

Maternal and Neonatal Outcomes of a Free Maternal Care Programme at Yardimeli Specialist Hospital, Somalia: A Two-Year Retrospective Study

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Abstract

Background: Maternal and neonatal mortality remain important public health challenges in Somalia, where access to affordable and quality maternity care can be limited. Hospital-sponsored programmes that provide free maternity services combined with home-based midwife follow-up may help address barriers to essential maternal and newborn care. However, evidence describing outcomes among women enrolled in such programmes in Somalia remains limited. This study described maternal and neonatal outcomes among women participating in a hospital-sponsored free maternity care programme. **Methods:** A retrospective observational study was conducted using routinely collected programme data from Yardimeli Specialist Hospital, Somalia, from January 2023 to January 2025. Of 201 women enrolled in the programme, 17 were excluded because outcome follow-up information was unavailable, leaving 184 women in the final analytical cohort. Maternal, pregnancy, delivery, and neonatal outcomes were summarized using descriptive statistics. Analyses were based on the relevant analytical unit for each outcome, with variable-specific denominators used where data were missing. **Results:** Among the 184 women in the final analytical cohort, 184 pregnancy outcomes were recorded, comprising 170 live-birth pregnancies (92.4%),

seven abortions (3.8%), and seven intrauterine fetal deaths (3.8%). Two twin pregnancies among the live-birth pregnancies resulted in 172 live-born infants. One maternal death (0.5%) was recorded among the 184 women, while four neonatal deaths occurred among the 172 live-born infants (2.3%). Low birth weight (<2500 g) was recorded in 20 of the 172 live-born infants (11.6%). Five-minute APGAR scores were available for 160 of the 172 live-born infants; among those with documented scores, 152 (95.0%) had a score ≥ 7 .

Conclusion: This study provides important preliminary evidence on maternal and neonatal outcomes within a hospital-sponsored free maternity care programme in Somalia. While most infants had favorable 5-minute APGAR scores, adverse maternal and neonatal outcomes were observed. Prospective comparative studies with standardized follow-up are needed to evaluate programme effectiveness and guide the development of accessible maternity care models in Somalia.

Keywords

Maternal Health, Neonatal Outcomes, Free Maternal Care, Antenatal Care, Somalia

1. Introduction

Despite substantial advances in maternal health care, maternal mortality remains a major global public health challenge [1]. In 2020, an estimated 287,000 women died from pregnancy- and childbirth-related causes, with the majority of these deaths occurring in low- and middle-income countries where access to high-quality maternal health services remains limited [2]. Many maternal and neonatal deaths are preventable through timely access to essential interventions, including adequate antenatal care, skilled birth attendance, and appropriate postnatal care [2].

Somalia continues to have one of the highest maternal mortality ratios globally. Limited healthcare resources, geographic barriers, shortages of skilled health personnel, financial constraints, weak referral systems, and prolonged conflict have substantially restricted access to essential maternal health services. These interconnected challenges contribute to delays in recognising obstetric complications, reaching appropriate healthcare facilities, and receiving timely emergency obstetric care (EOC), thereby increasing the risk of adverse maternal and neonatal outcomes [3]-[7].

The continuum of maternal care, including antenatal care, skilled birth attendance, and postnatal follow-up, is considered essential for achieving safe motherhood. Although evidence supports the importance of continuity across these stages, completion of the maternal care continuum remains inadequate in many low-resource settings. Previous reviews have demonstrated low coverage of the full continuum of care in sub-Saharan Africa, with substantial losses occurring

between antenatal care, delivery care, and postnatal follow-up [6] [8]. Factors such as household wealth, maternal education, healthcare access, distance to facilities, and service costs have been identified as important determinants of completing recommended maternal health services [7] [9]-[14]. In addition, financial protection mechanisms and sustainable healthcare financing strategies have been recognised as important enablers of equitable access to maternal healthcare services in low-resource settings [15]. In Somalia, available evidence indicates that only a minority of women receive the complete sequence of antenatal, delivery, and postnatal care, while incomplete antenatal care has been associated with factors influencing neonatal outcomes [16] [17]. These persistent gaps highlight the need for innovative approaches that extend maternity services beyond healthcare facilities, including community- and home-based midwife support, to improve continuity of care and facilitate early identification of pregnancy-related complications.

