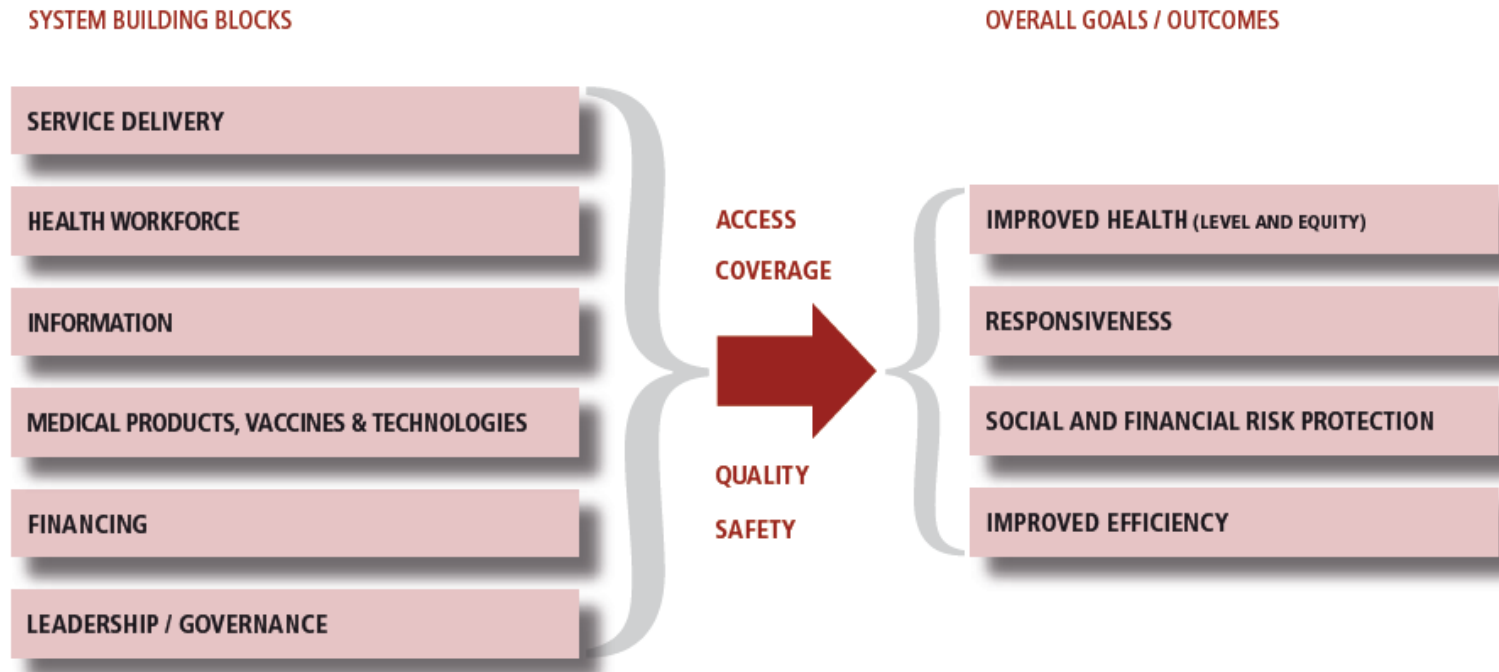


Global health research: what questions to ask?

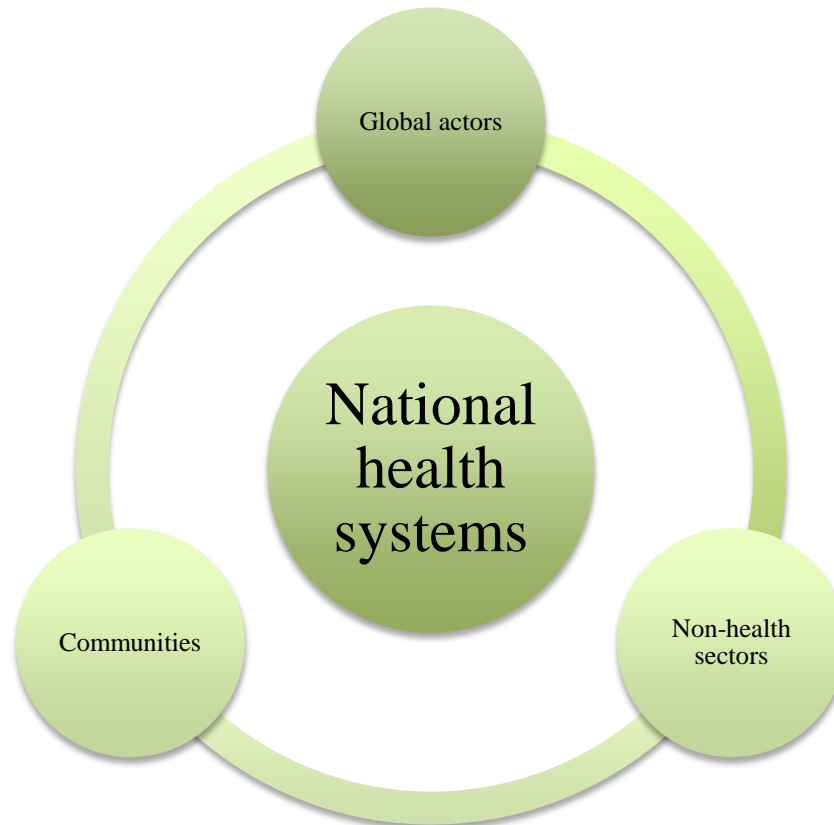
Margaret E. Kruk, MD, MPH
Mailman School of Public Health, Columbia
University

WHO's health system building blocks



WHO (2007). Everybody's business: strengthening health systems to improve health outcomes: WHO's framework for action. Geneva, World Health Organization.

