mHealth in the context of health systems and universal health coverage

Ophira Ginsburg, NYU Langone Health
Carter Smith, Department of Medicine, Queen’s University, Canada
Objectives

1. To understand basic concepts of mHealth and its potential applications in cancer control

2. To know about BMJ-WHO mHealth evidence reporting and assessment checklist (mERA)

3. To describe the current evidence for mHealth strategies in breast & cervical cancer control from LMICs

4. To recognize the potential role for mHealth and other eHealth approaches in the context of health system strengthening & UHC
What is mHealth?

“Medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices.”

mHealth: New horizons for health through mobile technologies, WHO, 2011

“The use of mobile wireless devices for public health”

WHA 71 DG report, 2018
mHealth

Use of appropriate digital technologies for public health

Report by the Director-General
The use of mobile wireless technologies for public health, or mHealth,\(^3\) is an integral part of eHealth, which refers to the cost-effective and secure use of information and communication technologies in support of health and health-related fields.\(^4\) Today the term “digital health” is often used as a broad umbrella term encompassing eHealth as well as developing areas such as the use of advanced computing sciences (in the fields of “big data”, genomics and artificial intelligence, for example).

WHA 72 (WHO 2018)
Background (from WHA 71/20)

- ITU 2015: 7 billion mobile phone subscriptions, 70% in LMIC
- In many LMICs, more people have access to a mobile phone than to clean water, a bank account, or electricity.
- Digital tech including mobile tech has the potential to revolutionize how populations interact with health services
- mHealth can improve quality and coverage of care, increase access to health information, services, and skills, and promote positive changes in health behaviours
“The spread of digital tech and global interconnectedness has significant potential to accelerate Member States’ progress towards achieving universal health coverage, including ensuring access to quality health services.”

from WHA 71/20
“Increasing the capacity of Member States to implement digital health, in particular mHealth, could play a major role in realizing that potential, particularly:

a) By increasing access to quality health services
b) By increasing access to sexual and reproductive health services
c) By reducing premature mortality from NCDs and NCD morbidities
d) By increasing global health security.
e) By increasing safety and quality of care
f) By increasing patient, family, and community engagement

from WHA 71/20
BUT....

Governments have found it challenging to assess, scale up, and integrate mHealth “solutions”
BUT....

++ pilot studies with no process for scaling

Lack of interconnectedness btw apps, and of integration with existing national eHealth & HIS architectures
BUT....

Absence of standards and tools for comparative assessment (functionality, scalability, value) = lack of evidence to articulate normative guidance

Lack of multisectoral approach within government & donor agencies i.e. MOH & Ministry of ICT
Rules of engagement between mobile network operators and the private sector
Aims of Scoping Review

*BMJ Innovations (in press)*

- The practical utility of the evidence describing these mHealth interventions has not been assessed in previous reviews.

- We conducted a modified scoping review to critically assess studies describing mHealth interventions for women’s cancers from a healthcare delivery perspective –

- Critique the reporting of these interventions from an implementation science and global health delivery perspective.
mHealth evidence reporting and assessment (mERA)

• Goal: To improve the reporting of mobile health (mHealth) interventions
• Created By: WHO mHealth Technical Evidence Review Group
• Minimum set of information needed to define what the mHealth intervention is (content), where it is being implemented (context), and how it was implemented (technical features), to support replication of intervention.
### WHO mERA Checklist

