Measuring maternal mortality: some innovations from Immpact

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- on behalf of the Maternal Outcomes team

Why measure maternal mortality?

- advocacy (mobilise resources, accountability)
- “population monitoring” of levels & trends - (e.g.MDG5)
- identify determinants, differentials & consequences
- planning of services and interventions
- monitoring and quality assurance of services
- evaluation of interventions

Guiding principles for maternal mortality work programme

1. Promote multiple measurement approaches
(to increase the armoury of tools)

2. Increase efficiency of data capture
(to address in-country capacity constraints & large sample sizes needed)

3. Improve reliability of data
(to promote awareness that quality matters)

4. Focus research and development effort
(to build on promising existing tools & innovate)

Work programme innovations in phase I

POPULATION BASED ESTIMATES	INSTITUTIONAL ESTIMATES	CAUSE OF DEATH	CAPACITY STRENGTHENING
1. Sampling at service sites (SSS-health facilities; SSS-markets) **2.MADE-IN/ MADE-FOR**	Secondary research: Familial Technique; Profiles; Meta-analytic methods	Rapid Ascertainment Process for Institutional Deaths (RAPID)	Barriers and facilitators to reporting facility and community deaths Computer algorithm for causes (InterVAM)	E.g. CAL packages Census workshop

Conventional surveys take the data capture process to the respondents – usually their household.

Innovation – let the respondents come to survey!

Innovation in sampling, hence called this approach:

Sampling at Service Sites (SSS)

SSS – essentially opportunistic sampling

Sites can be anywhere with large numbers of potential respondents

Representativeness of SSS respondents can be established by comparing with data from existing population surveys e.g.DHS

Must be limited number of questions in SSS: characteristics of respondent & deaths among sisters (direct sisterhood method)

FIRST FIELD TRIAL OF SSS IN GHANA

Central Region: 12 districts: 6 in mid-2004, 6 in early 2005

- Sites: district hospitals and major clinics – MCH, ANC,FP
- 15 fieldworkers
- 15 weeks
- Total cost: ~US $64,000

