Can mass media save lives?

Dr Joanna Murray, Research Manager
Development Media International
Who we are

DMI Board

David Heymann  Joy Phumaphi  Richard Horton  Bob Hornik  Mark Adams

Scientific Advisors

Cesar Victora  Rachel Glennerster  Simon Cousens

Scientific Collaborators

Anne Mills  Sophie Sarrassat
Can we reduce child mortality?

Modelling impact of mass media on child mortality

• Never previously measured or modelled

• Collaboration with LSHTM (*Prof Simon Cousens, Prof Anne Mills, Dr Jo Borghi*)

• Multi-disease approach

• Mathematical model based on:
  
  • *Lancet data* on impact of interventions on child mortality
    (*Child Survival Series 2003 and 2005*)
  
  • *DMI evidence* of previous behaviour change campaigns
## The model’s predictions

<table>
<thead>
<tr>
<th>Country</th>
<th>Under-five deaths per year</th>
<th>Predicted under-five lives saved</th>
<th>As % of all deaths</th>
<th>Media penetration</th>
<th>Cost per DALY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cameroon</td>
<td>74,000</td>
<td>8,917</td>
<td>12.1%</td>
<td>69%</td>
<td>$7.15</td>
</tr>
<tr>
<td>Chad</td>
<td>82,000</td>
<td>10,809</td>
<td>13.2%</td>
<td>45%</td>
<td>$6.66</td>
</tr>
<tr>
<td>Côte d'Ivoire</td>
<td>75,000</td>
<td>9,562</td>
<td>12.7%</td>
<td>74%</td>
<td>$7.55</td>
</tr>
<tr>
<td>DR Congo</td>
<td>391,000</td>
<td>14,384</td>
<td>3.7%</td>
<td>44%</td>
<td>$6.41</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>205,000</td>
<td>10,052</td>
<td>4.9%</td>
<td>33%</td>
<td>$7.48</td>
</tr>
<tr>
<td>Ghana</td>
<td>56,000</td>
<td>7,166</td>
<td>12.8%</td>
<td>92%</td>
<td>$11.87</td>
</tr>
<tr>
<td>Guinea</td>
<td>41,000</td>
<td>6,010</td>
<td>14.7%</td>
<td>64%</td>
<td>$10.42</td>
</tr>
<tr>
<td>Kenya</td>
<td>108,000</td>
<td>20,316</td>
<td>18.8%</td>
<td>86%</td>
<td>$6.36</td>
</tr>
<tr>
<td>Malawi</td>
<td>43,000</td>
<td>5,501</td>
<td>12.8%</td>
<td>70%</td>
<td>$14.45</td>
</tr>
<tr>
<td>Mali</td>
<td>83,000</td>
<td>16,379</td>
<td>19.7%</td>
<td>81%</td>
<td>$4.40</td>
</tr>
<tr>
<td>Mozambique</td>
<td>84,000</td>
<td>14,592</td>
<td>17.4%</td>
<td>88%</td>
<td>$7.12</td>
</tr>
<tr>
<td>Niger</td>
<td>91,000</td>
<td>12,392</td>
<td>13.6%</td>
<td>64%</td>
<td>$5.17</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>39,000</td>
<td>4,801</td>
<td>12.3%</td>
<td>57%</td>
<td>$14.31</td>
</tr>
<tr>
<td>Tanzania</td>
<td>98,000</td>
<td>18,040</td>
<td>18.4%</td>
<td>70%</td>
<td>$4.59</td>
</tr>
<tr>
<td>Uganda</td>
<td>103,000</td>
<td>14,967</td>
<td>14.5%</td>
<td>83%</td>
<td>$6.23</td>
</tr>
<tr>
<td>Zambia</td>
<td>50,000</td>
<td>11,182</td>
<td>22.4%</td>
<td>72%</td>
<td>$8.24</td>
</tr>
</tbody>
</table>
Testing the model through an RCT
Making media campaigns effective: Saturation+

Saturation

• Broadcast messages in local languages, several times a day, for a sustained period
• Use radio/TV networks that reach the target audience
• Develop partnerships with market-leading stations and procure airtime

Science

• Use modelling to maximise health impacts
• Monitor broadcasting and audience reactions (understanding & behaviour change)
• Measure outcomes and health impacts robustly

Stories

• Understand the audience using qualitative research to inform the creative process
• Recruit talented local scriptwriters
• Generate content that changes behaviours effectively
Using the model as a tool