<table>
<thead>
<tr>
<th>Item 1—Infrastructure: describe, in detail, the necessary infrastructure which was required to enable the operation of the mHealth programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 2—Technology platform: describe, in sufficient detail to allow replication of the work, the software and hardware combinations used in the programme implementation</td>
</tr>
<tr>
<td>Item 3—Interoperability: describe how, if at all, the mHealth strategy connects to and interacts with national or regional Health Information Systems (HIS)/programme context</td>
</tr>
<tr>
<td>Item 4—Intervention delivery: elaborate the mode, frequency, and intensity of the mHealth intervention</td>
</tr>
<tr>
<td>Item 5—Intervention content: describe how the content was developed/identified and customised</td>
</tr>
<tr>
<td>Item 6—Usability testing: describe how the end-users of the system engaged in the development of the intervention</td>
</tr>
<tr>
<td>Item 7—User feedback: describe user feedback about the intervention or user satisfaction with the intervention</td>
</tr>
<tr>
<td>Item 8—Access of individual participants: mention barriers or facilitators to the adoption of the intervention among study participants</td>
</tr>
<tr>
<td>Item 9—Cost assessment: present basic costs of the mHealth intervention</td>
</tr>
<tr>
<td>Item 10—Adoption inputs/programme entry: describe how people are informed about the programme or steps taken to support adoption</td>
</tr>
<tr>
<td>Item 11—Limitations for delivery at scale: present expected challenges for scaling up the intervention</td>
</tr>
<tr>
<td>Item 12—Contextual adaptability: describe appropriateness of the intervention to the context, and any possible adaptations</td>
</tr>
<tr>
<td>Item 13—Replicability: present adequate technical and content detail to support replicability</td>
</tr>
<tr>
<td>Item 14—Data security: describe security and confidentiality protocols</td>
</tr>
<tr>
<td>Item 15—Compliance with national guidelines or regulatory statutes</td>
</tr>
<tr>
<td>Item 16—Fidelity of the intervention</td>
</tr>
</tbody>
</table>
### Search Strategy

<table>
<thead>
<tr>
<th>Search Terms</th>
<th>Including terms:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Women’s cancers AND;</strong></td>
<td>women’s cancers, breast cancer, cervical cancer, cancer prevention, cancer screening</td>
</tr>
<tr>
<td><strong>Mobile health AND;</strong></td>
<td>mobile health, mHealth, eHealth, teleoncology, mobile phone, smartphone, telemedicine</td>
</tr>
<tr>
<td><strong>Low- and middle-income countries (LMICs)</strong></td>
<td>LMICs, India, Africa, Asia, South America, low-income country, middle-income country, developing country</td>
</tr>
</tbody>
</table>
Search Strategy

• Electronic Databases: MEDLINE, EMBASE, PsychINFO, Global Health (Ovid), Cochrane

• Hand searching using references from included studies, Google Search and Google Scholar

• Exclusion Criteria: studies on non-human animals, studies implemented only in HICs, studies with interventions not mainly dealing with women’s cancers, studies with interventions delivered through non-mobile technology (i.e. desktop computers)
PRISMA

194 references imported for screening
    32 duplicates removed
162 studies screened against title and abstract
    49 studies excluded
113 studies assessed for full-text eligibility
    72 studies excluded
      20 Not an mHealth intervention
      14 Not women’s cancer related
      10 Articles/studies focused only on high-income countries
      10 Non-mobile devices
      4 Non-mobile technology
    0 studies ongoing
    0 studies awaiting classification
14 studies included
Results and Interpretation

- 14 studies from LMIC included in results (7 cervical cancer, 8 breast cancer)
- All appeared to be pilot studies of the intervention with several different methodologies used
- Most (but not all) studies do not describe the intervention in sufficient detail to satisfy the mERA checklist – makes comparisons between interventions difficult
- Specific details describing how the intervention was delivered/implemented were sparse amongst included studies.
- Studies lacking these details make it challenging for end-knowledge users (e.g. MoH program managers) to determine whether a given intervention might be appropriate for their population/context.
Key takeaways

• Pre-implementation changes before rolling out the intervention should be described in detail

• Formative research should be done (and described) i.e. community-based participatory research, stakeholder consultation with pre-implementation testing for usability, feasibility
Key takeaways

Missed opportunities:

• linkages to the health system, context in terms of UHC, costs, cost-effectiveness, comparison with status quo

• viable path to scale from the pilot stage

• Identifying the strengths or weaknesses of an intervention with an eye towards scaling it are helpful details
QUESTIONS TO CONSIDER

1. Can the intervention be implemented as described?

2. Can the intervention be scaled?

3. Are there opportunities to link the intervention to the health system at local and/or national levels?
Thank You!
The promise of point-of-care technology: trends, opportunities, challenges, and limitations

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Division of Surgical Gastroenterology/Oncology
Department of Surgery
Obafemi Awolowo University
Ile-Ife, Nigeria
Introduction

• Cancer kills more people worldwide than HIV/AIDS, tuberculosis, and malaria combined

• By 2030, 70% of the mortality from cancer will come from LMIC
  • Poorly coordinated cancer control programme
  • Poor access to care
  • Sociocultural and psychosocial issues
  • Complicated health system
  • Lack of access to reliable, affordable, accurate laboratory services

Introduction

• With advance in technology most esoteric testing are being miniaturized

• POC tools can be defined as tests that are performed near the patient or treatment facility, and have rapid time-to-results, allowing for results to immediately influence patient management.

