Telehealth and eMedicine

ICT Tools in Achieving Universal Health Care

PORTIA FERNANDEZ-MARCELO, MD MPH
Director

www.telehealth.ph

Putting Health in the hands of the People
Telehealth and eMedicine

- The Philippine Health Situation
- Finding Solutions through eHealth:
  - The National Telehealth Center
- Telehealth and eMedicine

*based from previous slide*
Philippines

- 7,107 Islands
- 17 Regions
- 80 Provinces
- 138 Cities
- 1,498 Municipalities
- 42,025 Barangays
- 91.9M Filipinos
The Philippine Health Situation

- Lower Middle Income Country (LMIC)
- 94 Million, 63% live in urban centers
- Country of youths: 50% population < age 21
- Double disease burden: infectious + lifestyle and chronic diseases

- Modest improvement in health indicators vs SEA nations-
  - 4th highest:
    - IMR = 32/1000LB,
  - 2nd highest:
    - MMR = 221/1000000LB
The Philippine Health Situation

- **Accessibility**
  - Remote areas, difficult to reach

- **Affordability**
  - High Out-of-Pocket expenses
  - Universal Health Care → still to happen

Health Human Resource: Maldistribution of health professionals

Health Workforce Density per 10,000 population (WHO, 2010)

MD: Philippines=12  World=14

Nurses: Philippines =61  World =28

*But where are they?*

Migration and brain drain inevitable

Seek greener pastures
The Philippine Health Situation

Widening inequity in health
Disparity in health service delivery and utilization
Poor quality of data and information
Maldistribution of skilled health workers
High out-of-pocket payment (including drugs), low health expenditure by government

Food security and safety risk
Dual burden of diseases
Disasters, and chronic emergency in Mindanao
Slow progress in maternal and child health and nutrition
High population growth

-DOH, 2010 presented during the WHO-PHL Consultative Meeting
Data storage or data graveyard

Information Management
# Data Analysis and Reporting

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Finding Solutions
Opportunities: ICT and Health

Information and communications technology (ICT): essential infrastructure and tools, great enabler to people

- for knowledge creation, sharing and dissemination.
- boost the innovative capacity of all sectors and contributes to more than 40% of overall productivity growth (EU KLEMS, 2007 in EC, 2009).
- by facilitating greater access to health and education services, and creating economic opportunities for disadvantaged groups (Daly, 2003, K. Chen, 2004, Jensen, 2007; Mercer, 2001; Oberski, 2004; Reisman, Roger, & Edge, 2001; UNDP, 2001; The World Bank, 2001 in Fong, 2009: 471-472.)
eHealth

"eHealth is the cost-effective and secure use of information and communications technologies in support of health and health-related fields, including health-care services, health surveillance, health literature, and health education, knowledge and research" (WHO).
Health informatics

Information science, computer science, and health care.

Resources, devices, and methods required to optimize the acquisition, storage, retrieval, and use of information in health and biomedicine.

Tools: computers but also clinical guidelines, formal medical terminologies.
Benefits of eHealth

- Cost-effectiveness
- Efficiency
- Quality
- Safety
- Scope
- Capacities
- Response time
Opportunities

- Broadband infrastructure continuously improving
- Open source software becoming more popular
- Computerization is ubiquitous in all institutions but security is certainly a valid concern
  - Free email groups vs. institution-based
- Increasing public awareness on the benefits of ICT
Opportunities

• According to International Telecommunications Union 2010 Report
  • Mobile Phone Users per 100 population
    - PHILIPPINES 100.5/100
    - WORLD 49/100
  • Internet Users per 100 population
    - PHILIPPINES 9/110 (UP TO 35%, DOST-ICTO 2012)
    - WORLD 22/100

• Philippines is the Texting Capital of the world
Health Policy Directions

1) A roadmap towards universal health care through a refocused PhilHealth;
2) Particular attention to the construction, rehabilitation, and support of health facilities
3) Attainment of Millennium Development Goals 4, 5, and 6
4) Attain efficiency by using information technology (IT) in all aspects of health care
5) Increased attention to trauma, the 4th leading cause of death
6) More aggressive promotion of healthy lifestyle to prevent NCD
7) Attention to emerging diseases
8) Improve the access to quality affordable medicines
9) Continuing efforts in improving governance and regulation to eliminate graft and corruption in all areas of health care
10) Improve the plight of health workers through interventions in health education, placement, compensation, among others

