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Case Study

IMPLEMENTING A SMALL AND/OR SICK NEWBORN MODEL OF CARE

Early Experiences in Indonesia

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MOMENTUM A Global Partnership for Health and Resilience

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BACKGROUND

In Indonesia, the neonatal mortality rate was 11 deaths per 1,000 live births in 2021, representing an estimated 51,000 total deaths (Sharrow et al., 2023). According to Indonesia's Maternal Perinatal Death Notification System, the top causes of newborn death were low birthweight, asphyxia, and infections in 2022 (Table 1) (Ministry of Health of the Republic of Indonesia, 2022).

ACRONYMS

IDAI	Ikatan Dokter Anak Indonesia
IFCDC	Infant- and family-centered developmental care
INAP	Indonesia Newborn Action Plan
KMC	Kangaroo mother care
MCH	Maternal and child health
MNH	Maternal and newborn health
MPDSR	Maternal Perinatal and under-5 death surveillance and response
NICU	Neonatal intensive care unit
NTT	East Nusa Tenggara
QI	Quality improvement
SCN	Special care nursery
SSNB	Small and/or sick newborn
SSNC	Small and/or sick newborn care
WHO	World Health Organization

Table 1. Causes of Neonatal Death in Indonesia

CAUSE	SHARE OF NEWBORN DEATHS (AS OF SEPT. 2022)
Low birthweight	29.2%
Asphyxia	27.4%
Infection	5.4%
Congenital anomaly	5.0%
Neonatal tetanus	0.3%
COVID-19	0.2%
Other	32.5%

Source: Ministry of Health of the Republic of Indonesia, 2022.

Since early 2022, MOMENTUM has worked in partnership with the Indonesian Government to plan for the introduction of small and/or sick newborn care (SSNC) at the subnational level in both public and private sector facilities providing primary and secondary care (level 1 and level 2 facilities) (See Table 2 for clinical components by level of care). The special focus on private sector service delivery—including nongovernmental service providers such as faith-based, for-profit, and independent practices—is a unique aspect of Indonesia's work.

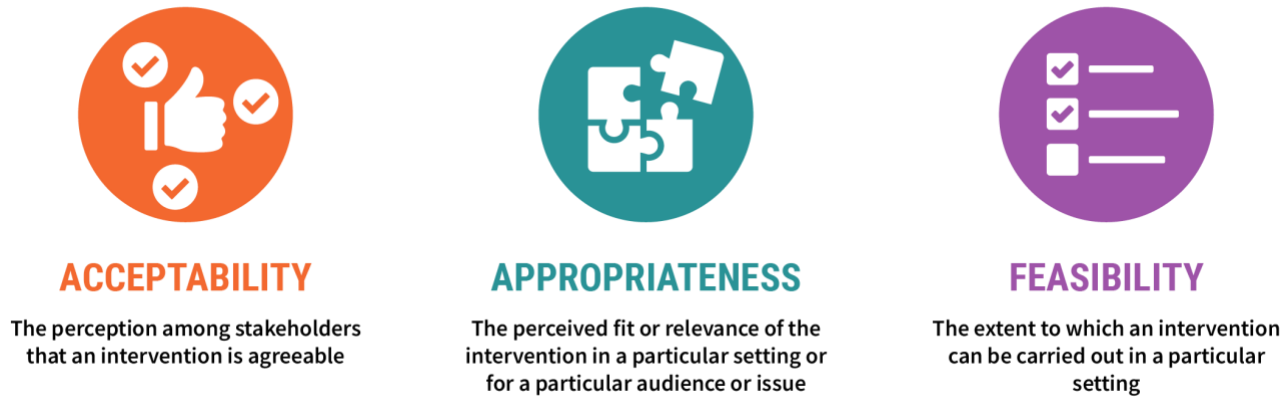
Table 2. Indonesia's Clinical Components of Small and/or Sick Newborn Care, by Level of Care

LEVEL OF CARE	WHO RECOMMENDED CLINICAL COMPONENTS
Level 1 (Primary care, e.g. puskesmas**)**	• Immediate newborn care (delayed cord clamping, drying, skin-to-skin contact). • Neonatal resuscitation. • Early initiation of breastfeeding. • Essential newborn care (cord care, thermal care, exclusive breastfeeding, eye care, birth vaccination). • Identification and referral for complications.

