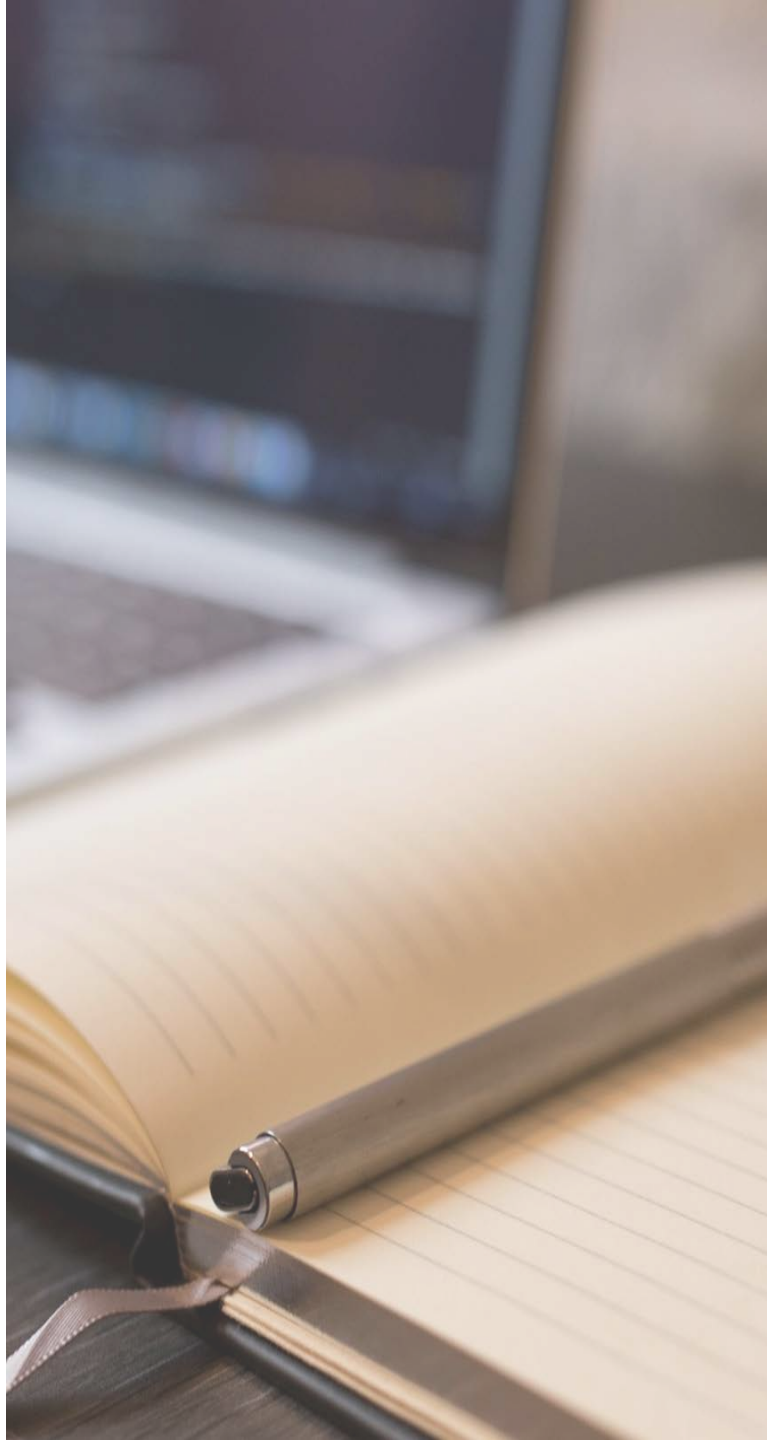
FIGHTING CHILDHOOD PNEUMONIA:

STARTING WITH UGANDA

A5 CONSULTING

AGENDA

- Vaccination Challenges
- Underlying Causes
- Areas of Improvement
- Solution
- Risk Evaluation
- Impact Forecast



