Maintaining the provision and use of services for maternal, newborn, child and adolescent health and older people during the COVID-19 pandemic

Timor-Leste: the use of digital health for maternal care

Introduction

Timor-Leste has progressed towards achieving its reproductive, maternal, neonatal, child and adolescent health (RMNCAH) goals in the last decade. The Government is committed to decreasing maternal, neonatal and child mortality and ensuring universal health coverage in all geographic areas across the country. The National health sector strategic plan II 2020-2030 (1) and the National strategy on reproductive, maternal, newborn, child and adolescent health 2015-2019 (2) have identified target indicators to contribute to reducing maternal and child mortality. The 2016 Demographic and Health Survey indicates that 84% of women received antenatal care (ANC) from a skilled provider, and facility-based childbirth is estimated at 49%; childbirth assisted by skilled health personnel reached 57% (3). The National health sector strategic plan 2011-2030 targets 70% of women receiving ANC four times, and 65% of women giving birth with a skilled health care provider by 2015 (4). While the country is on track to achieve some of these goals, more work needs to be done.

The first confirmed case of COVID–19 in Timor-Leste was detected on 24 March 2020, and the country has since experienced three waves. The Ministry of Health in Timor-Leste implemented several public health measures in response to the pandemic including social distancing, public sensitization, health worker training on infection, prevention and control measures and COVID-19 surveillance protocols, and launching the Health Emergency Operation Centre (5).

During the COVID-19 pandemic, routine essential health services were disrupted. Initial comparison of 2020 data on RMNCAH services from the health management information system with 2019 data indicated a minimal impact on coverage. However, subsequently, data showed a significant decline in the use of most maternal and child health (MCH) services. During the MCH annual review conducted in September 2020, strategies to overcome the low coverage were discussed, and among them was the expansion of Liga Inan, Timor-Leste’s first mobile health (mHealth) programme. Based on the results of an evaluation of the programme in 2015 (6), policymakers decided to strengthen the platform and widen its coverage in response to the pandemic.
The digital health landscape

The use of digital health applications has increasingly become an important enabler for achieving health goals. However, while 96% of the population in Timor-Leste are covered by a mobile cellular network, presenting an opportunity to implement mHealth technologies, only 29% of the population use the internet. This low use is an important barrier to the types of digital health tools that can be successfully implemented (7). The lack of infrastructure, high cost of broadband services and low level of income have contributed to the slow growth in internet connectivity (8).

Before the pandemic, there was one digital health intervention in operation – Liga Inan, which connects pregnant mothers and their health providers through mobile phones. In addition, the Ministry of Health operates systems such as the District Health Information System to aggregate, analyse, manage and present health data; and the Electronic Logistics Management Information System to monitor stocks and distribution of medical supplies. Although there is no separate unit for digital health, the Ministry provides leadership and governance, making use of the World Health Organization (WHO) Global strategy on digital health 2020-2025 (9) as interim guidance (Madalena Fatima Gomes, MCH Department, Timor-Leste Ministry of Health, personal communication, 27 April 2022).

Digital strategies to mitigate the impact of COVID-19 on RMNCAH services

Description of the Liga Inan Program

Liga Inan is a national health programme which aims to reduce high maternal and infant mortality. Using mobile phones to connect pregnant women with health providers, the programme supports Timor-Leste’s aim to improve RMNCAH by increasing access to ANC, attended childbirth, postnatal care (PNC) and family planning services, and supports efforts to improve maternal and newborn family care practices and care-seeking. The programme was established by a national nongovernmental organization, Hamutuk Nasau Saudavel (HAMNASA, formerly Health Alliance International) and Catalpa International in 2013, with funding from the Department of Foreign Affairs and Trade - Australia (DFAT) and the United States Agency for International Development (USAID).