Level 2 (Secondary care, e.g. district or private hospitals**)**	• Kangaroo mother care (KMC) for stable babies weighing ≤2000g. • Assisted feeding nasogastric/orogastric tube feeding + intravenous fluids. • Safe oxygen therapy. • Detection and management of neonatal sepsis with injectable antibiotics. • Detection and management of neonatal jaundice with phototherapy. • Detection and management of neonatal encephalopathy. • Detection of congenital abnormalities and referral. • Management of respiratory distress with continuous positive airway pressure (CPAP) therapy.
Transition	• Follow-up of at-risk newborns. • Exchange transfusion for hyperbilirubinemia.
Level 3 (Tertiary care, e.g. referral hospitals**)**	• Mechanical assisted ventilation. • Parenteral nutrition. • Screening and treatment for retinopathy of prematurity. • Work-up and treatment for congenital defects.

This case study presents aspects of SSNC implementation, with a focus on three implementation outcome measures defined by Peters et al. related to acceptability, appropriateness, and feasibility (Peters et al., 2013); the definitions are presented Figure 1. It also describes anticipated activities, opportunities, and challenges for the ongoing provision of quality SSNC, given Indonesia's shift toward primary health care, through a lifecycle-based approach, beginning in mid-2023.

Figure 1: SSNC Implementation Outcome Measures



PROGRESS TO DATE

SSNC in Indonesia is led by the Ministry of Health's Maternal and Child Health and Nutrition Directorate and Quality Health Services Directorate, with support from partners including the Neonatology Task Force, the National Referral Hospital RSCM, the East Nusa Tenggara (NTT) Provincial Government and Health Office, MOMENTUM Country and Global Leadership, MOMENTUM Private Healthcare Delivery, the Jakarta offices of UNICEF and the World Health Organization (WHO), and professional associations such as Ikatan Dokter Anak Indonesia (IDAI) - the Indonesian Pediatric Society. Key focus areas for implementation of SSNC have included strengthening quality improvement (QI) in hospitals; emergency obstetric and newborn care services; referrals within and between the private and public sectors; maternal, perinatal, and under-5 death surveillance and response (MPDSR) reviews and scorecards; hospital mentorship programs; and infant- and family-centered developmental care (IFCDC).

Planning for the rollout of SSNC in Indonesia began with mentoring activities in six Level 3 hospitals[1] in NTT province, including skills and institutional readiness assessments to examine aspects of **acceptability, appropriateness, and feasibility**. The institutional readiness assessments focused on evaluating the existing clinical performance of the hospitals with respect to:

- Initial response for newborn emergency.
- Neonatal resuscitation.
- Early initiation of breastfeeding.
- Management of in-hospital breastfeeding.
- Kangaroo mother care (KMC).
- Management of low-birthweight babies.
- Management of neonatal complications.

The MPDSR reviews and readiness assessments revealed several potential priority issues for capacity enhancement (including inadequacies in management, emergency response, and follow-up), which resulted in several recommendations within participating facilities in each province (Table 3). These findings are being used as the entry point for implementation of QI approaches in these facilities.

Table 3. Illustrative Institutional Gaps and Recommendations for SSNC Identified by MPDSR Reviews

PROVINCE	GAPS	RECOMMENDATIONS
DKI Jakarta	• Delay in providing antibiotics to infants with signs of infection due to delayed decision making by health care providers.	• Technical updates on the management of infants with infection, including the newborn sepsis algorithm for neonatal intensive care unit (NICU)/special care nursery (SCN) staff. • Internships at RSUD Koja (mentor hospital).
Banten	• Lack of skills to perform neonatal resuscitation among health providers in hospital, particularly in the labor and delivery unit (L&D) and perinatal ward. • Inadequate availability of working CPAP machines.	• In-house training for neonatal asphyxia management and routine emergency drills for health providers who work in the L&D unit and perinatal ward. • Develop and implement regular maintenance schedule for all neonatal devices.

[1] In Indonesia, hospitals designated as Level 3 facilities correspond to Level 2 hospitals as defined by the WHO.

East Java	• The application of cooling therapy is not optimal at the Level 3 hospital level. • The patient is not stable at time of referral.	• In-house training on management of newborns with asphyxia and management of hypoxic ischemic encephalopathy. • In-house training of nurses on skills to maintain airway. • Collaborate with the district health office to resolve identified gaps.
North Sumatra	• Delay in use of CPAP in infants with respiratory distress syndrome (RDS). • Delay in dexamethasone administration in premature labor.	• Technical update for management of premature baby with RDS. • In-house training on preterm labor management (including administration of dexamethasone and use of ultrasound).
South Sulawesi	• Management of infants with sepsis at Level 2 is not in accordance with national standards, due to poor knowledge and practice among providers.	• In-house training for infant sepsis management in hospital.

