

**Protocol for the Economic  
Evaluation of Mass Media  
Campaigns to Reduce Child  
Mortality in Burkina Faso**

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## Overview of the Mass Media Campaign

### Background

Whilst there is substantial evidence of the effect of mass media campaigns on knowledge and behaviour [1], there is more limited evidence of the impact of such campaigns on morbidity or mortality [2]. Furthermore, such campaigns typically focus on a single issue [2].

In recognition of the many factors contributing to child mortality, a mass media campaign was developed to address multiple cause of child mortality and implemented in Burkina Faso from January 2011 to October 2014. The multi-issue campaign tackles the most important life saving interventions relating to young children. The campaign was developed and implemented by Development Media International (DMI) with funding from the Wellcome Trust and the Planet Wheeler Foundation.

The objectives of the multi-issue media campaign (hereafter referred to as the 'mass media campaign' or 'the intervention') are:

1. To measure the impact of mother and child health messaging on the knowledge and behaviour of parents of young children.
2. To build health communications capacity in Burkina Faso.

A series of start up activities commenced in January 2011 and the intervention itself began in March 2012 and will run till October 2014. An overview of the start-up and ongoing intervention activities are summarised below.

### Start-up Activities

A number of start-up activities were carried out prior to the commencement of the intervention between January 2011 and March 2012.

### Media Survey

To inform the selection of study sites, and choice of media and radio stations that were popular among female listeners and fathers of young children, the times at which they listened to the radio, and the languages used for broadcasting, a media survey was conducted in March 2011. As a result of this survey, it was decided to focus on radio rather than television, due to the lower penetration of the latter.

### **Cluster (Radio Broadcaster) Identification**

Burkina Faso has a system of localised media whereby FM radio stations typically have a range of approximately 50km, which permit a cluster randomised trial. A motorbike survey was carried out later in 2011 to assess radio transmission signal strength and potential overlap in signal reach between clusters. Maps were created to illustrate this, along with compute simulated signal propagation maps. Based on the data gathered during this survey, 14 clusters were designed and selected for inclusion in the study, including 7 intervention clusters and 7 control clusters.

### **Recruitment of Long Format Teams**

Two media tools were identified to promote the key messages: a long format program lasting 2 hours and radio spots lasting 60 seconds. During the start-up period, long format program teams including actors and program hosts were recruited and trained in each of the 7 clusters to run the programmes at the identified radio station.

### **Recruitment of research teams for radio spot production**

A qualitative research team comprised of three staff were recruited to conduct focus groups and interviews to help inform messages around each of the identified key health areas being tackled within the intervention (the radio spot production process described below).

### **Establishment of advisory committee**

A Ministry of Health advisory committee was established to oversee the study process within Burkina and be kept abreast of key findings.

## **Ongoing Activities**

### **Broadcasting**

The campaign consists of 60 second radio spots to address a range of key health conditions/focal areas including: diarrhoea (promotion of oral re-hydration therapy), malaria prevention, breastfeeding, pneumonia, care of low birth weight babies, complementary feeding, hygiene promotion through hand washing, and maternal health. In the first year (March to October 2012) the campaigns ran continuously on a given public health message for one month. From Jan 2013 until the end of the programme (October 2014), the campaigns were changed every 2 weeks. The spots are broadcast by each radio station 10 times daily (Monday to Sunday).

In addition, 2 hour long format programmes are broadcast once per day five times a week.

The radio stations provide free air time for spots and long format programmes to DMI, in exchange for mentoring and training support, and some financial support.

### **Production (of spots and long format programmes)**

The qualitative research team undertakes formative research activities (literature review, focus group discussions, in-depth interviews) around the focal areas, each month to develop the key messages for the radio spots, as well as identifying target audiences and tailoring messages on specific health knowledge and behaviours. The spots are then pre-tested prior to final selection and broadcasting.

