avoiding 43,000 cases of mother-to-child transmission of HIV.

A cost-benefit analysis determined that the proposed interventions are highly cost-efficient, based on World Health Organization guidelines. If these interventions are implemented, Mozambique should reach its Sustainable Development Goal (SDG) target for reduced infant mortality by 2030, as well as make significant progress toward reducing maternal and child mortality in the country.

Snapshot of Healthcare Challenges in Mozambique

Mozambique struggles to sufficiently and sustainably finance its health system. Yearly public expenditure on health is US$30–35 per inhabitant, much below the World Health Organization estimate of US$60–80 for a basic health package, including HIV medication, in low- and middle-income countries. Mozambique's health system is highly dependent on foreign aid—approximately half of its funding comes from donor sources. The country relies on an array of players and has several assistance-disbursing mechanisms, including on-budget pooled funds (Pro-Saúde), on-budget vertical funds (Gavi, the Vaccine Alliance and the Global Fund), on-budget project funds (e.g., the World Bank), and off-budget modalities (e.g., the U.S. Government).

Reproductive, maternal, neonatal, child, and adolescent health in Mozambique is only slowly improving. Although Mozambique reached Millennium Development Goal 4—reducing the mortality rate for children under age five by two-thirds between 1990 and 2015—there has been slow progress in reducing maternal and neonatal deaths. Adolescents and their infants have particularly high maternal and neonatal mortality rates, driven by the country's high rate of teenage pregnancy (46.4%). Access to and quality of health care varies markedly across the population. For example, just over 40 percent of pregnant women in the lowest income quintile receive the standard five prenatal consultations, compared with 72 percent of patients from the highest income quintile. While roughly 40 percent of women who have completed secondary school use modern contraceptives, this number is less than half (18 percent) for those who have only completed primary school.

The Mozambique health system is slowly decentralizing, creating opportunities to better tailor activities to specific provinces or districts. Donors are looking to disburse funds directly to provinces to finance mechanisms that ensure sound public finance management and improve performance.

Two-thirds of Mozambicans live in rural, remote areas, supported by a large, geographically challenging network of health facilities (see Figure 1). There are significant inequities in access to care, particularly in the provinces of Nampula, Zambézia, and Tete.[1]

A shortage of maternal and child healthcare nurses places a strain on the system. Approximately 4,644 maternal/child health nurses provide all child and reproductive

[1] República de Moçambique, Ministério da Saúde. 2016. Anuário Estatístico, 2015. pg. 31–40.

health services for a population of over 25 million people. Although the number of nurses has increased recently, distribution across the country is irregular, with those working in remote, rural districts often experiencing strenuous workloads.

Priority Intervention Areas

The investment case's priority interventions aim to significantly improve maternal and neonatal mortality rates and continue progress in lowering infant mortality. These interventions will bring the country significantly closer to reaching Sustainable Development Goal 3 (good health and well-being), although further interventions will be needed to achieve country targets. The investment case categorizes priority interventions into three strategies, aiming to (1) increase service effectiveness, (2) stimulate user demand, and (3) strengthen the health system.

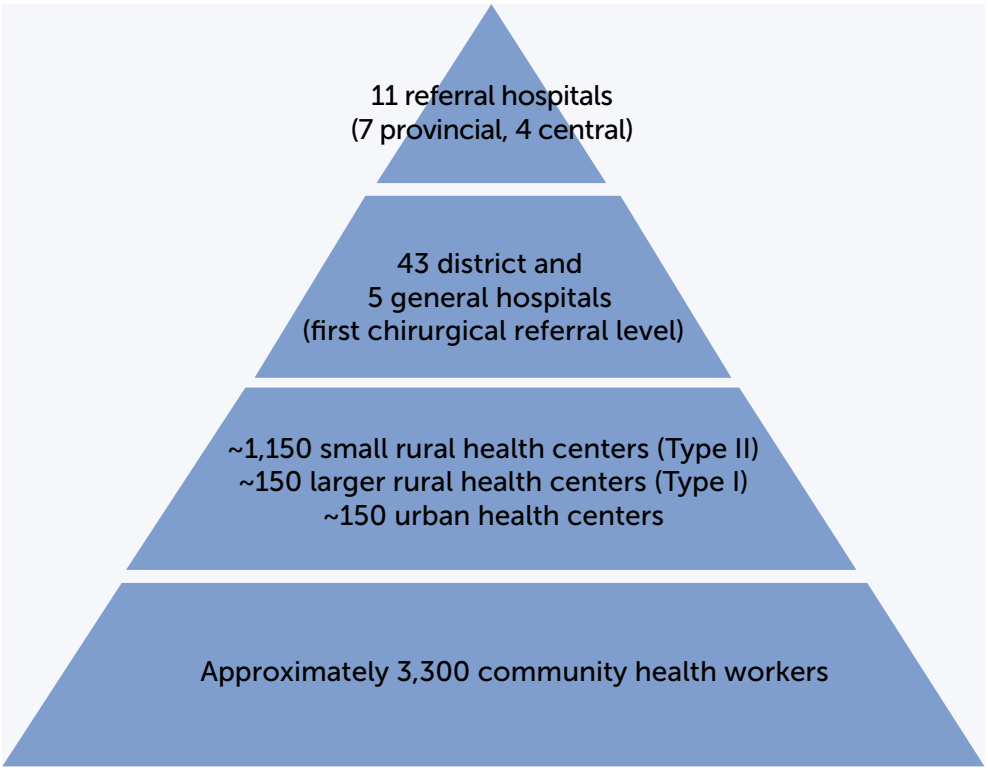
Strategy 1: Increase the Effectiveness of Service Provision