Source: Dwirani, 2023.

In addition, MOMENTUM supported an assessment, led by IDAI and the Neonatology Task Force, of the **feasibility** and capacity of 39 public hospitals and 55 private hospitals to provide American Academy of Pediatrics-standard neonatal care. The project then classified the hospitals according to the level of care provided: Level 1, Level 2, Level 3 (specialty care nursery [SCN]), and Level 4 (neonatal intensive care unit [NICU]). See Figure 2 for information on services available by level of care.

Government stakeholders and MOMENTUM Country and Global Leadership worked together between December 2022 and July 2023 to build the capacity of regional referral facilities and to ensure the **acceptability** of these referrals among staff in these facilities, particularly those serving several remote islands in NTT province. Since 2022, MOMENTUM Private Healthcare Delivery has provided technical assistance to health offices in 22 districts and three administrative cities to develop referral cooperative agreements involving all relevant stakeholders at the district level, including those in the private sector. These agreements were initiated by mapping of health facilities' capabilities, according to the level of care (Figure 2). With referral agreements in place, primary health

Figure 2. Types of Maternal and Newborn Health and Reproductive Health Services Available by Level of Care in Indonesia

	Level 1 WHO	Level 2 WHO			
	PRIMARY HEALTH CARE		HOSPITAL		
	BASIC Level 1	PRIMARY Level 2	MEDIUM CARE Level 3	PRIME CARE Level 4	PLENARY CARE Level 5
	Non-BEMONC	BEMONC	CEMONC at District/City Level	CEMONC at Province Level	CEMONC at National Level
Basic Service without complication	☑	☑	☑	☑	☑
24 hours Maternal Neonatal Emergency Service with minor complication		☑	☑	☑	☑
Specialist Services			☑	☑	☑
Sub-Specialist Services				☑	☑
Highly Complicated Case Services					☑

Source: Ministry of Health Regulation No.21/2021 on Health Services during pre-pregnancy, pregnancy, and after pregnancy, family planning and reproductive health

facilities can efficiently refer small and/or sick newborns to the appropriate facility in a timely manner to receive high-quality SSNC.

In addition, the teams contributed to the development of a national Low Birthweight Preterm Newborn Guideline (BBLR) for primary-level facilities. The Maternal Perinatal Death Notification system, which MOMENTUM helped to develop, became an important tool for prompt notification (within 24 hours) of newborn death as well as documentation of the suspected cause of death.

MOMENTUM Private Healthcare Delivery also explored the **acceptability, appropriateness, and feasibility** of implementing IFCDC approaches in private hospitals. Study instruments were prepared by examining the barriers and enabling factors for IFCDC within facilities in provinces that expressed interest in implementing this framework of care. Aspects of IFCDC that were of particular interest included emotional, psychosocial, and developmental support to newborns and their families in NICUs/SCNs; linkages (including private sector referrals); and family and community involvement in maternal and newborn care.

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CHALLENGES

The World Health Organization's Model of Care for Small and/or Sick Newborns (SSNBs) was developed to support countries in their efforts to reduce neonatal mortality in alignment with global and country targets and, in particular, to meet the needs of vulnerable newborns who require specialized care. The WHO Model of Care recognizes that many countries have already achieved mortality reductions over time through efforts to scale up basic preventive and promotive newborn care and services at community and Level 1 facilities, essential newborn care (i.e., immediate care at birth and resuscitation, thermal care, initiation of breastfeeding, prevention of infection, and recognition of danger signs), and quality intrapartum care (WHO-UNICEF Expert and Country Consultation on Small and/or Sick Newborn Care Group, 2023). However, in many countries, including Indonesia, critical gaps remain with respect to provision of quality inpatient care for small and/or sick newborns.