Regarding the long format programmes, the qualitative research team produce directives (or message briefs) which the creative team in Ouagadougou develop into programme scripts.

### **Quality Control**

Two people monitor the frequency and quality of broadcasting of spots long format and programmes in each zone. To this end they are provided with checklists, radios and blank cassettes for recording some spots.

### **Support to Radio Stations**

The DMI team provide a range of support services to the participating radio stations in the intervention area including: mentoring and training, contribution to solar power installation at one of the radio stations facing power outages that were affecting programmes; and monthly payments, as a subvention to production costs which includes the fees paid to the actors, of £550 per station that can be used according to the preferences of the radio staff.

## **The Evaluation**

The London School of Hygiene and Tropical Medicine (LSHTM) is conducting an independent evaluation of the mass media campaign. The impact of the mass media campaign on selected child health related outcomes will be evaluated by means of a randomised controlled trial. In seven sites, chosen at random, the radio spots and long-format interactive programmes are being broadcast, with seven other sites acting as controls.

The trial will evaluate the impact of the intervention on all cause post neo-natal under five mortality as the primary outcome, and all cause under five mortality as the secondary outcome by means of a baseline, midline and endline survey of a sample of

households in intervention and control communities surrounding the selected radio stations.

The following intermediate outcomes will also be evaluated:

- coverage of the intervention (proportion of mothers of children under-5, and male heads of households, who report having heard radio spots);
- proportion of mothers of children under-5 with knowledge of danger signs for diarrhoea, fever and acute respiratory infections;
- proportion of mothers reporting key behaviours (e.g. breastfeeding, handwashing, prompt and appropriate care seeking);
- proportion of children reported to have received appropriate care (e.g. antibiotics for a child with rapid/difficult breathing).

The baseline survey was conducted with 40,000 households and was completed by end of February 2012. The midline is planned in October 2013, and the endline in October 2014.

Efforts will be made to tease out the relative effects of the radio spots compared to the long format programmes within the midline and endline survey, by asking what emissions household have listened to and their preferences, and trying to work out which is more powerful using “feedback” (qualitative) research. (This can however not give a definite answer since spots and long format programmes are broadcast in simultaneously.)

The economic evaluation is one component of the broader evaluation of the mass media campaign, the methods of which are outlined subsequently.

## **Economic Evaluation of the Mass Media Campaign**

### **Rationale**

Governments in all countries face the problem of resource scarcity when seeking to meet the health needs of their population, so as to maximise human welfare [3].

Consequently, decision makers require information not just on the effectiveness of health care interventions but also on their relative cost compared to available alternative uses of those resources, to assess whether possible investments represent ‘value for money’.

Economic data can also be valuable for predicting resource requirements (or costs) of replicating an intervention in another district or region, or scaling-up to a larger population (especially, measuring the potential for economies of scale<sup>1</sup>).

In light of the above, there have been a growing number of economic evaluations in the health sector over the last 20 years. An economic evaluation can be defined as the systematic **comparison** of costs and consequences of two or more alternative courses of action ([4]<sup>2</sup>). By consequences, we mean the complete set of outcomes or impact of a given intervention.

There is growing evidence of the cost-effectiveness of maternal and child health programmes in low and middle income countries (e.g. [5]; [6]; [7]; [8-10]; [11]; [12]). However, such studies and reviews typically consider the efficiency of clinical interventions of specific health services targeting women, mothers and children.

There is a much more limited evidence base on the cost-effectiveness of health promotion programmes targeting mothers and children in low income settings [13] [14] [15] [16]. Many of the existing studies use modelling rather than primary data to infer cost-effectiveness, meaning the results may not accurately represent reality (e.g. [17] [18] [19] [20]); and very few studies have examined the cost-effectiveness of mass media campaign approaches to health promotion (e.g. [18] [20] [21]) and many of these relate to HIV prevention rather than broader health promotion activities (e.g. [20] [21]). Previous studies often lack access to final outcome data and have had to rely on intermediate indicators of knowledge or behaviour change to model outcome effects.

