Mortality of women and children and coverage of essential maternal and child health services during PIMI III

Policy Brief

Key messages

- The «Integrated Programme for the Reduction of Maternal and Child Mortality» (PIMI) has been implemented in Guinea-Bissau to contribute to improving maternal and child survival through increased coverage of essential quality maternal and child health services.
- In this policy brief, we describe mortality of women and children and coverage of essential maternal and child health services during PIMI III. To this end, we assessed the mortality of women of reproductive age and children under 5 years of age and perinatal mortality as well as coverage of antenatal care, facility-based childbirth, postpartum admission, and postnatal care in rural Guinea-Bissau from June 2022 to June 2024 based on community data from the nationally representative rural health and demographic surveillance system (HDSS) of the Bandim Health Project (BHP). Using the information collected through the BHP HDSS, we also assessed maternal mortality between June 2018 and June 2024.
- Between June 2022 and June 2024, the mortality among women of reproductive age remained high at 4.69 per 1,000 person years. The estimated under-5 mortality was 82 per 1,000 live births, infant mortality 61 per 1,000 livebirths and neonatal mortality 33 per 1,000 live births. The perinatal mortality rate was also high, at 74 per 1,000 births.
- The estimated maternal mortality ratio from 2018-24 was 507 per 100,000 live births.
- Between June 2022 and June 2024, coverage of any antenatal care contact was close to universal at 99% but coverage of the recommended eight or more antenatal care contacts was low at only 6%. Coverage of four or more antenatal care contacts, facility-based childbirth, and postnatal care within 24 hours was suboptimal at 52-61%. Among women who gave birth at a health facility, 20% did not remain at the hospital for at least 24 hours after birth for postpartum observation and 15% did not obtain a postnatal care contact within 24 hours.
- Mortality rates are persistently high and coverage of essential maternal and child health services inadequate in rural Guinea-Bissau. There is an urgent need for further targeted measures to improve accessibility and availability of quality maternal and child health services and advance universal health coverage across the country.

Context

Despite the remarkable progress that has been made over the past decades, Guinea-Bissau continues to rank amongst the countries with the highest maternal and child mortality rates globally. According to the most recent international estimates, the country experiences 505 maternal

deaths per 100,000 live births, 29 stillbirths per 1,000 births, and 33 neonatal and 69 under-5 deaths per 1,000 live births.[1] Hence, Guinea-Bissau is far from the 2030 goals of reducing maternal mortality to below 70 deaths per 100,000 live births,[2] stillbirths to below 12 deaths per 1,000 births,[3] and neonatal and under-5 mortality to below 12 and 25 deaths per 1,000 live births, respectively.[2]

Universal access to high-quality essential maternal and child health (MCH) services is considered fundamental to improving maternal and child survival.[4-7] In Guinea-Bissau, the 'Integrated Programme for the Reduction of Maternal and Child Mortality' (PIMI) has been implemented with the aim to increase access to quality MCH services and thereby improve maternal and child survival.[8-10] PIMI has been implemented with core funding provided by the European Union.[11] The programme was first introduced in four of the country's eleven health regions in 2013 (PIMI I) before being rolled-out nation-wide in 2017 (PIMI II).[8,9] In July 2021, after the end of PIMI II, the World Bank integrated PIMI's core activities into its country health programme (transition period).[12] In June 2022, PIMI was transitioned back to European Union financing (PIMI III). During PIMI III, PIMI's core activities are to be transferred to MINSAP.[13]

Throughout its implementation, PIMI employed a comprehensive intervention design including a user-fee waiver policy covering essential MCH services and medicines, capacity building for medical and managerial staff, strengthening of the supply chain of essential medicines and consumables and strengthening of the health information system.[10]

PIMI III has been implemented by Instituto Marquês Valle Flôr (IMVF) and the World Health Organisation's country office Guinea-Bissau in collaboration with the Bissau-Guinean Ministry of Health (MINSAP). To evaluate effects of PIMI III, the Delegation of the European Union to Guinea-Bissau has commissioned the Bandim Health Project (BHP).

