Institute for Globally Transformative Technologies
at the Lawrence Berkeley National Lab

The Nairobi Women's Hospital
With passion we deliver healthcare

INDUS HOSPITAL
Pakistan

University of California
San Francisco

The Universal Clinics Project

An innovative model for quality, hi-tech, and affordable healthcare

June, 2015

LIGTT: An Introduction

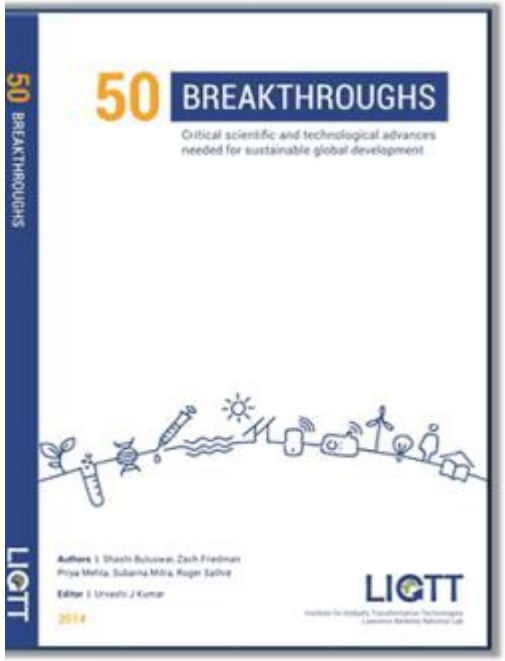
- **3,500** scientists and engineers
- **$800 million** of annual R&D
- **13** Nobel Laureates
- **US**-focused

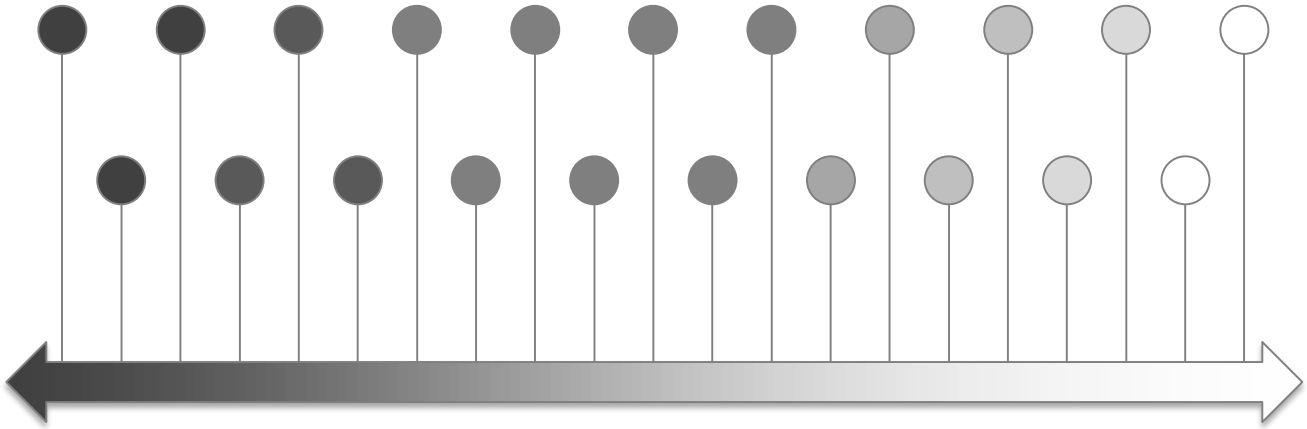
LIGTT

Institute for Globally Transformative Technologies
at the Lawrence Berkeley National Lab

- **Objective:** Leverage LBNL's capabilities to develop breakthrough technologies for addressing global poverty
- **India** is a primary area of focus