However, mass media campaigns show the potential to be a highly cost-effective mechanism for achieving public health goals and reducing mortality, with increasing access to radio media in many countries, also offering the possibility of significant economies of scale. Hence, it is imperative to obtain further evidence as the cost-effectiveness of such initiatives.

The current trial in Burkina Faso provides a unique opportunity for doing this, as it will generate final outcome as well as intermediate outcome data and access to primary data on the cost of intervention implementation in a low income setting.

### **Aims and Objectives**

The aim of the economic evaluation is to estimate the incremental cost-effectiveness of the mass media campaign relative to current practice (no-mass media campaign) from a societal (implementers, health care providers and population) perspective.

The specific objectives of the economic evaluation are to:

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<sup>1</sup> As the target population increases, fixed costs such as overhead will remain constant, reducing per capita costs.

<sup>2</sup> Mike Drummond is the 'guru' of health economics and a must read for those wishing to undertake economic evaluations.

1. Estimate the total incremental financial<sup>3</sup> and economic costs to the implementers (DMI, radio stations, and ultimately the Ministries of Health/Communication) of setting up and running the mass media campaign in the seven intervention clusters from January 2011 to October 2014;
2. Estimate the average annual running costs to the implementers over the period March 2012-March 2014;
3. Estimate the household costs of behaviour change and increased service use (transport and out of pocket payments) directly resulting from the mass media campaign;
4. As the mass media campaign is expected to impact on health care utilisation, measure the level of capacity utilisation related to staff, beds, and infrastructure within health facilities, in order to assess likely health system costs which would be engendered by programme scale up;
5. Estimate the incremental cost-effectiveness of the mass media campaign relative to current practice (no campaign);
6. Undertake sensitivity analysis to assess how results change in response to variation in the value of uncertain parameters.
7. Model the national scale up costs and cost-effectiveness of the mass media campaign within Burkina Faso.
8. Within the former scenario, an important component will be to ascertain how costs vary if DMI technical support were removed, and the Ministries of Health/Communication, or local NGOs were to undertake all implementation activities, as would be desirable in the longer term;
9. Model the costs of replicating the intervention in other countries on the continent, with differing media structures.

As we are only interested in the costs of implementing the programme, or of all inputs that are associated with the outcomes measured, the costs of the evaluation research will not be included in the cost-effectiveness analysis. However, the costs of monitoring the quality of the spots and transmission frequencies will be included as this is a fundamental part of the programme and would be required for scale up.

## Methods

### Perspective of the Analysis

The choice of costs and benefits to be included in the analysis and the basis for their evaluation are determined by the study perspective [23].

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<sup>3</sup> Financial costs are direct costs or expenditures incurred by the implementers. Economic costs represent the opportunity cost, or value of all resources used irrespective of whether these involve an additional direct cost.



This study will be carried out from a societal perspective, which includes all agencies or bodies that are involved in implementation or who incur costs as a result of the intervention, for example:

- the implementers (or provider perspective) e.g. DMI and the participating radio stations; as well as
- those who are affected by implementation and may incur costs as a result (e.g. household members who listen to radio messages and respond to them, health workers dealing with the health conditions dealt with by the radio programmes).

Resources will be valued at their opportunity cost, or the value of the benefits forgone by using resources in one way rather than another.

### **Alternatives to be Compared**

In the first instance, we will estimate the costs and cost-effectiveness of the mass media campaign (and projected national scale up) to the current situation (doing nothing).

As the analysis is incremental, we will essentially be estimating what it would cost to add this intervention onto the existing health system.

### **Estimation of Costs**

#### **1) Evaluation of the Provider (project) Costs – Costs of Implementation**

##### *Classification of Costs*

Costs will be classified according to project activities as well as by resource inputs (recurrent items such as staff, supplies, transport etc. as well as capital costs such as equipment, vehicle etc.). Capital items will be annualised over the lifetime of the project [4].