Challenges and barriers relevant to the WHO Model of Care that were identified during the planning process in Indonesia include:

1. **Vision:** The Indonesia Newborn Action Plan (INAP) has expired. Undertaking work at the national level is challenging because individual provinces and districts have competing priorities. In addition, the national Technical Working Group for Maternal Mortality and Infant Mortality Rate Reduction has been disbanded.
2. **Financing:** Maternal and newborn health (MNH) is already covered within the Indonesian Government's budget but, for many SSNC conditions, cost reimbursement for care at hospitals is low or inadequate.
3. **Human resources:** The insufficient workforce for SSNC is a substantial challenge, especially with respect to the national shortage of neonatal nurses, neonatologists, and pediatricians. More neonatal and pediatric fellowships are needed and are being promoted for the public sector through the Referral Health Services Directorate in the Ministry of Health. Biomedical engineers are also in short supply.

4. **Training:** There are also tremendous training needs at the primary care level and in hospitals, particularly to build the capacity of nurses to deliver SSNC and, more broadly, essential newborn care, as well as to provide outpatient treatment of possible serious bacterial infection, KMC, and neonatal resuscitation at the primary and secondary levels.
5. **Infrastructure:** Facilities, including Level 3 hospitals, need infrastructure upgrades to achieve the recommended standards. This is particularly true for private sector hospitals, but all facilities should be assessed for institutional readiness (including adequate human resources, equipment, supplies, medicine, and funding) to provide the appropriate level of care to newborns. Relatedly, hospitals' accreditation status should be reviewed to ensure that hospitals at all levels of care can provide the expected services.
6. **Equipment:** Inequities exist in meeting the Ministry of Health standards for SSNC equipment at primary level facilities. There are also inequities within both rural and urban areas because local government policies, awareness, and budgets vary greatly.
7. **Referral network:** The lack of a functional referral network, particularly in remote provinces such as NTT, has hampered progress toward improving SSNC in Indonesia. The development of a national referral network with an information system to support it is underway.
8. **Data systems:** Currently, multiple health information systems exist. Under its Digital Transformation Agenda, the Ministry of Health is working to consolidate these systems into one data platform (called Satusehat) that includes individual-level data. An MNH module (called Simatneo) will be integrated into the Satusehat platform; the MOMENTUM Country and Global Leadership and MOMENTUM Private Healthcare Delivery teams are supporting the standardization of MNH indicators that would be captured through Satusehat.
9. **Linkages:** Linkages (for example, private/public partnerships and coordination between Level 1 and Level 2 facilities) are a challenge in such a complex and decentralized health system. Thus, creating and strengthening linkages has been a major focus of SSNC activities to date, particularly in NTT province (where most Level 1 facilities are public) and, more broadly, in the private sector. Creating regional Level 2 or Level 3 Centers of Excellence throughout the country is one strategy underway to improve linkages.
10. **Family and community involvement:** To date, efforts to improve family/community involvement have been somewhat fragmented and spread across different stakeholders. While professional associations in Indonesia have a focus on improving family/community involvement outside of SSNC, MOMENTUM Private Healthcare Delivery is working to integrate IFCDC in comprehensive MNH services, while improving overall experience of care, through implementing patient satisfaction surveys, supporting local accountability mechanisms, and other community involvement efforts.
11. **Post-discharge follow-up:** Follow-up of vulnerable SSNBs is a neglected area of work; national and subnational strategic implementation plans are needed to support follow-up care, such as transportation funds for families to access care in remote areas.

LEARNINGS

Early activities in planning for SSNC also produced several learnings, including:

- Hospital mentoring, including mentoring for SSNC, yields positive results but requires reliable and real-time data and information.
- Results from hospitals showed that point-of-care QI was practical and sufficient to identify gaps and provide practical solutions to inform SSNC standards of care.
- Involvement of multilevel stakeholders has been critical at various levels. At the provincial level, support from leaders, such as the Governors of NTT and North Sumatra, has been necessary for channeling and reallocating resources. At the national level, the involvement of professional organizations such as IDAI, the Indonesian nursing association (IPANI), and the Neonatology Working Group has been extremely important.
- While a strong and inclusive coalition of stakeholders (including partners such as UN agencies and nongovernmental organizations, as well as doctors, nurses, and midwives) is necessary to reach consensus on SSNC priorities, this coalition must be country led and not externally driven. This has been challenging across partners in Indonesia due to different project periods.
- Entry points for SSNC may vary depending on the sector (public or private) and local context. For example, in some settings KMC or IFCDC might be **appropriate**, but other aspects of SSNC may need to be incorporated at later stages. Readiness assessments to understand the status of newborn care are critical. Targeted hospitals can then be grouped by readiness level, rather than public or private status. In addition, it is critical to integrate MPDSR audit guidelines into MNH services, as SSNC needs assessments should identify the main causes of death and gaps in care.

