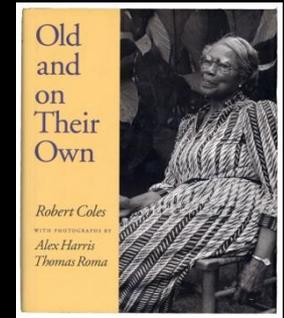


# M-Health for Vulnerable Populations



**Patricia Abbott, PhD, RN**

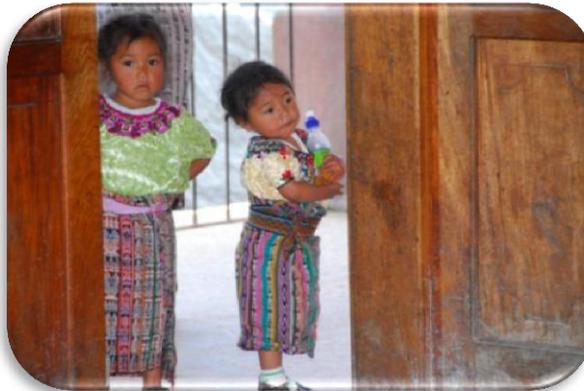
University of Michigan School of Nursing

Johns Hopkins University Schools of Nursing and Medicine

# Objectives

- **At the completion of this presentation, participants will be able to:**
  - Identify the balance between NCD (non-communicable disease) and ID (Infectious Disease) prevention efforts in the developing world
  - Project the potential impact of NCD in Central America on emerging economies and the US healthcare system
  - Describe the pros and cons of mHealth in low resource areas & challenges of digital connectivity in LMIC (political, technical, financial)
  - Debate the concept of a “digital ecosystem for health” in LMIC (low and middle income countries).
  - Assess the impact of mHealth efforts at the grass-roots community level with field workers.

# Geography is Irrelevant



# Balancing: NCDs & ID

- Today 20-25% burden global disease from lifestyle & behavior – rocketing in LMIC<sup>1</sup>
- 4/5 of worlds pop'ln in developing regions – where NCDs & MVA are quickly replacing ID & malnutrition – now leading cause of death. <sup>1</sup>
- By 2020 – NCDs will be 7 of 10 deaths worldwide<sup>1</sup>
- CVD - principal cause of death in the developing world, accounting for twice as many deaths as TB, malaria, and HIV combined<sup>2</sup>

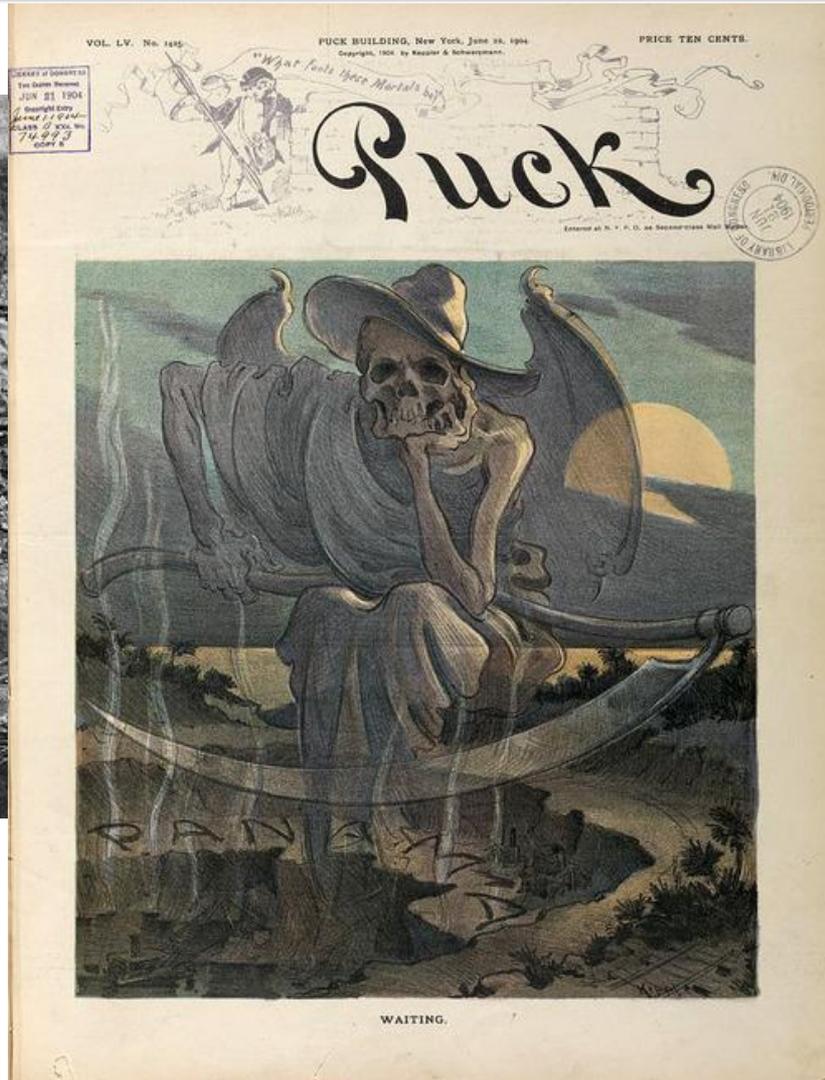
<sup>1</sup>. <http://www.who.int/trade/glossary/story050/en/>

