Progress and challenges in measuring the health systems impact of elimination and eradication programs: The example of lymphatic filariasis

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  - National LF Program, Ghana Health Service
- Dr. Dominique Kyelem, Mr. Roland Bougma
  - National LF Program, Burkina Faso MOH
- Dr. Bagrey Ngwira
  - Liverpool School of Tropical Medicine (Malawi LF Program)

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Overview

- Context
- Process
  - Dynamic, creative endeavor
  - Nontraditional analysis
- Methods
  - Data collection
  - Analysis
- Results
- Discussion—Progress and Challenges

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Focus on EE Programs

- Extreme, high-stakes efforts
  - No margin of error
    - Require sustained and strict adherence to program strategies and epidemiologic principles
    - Vigilance in surveillance and containment
  - Resource intensive
    - Significant uninterrupted funding
    - Sustained political commitment
- Globally driven, outcome oriented
  - Evaluated on disease reduction goals
- National implementation
  - Global pressure on individual nations to achieve goals
- Criticism that EE efforts have unintended negative consequences on implementing health systems
- Proliferation of EE efforts

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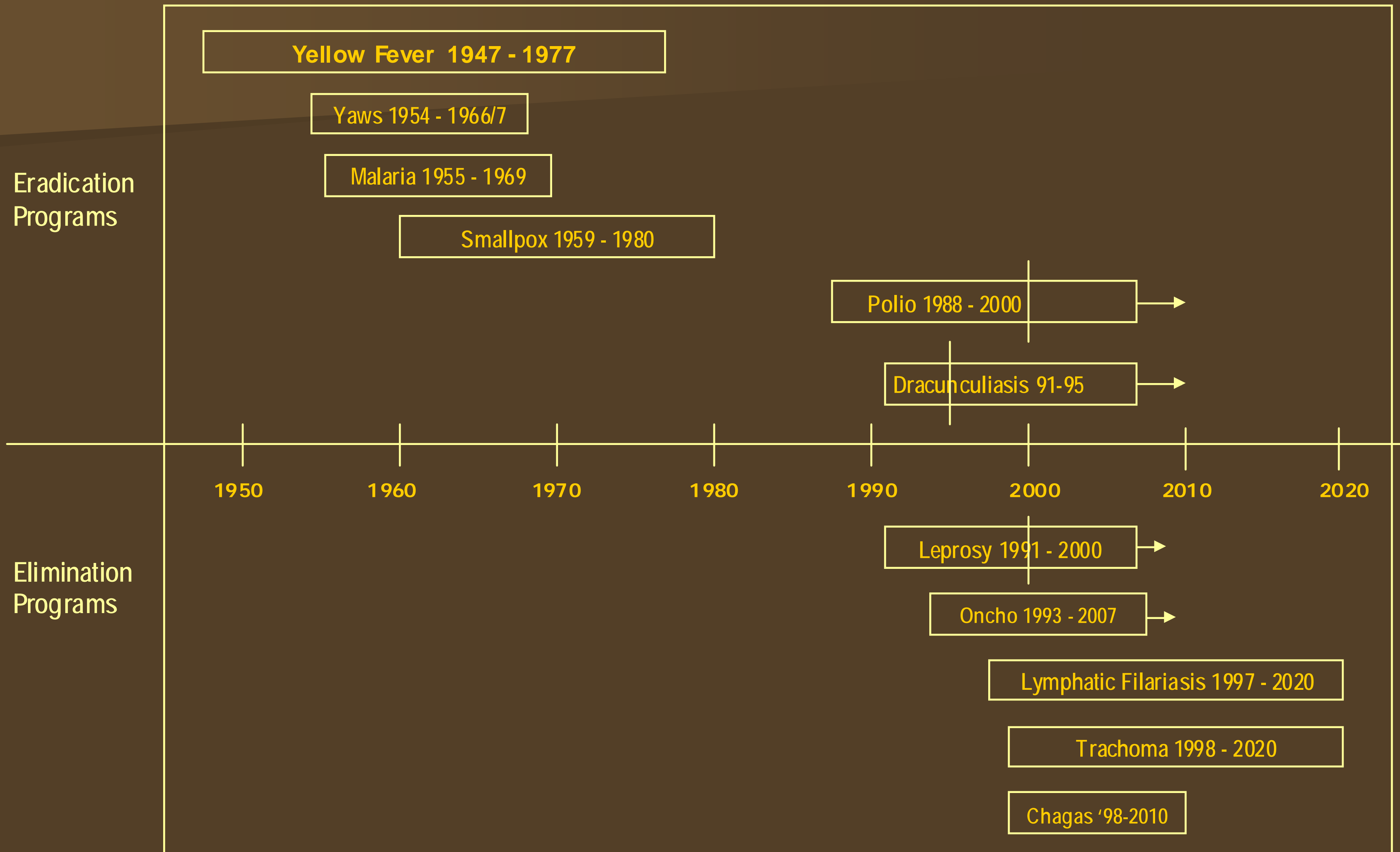

