BLOOD AND CELL TECHNOLOGIES

Unlocking Potential

Real-World Cost of Automated Red Blood Cell Exchange for Sickle Cell Disease in Kenya: A Cost-Reimbursement Gap Analysis From a Public Sector Perspective

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Background

- Sickle cell disease (SCD) is a high-burden condition in Kenya, particularly among children and young adults in western and coastal regions.[1]
- In response, Kenya's 2023 Social Health Insurance Act introduced the Social Health Insurance Fund (SHIF), which now reimburses automated red blood cell exchange (aRBCX) at a fixed tariff of KES 70,000 per session.[2]
- This study aimed to estimate the real-world per-procedure cost of aRBCX in Kenya's public sector and to compare it against the current SHIF reimbursement level.

Methods

- A micro-costing analysis was conducted from the public provider perspective, capturing all direct cost inputs associated with aRBCX delivery.
- Personnel costs were derived from national wage scales and time-motion estimates.[3-5]
- Capital equipment was amortised over a 10-year period.
- Consumables, venous access, packed RBCs (pRBCs), and additional solutions, including anticoagulants and calcium gluconate, were also considered.[6]
- Cost data in Kenyan shillings were gathered from hospital procurement records, national wage scales, and supplier quotes, with total costs compared to the SHIF ceiling.[7,8]

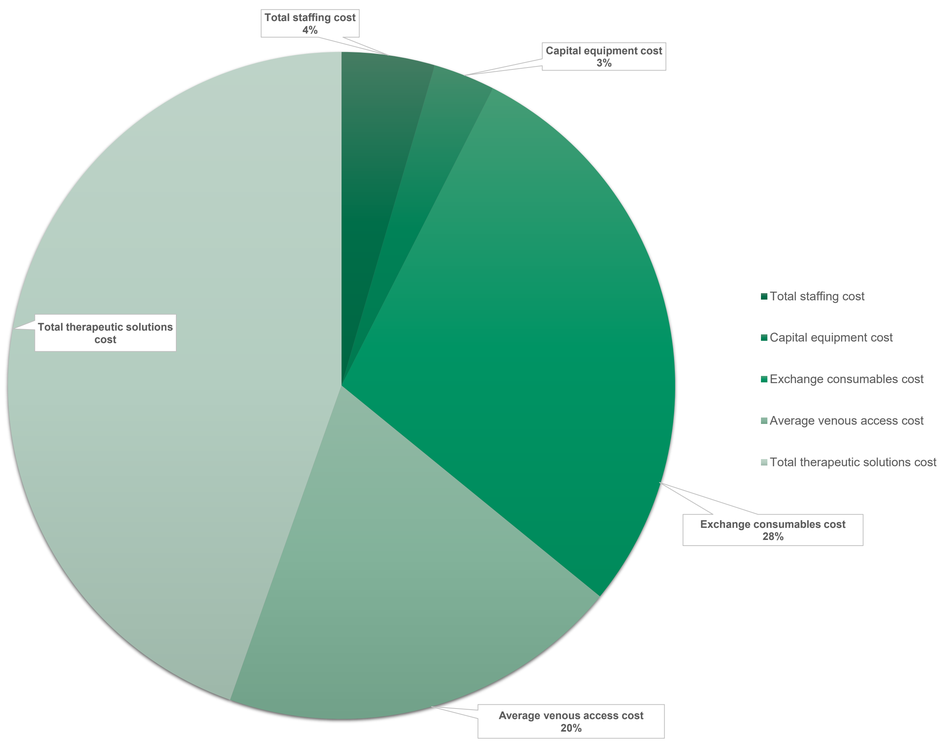

Figure 1. Cost distribution per aRBCX procedure (public sector, Kenya)

Results

- The estimated mean cost per aRBCX session ranged between **KES 130,000** and **KES 150,000**, depending on pRBC usage.
- Blood products constituted the largest cost component, ranging from **KES 54,000 to KES 72,000 (45%-51%)**, followed by consumables, estimated at **KES 36,700 (25%)**, and venous access with an average cost of **KES 25,200 (17%)**.
- Compared to the SHIF reimbursement ceiling of **KES 70,000**, the cost gap ranged from **KES 59,050** to **KES 77,050 per session**, indicating an under-reimbursement of **46% to 52%.**