Ona, E (2010). The Aquino Health Agenda: Delivering Universal Health Care
(from presentation slides delivered on October 22, 2010 at the 2nd Philippine Health Outlook Forum, AIM, Makati City)
THE WHO HEALTH SYSTEM FRAMEWORK

SYSTEM BUILDING BLOCKS

SERVICE DELIVERY

HEALTH WORKFORCE

INFORMATION

MEDICAL PRODUCTS, VACCINES & TECHNOLOGIES

FINANCING

LEADERSHIP / GOVERNANCE

OVERALL GOALS / OUTCOMES

ACCESS

COVERAGE

QUALITY

SAFETY

IMPROVED HEALTH (LEVEL AND EQUITY)

RESPONSIVENESS

SOCIAL AND FINANCIAL RISK PROTECTION

IMPROVED EFFICIENCY

THE SIX BUILDING BLOCKS OF A HEALTH SYSTEM: AIMS AND DESIRABLE ATTRIBUTES
“No one is left behind, especially the poor.”
The National Telehealth Center
The National Telehealth Center

- UP Board of Regents: 1998

To improve the health of Filipinos through the optimal use of ICT
The National Telehealth Center: Targets

Doctor-to-the-Barrios:
- Single doctor operations (SDOs/MHOs)
- Doctor-less communities (with nurses or midwives)

District Hospitals:
- Provincial Hospitals
- Regional Hospitals
National Telehealth Center

- cited as Centre of Excellence for Free and/or Open Source Software for ASEAN+3 by UNDP
- home of the International Open Source Network ASEAN+3
International Affiliation

Ethical Framework

Asia eHealth Information Network (AeHIN)
e-Health Policy Advocacy

UP Manila

Guidelines on Ensuring Privacy of Patients when Students and Health Professionals of the UP Manila Use the Internet

Guidelines in Handling Electronic Documents with Personally Identifiable Information

Proposed by the National Telehealth Center

Purpose

This policy recommendation aims to establish the proper attitude and high regard towards any form of patient information found in electronic documents by all students, faculty, health professionals, and administrative staff of the University of the Philippines Manila.

*based from previous slide
e-Health Policy Advocacy

Philippine National Health Information Systems

Standards and Inter-operability
"eHealth is the cost-effective and secure use of information and communications technologies in support of health and health-related fields, including health-care services, health surveillance, health literature, and health education, knowledge and research" (WHO).
Functional Areas of eHealth

- Telemedicine / telehealth – *tele* *(distance)*
- *m*Health – mobile technologies
- Electronic Medical / Health Records
- eSurveillance and Tracking
- eLearning for Health
The National Telehealth Service Program

Center's current four-point strategy for attaining its mandate: *e*Medicine, *e*Records, *e*Learning and *e*Health policy advocacy.
eRecords

Community Health Information Tracking System (CHITS)
Open Medical Records System (OpenMRS)
### Patient Queue

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Showing 1 to 10 of 11 entries

**Add patient to queue**
What is CHITS?

Modular System
EMR for Health Centers
Electronic Medical / Patient Record

E-Governance
Integrating health information through data modeling and business process re-engineering.

**CORE MODULES**
- PhilHealth
- Maternal Care
- Immunization
- Child Care
- DOTS

**DEMOGRAPHICS**
- Patient
- Family
- Barangay

**REPORTS**
- Immunization
- Notifiable Diseases

**MODULES**

**USER INTERFACE**

**VERTICAL PROGRAMS**
- Maternal and Child Health
- Immunization
- Notifiable Diseases
a new way of doing things…
CHITS Project

• Pilot in Pasay City health centers in May 2003
• Improved health information management
• Improved computer literacy among government midwives and nurses
• Demonstrated electronic records management to UP medical students plus