<sup>2</sup>. <http://www.who.int/mediacentre/factsheets/fs317/en/index.html>

# First – Orientation Guatemala – Geopolitical Boundaries



# Impact – Why Should the US Care?



# Impact on US Healthcare

- By 2020, Hispanic ethnicities will comprise 30% of US population.
- “10% escalation CVD within the next 20 years with a 3-fold direct cost increase, directly attributed to an aging society and the growth of CVD-prone Hispanic populations in the US”

*Value of Primordial and Primary Prevention for Cardiovascular Disease: A Policy Statement from the American Heart Association. Circulation, (2011), 124:967-990.*

# Guatemala Society & Health

- 131 out of 187 (UN Human Development Index)
- Mixed society– varying levels of poverty
- Indigenous
  - Marked childhood malnutrition
  - Stunting and anemia
  - High obesity & HTN
  - Primarily in Western Guatemala
  - Severe poverty
  - Marginalized



# The Most Vulnerable Ones

- Indigenous Mayans
- Similar to US Native American treatment
- Non-Spanish speaking (Tzu'tzuhil)
- 84% illiteracy rate
- Influence of Western lifestyles, Chinese/American goods and tuk-tuks
- 60% increase CVD in last decade
- “Starving with a Full Stomach”



# The Healthcare System

- Health Centers

- Health Posts
- Auxiliary nurses
- 8<sup>th</sup> grade education
- 9 months training in healthcare by MOH
- Case load is 1500 to 2000 per AN
- No training in chronic diseases
- Low med availability
- NO injectable insulin



# The Promise - mHealth

- **92% of all Guatemalans have (and use) a cell phone**
- Widespread digital connectivity
- Using cellular technology to:
  - Educate health workers
  - Connect with patients
  - Collect, organize, store, & manipulate data
  - Coordinate care – patients/communities/regions
  - Turn data to information
  - Influence behaviors



# Ok Informaticians – What Are the Challenges?

- Money to support project? YES
- Connectivity? not so much
  - But what about electrical power??
- Illiteracy? You betcha
- Corruption in Telecom? Absolutely
- Standards? Always
- Compliance? Maybe
- Local IT Workforce? Definitely
- **Interoperability and avoiding “one-offs” – CRITICAL & a “BHAG”**