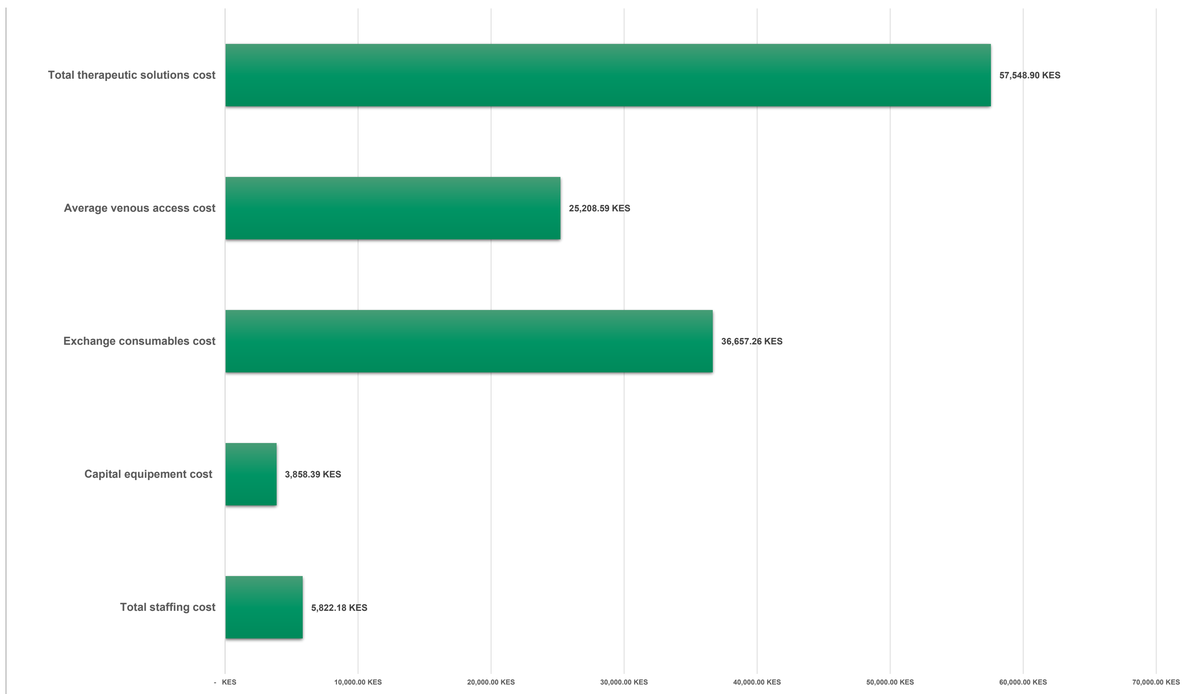

Figure 2. Component-Wise aRBCX Cost Breakdown in Kenyan Shillings

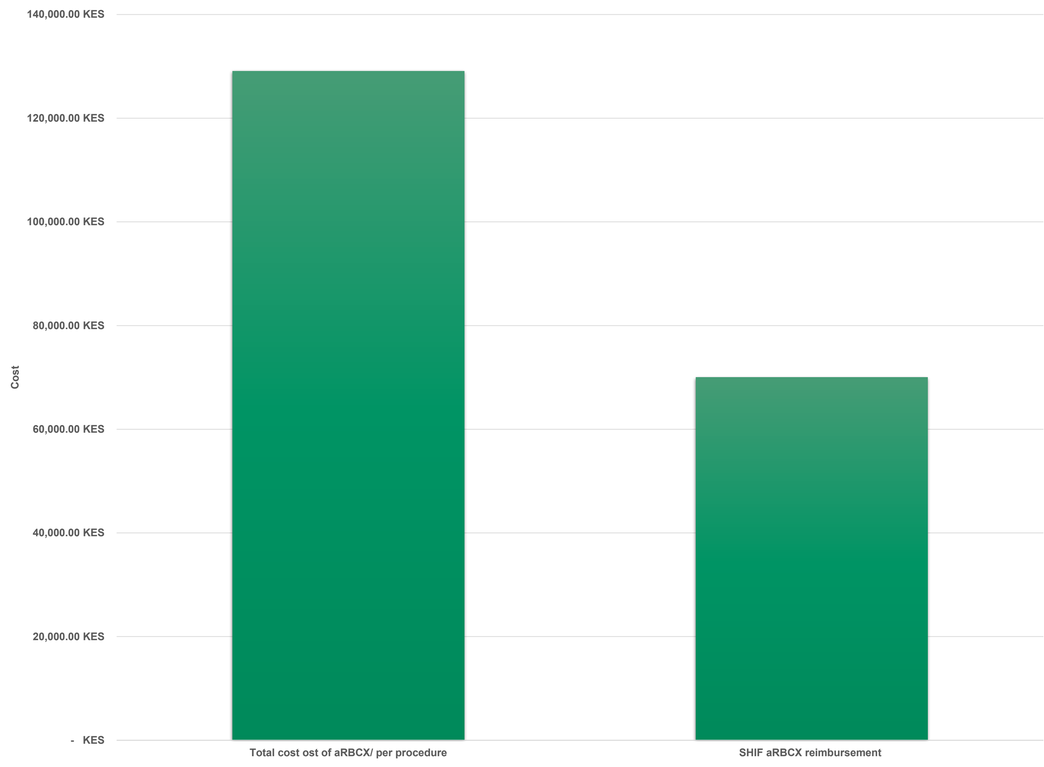

Figure 3. Actual aRBCX cost versus SHIF reimbursement tariff

Conclusion

- The analysis revealed that current SHIF reimbursement significantly underestimates the actual cost of aRBCX, posing risks to service sustainability within the public sector.
- This underscores the need for policymakers and payers to revisit the reimbursement level or identify subsidies to better align with actual costs.
- Bridging this mismatch is crucial to ensure that SCD patients can receive lifesaving treatments without financial barriers or straining hospital resources.

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