Pregnant women are registered into the system with their name, phone number, address and date of last menstrual period. This registration occurs at health posts, community health clinics (CHCs) and hospitals. At the first ANC contact, women are given a Livro Saude Inan ho Oan (MCH handbook/record) where a sticker is pasted to indicate the coverage area of the CHCs. The registered women receive automated messages twice per week customized to the corresponding phase of the pregnancy-childbirth-postnatal continuum. For example, early in the pregnancy a woman will receive reminders to take iron supplements or attend her monthly check-up. Once she gives birth, she receives a congratulatory message on the birth of the newborn and thereafter receives information on danger signs for the mother and newborn and on general health including nutrition, breastfeeding and immunization schedules. Health workers may write and send messages through the system, allowing them to reach all registered women at once. The system also includes a feature that permits health workers to segment users into population groups. This feature enables them to target separate groups of women, for instance to send an SMS only to women in one village. In addition to the messaging capabilities, Liga Inan facilitates phone calls between women and health workers which enables women to contact their health provider directly, and the health provider to respond quickly and directly to questions and emergencies. The Liga Inan service prompts health workers to call women three weeks before their estimated due date to plan for safe childbirth with skilled health personnel.

Women registered on the system initially were monitored for up to six months after birth, but this period was extended to two years in 2020. During the pilot phase in 2013, Liga Inan was found to substantially increase the likelihood of skilled birth attendance, facility-based childbirth and timely PNC for the woman and the newborn; no impact was noted on ANC usage. The programme was initially piloted in four municipalities but was so well received that Timor-Leste’s Ministry of Health adopted it nationally. HAMNASA and Catalpa International were enlisted to assist with the scale-up in 2015 to all 12 municipalities including Regiaun Autonomy Especial Oecusse Ambeno/Special Autonomy region of Oecusse Ambeno (RAEOA) at the CHC level. The programme has grown into a nationally-available service offered through and led by Timor-Leste’s national health system and the Ministry of Health. As of April 2022, the Liga Inan Program enrolled 100,542 women into the system. Funding from DFAT is available for the programme until June 2022.
Implementation

In 2013, before the implementation of the programme, an advocacy meeting was conducted at the municipality level with local authorities, including the health director and senior midwives. This process was repeated for each new municipality when the decision was made to expand the programme. Figure 1 shows the different years for incorporation of municipalities into the programme.

A situation analysis was conducted to identify service gaps, focusing on pregnant women and midwives at the CHC level. Following that, advocacy and piloting were carried out at the sub-municipality level. Health workers were trained on maternal, newborn and child health topics by the MCH Department of the Ministry of Health. Topics included how to estimate gestational age and correct management of pregnancy. The training also covered details of the Liga Inan Program, use of the mobile app, and interpersonal communication. A key message during the training was, “Be ready at any time, anywhere, to respond to calls from women” (10).

To ensure integration of Liga Inan into services, a national technical working group was established in 2018-2019, led by the MCH Department, Ministry of Health. The Liga Inan Program was integrated into ANC; women can join the programme by registering with a local health provider during ANC contacts. This allows the system to capture the total number of women registered in each health facility and can be used to monitor the total number of women visiting for ANC, the number of facility births and PNC visits (10).

The system is monitored through a hotline set up at the HAMNASA office. The technical team at HAMNASA, in coordination with the MCH Department, conducts troubleshooting every three months to ensure that accurate messages reach pregnant and postpartum women, are read and understood, and shared with other family members. The technical supervision includes advice on activities to be conducted at CHCs, health posts, mobile clinics and/or servisu integradu saude communitaria (integrated community health services) within the specific areas. Catalpa International provides information, communication and technology support. Members of the HAMNASA and Catalpa teams monitor the system through a dashboard. Routine data on the dashboard allow managers to provide programme oversight. As an interactive system, the Liga Inan service allows for immediate response by managers to encourage the best use of the programme while also identifying areas for improvement, including for low-performing facilities, through real-time data analysis (11).

Fig. 1. Timeline of the scale-up of Liga Inan to all municipalities*

The programme has partnered with the three internet providers in Timor-Leste (Timor-Telecom, Telkomcel, and Telemor) to facilitate free calls and messaging within their networks. For example, free calls and SMS are offered from Timor-Telecom users to other users of the same provider.