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Definition: Health Systems

- Health System:
  - All the organizations, institutions and resources that are devoted to producing health actions (any effort whose primary purpose is to improve health)
- Four Functions:
  - Stewardship (S)
  - Service Provision/Delivery (SD)
  - Financing (F)
  - Resource Development (RD)

➢ WHO *World Health Report 2000 Health Systems: Improving Performance*

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Lymphatic Filariasis

- Mosquito-borne parasitic disease
- 80 endemic countries
- 1.3 billion at risk
- 120 million affected
- Morbidity Control
  - Surgery for hydrocele
  - Support groups for affected individuals and families
  - Washing affected limbs
  - Shoes for lymphoedema sufferers
- Prevention
  - Health education
  - Provision of bed nets
- Key strategy to interrupt transmission: once annual distribution to entire at-risk population of 2 drugs: albendazole (GSK) and ivermectin (Merck) or DEC for 5-7 consecutive years

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LF & HS: Process & Methods

- Brainstorm discussions
  - Research questions
  - Motivation
- Literature review
- Analysis of similar efforts & lines of inquiry
  - PEI
  - GFATM

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LF & HS: Process & Methods

- Established international working group on LF & HS
- 2 day working meeting
  - Reviewed literature, discussed perceptions and ideas
  - Identified 6 major categories in which LF program may have effect on health system
    - Mass Drug Administration
    - Drug Supply & Distribution
    - Program Linkages & Sectoral Integration
    - Disease Management
    - Community Awareness/Demand Creation
    - Infrastructure Development
  - Created draft indicators for each of the 6 major categories
  - Determined HS functions and issues addressed by each indicator
- Further refinement resulted in Draft Indicator Matrix

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Indicator Matrix (1)

Category	Indicator Number	Indicator Name/ Short Title	HS Functions Affected			
			S	SD	F	RD
A. Mass Drug Administration	A1	Unserved communities reached by LF program	P	P		
	A2.1	Community access to MDA	P	P		
	A2.2	Lowest SES access to MDA	P	P		
	A3	MDA program coordination	S	P		S
B. Drug Supply/ Distribution	B1	Community drug supply		P		
	B2	Drug distributors involved in multiple health programs		P		P

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Indicator Matrix (2)

Category	Indicator Number	Indicator Name/ Short Title	HS Functions Addressed			
			S	SD	F	RD
C. Program Linkages & Sectoral Integration	C1	Community supervision from SDHT	S	P		
	C2	District work-plan includes LF		P		S
	C3.1	Transport provided by LF	S	P		S
	C3.2	Transport provided to LF	S	P		S
	C4	Disease control task force for MDA diseases	P			
	C5	Share of government expenditures			P	
	C6	Health education curriculum		P		
	C7	Community micro-enterprise schemes		P		
	C8	Public health schemes available to community	S	P		
	C9	LF registers used for non-LF programs		P		
	C10	Integrated social mobilization activities		P		
	C11	Synergies between RBM and LF		P		