To reduce financial barriers that limit access to maternity services, several low-resource countries have introduced free maternal healthcare programmes. However, evidence regarding their effects on maternal and neonatal outcomes remains inconsistent, with most evaluations conducted in relatively stable healthcare systems rather than fragile or conflict-affected settings. Studies from Kenya have shown that free maternity policies can improve access to facility-based delivery, although improvements in service utilisation alone do not necessarily translate into better maternal and neonatal outcomes when the quality and continuity of care remain challenges [18] [19]. Evidence suggests that nursing and midwifery interventions may contribute to improved maternal outcomes in resource-limited settings. However, evidence regarding integrated models combining free facility-based maternity care with structured home-based follow-up remains limited, particularly in fragile settings such as Somalia [20].

Collectively, available evidence suggests that free maternal care programmes can improve access to maternity services; however, their effects on maternal and neonatal outcomes remain inconsistent. Furthermore, most existing evidence comes from relatively stable healthcare systems, and evaluations of integrated free maternal care models with home-based midwifery support in fragile and conflict-affected settings remain limited. Therefore, the applicability of these approaches to the Somali context remains uncertain.

In Somalia, evidence describing maternal and neonatal outcomes among women enrolled in routine free maternal care programmes is scarce. Previous studies have mainly focused on women presenting with severe maternal complications or accessing referral-level hospital services rather than evaluating preventive and continuous models of maternity care [3] [21]. Community-based interventions in Somalia have demonstrated potential improvements in maternal health service utilisation; however, these programmes have not incorporated structured home-based midwife follow-up combined with free facility-based maternity care [4]. Although broader health-system evidence supports reducing financial barriers to

improve access to essential health services, the effectiveness of integrated maternal care models within fragile settings such as Somalia remains insufficiently understood [5].

To our knowledge, previous studies have not evaluated maternal and neonatal outcomes among women receiving an integrated model of free facility-based maternity care combined with structured home-based midwife follow-up, representing an important evidence gap. Beyond Somalia, similar challenges exist in other fragile settings, where limitations in routine health information systems and outcome monitoring can hinder the evaluation of maternal and neonatal care programmes [22]. Existing studies have generally examined individual components of maternal care, such as clinical outcomes, community-based interventions, financing approaches, or health data systems, rather than assessing a comprehensive integrated care model. Therefore, evaluating maternal and neonatal outcomes within a hospital-sponsored free maternal care programme with structured home-based midwife support may provide valuable evidence for strengthening maternity services in fragile and resource-limited settings.

To improve access to essential maternity services, Yardimeli Specialist Hospital established a hospital-sponsored programme providing free antenatal, intrapartum, and postnatal care, complemented by structured home-based follow-up delivered by trained midwives. As the programme was implemented as part of routine clinical services rather than as a research intervention, routinely collected programme data provide an opportunity to describe maternal and neonatal outcomes under real-world conditions.

Accordingly, this study aimed to describe maternal and neonatal outcomes among women enrolled in the hospital-sponsored Free Maternal Care Programme with structured home-based midwife support at Yardimeli Specialist Hospital, Somalia, between January 2023 and January 2025. The study was designed to characterise outcomes observed during routine programme implementation and was not intended to assess programme effectiveness or establish causal relationships.

2. Methods

2.1. Study Design and Setting

A retrospective observational study was conducted at Yardimeli Specialist Hospital, Somalia, using routinely collected maternal care records from January 2023 to January 2025. The objective was to describe maternal and neonatal outcomes among women enrolled in a hospital-sponsored free maternal care service that integrated facility-based maternity care with structured home-based follow-up by trained midwives. No interventions were introduced by the investigators, and the study did not include a comparison group.

2.2. Description of the Maternal Care Programme

The hospital-sponsored free maternal care programme was established to improve access to comprehensive maternity services for economically disadvantaged women

who might otherwise experience financial barriers to care. The programme covered free antenatal consultations, routine laboratory investigations, obstetric ultrasonography, skilled birth attendance, emergency obstetric services as necessary, postnatal follow up, and assessment of the newborn.

Trained midwives provided structured home visits as part of the programme during pregnancy and the early postnatal period in addition to facility-based care. Documentation of home-based follow-up was available for 183 of the 201 enrolled women. The number and frequency of home visits were based on the clinical practice of the home-visiting team and individual patient needs rather than a predetermined research protocol; however, the general content of the visits consisted of evaluation of the mother and baby's health, review of health education, monitoring adherence to treatment, detection of signs and symptoms, encouragement to attend scheduled prenatal visits, and referral to hospital when complications or concerns were identified.