Beyond the health system



How to choose research questions to ask?

- Policy relevant
- Timely
- Feasible

Examples

Global context: What is the effect of US-funded big-push programs on the health system (Uganda, Zambia)?

Service delivery: How can we bring more women into obstetric care to reduce maternal mortality (Tanzania)?

Human resources: What are the policy options for bringing doctors to rural areas (Ghana)?

Global context

What is the effect of big push programs on national health systems?

Policy relevant?

Timely?

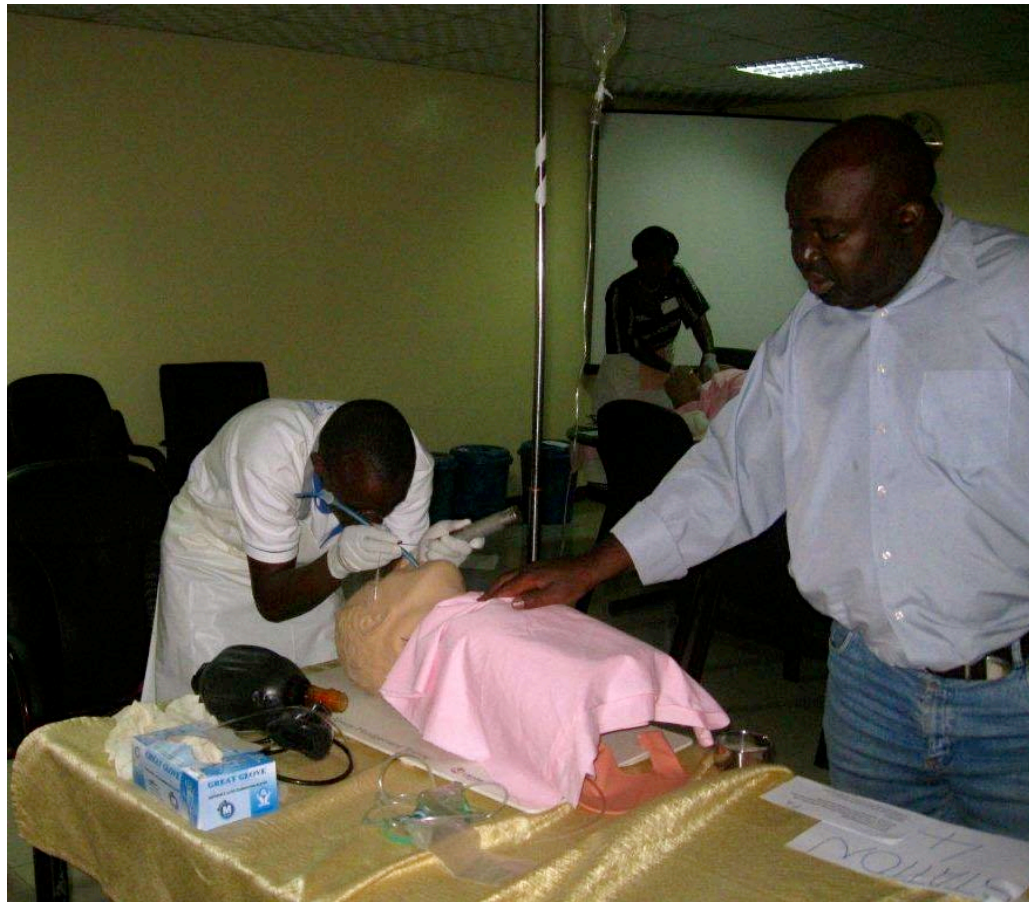
Feasible?

Saving Mothers, Giving Life

- \$200 million five-year initiative
- Aim: reduce maternal mortality by 50% in one year
- 4 districts in Zambia; 4 in Uganda
- Whole-of-health system approach: complex package of interventions