Awardee 2x, Health Market Innovations, PIDS-CHMI, 2011
Finalist, Stockholm Challenge, 2006
Best e-Gov projects, APEC Digital Opportunities Center, 2006

Compendium of Best Practices in Local Health Systems, DOH, 2006
Maternal Record

Before

After
Family Planning

Before

After
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<td>Moreno,</td>
<td>Nenoli</td>
<td>0</td>
<td>Dec 04</td>
<td>1/1/04</td>
<td>2/2/04</td>
<td>3/10/04</td>
<td>4/12/04</td>
<td>5/10/04</td>
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<td>726</td>
<td>12/18/03</td>
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<td>Salado, Red</td>
<td>Marjorie</td>
<td>0</td>
<td>Dec 04</td>
<td>1/1/04</td>
<td>2/9/04</td>
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<td>4/12/04</td>
<td>5/19/04</td>
<td>7/21/04</td>
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<tr>
<td>1452</td>
<td>12/20/03</td>
<td>0</td>
<td>Pocoy,</td>
<td>Locelyn</td>
<td>0</td>
<td>Dec 04</td>
<td>9/29/04</td>
<td>1/10/04</td>
<td>3/10/04</td>
<td>4/12/04</td>
<td>5/19/04</td>
<td>7/21/04</td>
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Data Visualization

Male

Female

<table>
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<tr>
<th>Age Range</th>
<th>Male Count</th>
<th>Female Count</th>
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<tbody>
<tr>
<td>0 - 0</td>
<td>3415</td>
<td>3025</td>
</tr>
<tr>
<td>1 - 5</td>
<td>1252</td>
<td>1149</td>
</tr>
<tr>
<td>5 - 19</td>
<td>1665</td>
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<td>1461</td>
<td>2234</td>
</tr>
<tr>
<td>30 - 45</td>
<td>662</td>
<td>874</td>
</tr>
<tr>
<td>45 - 60</td>
<td>326</td>
<td>548</td>
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<tr>
<td>60 - 99</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>
Average Duration of Consult
Immunizations Received

MONITOR
CCT-4Ps compliance conditionalities
Number of Prenatal Visits

MONITOR CCT compliance conditionalities
Birth DELIVERY Location

MONITOR CCT compliance conditionalities

- Lying In
- Hospital
- Home

Years: 2004 to 2010
Family Planning Method

- DMPA: 60%
- Pills: 34%
- IUD: 4%
- Condom: 2%
PhilHealth Coverage

• Only 431 (of 25K patients) have Phil Health numbers recorded

<table>
<thead>
<tr>
<th>YEAR</th>
<th>No. of Patients Registered</th>
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<tbody>
<tr>
<td>2004</td>
<td>34</td>
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<td>2009</td>
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<tr>
<td>2010</td>
<td>1</td>
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</table>

**MONITOR PhilHEALTH utilization:**

OP/PC Benefits
mCHITS in Navotas City
## Summary Dashboard

### Routine Reports

<table>
<thead>
<tr>
<th>Type</th>
<th>Date</th>
<th>Cause of Death</th>
<th>Num.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth Reports</td>
<td>04/30/12</td>
<td>CONGESTIVE HEART FAILURE, HPN</td>
<td>1</td>
</tr>
<tr>
<td>Death Reports</td>
<td>04/25/12</td>
<td>CEREBROVASCULAR ACCIDENT, HYPERTENSION</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>04/23/12</td>
<td>ASPHYXIA: ASPIRATION</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>04/22/12</td>
<td>CHRONIC KIDNEY DISEASE SEC. TO HPN, NEPHROSCLEROSIS</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>04/06/12</td>
<td>HEPATOMA</td>
<td>1</td>
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<tr>
<td></td>
<td>04/16/12</td>
<td>CEREBROVASCULAR ACCIDENT</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>04/01/12</td>
<td>PNEUMONIA</td>
<td>1</td>
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<tr>
<td></td>
<td>04/08/12</td>
<td>LUNG CANCER</td>
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<tr>
<td></td>
<td>04/01/12</td>
<td>SENILITY</td>
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<tr>
<td></td>
<td>04/09/12</td>
<td>SENILITY</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>04/03/12</td>
<td>HEPATIC FAILURE</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>04/15/12</td>
<td>CEREBROVASCULAR ACCIDENT, HYPERTENSION</td>
<td>1</td>
</tr>
</tbody>
</table>
R4Health
Real Time Regular Routine Reporting for Health