2.3. Study Population

During the study period, 201 women were enrolled in the hospital-sponsored Free Maternal Care Programme. Of these, 184 women were included in the final analytical cohort, while 17 were excluded because available records did not provide sufficient outcome follow-up information to determine maternal and pregnancy outcomes.

For this study, complete follow-up was defined as the availability of sufficient hospital or programme records to establish the pregnancy outcome and maternal vital status within the period covered by the available programme records. Women for whom these outcomes could not be reliably determined from the available records were classified as having incomplete follow-up and were excluded from the outcome analysis.

The available retrospective records did not allow the specific reason for unavailable follow-up to be reliably determined for each of the 17 excluded women. Therefore, these participants were not classified as withdrawn, lost to follow-up, or non-responsive.

Baseline characteristics were available for the 201 women enrolled in the programme and were therefore considered for the overall enrolled cohort. However, a formal comparison of baseline characteristics between women included in the final analytical cohort and those excluded because of unavailable follow-up data was not feasible because the records of the excluded women were insufficient to support a reliable comparison.

2.4. Eligibility Criteria

Women had to be registered on the hospital's free maternal care programme, be assessed by hospital's routine social welfare assessment process as being economically disadvantaged, and have complete baseline antenatal and delivery records for analysis. Admission to the programme was based on the hospital social welfare

department's usual institutional admission criteria, which included financial need and lack of funds for maternity services. This assessment was part of the regular service delivery and socioeconomic information was not collected consistently and documented in the programme database in detail.

Women for whom sufficient outcome follow-up information was unavailable in the hospital or programme records were not included in the final outcome analysis.

2.5. Sample Size

A formal sample size calculation was not performed because the study included all women enrolled in the hospital-sponsored free maternity care programme during the study period. A total of 201 women were enrolled, of whom 17 were excluded because adequate outcome follow-up data were unavailable. The remaining 184 women constituted the final analytical cohort for maternal and pregnancy outcome analyses.

2.6. Analytical Units

The unit of analysis for maternal characteristics and maternal outcomes was the individual woman. Pregnancy outcomes were analyzed at the pregnancy-outcome level, delivery characteristics at the delivery-event level, and neonatal outcomes at the live-born infant level.

Two women in the final analytical cohort had twin pregnancies. Each twin pregnancy represented one pregnancy outcome but produced two live-born infants. Thus, pregnancy outcomes were analyzed at the pregnancy level, while neonatal outcomes were analyzed at the infant level. The two twin pregnancies accounted for four live-born infants among the 170 live-birth pregnancies, resulting in 172 live-born infants.

Accordingly, the number of women, pregnancy outcomes, delivery events, and live-born infants differed because they represented different analytical units rather than because twin pregnancies created additional pregnancy outcomes. Two twin pregnancies produced four live-born infants.

2.7. Data Collection

Data were collected using a standardized data extraction form, electronic medical records, and maternal care registers. Information on demographic characteristics, antenatal care attendance, obstetric history, delivery characteristics, maternal outcomes, and neonatal outcomes was extracted.

Data were collected by trained members of the research team under the supervision of the principal investigator. Completed data extraction forms were reviewed for completeness and cross-checked against the original medical records to ensure accuracy and consistency. The dataset was further reviewed for duplicate records, missing data, and inconsistencies before analysis. Variables with missing observations were analyzed using available-case analysis without data im-

putation.

During data validation, duplicate records, recurring pregnancies and multiple gestations were checked to make sure that discrepancies between women, pregnancy outcome, delivery and infant counts were not as a result of duplication of data entry.

For live-born infants, neonatal survival status was determined using available hospital records and documented programme follow-up records, including records from home-based midwife visits. For births occurring outside Yardimeli Specialist Hospital, subsequent programme follow-up records were used to determine survival status when available. When no documentation was available to establish survival status, the outcome was classified as unavailable and excluded from the analysis.

2.8. Operational Definitions

The following operational definitions were applied throughout the study:

Maternal death: Death of a woman during pregnancy or after the outcome of pregnancy, as documented in the available hospital medical records and programme follow-up records. Because the available records did not contain sufficient information to determine the exact interval between the end of pregnancy and death, the timing of maternal death relative to the pregnancy outcome could not be established retrospectively.