INPUTS	ACTIVITIES (Both countries, Zambia , Uganda)	OUTPUTS	OUTCOMES
<ul style="list-style-type: none"> • SMGL program plan • Funding • USG, MoH and implementing partners • Health workers • Trainers and training curricula • Equipment (e.g. laboratory; vehicles; scales; delivery equipment, etc.) • Supplies (e.g. essential medicines, blood supply) • Basic infrastructure (e.g. water, electricity) • Guidelines (clinical, data, supply chain) • Information and communication technology 	<p><u>Demand</u></p> <ul style="list-style-type: none"> • Train and supervise community groups to promote facility delivery and birth preparedness (Safe Motherhood Action Groups, Village Health Teams) • Identify and engage community influencers in safe motherhood (Change Champions) • Provide basic newborn/birth supplies to pregnant women (Mama Kits, Mama Packs) • Run mass media campaigns on radio, engage community drama groups <p><u>Access</u></p> <ul style="list-style-type: none"> • Build new operating theatres with EmONC capacity • Expand/refurbish maternity wards, labs, pharmacies • Build/renovate mothers' shelters near hospitals for high risk women • Provide service delivery vouchers and vouchers for transport to facilities and referral to higher-level care • Buy emergency obstetric and newborn care (EmONC) equipment • Buy ambulances, motorcycles and motorbikes for transportation and referrals • Form district-level transport committees to improve referral • Contract with private providers for EmONC <p><u>Quality</u></p> <ul style="list-style-type: none"> • Hire new doctors, nurses, midwives, and Peace Corps Volunteers in collaboration with Ministry of Health • Train health workers in EmONC • Train health workers in newborn resuscitation ("helping babies breathe") • Train doctors in surgical obstetric care and anesthetic officers in anesthesia • Provide regular supportive supervision to frontline health workers to maintain and improve skills in: obstetrics, newborn care and anesthesia • Provide training and oversight for maternal death reviews in facilities • Train health workers in data collection and health information systems • Provide essential medicines <p><u>System strengthening</u></p> <ul style="list-style-type: none"> • Build Provincial and District Health Team capacity with SMGL staff • Strengthen supply chains through training on procurement and stock management • Build capacity of facility staff to supervise community health workers • Provide computer-based medical records (Smart Care) • Strengthen pharmacy, lab, blood supply • Support roll-out of electronic district health information system • Train health workers in data collection and health information systems 	<p><u>Utilization</u></p> <p>Increase in:</p> <ul style="list-style-type: none"> • facility deliveries • four antenatal care visits • postnatal care • referrals for complications • EmONC • neonatal resuscitation <p><u>Quality</u></p> <p>Reduction in:</p> <ul style="list-style-type: none"> • maternal facility case fatality rate • perinatal mortality in facilities <p><u>System strengthening</u></p> <ul style="list-style-type: none"> • Stronger supply chains, health information systems • New operating theaters • More mothers' shelters • Improved transport and communication 	<p>Reduction in maternal mortality</p> <p>Reduction in newborn mortality</p>

Health Worker Training in Zambia



Renovations of an operating theater in Kyenjojo, Uganda



Conceptual framework

Context and program

- **Local context** (political, geographic, budgetary, health system, cultural)
- **Logic model** (new vs. expanded activities, partners)

Implementation

- **Dose** (e.g., how much training, equipment, transport, media)
- **Reach and engagement** (e.g., community awareness, utilization of intervention, women's perception and satisfaction)
- **Fidelity** (health worker and facility performance, facility functioning)

Emergence and adaptation

- **Functioning** of partnership, country ownership
- **Evolution** of program during implementation
- **Positive synergies**
- **Unintended consequences**

Methods

- 9 person team: 4 faculty, 5 full-time researchers
- October 2012-January 2013
- **143** interviews (**67** Uganda, **76** Zambia), including all DMOs and SMGL coordinators
- **134** person-days in country
- **50** sites (MoH, USG, IP, district health offices, clinics, mothers' shelters)
- **536** documents