In the evaluation of PIMI, BHP builds on its nationally representative rural health and demographic surveillance system (HDSS). This HDSS monitors pregnancies, births, the uptake of health interventions, and deaths in an open cohort of more than 50,000 women and children under 5 years of age in rural Guinea-Bissau.[14] Thereby, the HDSS provides population-based information on service coverage and mortality from a nationally representative sample of the full target population of PIMI in rural Guinea-Bissau independent of health facility data.

In this policy brief, we provide updated estimates for mortality of women of reproductive age, children under 5 years of age, perinatal mortality, and coverage of essential MCH services during PIMI III. Furthermore, we provide maternal mortality estimates and assess the proportions of child and maternal deaths by place of death to aid the interpretability of mortality estimates originating from health-facility data. Finally, we compare the maternal mortality ratios in DHIS2 data with those assessed through BHP's HDSS.

Methods

We employed an observational study design based on data from the BHP's HDSS which has, in its current set-up, been running since 2006. Through this system, we are continuously monitoring >50,000 women of reproductive age and children below 5 years of age in a nationally representative random sample of 182 village clusters across all ten rural health regions in Guinea-Bissau (i.e., all

health regions with the exception of the capital region) (Figure 1).[14]

Figure 1: Village clusters under surveillance across rural Guinea-Bissau.

The rural HDSS is an open cohort. Upon informed consent, women who have grown up in a village cluster under surveillance and reached fertile age are enrolled as cohort members. The same applies to women and children below 5 years of age who have moved into a village cluster under surveillance. At each visit, registered women are asked if they are pregnant; if they are, the yet unborn child is registered. Children exit the cohort upon reaching 5 years of age, death, or out-migration; women upon death or out-migration.

The cohort members are followed through at least biannual household visits (more frequent visits in selected health regions during selected periods). Upon registration of a woman, information on ethnicity, age, schooling, and obstetric history is collected. At all household visits, in addition to being asked about a current pregnancy, women are asked whether they had a birth or miscarriage since the last visit. For all registered pregnancies, we collect information on obtained antenatal care (ANC). Information on socio-economic background factors is collected upon registration of a pregnancy or in-migrating children. Upon registration of pregnancy outcomes and in-migrating infants, (further) information on obtained ANC, the place of birth, and obtained postnatal care (PNC) including if and how long the woman remained in a health facility after birth is collected. Data on childhood vaccinations is collected and updated during every household visit.[14] Following the registration of a death, a brief interview seeking to classify the cause and place of death is conducted.

For the main assessment of mortality among children and women of reproductive age, perinatal mortality, and coverage of essential MCH services, we defined the observation period as June 2022-24. This provides a comprehensive overview of mortality and coverage patterns during PIMI III and allows for comparison with pre-PIMI-III estimates (Figure 2). For maternal mortality and for the place of death description, we included information from June 2018-24.

For the assessment of perinatal mortality and service coverage, the observation period corresponds to births occurring during this time frame. For mortality of women of reproductive age, maternal mortality, and mortality of children below 5 years of age, the observation period corresponds to time of observation.

We assessed the following outcomes based on data from the rural HDSS:

- Mortality of women of reproductive age;
- mortality of children under 5 years of age;
- perinatal mortality;
- probable maternal deaths in 2018-24;
- place of death for maternal and under-5 deaths
- proportion of women who have obtained one/four/eight or more ANC contacts (ANC1/ANC4/ANC8);
- proportion of women who have given birth at a health facility;
- proportion of women who have given birth

at a health facility and remained at the health facility for at least 24 hours after birth (postpartum admission);
- proportion of women who had a maternal and/or newborn PNC contact within 24 hours after birth;
- childhood vaccination coverage.

We also assessed associations between background factors (household assets, maternal education, parity, maternal age, region, ethnicity, and distance to the nearest health facility) and coverage and perinatal mortality.