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Indicator Matrix (3)

Category	Indicator Number	Indicator Name/ Short Title	HS Functions Affected			
			S	SD	F	RD
D. Disease Management	D1	Cases referred using LF case detection method	S	P		
	D2.1	QA system established for hydrocelectomies		P		
	D2.2	LF established QA system applied to other procedures		P		
E. Community Awareness/ Demand Creation	E1	Communities providing incentives to CDDs		P		P
F. Infrastructure Development	F1	Training provided by LF to health personnel		P		P
	F2	LF provided lab equipment		P		P
	F3	Surgical capacity	S			P

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Process & Methods—Identifying Data Needs

- Further development of indicators: data needs for numerators & denominators
- Example A1: Proportion of all otherwise unserved villages (and/or population) that are reached by the LF program

$$\frac{\text{Total \# of otherwise “unserved” villages in the LF program area that are served by LF program}}{\text{Total \# of otherwise “unserved” villages in LF program area}}$$

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Process & Methods—Indicator Field Test

- Field visits to 3 countries involved in the working group/indicator development
  - Ghana & Burkina Faso (established programs)
  - Malawi (start-up program)
- Interview staff and collect data at national, regional, district, sub-district, and first-line facilities
  - Identify appropriate level of data collection
  - Identify data source
  - Gather all possible data points

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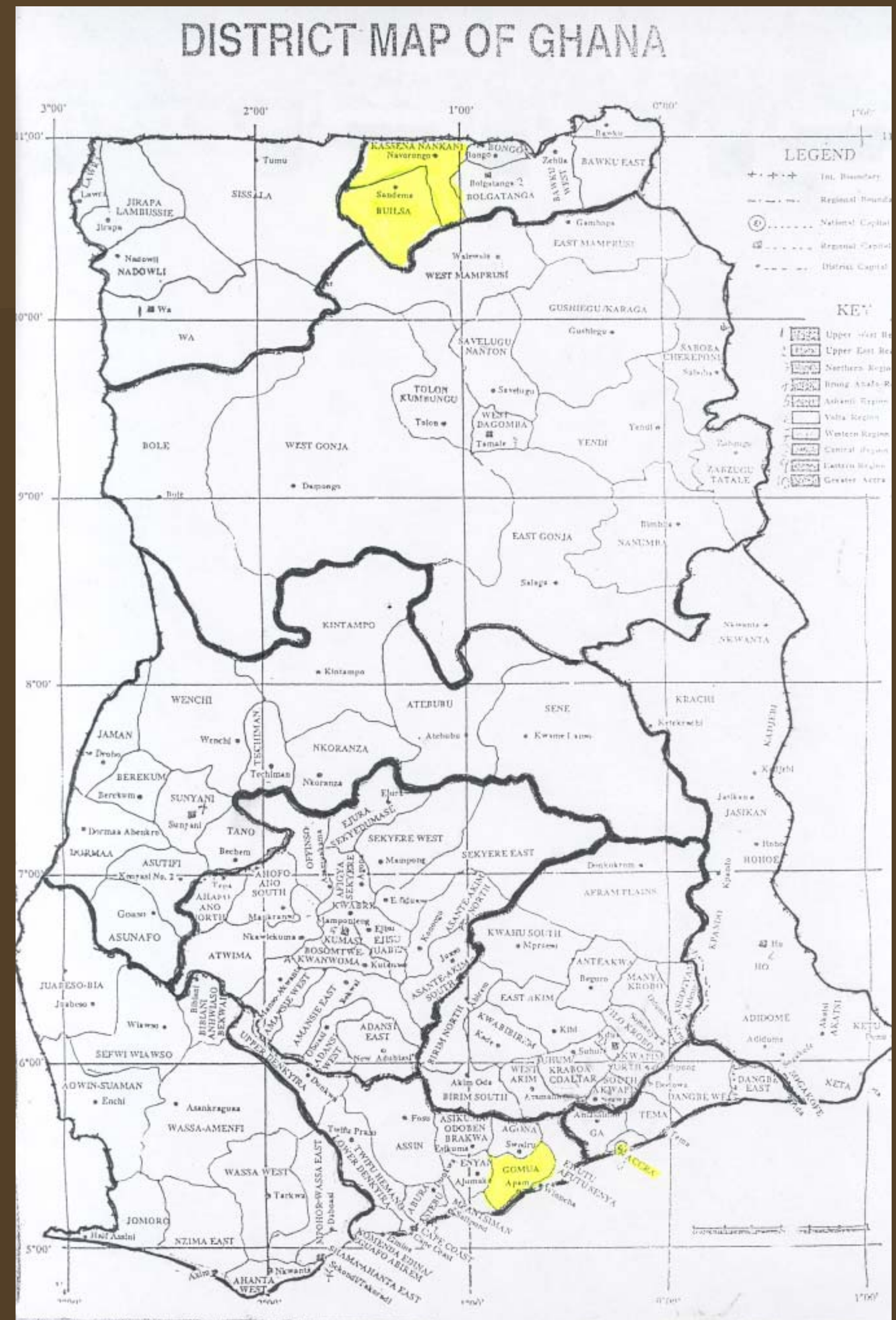
Ghana Data Collection Sites