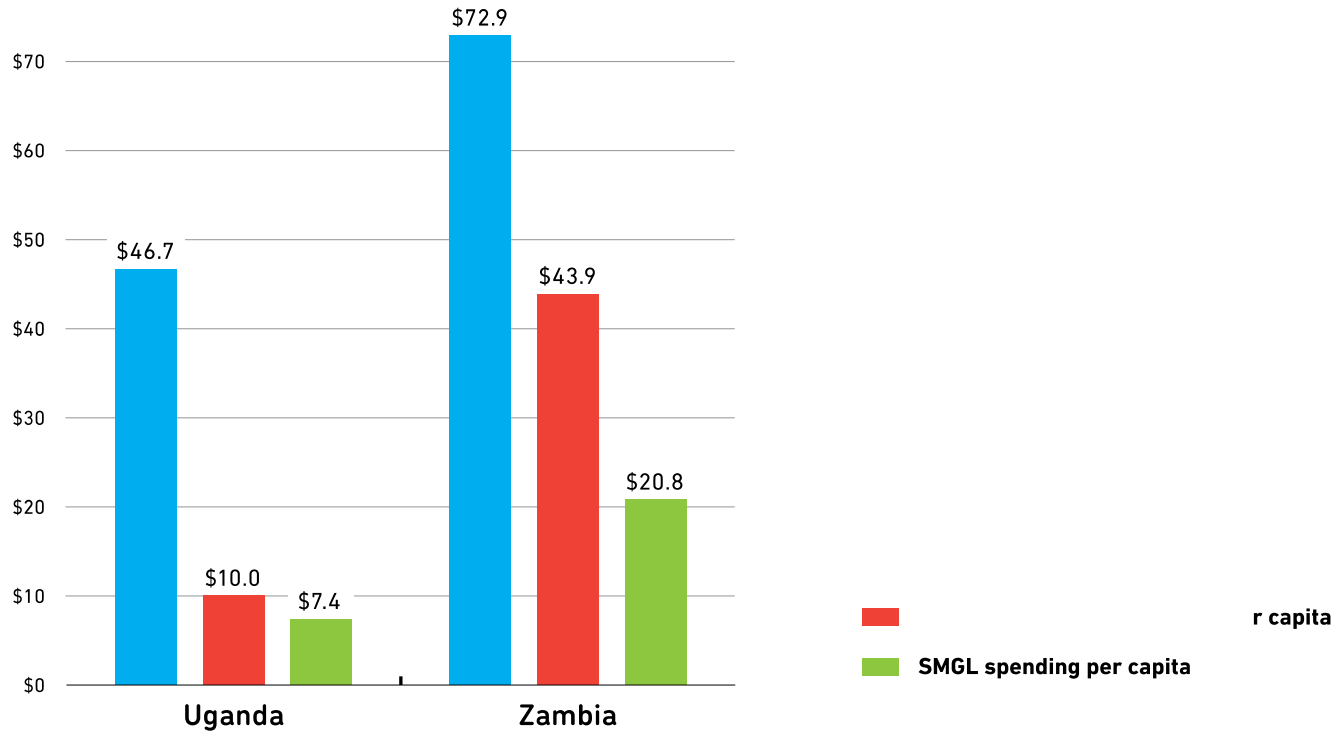


SMGL districts



Note: Kalomo district boundaries were recently redrawn—some of the health facilities that are included in the Kalomo SMGL intervention now lie outside the district.

Health system effects: funding



Positive health system effects

Ways of working

- Onsite mentoring
- District SMGL coordinators
- High-level partner coordination
- Data collection by VHT/SMAGs
- Involvement of private facilities (Uganda)
- Emergency drills for health workers (Zambia)

Community mobilization

- Mama kits/Mama packs
- Safe motherhood day/week
- Transport committees (Uganda)
- Incentives for postnatal care (Zambia)

Technology

- Solar lighting
- Phones and phone network for VHTs (Uganda)
- Bodas for Mothers (Uganda)
- Terrain-appropriate vehicles (Zambia)
- Kit boxes for obstetric emergencies (Zambia)

Negative health system effects

- Less focus on other health priorities, particularly in districts
- De-emphasis on family planning
- SMGL districts benefit over other districts
- Demand created before facilities were sufficiently expanded, upgraded and staffed
- Health workers spend many days off-site for trainings
- Resentment of non-SMGL staff due to differential pay and benefits (Uganda)
- Local leaders imposed penalties for home births (Zambia)

Service delivery:

How can we bring more women into obstetric care to reduce maternal mortality?

Policy relevant?

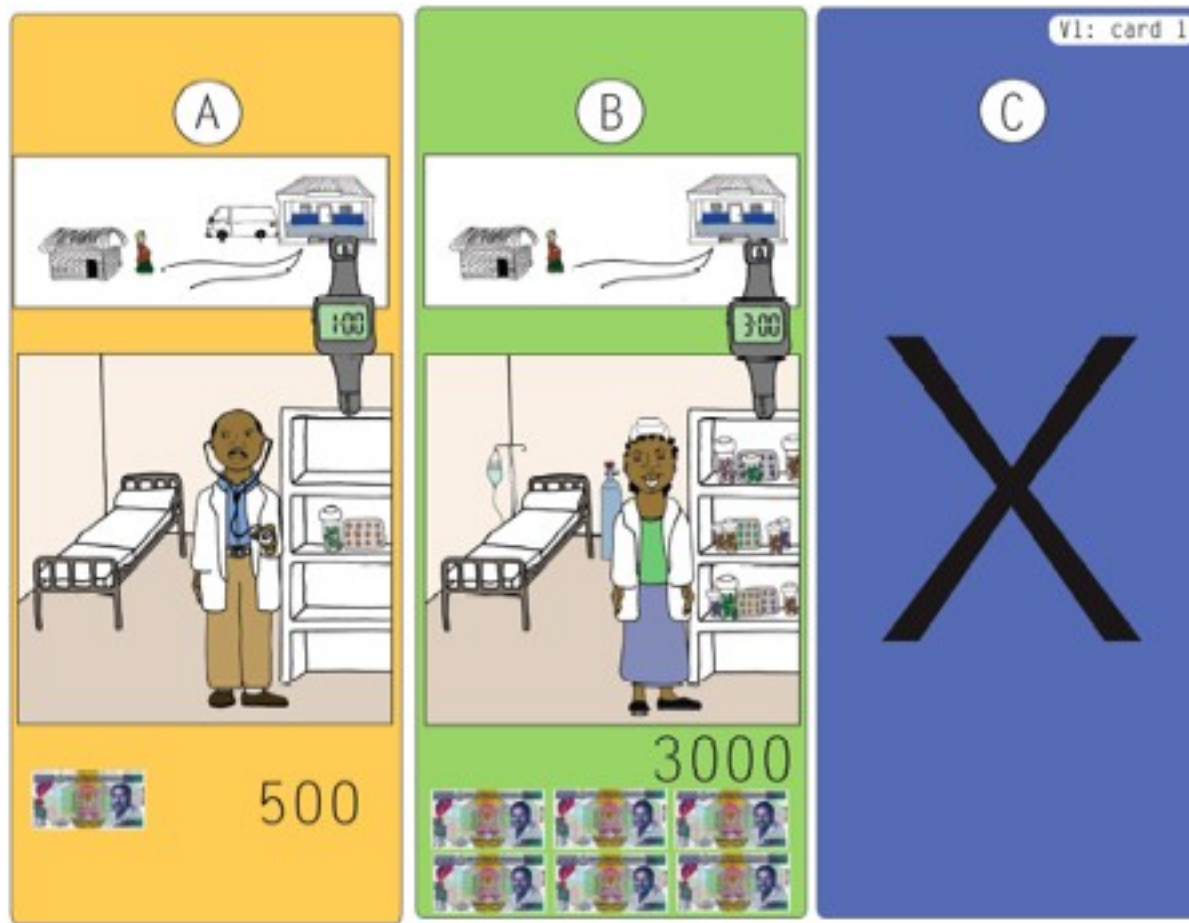
Timely?