CHALLENGES

AWARENESS

CULTURE

DEMAND

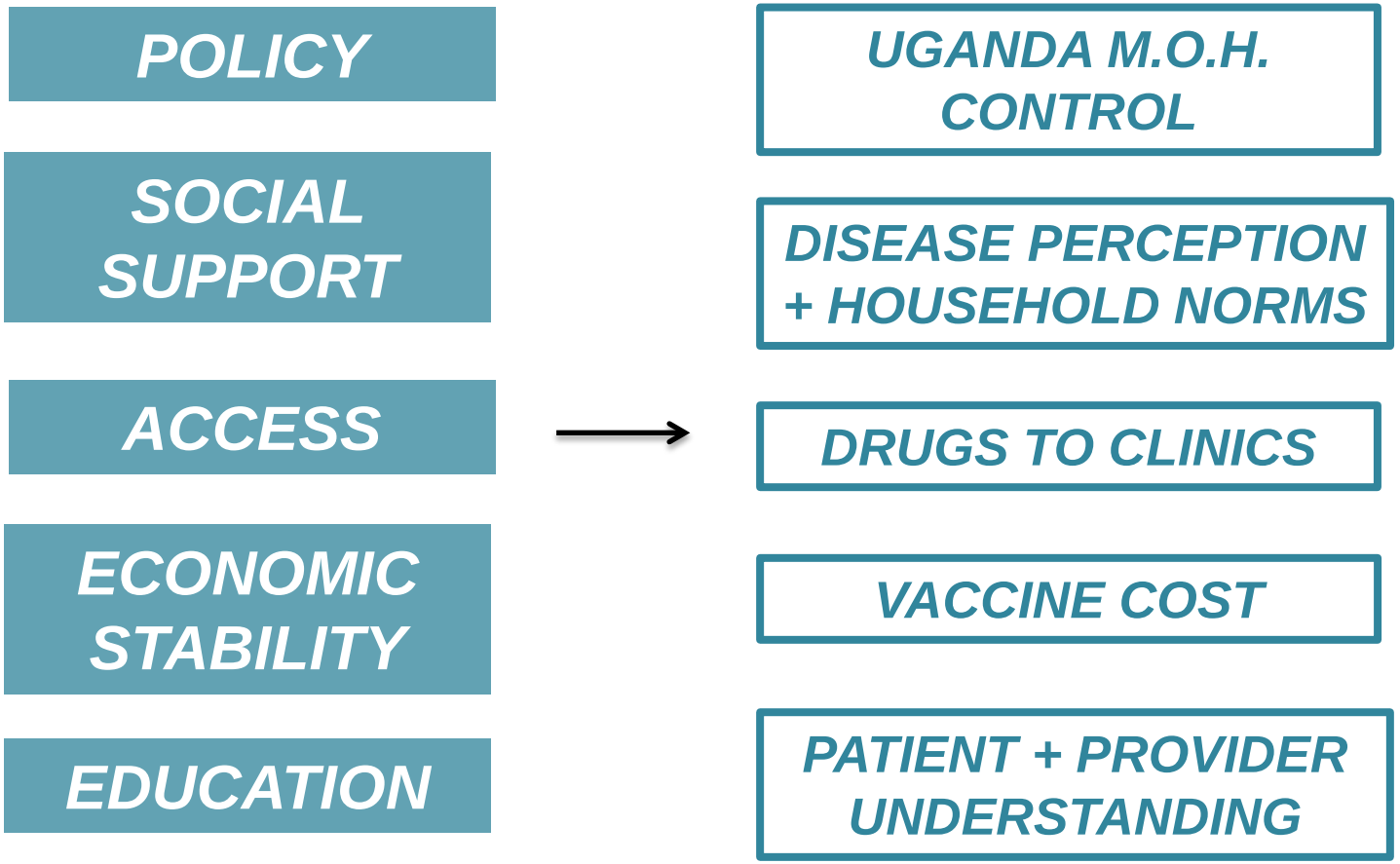
FUNDING

DISTRIBUTION

RESOURCES

SUPPLY

key areas of improvement



underlying determinants

solution criteria

MEDICAL INTERVENTION

…LTH SYSTEM …RENGTHENING

DIAGONAL APPROACH

- ✓ Vaccinations
- ✓ Diagnc…
- ✓ Treatment

- Clinic supply coordination
- ✓ Educating population
- ✓ Training workers

SOLUTION

SUPPLY SIDE

Public/Private Partnership

- GAVI Advance Market Commitment for Vaccines
- Create Clinic Network
- Provide network with vaccines and antibiotics

