PIVOT’s Role in $E^2M^2$
the interface between health care and research

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Investing in health for economic development

Macroeconomics and Health: Investing in Health for Economic Development

Report of the Commission on Macroeconomics and Health

Presented by Jeffrey D. Sachs, Chair to Gro Harlem Brundtland, Director-General of the World Health Organization on 20 December 2001
Investing in health for economic development

Development assistance for health (DAH)

Growth is stagnant, but the needs haven’t gone away

DAH by health focus area, 1990-2016

Total DAH amounted to **$37.6 billion** in 2016

- Continued improvements in maternal, newborn, and child health may depend on increased funding in those areas.
- HIV/AIDS remains an epidemic, but DAH for HIV/AIDS has declined by $100 million per year since 2010. With access to treatment, HIV/AIDS is a chronic condition requiring ongoing management.

*2015 and 2016 are preliminary estimates.
†The majority of countries did not reach their goals for MDGs 4 and 5 (reducing child and maternal mortality).

**Note:** Health assistance for which we have no health focus area information is designated as “unidentified.” “Other” captures DAH for which we have project-level information but which is not identified as funding any of the health focus areas tracked.
Major improvements in health and economic development

4. The global under-5 mortality rate reduced by 53% in the past 25 years (from 90.6 to 42.5 per 1000 live births)

5. The global maternal mortality rate reduced by 43.9% in the past 25 years (from 385 to 216 per 100,000 live births)

6. Mortality related to HIV, Tuberculosis and Malaria declined by 30-60 percent (depending on the disease) between 2000 and 2015
A new framework of action

1. Reduce poverty and social exclusion
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS and tuberculosis
7. Ensure environmental sustainability
8. Partnership for development

2000-2015

2016-2030

Sustainable Development Goals
Ensuring sustainability through horizontal programs

At least 400 million people worldwide lack access to essential health services

THE WHO HEALTH SYSTEM FRAMEWORK

SYSTEM BUILDING BLOCKS

SERVICE DELIVERY
HEALTH WORKFORCE
INFORMATION
MEDICAL PRODUCTS, VACCINES & TECHNOLOGIES
FINANCING
LEADERSHIP / GOVERNANCE

ACCESS

QUALITY

COVERAGE

SAFETY

OVERALL GOALS / OUTCOMES

IMPROVED HEALTH (LEVEL AND EQUITY)
RESPONSIVENESS
SOCIAL AND FINANCIAL RISK PROTECTION
IMPROVED EFFICIENCY
Ensuring sustainability through horizontal programs

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Challenges for investing in horizontal interventions

« Achieving convergence in global health by 2035 (...) will only be possible if the very large “delivery gap” can be closed—that is, the gap between the interventions known to be effective and what is actually being delivered. »

*Lancet Global Health 2035 Commission on Investing in Health*

« When assessments of delivery do occur, they are often narrow studies of the cost-effectiveness of a single intervention rather than the complex set of them required to deliver value to patients and their families »

J. Kim, P. Farmer, M. Porter (2013) *The lancet*
Building a platform for HSS research
Challenges and opportunities in Madagascar

- Poverty rate: 82% (1,90 USD/day)

Lowest health expenditure in the world (USD per capita, 2014):
- Sub-Saharan Africa: 98
- Low income: 37
- Madagascar: 14

Challenges and opportunities in Madagascar.
Our Approach

We are creating an evidence-based model health district in partnership with the Ministry of Health that can be scaled throughout Madagascar.

Guided by existing policies, the model includes the integration of clinical programs, strengthened systems, and data and research...