We select technologies from our ‘50 Breakthroughs’ study



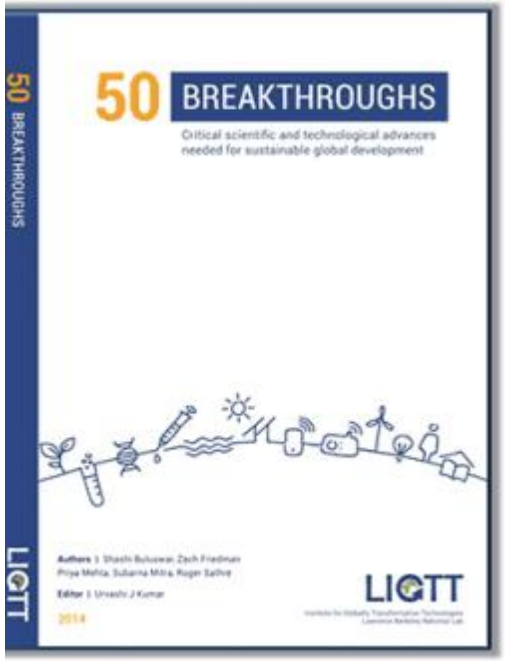


Least ready (>= 10 years)

Most ready (1-2 years)

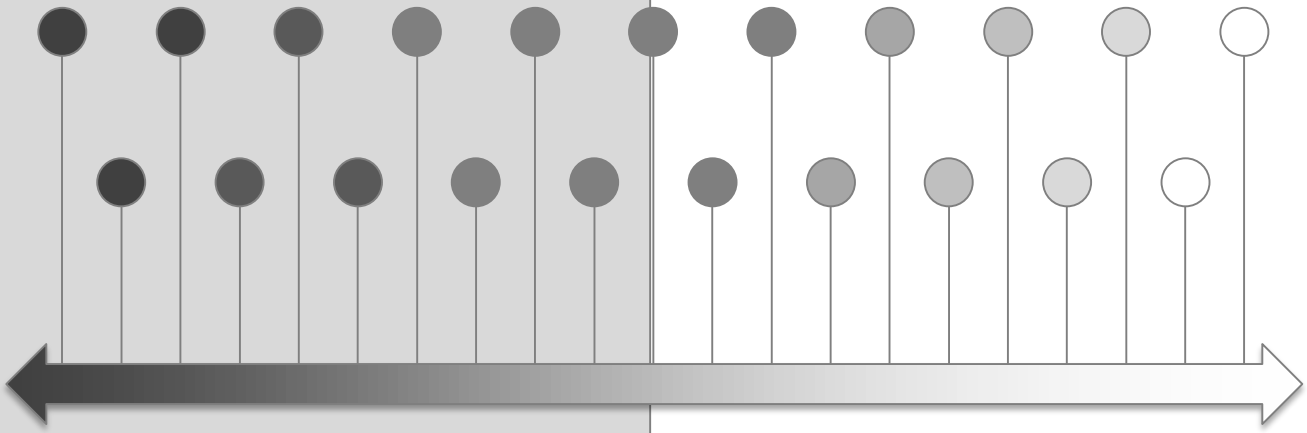
Projected market readiness

… and focus on breakthroughs which need acceleration



LIGTT focus

On-the-horizon breakthroughs that can be **accelerated** by leveraging R&D from LBL & other research institutions