MEDIC MOBILE DATA COLLECTION

DEMAND SIDE

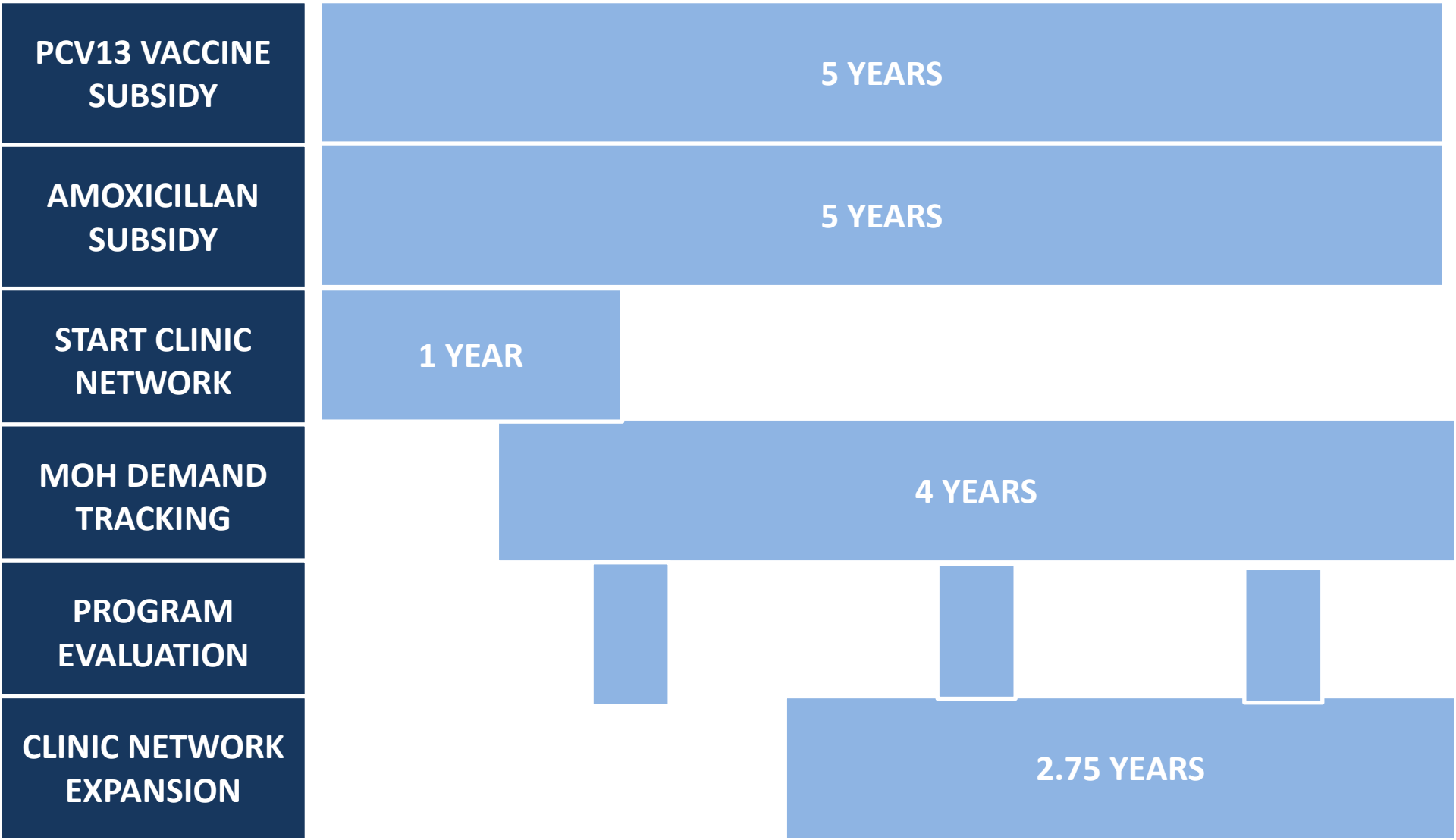
Community Approach

- Expand VHT program
- Improve data collection
- Increase patient referrals
- Implement educational component