We will estimate both the financial costs of each activity (i.e. what is paid out by the funding body – all financial transactions), as well as the economic costs, which includes the value of all resources valued at their opportunity cost. So for example, the time of radio staff attending training sessions would be valued using their salaries, as this time is time away from their radio activities or other money making ventures, and has an opportunity cost. (It will be taken into account what extent of radio staff training that is on the job training, e.g. when the staff members are supported by DMI while producing radio, the long format programmes.) Similarly, any donated or subsidised items, such as equipment offered to the radio stations, will be valued at market prices.

We will also estimate the start-up costs, or the costs of activities required to introduce the mass media campaign. An overview of the core start-up and ongoing/running activities of the mass media campaign are outlined in Table 1 below. The study will classify costs according to each of these activities, to provide insight into the relative cost of each component of the mass media campaign.

The assessment of costs will be made with reference to the financial accounting data of the relevant implementing agency (DMI, radio stations), and in some cases this will be supplemented with interviews with key stakeholders to ascertain exact costs, cost components as well as any additional time costs and other resources not reflected in the accounting systems. As a result, the cooperation of implementers to meet the evaluation team and be transparent in the provision of all needed financial and accounting data, will be critical to the effective completion of the study.

#### *Dealing with Joint Costs*

Project staff may sometimes be engaged in a number of activities, not all related to the intervention. Others may be working partly on the evaluation of the campaign as well as its implementation. In such cases we will need to allocate staff time to the intervention based on interviews with the relevant staff who will be asked to apportion the time spent on each activity over different periods of the project life cycle, so we can derive the full time equivalent staff time (and costs) required for replication of the intervention.

Similarly, some vehicles may be used for the intervention as well as for other projects. In this case, vehicle log books will be used to allocate associated vehicle/transport costs.

**Table 1: Description of Core Start-Up and Ongoing Activities, source of funds, and proposed costing methods and assumptions**

<b>Timing of Activity</b>	<b>Activities</b>	<b>Source of funding, and agencies involved</b>	<b>Method of costing</b>	<b>Assumptions</b>
Start-up Activities	Identification of clusters: Media survey or equivalent	DMI	Financial accounts data from DMI.	
	Contracting with radio stations	DMI/radio stations	Financial accounts data from DMI. Interviews with sample of radio stations to ascertain time spent.	
	Recruitment, training and formation of long format teams	DMI	Financial accounts data from DMI. Interviews with one or two teams.	
	Recruitment, training and formation of radio spot qualitative research teams	DMI	Financial accounts data from DMI. Interviews with members of the qualitative research team members in Burkina.	
	Setting up steering and advisory committees	DMI, Ministry of Health, Ministry of Communication?	Financial accounts data from DMI. Interviews with sample of members of the committee.	
Ongoing activities	Broadcasting	Radio stations	In-depth interviews with a sample of radio stations.	Although the air time is provided for free, it is a resource being used by the study, and if the intervention were to be replicated, may need to be paid for. The costs of spots and long format programmes will be estimated separately.

				(However, need to make sure not to double-count costs, as DMI is providing support and paying some production costs to the radio stations.)
	Spot production cycle	DMI	DMI accounts. Interviews with qualitative team in Burkina.	
	Long format show production	DMI	Financial accounts data from DMI. In-depth interviews with creative team in Ouaga and long format teams.	
	Quality control	DMI	Financial accounts data, interviews with people monitoring transmission.	
	Support to radio stations (capacity building and material support: training, mentoring, equipment, CDs, money)	DMI, radio stations (staff time)	DMI accounts. Interviews with radio stations.	
	General operational/administrative costs (office running costs)	DMI	Financial accounts data, interviews with project staff to ascertain time allocation.	