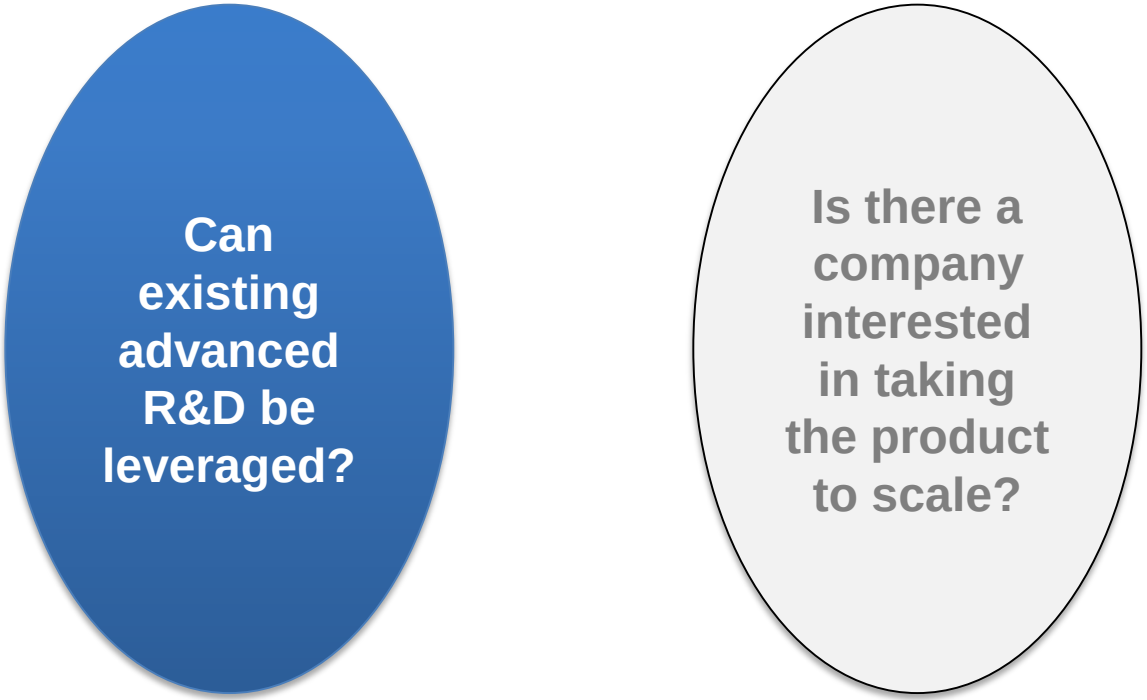


Least ready (>= 10 years)