Content is available in the local dialect, specifically for RAEOA and Lautem municipalities where Tetum and Portuguese – Timor-Leste’s official languages - are not primarily used.

The municipality’s health services director is responsible for monitoring implementation of the programme, advocacy, managing the health facilities, and ensuring current and new health workers are oriented and up to date on the programme.

**COVID-19 adaptations**

During the pandemic, fear of getting infected, uncertainty about service availability and mandatory confinement during the lockdown period reduced care-seeking at health facilities. Essential services were disrupted because of priorities shifting to COVID-19 work. The Liga Inan Program was leveraged to facilitate continuous health messages to registered women and communication between women and health workers through text messages and direct calls. Health workers used Liga Inan to:

- send text messages to pregnant women ensuring them of the safety of attending ANC and to continue planning for birth with skilled health personnel;
- stay engaged with pregnant and postpartum women;
- share information on the importance of COVID-19 vaccines for pregnant and lactating women;
- collaborate with their peers during the pandemic.

**Results**

The impact of the programme at community level is difficult to ascertain from the health management information system as the data are aggregated at municipality level.

Data from HAMNASA (Figure 2) indicate a decrease in enrollments into Liga Inan in seven municipalities in 2020 during the peak of the pandemic compared to the same period in 2019. This may have been due to the fear of infection with COVID-19 and mandatory quarantine for all positive COVID-19 patients (Esperansa Assunção, District Public Health Officer, MCH Department, Timor-Leste Ministry of Health, personal communication, 2022). During 2021, the number of pregnant women enrolled increased in four municipalities compared to 2020, while the number decreased in nine municipalities. In five of these nine municipalities with decreases in 2021, the reported number of enrollments was nonetheless higher than 2019.

![Figure 2. Percentage of pregnant women enrolled in the Liga Inan Program in 2019, 2020 and 2021.](source)

**Figure 3** demonstrates a decrease in health facility births in five municipalities in 2020 during the peak of the pandemic compared to the same period in 2019. Three municipalities also reported a decline in enrollments into Liga Inan. A further decrease was observed in 2021 in eight municipalities, although five municipalities reported an improvement in health facility births.

![Figure 3. Number of pregnant women who gave birth at a health facility in 2019, 2020 and 2021.](source)
To ensure equity in the programme, the MCH Department paid special attention to low-coverage areas and worked with municipalities to improve service provision as well as provide feasible solutions to address issues, such as how to track dropouts, with support from local leaders and families. For example, in Lautem (see Figure 3), there was a 20% decline in health facility births in 2020 compared to 2019. Efforts to encourage facility births were made through Liga Inan including routine messaging twice a week as well as during ANC visits. Pregnant women were educated on the risks of COVID-19 for them during birth and the postpartum period as well as preventive measures, encouraging them to go to health facilities for childbirth. The Ministry of Health considers Liga Inan to be one of the contributing factors for the increase in the number of facility births in Lautem in 2021.

Challenges and lessons learned

Challenges
The MCH department and HAMNASA teams identified several challenges through supportive supervision, spot checks and with the help of an issue tracking system.

- Not all women have access to a mobile phone. Some users shared phones (with relatives, spouses or adult children) to register and communicate with their midwife. Maintaining privacy was a challenge, because of using shared phones.

- Some geographical areas are not covered by all the internet providers. As a result, both women and health workers experienced internet interruptions. Infrastructure, such as electricity and internet, is available in health facilities, but once health workers leave a facility, they may lose access. Community leaders have advised the national coordinator and health workers on the best internet connections. For example, in Ermera Municipality, while Timor Telecom provides phone credit, Ermera Telkomcel has better connection in some areas. Hence Ermera Telkomcel was used.

- Some of the health workers who were initially oriented and assigned to the programme moved on to different roles and/or to other municipalities. Newly-assigned health workers who are not knowledgeable about the programme may have negatively affected programme outcomes.

- The programme experiences a high level of dropouts due to women changing phone numbers or relocating from their initial registration area.