Feasible?

Tanzania



In a previous study we asked women about what they want from a clinic



Kruk ME, Paczkowski M, Mbaruku G, de Pinho H, Galea S. Women's preferences for place of delivery in rural Tanzania. a population-based discrete choice experiment. American Journal of Public Health. 2009. 99(9): 1666-72.

Utilities

Attribute	Utility ^{a,b}	p-value
Distance		
1/2 hour by foot	12.4	<0.001
1 hour by foot	11.9	<0.001
1 and 1/2 hours by foot	12.8	<0.001
2 hours by foot	2.8	0.018
3 hours by foot	0	ref
Type of provider		
Doctor	29.0	<0.001
Clinical officer	6.9	<0.001
Nurse	0	ref
Provider attitude		
Provider smiles, listens carefully	168.5	<0.001
Provider does not smile, does not listen carefully	0	ref
Availability of drugs and medical equipment		
Drugs and medical equipment always available	160.0	<0.001
Drugs and medical equipment not always available	0	ref
Availability of transport		
Transport available	21.5	<0.001
Transport not available	0	ref
Cost		
250 Shillings	33.3	<0.001
500 Shillings	46.7	<0.001
1000 Shillings	10.8	<0.001
2000 Shillings	20.2	<0.001
3000 Shillings	0	ref

Maternal health care...



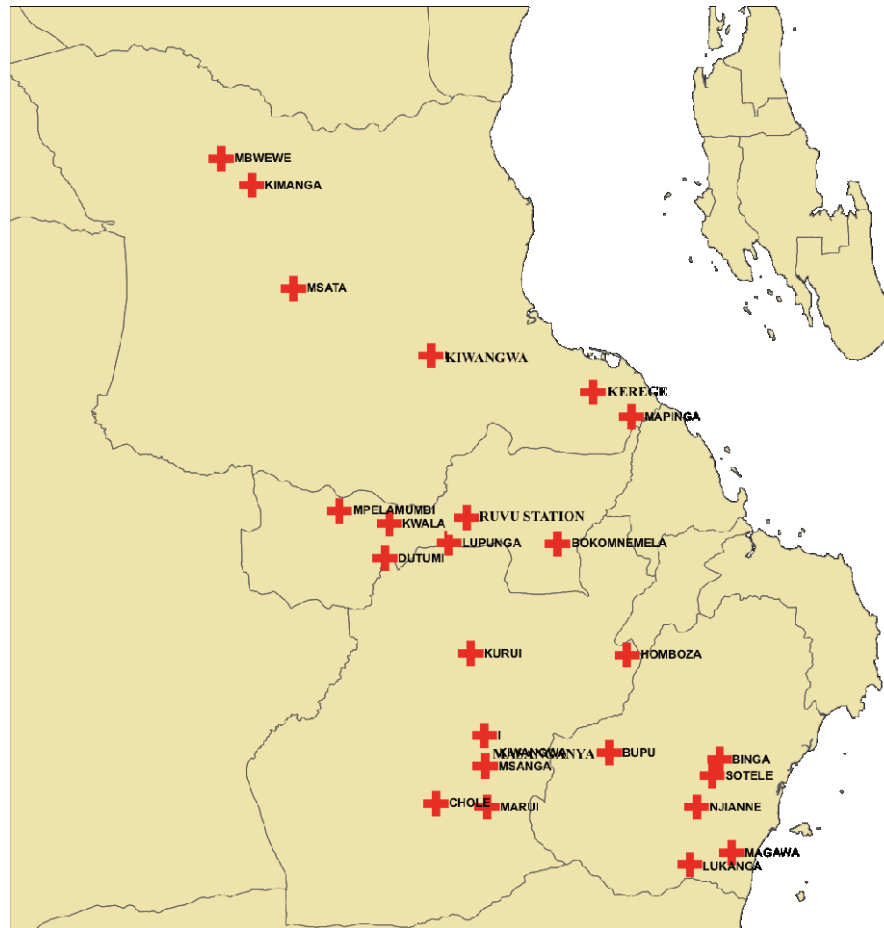
Hypothesis

Strengthening MNH services and outreach using the HIV program strategy (MNH+) will improve quality and utilization of essential MNH **and** HIV services and in turn lead to better health outcomes for mothers and newborns.

Study design

- Cluster-randomized implementation science study
- 12 clinics will be randomly selected for the intervention group, 12 in control group
- Few implementation studies are randomized or include any comparison group (20/743 implementation evaluations in the Fixsen review were randomized)

Study facilities



What we've learned so far...