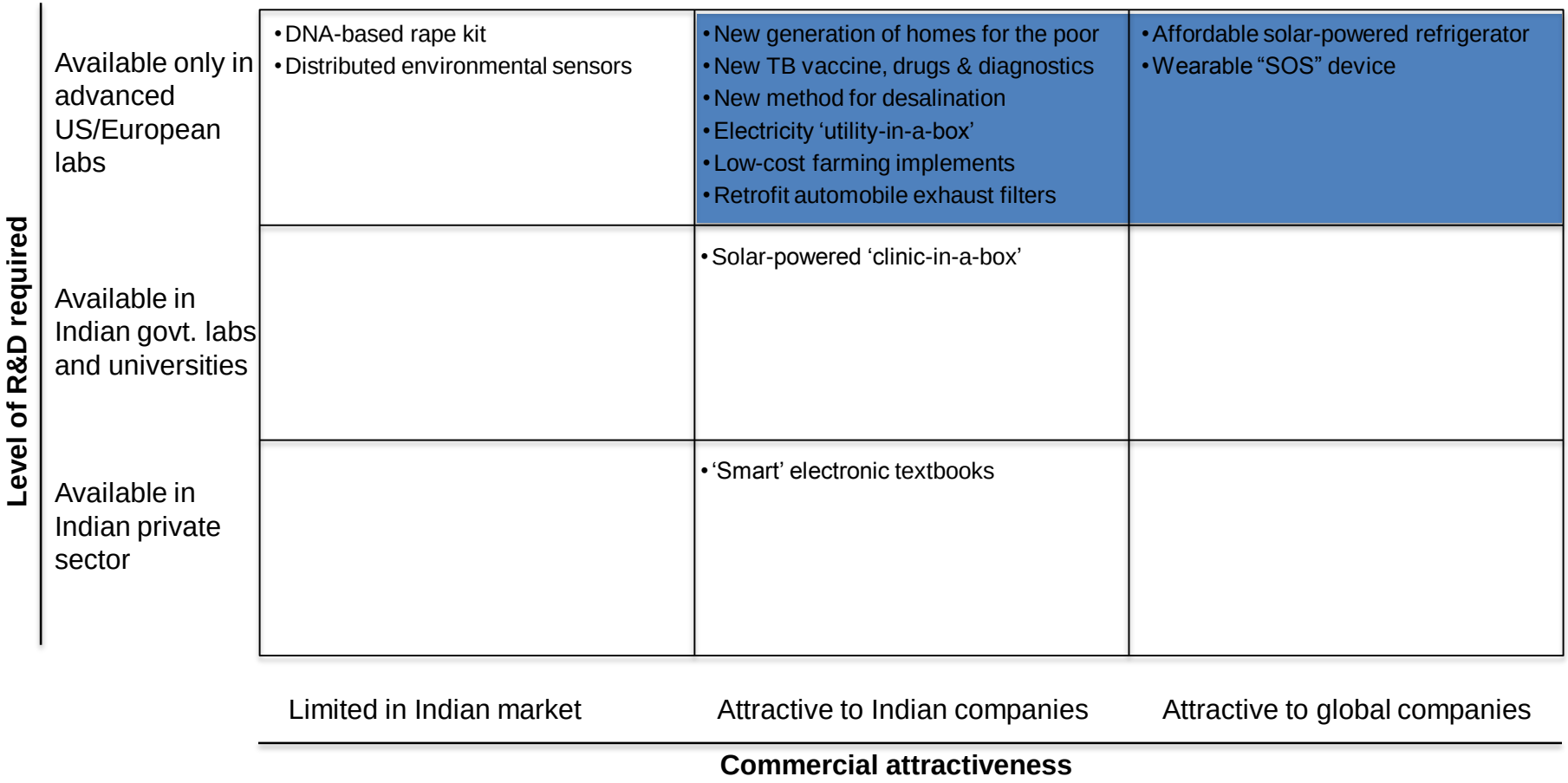
Most ready (1-2 years)