Trend

• The POC testing era began in 1956
  • POC for blood glucose - 1962
  • Rapid pregnancy test- 1977.
  • Market of POC is growing rapidly – $27.5 billion by 2018
• Microfluidic technology introduce in 1980s
• Biosensor technologies
  • lab-on-a-chip”
• Nanotechnology

Potential advantages of POC in cancer diagnostics & treatment?

• ‘Without reliable diagnostic testing, global health care is essentially flying blind’

• Early detection of cancer

• Assess the extent of the disease

• Monitor response to treatment
  • ‘rate of killing’ tumor cells 24 h after chemotherapy has begun

• Monitor recurrence

Potential benefit in LMIC

- Strengthening the primary care with potential to save million of lives

- Afford introduction of basic laboratory-based diagnostics to settings without previous capabilities
  - Syndromic treatment which may lead to overprescription and undertreatment
  - “ease-of-use” formats
  - Easy deployment in remote settings with poor or no laboratory infrastructure

Potential benefit in LMIC

• Possibly improve quality of lab result
  • QC of lab are lacking due to poor maintenance of equipment

• Improve follow up and reduce complexity of health system in LMIC
  • Potential to reduce travel distance

• Improve access
  • short turnaround time (TAT), minimal manual input, portability, low cost, immediate clinical decision-making

Putting the Power of ‘Omics into the Palm of your Hand – Role in upsurge of CRC in LMIC

Portable, Precise, Predictive & Preventative
Changing the Patient Journey

6-8 weeks, $300-$800

10-15 min, $10-$30
Patients present late in Nigeria

<table>
<thead>
<tr>
<th>Presenting stage</th>
<th>% Nigeria (n=145)</th>
<th>% USA (SEER)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>0%</td>
<td>39%</td>
</tr>
<tr>
<td>II</td>
<td>9%</td>
<td>36%</td>
</tr>
<tr>
<td>III</td>
<td>27%</td>
<td>-</td>
</tr>
<tr>
<td>IV</td>
<td>64%</td>
<td>20%</td>
</tr>
</tbody>
</table>

In Nigeria: 5x increase from 1979-2008

Alatise & Kingham unpublished data
Survival with CRC in Nigeria is poor

- 6 month survival (95% CI) was 62.6% (53.6-72.1)
- 12 month survival was 48.4% (95% CI 38.9-60.1)

Alatise & Kingham unpublished data
Our team

• USA:
  • Memorial Sloan Kettering Cancer Center
  • Albert Einstein

• Nigeria:
  • Obafemi Awolowo University Teaching Hospital
  • University College Hospital Ibadan
  • Ilorin Teaching Hospital

• Canada:
  • Alberta
Project Goals

• Develop a point-of-care urine metabolite test that can be administered to a high-risk patient population
  • Similar to breast cancer: screening finds a palpable mass -- identifies pts for a dx test (US or mammo)
  • Identify those at risk for colorectal cancer with a sensitivity of at least 80%
  • Reduce the number of normal colonoscopies by at least 50%

• Long-term goal: Limit need for and increase the yield of colonoscopy
Objective 1: Develop CRC screening Test for use in West Africa

Aim: Confirm signature and performance of PolypDx™ (3 metabolites devise) for polyps and CRC prior to transitioning to device-based test

• Phase I: Patients >40 years with CRC (n=150), polyps (n=150), controls (n=150)

• Quantified 141 metabolites in all samples by LCMS

• 468 Nigerian samples in 6 batches
  - 180 CRC, 58 polyp, and 229 normal
• Canadian samples
• American samples
Development and validation of a CRC predictor

Samples Split:
2/3 Training
1/3 Testing

Data Processing

Identify Key Metabolites on Training Samples

Train Predictor on Training Samples

Evaluate Predictor on Testing Samples

OAU

UA and MSK

AUC: 0.948

AUC: 0.864
Polyp detection in Nigerian patients adequate

MS-based predictor using:
- 3 metabolites
- Smoking History
- Sex
- Age

Nigerian data: Sensitivity 80% at specificity 46%
Cancer detection using 5 metabolites in West African and North American samples