Neonatal death: Death of a live-born infant documented in the available hospital or programme records during neonatal follow-up. Neonatal survival status was determined using hospital records and documented programme follow-up, including home-based midwife follow-up. The available records did not indicate a standardized duration of post-discharge follow-up for all live-born infants.

Live birth: Delivery of an infant showing evidence of life at birth.

Abortion: Termination of pregnancy before the fetal-viability threshold documented in the hospital records. The available retrospective data did not contain sufficient information to confirm that a single gestational-age threshold had been applied consistently to all seven recorded abortions.

The available programme data were also insufficient to reliably classify the seven recorded abortions as spontaneous or induced. Therefore, abortion type was considered **indeterminate** when the corresponding clinical information was not explicitly documented in the available maternal records.

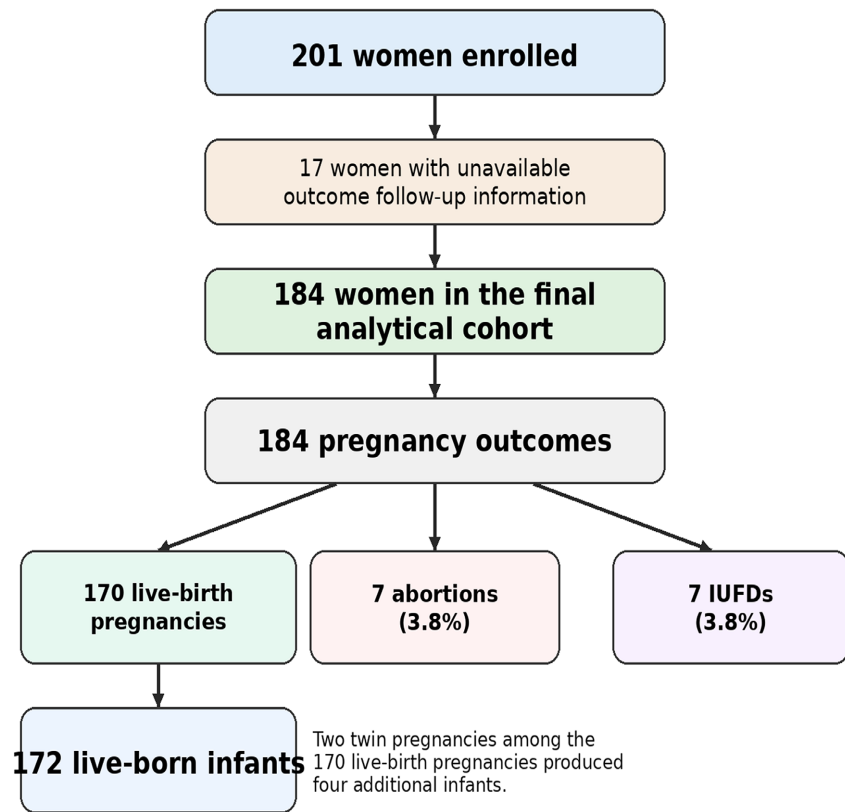
Intrauterine fetal death (IUFD): Pre-delivery fetal death, which is reported and proved in the hospital obstetric records.

Low birth weight: Birth weight below 2500 g.

Hospital delivery: Delivery that occurred within Yardimeli Specialist Hospital.

Outside-hospital delivery: Delivery that occurred outside the hospital but was

subsequently reported during programme follow-up (**Figure 1**).



IUFD = intrauterine fetal death; APGAR = Appearance, Pulse, Grimace, Activity, and Respiration.

Abbreviation: APGAR = Appearance, Pulse, Grimace, Activity, and Respiration score.

Figure 1. Flow diagram of study participants (STROBE-compliant).

A total of 201 women were enrolled in the hospital-sponsored free maternity care programme. Outcome follow-up information was unavailable for 17 women; therefore, 184 women were included in the final analytical cohort. The 184 women contributed 184 pregnancy outcomes, comprising 170 live-birth pregnancies, seven abortions, and seven intrauterine fetal deaths. Two twin pregnancies among the live-birth pregnancies produced four additional infants, resulting in 172 live-born infants.

2.9. Statistical Analysis

Microsoft Excel was used for data management and statistical analysis (Microsoft Corporation, Redmond, WA, USA). Categorical variables were summarized using frequencies and percentages. As this was a descriptive study, no inferential statistical analyses were performed.