Projected market readiness

Our basic model



Our basic model (India example)

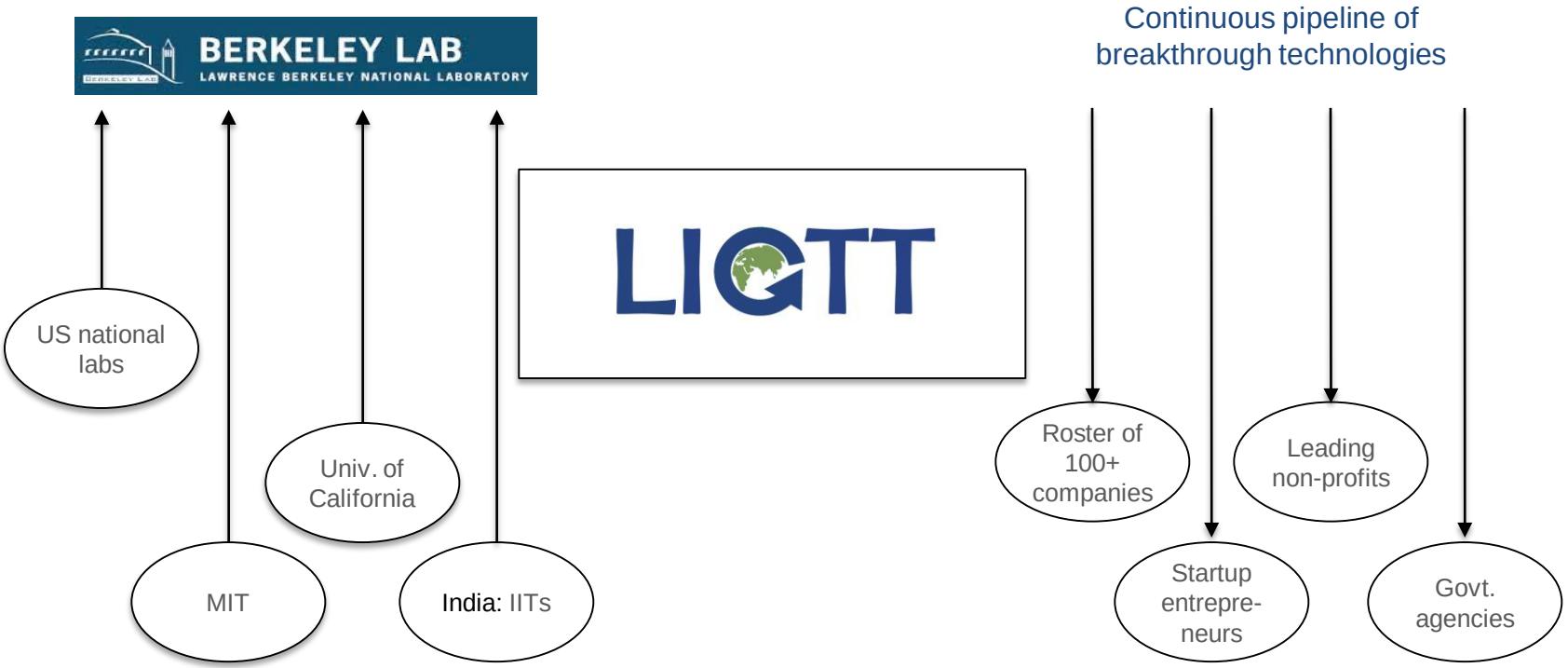


We bring advanced R&D to life and impact

R&D:
Source targeted innovations from world's best institutions

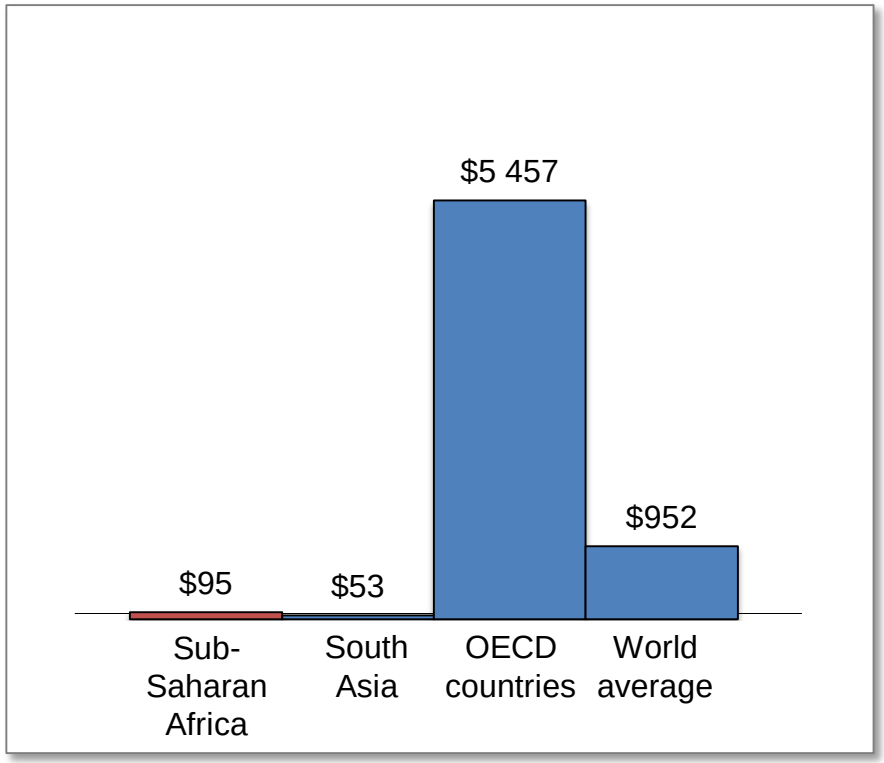
Product development:
Working closely with scientists & downstream companies

