



STRENGTHENING FACILITY-BASED MEASUREMENT OF MATERNAL AND NEWBORN HEALTH

TECHNICAL REPORT
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1. INTRODUCTION

The Government of Indonesia (GOI) is committed to ending preventable maternal and newborn deaths. However, the GOI's ability to assess the progress of policies and strategies to accelerate reductions in mortality is challenged by a lack of reliable, relevant data at all levels of the health system. A health information system does exist, however its utility is challenged by data quality concerns (e.g. completeness and reliability) and by the limited amount of information relevant for monitoring maternal or newborn health evidence-based practices or outcomes.

A 2013 review concluded, "the inadequate health information system in Indonesia is attributable, at least in part, to the limitations of facility-based data sources." (Reducing Maternal and Neonatal Mortality in Indonesia, The Data Conundrum, 2013).

Current efforts at the Ministry of Health, including an expanded MNH indicator list and an online reporting system, will bolster health information, but both are still in the early stages of introduction.

What is known about maternal and newborn health (MNH) is primarily based upon survey data vs. routine health information. While population-based surveys such as the IDHS or special studies generate meaningful information, results are not as useful at a facility or sub-national level and are not conducted with sufficient frequency to inform decision-making.

This technical report describes how EMAS has strengthened MNH measurement and data use within hospitals and community health centers (*puskesmas*).

2. DEFINING MNH MEASUREMENT NEEDS

The five-year USAID-funded Expanding Maternal and Neonatal Survival (EMAS) Program¹ began in 2011 with the aim to support 450 health facilities across 30 districts in Indonesia with the largest proportion of

¹ EMAS is a partnership of five organizations—Jhpiego (lead partner), Lembaga Kesehatan Budi Kemuliaan (LKBK), Muhammadiyah, Save the Children, and RTI International. From 2011–2016, EMAS will work with at least 150 hospitals (both public and private) and 300 *puskesmas* in North Sumatra, Banten, West Java, Central Java, East Java and South Sulawesi provinces. The three EMAS objectives are to: 1. Improve the quality of emergency obstetric and neonatal care services in hospitals and community health centers; 2. Increase the efficiency and effectiveness of referral systems between community health centers and hospitals; and 3. Strengthen accountability amongst government, the community and health system. For more information, visit emasindonesia.org



"...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."

—Reducing Maternal and Neonatal Mortality in Indonesia, 2013

maternal and newborn mortality. The EMAS Program in part, aims to improve the quality of emergency obstetric or newborn care provided in health centers and hospitals. Improving clinical governance (CG) is the underlying principle guiding EMAS facility strengthening efforts. Within the context of CG, measurement and accountability are key themes and are operationalized through the analysis, visualization, and use of data for performance monitoring and decision-making.

EMAS as a program, the health facilities supported by EMAS, and stakeholders committed to improving MNH outcomes require routinely available information on the coverage of evidence-based MNH interventions as well as related health outcomes to appropriately monitor and assess whether interventions are achieving their intended effects. A set of MNH measures (see below) was prioritized early in the program as key indicators for both routine and emergency MNH care. The measures would be assessed both within individual facilities and across geographic areas to monitor performance over time; all of which required a degree of standardization.

The available facility data systems were not able to generate the needed information and served as the impetus for MNH measurement strengthening activities.

MNH measurement needs

Routine care

- The percentage of live births breastfeeding within one hour after delivery
- The percentage of women receiving uterotonic in the third stage of labor

Care for complications

- The percentage of women delivering preterm (24–34 weeks) who receive at least one dose of antenatal corticosteroids.
- The percentage of severe PE/E cases that receive at least one dose of magnesium sulfate ($MgSO_4$)
- The percentage of referred cases of severe PE/E that receive at least one dose of $MgSO_4$ prior to referral
- The percentage of referred neonatal cases of suspected severe infection that receive at least one dose of antibiotic prior to referral

Health outcomes

- Institutional maternal mortality ratio
- Hospital-level case fatality rates for direct obstetric complications, including PPH, severe PE/E, maternal sepsis
- Very early newborn mortality rate
- Institutional newborn mortality rate

Challenges with facility recording and reporting

EMAS supports both health centers and public and private hospitals. Site visits were conducted to facilities to understand and review primary and secondary data sources, data quality considerations, current recording and reporting practices, forms and tools being used, and the flow and use of information.

It was found that the data registers used in both labor and delivery and in postnatal wards were not standardized, but instead were made by each facility to track information of interest. Registers provided by the MOH did exist (but were not observed in use). Hospital staff reported that the registers did not track enough data elements, so facilities took the initiative to make their own, handwritten registers. Across facilities, registers varied in the data elements tracked and in how information was recorded. Facility-created registers also did not always map to the aggregate MOH reporting forms for MNH service tracking (Form RL 3.4 and 3.5). Staff spent a substantive amount of time double entering information into different registers. The majority of facilities also were not using data from these registers for analysis or decision-making.