- Most health facilities at the municipality level have limited human resources, and implementing Liga Inan is considered extra work.

Lessons learned from the use of Liga Inan during COVID-19

Lessons were captured through discussions with HAMNASA, and during the MCH annual review meeting in February 2022.

- Infrastructure, such as electricity and internet, is essential to successfully implement mHealth interventions. Supporting health workers and mothers with devices to use the system can improve usage and health outcomes.

- Training health providers to use technology is important. To achieve the potential impact of Liga Inan, health providers need to be both willing and able to use the technology. Equipping them with skills and experience in the technology can help them use it effectively.

- Empathetic personalized messages help counter misinformation during crises. The rapport established between women and health providers through Liga Inan before the pandemic positioned the programme as a trusted source for COVID-19 information.

- Data from the Liga Inan dashboard on usage of the Liga Inan facility and service delivery coverage were useful to identify the impact of the pandemic on maternal and newborn care. The data supported decision-making and allocation of resources.

- Digital health can support broader health goals. The implementation of Liga Inan has contributed to the acceleration of MCH service delivery across the country. The programme has helped identify gaps and contributed to the development of solutions to address issues quickly. For example, the revision of the National health sector strategic plan in 2021 and development of the national guidelines and protocols for ANC/PNC were carried out as evidence-based policy actions.

Moving forward

The implementation of the Liga Inan Program is being handed over to the Ministry of Health, with the process expected to be completed in mid-2022. The Ministry of Health will continue to work with development partners to ensure sustainability of the programme. The MCH Department will provide oversight through supervision and monitoring at the national level, while municipal health directors will oversee CHCs and health posts. Process and/or outcome evaluations will be needed to identify challenges and how to overcome them, and strengthen the health system to prepare for future emergencies as part of country preparedness plans.
Acknowledgements

Liga Inan is a programme implemented by HAMNASA and Catalpa International and funded by USAID and DFAT - Australia through the Partnership for Human Development.

This report was developed using information from existing documents as well as that captured through discussions with representatives of the Ministry of Health of Timor-Leste and other key stakeholders, including the initiator and implementor of the Liga Inan Program.

Angelina Gusmao prepared the report with inputs from a team from Timor-Leste (Virginia Alves, Esperansa Assunção, Paul Arminho de Vasconcelhos, Nilmini Hemachandra, Gabriela Leite, and Madalena Fatima Soares Gomes). Chomba Zenengeya, Saramma Thomas Mathai and Anayda Portela also provided inputs. The team is grateful to the contributions of representatives of HAMNASA, Catalpa International, the MCH Unit of the WHO Country Office for Timor-Leste, the WHO Regional Office for South-East Asia (Neena Raina, Director FGL and Anoma Jayathilaka) and the WHO Department of Maternal, Newborn, Child and Adolescent Health and Ageing. The final report was approved by the Ministry of Health of Timor-Leste.

This report was developed with support received from WHO/MCA - through a grant from the Bill and Melinda Gates Foundation (INV-017424).

---

The views in this brief do not necessarily represent the decisions, policy or views of the World Health Organization.

---

Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANC</td>
<td>antenatal care</td>
</tr>
<tr>
<td>CHC</td>
<td>community health centre</td>
</tr>
<tr>
<td>DFAT</td>
<td>Department of Foreign Affairs and Trade (Australia)</td>
</tr>
<tr>
<td>HAI</td>
<td>Health Alliance International</td>
</tr>
<tr>
<td>HAMNASA</td>
<td>Hamutuk nasaun saudavel (Together for a healthy nation)</td>
</tr>
<tr>
<td>MCH</td>
<td>maternal and child health</td>
</tr>
<tr>
<td>PNC</td>
<td>postnatal care</td>
</tr>
<tr>
<td>RAEOA</td>
<td>Regiaun autonomy especial Oecusse Ambeno (special autonomy region of Oecusse Ambeno)</td>
</tr>
<tr>
<td>RMNCAH</td>
<td>reproductive, maternal, neonatal, child and adolescent health</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
</tbody>
</table>
References


