransi Kesehatan) Social health insurance.

Askeskin (Asuransi Kesehatan Keluarga Miskin) Social health insurance for poor families. Replaced with Jamkesda (see *Jamkesda*).

Bappenas (Badan Perencanaan Pembangunan Nasional) Also known as the National Development Planning Agency, a national agency engaged in all areas of the country's development.

BEmONC Basic emergency obstetric and newborn care (*pelayanan obstetri dan neonatal emergensi dasar*). BEmONC facilities meet the definition of a CEmONC but lack the capability to perform a cesarean section and to administer a blood transfusion (see *CEmONC*).

Bidan Delima Midwife accreditation program aimed at improving the quality of midwifery services in Indonesia. Program was launched in 2003 by the Indonesian Midwives' Association (*Ikatan Bidan Indonesia*, IBI) to educate private midwives and give them the incentive to meet and maintain the standard of care.

Bidan di Desa Program launched in 1989 in which a trained midwife was placed in each village along with a village birth facility (see *Polindes*),

BOK (Bantuan Operasional Kesehatan) Assistance fund for operational costs at the health center level.

BPS (Badan Pusat Statistik) Also known as Statistics Indonesia, a nondepartmental national agency whose chief mandate is to provide the government and the public with periodic information on the structure and growth of economy, social change, and development. Those statistics may be derived from its own research and surveys as well as from other government department as secondary data. The agency reports directly to the president of the Republic.

CEmONC Comprehensive emergency obstetric and newborn care (*pelayanan obstetri dan neonatal emergensi komprehensif*). As defined by the World Health Organization, CEmONC capabilities consist of trained doctors, nurses, and midwives who possess the abilities to perform a cesarean section, provide a blood transfusion, undertake vacuum delivery of a baby, administer magnesium sulfate and antibiotics, and render the other services necessary to remedy those conditions that most commonly cause maternal or neonatal mortality in Indonesia.

DAK (dana alokasi khusus) Government funds provided by the line ministries to district governments to primarily fund public infrastructure and equipment. Local counterparts are required to provide 10 percent of funding, generally from DAU support (see *DAU*).

DAU (*dana alokasi umum*) Government funds provided by the Ministry of Finance to district governments to fund public services. Mainly cover operational costs.

dekon (asas) dekon(sentrasi) Deconcentration fund in which grants from the Ministry of Health are used for activities sponsored by the central government. District proposals that utilize these funds are approved at the provincial level.

Jamkesda (Jaminan Kesehatan Daerah) Various community-based health insurance schemes.

Jamkesmas (Jaminan Kesehatan Masyarakat) Community health insurance.

Jampersal (Jaminan Persalinan) Community insurance for antenatal, childbirth, and postnatal care.

JNPK (Jaringan Nasional Pelatihan Klinis) Also known as the National Clinical Training Network, the clinical training institution endorsed by the Ministry of Health since 1998 to improve health provider performance in Indonesia.

JPKM (Jaminan Pemeliharaan Kesehatan Masyarakat) Public health care insurance; managed-care model.

IBI (Ikatan Bidan Indonesia) Also known as the Indonesian Midwives' Association, a national group that developed a standardized examination system leading to the credential Certified Professional Midwife (CPM).

kader Village-level community health volunteer.

maternal mortality rate Defined in low-income countries as the death of the mother during pregnancy or within 42 days (six weeks) of the birth. Rate is reported for every 100,000 live births.

maternal mortality ratio Defined as the number of women who die during pregnancy and childbirth per 100,000 live births per year.

midwife According to the World Health Organization, “a person who, having been regularly admitted to a midwifery educational programme, duly recognized in the country in which it is located, has successfully completed the prescribed course of studies in midwifery and has acquired the requisite qualifications to be registered and/or legally licensed to practise midwifery.”

midwifery According to the World Health Organization, midwifery encompasses care of women during pregnancy, during labor, and after delivery, as well as care of the newborn. It includes measures aimed at preventing health problems in pregnancy, detecting abnormal conditions, procuring medical assistance when necessary, and executing emergency measures in the absence of medical help.

MDG 4 One of eight Millennium Development Goals (MDGs) adopted by world leaders at the Millennium Summit at the United Nations in 2000, with the global aim of reaching equitable development by 2015. MDG 4 seeks to reduce the 1990 under-5 infant mortality rate by two-thirds.

MDG 5 One of eight Millennium Development Goals (MDGs) adopted by world leaders at the Millennium Summit at the United Nations in 2000, with the global aim of reaching equitable development 2015. MDG 5 seeks to improve maternal health by reducing maternal mortality by three-quarters of its 1990 value and by ensuring skilled birth attendance for all. In 2005 the international community added a second target to MDG5: universal access to reproductive health.

National Clinical Training Network (NCTN). See *JNPK*.

neonatal mortality rate The probability of a neonate dying before reaching 28 days of age, per 1,000 live births in a given year.

pajak Tax.

perda (peraturan daerah) (Municipal/district regulation).

perinatal care The care of a fetus or newborn given before, during, and after delivery from the 28th week of gestation through the 7th day after delivery

PKK (Pemberdayaan dan Kesejahteraan Keluarga) Also known as the Family Empowerment and Welfare Movement, a program launched to promote government programs in which mothers are the most important agents in families.

PNS (*pegawai negeri sipil*) Civil servants.

polindes (pondok bersalin desa) Village maternity clinic or village birth center.

poskesdes (pos kesehatan desa) Village health post (physical building).

posyandu (pos pelayanan terpadu) Integrated health post that provides preventative maternal and child health services, including birth monitoring, monthly birth weight, distribution of vitamin A, and immunizations (if health worker is present). Not a physical building.

PNPM (Program Nasional Pemberdayaan Masyarakat). Also known as the National Program for Community Empowerment, central government grants used for community empowerment activities such as building and rebuilding village sanitation units and community health posts and constructing and reconstructing roads. Community proposals for these funds are approved by the district administration.

PTT (*[dokter/bidan] pegawai tidak tetap*) Temporary public health employee.

puskesmas (pusat kesehatan masyarakat) Community health center (physical building). Offers a wide range of services but generally has an antenatal and family planning room. If a center is designated as one that assists in births, it has a delivery bed, water source, basic supplies, and the equipment needed to manage a normal birth.

pusling (puskesmas keliling) Mobile health center designed to reach remote and isolated areas of Indonesia.

pustu (puskesmas pembantu) Sub-health center.

PWSKIA (Pemantauan Wilayah Setempat Kesehatan Ibu dan Anak) Local area monitoring for maternal and child health.

Riskesdas (Riset Kesehatan Dasar) Basic health survey that provides information on the population's health status.

Seknas-Fitra (Sekretariat Nasional Forum Indonesia untuk Transparansi Anggaran) Also known as the National Secretariat–Indonesian Forum for Budget Transparency, a local nongovernmental organization.

skilled birth attendant An accredited health professional—a midwife, doctor, or nurse—who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth, and the immediate postnatal period, and in the identification, management, and referral of complications in women and newborns.

stillbirth Defined as death *in utero* after 28 weeks of pregnancy. Stillbirth is also referred to as intrauterine fetal death (IUFD).

swadana Self-supporting principle.

traditional birth attendant (*dukun bayi*) A person who assists the mother during delivery and who initially acquired her skills by delivering babies herself or by working with other TBAs.

under-5 mortality rate The probability per 1,000 that a newborn baby will die before reaching age 5, if subject to current age-specific mortality rates. Rate is composed of three components: newborns (neonates), infants (1 month to 1 year), and children 1–5 years of age.

World Health Organization (WHO) Specialized agency of the United Nations concerned with