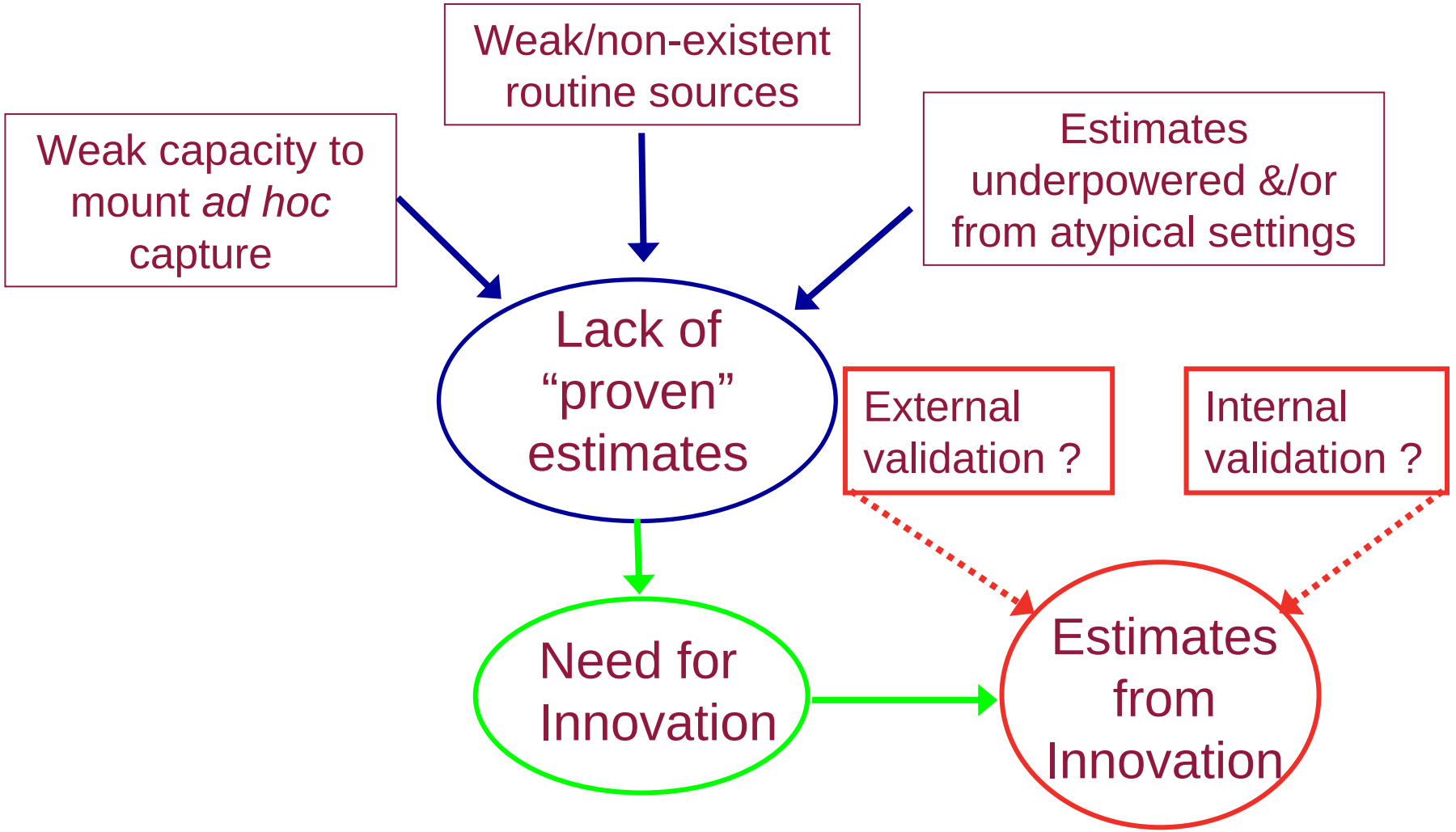
11,329 respondents

23,838 sisters aged ≥ 15

Maternal Mortality Ratio: 734 per 100,000 live births (95% C.I. 580 to 880)

Time location: ~2002

Validation challenge for maternal mortality estimates



	IMMPACT SSS-H: Central Region, Ghana ~2002		Ghana World Health Survey: National ~1999-2000	
	Estimates	95% C.I.	Estimates	95% C.I
Maternal mortality ratio (maternal deaths per 100,000 live births)	**734**	580-880	**490**	252-723
Maternal mortality rate (maternal deaths per 10,000 woman 15-49 years risk exposure)	**9.4**	7.4 -11.3	**7.4**	3.8 -11.0
Proportion of deaths to women of reproductive age which are maternal	**22%**	18% - 26%	**19.0%**	11% - 27%
WRA death rate (maternal deaths to women 15-49 per 1000 woman years risk exposure)	**4.2**	3.8 - 4.6	**3.9**	3.2 - 4.6