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THE WAY FORWARD

In mid-2023, the Indonesian Government announced a new Health Transformation Agenda, which decreed that future activities would be based on primary health care through a lifecycle-based approach with all maternal and child health (MCH) interventions, including SSNC, integrated under a common cluster. This presents both opportunities and challenges for SSNC. For example, the shift toward a focus on primary health care may enable greater attention at this level for low birthweight babies. In addition, the new approach will continue to involve key SSNC partners, such as MOMENTUM Private Healthcare Delivery, MOMENTUM Country and Global Leadership, and IDAI, who can facilitate integration and sustainability of SSNC within the continuum of care for women and newborns. For example, IDAI is playing an important role in updating guidance for SSNC and in hospital mentoring. Follow up on referral cooperative agreements for SSNC across all levels of care demonstrates increasing commitments to continue an emphasis on improving quality of care for SSNB in the health system.

With appropriate attention, Indonesia's whole system approach to SSNC can allow for progress to occur at multiple levels of the health system and demonstrate that the components of the WHO Model of Care are just as relevant for Level 1 as Level 2. The work undertaken by the Government of Indonesia and its partners prior to the shift to a primary health care focus should provide a firm basis for the continuation of activities to support SSNC. For example, the Ministry of Health, with support from local governments, has committed to continuing and expanding the pilot SSNC QI hospital mentoring approach to Level 2 and Level 3 hospitals throughout the country.

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Other SSNC activities will inform the planned review and update of the new INAP, as well. This includes a Gadjah Mada University study on low birthweight burden and capacity at primary care and hospital levels in five districts that use SSNC clinical performance monitoring tools and NEST360 tools. The study will provide important information on newborn health outcomes and existing capacities to respond to the needs of newborns at different levels of the health system. Related activities, such as the WHO's national SSNC survey using NEST360 tools at primary and referral levels, could present further opportunities to build momentum and create synergies to advance the SSNC agenda. If feasible, undertaking rapid assessments to examine gaps in areas such as financing or human resources could be presented as evidence to the Indonesian Government to help inform national SSNC plans and strategies.

The shift toward a lifecycle-based approach may present challenges for SSNC in Indonesia. For example, providers at the community and puskesmas (primary care) levels will need to strengthen capacity not just for MCH cluster

interventions, but also for interventions that address the needs of older adults and adolescents. This will require coordinating linkages and engagement among stakeholders at every level to ensure quality of care across the continuum. In addition, supplies and available and functional equipment for SSNC remain a problem, particularly in disadvantaged settings; existing performance evaluation tools need to be updated; and it will be critical to ensure that the quality of home visits by community cadres is monitored on a regular basis. Education of families (for example, on KMC and proper feeding of small and/or sick newborns) also remains a key priority that must be a focus of community cadres.

To overcome these challenges, the Government of Indonesia and its partners should continue capacity building and supervision of facility providers and community cadres, as well as supporting cadres to collect and report on data on needed for follow-up care of SSNBs. The SSNC capacity building activities carried out in Indonesia to date will no doubt be useful for a broader range of MCH cluster teams caring for mothers and SSNBs as well as for broader efforts to strengthen the health system in Indonesia.

CONCLUSION


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Under the leadership of the Indonesian Government, several activities have been carried out to improve the care of small and/or sick newborns at different levels of care across public and private sector facilities. Indonesia enjoys fluidity in service delivery across the public and private sectors, and therefore a considerable amount of work has involved alignment of SSNC activities across these sectors where feasible. Because the country is highly decentralized and provincial governments have their own budgets, the focus of SSNC activities to date has been less on implementation of a national model and more on improving care based on assessments that identify contextual system weaknesses. The Governor of NTT, for example, is interested in continuing to push for improved newborn care after successfully reducing maternal mortality rates during their Revolusi KIA (Maternal and Child Health Revolution). However, the Government of Indonesia should still consider an umbrella/overarching framework that will inform the package of SSNC services that is ultimately available across the country at primary, secondary, and tertiary levels. This can be done in support of Indonesia's recent shift toward providing primary health care via a lifecycle-based approach that meets the needs of all Indonesians, including the most vulnerable small and/or sick newborns.

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