The unit of analysis varied according to the outcome of interest: women for maternal characteristics and maternal outcomes, pregnancies for pregnancy outcomes, delivery events for delivery characteristics, and live-born infants for neo-

natal outcomes. Percentages were calculated using the appropriate denominator for each variable. Available-case analysis was used to handle missing observations, with no data imputation performed.

2.10. Ethical Considerations

Ethical approval for this study was obtained from the Somali National Research Ethics Board (SNREB), National Institute of Health (NIH), Somalia (Approval No. NIH/SNREB/023/JUNE/2026; approved on 14 June 2026). The requirement for individual informed consent was waived because the study used anonymised retrospective data.

3. Results

3.1. Study Population

The hospital-sponsored Free Maternal Care Programme enrolled 201 women between January 2023 and January 2025. Outcome follow-up information was unavailable for 17 women, resulting in a final analytical cohort of 184 women. These 17 women were excluded because the available records were insufficient to reliably determine pregnancy outcomes and maternal vital status.

Baseline characteristics were described for all 201 enrolled women, while maternal and pregnancy outcomes were analyzed among the 184 women with sufficient outcome follow-up information.

3.2. Maternal and Pregnancy Outcomes

Among the 184 women in the final analytical cohort, 184 pregnancy outcomes were recorded. These comprised 170 live-birth pregnancies, seven abortions, and seven intrauterine fetal deaths. Two of the live-birth pregnancies were twin pregnancies, resulting in 172 live-born infants for neonatal analyses.

One maternal death was recorded among the 184 women (1/184; 0.5%), while 183 women were documented as alive at the end of the available follow-up period. The available records did not contain sufficient information to determine the precise interval between the pregnancy outcome and the maternal death.

3.3. Delivery Outcomes

A total of 177 delivery events were documented. These comprised delivery events associated with the 170 live-birth pregnancies and the seven pregnancies complicated by intrauterine fetal death (IUFD). Of these 177 delivery events, 165 (93.2%) occurred at Yardimeli Specialist Hospital and 12 (6.8%) occurred outside the hospital. Delivery characteristics were analyzed at the delivery-event level; therefore, the denominator for delivery location and mode of delivery was the number of documented delivery events rather than the number of individual women or pregnancy outcomes. Among the 165 hospital delivery events, 117 (70.9%) were recorded as normal vaginal deliveries, 10 (6.1%) as inductions of labour, and 38

(23.0%) as caesarean sections.

3.4. Neonatal Outcomes

Among the 172 live-born infants, four neonatal deaths were recorded (4/172; 2.3%), while 168 (168/172; 97.7%) were documented as surviving during the available neonatal follow-up period. Low birth weight (<2500 g) was recorded in 20 of the 172 live-born infants (20/172; 11.6%).

The neonatal denominator was based on live-born infants because neonatal outcomes were evaluated at the infant level. Two twin pregnancies contributed four live-born infants; therefore, 170 live-birth pregnancies resulted in 172 live-born infants.

Five-minute APGAR scores were available for 160 of the 172 live-born infants (160/172; 93.0%). Among those with documented scores, 152 (152/160; 95.0%) had a score ≥ 7 , while eight (8/160; 5.0%) had a score <7. Twelve live-born infants (12/172; 7.0%) had no documented five-minute APGAR score.

3.5. Missing Data

Missing observations were also present for selected maternal and antenatal variables. Among the 201 women enrolled in the programme, records of fourth antenatal-visit HIV, hepatitis B virus (HBV), and hepatitis C virus (HCV) screening were available for 176 (87.6%), 174 (86.6%), and 173 (86.1%) women, respectively. Five-minute APGAR scores were available for 160 of the 172 live-born infants (93.0%), while 12 (7.0%) had no documented score.

Variables with incomplete observations were analyzed using available-case analysis without imputation. Percentages were calculated using the number of available observations for each variable as the denominator, with the denominator explicitly reported when it differed from the primary analytical cohort.

3.6. Summary of Major Findings

Overall, among the 184 women in the final analytical cohort, 170 of 184 pregnancy outcomes (92.4%) resulted in live births. One maternal death (0.5%) and four neonatal deaths among 172 live-born infants (2.3%) were recorded during the available follow-up period. Most documented delivery events occurred at the hospital (93.2%). Among hospital delivery events, 70.9% were recorded as normal vaginal deliveries, 6.1% as inductions of labour, and 23.0% as caesarean sections. Among infants with recorded five-minute APGAR scores, most had scores of 7 or higher ([Table 1\(A\)](#), [Table 1\(B\)](#) and [Table 2](#)).