Exploring alternative sampling sites – Burkina Faso

"Sampling at shopping sites"- market places

Proof of principle trial of SSS-M in Hounde, compared to household survey

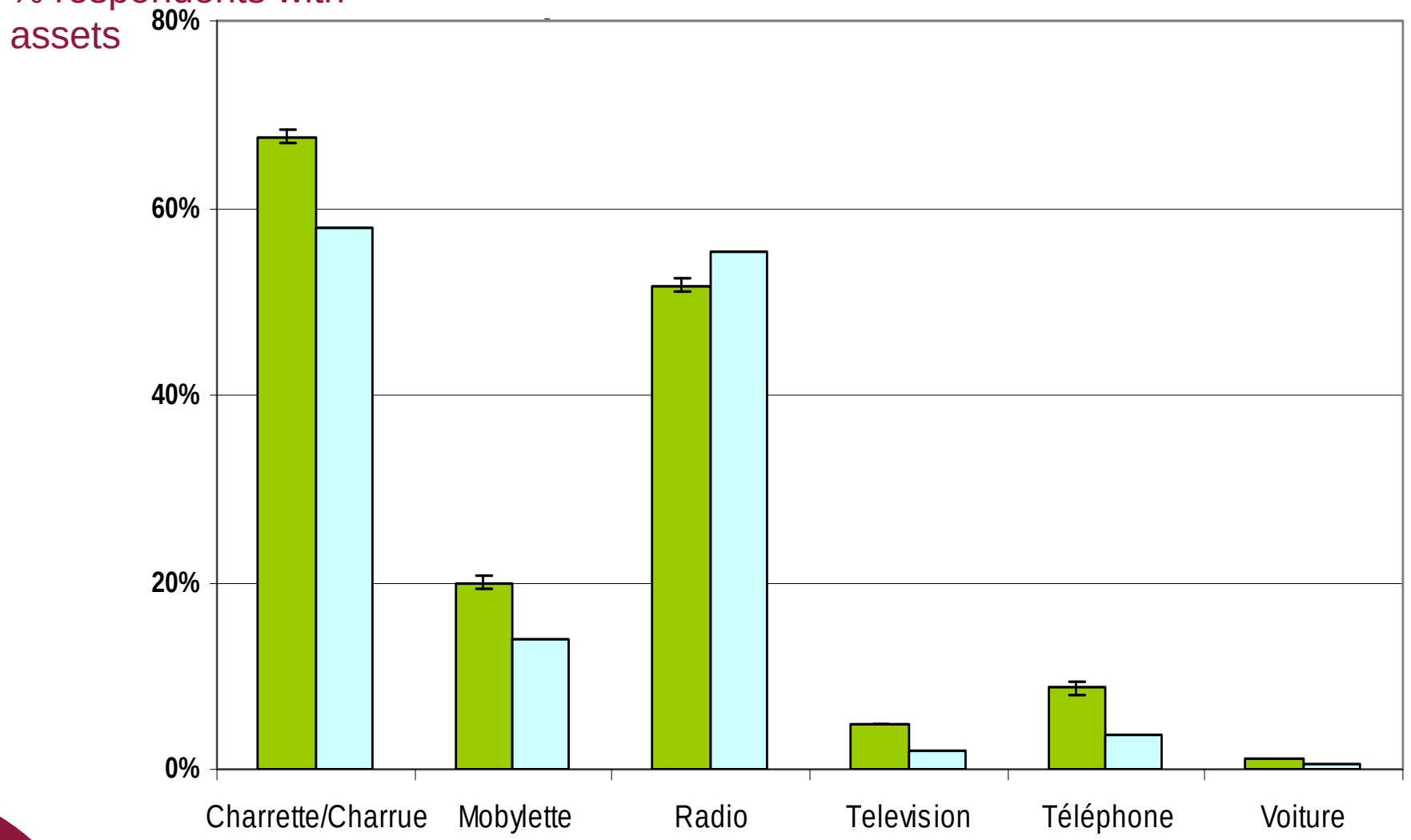
Market survey was quicker (3 weeks for 5020 women versus 3 weeks for 1276 women) and also cheaper (<US$ 3 per woman for SSS-M compared to US$ 11 for household survey)

Full field trial in Ouargaye District: Jun/Jul 2006

Unusual validation opportunity: compare SSS-M with full enumeration (census) – asking about deaths in household & sisters deaths – using PDAs

- Five weeks, 39 markets in Ouargaye, 20 data collectors & 4 supervisors, 31 days.
- 16,606 female respondents aged 15-49 years, reporting 24,350 adult sisters
- 368 deaths to adult sisters in previous 5-years, 27% (99) pregnancy-related deaths.