# eHealth in LMIC - CommCare

- Case Management System

The screenshot shows the homepage of the CommCare HQ website. At the top, there is a navigation bar with links for Home, Tour, Our Users, Support, and Plans & Pricing, along with a Sign In button and the dimagi logo. Below the navigation bar, a blue banner reads "REQUEST FOR APPLICATIONS" and "CommCare Proof of Concept in India 40 organizations. Free phones and support." The main content area features the CommCare HQ logo, an illustration of a woman using a smartphone, and a woman holding a baby. Arrows indicate data flow between the user and the system, with icons for SMS, XLS, XML, and CSV files. Two prominent buttons are visible: "Try CommCare Create a free account." and "Contact Us Request more info." Below these buttons, a small link says "Take a quick tour of CommCare HQ." At the bottom of the page, three statistics are displayed: "20+ organizations", "500,000+ forms submitted", and "15+ countries".

<http://www.commcarehq.org/home/>

# eHealth in LMIC - MOTECH

- SMS “engine” with intelligence



The screenshot shows the Grameen Foundation website. At the top right, there are links for "Contact Us", "Careers", and "Press Room". The Grameen Foundation logo is on the left, with the tagline "Empowering People. Changing lives." on the right. A navigation bar contains links for "WHO WE ARE", "WHAT WE DO", "WHERE WE WORK", "OUR IMPACT", "TAKE ACTION", and "NEWS". The main content area features a sidebar with links under "Financial Services" such as "Microfinance Basics", "Financing Microfinance", "Strengthening People & Organizations", "Reaching the Poorest Billion", and "Measuring Progress". The main article is titled "Mobile Technology for Community Health (MOTECH)" and includes a "Watch a Video" link and a paragraph about mobile phones in developing countries. A breadcrumb trail "Home > View" is visible in the top right of the content area.

Contact Us | Careers | Press Room |

**GRAMEEN**  
FOUNDATION

*Empowering People. Changing lives.*

WHO WE ARE | WHAT WE DO | WHERE WE WORK | OUR IMPACT | TAKE ACTION | NEWS

Home > View

**Mobile Technology for Community Health (MOTECH)**

[Watch a Video](#) about our Mobile Midwife implementation of MOTECH.

Mobile phones have become a pervasive technology in developing countries. But can information delivered over a mobile phone change the outcome of a pregnancy? Can a network of mobile phones be deployed that coherently engages communities and healthcare workers to save the lives of newborns?

Grameen Foundation has launched an initiative to determine how best to use mobile phones