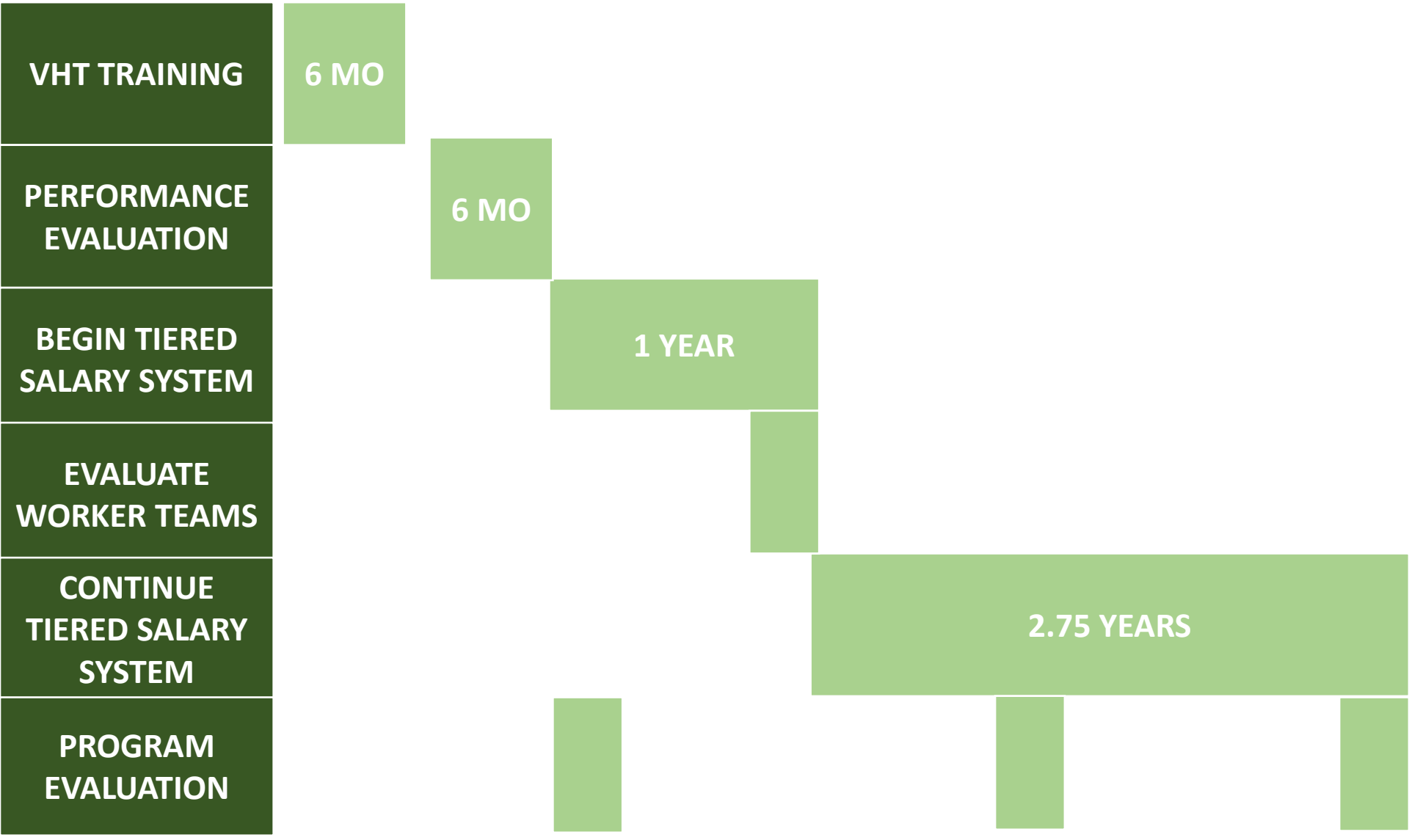
Partnership Development	**$1M**	5-Year Program Cost	**$11M**
Medic Mobile	**$890,000**	Cost of VHT Workers	**$17M**

