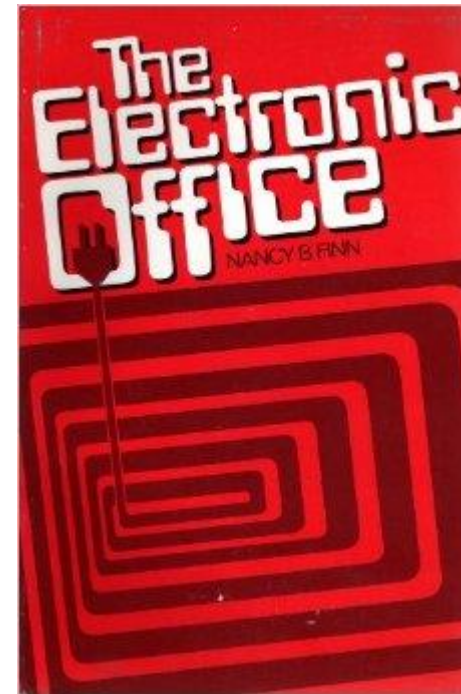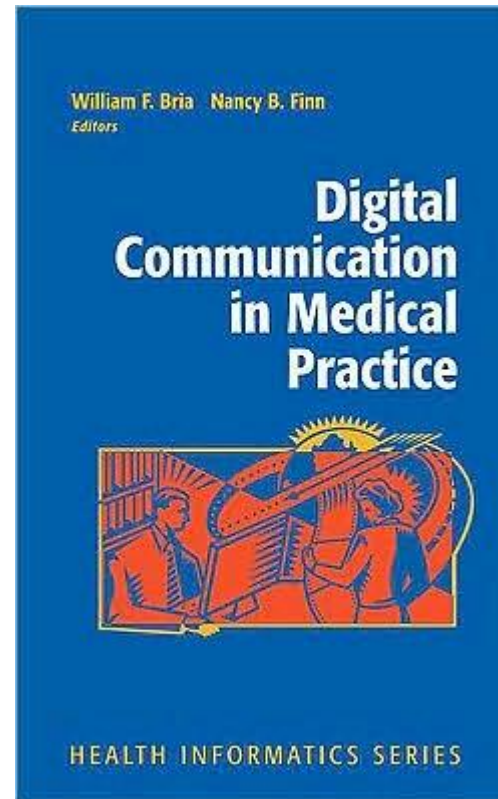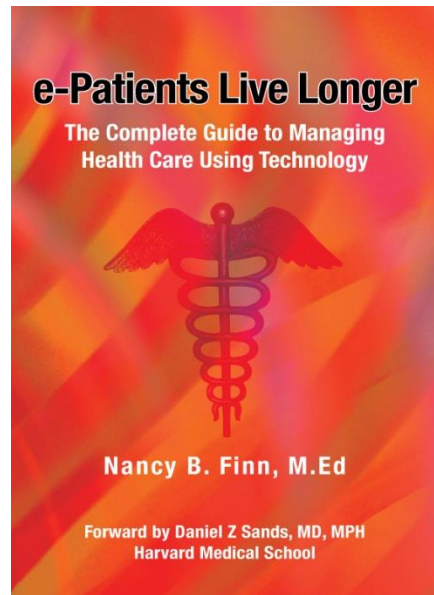# How Digital Communication Impacts Health Outcomes in Developing Nations

United Nations 58th session of Commission on the Status of Women

Nancy B. Finn  March 13, 2014

# Presented by Nancy B. Finn, M.Ed.
# Author, Journalist



e-Patients Live Longer
The Complete Guide to Managing Health Care Using Technology
Nancy B. Finn, M.Ed
Forward by Daniel Z Sands, MD, MPH Harvard Medical School



William F. Bria  Nancy B. Finn
Editors
Digital Communication in Medical Practice
HEALTH INFORMATICS SERIES



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# Overview
## How Digital Communication can Improve Maternal Mortality and other Health Issues

► Email–point-to-point communication including text, data, and images.

► mHealth – ubiquitous with cell phones and tablets, to send text messages, email, and data transmissions, using radio waves,satellite,and wifi.