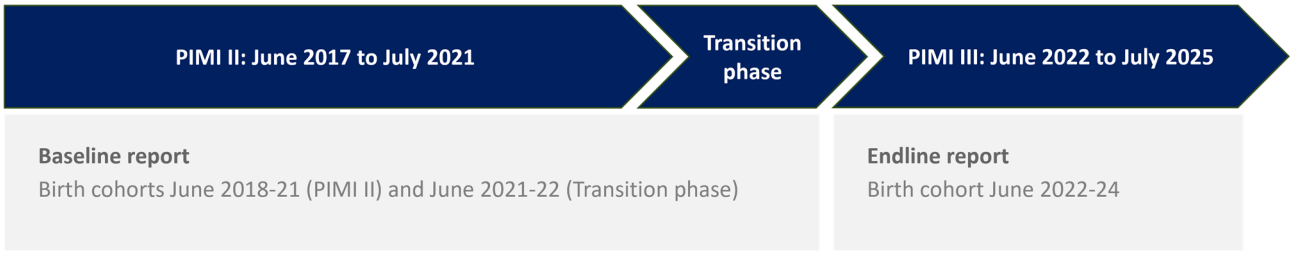

Figure 2: Annual birth/observation cohorts covered in this policy brief and the preceding baseline assessment.

Key findings

Among 29,824 women aged 15-49 years followed between June 2022 and June 2024, 240 women died during the 51,180 person years of observation. Hence the mortality rate was 4.69 per 1,000 person years (95%CI 4.15-5.32).

During the same period, 23,662 children under 5 years of age were followed for 31,049 person years and 514 deaths were registered. The estimated under-5 mortality was 82 per 1,000 live births while the infant mortality was 61 per 1,000 live births and neonatal mortality 33 per 1,000 live births. The perinatal mortality rate was also high, at 74 per 1,000 births (95%CI 67-82).

In 2018-24, we followed 38,412 women aged 15-49 years and registered 742 deaths. 100 of these deaths were likely maternal deaths occurring during pregnancy, birth or within the first 42 days postpartum. With 19,702 live births to the women under surveillance, this translates into a maternal mortality ratio of 507 per 100,000 live births. Thereby, the maternal mortality ratio is comparable to the DHIS2 estimate for 2022 (548 deaths per 100,000 live births[15]), which is based on facility births. However, it should be noted that, based on our analyses, only 58% of the maternal deaths occur in health facilities, leading to a highly incomplete picture when basing maternal mortality assessments solely on facility data. For under-5 deaths, this is even more pronounced: only 40% of the 1,533 under-5 deaths in 2018-24 occurred at health facilities.

A total of 7,006 births were eligible for the coverage analyses. Overall, 99% obtained ANC1 (6,761/6,824), 61% ANC4 (3,140/5,109), 6% ANC8 (290/5,109), 59% facility-based childbirth (4,070/6,925), and 52% PNC (2,435/4,704). Among facility-based childbirths, 80% remained at the hospital for at least 24 hours after birth (postpartum admission) (2,440/3,034) and 85% obtained PNC (2,240/2,628) (Figure 3).

We found a pronounced negative association between coverage of ANC1, ANC4, facility-based childbirth, and PNC (among all births) and distance to the nearest health facility: In comparison with women living close to the nearest health facility (<2 km), coverage rates amongst women living further away dropped markedly. We observed the largest drop for PNC coverage and facility-based

childbirth. PNC coverage amongst women living <2 km from the nearest health facility was 74% (861/1,156), but only 41% for those living more than 8 km away (476/1,171; OR 0.29 (95%CI 0.21-0.41)). Similarly, facility-based childbirth coverage amongst women living <2km from the nearest health facility was 82% (1,399/1,707), but only 49% for those living more than 8 km away (832/1,690; OR 0.25 (95%CI 0.18-0.35)). This pattern was different for the outcomes assessed among facility-based childbirths (postpartum admission and PNC among facility-based childbirths), where distance was no longer associated with coverage.

Meanwhile, we found a pronounced regional heterogeneity in the coverage rates, with the highest rates of ANC, facility-based childbirth, and PNC (among all births) observed in Bolama/Bubaque. The lowest coverage rates were observed in Oio/Farim except for ANC8 and postpartum admission, where Gabu (ANC8) and Cacheu (postpartum admission) had the lowest coverage. Similarly, there were pronounced heterogeneities between ethnic groups across the outcomes.