- National Level
  - National LFEP
- Central Region
  - Gomua District
    - Obuasi Subdistrict
- Upper East Region
  - Kassena Nankana Dst
    - Central Subdistrict
  - Builsa District



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Burkina Faso Data Collection Sites

- Central Level
  - National LFEP
- Cascades Region
  - Regional Office
- Hauts Bassins Region
  - Secteur 22 District (urban)
- Sud-Ouest Region
  - Diebougou District (CMA)
  - Gaoua CHR
  - Batie District
    - Boussoukoula Subdst.
- Centre-Est Region
  - Tenkodogo CHR
  - Ourgaye District
    - Yourga Subdistrict

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Malawi Data Collection Sites

- Lilongwe: Central Level MOH
  - Director of Planning
  - Director of Management Information
- Blantyre
  - Oncho Program Manager
  - Professor, Malawi Medical College
  - Subdistrict Nurse
- Chikwawa District
  - Central Level MOH
    - District Health Officer
- Dedza District
    - Hospital Official

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Results for each data point compiled in Data Table

Indicator	Ghana: Central Region: Gomua District (Obuasi Subdistrict)	Ghana: Upper East Region: Kasena Nankana District (Central Subdistrict)	Ghana: Upper East Region: Builsa District
Proportion of all otherwise un-served villages (and/or population) that are reached by the LF program.	No un-served villages	6/6	xxx
Proportion of targeted, endemic villages with access to the MDA (community access)	186/186	206/206	139/139
Proportion of targeted, endemic population in the lowest income quintile (lowest SES category) as documented by the PRSP process	48%	88%	88%
Proportion of other MDA programs or other disease control programs coordinating distribution activities with the LF program	1/1	1/4	xxx

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Indicator Analysis Template

1. Indicator Name/Short Title

Full text of indicator (original)		
Definition	Numerator	
	Denominator	
	Unit	
Data Source/ Availability	Numerator	
	Denominator	
Level	Ghana	
	Burkina Faso	
Goal/Target		
Significance/ Issue addressed		
HS Function(s) addressed		
Pathway to HS effect		
Sensitivity & Specificity		
Interpretation		
Frequency of collection		
Strengths		
Challenges		
Suggestions for improvement, revision and use		
Verdict		

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Indicator Analysis Template

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Full text of indicator (original)		
Definition	Numerator	
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Interpretation		
Frequency of collection		
Strengths		
Challenges		
Suggestions for improvement, revision and use		
Verdict		

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Analysis simplified—verdict

- Considering all factors in analysis, each indicator assessed as:
  - **Strong:** Important concept prioritized by field staff, data available or easily gathered, revision still needed
  - **Moderate:** Has potential, but needs significant revision
  - **Weak:** Data too difficult to collect, but concept may be important
  - **Delete:** Data not available, concept not important, etc.