TOTAL = $29.89M

partnership implementation timeline



community approach implementation timeline



RISK EVALUATION

PUBLIC-PRIVATE PARTNERSHIP

ASSUME INDEFINITE SUBSIDIZED VACCINATIONS

CLINIC NON-PARTICIPATION

LACK OF DATA FROM CLINICS

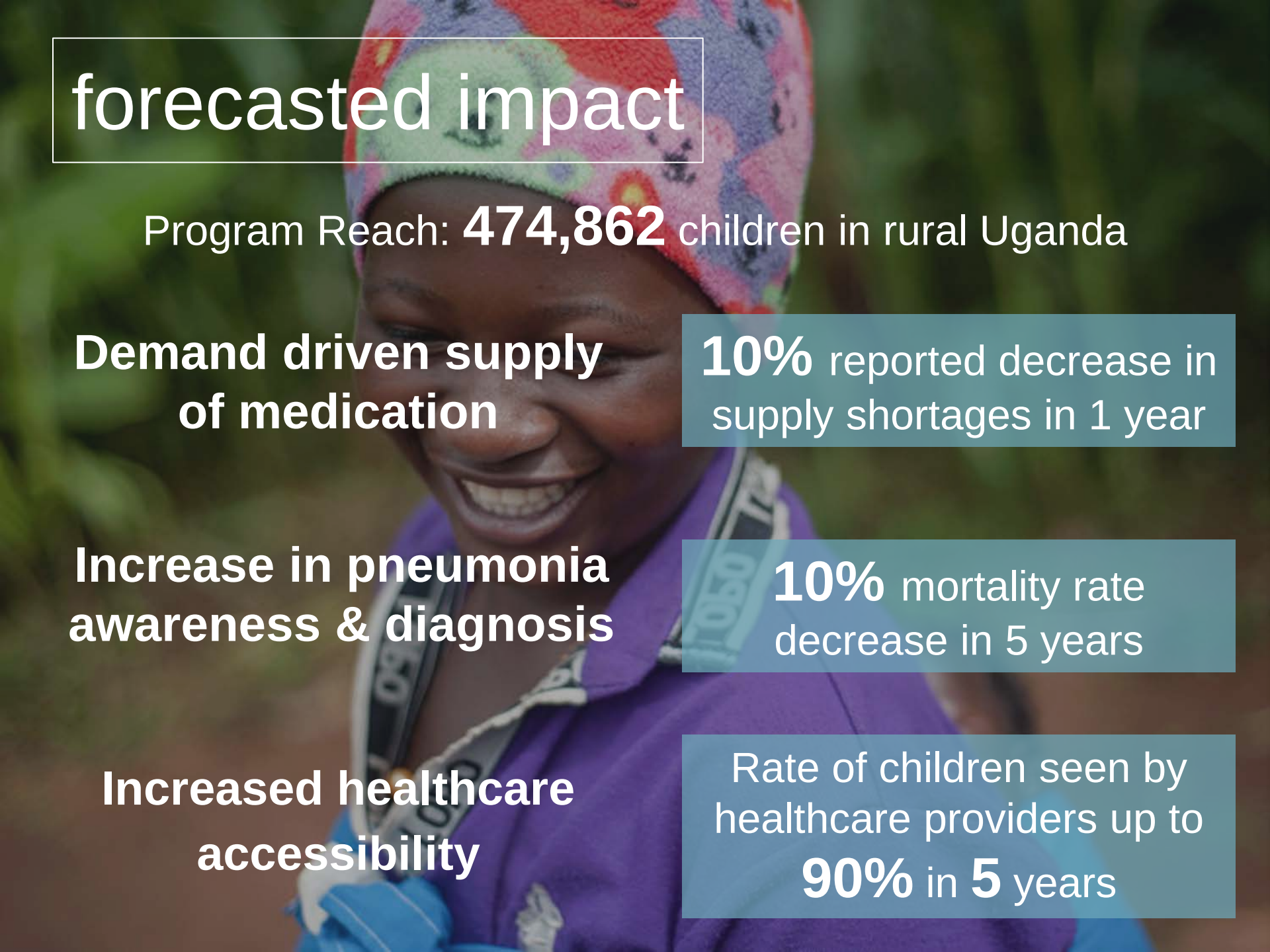
COMMUNITY HEALTH WORKERS

FUNDING DECLINE

“BRAIN DRAIN”