As of the end of 2016, PIVOT had begun the transformation of the District Hospital, established four model health centers, and constructed twenty community health posts.
A platform for health system strengthening

1. Health System
   - Hospital
   - Health center
   - Community

Health System Strengthening (Inputs)
- Service Delivery
- Health Workforce
- Information Systems
- Medicines and Supplies
- Financing
- Leadership and governance

Health System Performance (Outputs)
- Service and Readiness
- Quality
- Access

Population Health (Outcomes and Impacts)
- Changes in population health

2. Data Platform
   - Input metrics
   - Quality of Care Assessments
   - Health Management Information Surveys (HMS)
   - Health Facility Surveys
   - Household Surveys
   - Contextual Knowledge
   - Cohort Study

3. Analysis
   - Routine and Contextual Analysis
   - Policy Implementation Research
   - Scientific Research
A platform for health system strengthening

PIVOT intervention

Data collection

Ifanadiana District 2017

Health Center Intervention
- CSB1 Partial Intervention
- CSB2 Partial Intervention
- CSB2 Full Intervention

Community intervention
- No
- Yes

Road Type
- Paved road
- Non-paved road
## A platform for health system strengthening

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### 2014
- Referral network
- User fee exemptions
- Facility Renovations
- Medical staff hires
- Medical trainings
- Malnutrition program (1<sup>ary</sup> & 2<sup>ary</sup> level)
- Support to IMCI

### 2015
- Referral network
- User fee exemptions
- Facility Renovations
- Medical staff hires
- Medical trainings
- Malnutrition program (1<sup>ary</sup> & 2<sup>ary</sup> level)
- Support to IMCI
- Community-level care

### 2016
- Referral network
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- Malnutrition program (1<sup>ary</sup> & 2<sup>ary</sup> level)
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### 2017
- Referral network
- User fee exemptions
- Facility Renovations
- Medical staff hires
- Medical trainings
- Malnutrition (1<sup>ary</sup>, 2<sup>ary</sup> & community level)
- Support to IMCI
- Community-level care (expansion)
- Tuberculosis program

### 2018
- Referral network
- User fee exemptions
- Facility Renovations
- Medical staff hires
- Medical trainings
- Malnutrition (1<sup>ary</sup>, 2<sup>ary</sup> & community level)
- Support to IMCI
- Community-level care (expansion)
- Tuberculosis program
The situation when PIVOT started (2014)

THE SURVEY
1,600 Households across Ifanadiana
Information on > 8,000 individuals

1 in 6  Under-5 Mortality
1 in 14 Lifetime Maternal Mortality

Population living in extreme poverty 73%
Children under 5 with ARI taken for care 35%
Mothers delivering last baby in a health care facility 18%

Miller et al. (2017)
Impact evaluation of two user-fee exemptions

Legend

Health System
- District Hospital
- Major Health Center (CSB2)
- Basic Health Center (CSB1)
- Village included in baseline survey
- Village not included in baseline survey

% of households seeking health care
- 0% - 9.9%
- 10% - 15%
- 15.1% - 25.1%
- 25.2% - 35%
- 35.1% - 64.7%

Paved road
Non-paved road

Average household wealth score
- 0.02 - 0.06
- 0.07 - 0.1
- 0.11 - 0.16
- 0.17 - 0.27
- 0.28 - 0.5

Garchitorena et al. (2017)
Impact evaluation of two user-fee exemptions

PAUSENS program characteristics
- Since February 2014 at all CSBs 2 in the district
- Target: children <5 & pregnant women of the whole 185,000 district population
- Reimbursement of all medical visit costs

PIVOT program characteristics
- Since October 2014 at 4 PIVOT supported CSBs
- Target: all patient in the catchment population (1/3 of 185,000 district population)
- Reimbursement of 40 essential meds and 20 consumables

Garchitorena et al. (2017)
Impact evaluation of two user-fee exemptions

Impact of user-fee removal
- 65% increase in outpatient consultations (all patients)
- 52% increase in outpatient consultations (children under five)
- 25% increase in maternal consultations (prenatal, deliveries, postnatal)

Cost Per Patient
- Health Center: $0.68
- Hospital: $26

Garchitorena et al. (2017)
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**Data collection**

- 2014: Baseline population survey, Internal PIVOT data, MoH HMIS data, Facility Assessments
- 2015: Follow-up population survey, Internal PIVOT data, MoH HMIS data
- 2016: Internal PIVOT data, MoH HMIS data, Facility Assessments, Project-driven data
- 2017: Internal PIVOT data, MoH HMIS data, Facility Assessments, Project-driven data
- 2018: Follow-up population survey, Internal PIVOT data, MoH HMIS data, Project-driven data
Changes in coverage: catchment vs. rest of Ifanadiana