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Sample Indicator Analysis: A1—Unserved communities reached by LF program

- Full text of indicator:
  - Proportion of all otherwise unserved villages (and/or population) that are reached by the LF program.

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Sample Indicator: A1 (cont)

- Definition:
  - Numerator: The total number of otherwise unserved villages in the LF program area that are served by LF program
  - Denominator: Total number of otherwise unserved villages in LF program area
  - Unit: Proportion

- Data source/availability:
  - For available data points: record or file name, where data found, gatekeeper to or source of data
  - For unavailable data: assessment of what would be required to gather—special study, adding question/column to existing form
  - Numerator: Subdistrict health officer
  - Denominator: Subdistrict health officer
  - Not routinely collected, but known at subdistrict level

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Sample Indicator: A1 (cont)

- Level at which to monitor or measure:
  - **Central, Regional, District, Sub-district, etc.**
  - **Ghana** = Subdistrict
  - **Burkina Faso** = Subdistrict
- HS Function(s) addressed:
  - **Stewardship**
  - **Service Delivery**

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Sample Indicator Analysis: A1

- Goal/Target:
  - LF program goal or objective indicator monitors
  - What level of accomplishment is desired, and in what time frame
  - What change would indicate a positive or negative effect
  - What evidence supports the target/goal
  - "How much" HS effect will occur "when"
  - A1: To reach every village/community in every implementation unit, regardless of distance, language, resource levels, access difficulties, etc.
  - Needs a time frame—within first 2 MDAs, etc.

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Sample Indicator Analysis: A1

- **Significance of this indicator/Issue addressed:**
  - "Why" is it important to measure the phenomenon?

A1:

- **Reaching the poorest of the poor—the unreachable**
  - Evidence of GPELF goals and strategic operating principles to strengthen health systems

- **What is the unserved area of the population for which LF offers a gateway/entry to the formal health system**
  - Captures the short-term effect of unserved areas receiving LF program
  - *Ideal:* capture long-term improvement in services/programs offered to unserved communities—to know the residual effect, not just the current effect: e.g., of those otherwise unserved villages reached through LF, how many receive additional services *as a result of* LF program?

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Sample Indicator Analysis: A1

- **Pathway to HS Effect:**
  - "How" the HS effect occurs: through what specific processes and activities does the LF program strengthen particular functions of the HS
  - Links the goal/target (what and when) and the significance (why) to the HS function

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Sample Indicator Analysis: A1

- **Pathway to HS effect—A1:**
  - Assumption: If the LF program reaches "unserved" villages, there will be carry-over to other health interventions. How?
  - By providing specific tasks that require (encourage) health personnel to make outreach and supervisory visits to every village/community, the LF program facilitates increased contact between underserved communities and the formal health system.
  - It is supposed that these increased contacts foster the development of keener relationships between health workers and communities, which will...
  - Translate into the provision of larger numbers of outreach and supervisory visits on a variety of other health concerns, not just LF. (Despite resource difficulties, personnel will make greater effort to serve communities with which they have a strong rapport.)