- Sensitivity 92% at Specificity 50%
Cancer detection using 4 metabolites and clinical symptoms in West African and North American samples

- Sensitivity 82% at Specificity 50%
Objective 2: Transition LCMS-Based Screening Test to Portable Device

- Opted for Colorimetric assay to detect urine metabolites
  - Inexpensive (cartridges, reagents)
  - Assays specific for each of the 5 metabolites

- Device features
  - Automated functionality
  - Simple user interface and reporting format
  - Single-use cartridges (no need for cleaning)
  - ISO 13485 compliant; ready for large-scale manufacturing
Metabolomic Assay Development: Challenges

- Working with Urine samples
  - Variations in reaction conditions due to sample-to-sample variation
  - Presence of unknown inhibitory compounds (affecting each test)

- Developing multiple-enzyme assays
  - Identification and linking of biochemical reactions
  - Optimization of 1 condition for all reactions in each assay
  - Types of substrate (cellulose, cotton, acrylamide, PVA, PVP)

- Moving assay to solid substrates
  - Optimization of protecting additives: cryoprotectants, dry-protectants (polymers, sugars, surfactants)

- Storage and shipping challenges
  - Optimal shelf life & storage (4C, -20C)
New Device

• Multiple sensors
• Smaller overall
• More customizable
The Device

Colorimetric RGB Sensor

Portable, Quantitative Metabolomic Devices
Two-part Device

1. Cartridge
   • Single use, disposable, non-toxic, acrylic
   • Shipped ready-for-use

2. Box
   • Multiple uses (>2,000; testing in progress)
   • White light sensors and imaging system
   • Automated pump to load urine into cartridge
   • Automated image capture system
   • Android tablet for data entry, internet connectivity, and reporting
Challenges and limitation

• Most POC tests are developed in high-income countries, they might not be the optimal tools in settings with weak health care infrastructures

• Evaluation of the impact
  • Accuracy, Clinical impact and Cost effectiveness
  • highly sensitive, specific, easy, cheap, and rapid, but in many cases technological or capacity limitations make it impossible

Challenges and limitation

• Standardization and comparability
  • Different way of doing same test

• Vendor specific vs vendor neutral data management systems

• Time to migrate from innovation to clinical usage – FOBT

• Procurement and distribution challenges – urban vs rural community
  • Poor forecasting and stock management

Challenges and limitation

• Reduce investment in high tech laboratory services which is found in developed country that could support not only treatment but research.

• Replacement or supplement
  • Is faster always better?
Overcoming the challenges

• Let the local be part of the solution with critical need assessment

• “Poor countries deserve good laboratories, and point of care devices too. All countries deserve the technologies that we enjoy here. It is time to reject the mind-set that syndromic treatments are adequate for poor countries, and work towards having a functional lab infrastructure” (Prof Madhukar Pai).
Way forward

• Continued search for ASSURED tests

• Create a road map for test introduction

• Developing sustainable diagnostic quality assurance programmes

• Advocate for an increased focus on diagnostics in research and policy which should include honest assessment of innovation

Way forward

• Defining the role of rapid diagnostics for each cancers

• Inclusion of POC as part of an essential diagnostics package for improving health in developing countries.

• Investment in health sector strengthening

• Addressing market shortcomings and supply chain

Acknowledgements

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MEMORIAL SLOAN KETTERING CANCER CENTER, USA
Thank you
Project ECHO
Changing the World, FAST

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@ProjectECHO
UNMProjectECHO
Project ECHO reduces disparities in health by moving knowledge instead of people.

We democratize knowledge to get best practices in care to underserved people all over the world.