Maximising health impacts through message selection

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Message</th>
<th>Impact*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breastfeeding</td>
<td>Exclusive breastfeeding for six months, continue for 24 months</td>
<td>1,659</td>
</tr>
<tr>
<td>Insecticide-treated nets</td>
<td>Use bednets for the whole family, especially mother and baby</td>
<td>1,452</td>
</tr>
<tr>
<td>Extra care for LBW</td>
<td>Feed small babies more often, keep them warm, avoid bathing</td>
<td>1,161</td>
</tr>
<tr>
<td>ORT</td>
<td>Continue feeding and provide appropriate fluids</td>
<td>2,530</td>
</tr>
<tr>
<td>Antibiotics for ARIs</td>
<td>Know danger signs of pneumonia and seek treatment</td>
<td>671</td>
</tr>
<tr>
<td>Anti-malarials</td>
<td>Recognise symptoms and seek treatment</td>
<td>2,046</td>
</tr>
</tbody>
</table>

* Predicted lives saved in DRC
Midline results

Our study measures mortality in seven intervention zones and seven control zones:

50,000 sampled at baseline, 100,000 at endline.

We are also conducting surveys of behaviour: 5,000 mothers sampled at baseline, midline & endline.

These results are the preliminary midline behavioural results.

Fieldwork took place after 20 months of broadcasting (after 59% of a 34-month campaign) and was supervised and analysed by Simon Cousens and Sophie Sarrassat at LSHTM.
### Midline results | Changes in behaviours

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Control</th>
<th>Intervention (adjusted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sought treatment for diarrhoea at a clinic</td>
<td>8.6</td>
<td>24.6</td>
</tr>
<tr>
<td>Received ORT or increased liquids for diarrhoea</td>
<td>1.5</td>
<td>24.8</td>
</tr>
<tr>
<td>Received antibiotics for pneumonia</td>
<td>10.5</td>
<td>25.3</td>
</tr>
<tr>
<td>Sought treatment for fever at a clinic</td>
<td>8.7</td>
<td>17.8</td>
</tr>
<tr>
<td>Women sleeping under bed net during pregnancy</td>
<td>12.6</td>
<td>16</td>
</tr>
<tr>
<td>Household ownership of latrines</td>
<td>9.6</td>
<td>11.9</td>
</tr>
<tr>
<td>Early initiation of breastfeeding (2 hours of birth)</td>
<td>-2.5</td>
<td>8.2</td>
</tr>
<tr>
<td>Exclusive breastfeeding aged 0 to 5 months</td>
<td>8.2</td>
<td>14.1</td>
</tr>
<tr>
<td>Gave birth in health facility/with skilled attendant</td>
<td>11.5</td>
<td>11.7</td>
</tr>
<tr>
<td>Saved money for an emergency during pregnancy</td>
<td>5.6</td>
<td>14.1</td>
</tr>
</tbody>
</table>
Midline results | Dose-response analysis

Difference in difference vs. Number of weeks of spots broadcast at midline

- Difference in difference: Y-axis
- Number of weeks of spots broadcast at midline: X-axis

Data points plotted on the graph show a positive trend, indicating an increase in difference as the number of weeks increases.
Implications of midline results for remainder of RCT