Asset ownership in SSS-M population compared to Immpact census data



Results from SSS-M compared to alternatives

	MM ratio (per 100,00 live birth)		% maternal deaths among all deaths to women of reproductive age
SSS-M (Ouargaye; 2003/04)	397 (254 - 540)		26.9%
Immpact census: deaths in household (Ouargaye; 2003/04)	400 (343 – 457)		26.4%
Immpact census: direct sisterhood method (Ouargaye part; 2003/04)	332 (246 - 418)		18.0%
DHS (National; 1999) WHO/UNICEF/UNFPA (National, modelled; 2000)	484 1000 (630 -1500)		22% 37%

Work programme innovations in phase I

POPULATION BASED ESTIMATES

1. Sampling at service sites (SSS-health facilities, SSS-markets);

2. MADE-IN/ MADE-FOR

INSTITUTIONAL ESTIMATES

Secondary research:

Familial Technique;

Profiles;

Meta-analytic methods

CAUSE OF DEATH

Rapid Ascertainment Process for Institutional Deaths (RAPID)

Barriers and facilitators to reporting facility and community deaths

Computer algorithm for causes (InterVA-M)

CAPACITY STRENGTHENING

E.g. CAL packages

Census workshop

What is MADE-IN/MADE-FOR?

Maternal Death from Informant (MADE-IN)

Maternal Death Follow On Review (MADE-FOR)

This approach uses a). village-based informants to identify maternal deaths among women of reproductive age (MADE-IN), and b). follow-up interviews with families to confirm cause of death (MADE-FOR).

Five main steps to MADE-IN/MADE-FOR:

1. Identify suitable types of informants :in Indonesia, Kaders and RTs;
2. Orientate informants at sub-district level;
3. Prepare village listing of “likely” maternal deaths to women of reproductive age from village-based informants;

4. Visit families to conduct verbal autopsy (InterVA-M used) to confirm maternal deaths;
5. Use capture-recapture technique to arrive at arrive at final number of maternal deaths.

Use of Capture-Recapture Technique

Rationale: most sources underestimate maternal mortality & thus >1 source of data is preferable.

- Need at least two independent sources for identifying maternal deaths
- Each source must have potential to yield a random sample of all deaths of reproductive age
- Capture-recapture requires that maternal deaths which are identified by different sources can be 'matched‘
- Second source allows an estimate of proportion of maternal deaths captured in first source
- This allows an estimate of “true” total number of maternal deaths.

Results from MADE-IN/MADE-FOR

	MMR (deaths/100,000 live births (95% CIs))
Serang & Pandeglang (2004-05)	**429** (372,494)
Serang	**381** (319,452)
Pandeglang	**511** (421,616)
Indonesia (DHS 2003)	**307** (219, 395)
Indonesia (WHO)	**230** (58, 440)

Comparative efficiency of methods

	MI/MF Indonesia	SSS Ghana Health Facilities	SSS Burkina Faso Markets
Survey effort (interviewer-weeks)	830	170	130
Women covered	758,000	21,500	24,900
Women per effort	1600	130	200
Reference period	2 years	5 years	5 years
Exposure (women years)	1,520,000	108,000	125,000
Exposure per effort	3200	640	990
Deaths detected	474	93	99
Deaths per effort	0.99	0.55	0.79

Next steps for Immpact maternal mortality tools?

Immpact Phase I:

- Communication of experience – peer review
- Immpact toolkit

Immpact Phase II:

- SSS: further applications; search for other sampling sites
- MADE-IN/MADE-FOR: trial of institutionalising (routine prospective reporting); empowering communities
- Further development of other MM tools e.g. cause of death
- Effective technical support through Ipact