UNDER-QUALIFIED

UNCERTAIN IMPACT



forecasted impact

Program Reach: **474,862** children in rural Uganda

Demand driven supply of medication

10% reported decrease in supply shortages in 1 year

Increase in pneumonia awareness & diagnosis

10% mortality rate decrease in 5 years

Increased healthcare accessibility

Rate of children seen by healthcare providers up to **90%** in **5** years


Q&A

APPENDIX

- Effectiveness of Community HWT & Pneumonia
- Strengths & Weaknesses of Current Efforts
- Detailed Financials
- Availability of PCV & Amoxicillin
- Creating Sustainable Financial Models
- Looking Forward
- Other Clinical Benefits of Health System Strengthening
- Target Populations
- Medic Mobile Tool
- Referral System to Clinics & High Level Facilities
- Forecasted Impact
- Detailed Implementation Timeline

Effectiveness of Community Health Workers Treating Pneumonia

"To ensure that every child with severe pneumonia has rapid access to treatment with an effective antibiotic, treatment in the community by workers with limited training is necessary in many developing country situations and is essential in ensuring equity in access to treatment. Community management programmes can be scaled up effectively." - *World Health Organization*

"Community-based management of pneumonia doubled the total number of cases treated compared with districts with facility-based treatment only."

- Dawson, *20 years of community based management of childhood pneumonia in Nepal*

SWOT

Village Health Teams

STRENGTHS	WEAKNESSES
- Structure already established - Managed by MOH - Relationships with intl NGOs - Community trust	- brain drain (if not paid) - expensive ($18 million/year for the country) without paying workers - impact not clear - lower level health workers - lack of health system integration

Sustainable Drug Seller Initiative

STRENGTHS	WEAKNESSES
- intervenes in the hierarchy of resort - Already a cultural norm	- Incentive to oversell for profit - study showed ineffectiveness - gives credibility to self-treatment - Ugandan government unable to fund - $4 million annual cost for all of Uganda - undermines pharmacists - requires constant government monitoring

Patient Awareness Campaigns

STRENGTHS	WEAKNESSES
- 880,000 for 3 months in 34 poorest districts (30% of population) - supplements other approaches - can teach multiple topics without incurring more cost//easily adaptable - addresses EDUCATION - target audience on fleek	- isn't a direct fix - no direct impact results (other than listening rate)

Healthcare Provider Training

STRENGTHS	WEAKNESSES
- increase accuracy of diagnosis - training program is relatively cost effective ($3.4M/year) - healthcare providers are trustworthy investment - impact numbers likely high	- Pulse oximeters at $500/clinic/year - Timers not available in most clinics - logistics of replacing the oximeters each year - Too vertical

Program Cost	
Inflation rate (2012-2014)	3.1%
Program cost 2012 (10% of pop)	$ 1,800,000.00
Program cost in 2014 (10% of pop) w/ inflation	$ 1,855,800.00

Cost of VHT Worker	
Cost per worker in 2012	$ 1,000.00
Cost per worker in 2014	$ 1,031.00
Half cost' per worker	$ 515.50

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL (ending Year 5)
Paid workers/VHT	0	0.5	0.5	1.5	1.5	2.5	2.5
VHTs needed per household	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Paid Workers per Household	0	0.002	0.002	0.006	0.006	0.01	0.01
Uganda population 2014	37,800,000.00	37,800,000.00	37,800,000.00	37,800,000.00	37,800,000.00	37,800,000.00	37,800,000.00
13.4% population	5,065,200.00	5,065,200.00	5,065,200.00	5,065,200.00	5,065,200.00	5,065,200.00	5,065,200.00
People per Household	8	8	8	8	8	8	8
Number of Households	633,150.00	633,150.00	633,150.00	633,150.00	633,150.00	633,150.00	633,150.00
Total Workers Needed	-	1,266.30	1,266.30	3,798.90	3,798.90	6,331.50	6331.5
Worker Cost	-	1,305,555.30	1,305,555.30	3,916,665.90	3,916,665.90	6,527,776.50	$ 16,972,218.90
Total Worker and Program Cost	$ 1,855,800.00	$ 3,161,355.30	$ 3,161,355.30	$ 5,772,465.90	$ 5,772,465.90	$ 8,383,576.50	**$ 28,107,018.90**

Medic Mobile	
Clinics	2500
Hardware Cost per Clinic	$ 100.00
Number of VHT teams	1890
Hardware Cost per VHT Teams	$ 50.00
5 year Maintenance Cost	$ 344,000.00
Initial Implementation Cost	$ 200,000.00
Total Cost	**$ 888,500.00**