We also observed coverage of ANC4, ANC8, facility-based childbirth and PNC (both among facility-based childbirths and among all births) to be associated with household wealth: In comparison with the poorest group, women allocated to the richer groups had a statistically significantly higher coverage. Similarly, higher maternal schooling was associated with higher coverage for most outcomes. Women who had given birth before had statistically significantly lower coverage rates of ANC4, ANC8, facility-based childbirth and PNC (among all births) in comparison with primigravidae. In comparison with teenage women (<20 years of age), women in the older age groups (≥20 years) were statistically significantly less likely to obtain facility-based childbirth and PNC (among all births).

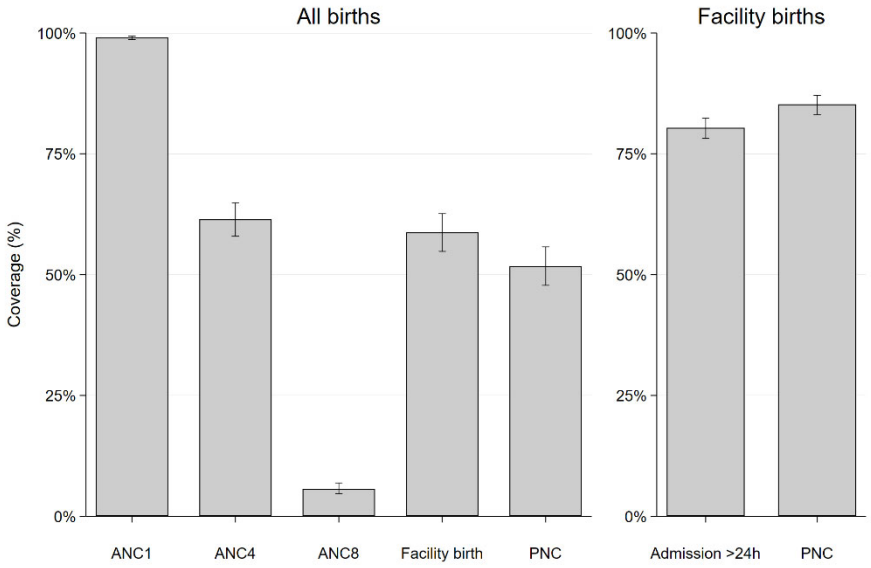

Figure 3: Coverage of at least one/four/eight antenatal care visits (ANC1/ANC4/ANC8), facility-based childbirth (HF births, and postnatal care (PNC) among all registered pregnancies (left); coverage of postpartum admission and PNC among HF births (right).

Implications and key policy options

- Persistently high mortality rates and inadequate coverage of essential MCH services in rural Guinea-Bissau are likely driven by ongoing challenges in service accessibility and availability, highlighting an urgent need for further interventions targeting unmet care needs caused by barriers to care.
- Our analyses show that care attainment is strongly associated with higher household wealth and shorter distances to health facilities, thereby suggesting that financial and geographical obstacles remain key challenges in rural Guinea-Bissau. As these obstacles disproportionately affect poorer households, this entails severe equity concerns. Ensuring true gratuity of essential services and improving transportation access are cornerstones for progress.
- Gaps in the continuum of care, especially inadequate coverage of postpartum observation and timely PNC among women with a facility-based childbirth, represent missed opportunities and should be prioritised. Retaining women in care following their initial ANC contact is another critical step. Strengthening health-facility readiness will be essential to meet growing service demand.
- Moreover, coordinated efforts among stakeholders are essential to maximise impact. Continuous monitoring of equity, coverage, and mortality outcomes - and the use of information from both in- and outside health facilities - is vital to guide such efforts and assess progress effectively.

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This policy brief was prepared by Sabine Margarete Damerow, Justiniano Sebastiao Dunga Martins, Linea Olga Karlqvist, and Ane Bærent Fisker. Further information can be found on www.measureeffects.org.