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Sample Indicator Analysis: A1

- **Sensitivity and Specificity:**

  Many programs, policies, and people can influence the performance of a health system. How well does the indicator:

  - pick up true LF/HS effects,
  - show no effect when there is none
  - distinguish between HS effects that *are* a result of the LF program, and those that *are not* a result of the LF program

  - A1: Highly sensitive—no determination of which contributing factor(s) led to + or – in villages served
    - Additional fuel budget
    - More health staff
    - More physical resources
  - Additional, probing questions needed

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Sample Indicator Analysis: A1

- **Interpretation:**
  - What does the proportion mean in concrete terms
  - Single, unequivocal interpretation of the indicator results
  - Evidence to suggest the effect desired/measured is preferable to any alternative effects

  - B3: CDDs involved in multiple health programs
    - Does involvement in 3+ programs mean that the HS has been strengthened because developing a cross-trained health worker at village level, or
    - Does fewer people having access to some training mean missed opportunities, more disruption if the CDD is not available for drug distribution

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Sample Indicator Analysis: A1

- **Frequency of collection:**
  - Evaluation: Baseline, midterm, final
  - Monitoring: Annually, monthly
  - What is reasonable and necessary for each indicator
  - A1:
    - Annual reporting to coincide with MDAs
    - Less frequently could be considered

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Sample Indicator Analysis: A1

- **Strengths:**
  - Important concept—extending the reach of the health system and stewardship to underserved communities
  - Data are available. Subdistrict (and most district) officers know immediately which and how many communities are “underserved”
  - Provides greater detail to simple coverage statistics
  - Applies to overall LF program goal—there is intent, so causation may be possible to establish

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Sample Indicator Analysis: A1

- **Challenges:**
  - Getting at long-term/post-LF/sustainable improvement to health system: of those otherwise unserved villages reached through LF, how many receive additional services *as a result of* LF program?
  - Defining and standardizing "unserved" or "underserved"
    - Number of outreach services
    - Distance to first-line health facility
  - Addressing underlying, root causes: underserved due to understaffing, physical resource availability, insufficient fuel budget, etc.

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Sample Indicator Analysis: A1

- **Improvement suggestions/ideas:**
  - Define terms: village vs. community
  - Change “unserved” to “underserved”
  - Attach an outreach visit criteria (e.g. 2-or fewer, or whatever a country defines as an adequate number of outreach visits per year to accomplish its PHC goals).
  - Select an outcome measure or comparison figures to use in conjunction with A1. E.g. outreach visits for EPI per year of LF MDA—do the number of EPI visits increase over the course of LF program?
  - Compare to post-intervention and/or reach of other programs
  - Add a qualitative component to address sensitivity and specificity

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Sample Indicator Analysis: A1

- Improvement and use suggestions:
  - Reworded: Proportion of communities receiving 2 or fewer outreach visits from MOH district or subdistrict personnel for primary or preventive care per year will decrease from x/x (baseline figure) to x/x (target figure 1) by the end of the 3rd MDA, and to x/x (target figure 2) by the conclusion of the LF program.

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Sample Indicator Analysis: A1

- **What's the verdict?**
  - Strong?
  - Moderate?
  - Weak?
  - Delete?

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Sample Indicator Analysis: A1

- **What's the verdict?**
  - **Strong**
  - Moderate
  - Weak
  - Delete

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Results Summary

VERDICT	NUMBER
Strong	3
Moderate	6
Weak	7
Delete	9
	25

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Analysis Results (1)

Category	Indicator Number	Indicator Name/ Short Title	"Verdict"			
			S	M	W	D
A. Mass Drug Administration	**A1**	**Unserved communities reached by LF program**	**X**			
	A2.1	Community access to MDA		X		
	A2.2	Lowest SES access to MDA		X		
	A3	MDA program coordination		X		
B. Drug Supply/ Distribution	B1	Community drug supply			X	
	B2	Drug distributors involved in multiple health programs			X	

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Analysis Results (2)