Baseline programme participation is presented for all enrolled women ($n = 201$), pregnancy and maternal outcomes were analyzed among women with complete outcome follow-up ($n = 184$), delivery location was analyzed using all documented delivery events ($n = 177$), mode of delivery was analyzed using hospital delivery events ($n = 165$), and neonatal outcomes were analyzed among live-born infants ($n = 172$) ([Table 3](#)).

Table 1. (A) Antenatal care and screening coverage (n = 201); (B) Maternal sociodemographic and obstetric characteristics (n = 201).

(A)			
Indicator	n	%	
Received baseline antenatal assessment	201	100	
Blood grouping completed	201	100	
Blood glucose screening completed	201	100	
VDRL screening completed	201	100	
Urinalysis performed at enrollment	201	100	
Baseline obstetric ultrasound completed	201	100	
Weight, BP, pulse, temperature recorded	201	100	
Tetanus toxoid vaccination documented	201	100	
Follow-up ultrasound completed	201	100	
Follow-up CBC completed	201	100	
Fourth antenatal assessment completed	201	100	
HIV screening completed (4th visit)	176	87.6	
HBV screening completed (4th visit)	174	86.6	
HCV screening completed (4th visit)	173	86.1	
Anti-D immunoglobulin administered (clinically indicated cases)**	18	100.0% of clinically indicated cases (n = 18)	
(B)			
Variable	Category	n	%
Maternal age (years)	<20	34	16.9
	20 - 29	112	55.7
	30 - 39	47	23.4
	≥40	8	4
Gravidity	Primigravida	61	30.3
	Multigravida	140	69.7
	Nulliparous	58	28.9
Parity	Para 1 - 4	123	61.2
	Para ≥5	20	9.9
History of abortion	Yes	38	18.9
	No	163	81.1
History of IUFD	Yes	11	5.5
	No	190	94.5

Continued

Maternal education	No formal education	87	43.3
	Primary	74	36.8
	Secondary or higher	40	19.9
Paternal education	No formal education	72	35.8
	Primary	81	40.3
	Secondary or higher	48	23.9
Antenatal care attendance	≥4 visits	156	77.6
	<4 visits	45	22.4
Home midwife follow-up status	Yes	183	91.0
	No/incomplete	18	9.0

(A): *Anti-D immunoglobulin was administered to all 18 women for whom it was clinically indicated. The percentage is calculated among clinically indicated cases and not among all 201 enrolled women. **Anti-D immunoglobulin was administered only to Rh-negative women for whom it was clinically indicated, not to all Rh-negative women in the cohort; the percentage shown is therefore calculated among clinically indicated cases (n = 18) rather than against the full study population denominator. (B): #Percentages are based on the 201 enrolled women. Variable-specific denominators are used where records were incomplete.

Table 2. Maternal, pregnancy, and delivery outcomes according to the relevant analytical unit.

Variable	Category	n	%
Enrolled women	Total	201	100
	Outcome follow-up unavailable	17	8.5
Follow-up status	Included in final analytical cohort	184	91.5
	Abortion	7	3.8
Pregnancy outcomes	IUFD	7	3.8
	Live birth	170	92.4
Maternal outcomes	Maternal death	1	0.5
	Maternal survival	183	99.5
Delivery location	Hospital delivery events	165	93.2
	Outside-hospital delivery events	12	6.8

*The unit of analysis of maternal outcomes was women, delivery characteristics at the delivery-event level, pregnancy outcomes at the pregnancy-outcome level, and neonatal outcomes at the live-born infant level. Two twin pregnancies produced four live-born infants. Percentages were calculated using the appropriate denominator for each outcome.

Table 3. Neonatal outcomes among live births (n = 172).

Variable	Category	n	%
Live-born infants	Total	172	100
	Survived during available neonatal follow-up	168	97.7
Neonatal vital status	Neonatal death	4	2.3

Continued

Birth weight	≥2500 g	152	88.4
	<2500 g	20	11.6
APGAR at 5 min	≥7	152	95.0*
	<7	8	5.0*
	Missing	12	7.0 [†]

*APGAR percentages were calculated among the 160 live-born infants with recorded five-minute APGAR scores. The infant level was the level at which neonatal outcomes were measured. Two twin pregnancies provided four live-born infants among the 172 live-born infants analyzed. [†]Missing APGAR percentage was calculated against all 172 live-born infants.