## 2) Estimating the Costs of the Increased Utilisation resulting from Mass Media

In addition to the costs of implementing the mass media campaign, we will also estimate the costs /savings of the consequences of the campaign to households and the health system. It is expected that knowledge generated through the mass media campaign may increase utilisation of all targeted maternal and child health services, by increasing awareness of the need for preventive services (e.g. antenatal care utilisation rates, vaccinations, ORS for diarrhoea). However, if the intervention is highly effective in reducing disease incidence by promotion of healthy preventive behaviours, it is also expected that service utilisation for curative care will reduce. The midline and endline surveys will provide evidence of such changes in utilisation to inform the economic evaluation. If service utilisation increases or reduces as a result of the intervention, this has cost implications for households and potentially for the health system as well, which we will capture within the economic evaluation.

### *Evaluation of Household Costs / Savings*

More (less) visits to the health facility results in travel costs (savings) as well as eventual out of pocket payments (savings). Women and their companion may also incur time costs (or time savings), as time at the facility is time away from productive activities. Changing behaviour at home could also result in costs or savings. Increased breastfeeding duration may lead to cost savings, for example, from reduced expenditure on formula. Furthermore, households changing behaviours through hand washing for example, may result in additional household costs of purchasing soap. A series of questions were included in the baseline survey to quantify and value any resource costs or savings that may be incurred by households associated with behaviour change linked to the campaign messages or to health care seeking (transport, time and OOP). These data will be used to estimate the average cost of behaviours as well as health care seeking, to assess the resource implications of changes brought about by the campaign.

### *Evaluation of Health System Costs*

Finally, we will explore to what extent any change in service use in intervention health facilities results in efficiency gains or losses to facilities. Marginal costs to facilities may be incurred if existing capacity becomes saturated. For example, we will explore staff to patient ratios over time, and monitor whether additional staff are employed if and when staff to patient ratios exceed a threshold of efficiency. Similarly, we will monitor the number of beds at health centres and hospitals in maternity wards to assess if the availability of beds increases as a result of increased facility based deliveries. Finally, we will track any changes to facility equipment and infrastructure that may be due to expanded patient load. These data will be obtained through compilation of facility survey data. A question will be included in the endline survey regarding the cause for any changes in staff, beds, equipment and infrastructure.

**Box 1: Overview of Cost Components and Main Data Sources**

**Project Costs** - project accounts (DMI, radio stations), staff interviews for time allocation, time sheets for volunteers, log books for vehicle use.

**Household Costs** - costs of increased service use, by means of both baseline, midline and endline household survey data

**Health System Costs** - assessment of facility capacity to meet additional care seeking – through surveys of health facilities and marginal costs of capacity upgrade (additional beds, more equipment, infrastructure expansion)

**Estimation of Outcomes**

The impact of the mass media campaign will be measured through the randomised controlled trial described above.

**Measurement of Cost-Effectiveness**

We will estimate the average cost of each of the programme activities as described above. Further, we will estimate the average cost per cluster, per child and per capita.

The following three incremental cost-effectiveness ratios will also be estimated:

- the cost per Disability Adjusted Life Year (DALY) saved
- the cost per under five life saved
- the cost per post neonatal under five life saved.

**Sensitivity Analysis**

One, two way and probabilistic sensitivity analyses will be conducted to assess the impact on results of variations in all uncertain parameters. Parameters that will be varied include:

- Duration of production cycle
- Inclusion or not of long format radio programmes
- No of spots in total per day/week and per subject
- Airtime costs per minute (instead/in addition to the DMI capacity building approach)
- Unit costs of studio hire, actor salaries, audio distribution.
- A completely local versus an international team.

**Modelling the costs and cost-effectiveness of replication, and scale-up**

Based on the results of the sensitivity analysis as well as assessment of potential for economies of scale under differing radio infrastructures (localised versus centralised), we will predict the costs of scaling up the mass media campaign in Burkina Faso and of

replicating the mass media campaign programme in other countries (up to 5) with differing radio infrastructure.

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