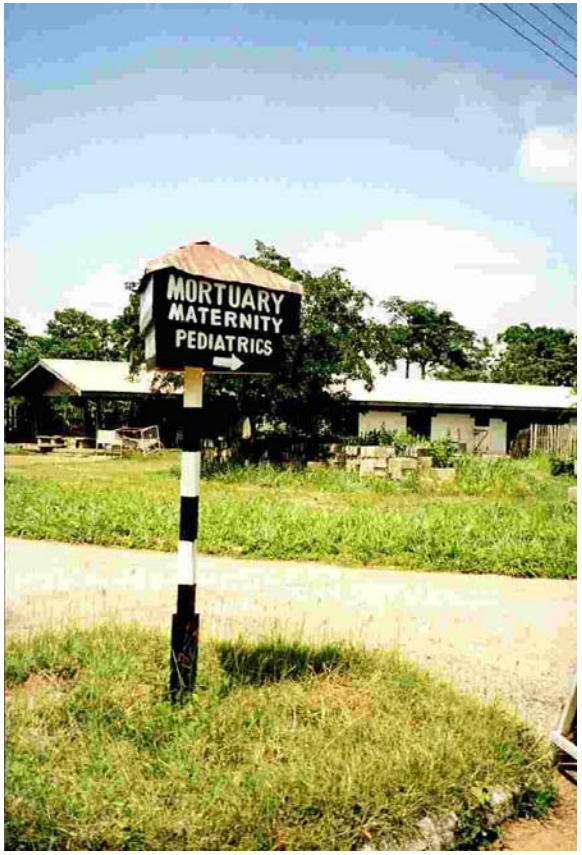
Potential of new population-based methods

Helping to meet acute need: MDG5 national & sub-national monitoring

Is SSS technique ready to go?

History repeating itself?

- Original sisterhood developed by Graham & Brass in late 1987 – The Gambia – trial cost £1500, funded by ODA (DFID)
- Further refinements by others – especially DHS
- Crucial to continue to build sustainable routine sources and to commit resources



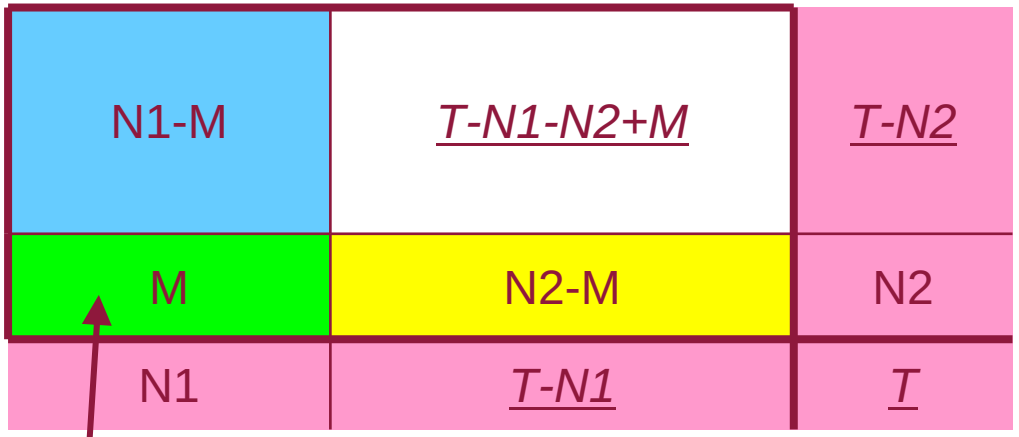
With thanks to Immpact Maternal Outcomes teams & collaborating countries

Visual Representation of C-RC

The area inside the bordered rectangle represents all deaths

This column represents deaths identified by method 1

The white cell represents deaths not identified by either method



This row represents deaths identified by method 2

The green cell represents deaths identified by both methods

A good estimate of the total number of deaths *T* is simply (N1xN2) / M

Framework of objectives for Immpact II

GOAL
Reduce maternal mortality in poor countries

PURPOSE
Improve policy and programme decision-making to reduce maternal mortality based on robust evaluation and measurement

MM+
Global technical leadership in measurement to reduce maternal mortality

Ipact
Technical support and strengthened capacity for programme evaluation

OUTPUT 1
Enhanced **methods** for measurement of maternal mortality & related indicators

OUTPUT 2
Effective **communication** of methods & data on maternal mortality & related indicators

OUTPUT 3
Strengthened **capacity** to capture & use data to reduce maternal mortality