- 71% of women deliver in the health system
- 40% of women who decide to deliver in the health system avoid the primary health clinic and deliver in a hospital or health center

Benefits of bypassing primary care

	Bypassers (n=793)	Non-bypassers (n=1104)	OR (95% CI)	p-value
Services received				
Baby checked before discharge	584 (74.9)	748 (69.0)	1.34 (1.09, 1.65)	0.006
Mom checked before discharge	345 (43.6)	357 (32.7)	1.59 (1.32, 1.92)	<0.001
Uterotonic received	602 (76.1)	856 (78.3)	0.88 (0.71, 1.10)	0.258
Antibiotic or other drug by IV	177 (22.4)	236 (21.6)	1.05 (0.84, 1.3)	0.684
Blood transfusion	21 (2.6)	15 (1.4)	1.96 (1.00, 3.83)	0.049
Payment				
Provider fees, drugs, supplies, tests & services	11.60 (26.73)	6.90 (15.00)	4.70 (2.70, 6.70)	<0.001
Transportation	59.81 (80.70)	19.58 (45.25)	40.22 (34.42, 46.02)	<0.001
Room and board	1.90 (9.83)	0.23 (0.97)	1.66 (1.08, 2.25)	<0.001
Distance travelled				
Distance travelled (in minutes)	54.5 (66.8)	34.8 (42.6)	19.69 (14.75, 24.64)	<0.001
Perceived very good or excellent quality*				
Overall delivery care	467 (58.9)	511 (46.7)	1.64 (1.36, 1.97)	<0.001
Respectful communication from the health worker	380 (48.0)	443 (40.4)	1.36 (1.13, 1.63)	0.001
Cleanliness of the delivery room	284 (35.9)	311 (28.4)	1.41 (1.16, 1.71)	0.001
Privacy of the delivery room	317 (40.2)	426 (38.9)	1.06 (0.88, 1.27)	0.562
Clarity of communication from the health worker	310 (39.2)	370 (33.8)	1.26 (1.04, 1.53)	0.016
Knowledge of the health worker	352 (44.6)	404 (36.9)	1.38 (1.14, 1.66)	0.001
Availability of drugs and modern equipment	276 (35.4)	248 (22.9)	1.84 (1.50, 2.26)	<0.001
Satisfaction and respect				
Very satisfied with the delivery experience	513 (64.7)	543 (49.5)	1.87 (1.55, 2.25)	<0.001
Was humiliated during delivery	53 (6.7)	95 (8.7)	0.76 (0.53, 1.07)	0.116
Data are mean (SD), number (%), OR, or mean difference. All currency amounts are in USD. *Women who rated quality as very good or excellent, versus those who did not.				
Table 3. Bivariate associations between participant and local health facility characteristics and bypasser status for a census of women with a recent delivery from the catchment areas of 24 health facilities in Pwani Region, 2012				

Human resources

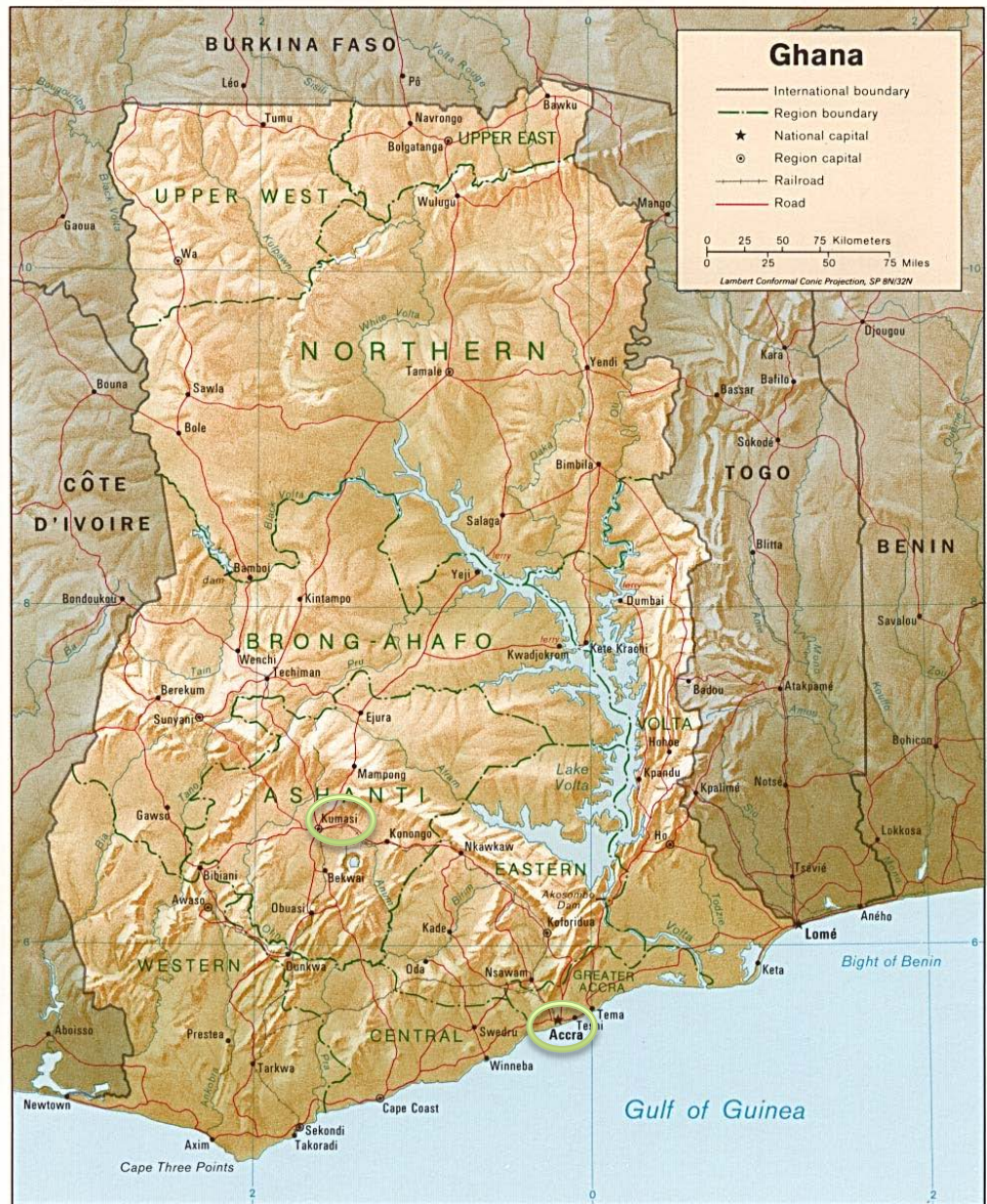
What are the policy options for bringing doctors to rural areas?

