

Needs assessments in low resource settings and the role of biomedical engineers

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Outline

- Methodologies to identify clinical needs
- Limitations with existing medical devices and equipment
- Ranking and prioritizing clinical needs
- Case study on needs assessment in Uganda
 - Background of Study
 - Methodology
 - Results

Methodologies to identify clinical needs

- Qualitative and quantitative approaches
 - Collection of primary data most reliable –limited literature
 - Open ended questionnaires to reduce bias
 - One to one interviews
 - Observing and documenting clinicians at work uninterrupted
 - Observation of patients and documenting their experiences receiving clinical care

Limitations with existing medical devices and equipment



- ‘70% of donated medical equipment > 10yrs old, 50% either broken or functioning unsatisfactorily’ – WHO report

Ranking and prioritizing clinical needs

- Select factors to consider in the decision-making process
 - Disease burden
 - Alternatives to existing standard of care
- Assign rankings for each factor for each need using a 5-point Likert scale
- Combine values to produce a score to rank needs
- Perform additional research on smaller set of needs and repeat steps
- Engage clinicians and key stakeholders to validate choices



Importance of clinical needs assessments

- Understand the most pressing healthcare challenges
- Assess limitations of existing devices
- User centric design for ease of use
- An assessment of desired functionality

‘Design with instead of Design for’

Case Study: Needs Assessment in Uganda

- Study Objective: Establish baseline clinical and medical equipment priorities to develop needs-driven medical technologies
 - Lack of regular assessments by the Uganda National Framework and Policy Regulation for medical devices
 - unaffordable and maladapted for the complex healthcare system
 - Limited information on the status of medical equipment in Uganda and EAC

Case Study: Needs Assessment in Uganda

- Tiered healthcare system- National Referral Hospital Mulago
- 4 Regional Referral Hospitals- Mbarara, Fort Portal, Mbale, Soroti and Gulu
- 3 Health Center IV's – Bukuku, Lalogi, Amuria
- Paediatrics, Obs & Gyn, intensive care unit (ICU), emergency, surgery and laboratory departments



Case Study: Needs Assessment in Uganda

- Understand the most critical healthcare challenges
- Assess and determine limitations with existing/available device
- Establish reasons for the lack/ineffectiveness of devices