Our goal: to improve the lives of 1 billion people by 2025.
Initially focused on one disease: Hepatitis C

In 2004:

- 28,000 infected with HCV in New Mexico
- Zero treatment of prison population
  - 2,300 prisoners were HCV positive, representing 40% entering corrections system
- Wait list for HCV Clinic = 8 months
The ECHO Model - Move Knowledge Not Patients

Amplification – Use Technology to leverage scarce resources

Case Based Learning to master complexity

Share Best Practices to reduce disparity

Web-based Database to Monitor Outcomes

Copyright © ECHO Institute
ECHO model is not ‘traditional telemedicine’.
Treating Physician retains responsibility for managing patient.
## Project ECHO Clinicians

### HCV Knowledge Skills and Abilities (Self-Efficacy)

scale: 1 = none or no skill at all 7= expert-can teach others

<table>
<thead>
<tr>
<th>Community Clinicians</th>
<th>BEFORE Participation MEAN (SD)</th>
<th>TODAY MEAN (SD)</th>
<th>Paired Difference (p-value) MEAN (SD)</th>
<th>Effect Size for the change</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Ability to identify suitable candidates for treatment for HCV.</td>
<td>2.8 (1.2)</td>
<td>5.6 (0.8)</td>
<td>2.8 (1.2) (&lt;0.0001)</td>
<td>2.4</td>
</tr>
<tr>
<td>2. Ability to assess severity of liver disease in patients with HCV.</td>
<td>3.2 (1.2)</td>
<td>5.5 (0.9)</td>
<td>2.3 (1.1) (&lt; 0.0001)</td>
<td>2.1</td>
</tr>
<tr>
<td>3. Ability to treat HCV patients and manage side effects.</td>
<td>2.0 (1.1)</td>
<td>5.2 (0.8)</td>
<td>3.2 (1.2) (&lt;0.0001)</td>
<td>2.6</td>
</tr>
</tbody>
</table>

(continued)
<table>
<thead>
<tr>
<th>Community Clinicians N=25</th>
<th><strong>BEFORE Participation MEAN (SD)</strong></th>
<th><strong>TODAY MEAN (SD)</strong></th>
<th><strong>Paired Difference (p-value) MEAN (SD)</strong></th>
<th><strong>Effect Size for the change</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Ability to assess and manage psychiatric co-morbidities in patients with hepatitis C.</td>
<td>2.6 (1.2)</td>
<td>5.1 (1.0)</td>
<td>2.4 (1.3) (&lt;0.0001)</td>
<td>1.9</td>
</tr>
<tr>
<td>5. Serve as local consultant within my clinic and in my area for HCV questions and issues.</td>
<td>2.4 (1.2)</td>
<td>5.6 (0.9)</td>
<td>3.3 (1.2) (&lt;0.0001)</td>
<td>2.8</td>
</tr>
<tr>
<td>6. Ability to educate and motivate HCV patients.</td>
<td>3.0 (1.1)</td>
<td>5.7 (0.6)</td>
<td>2.7 (1.1) (&lt;0.0001)</td>
<td>2.4</td>
</tr>
</tbody>
</table>
Cronbach’s alpha for the BEFORE ratings = 0.92 and Cronbach’s alpha for the TODAY ratings = 0.86 indicating a high degree of consistency in the ratings on the 9 items.

<table>
<thead>
<tr>
<th>Community Clinicians</th>
<th>BEFORE Participation MEAN (SD)</th>
<th>TODAY MEAN (SD)</th>
<th>Paired Difference (p-value) MEAN (SD)</th>
<th>Effect Size for the change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Competence (average of 9 items)</td>
<td>2.8* (0.9)</td>
<td>5.5* (0.6)</td>
<td>2.7 (0.9) (&lt;0.0001)</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Patient Outcomes Equal to University in Rural Areas and Prisons

- Patient cure rates equal to those of UNM specialists
- Patients stay in communities treated by people they know and trust
- Many more people getting treatment

### Patient Viral Response

<table>
<thead>
<tr>
<th>Outcome</th>
<th>ECHO</th>
<th>UNMH</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minority</td>
<td>68%</td>
<td>49%</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>SVR* (Cure) Genotype 1</td>
<td>50%</td>
<td>46%</td>
<td>ns</td>
</tr>
<tr>
<td>SVR* (Cure) Genotype 2/3</td>
<td>70%</td>
<td>71%</td>
<td>ns</td>
</tr>
</tbody>
</table>

