TECHNOLOGIES FOR CLINICALLY RELEVANT PHYSIOLOGICAL MEASUREMENTS IN DEVELOPING COUNTRIES

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Published 19th July 2007

World map of disease prevalence removed due to copyright restrictions.

***Presented by Sameer Hirji ***
Focus Areas

✓ **Bottlenecks** in Developing counties

✓ **Factors for successful implementation** of Health care Technologies
  - Capital cost
  - Spare parts
  - Consumables
  - Embedded Service Contracts
  - Brain Drain Syndrome
  - Myths and Misconceptions

✓ Role of **CURE (Competition for Underserved, Resources-Poor Economies)** as a blueprint for Success. “A *not-for-profit business plan competition that develops new medical devices that specifically target unique needs of people in developing countries.*”
Comparison of Bottlenecks

Statistical Data (WB 2001)

- Of 5 Billion people in LDC’s
  - 1 Bn illiterate
  - 1 Bn Lack Safe water access
  - 2.5 Bn poor sanitation

- Avr. Life Expectancy in LDC is 38 yrs compared to greater than 75 yrs in Developed Countries

- GDP per Capita spent on Health is < $100 compared to $4000 in USA and $2000 in Europe

- Increased Excellent private Clinics / Hospitals in LDC’s since 1991.

“BUT WHY IS LIFE EXPECTANCY SO LOW?”
Barriers to Health Care Technology based on EWH Survey

- **High Capital Cost** e.g. Single MRI machine can cost US$10 000 000, or about 0.5 % GDP of Sierra Leone (compared to 0.0001% of US GDP), reliable power and electricity
  - Solution: Donation of Used Machinery, Foreign Govt Funding, Govt Expend.
  - Problems??????

- **Embedded Service Contracts and Spare Parts** e.g. Need regular maintenance due to frequent use (Flow Cytometers), Lack of replacement parts (12.3%), expensive, Experts to repair, No manuals, no specialized Equipment training

- **Consumables** e.g. No potential for reuse, LDC’s have low budget ($0.30 per patient), Equipment specific items, non-functional/idle equipments, transportation costs

- **Brain drain Syndrome**: Skilled staff move to developed countries

**QUEST**: How do we tackle this issue? What measures do we need to take?
Blueprint for Success

• **Physiological Measurements**- important tool for diagnosis and treatment

• **Alternate Designs** should avoid consumables, require little specialization, no extensive infrastructure, require infrequent service

• Development Initiative by Duke-EWH CURE (One of the largest in the country)

• **WINNER** receives **$100 000** for a year of incubation in Pratt School of Eng.

• **Process Involves:**
  – Needs Assessment through on the ground market research in Developing Countries (**Customer**)
  – Non-profit business development with national panel of experts (**Business Plan**)
  – Develop **prototype** through formal design class.