- Composite coverage index
- Child received all vaccines
- Oral rehydration therapy for diarrhea
- Care seeking for fever
- Care seeking for ARI
- Antenatal care (1+ visits with skilled provider)
- Antenatal care (4+ visits with skilled provider)
- Birth delivered at Health Facility
- Birth delivered by c-section
- Postnatal care (within 48h with skilled provider)
- Care seeking for illness of a household member
Changes in healthcare utilization

- **ALL PATIENTS**
- **CHILDREN UNDER 5**
- **PRENATAL CARE (CPN1)**
- **PRENATAL CARE (CPN4)**
- **DELIVERIES**
- **POSTNATAL VISITS**

The graphs show the yearly per capita utilization from 2013 to 2016, comparing Pivot-supported CSB2 (red) and Not supported CSB2 (blue).
Changes in child mortality

- Neonatal mortality (deaths/1000)
- Infant mortality (deaths/1000)
- Under 5 mortality (deaths/1000)

Graphs showing trends from 2014 to 2018 for PIVOT catchment, Rest of District, and Madagascar.
Changes in coverage: spatial distribution (children)

Legend:
- Commune Limit
- Villages Sampled
- Paved road
- Non-paved road

Health System:
- Hospital
- Health Center (PIVOT supported)
- Basic Health Center

HC access for fever (Children under five):
- 0 - 0.05
- 0.05 - 0.15
- 0.15 - 0.25
- 0.25 - 0.35
- 0.35 - 0.5
- 0.5 - 0.65
- 0.65 - 0.8
- 0.8 - 1

2014

2016
Driving innovation in global health

Field testing of frugal technologies for disease surveillance and diagnosis
Lymphatic filariasis research:

(1) Measure point prevalence of Lymphatic Filariasis in Ifanadiana

(2) Transmission Assessment Survey in 3 other districts
Setting the stage for a Planetary Health research agenda

1. Determinants of vector dynamics
   1.1 Entomological identification & infection
   1.2 Satellite & climate data
   1.3 Statistical modelling of vector dynamics

2. Drivers of malaria spatio-temporal patterns
   2.1 Human disease data collection
   2.2 Socio-economic data collection
   2.3 Statistical modelling of transmission risk

3. Coupled transmission models
   3.1 Mathematical model development
   3.2 Integration in routine monitoring and evaluation

IMPACT
Prediction of malaria risk in Ifanadiana
Development of early warning system for NGO activities
Information on best strategies for local malaria control
The role of PIVOT in E2M2
So why is PIVOT interested in supporting E2M2?

ANNOUNCING THE INAUGURAL CLINIC -
E2M2: ECOLOGICAL AND EPIDEMIOLOGICAL MODELING IN MADAGASCAR
NOVEMBER 27-DECEMBER 3, 2016
CENTRE VALBIO, RANOMAFANA NATIONAL PARK, MADAGASCAR

PIVOT is all about strengthening!!
So why is PIVOT interested in supporting E2M2?

Partners in Health is a non-governmental health care organization that focuses on supporting governments to provide health care to under-served communities. In 2005, PIH was invited by the Government of Rwanda (GoR) to support the implementation of a model health care system in the Southern Kayonza and Kirehe districts of Rwanda’s impoverished Eastern Province, where the U5 mortality rate was 233/1000 (17), and later to expand this program to the Burera district of the Northern province (Figure 1). The partnership has since completed the construction of three district hospitals. In addition to providing resources and services that strengthen the district hospitals and their satellite health centers, PIH has developed and supported a network of trained and compensated community health workers who visit every household at least once per month. The three district hospitals support over 30 health centers, 9 of which are now fully capacitated. By 2015, 25 health centers will be operating at full capacity. With over 800 full-time employees, in addition to supporting many more MoH staff, and over 3000 trained and compensated community health workers, PIH is now the largest nongovernmental health care provider in Rwanda. Children who were born when PIH finished constructing its first hospital in Southern Kayonza are now entering primary school, offering us a rare opportunity to measure changes in child development in real time.

Quantitative research capacity to advance our mission
The longterm goal...

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   - Health center
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   **Health System Performance (Outputs)**
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