In speaking with district and province health office staff, it was noted that hospital reporting using the MOH reporting forms is encouraged, but is not always enforced and as a result can be irregular or incomplete. Reporting by health centers to district health offices was more complete and health centers did use standardized registers as part of Local Area Monitoring efforts. However, even among the health centers, handwritten registers were still in use within the health center to track additional client characteristics and outcomes of interest.

3. EMAS APPROACH TO STRENGTHENING MNH MEASUREMENT AND DATA USE

Strengthening health information systems and data use within hospitals and health centers was not originally an objective of the EMAS program. As challenges with existing facility-level data recording and data use practices were better understood, introducing processes and tools to strengthen these areas became a significant undertaking of the EMAS monitoring and evaluation (M&E) team. The M&E team's efforts to strengthen the measurement and use of MNH data have been guided by the following principles:

○ **Complement and strengthen the GOI HIS:** Existing forms and reporting processes were reviewed with health facility and DHO staff to understand the flow of information from health facilities to the district, province, and national MOH. EMAS engaged key stakeholders at health facilities and district health offices (DHOs) to develop and pilot tools and to ensure that parallel recording or reporting was not introduced.

○ **Simplify data recording for facility staff while empowering them to use their information:** Printed registers with standardized formats simplified routine reporting and reduced duplicate recording practices. Regular use of the collected information through clinical governance activities, e.g. clinical dashboards, death reviews, D4D posters etc. empowered facilities to increasingly use information to assess the quality of care and monitor their own ward or facility performance.

○ **Ensure the relevancy and use of collected information:** EMAS was purposeful in identifying data elements to include in the standardized registers with the focus on generating measures that could assess the coverage of key interventions and performance of health outcomes, e.g. cause-specific obstetric case fatality rates and very early newborn mortality rates.

○ **Improve data quality and data availability to facilitate data use:** Data need to be of sufficient quality so that related analysis and recommendations are trusted and can inform decision making. Routine data quality assessments and monthly visits by EMAS staff emphasized the importance of the various dimensions of data quality. (See **Figures 1 and 2**) Tools used to visualize information (e.g.

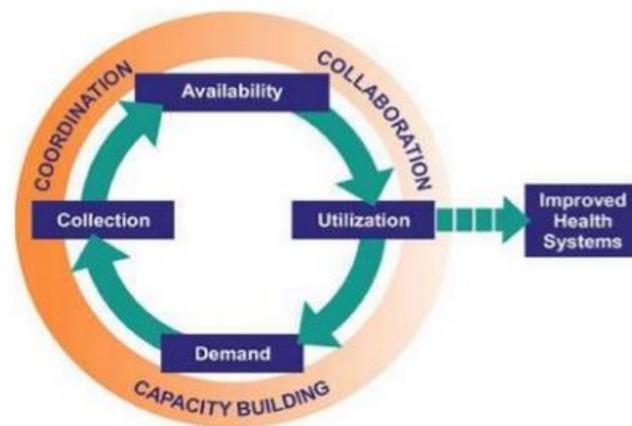
clinical dashboard and D4D poster) helped to ensure that performance measures were readily visible and available.

- **Introduce feasible and sustainable improvements:** EMAS staff introduced low-cost tools and processes alongside facility and DHO staff to ensure that any improvements could be sustainable by GOI systems and resources.

Figure 1. Elements of data quality (MEASURE, 2008)



Figure 2. The cycle of data use (MEASURE Evaluation, 2012)



4. IMPROVED MNH MEASUREMENT AND DATA USE AT FACILITIES

Standardized registers

To support facilities with their routine recording and reporting practices, standardized, printed registers were developed. The initial set of registers was developed after collecting handwritten examples from several facilities to understand the optimal set of information and taking into account patient flow within a facility.

In addition to including data elements routinely tracked and prioritized by the facilities, the registers introduced data elements needed to complete the MOH forms 3.4 and 3.5, and to report on maternal and newborn evidence-based practices. Codes were incorporated to minimize the need for extensive writing and to standardize inputs. Summary rows were also added to each page to facilitate aggregating results for indicator calculations.

Box 1 describes the seven registers were drafted to record monitoring maternal and newborn health outcomes: four for hospitals and three for health centers.

Box 1. Standardized registers

Hospital Registers

- Labor and delivery ward register
- Postpartum ward register
- Maternal death register
- Newborn death register

Health Center Registers

- Maternal and newborn register
- Maternal death register
- Newborn death register

The registers were piloted in health centers and both public and private hospitals and were subsequently updated with facility feedback to ensure ease of use, relevance, and acceptability. At the national level, the EMAS M&E team also shared drafts of the pilot registers with MOH colleagues. In collaboration with the health facilities, province and district-level stakeholders, EMAS designed a strategy to introduce the standardized registers. One-day sensitization workshops were conducted in each district. During these workshops, facility and district health staff were shown the registers and oriented to their use. EMAS offered the registers as a tool to assist facilities with their recording and reporting practices, but did not require their use as part of program participation.

