



**International
AIDS
Research
Collaboratory**

University of Michigan

Distributed Medicine and Interpersonal Interaction: Implications for Technology Design

Matthew J. Bietz
School of Information
University of Michigan
mbietz@umich.edu



International
AIDS
Research
Collaboratory

University of Michigan

Introduction

- Exciting opportunities for using new technologies in clinical settings
 - Especially HIV/AIDS clinics in Africa
- Too often telemedicine systems lack social sophistication
 - Deep understanding of the work
 - Impact of technology on social processes
 - Social acceptability of technology



International
AIDS
Research
Collaboratory

University of Michigan

Overview

- International AIDS Research Collaboratory project
- Promise of Distance Spanning Technologies (DSTs)
- Findings from Computer-Supported Cooperative Work literature
- Suggestions for design practice



International
AIDS
Research
Collaboratory

University of Michigan

International AIDS Research Collaboratory

- Collaboratory = Collaborate + Laboratory
- Working with HIV/AIDS researchers collaborating between the United States and southern Africa
 - Technology needs assessments
 - Implementing new technologies
 - Studying the use of the technologies



International
AIDS
Research
Collaboratory

University of Michigan

Data Collection

- Open-ended interviews and observations with medical researchers
 - More than 50 interviews between February 2002 and the present
 - Many interviewees are practicing clinicians
 - Often involves demonstrating new technologies
- Often heard the “Remote Expertise Story”



International
AIDS
Research
Collaboratory

University of Michigan

The Remote Expertise Story

- Many clinics in southern Africa do not have adequate medical staff
 - Especially in rural areas, townships, etc.
- Difficult to deliver continuing education
 - Especially serious for HIV/AIDS care
 - New and rapidly changing treatments
- One solution: Use information technology to connect local clinic doctors with remote specialists



International
AIDS
Research
Collaboratory

University of Michigan

Potential Benefits of DSTs

- Allows for efficient and widespread use of limited expertise
- Cost savings compared to travel
- Immediate response from specialist
- Additional benefits from having technology available
 - Professional support, patient education, clinical monitoring, etc.

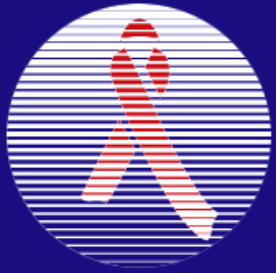


International
AIDS
Research
Collaboratory

University of Michigan

This Isn't New

- Doctors have been consulting over the phone for a long time
- Part of every-day work for the doctors we interviewed
 - One even did a consultation in the middle of the interview
- Certain medical specialties typically done remotely
 - e.g. Radiologists often read X-rays without ever meeting the doctor or patient face-to-face



International
AIDS
Research
Collaboratory

University of Michigan

This Is New

- New technologies
 - Video-conferencing, Voice-over-IP, etc.
- New clinical context
 - Rapid deployment of HIV/AIDS treatments
 - Increasing demands on clinical staff
 - New symptoms, drugs, etc.
 - Disease not as well-understood as some others
- New relationships
 - Greater interaction across cultures



International
AIDS
Research
Collaboratory

University of Michigan

Why the “New” Matters

- Underlying the requests for video and similar technologies is an urge to “be there”
 - Allows for both sight and sound
 - Feels more “present” than phone
- Attempts at “being there” are problematic
 - Mixed results from Human-Computer Interaction and Computer Supported Cooperative Work research



International
AIDS
Research
Collaboratory

University of Michigan

Being There: Technical Concerns

- Each step closer to “being there” adds significant cost
- More complex technologies tend to be harder to use and support
- The technology will never get us all the way to “being there”



International
AIDS
Research
Collaboratory

University of Michigan

Being There: Social Concerns

- Tendency for increased social problems in technology-mediated distance work
 - Less trust, More conflict
 - Delays in getting work done
- Technology design can influence interactions
 - Perceptions of lying affected by video quality
 - Influence in decisions affected by camera placement



International
AIDS
Research
Collaboratory

University of Michigan

DSTs in Clinical Practice

- We don't know impact of technology use on clinical practice
 - Decision making / Diagnosis
 - Doctor-Patient relations
 - Overall treatment success
- Potential for both positive and negative effects
 - Access to expertise → better decisions?
 - Technological mediation → worse decisions?



International
AIDS
Research
Collaboratory

University of Michigan

Implications for Design

- Understand the work we are trying to support
 - Healthcare tends to be both information rich and unpredictable
- Look for “Beyond Being There” solutions
 - Hollan & Stornetta, 1992
- Design with social awareness
- Don’t assume technical solution is the only or correct solution



International
AIDS
Research
Collaboratory

University of Michigan

Unanswered Questions

- Technology and medical decision making: what is the interaction?
 - What are the important technical and social parameters
 - How do we evaluate Telemedicine systems? Do we need full clinical trials?
- Cost tradeoffs for these technologies
- What are the “second order” effects of Telemedicine?



International
AIDS
Research
Collaboratory

University of Michigan

Conclusion

- Distance-spanning technologies could be very beneficial in clinical settings, especially in HIV/AIDS care in Africa
- We must not naively assume that the impact will be positive
- Designing effective telemedicine systems requires accounting for social as well as technical requirements