**“Improving Health Insurance Claims Integrity in Rwanda: A Study of Medical Denials, Fraud, and the Feasibility of Digital-Driven Claims Validation”**

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**Abstract**

**Background:**Rwanda’s national health insurance schemes such as Mutuelle de Santé and RSSB serve over 12 million beneficiaries. Manual claims processing, long reimbursement delays, and suspected billing fraud threaten financial sustainability and public trust. We hypothesize that an AI‑augmented, rule‑based validation engine can reduce erroneous claim submissions by ≥20%, shorten processing time by 30%, and save millions of RWF annually.

**Objectives:**

1. **Quantify the extent and types of medical claims denials and fraud in Rwanda’s public and private health insurance systems**
2. **Identify operational and technological bottlenecks in current workflows.**
3. **Design and test a prototype “ClaimGuard” audit engine using expert rule-based and machine learning.**
4. **Assess feasibility, acceptability, and projected impact of scaling a digital claims validation platform.**

**Methods:  
A mixed‑methods design will be used:**

* **Quantitative**: Retrospective analysis of anonymized claims data from seven diverse facilities.
* **Qualitative**: Semi‑structured interviews with ≈10 insurance reviewers and facility finance officers to map end‑to‑end workflows.
* **Prototype Development**: Build and simulate a claims audit engine on historical data to measure detection accuracy, time savings, and cost impact.  
  Ethical approval will be secured from RNEC; all personal identifiers will be removed and data encrypted.

**Anticipated Outcomes:**We expect the prototype to flag ≥20% of erroneous or fraudulent claims pre‑submission, accelerate reimbursements by 30%, and inform targeted policy recommendations for MoH/RSSB.

**Conclusion:**This study will deliver both a validated digital tool and evidence‑based guidance for nationwide deployment, strengthening Rwanda’s UHC goals and providing a scalable model for similar low‑resource settings**.**

**Keywords:  
Claims validation; mixed‑methods; fraud detection; digital health; Rwanda**