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Impact of Universal Health Coverage on In-Hospital Maternal and Neonatal Mortality at the CHU Renaissance, Kinshasa: A Comparative Before-After Study and Referral Path Analysis

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ABSTRACT

Background: *Universal Health Coverage (UHC) initiatives were implemented in the Democratic Republic of the Congo (DRC) to eliminate financial barriers to essential maternal care. This study evaluates the impact of free maternal and neonatal healthcare on institutional mortality at the CHU Renaissance (Kinshasa) and identifies critical risk factors associated with adverse outcomes among emergency transfers.*

Methods: *A quasi-experimental, comparative before-after design (2021 vs. 2024) was conducted to measure system-wide clinical impacts. Additionally, a retrospective analytical cohort of 184 emergency referrals transferred in 2024 was examined using multivariable logistic regression to identify independent predictors ofmaternal mortality.*

Results: *Following UHC implementation, total annual deliveries increased more than threefold, rising from 1 ,105 in 2021 to 3,578 in 2024 (+223.8%). Concurrently, institutional maternal case fatality fell by 50% (3.80% to 1 .90%, $p < 0.001$), as did early neonatal mortality (4.25% to 2.12%, $p < 0.001$). Among emergency transfers, independent determinants of maternal mortality included admission in shock (aOR = 5.42, 95% CI: [2.31 –12.70], $p < 0.001$), unmet blood transfusion requirements (aOR = 4.12, 95% CI: [1 .89–8.98], $p < 0.001$), referral delays exceeding 4 hours (aOR = 3.85, 95% CI: [1 .72–8.61], $p = 0.001$), and lack ofa standardized transfer document (aOR = 2.18, 95% CI: [1 .05–4.52], $p = 0.036$).*

Conclusion: *Eliminating point-of-care user fees drastically expanded facility access and reduced in-hospital mortality. However, optimizing clinical outcomes requires urgent structural investments in emergency referral dispatching systems, specialized transport, and blood bank availability.*

+223.8%	-50.0%	-50.1 %
DELIVERY VOLUME	MATERNAL CASE FATALITY	EARLY NEONATAL MORTALITY

Keywords
Universal Health Coverage (UHC), Maternal healthcare, Neonatal mortality, Maternal mortality, Free maternal healthcare.

Introduction
Reducing maternal and neonatal mortality remains a pressing global public health imperative, particularly across Sub-Saharan Africa where structural barriers impair care delivery [1,2]. In the Democratic Republic of the Congo (DRC), maternal mortality rates have historically remained high due to direct out-of-pocket healthcare payments, which act as a major structural barrier causing delayed care-seeking and financial catastrophe [3,4].

To address these systemic inequities, the DRC Government initiated a progressive rollout of Universal Health Coverage (UHC). In the province of Kinshasa, this program established free access to essential childbirth and basic neonatal healthcare services [5]. The intervention aims to guarantee unhindered access to Emergency Obstetric and Newborn Care (EmONC) and mitigate severe maternal morbidity [5,6].

While fee-waiver policies typically boost facility utilization, evaluating their net effect on tertiary hospital mortality rates and emergency transfer pathways is essential. This study assesses the institutional impact of UHC implementation at the CHU Renaissance (Kinshasa) by comparing clinical outcomes before and after policy rollout, and analyzing independent predictors of mortality among acute emergency referrals.

Methods
This quasi-experimental, comparative before-after study was conducted within the Departments of Obstetrics & Gynecology and Pediatrics at the CHU Renaissance in Kinshasa, DRC. The study integrated two methodological arms:

Historical Comparative Analysis (2021 vs. 2024)
Aggregate hospital data from the pre-UHC baseline period (2021) were compared with post-UHC operational data (2024) to quantify changes in total delivery volume, maternal case fatality rates, and early neonatal mortality rates [5].

Cross-Sectional Referral Analysis (2024)
A retrospective analytical cohort comprising 184 consecutive maternal patients referred in emergency from peripheral healthcare facilities was analyzed to evaluate transfer dynamics and clinical outcomes.

Statistical Analysis
Categorical outcomes were evaluated using Pearson's chi-squared test. To identify independent predictors of maternal mortality among emergency referrals, multivariable logistic regression modeling was conducted. Adjusted Odds Ratios (aOR) and 95% Confidence Intervals (95% CI) were calculated, with statistical significance set at $p < 0.05$.

Results
Hospital Admissions and In-Hospital Case Fatality
The introduction of free maternal care led to a more than threefold increase in total deliveries managed at the facility (+223.8%), alongside a statistically significant 50% reduction in maternal and early neonatal case fatality rates (Table 1).

Etiological Profile of Maternal Deaths
Despite the overall reduction in mortality rates, obstetric hemorrhage and hypertensive disorders remained the primary direct causes ofmaternal death across both periods (Table 2).

Table 2: Etiological distribution of maternal mortality causes (ICD-10/ WHO) (2021 vs. 2024).