Category	Indicator Number	Indicator Name/ Short Title	"Verdict"			
			S	M	W	D
C. Program Linkages & Sectoral Integration	C1	Community supervision from SDHT		X		
	C2	District work-plan includes LF			X	
	C3.1	Transport provided by LF				X
	C3.2	Transport provided to LF				X
	C4	Disease control task force for MDA diseases				X
	C5	Share of government expenditures		X		
	C6	Health education curriculum				X
	C7	Community micro-enterprise schemes				X
	C8	Public health schemes available to community				X
	C9	LF registers used for non-LF programs		X		
	C10	Integrated social mobilization activities				X
	C11	**Synergies between RBM and LF**	**X**			

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Analysis Results (3)

Category	Indicator Number	Indicator Name/ Short Title	"Verdict"			
			S	M	W	D
D. Disease Management	D1	Cases referred using LF case detection method				X
	D2.1	QA system established for hydrocelectomies			X	
	D2.2	**LF established QA system applied to other procedures**	**X**			
E. Community Awareness/ Demand Creation	E1	Communities providing incentives to CDDs				X
F. Infrastructure Development	F1	Training provided by LF to health personnel			X	
	F2	LF provided lab equipment			X	
	F3	Surgical capacity			X	

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Revised Matrix—Strong & Moderate

Category	#	Indicator—Complete text	Verdict
A. Mass Drug Administration	A1	Proportion of all otherwise unserved villages (and/or population) that are reached by the LF program	Strong
	A2.1	Proportion of targeted, endemic villages with access to the MDA	Moderate
	A2.2	Proportion of targeted, endemic population in the lowest income quintile (lowest SES category) as documented by the PRSP process	Moderate
	A3	Proportion of other MDA programs or other disease control programs coordinating distribution activities with the LF program	Moderate
C. Program Linkages and Sectoral Integration	C1	Proportion of communities receiving supervision from first line health facilities in LF areas compared to non-LF areas.	Moderate
	C5	Share of government expenditures for LF program as a percent of disease control budget at national, regional and district levels	Moderate
	C9	Percent of districts using LF registries for non-LF programs, for activities such as planning, monitoring, referrals, etc. [Which other disease control programs use the LF register.]	Moderate
	C11	Areas of LF endemicity where Roll Back Malaria programs co-exist—synergies between programs, bed nets, etc.	Strong
D. Disease Management	D2.2	Percentage of LF endemic regions/districts/ facilities have used the QA system for other surgeries/procedures, etc.	Strong

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Progress towards measuring impact of EE programs on HS

- Formative research, lessons learned, first M&E tool for EE/HS (PEI)
- Definition and conceptualization of Health Systems (WHO 2000)
- Widespread recognition that strong health systems are the key to improved health status of populations
  - Disease elimination and eradication programs (late 1990s)
  - WHR 2003 Shaping the future
- Commitment to invest in health systems at all time high
  - Mexico Summit on Health Systems 2004
- Current efforts to measure effects of large "vertical programs" on health systems
  - GPELF
  - GFATM

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Challenges

- Which HS functions are most responsive to change
- Evidence to support targets: How much change can be expected
  - Trachoma 3 years
  - LF 5-7 years
  - Oncho 10+ years
- Locus of control for measuring and making health system changes often not assigned
- Health system strengthening still elusive concept, empirically and conceptually

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Conclusion

- Current LF effort demonstrates possible to create indicators to monitor and evaluate the HS impact of EE programs,
  - avoiding negative consequences
  - strengthening health systems while reaching disease elimination targets, but more research and funding is essential
- Need to show results to capitalize on current commitment to HS strengthening

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Medaci

Merci

Thanks

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Extra Slides

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Provision of Health Care

- Vertical vs Horizontal debate:
  - 1960s: Criticism of MEP
  - 1978: Alma Ata Primary Health Care (PHC)
  - 1988: WHA launched PEI, "eradication efforts should be pursued in ways which strengthen the development of the EPI as a whole, fostering its contribution, in turn, to the development of the health infrastructure and of PHC"
  - 1990s: Continued criticism of EE programs—PEI, in particular
- Engagement of disease-specific (EE) programs:
  - worldwide meetings on role and function of EE programs and impact on health services and infrastructure