Commercialize:
Identify appropriate company and license the technology

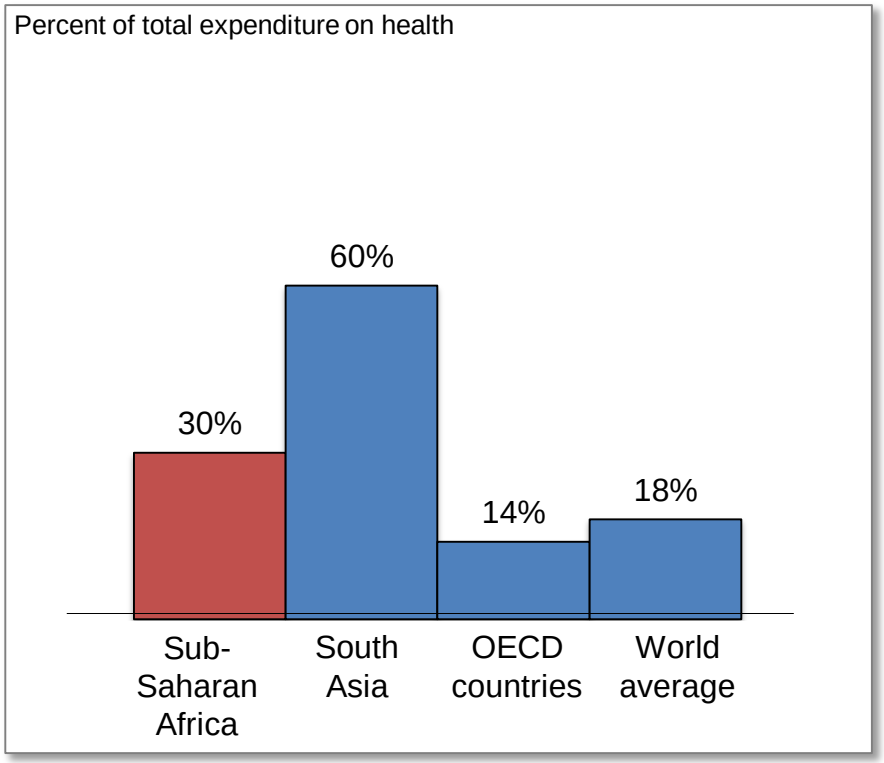


Public healthcare funding in developing countries is very low

Per capita annual expenditure on health



Out-of-pocket expenditure on health



Most existing clinics are very poorly equipped

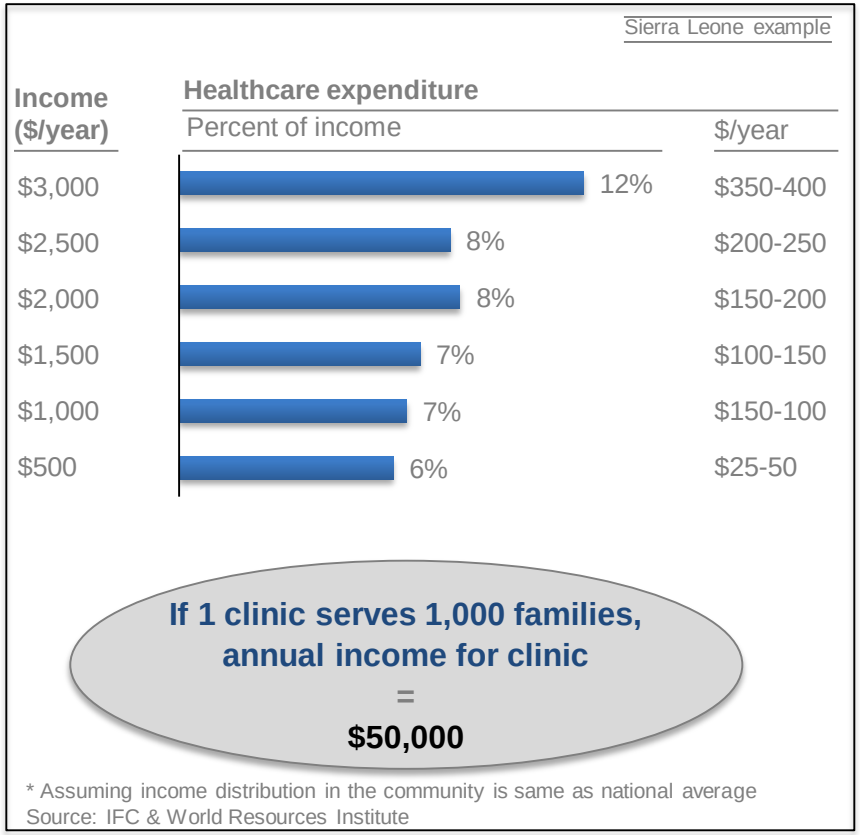
Currently, it costs $100,000-150,000 to build a basic clinic

	Main devices/equipment	Current lowest cost
Basic amenities	• Building/structure • Power source • Medical quality lighting • Water purifier • Sanitation	$ 25,000 - 30,000
Maternal care	• Ultrasound • PPH kit (hemoglobin test, anti-shock, blood volume measurement, hemoglobin test) • Suturing kit	$ 15,000 - 25,000
Neonatal care	• NICU incubator: lighting, CPAP, oxygen concentrator, heat, etc. • Suction device	$ 30,000 - 50,000
Other	• Sterilizer • Medical/vaccine refrigerator • Medical transport (e.g., light ambulance) • IV equipment • Biometric patient tracking • Patient database	$ 25,000 - 50,000
		$ 100,000 - 150,000