Adding a Patient Record and Health Worker Profile to the R4Health Database

1. Search for the icon of R4Health (figure 1) then tap it.
2. Enter your PIN then tap Login (Figure 2)
3. Tap the Add Patient button. (Figure 3) 
   (Only the healthworker can perform this function)
PRIMARY CARE BENEFITS
CONSULT/ & COMPACK
MEDICINES DISPENSING

Figure 47: PCB Consult/COMPACK Dispense Link

Figure 48: Add New PCB Consult/COMPACK Dispense
Some R4Health Data

- No. Of Patients Enrolled 14,118
- No. Of Children who received Vaccination 2,087
- No. Of Children who received Deworming tablets (PCB) 443
- No. Prenatal Care Reports 1,052
- No. Of (Fetal) Delivery Reports 342
- No. Of Postnatal Care Reports 232
- No. Of Family Planning Service Reports 845
- No. Of PCB Services Reports 3,062
Telemedicine in the Philippines

6 years of experience and collaborations with DOH-DTTBs with research support from DOST

DOST, 2008

RESEARCH
CICT
2004

BUDDYWORKS Project

SERVICE
DTTBs 2007-2011

UP Manila and UP Diliman
How do we do Telemedicine?

We train health workers how to use the cellphone to effectively collaborate with doctors and specialists (in their regional network).

UP Diliman VC Research
Eng. Luis Sison PhD
& the RxBox

RXBOX: undergoing field testing

2006 mHealth
TELEMEDICINE

How it Works

Patient

Remote Doctor

From 4th, 5th, 6th class LGUs

Doctorless sites

**Built on internationally-accepted ethical, legal, and social guidelines for the practice of telemedicine

NTSP Central

Clinical Specialists

Internal Medicine

Pediatrics

Surgery

OB

ORL

Medico Legal

Radiology

Dermatology

Ophthalmology

ECG

University of the Philippines – Philippine General Hospital
Teleconsults per Clinical Specialty (October 2007-December 2012)

- Internal Medicine: 28%
- Pediatrics: 20%
- OB Gyn: 13%
- OB-GYN: 13%
- Surgery: 6%
- Radiology: 9%
- Dermatology: 7%
- QTN: 9%
- OPH: 2%
- ORL: 3%
- Family Medicine: 0%
- Medico Legal: 3%
- Neurology: 0%

- 2-3 teleconsults per day
- 3-40 teleconsults per month
Region 8 Teleconsults:
- Region 8 vs Central Clinical Specialists

- October – December 2012

- Teleconsults answered by Central CS 77%
- MED8 9%
- PEDIA8 5%
- SURG8 9%
Stories of TELEMEDICINE
Batanes: 23/M Post Traumatic Osteomyelitis

Teleradiology, teleorthopedics

Ortho: wash-out the antibiotic for one week then CS/debridement
Batanes: 23/M Post Traumatic Osteomyelitis

Saved patient P8400 for one week “unnecessary” stay in Manila

Saved PGH P10,500 by asking antibiotic wash-out to be done in Batanes General Hospital instead of the PGH surgical bed
Sarangani: *Tinea imbricata* among IP Community (teledermatology)

Message of dermatologist:

...It appears to be a lovely case of *Tinea imbricata* or Tokelau ringworm caused by the dermatophyte *Trichophyton concentricum*. This is a relatively rare dermatophytosis but is found among Filipinos in Mindanao or other rural areas. The first reported case was in 1789 by Williams Dampier-- of a Filipino from Mindanao. One early case report was on a Filipino from Mindoro (1962 MC Fernandez of PGH). A co-resident of mine CTan reported one case in the 1990s, a Badjao patient from Mindanao if I recall.