Effective interventions must be customized to fit the context of each district and occur at the appropriate referral level, with intensive support at district hospitals and large rural health centers to maximize use of expected financing.

Building Blocks of Strategy 1

- Build 260 new emergency neonatal and obstetric facilities
- Rehabilitate and upgrade 55 district hospitals
- Train and employ 2,000 additional maternal/child health nurses;

Figure 1. Healthcare Facilities and Community Health Workers in Mozambique[2]



[2] Ibid

create a specialized career path for these workers
- Invest in surgical teams at district hospitals
- Improve communication and transportation between health centers and district hospitals for emergency referrals

Strengthen referral and outreach. Over 40 percent of maternal deaths occur during the time a woman is transported from a health unit to a referral hospital. Under Strategy 1, facilities in districts with strong healthcare networks will focus on strengthening their referral capabilities. Facilities in districts with inadequate resources should focus on expanding their reach to remote segments of the population by employing an additional 1,300 community health workers (known locally as *agentes polivalentes elementares*, or APEs) or mobile health brigades.

Increase staffing and training. To address the countrywide shortage of maternal/child health nurses, an additional 2,000 nurses should be employed. The investment case suggests providing additional obstetric-midwifery and neonatology training to nurses in first tier referral facilities to strengthen emergency preparedness and help build a designated career path, promoting health worker retention. Training of maternal/child health nurses can be improved by extending practical training by six months and including lessons on adolescent health. Higher quality of care in rural areas can be achieved through improved supervision of APEs and maternal/child health nurses in peripheral health units.

Invest in infrastructure at district hospitals. The investment case provides plans to rehabilitate and upgrade 55 district hospitals, enable 260 large health centers to become basic emergency obstetric and neonatal care units, and invest in ambulances.

Invest in supplies and commodities. A need exists for increased availability of drugs and consumables, including modern contraceptives; consumables needed for obstetric, neonatal, birth, and prenatal care; and curative drugs needed to fight common causes of disease and death among children. Additionally, a need exists for increased investment in emergency obstetric and neonatal equipment to ensure preparedness.

Strategy 2: Generate Demand and Participation

To increase utilization of health services by the target population, the capacities of community organizations and nongovernmental organizations (NGOs) should be leveraged to improve health education and advocate for change in traditional practices that may be dangerous or pose health risks. In addition, key messages on child nourishment and teen pregnancy/early marriage should be intensified. Lastly, measures should be taken to incentivize the target group to seek health services and reduce interruptions in care.

Building Blocks of Strategy 2

- Target adolescents with health messaging
- Communicate with adolescents through schools

- Employ mass media and social networking strategies
- Enroll community leadership and NGOs to implement activities
- Link maternal/child health nurses and APEs for continuity of care

Improve communication across the health system. Poor communication among those who work and engage with the health system (e.g., facility healthcare workers, APEs, community organizations, and clients) presents a challenge to achieving health outcomes. Fostering communication between health service providers and clients, health unit staff and APEs, and the community and health service system will drive demand for health services and increase provision of care to pregnant women. Local experiences, shared during creation of the investment case, suggested that adolescent use of services can be increased through NGO awareness-raising activities as well as subsidizing private providers to complement public services. A successful pilot intervention using mobile phones to link professional supervisors in health facilities with APEs suggests that similar links between APEs and maternal/child health should exist.

Strategy 3: Strengthen the Health System

To strengthen the management capacity of the National Health Service, the investment case proposes creating a central technical unit at the National Directorate for Public Health. This unit will be tasked with 1) maintaining dialogue with development partners, 2) aligning policies and priorities spelled out in the investment case, and 3) improving coordination regarding investment plans, human resource planning, and consumable supplies across different aid health programs. The unit will leverage and reinforce the country's health information system (SIS-MA) to carry out monitoring and evaluation of health indicators at the national level as well as ensure accountability to donors.

At the provincial level, a coordination and implementation unit will help district governments efficiently allocate resources for obstetric and neonatal emergencies and assist with detailed planning of APE/mobile brigade coverage, reporting, coordination, and administration of pay-for-results mechanisms.