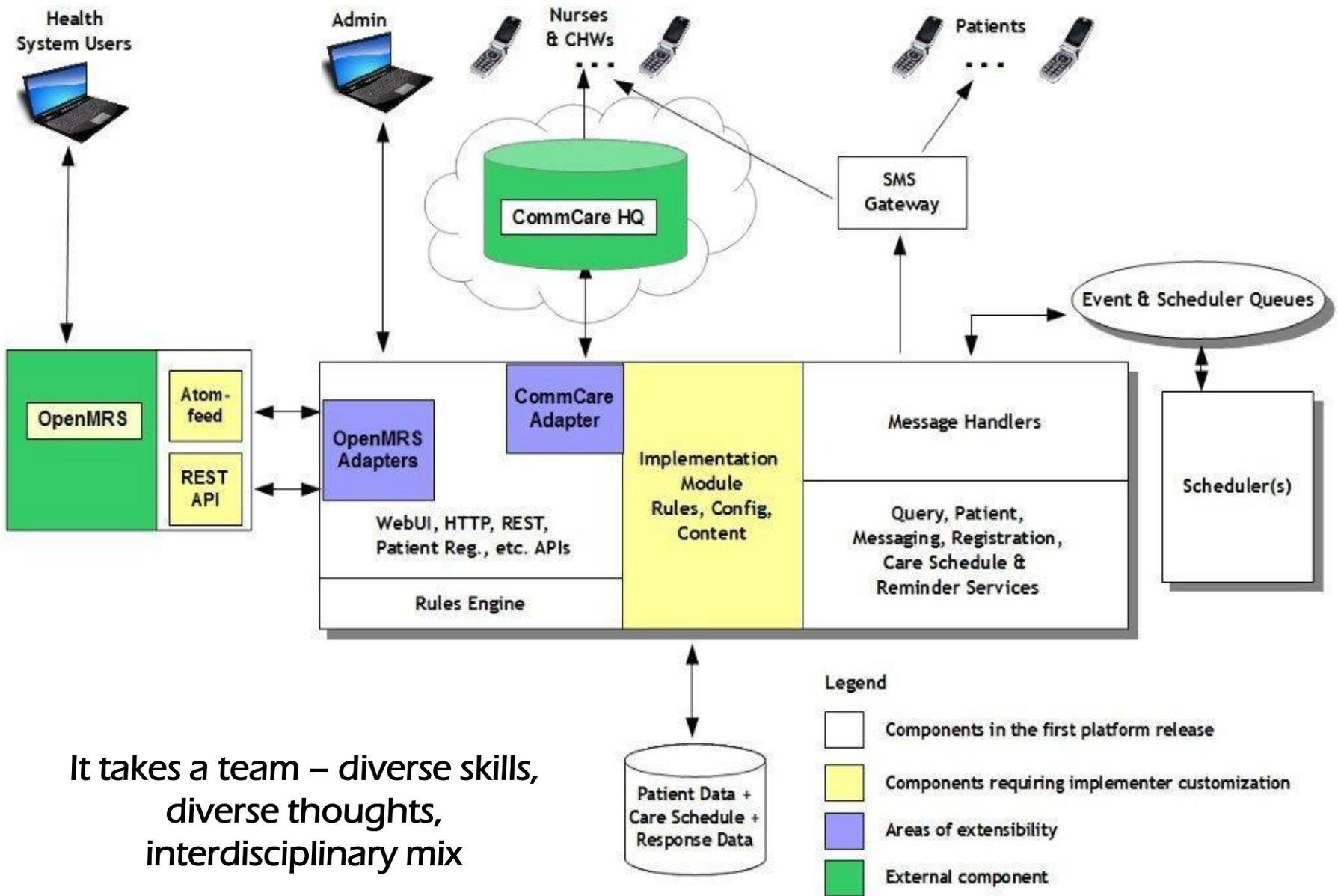
<http://www.grameenfoundation.org/what-we-do/technology/mobile-health>

# eHealth in LMIC - OpenMRS

- Open source medical record system



<http://openmrs.org/>



It takes a team – diverse skills,  
diverse thoughts,  
interdisciplinary mix

The “Ecosystem” – connecting silos to form a system

# Guatemala – or Anywhere?

- mHealth in Guatemala
  - Train the ANs – via Android tablets
    - 2 weekend immersions with local SON – chronic disease, health promotion, behavior modification
    - Ongoing remedial sessions weekly (case studies) in community
    - Risk stratifier – more efficient use of scarce resources
    - CHWs equipped with smart phones – data collection.
  - Connect Health Posts and Health Centers with smart phones - referrals
  - Connect ANs with patients – SMS'ing for Health
  - Creating a digital ECOSYSTEM
  - Empowering field workers & patients/families/communities

# Systems-Level Thinking

From Silos to Systems: An Overview of eHealth's Transformative Power



## Rockefeller Foundation Report

*Making the eHealth Connection:*

*Global Partnerships, Local Solutions*

Bellagio Center Conference Series

[http://www.rockefellerfoundation.org/uploads/files/e331d255-059f-4fc6-b814-5938f8ee017e-rf.silos\\_1-13.pdf](http://www.rockefellerfoundation.org/uploads/files/e331d255-059f-4fc6-b814-5938f8ee017e-rf.silos_1-13.pdf)

# Conclusion

- The need is great & ICT is the “killer app”
- NCDs are stealthy grim reapers
- Geography is irrelevant – disparity is everywhere
- mHealth/eHealth – Health & Healthcare “Off the Mainframe”
- It is about data libre, empowerment, & social good

*GRACIAS*  
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