<table>
<thead>
<tr>
<th>Message</th>
<th>Broadcasting to date (up to end Oct 2013)</th>
<th>Proposed message weightings for remainder of campaign</th>
<th>Predicted impact (based on BC impact from BL to MD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of weeks of spots</td>
<td>% BC increase (BL to MD)</td>
<td>% Increase in behaviour per week broadcast</td>
</tr>
<tr>
<td>Diarrhoea: ORS/</td>
<td>12</td>
<td>5.0</td>
<td>0.42</td>
</tr>
<tr>
<td>Diarrhoea: increased liquids</td>
<td>12</td>
<td>25.8</td>
<td>2.15</td>
</tr>
<tr>
<td>Diarrhoea: Dysentery treatment</td>
<td>5</td>
<td>15.2</td>
<td>3.04</td>
</tr>
<tr>
<td>MAL: Seek treatment (antimalarial)</td>
<td>10</td>
<td>15.9</td>
<td>1.59</td>
</tr>
<tr>
<td>MAL: Bednet use</td>
<td>6</td>
<td>4.9</td>
<td>0.82</td>
</tr>
<tr>
<td>BF: Exclusive breastfeeding</td>
<td>5</td>
<td>12.2</td>
<td>2.44</td>
</tr>
<tr>
<td>BF: Colostrum</td>
<td>6</td>
<td>10.4</td>
<td>1.73</td>
</tr>
<tr>
<td>WASH: Handwashing</td>
<td>8</td>
<td>0.4</td>
<td>0.05</td>
</tr>
<tr>
<td>WASH: Latrines</td>
<td>2.5</td>
<td>10.9</td>
<td>4.36</td>
</tr>
<tr>
<td>WASH: Hygienic disposal</td>
<td>2.5</td>
<td>5.9</td>
<td>2.36</td>
</tr>
<tr>
<td>Pneum: Seek treatment (antibiotic)</td>
<td>7</td>
<td>18.2</td>
<td>2.6%</td>
</tr>
<tr>
<td>Pneum: Treatment adherence</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>LBW: Skin-skin; BF: avoid washing</td>
<td>3</td>
<td>0.9</td>
<td>0.30</td>
</tr>
<tr>
<td>LBW: Take babies to be weighed</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CF: Enriched “bouillie”</td>
<td>4</td>
<td>8.7</td>
<td>2.18</td>
</tr>
<tr>
<td>CF: Monthly weighings</td>
<td>4</td>
<td>7.0</td>
<td>1.75</td>
</tr>
<tr>
<td>MH: ANC 4+</td>
<td>3</td>
<td>11.4</td>
<td>3.80</td>
</tr>
<tr>
<td>MH: Health centre delivery</td>
<td>5</td>
<td>9.3</td>
<td>1.86</td>
</tr>
</tbody>
</table>

Adjusting broadcasting doses

1. Calculate lives saved per 1% change in behaviour (LiST)

2. Measure % behaviour change actually achieved per week of broadcast during first half of RCT

3. Can then predict lives saved for each message by end of campaign and allocate weights accordingly.
Qualitative Research

3 core elements:

• **Formative research** - every spot or drama script is based on a one-page ‘message brief’: a set of instructions to the creative team, summarising research findings about key behaviours and barriers to behaviour change.

• **Pre-testing** - spots with focus groups that are representative of our target audience, to investigate clarity, understanding and appeal.

• **Post-broadcasting feedback research** - to help us understand audience reactions and find out whether people who hear our messages have changed their behaviours, and if not, why not - what are the remaining obstacles?
Implications for our future research agenda

Addressing the evidence gaps: key learning points

• Robust evaluation **measuring hard health outcome** and estimating the **cost-effectiveness of mass media**, to permit comparison with other child health interventions

• Importance of linking research findings into **program design** (modelling and formative research) **and implementation** (qualitative and quantitative research findings), allowing **continual refinement of messaging**

• Importance of documenting and sharing *how* campaign was implemented, lessons learnt, recommendations & aspects of context essential for scale-up

• Next steps: rapid scale-up using spot format (from 7 to 28 radio stations estimated to reach 78% of the population of Burkina Faso)
Thank you for listening

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Recent BBC news article about DMI:
http://www.developmentmedia.net/oct-2014/dmi-bbc-news-can-radio-save-lives
Future research questions

Measuring and achieving impact at scale

• Standardised indicators

• Long-term, sustained impact?

• Impact in food secure and insecure settings?

• Operation al challenges of implementation and research at scale – geographic and ethnically diverse populations, multiple-languages

• Responding to environmental/social/political changes in real-time
## Disparity in access to health facilities

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Intervention clusters</th>
<th>Control clusters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of women giving birth in a health facility</td>
<td>56%</td>
<td>82%</td>
</tr>
<tr>
<td>Mean distance to a health facility</td>
<td>6.5km</td>
<td>3.3km</td>
</tr>
<tr>
<td>Mean distance from Ouagadougou</td>
<td>232km</td>
<td>158km</td>
</tr>
<tr>
<td>Total number of health centres</td>
<td>22</td>
<td>41</td>
</tr>
</tbody>
</table>
THEORY OF CHANGE FOR A SATURATION+ (SATURATION, SCIENCE AND STORIES) CAMPAIGN

**INPUTS/ACTIVITIES**

1. Media campaign is designed to maximise the reach of the messages (Broadcast on stations heard by at least 75% of the target population and in languages which at least 75% of the target population can understand well)