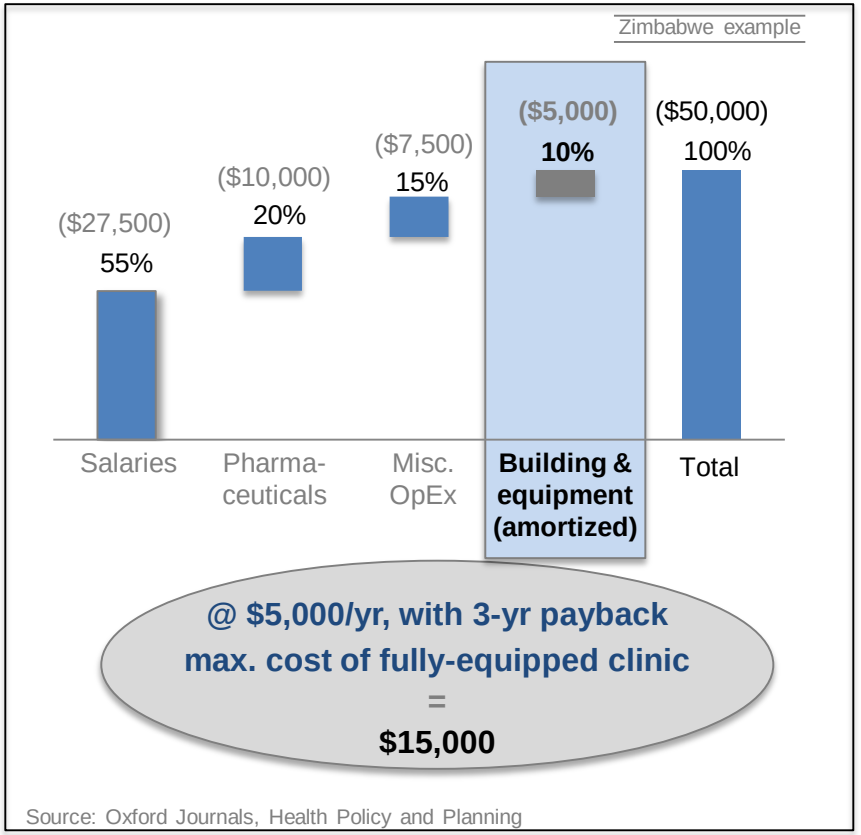
- Current cost of basic clinic: **$100,000 - 150,000**
- Most functional clinics also require **diesel generator**
- **<10%** of rural poor in developing countries have access to adequate clinics

Our analysis: fully equipped clinics needs to cost $15,000

How much low-income families spend on healthcare: 5-15% of income



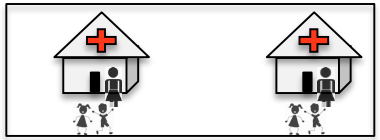
Typical cost of operating a rural clinic



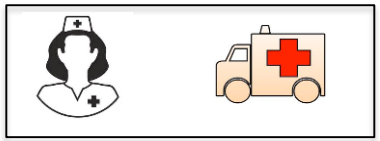
A hub-spoke-outreach model

Hubs:
6-10 hospitals nationwide

Spokes:
1,000+ rural clinics



Outreach:
Sparsely populated areas



Role/services at each level

- Doctors consult with spoke-based clinicians as required, based on based on protocol
- Each doctors responsible for outcomes, quality control at 10-15 clinics
- Hubs responsible
- Advanced labs, facilities and care

- Powered by “clinic-in-a-box”, with oversight from hub-based doctor
- Two types of clinics outpatient-only and inpatient
- Outpatient-only services
  - Routine primary care, antenatal and postnatal care
  - Immunizations and well-baby care
  - Pharmacy
  - Point-of-care diagnostics
- Inpatient services includes all outpatient-only services, plus
  - Ob/Gyn with peri- and post-natal care for routine and high-risk pregnancies
  - Immediate baby care up to 6 weeks
  - Comprehensive labs
- One [1+5] *cluster* = 1 inpatient clinic + 5 outpatient-only clinics

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- Mobile unit with most of the ‘clinic-in-a-box’ devices, likely visiting communities periodically (e.g., one week out of a month)
- Community medical officer with a smaller set of devices to provide routine care

Five key elements of the model

Integrated suite of new-generation medical devices

Enabling a range of diagnostic and treatment services, which are simply not possible today

- Solar-powered
- Substantially less expensive than devices currently on the market
- Robustly engineered
- User-centric design

Tiered hub-spoke-outreach model

Three service delivery modalities

- Core clinics (retrofitted existing facilities, new structures, or shipping containers
- Mobile clinics (custom-fitted buses or vans)
- Telemedicine (audio/video linkages, connecting clinics with nurses/physicians in the hub)

Financially sustainable business model

An economic model which ensures that each clinic, and the network of clinics, is financially sustainable

- Without the need for ongoing philanthropic funding
- Based on published understanding of how much low-income families currently spend on healthcare

Training, certification & ongoing skill-building

Based on existing UNICEF/WHO-endorsed material

- Material in electronic form on a tablet, with embedded photographs and video
- Regular push updates
- Financial incentives for clinicians to keep abreast of new material

Customer-centric, outcome-focused management

Patient health tracking using thumbprint ID and patient database, combined with clinician incentives

- Clinicians incentivized to create demand for their services, and increase throughput
- Annual wellness check (core diseases, BP, nutrition level, etc.) to optimize for long-term patient health