*SVR = sustained viral response

ECHO now reaching a breadth of areas

- Antimicrobial Stewardship
- Autism
- Behavioral Health
- Bone Health
- Cancer
- Cardiology
- Chronic Lung Disease
- Chronic Pain
- Crisis Intervention
- Diabetes and Endocrinology
- Education
- Geriatrics
- Good Health and Wellness in Indian Country
- Hepatitis
- High-Risk Pregnancy
- HIV/AIDS
- Infectious Disease
- Integrated Addictions & Psychiatry
- Laboratory Medicine
- LGBT Health
- Opioid Use Disorder
- Palliative Care
- Pediatrics
- Prison Peer Education
- Quality Improvement
- Rheumatology
- Sexually Transmitted Diseases
- Trauma-Informed Care
- Tuberculosis
Broader ECHO outcomes
513 patients who had a liver SCAN-ECHO visit were found within the cohort. Patients who had completed a virtual SCAN-ECHO visit were more likely younger, rural, with more significant liver disease, and evidence for cirrhosis. Propensity adjusted mortality rates using Cox Proportional Hazard Model showed that a SCAN-ECHO visit was associated with a hazard ratio of 0.54 (95% CI 0.36-0.81, p = 0.003) compared to no visit.

Peer Reviewed Publications n=129

% of peer-reviewed publications (N=116)

- Provider Learning: 73%
- Quality of Care: 19%
- Access to Care: 15%
- Workforce Issues: 13%
- Efficiency and Cost Barriers to Adoption: 5%
- Implementation science: 5%
ECHO Publications by Moore’s Outcome Levels

- Participation: 60
- Satisfaction: 35
- Learning: 30
- Competence: 25
- Performance: 20
- Patient Health: 10
- Community Health: 0
ECHO Hubs and Spokes: State of New Mexico
ECHO Hubs and Superhubs: United States
ECHO Hubs and Superhubs: Global
Force Multiplier
Use Existing Community Clinicians

Specialists | Primary Care | Physician Assistants | Nurse Practitioners
---|---|---|---
Chronic Pain | Palliative Care | Survivorship
Potential Benefits of the ECHO Model

- Quality and Safety
- Rapid Learning and best-practice dissemination
- Reduce variations in care
- Access for Rural and Underserved Patients, reduced disparities
- Workforce Training and Force Multiplier
- Improving Professional Satisfaction/Retention
- Supporting the Medical Home Model
- Cost Effective Care- Avoid Excessive Testing and Travel
- Prevent Cost of Untreated Disease (e.g.: liver transplant or dialysis)
- Integration of Public Health into treatment paradigm

Democratize Knowledge
Opportunity to improve cancer care

Prevention
- Smoking cessation
- HPV vaccination
- Hepatitis B vaccination
- Sun safety & skin cancer prevention
- Community cancer intervention & prevention

Screening
- Dermatology
- Breast cancer
- Cervical & colorectal cancer
- Oral & lung cancer
- Pathology best practices
- Training peer and community health advocates

Treatment
- Hepatitis B and C
- Pain & toxicity management
- Tumor Boards
- Cancer care navigation
- Precision medicine & cancer genomics
- Palliative care
- Survivorship
- Clinical trial enrollment
Cancer ECHO Hubs & Programs

Cancer ECHO Hubs
24

Countries
7

Programs
65
Active Programs: Participation from ministries of health, NGOs, UICC, WHO, CDC, AORTIC, international foundations, cancer centers.

- **Asia-Pacific Economic Cooperation (APEC) ECHO**: Cancer Control Planning ECHO with work in Cervical Cancer Implementation of evidence based practices
  - Participants from China, Malaysia, Peru, Papua New Guinea, Thailand, Vietnam, Canada and the United States

- **Africa ECHO**: Cancer Control Planning ECHO
  - Participants from Botswana, Ethiopia, Kenya, Malawi, Namibia, Nigeria, Rwanda, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe

Cohort Program

- **Caribbean ECHO**: Cancer Control Planning specific to Cervical Cancer Caribbean ECHO Asian Pacific Economic Cooperation ECHO
  - Participants from Suriname, Jamaica, Trinidad and Tobago, Grenada, Barbados, Dominican Republic and Dominica
The ECHO Team
What Makes ECHO Work?

- Team Based Care
- Task Shifting
- Interprofessional Consultation
- Guided Practice
- Movement Building Vs. Organization Building
- All Teach All Learn
- De-monopolizing Knowledge
- Force Multiplication
- Technology

- Community of Practice (Social Network)
- Joy of Work
- Mentor/Mentee Relationship

N M HEALTH SCIENCES  ECHO
Thanks to our supporters
Join Us

Be part of the movement to improve 1 billion lives

For more information

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