You really should make a case report of your patient, and try to document any other cases existing in her community...
Batanes: 55/F sudden onset of blindness

Tele-Ophthalmology

suddenly lost sight after 'hitting a spider' she felt on her eye.
55/F Acute Angle Closure Glaucoma

Tele-Ophthalmology

Saved patient Php 36600 in Travel/Accommodations

Ophtha:

Passed prescription to Batanes MHO

Patient was managed conservatively in the island

Monitored remotely
Telemedicine Services
“Very useful to us DTTBs esp those in remote areas where net access aren’t that gud. Responses r readily sent so mgmt is not compromised. Very helpful since its jst a txt away and pxs are then quickly managed.” -DTTB, Agutaya, Palawan
NTSP Training – for Telemedicine

357 Trained

276 Currently Enrolled Referring Physicians

144 Doctors-to-the-Barrios

132 Municipal Health Officers
How do we do Telemedicine?: RxBox

We train health workers how to use the cellphone to effectively collaborate with doctors and specialists (in their regional network).

UP Diliman VC Research
Eng. Luis Sison PhD
& the RxBox

RXBOX: undergoing field testing
Rxbox

• Measures Vital Signs
  • Heart rate and electrical heart activity
  • Blood pressure
  • Oxygen saturation of blood
  • Tocometer
  • Fetal Heart Tones
  • Partograph

• Transmit Vital Signs (from remote rural town) → Internet → medical specialist in urban center

The National Telehealth Service Program
RxBox
Baler
Baler
The National Telehealth Service Program: Backbone and Platform

- For RxBox + future telemedical devices
- For future telemedicine services → telegenetics, teleophthalmology, teleprostheses, etc.
- Primary target: remote underserved areas
- Providing access to specialty clinical care
An Online Method for Diagnosis of Difficult TB Cases for Developing Countries

eTBDC

e-TB Diagnostic Committee

Alvin MARCELO, Zafar FATMI, Paul Nimrod FIRAZA, Shiraz SHAIKH and Richard E SCOTT
TB Problem in Developing Countries

- High TB Disease burden – TB epidemic!
  - Philippine – top 9\textsuperscript{th} country;
  - Pakistan – 6\textsuperscript{th}

- Lack trained physicians and chest specialists in remote and rural areas
- Large section of the population receives treatment from the private sector.
TB Problem in Developing Countries

• **PHILIPPINES**
  - PPP – public private sector partnership in TB Control since 2004
  - TBDCs – TB Diagnostic Committee – adopted

• **PAKISTAN**
  - Similar systems for TB control
  - Does not have TBDC
Results - PHILIPPINES

• Decisions of face to face TBDC is comparable to electronic TBDC.

• Electronic TBDC decisions are at par with the culture results

• F2F TBDC has a lesser delay as compared to eTBDC
  • Technology infrastructure
  • Physician comfort with technology
Results - PAKISTAN

• e-TBDC = F2F diagnosis using the culture result (Gold standard)
• e-TBDC diagnosis was more sensitive and specific vs. F2F diagnosis
CONCLUSIONS

• The use of “iPath” for hosting e-TBDCs is a potential alternative to the current practice of face-to-face TBDCs
• Using telehealth solution, can improve TBDOTS coverage
• Reduction delay in diagnosis related to the conventional process – not demonstrated:
  • Limitations in technical capacities of
8 years of Telemedicine in the Philippines

• Telemedicine is possible in geographically isolated and disadvantaged areas (GIDA)
• Telemedicine is fraught with ethical, social, and legal challenges (read: should only be done by trained health professionals and certified personnel). Protocols are important.
• Telemedicine is expensive for few sites, but costs go down with more sites
8 years of Telemedicine in the Philippines

• Telemedicine – connects. Links rural 1* care MD and specialists – professionally, socially
• Telemedicine – is a supportive tool
  • 1* care MD can take care of majority of cases but appreciate the support
• Current benefits are not enough → improvements needed
Contact us!

admin@info.telehealth.ph

NTHC
National Telehealth Center

eRecords  eLearning  Telemedicine

www.telehealth.ph

Putting Health in the hands of the People