2. Capacity building of broadcast partners

3. Develop multi-issue campaigns to tackle all major causes of death; use mathematical modelling to estimate the number of lives saved by each message and allocate airtime to each message based on number of lives saved and seasonality

4. Formative research identifies key barriers to behaviour change and is presented to creative team in digestible format

5. Recruitment of experienced international broadcasters who provide ongoing creative and programme management

6. Grassroots recruitment and training of local scriptwriters

**OUTPUTS**

- Broadcast partners have the capacity to broadcast spots and modules (ii)
- Spots are broadcast 10 times per day (iii) and modules are broadcast every weekday. Campaign is broadcast 365 days/year.
- Women and entourage hear spots (iv) as intended
- Women change household health behaviours (v)
- Women change health-seeking/facility-dependent behaviours (vi)

**OUTCOMES**

- Women and mothers maintain improved household health behaviours (v)
- Pregnant women and mothers maintain improved health-seeking behaviours (vi)
- Pregnant women and mothers maintain improved health-seeking / facility dependent behaviours (vii)
- Reduction in child mortality (vii)

**IMPACT**

**Assumptions:**

A. The investment in the recruitment, training and management of a creative team will result in high quality scripts and spots.

B. Capacity building of broadcast partners leads to reliable broadcasting of spots and modules by ensuring radio station remains on air

C. Investment in broadcast partners increases adherence to commitments to broadcast spots 10 times/day.

D. That women who hear the radio spots will change their behaviours according to the message that they’ve heard.

E. Cultural beliefs, family hierarchies, and community structures will not prevent the adoption of healthy behaviours because messages broadcast will directly address these barriers to change.

F. Women are able to access and travel to a health facility.

G. The health facility has sufficient service provision to meet increased demand and provides a good quality of care.

**Rationale:**

a. Evidence articulated in Exposure: Theory and Evidence about all the ways it matters (Robert C Hornik, 2002) plus evidence from a high exposure (spots broadcast up to 14 times per day for three years) hand washing campaign in Ethiopia, which resulted in significant reductions in observed dirty hands (decreasing from 74% to 26%) and a 20% reduction in the prevalence of trachoma indicates that increased exposure results in a higher impact. Dose response analysis of the midline data for the Burkina Faso RCT found a strong correlation between the intervention ‘dose’ (the number of weeks each message was broadcast) and the impact on behaviours, providing further support for exposure theory.

b. Evidence published in the Lancet Child Survival Series 2003, the International Journal of Epidemiology (Development and use of the Lives Saved Tool (LiST): A model to estimate the impact of scaling up proven interventions on maternal, neonatal and child mortality, Volume 39 suppl 1 April 2010); BMC Public Health (Technical inputs, enhancements and applications of the LiST 2011, 11) and Reproductive Health (Essential interventions for maternal, newborn and child health: background and methodology; Lassi et al. 2014, 11) indicate that increasing coverage of key health behaviours and interventions leads to a reduction in child morbidity and mortality.

**Indicators:**

1. Number of trained scriptwriters in position.
2. Number of weeks/year that partner radio stations are off-air
3. The broadcasting of spots is monitored by independent ‘trackers’
4. Qualitative research and quantitative cross-sectional surveys investigate whether women have heard the radio spots and modules
5. Baseline, midline and endline surveys of reported household behaviours
6. Baseline, midline and endline surveys of reported health-seeking behaviours
7. Baseline and endline surveys of reported health-seeking behaviours
8. Baseline and endline surveys of reported health-seeking behaviours
IMPACT AT SCALE
The *Saturation+* approach
### Achieving impact | Current practice

#### 1 | Saturation

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>Broadcast spots <strong>8-12 times per day</strong> (radio), or 3 times (TV), and strip-schedule longer formats</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Broadcast <strong>365 days of the year</strong> for <strong>at least one year</strong> (preferably for three years or more)</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>Broadcast in languages which <strong>at least 75% of the target population</strong> can understand well</td>
</tr>
<tr>
<td><strong>D</strong></td>
<td>Broadcast on stations viewed or heard <strong>at least weekly by at least 75% of the target population</strong></td>
</tr>
</tbody>
</table>