► Telemedicine – allows people to be cared for across geographic boundaries with local data collection and transmission to experts.

► Wearable devices: Apparel and gadgets infused with sensors that enable apps that send information from patients to providers for interpretation and analysis.

► Future technology advances including digital health records and personalized medicine, robotics, population health diagnostics.

# Email Fosters Digital Communication

Email is on every digital device, including: cell phones, computers, the Internet and tablets.
Email enables remote resolution of emergency and non-emergency issues.
Email helps analyze and resolve complex cases.

# How email
# changes health outcomes



▶ Transmission of text and images, shortens the miles between the patient's face to face meeting with a health worker and provides the opportunity for diagnosis of issues by a physician or specialist.

▶ Story of Tengis Baasanjav from Outer Mongolia.

# How mHealth Extends the Reach



Applications    Devices

mHealth

Infrastructure

Source: TripleTree, LLC
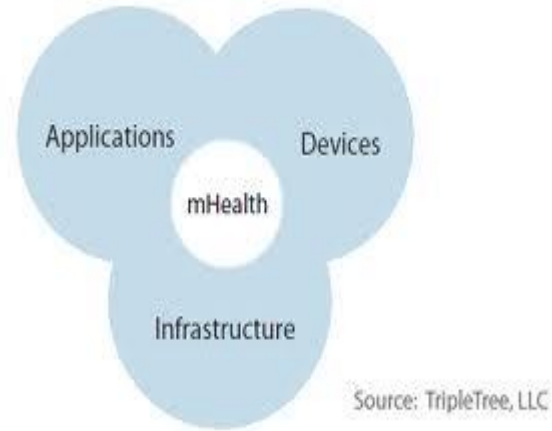
- ▶ Increasing availability of cellular networks with charging stations, and new creative uses of solar power, provide the enabling technology.

- ▶ Resolves the issue of too few health workers in remote areas by connecting health care extenders with professionals for real-time assessment.

- ▶ Successful mHealth examples reaffirm use.

# Key Global Telecom Indicators for the World Telecommunication Service Sector in 2012

## (all figures are estimated.)

Source © International Telecommunications Union, Feb. 2013

**Key Global Telecom Indicators for the World Telecommunication Service Sector in 2012 (all figures are estimates)**

| | Global | Developed nations | Developing nations | Africa | Arab States | Asia & Pacific | CIS | Europe | The Americas |
|---|---|---|---|---|---|---|---|---|---|
| Mobile cellular subscriptions (millions) | 6,835m | 1,600m | 5,235m | 545m | 396m | 3,547m | 476m | 790m | 1,048m |
| Per 100 people | 96.2% | 128.2% | 89.4% | 63.5% | 105.1% | 89.7% | 169.8% | 126.5% | 109.4% |
| Fixed telephone lines (millions) | 1,171m | 520m | 652m | 12m | 35m | 515m | 72m | 243m | 272m |
| Per 100 people | 16.5 | 41.6% | 11.1% | 1.4% | 9.3% | 12.9% | 25.7% | 39.0% | 28.4% |
| Active mobile broadband subscriptions (millions) | 2,096m | 934m | 1,162m | 93m | 71m | 895m | 129m | 422m | 460m |
| Per 100 people | 29.5% | 74.8% | 19.8% | 10.9% | 18.9% | 22.4% | 46.0% | 67.5% | 48.0% |
| Mobile broadband growth CAGR 2010-2013 (millions) | 40% | N/A | N/A | 82% | 55% | 22% | 27% | 33% | 28% |
| Fixed broadband subscriptions (millions) | 696m | 340m | 357m | 3m | 12m | 303m | 38m | 168m | 164m |
| per 100 people | 9.8% | 27.2% | 6.2% | 0.3% | 3.3% | 7.6% | 13.5% | 27.0% | 17.1% |

Source: © International Telecommunication Union (February 2013)

via: © mobiThinking

# Important Stats
## International Telecommunications Union(2012)

- 98% of people worldwide own mobile devices.

- 128.2% in developed nations; 89.4 % in developing nations.