Public Private Partnership Development
$ 1,004,481.10

PCV and Amoxicillin

PCV13 (pneumococcal conjugate vaccines) - via Advance Market Commitment Initiative

GSK will start supplying 24 million doses annually (Annual Supply Commitment) from 2015 for a period of 10 years

Pfizer will start supplying 26 million doses annually (Annual Supply Commitment) from 2016 for a period of 10 years

....provides a **sustainable** supply for vaccines until the demand goes down due to high vaccination rates

Amoxicillin

patent expired over 10 years ago

stiff price competition and low profit margins

dosage cost: $.4 per regime

Sustainable Financial Models

- Slow implementation when paying community health workers.
- Measured Success of Community Case Management should alleviate donor fatigue, allowing for increased payment and better retention.
- Begin funding Community Health Workers through Co-Ops and grass roots funding mechanisms

Looking Forward

1 Million dedicated to stimulating local innovation

Public & Private Partnerships to empower the MOH

Other Clinical Benefits of Health System Strengthening

Improves treatment for both influenza and RSV - both key contributors to Pneumonia.

CCM can also help improve HIV treatment, reducing immunocompromised adults and preventing vertical transmission.

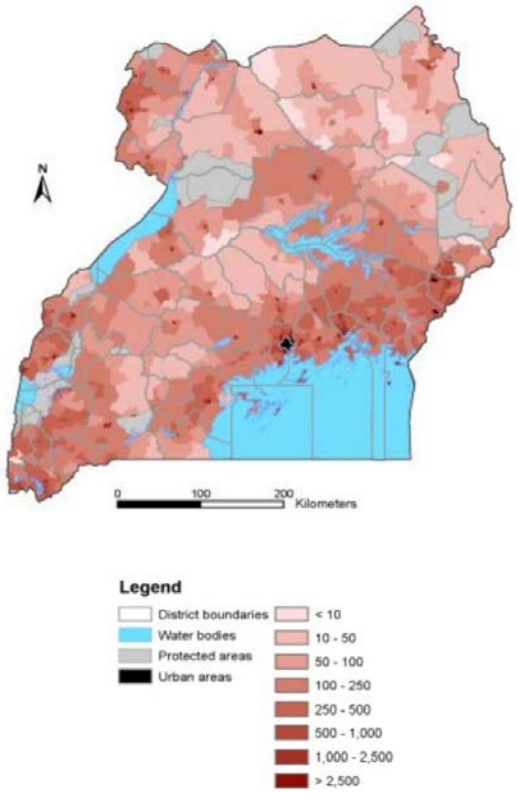
Vaccination for Pneumonia also prevents meningitis

Target Populations

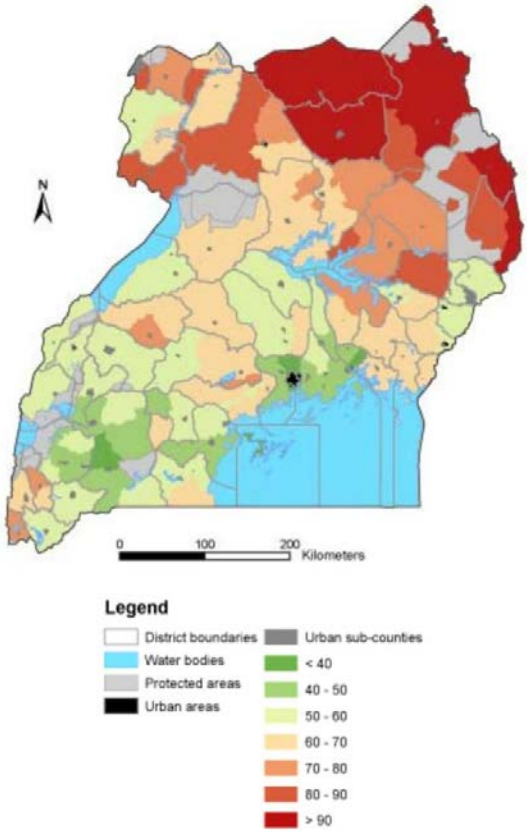
Children under 5: highest mortality rate during childhood

Soon-to-be-mothers: maternal vaccination can result in offspring immunity

Rural population density estimated at sub-county level from the 2002 Uganda national housing and population and census (UBOS 2002).