4. Discussion

This retrospective observational study provides descriptive evidence on maternal, pregnancy, delivery, and neonatal outcomes among women enrolled in a hospital-sponsored free maternity care programme with home-based midwife support in Somalia. The findings demonstrate that the programme was implemented within routine clinical practice and was associated with documented maternal and neonatal outcomes, including both favorable and adverse events. However, these findings cannot establish programme effectiveness or causality because of the retrospective design, incomplete follow-up, missing data, variable neonatal follow-up duration, and absence of a comparison group.

4.1. Comparison with Previous Literature

Overall, the maternal and neonatal outcomes observed in this study compare favourably with previously published data from Somalia and other fragile healthcare settings, although such comparisons must be interpreted cautiously given differences in study populations, case-mix, and outcome definitions. The maternal mortality observed here (0.5%) is markedly lower than the severe maternal outcome and near-miss rates reported by Egal *et al.* among women presenting to a national referral hospital in Somaliland [3], and by Kiruja in a comparable low-resource referral setting [21]; because both comparator studies enrolled women already presenting with obstetric complications, however, the lower rate observed here may reflect differences in case-mix and cohort selection at least as much as it reflects any effect of continuous, programme-based antenatal and postnatal follow-up. Similarly, the neonatal mortality observed in this study (2.3%) is lower than rates reported among hospital-born infants in Mogadishu by Ali *et al.*, who identified incomplete antenatal care and delayed care-seeking as key contributors to neonatal death [17]; the structured home-based midwifery component of the present programme was specifically designed to address both factors, although, again, the absence of a comparison group means this cannot be confirmed as the explanation. Consistent with Mohamed *et al.*, who reported low completion of the maternal care continuum among Somali women nationally [16], our results suggest that a structured, hospital-sponsored model actively linking facility care with

home-based follow-up may have facilitated more complete engagement with antenatal, intrapartum, and postnatal services than is typically achieved in routine national-level care, though the two studies used different populations and data sources and are not directly comparable. Findings from Kenya's free maternity policy evaluations provide a relevant, though imperfect, comparator: while Oyugi *et al.* [18] and Kovacs [19] found that removing user fees increased facility-based delivery without a clear corresponding reduction in mortality, the additional home-based midwifery component in the present programme may represent one plausible mechanism through which free care could translate more directly into improved outcomes; this remains speculative, however, in the absence of a comparison group, and should be tested directly in future comparative research rather than assumed from the pattern observed here. Direct comparison across studies should be approached with caution because differences in study populations, healthcare systems, programme characteristics, outcome definitions, and follow-up periods may influence reported results.

Within Somalia and other fragile healthcare settings, published evidence has focused largely on maternal mortality, healthcare utilisation, and barriers to accessing maternity services [3]-[5] [16] [17] [21], with comparatively little information available on maternal and neonatal outcomes among women receiving integrated maternity care under routine clinical conditions. Consistent with the broader evidence gap identified by Tuti *et al.* regarding the quality of routinely collected neonatal data in fragile settings [22], this scarcity most plausibly reflects limitations in routine data quality and programme coverage rather than an absence of clinical need, although we cannot rule out that comparable programmes exist but remain unpublished or unevaluated. The present study therefore adds descriptive evidence from a real-world hospital programme and contributes to the limited literature available from this setting.

4.2. Interpretation of Findings

The observed maternal and neonatal outcomes occurred within a programme that integrated free facility-based maternity care with home-based midwife follow-up. The programme was designed to reduce financial barriers to maternity care while strengthening antenatal and postnatal follow-up, health education, early identification of potential complications, and referral when concerns arose. These programme components provide important contextual information for interpreting the observed outcomes; however, they cannot be considered causal explanations in this retrospective descriptive study. The absence of a comparison group, incomplete follow-up, and missing observations preclude attributing the observed maternal or neonatal outcomes to the programme or to any specific programme component.

4.3. Public Health Implications

The findings provide descriptive information on maternal healthcare delivery

within a routine hospital programme serving economically disadvantaged women in a fragile health system. Such evidence may assist clinicians, hospital administrators, and policymakers in understanding patterns of maternal and neonatal outcomes while informing future service planning and evaluation. Well-designed prospective studies with appropriate comparison groups are required to determine whether integrated maternal care programmes incorporating home-based midwife support improve maternal and neonatal health outcomes.