Cause of Death (ICD-10 / WHO)	2021 (N = 42)	2024 (N = 68)	*p*-value
Obstetric Hemorrhage (PPH, Abruptio Placentae)	16 (38.1%)	33 (48.5%)	0.287
Eclampsia / Severe Pre-eclampsia	12 (28.6%)	17 (25.0%)	0.678
Uterine Rupture	4 (9.5%)	9 (13.2%)	0.562
Sepsis / Puerperal Infection	7 (16.7%)	6 (8.8%)	0.214
Indirect Causes (Severe Anemia, Malaria)	3 (7.1%)	3 (4.4%)	0.548

Determinants of Mortality among Transferred Emergency Patients (2024, N = 1 84)
In 2024, informal transport (motorcycles or private taxis) accounted for 77.2% of patient referrals. Multivariable logistic regression identified several critical independent risk factors

Table 1: Comparison of hospital delivery volumes and case fatality rates before (2021) and after (2024) UHC rollout.

Hospital Indicator	Pre-UHC (2021)	Post-UHC (2024)	Absolute Change / Stat. Significance
Total Deliveries Managed	1,105	3,578	+223.8% increase
Institutional Maternal Case Fatality	3.80% (42 / 1,105)	1 .90% (68 / 3,578)	$p < 0.001$ (-50.0%)
Early Neonatal Mortality Rate	4.25% (47 / 1,105)	2.12% (76 / 3,578)	$p < 0.001$ (-50.1%)
Favorable Outcome / Discharge Rate	96.20% (1,063 / 1,105)	98.10% (3,510 / 3,578)	$p < 0.001$

Table 3: Multivariable logistic regression analysis of independent predictors of maternal mortality in transferred patients (N = 184).

Adjustment Variable	Adjusted Odds Ratio (aOR)	95% Confidence Interval	*p*-value
Hypovolemic / Septic Shock at Admission	5.42	[2.31 – 12.70]	< 0.001
Unmet Blood Transfusion Requirement	4.12	[1 .89 – 8.98]	< 0.001
Transfer Delay > 4 Hours	3.85	[1 .72 – 8.61]	0.001
Absence of Standardized Referral Note	2.18	[1 .05 – 4.52]	0.036

for maternal death among referred patients (Table 3).

Discussion & Recommendations

The total removal of point-of-care financial barriers through UHC successfully mitigated Thaddeus and Maine's "First Delay" (delay in deciding to seek care), resulting in a twofold reduction in maternal mortality and early neonatal mortality [4,5]. This massive increase in demand underscores the high latent need for skilled obstetric care that was previously suppressed by user fees.

However, the persistency of high absolute mortality among emergency transfers exposes acute vulnerabilities in the second and third delays (transportation delays and facility readiness). The predominant reliance on informal transport (77.2%) and prolonged travel times (>4 hours; aOR = 3.85) highlight severe deficiencies in inter-facility coordination. Furthermore, unmet transfusion needs (aOR = 4.12) demonstrate that financial access must be supported by adequate health system infrastructure [4].

Strategic Policy Recommendations

Institutionalize MPDSR: Systematically integrate Maternal and Perinatal Death Surveillance and Response audits within all UHC-contracted facilities [1,2,7].

1. **Centralize Emergency Dispatch:** Establish a dedicated medical regulation center in Kinshasa to streamline inter-facility transfers and ambulance dispatching.
2. **Strengthen Blood Supply Chains:** Secure a permanent strategic blood reserve and rapid cross-matching capacity at tertiary referral centers, notably CHU Renaissance.

References

1. World Health Organization. Maternal and perinatal death surveillance and response materials to support implementation. Geneva World Health Organization. 2021.
2. EQUAL Research Consortium, Université Catholique de Bukavu, Johns Hopkins University. Service Delivery Point and Maternal Care Mapping Study in DRC: Policy Brief. 2023.
3. World Health Organization. UNICEF UNFPA World Bank Group United Nations Population Division. Trends in maternal mortality 2000 to 2020 estimates by WHO UNICEF UNFPA World Bank Group and UNDESA/Population Division. Geneva World Health Organization. 2023.
4. Thaddeus S, Maine D. Too far to walk maternal mortality in context. Soc Sci Med. 1994; 38: 1091-1110.
5. Mpunga Mukendi A, Chenge F, Mafuta P, et al. Progress opportunities and bottlenecks of Universal Health Coverage implementation in the Democratic Republic of Congo. Afr J Reprod Health. 2023; 27: 45-58.
6. United Nations Inter-agency Group for Child Mortality Estimation UN IGME. Levels & Trends in Child Mortality Report 2024. New York. UNICEF. 2024.
7. Bandali S, Thomas C, Hukin E, et al. Maternal and Perinatal Death Surveillance and Response in low- and middle-income countries a scoping review of implementation factors. Health Policy Plan. 2021; 36: 1147-1158.

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