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Criticisms of EE Programs

- Disrupt provision of routine services
- Divert scarce human and financial resources away from PHC to a single issue
- Allow global/donor priorities to take precedence over national/local ones
- Create parallel structures
- Take human resources away from national health ministries and facilities
- Require significant financial input from poor countries who can ill afford it

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Definitions

- Eradication
  - The permanent reduction to zero of the worldwide incidence of infection caused by a specific agent as a result of deliberate efforts; intervention measures are no longer needed
- Elimination
  - The reduction to zero of the incidence of a specified disease in a defined geographic area as a result of deliberate efforts; continued intervention measures are required outside of the defined geographic area

➢ Ottesen et al. 1998 (Dahlem Workshop)

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The Example of PEI

- Contributions acknowledged, but solid evidence lacking
- Several studies in late 1990s
- Lessons Learned
  – Negative consequences can be avoided
  – Need a clear goal for HS strengthening
  – Impact varies within and between countries
  – Prospective rather than retrospective methods
- Result: Checklist and indicators (2001)

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Data Collection Points

Full name of indicator		
Definition	Numerator	
	Denominator	
	Unit	
Data Source	Numerator	
	Denominator	
Level	Ghana	
	Burkina Faso	

Result: Completed Data Tables for each level visited in Ghana and Burkina Faso

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Health systems

- Health systems widely perceived to be major bottleneck to improving health outcomes
- Demand for improved metrics at global and national level
- Info about health systems strengthening often diffuse and unclear
- Impact of measurement on health systems, e.g. indicators that are measured often improve

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				Health System Functions			
Categories	Indicators	#	Issues to be addressed	S	SD	F	RD
A. Mass Drug Administration	Proportion of all otherwise unserved villages (and/or population) that are reached by the LF program	A1	What is the unserved area of the population for which LF offers a gateway/entry to the formal health system?	P	P		
	Proportion of targeted, endemic villages with access to the MDA (community access)	A2.1	Equity—community access to MDA	P	P		
	Proportion of targeted, endemic population in the lowest income quintile (lowest SES category) as documented by the PRSP process (population in the lowest SES over total population in targeted endemic communities)	A2.2	Equity—LF as dz of poorest of the poor—takes A2.1 a little further: not just community access, but are the poorest people in the communities also receiving intervention/treatment? Individual access to MDA—do the poor have equal access?	P	P		
	Proportion of other MDA programs or other disease control programs coordinating distribution activities with the LF program	A3	Where/when is LF MDA a vehicle or platform for other diseases using an MDA strategy? LF is more extensive than other MDA diseases that are focal.	S	P		S

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				Health System Functions			
Categories	Indicators	#	Issues to be addressed	S	S D	F	R D
A. Mass Drug Administration	Proportion of all otherwise unserved villages (and/or population) that are reached by the LF program	A1	What is the unserved area of the population for which LF offers a gateway/entry to the formal health system?	P	P		
	Proportion of targeted, endemic villages with access to the MDA (community access)	A2.1	Equity—community access to MDA	P	P		
	Proportion of targeted, endemic population in the lowest income quintile (lowest SES category) as documented by the PRSP process (population in the lowest SES over total population in targeted endemic communities)	A2.2	Equity—LF as dz of poorest of the poor—takes A2.1 a little further: not just community access, but are the poorest people in the communities also receiving intervention/treatment? Individual access to MDA—do the poor have equal access?	P	P		
	Proportion of other MDA programs or other disease control programs coordinating distribution activities with the LF program	A3	Where/when is LF MDA a vehicle or platform for other diseases using an MDA strategy? LF is more extensive than other MDA diseases that are focal.	S	P		S

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LF & HS: Process & Methods

- Further refinement resulted in a draft Indicator Matrix
  - 25 indicators in 6 categories

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