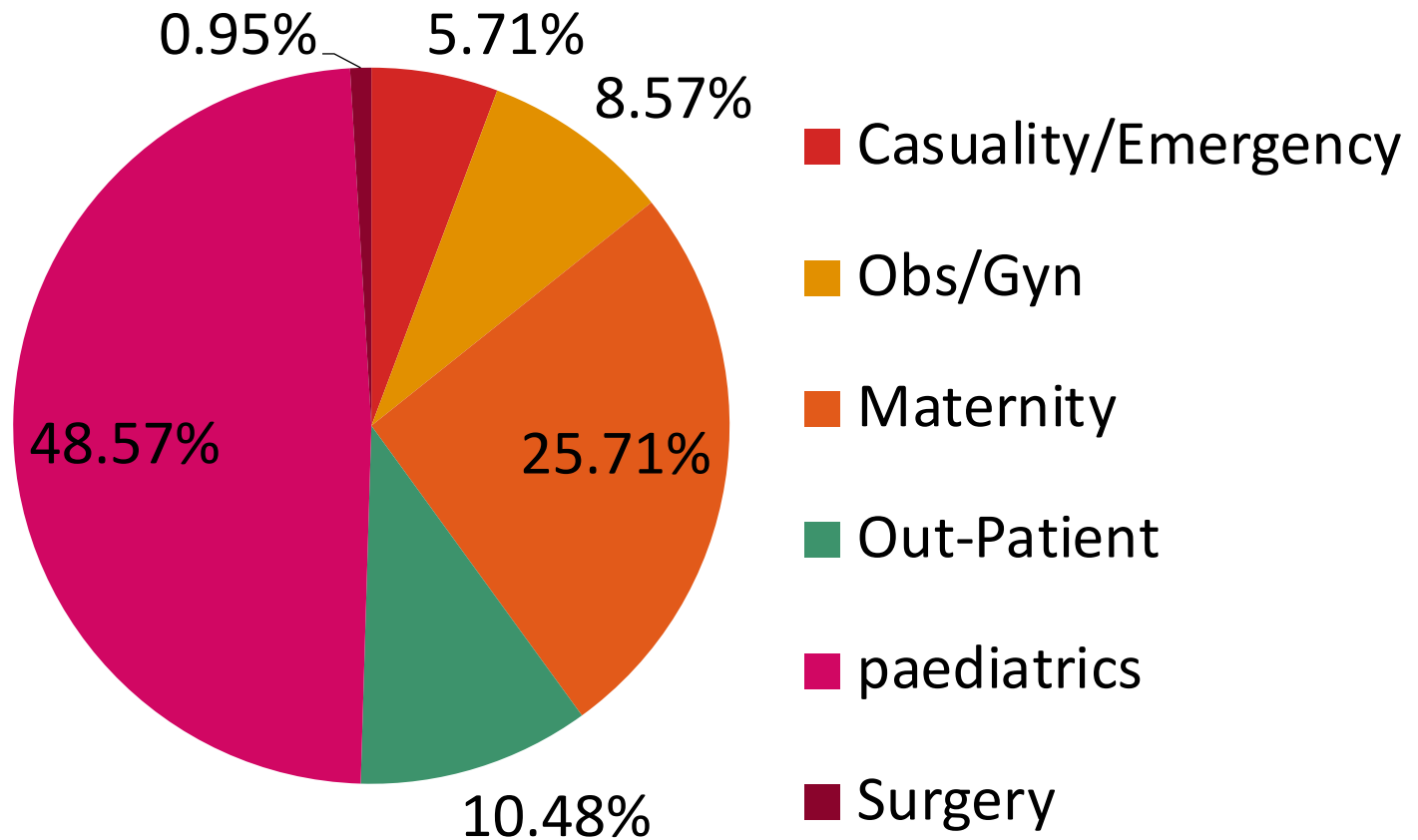


Case Study: Needs Assessment in Uganda

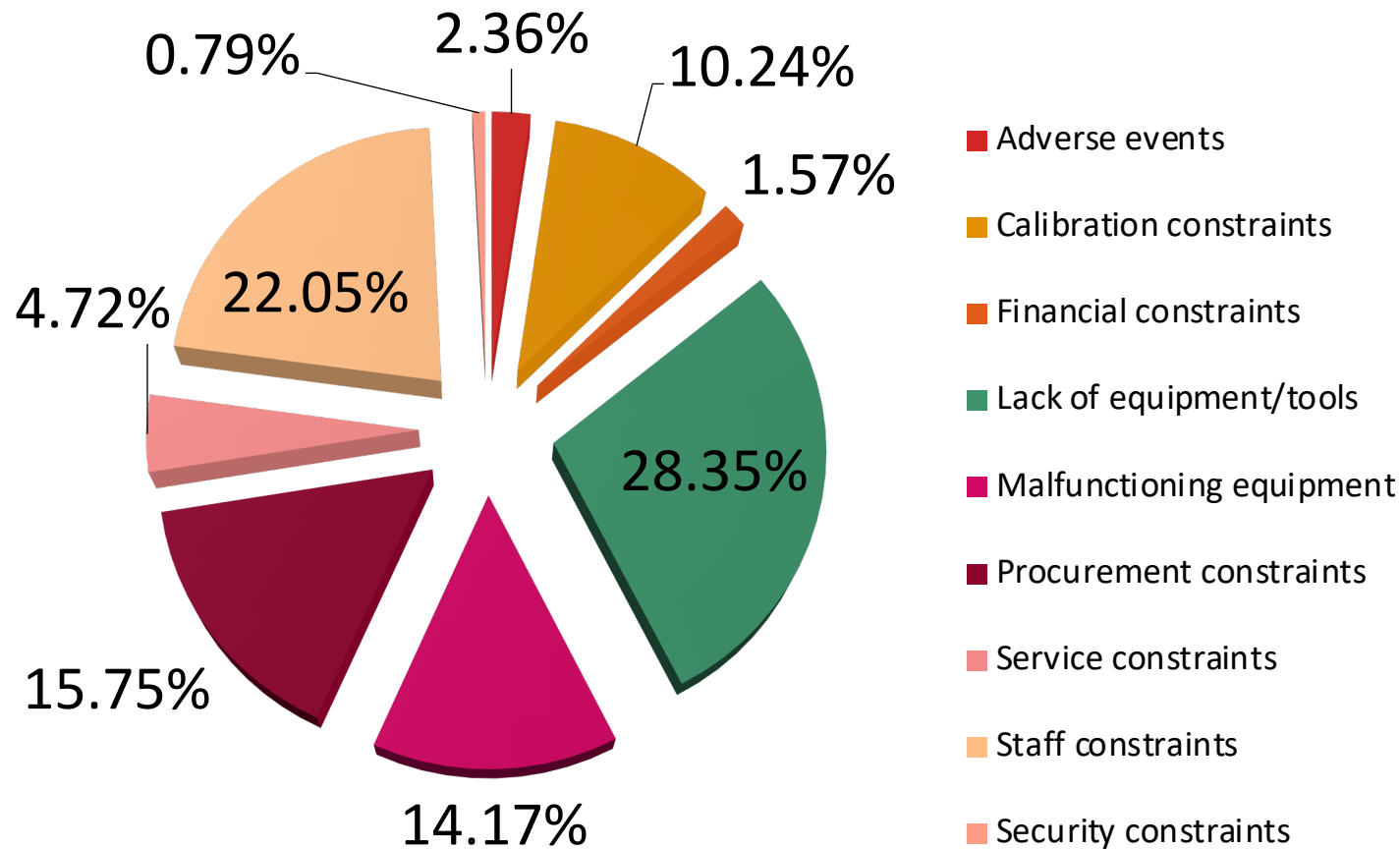
- **Method:** Interviews (direct and indirect), Observation and documentation
- **Data Collection Tools:** Questionnaires, Inventories and repositories
- **Task:** Assess standard of care, clinical needs, available devices, challenges faced with the existing devices



Case Study: Needs Assessment in Uganda-clinical results



Case Study: Needs Assessment in Uganda- medical equipment results



Case Study conclusions

- The results paint a clear picture of the clinical and medical device gaps faced in Ugandan government health facilities.
- Healthcare problems greater in Maternal and Paediatric health
 - neonatal sepsis, malaria, pneumonia, anaemia, birth asphyxia and premature births, PPH etc.
- Existing medical devices - inadequate, difficult to maintain and lack user training compromising patient safety

Role of biomedical engineers designing for global health challenges

- Resource limited settings with design constraints
- Power supply considerations - rural off grid settings
- Modularity in design key
- Supply chain considerations
- Low manufacturing cost
- Local and international collaboration

Example of a needs-driven health innovation



**Thank you for your attention,
questions?**

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