The registers have been a success with the majority of all EMAS-supported facilities actively using them. In some districts, DHOs have used their own funds to produce and disseminate registers to non-EMAS supported facilities.

Figure 3. Health facility staff reviewing the standardized registers



Data for decision making workshops and D4D posters

As facilities started using the registers, data availability improved. To assist facilities with converting these data elements into meaningful information, Data for Decision-Making (D4D) Workshops were introduced in year 3 of the EMAS program. The 2-day D4D workshops were conducted at the district level. The first day, hospital providers brought their registers and used their own data to calculate MNH indicators (see list of MNH measures above). A large D4D wall poster was used to plot monthly performance and to observe trends overtime. Data quality issues were also made apparent once data were visualized. During the second day of the workshop, facility leadership and representation from the district health office attended to review and discuss facility performance on key MNH evidence-based practices.

The D4D workshops were originally intended only for hospitals given their larger volume of data. At the request of district health offices, a 1-day D4D workshop for health centers was added as DHOs felt the forum to analyze, visualize, and discuss performance was important for all providers.

As of September 2015, staff from over 70 hospitals and 217 health centers have participated in D4D workshops across EMAS-supported districts.

Figure 4. West Java Mini University where facility staff shared experiences using the EMAS register and Data for Decision Making Posters



5. RESULTS—WHY MNH MEASUREMENT MATTERS

Introducing the standardized registers as well as the tracking of MNH indicators not previously monitored, required a learning curve and time to produce reliable information. As the data systems have matured and data are used more frequently, the quality of the data has improved.

Across EMAS-supported interventions areas, analysis of these data indicates significant improvement in the percentage of clients receiving evidence-based interventions as illustrated in Tables 1 and 2. Among both Phase 1 and Phase 2 hospitals, the odds of clients receiving MNH interventions between two points in time were higher following EMAS-support. Most notably, the odds of receiving antenatal corticosteroids (ACS) and MgSO₄ for severe PE/E cases improved among both phase 1 and 2 hospitals. For ACS, the odds of women delivering preterm receiving at least one dose of ACS is 4.15 time higher in phase 1 hospitals (comparison 2013 with 2015) and is 2.41 times higher among Phase 2 hospitals (comparison between 2014 and 2015). For women with severe PE/E, the odds of receiving at least one dose of MgSO₄ is 11.4 times higher for Phase 1 and 3.05 times higher for Phase 2 facilities for the same time periods. Of note, earlier dates were not used as a comparison point as data were not sufficiently reliable and increases in numbers often reflected better recording vs. real improvements in provision of interventions.

Table 1. MNH Intervention in 22 Phase 1 hospitals: 2013 compared to 2015

	Number of eligible clients (July-Sept 2013)	Number of eligible clients (July-Sept 2015)	Odds Ratio	95% CI	p-value
Routine care					
Breastfeeding within one hour*	10,023	9470	1.25	(0.80- 1.96)	0.329
Uterotonic provision*	10,296	9597	10.6	(1.29- 88.5)	0.028
Care for complications					
ACS provision**	494	517	4.15	(1.76-9.78)	0.001
MgSO ₄ provision for PE/E**	1036	935	11.4	(3.53- 36.8)	<.001
MgSO ₄ provision for PE/E referral cases	797	773	3.12	(1.42-7.01)	0.005
Antibiotic provision for newborn infection referral cases	186	140	2.66	(1.13-6.29)	0.025

**22 facilities included; two-level logistic regression model for grouped data with standard errors adjusted for within facility correlation; $p \leq 0.05$ level of significance.

Table 2. MNH intervention coverage in 42 Phase 2 hospitals: 2014 compared to 2015

	Number of eligible clients (April-June 2014)	Number of eligible clients (July-Sept 2015)	Odds Ratio	95% CI	p-value
Routine care					
Breastfeeding within one hour	13930	14666	1.90	(1.36-2.66)	<.001
Uterotonic provision	14855	15610	24.9	(7.48- 82.9)	<.001
Care for complications					
ACS provision	1523	798	2.41	(1.48-3.94)	<.001
MgSO ₄ provision for PE/E	1613	1729	3.05	(1.74- 5.36)	<.001
MgSO ₄ provision for PE/E referral cases	1247	1293	2.70	(1.92-3.78)	<.001
Antibiotic provision for newborn infection referral cases*	309	122	1.10	(0.55-2.21)	0.784

**42 facilities included; two-level logistic regression model for grouped data with standard errors adjusted for within facility correlation; $p \leq 0.05$ level of significance.

*41 facilities included in the analysis for this indicator due to missing data in one facility

REFERENCES

The measurement strengthening process was informed and guided primarily by three documents:

MEASURE Evaluation. 2008. *Routine Data Quality Assessment Tool (RDQA): Guidelines for Implementation*

MEASURE Evaluation. 2012. *Improving Data Use in Decision Making*

National Academy of Sciences. 2013. *Reducing Maternal and Neonatal Mortality in Indonesia: Saving Lives, Saving the Future*. Washington, DC: National Academies Press (US)