Policy relevant?

Timely?

Feasible?

Ghana



Human resource context

- Population 22.2 million; 62% in rural areas
- 2442 MDs were working in Ghana in 2009
- 61% of medical school graduates between 1985 and 1994 emigrated, primarily to UK and US
- 69% of physicians practice in Accra region or the Kumasi teaching hospital (Komfo Anokye)
- Physician to population ratios:
 - 1:5000 in Greater Accra region
 - 1:92,000 in Northern region

Methods

- Invited all 4th year medical students in Ghana to participate
- Gave electronic survey on background, career plans, motivation for rural practice along with DCE module (12 choice tasks) in computer labs with trained surveyors

Figure 2. Sample DCE question

Imagine that upon completing your housejob, you have decided to go into **general practice** for several years. The Ministry of Health offers you two postings in two different **deprived areas**. By deprived area, we mean a rural area that is distant from a big city with few social amenities such as schools, roads, pipeborne water, etc.

Each of these two postings has different benefits including: salary; children’s education; infrastructure, equipment and supplies; management style; minimum years of work before study leave; housing; and transportation. It is important that you imagine yourself making a real decision between the two postings. Although we know that some of the deprived area benefits have not been properly implemented in the past, please assume that you will receive the benefits described for your posting. In making your choice, please read carefully the full list of benefits for each posting and do not imagine any additional features of these postings.

Tell us which of these postings do you prefer?

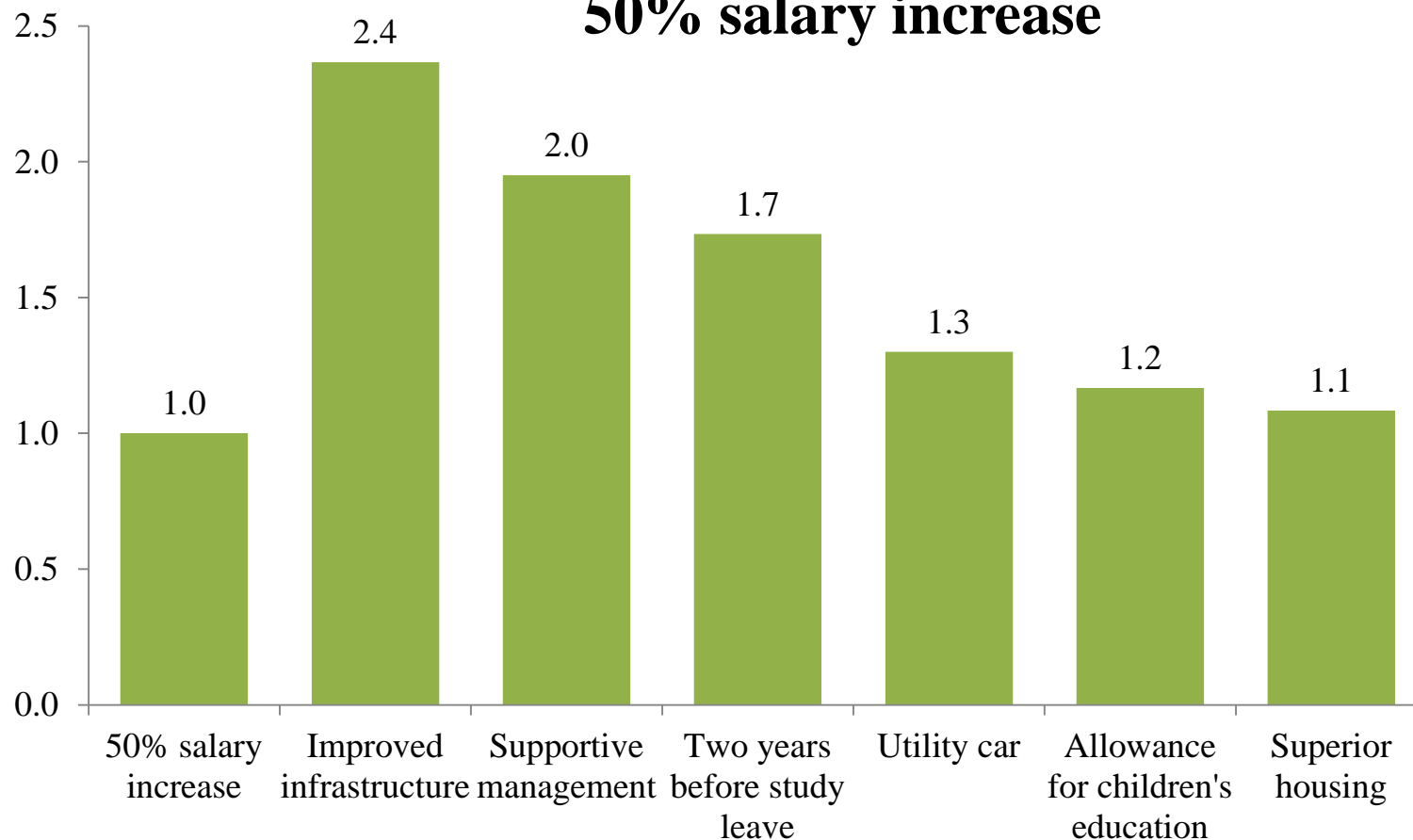
	Posting A	Posting B
Salary:	Two times base salary	Base salary plus 50%
Children's education:	Allowance for children's education	No allowance for children's education
Infrastructure, equipment, and supplies:	Advanced (e.g. reliable electricity, ultrasound, constant drug supply)	Basic (e.g. unreliable electricity, x-ray, intermittent drug supply)
Management Style:	Workplace and management are not supportive	Workplace and management are supportive
Minimum years of work before study leave	Study leave after 2 years of service	Study leave after 5 years of service
Housing:	Housing not provided	Free basic housing provided (e.g. 2 bedrooms, 1 bathroom, kitchen)
Transportation:	Utility car not provided to you	Utility car provided to you