4.4. Strengths and Limitations

This study has several limitations. First, its retrospective observational design and absence of a comparison group preclude causal inference and prevent direct assessment of programme effectiveness. Second, selection bias cannot be excluded because 17 of the 201 enrolled women had insufficient outcome follow-up information and were therefore excluded from the final outcome analysis. Third, the available records did not permit a reliable comparison of baseline characteristics between women included in the final analysis and those excluded because of unavailable follow-up data.

Fourth, different units of analysis were required for different outcomes: 184 women, 184 pregnancy outcomes, 177 delivery events, and 172 live-born infants. Two twin pregnancies produced four live-born infants, explaining the difference between pregnancy-level and infant-level counts. Fifth, several variables, including HIV, HBV, HCV screening and five-minute APGAR scores, had missing observations. Although available-case analysis was used without imputation, systematic differences between observations with and without recorded data may have introduced bias. Sixth, the duration of post-discharge neonatal follow-up was not standardized across all live-born infants, limiting interpretation of neonatal survival outcomes. Finally, the relatively small sample size limits the precision of estimates, particularly for rare maternal and neonatal outcomes.

Despite these limitations, the study has important strengths. It provides real-world descriptive data from a hospital-sponsored free maternity care programme in Somalia, an area where evidence on integrated facility-based and home-based maternity care models remains limited. The study also reports maternal, pregnancy, delivery, and neonatal outcomes using clearly specified analytical units and transparently addresses missing data and follow-up limitations.

5. Conclusions

This retrospective descriptive study provides preliminary evidence on maternal, pregnancy, delivery, and neonatal outcomes among women enrolled in a hospital-sponsored free maternity care programme with home-based midwife support in Somalia. Among the 184 women with sufficient outcome follow-up, 184 pregnancy outcomes were documented, comprising 170 live-birth pregnancies, seven abortions, and seven intrauterine fetal deaths. Two twin pregnancies among the live-birth pregnancies produced 172 live-born infants. One maternal death was

recorded, and four neonatal deaths occurred among the 172 live-born infants during the available neonatal follow-up period. Most documented delivery events occurred at the hospital, and most live-born infants with available five-minute APGAR scores had scores ≥ 7 .

These findings describe outcomes observed during routine programme implementation and should not be interpreted as evidence that the programme improved maternal or neonatal outcomes, given the retrospective design, incomplete follow-up, missing data, variable neonatal follow-up duration, and absence of a comparison group. Future prospective studies with standardized follow-up, clearly defined analytical units, complete outcome ascertainment, and appropriate comparison groups are needed to evaluate the effectiveness of integrated free maternity care and home-based midwife support in Somalia.

Ethics Approval and Consent to Participate

This study was conducted in accordance with the principles of the Declaration of Helsinki. Ethical approval was obtained from the Somali National Research Ethics Board (SNREB), National Institute of Health (NIH), Somalia (Approval No. NIH/SNREB/023/JUNE/2026; approved on 14 June 2026). The requirement for individual informed consent was waived due to the use of anonymised retrospective data. All data were handled confidentially in accordance with ethical standards.

Availability of Data and Materials

The datasets analyzed during the current study are not publicly available because they contain patient-level information and are subject to confidentiality and institutional data-protection requirements. De-identified data may be made available from the corresponding author upon reasonable request, subject to institutional approval and applicable ethical and confidentiality requirements.

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Author Contributions

All authors contributed to the conceptualization, methodology, data collection,

validation, analysis, interpretation of findings, and preparation of the manuscript. All authors contributed to reviewing and editing the manuscript, approved the final version, and agreed to be accountable for all aspects of the work.

Conflicts of Interest

All authors are professionally affiliated with Yardimeli Specialist Hospital, which established and funded the Free Maternal Care Programme evaluated in this study. This institutional relationship represents a potential non-financial competing interest and is disclosed for transparency. Yardimeli Specialist Hospital provided access to the hospital and programme records used for this retrospective study. Based on the available study records, there is no documented evidence that hospital management had an independent role in the statistical analysis or interpretation of the findings. The available records do not separately document the role of hospital management in the decision to submit the manuscript for publication. None of the authors received personal financial compensation from the Free Maternal Care Programme or for the preparation of this manuscript.

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