Building Blocks of Strategy 3

- Increase emergency obstetric and neonatal care capacity
- Address health sector human resources by improving quality of training, increasing size and distribution of workforce, and fostering motivation and specialization to ensure retention
- Organize a technical unit at the national level
- Organize a coordination and implementation unit at the provincial level
- Create incentives through performance-based financing
- Improve consumable supply chain and invest in warehouses/storage
- Improve facility management
- Improve civil register upgrades and usage

Link disbursement of funds to desired results. The use of disbursement-linked indicators, which

will serve as a basis for target setting and fund disbursement, can help foster improvements in communication and coordination between the Ministry of Health, donors, and the health system. Furthermore, this pay-for-results approach will incentivize performance of health professionals on the periphery. Selected indicators reflect expected outputs and outcomes from the interventions recommended in the investment case and draw upon existing information systems and indicators already agreed upon by the Ministry of Health and donors.

Invest in the civil register. The civil register records specific causes of newborn and maternal deaths as well as non-institutional births. This data can be reviewed by committees and is made available to the Ministry of Justice and the National Statistics Authority. Investment in the register can improve the quality and accessibility of health information and countrywide statistics.

Expected Costs and Results

The World Health Organization's OneHealth tool was used to quantify the cost and payout of the proposed interventions based on two scenarios: one that includes low investment costs and modest coverage growth, and another with higher infrastructure investment, such as construction of 24 Type II health centers, and more ambitious health coverage, resulting in higher consumable costs.

The estimate for implementation of the recommended priority interventions is between US$1.3 and US$1.5 billion. Infrastructure rehabilitation costs will be high during the first years (approximately 40 percent), whereas staff costs will increase in later years due to a large increase in the number of maternal/child health nurses (45–48 percent). Consumable costs are projected to stay at approximately 26 percent.

What Was Costed

Human resource needs:

- 2,000 maternal/child health nurses
- 250 specialized maternal/child health nurses
- 170 surgery teams
- 1,400 APEs (in scattered districts)
- 500 physicians
- 200 physicians, pediatricians, and obstetrician-gynecologists

Equipment/infrastructure needs:

- Build/upgrade 7 district hospitals and 24 Type II health units for scattered districts
- Water/electricity in 55 district hospitals and 260 Type I health units/emergency obstetric care Type B units
- Transportation to all district hospitals and Type I health units/emergency obstetric care Type B units
- Telecommunications coverage for district hospitals and Type I health units/emergency obstetric care Type B units
- Communication for maternal/child health nurses and APEs across 1,300 Type II health units
- 300 emergency obstetric care units with six basic capabilities according to UNFPA standards
- Consumables needed to meet coverage targets

Table 1. Expected Indicator Results in 2030

Indicator	Baseline (2015)	Result (2021)	Annual reduction (2015–2021)	Annual reduction (%) (2015–2021)	Cumulative reduction (%) (2015–2030)	Estimated result (2030)	SDG goal (2030)
Child mortality (0–5 years)	79	60	3.80	4.8%	52.4%	37.60	20
Maternal mortality	408	231	35.40	8.7%	74.4%	104.60	70
Neonatal mortality	27	15.15	2.37	8.8%	74.8%	6.80	12

With this level of investment, each year Mozambique could reduce its maternal mortality rate by between seven and nine percent, its neonatal mortality rate by nine percent, and its child mortality rate by nearly five percent. In addition, 237,500 disability-adjusted life years (DALYs) would be averted annually. Increased contraceptive use would prevent close to a million unwanted pregnancies and 100,000 stillbirths, reducing maternal and neonatal mortality by 19 percent and 10 percent, respectively, while avoiding 43,000 cases of mother-to-child transmission of HIV.

In a cost-benefit analysis for the year 2021, the cost per DALY was calculated at US$1,710, assuming a 2021 GDP per capita of US$918. This scenario would result in a cost-benefit ratio of 1.86. Assuming eight percent GDP growth, this ratio places the proposed interventions well within a highly cost-efficient range according to World Health Organization guidelines.

The analysis determined that Mozambique will reach its target for reducing infant mortality by 2030. However, maternal and child mortality rates are expected to remain above targets set out in the Sustainable Development Goals (see Table 1).

Challenges Identified

Emphasizing and prioritizing the reform agenda. A lack of urgency in the much-needed reorganization of Mozambique's basic primary healthcare package poses a challenge to the interventions outlined in the country's investment case. While some successes have been derived from one-time programs (such as campaigns and health events), these pose a risk of unintentionally hiding underperformance within the health system.

Outdated strategies. Strategies and practices managed by the Ministry of Health and donors need to be updated to fit within new health targets and financial considerations.

Next Steps

The establishment of disbursement-linked indicators has been defined as the next step toward attaining funds from the World Bank under the Global Financing Facility umbrella. Funding would be available as of January 2018; several donors in addition to the World Bank are expected to join the umbrella fund.

Integrating and operationalizing investment case recommendations in

Mozambique's national health system is needed to trigger the disbursement of funds for further investment in the national health sector.

Conclusion

With an eye toward 2030—the deadline for the Sustainable Development Goals—it is undeniable that further work is needed to put Mozambique on track to achieve its health sector goals. The investment case enables a leap forward, but is not sufficient in and of itself to reach these targets in reproductive, maternal, neonatal, child, and adolescent health in Mozambique.

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