Small area estimates of poverty incidence in 1992 at county-level. Adapted from Emwanu et al. (2003).



Referral System to Clinics and High Level Facilities

Each clinic should maintain a working vehicle to transport patients to and from facility, reducing barriers to access.

Viral Pneumonia should receive supportive care at a level 3 or 4 facility with oxygen, rest, antipyretics, analgesics, nutrition, and close observation.

Forecasted Impact

Reach: our VHT program reaches 13.5% of the population:

37,500,000 million * .135 = 5,500,000 people in the program area
5,500,000/ 8 = 687,500 households
632,581 households *.75 (on the assumption that rural households average 6 children and 2 parents) = 474,863

10% reported decrease in supply shortages in 1 year
2,500 clinics into network
immediate data collection in 500/year, distribution system
50% of clinics have reported supply shortages: those 250 clinics will be better stocked based on data collection system
goal: 90% of clinics stocked with AMOX after 1 year

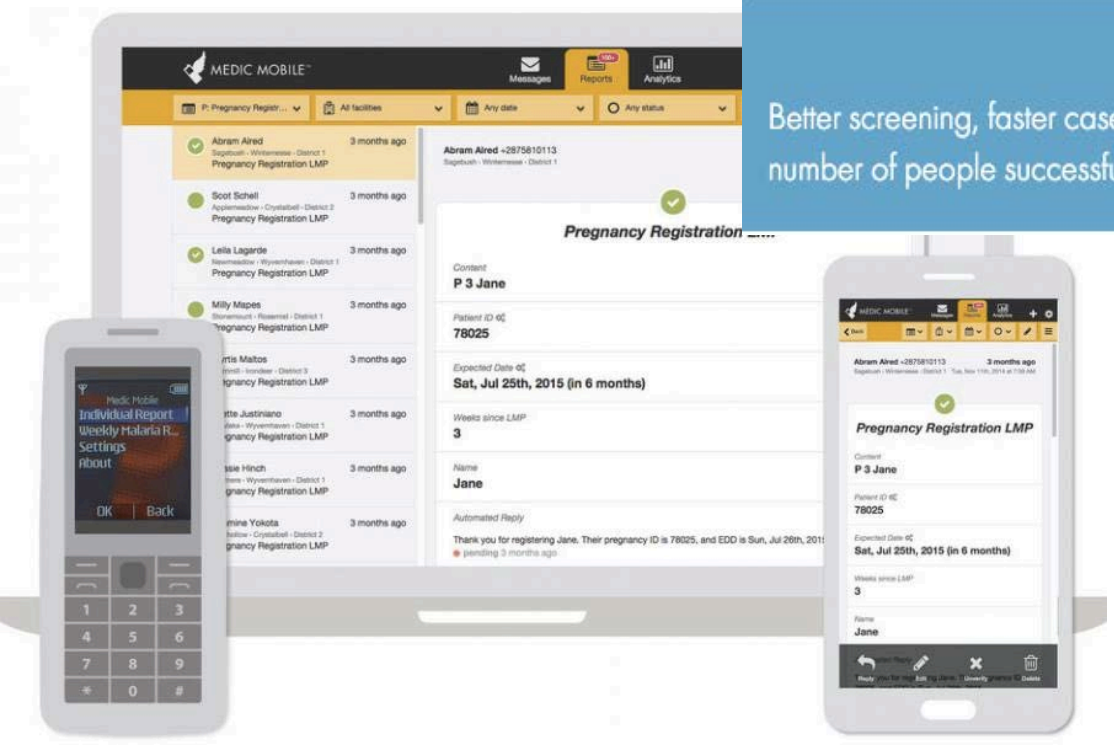
10% mortality rate decrease in 5 years
currently 15% of under 5 years are due to pneumonia. impact: conservative estimate to decrease 10% by targeting 13.5% of the population via CHWs (which can reduce mortality up to 60%) and up to 100% of clinics stocked with vaccines.

Rate of children seen by healthcare providers up to **90%** in **5** years
currently at 75% - community health worker program will refer all suspected cases, pushing rate seen up to 90%

Medic Mobile Tool

Impact logic

Better screening, faster case detection, and active follow-up lead to an increase in the number of people successfully treated.



Implementation Timeline