Demographics

Characteristic	Mean (SD) or No (%)
Age	22.9 (1.4)
Gender	
Female	118 (39.1)
Male	183 (60.6)
Rather not say	1 (0.3)
Marital status	
Married or cohabitating	2 (0.7)
Unmarried, but in a relationship	117 (38.7)
Not in a relationship	176 (58.3)
Don't know/Rather not say	7 (2.3)
Has children	3 (1)
Mother's education	
No schooling or basic schooling	64 (21.2)
Secondary or technical vocational	89 (29.5)
Polytechnical school	42 (13.9)
University degree	100 (33.1)
Don't know/Rather not say	7 (2.3)

What mattered

Relative value of incentives, compared to a 50% salary increase



Incentives for rural medical practice in Ghana: results from a discrete choice experiment

Policy Problem and Study Aims

Health worker shortages are a critical constraint to meeting the health needs of Ghanaians. In addition, most physicians choose to live in urban areas, leaving rural regions medically underserved. For example, of the 2500 physicians working in Ghana, over 69% practice in Accra or Kumasi. Inequitable distribution of health workers is noted as a key challenge in the Ministry of Health's 2009 Programme of Work.

The aim of this study was to assess which rural practice incentives might have the greatest impact on preference for rural medical service. We investigated seven incentives: increased salary, improved infrastructure and equipment, supportive workplace and management, reduced time before study leave (2 vs. 5 years), utility car, allowance for children's education, and superior housing (versus basic or no housing). This study focused on policy changes amenable to intervention by the Ministry of Health.

Study Design and Findings

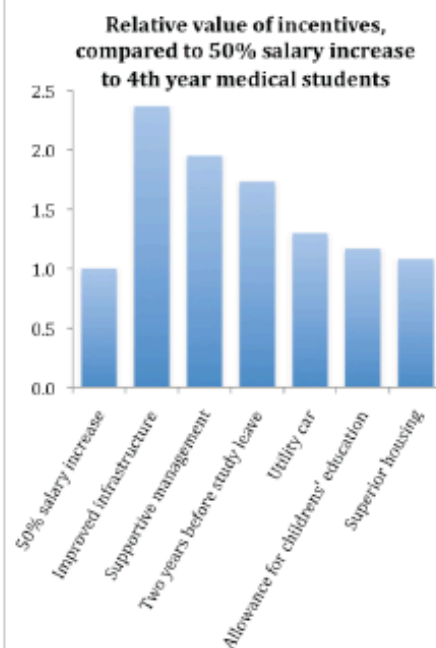
We performed a discrete choice experiment with all fourth-year medical students in Ghana, asking them to pick between two hypothetical rural job posts with a mix of the incentives listed above. Based on their choices, we determined the relative value of each incentive.

This study found that non-financial incentives such as infrastructure and management were very important.

In order of declining value, the incentives are:

1. Improved infrastructure and equipment
2. Supportive workplace and management
3. Two years before study leave
4. Utility car
5. Allowance for children's education
6. Superior housing
7. A 50% increase in salary

The chart to the right shows the relative value of each incentive to fourth-year medical students, compared to a 50% salary increase. The analysis also suggested that supportive workplace and management were especially important to women.



Recommendations

1. Ministry of Health could develop a policy experiment to test impact of incentive package offering one or more preferred incentives (e.g., infrastructure, supportive management) on recruitment.
2. This package could be offered in rural hospitals/clinics in several districts and uptake of postings by doctors could be compared to control districts offering standard rural job conditions.
3. This experiment should be rigorously evaluated using a randomized study design.

Research team: Margaret E. Krusk, Jennifer C. Johnson, Mawuli Gyakobo, Peter Aggel-Baffour, Kwesi Asabir, S. Rani Kotha, Janet Kwansah, Emmanuel Nakua, Rachel C. Snow, Mawuli Dzodzomenyo. Contact: mkrusk@umich.edu.

Questions?