- Spots are often broadcast once or twice per day, and dramas are usually weekly
- Many campaigns are broadcast for limited periods, sometimes as little as one week
- Many campaigns use the lingua franca, which many understand only imperfectly
- Partner stations often have large urban audiences but reach smaller rural audiences
<table>
<thead>
<tr>
<th></th>
<th>Achieving impact</th>
<th>Current practice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>A</strong></td>
<td>Use mathematical modelling to estimate the <strong>number of lives saved</strong> by each message</td>
</tr>
<tr>
<td></td>
<td><strong>B</strong></td>
<td>Create <strong>multi-issue campaigns</strong> to tackle all major RMNCH issues</td>
</tr>
<tr>
<td></td>
<td><strong>C</strong></td>
<td>Allocate airtime to each message based primarily on the number of lives saved (and e.g. seasonality)</td>
</tr>
<tr>
<td></td>
<td><strong>D</strong></td>
<td>Measure and attribute impacts using time series (or quasi-experimental) evaluations</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>No current media campaigns are able to estimate the number of lives saved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Many campaigns cover vertical diseases or issues such as malaria or breastfeeding</td>
</tr>
<tr>
<td></td>
<td>No current media campaigns are able to prioritise messages based on lives saved</td>
</tr>
<tr>
<td></td>
<td>Many campaigns measure impact using pre-post designs, with little attribution</td>
</tr>
</tbody>
</table>
Achieving impact | Current practice

3 | Stories

**A** Integrate formative research findings into the creative process

Most campaigns have formative research but it is not always used effectively

**B** Test all materials before and after broadcast to check audience reaction, message clarity and impact

Most campaigns pre-test materials but few collect post-broadcast feedback

**C** Recruit and train local scriptwriters who are familiar with the culture of all target audience groups

Most campaigns produce content locally, but many scriptwriters are urban-focused

**D** Ensure emotional climax of dramas reflects key barriers to behaviour change

Most campaigns use drama rather than simply giving information but not all do it well
Comparing the cost of different interventions

Years of healthy life bought for $1,000 by key health interventions

- **Anti-retrovirals**: 0.7 years
- **Primary care**: 2.4 years
- **Insecticide-treated nets**: 42 years
- **Childhood immunisation**: 125 years
- **Mass media**: 166.7 years
Diarrhoea

Received more liquids / ORT for diarrhoea

Control

Baseline, 42.0
Midline, 43.5

Intervention

Baseline, 32.4
Midline, 57.9

Crude DiD: 24.0
DiD (based on cluster-level analysis): 23.3
p value: 0.012
Pneumonia

Received an antibiotic in a health facility for fast/difficult breathing

Control

- Baseline, 28.2
- Midline, 38.7

Intervention

- Baseline, 27.0
- Midline, 45.2

Crude DiD: 7.7
Adjusted DiD: 14.8
p value: 0.079
Nutrition

Breastfeeding initiated within two hours of birth

Control
Baseline, 45.3
Midline, 42.8

Intervention
Baseline, 39.0
Midline, 49.4

Crude DiD: 12.9
DiD (based on cluster-level analysis): 10.7
p value: 0.171
Additional slides showing **evidence of impact**
Evidence of behaviour change

Calls to Telehansen during Brazil Leprosy Media Campaign, 29 January - 27 February 2003
(10,501 calls recorded during campaign, average 477 calls/day)

prior to campaign - weekly average - 22-27 Jan preparing for launch

week 1 - launch 29 Jan

week 2

week 3

week 4

week 5 - broadcasts end 27 Feb, Rio civil unrest - Telehansen closed early, Carnival 28 Feb-5 March
Evidence of behaviour change

Ethiopia impact data (2002-2005)*

* Edwards et al, Ophthalmology. 2006 Apr;113(4):548-55, and Tropical Medicine and International Health, Vol.13, no.4 pp556-565. Sample size 2008. P-values calculated, ranging from p<0.001 to p=0.17
Evidence of impact on public health

India impact data (1999-2001)

Number of people treated for leprosy in India following a campaign: **200,000**

Percentage of respondents who would be unwilling to sit beside a leprosy patient:
Evidence of a dose-response relationship

**Cambodia** impact data (2004-2006)

- **Baseline (2004)**
  - Washing hands: 10.0%
  - Ante-natal check-ups: 49.2%

- **Low exposure (2006)**
  - Washing hands: 21.7%
  - Ante-natal check-ups: 63.9%

- **Medium exposure (2006)**
  - Washing hands: 25.2%
  - Ante-natal check-ups: 67.1%

- **High exposure (2006)**
  - Washing hands: 28.4%
  - Ante-natal check-ups: 74.5%