- Africa 63.5%   Arab States 105.1%  Asia Pacific 89.7% .

- Commonwealth of Independent States (Russia, Ukraine, Republic of Belarus).

- 169.8%

- Europe 125.5%.

- The Americas 109.4%.

# mHealth Examples

- **MAMA Mobile Alliance for Maternal Action** - "Aponjon," Bangladesh, Twice week texts deliver vital health messages to new and expectant mothers with reminders about check-ups and nutrition information.

- **Health Call Centers – worldwide – broadcast messages via text, email, voice.**

  - Expert health care professionals provide advice in a crisis and address diseases:  HIV, cholera, malaria, malnutrition and anemia.

- SMS (short message campaigns for reminders about immunizations, nutrition, basic hygiene.

  - According to WHO 55 million mobile users receive such information.

  -  Provide low cost, broad reach education.

  - Proven positive results, including 50%  reduction in child deaths.

# Nutrition and mHealth



- ¼ of world's population are anemic – 42% pregnant women, 30% non-pregnant women and 47% of preschool age children.

- Challenge – how to reach these groups and educate them in good nutrition habits.

- SMS Broadcast messages and call center messages.

- Hundreds of Cell Phone Apps on nutrition and weight tracking and management

  - Fooducate

  - The Carrot and Vitamins Guide

# Telemedicine



- Enables health care in real time where distance is a critical factor, especially for the rural inhabitants.

- Uses cell phones, video and standard cameras, wireless electronic devices such as stethoscopes, apps to measure blood pressure, heart rate, etc.

- Uses both broadband and mhealth technology to address physician shortages. For underserved population, health extenders are supported by the technology.

# Telemedicine Projects in Remote Locations

- Uganda – Pathology samples collected, stored and emailed to Kampala hospital for diagnosis using CoolScope. Pathologist provides diagnosis and treatment recommendations.

- Botswana Teledermatology project since 2006 for diagnosis and treatment of HIV; captures images which are sent to Gaborone or US for review. Diagnosis & treatment sent back to local health workers – has served thousands.

- Botswana Cervical cancer screening via cellphone images sent to Gaborone

- Connected Health in Cambodia – treating thousands of patients with health extenders interconnected to US physicians.

- OB Ultrasound of women with difficult pregnancies: the Congo, Guatemala, Zambia, Kenya and Pakistan. Images sent via Samsung smartphones and transferred to flash drives or sent via email to radiologists.

# Telemedicine's potential



▶ Immediate Assistance in an emergency: Using a cellphone or tablet and texting for instant feedback in real time, local health care workers are able to communicate with an expert in a trauma center anywhere in the world.

▶ Ongoing tele-physical therapy delivered via text message, email on a tablet, using photos to illustrate stretches and exercises and deliver instruction in how to alleviate pain. Used for patients with acute stroke care or severe injury.

▶ Tele-Speech Therapy, Mental Heath Counselling, Telemonitoring.

# Wearable Devices



▶ i-Watch – a wristwatch with smartphone and tablet and  sensors for monitoring heart rate, blood pressure, blood sugar, and pulse. They are wireless and do not require electricity. They can be powered by solar or kinetic energy.

▶ Google Glass which includes a display camera and microphone to support mobile apps. Uses a tiny sensor and wireless transmitter to monitor and measure glucose levels in tears.

▶ Other wearable devices include t-shirts, wrist bands, shoes, Velcro straps, mats, hats and more that measure weight, heart rate, and physical activity.

# Future Trends for Digital Communication in Developing Nations



▶ Electronic Health Records created from data gathered by local health workers, entered directly into a cell phone and forwarded to a database to be stored for continuity of care.

▶ Personalized Medicine where genome sequencing and analysis will provide the data to individualize care and ultimately resolve some of the health issues that plague the world.

▶ Smart Pills – experimental use today for monitoring vitals or gastro imaging.

▶ Robotics, remote robot-assisted surgery using cell phones and tablets.

▶ Digital detection of outbreaks of disease using sophisticated web-based software to identify trends

# Questions?

# Contact Information

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