Sana: Democratizing knowledge, technology and access to quality healthcare
A **lack of trained physicians** is one of the largest issues facing healthcare in the developing world.

Patients often make long journeys to clinics, only to be referred to **expensive and far away** medical centers for a diagnosis.

**Paper based medical records** further contribute to inefficiencies.
Bigger Systems Problems

• Care provision is fragmented: providers work independently
• Lack of process standardization and outcomes tracking – “ad hoc” care -> care variability
• Weak system for quality assurance and improvement
Every system is perfectly designed to achieve the results that it gets.

Donald Berwick
Quality of care is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.

Institute of Medicine
Six Worthy Aims of Healthcare

• **Safe** – as safe as in our homes
• **Effective** – matching care to science
• **Patient-centered** – respect for the individual’s values and choices
• **Timely** – less waiting for both patients and those who provide care
• **Efficient** – reducing waste
• **Equitable** – closing gaps (e.g. racial, urban-rural) in access to and quality of care
• No needless deaths
• No needless pain or suffering
• No unwanted waits
• No helplessness
• No waste
Approach in the 20th Century

• Everyone did what they wanted in medicine
  – Substantial variation
  – One learns of new findings through conferences
• Few guidelines and protocols
• No routine measurement
• No individual feedback
Approach in the 20\textsuperscript{th} Century

- No benefit for better performance, and worse, incentive for poor quality in fee-for-service reimbursement scheme
- Little information available to the public
Barriers to Quality Improvement

- Old-style control-oriented management
- Leadership system more focused on finance and revenue than on improving operational processes
- Strong sense of professional hierarchy and entitlement
- Lack of integration of the healthcare system with community resources
Is quality improvement feasible in resource-poor settings?
Developing World

• Lack of sufficient staff
• Absence of continuing education
• Poor physical facilities
• Long distance between health centers
• Top down management systems common: legacies of colonialism
Why QI is More Relevant in the Developing World

• Can optimize resource allocation and use
• Provide donors confidence in the ways in which their money has been spent
• Resources without improvement only buying the same, failed processes
How do you decide how much resources to allocate to quality improvement in resource-poor setting?
Accountability of Reasonableness

• Requires transparency in the discussions
• Involves all key stakeholders in prioritization and decision-making
• Employs evidence-based approach to weighing the alternatives
Accountability for Reasonableness

- Mandates continuous monitoring and evaluation mechanisms to assess progress towards the set targets
- Revision and cessation of the intervention allowed if expected gains not realized
- Decisions revisable in light of better evidence and argument
Accountability for Reasonableness

• Rationing decisions will always have losers
• What matters are the grounds for establishing the priority and the methodologies used
• Methods:
  – Public hearings
  – Testimonies from groups and individuals
  – Focus groups and other investigative approaches
Sana

• Volunteer organization hosted by the Computer Science and Artificial Intelligence Laboratory consisting of students and alumni of MIT, Harvard School of Public Health and Harvard Business School

• Offers an OPEN-SOURCE mobile tele-health platform for resource-poor settings
Mission

- Empower front-line health workers
- Early disease detection and treatment
- Patient monitoring and outcomes reporting
- Build the framework of a learning system to facilitate quality improvement
- Establish best practices in implementation and scaling of information systems
Sana Technology

• Interfaces with point-of-care diagnostic tools and a back-end EMR
• Allows guidelines, checklists and protocols to be hardcoded onto phones bringing EBM into the hands of CHWs
• Streamlines triage and referral system
• Facilitates coordination of care, care standardization, quality monitoring and improvement
Sana Technology

- Facilitates real-time decision support for CHWs from remote experts
- Enables development of clinical database to build customized decision support systems
Lessons Learned

• Information system, without an accompanying organizational transformation, will reinforce the same failed processes.

• Innovations need to address gaps in quality, otherwise they won’t sustain or scale.

• Adoption of innovation requires change management.
Capacity Building

• Promote a collaborative ecosystem to incubate, deploy and scale eHealth solutions
• Advocate grassroot project support and accountability
• Share what we learn at MIT and Harvard to our counterparts in developing countries
Sana Approach

• Partnership with local implementers – universities, healthcare organizations (government, NGOs, for-profit sector)
• Partners identify the gap in quality they want to address
Sana Approach

• Collaborate with partners on
  – Creating a new application or customizing an existing one
  – Iterative system re-design
  – Pilot and scaling
  – Monitoring and evaluation
    • Processes, structure and clinical outcomes
    • Cost-effectiveness analysis
  – Documenting and disseminating lessons learned
Our mission is to revolutionize healthcare delivery in remote areas through innovative mobile information services that improve patient access to medical specialists for faster, high quality, and more cost effective diagnosis and intervention.
CLASS 4: OPERATIONS MANAGEMENT AT THE FRONT LINES

Lecturer: Martin Were, Assistant Professor of Medicine, and Knowledge Informatics & Translation Indiana University

Objective: To evaluate the performance of operating units, understand why they perform as they do, and design new or improved operating procedures and systems
Sana India
Sana mHealth Research Lab

- Study human-mobile device interaction in the context of rural India
  - Develop effective and accessible user interfaces to support the needs of rural telemedicine
  - Discover trends regarding use behavior and opportunities for other applications of mobile technology in the rural context
- Perform utilization-focused evaluation
- Measure the impact of mHealth on population-based clinical outcomes
Sana

• Academic Research & Development group
  – Works with local multi-disciplinary implementers
  – Offers an open source mHealth platform customizable to any clinical application
  – Focuses on capacity-building by providing educational tools to strengthen healthcare infrastructure, including health information systems
  – Provides students an environment for experiential learning
Health System Strengthening

Primary Care

Empowering front line health workers

Connecting

Ensuring quality
Technology in Healthcare

• Technology won’t fix broken systems.
• Quality improvement in healthcare requires a multi-disciplinary and collaborative approach.
• Idea of collaboration runs counter to entrepreneurial spirit, thus, preponderance of innovations addressing low-hanging fruits
Technology in Healthcare

• Health is a complex “product” to sell
• Only achieved by numerous successful processes: timely diagnoses, effective treatments, adequate monitoring, consumers doing their part
Technology in Healthcare

• Coordination is as important as each individual process, and failed coordination leads to poor outcome despite successful care “pieces”

• ~500,000 medical technology, in ~10,000 generic groups, under 12 categories of products

http://www.eucomed.org/medical-technology
Join the team

- Identify your area of interest
- Shape strategy
- Develop content