



HEALTH COST EFFECTIVENESS BRIEF – Fifth Child

Uganda, 2018

Executive Summary

In 2016 and 2017 the International Rescue Committee (IRC) implemented the Fifth Child project, aiming to increase full immunization coverage among children in Northern Uganda. The project had two arms, one that provided multiple support activities for the immunization programs in three rural districts; the second, in a randomly-selected half of the locations, the IRC provided an additional component, the mReach data platform which helped health workers to track defaulters. A randomized evaluation of the project found a significant increase (10 percent) in immunization for both arms of the intervention, but no significant difference in immunization rates in areas which received the mReach platform.

The cost of health system support to reach under-served areas was nearly three times greater than the average cost per child of immunization in Uganda. Current immunization programs in Uganda cost an average of \$44 per child, while the Fifth Child project cost an average of \$270 per child reached. This suggests that NGOs or the Ministry of Health will need to budget at least three times that to reach full coverage in under-served areas.

Immunization coverage increased in both arms of the project by 10 percentage points (above an average baseline of 66% coverage). Adding mReach nearly doubled the cost of programming per child, and thus is not considered cost-effective

Project Description

Northern Uganda, a place with a fertility rate of 6.2 children per woman, is also a region struggling to get its young population to full immunization status. As of the 2011 Uganda Demographic and Health Survey, only 73% of children between 1 and 3 years has received the complete set of diphtheria-tetanus-pertussis (DTP3) vaccines, and barely half were fully immunized.¹ Thus, identifying interventions that improve immunization completion is high priority for health actors in the region, including the Ministry of Health.

While there are numerous cultural, social, and socioeconomic barriers that factors that contribute to the under-immunization of Uganda's youth, the weak health system is certainly a major factor. Understaffing and poor supervision of health facility staff, long distances to facilities, absence of equipment and supplies, and lack of resources for immunization follow up in the community all impede progress toward comprehensive immunization coverage.

The IRC designed the Fifth Child Project to address some of the key barriers to achieving full immunization coverage in Northern Uganda. The project focused on improving access to quality data on immunization status of children in select rural districts, utilizing community engagement and outreach to trace defaulters, and providing support to district health teams (DHTs) and health facilities – all with a goal of increasing full immunization by 10 percent.

Project activities were twofold. The first component, supportive activities (SA) for the health system, were provided to all catchment areas (1,492 children). The second component, the mReach application and defaulter tracing activities, were provided only to half the catchment areas (778 children).

Health System Support Activities

- Support cold chain management: monthly checks on fridges, supplemental funding to ensure cold chain functionality
- Training health center workers (HCWs) and village health teams (VHTs) on immunization and family planning
- Fund HCWs to do integrated outreach
- Fund monthly VHT meetings
- Hold project inception meetings with community leaders & district health team
- Conduct check-in visits (IRC and district health staff) to health facilities
- Provision of immunization and family planning supplies at health facilities where gaps exist

mReach Application & Defaulter Tracing Activities

- Maintain mReach data platform
- Train HCWs, ministry staff at health facilities, to use mReach for registration of newborns in mReach
- Provide smartphones and airtime needed for HCWs to use mReach
- Train VHTs to use defaulter lists and referral forms to track households HCWs identify as needing follow up visits
- Fund monthly meetings between HCWs and VHTs to update VHT defaulter lists based on mReach data platform maintained by HCWs
- Fund VHTs to make household follow up visits, and HCWs to do monitoring visits to ensure household visits

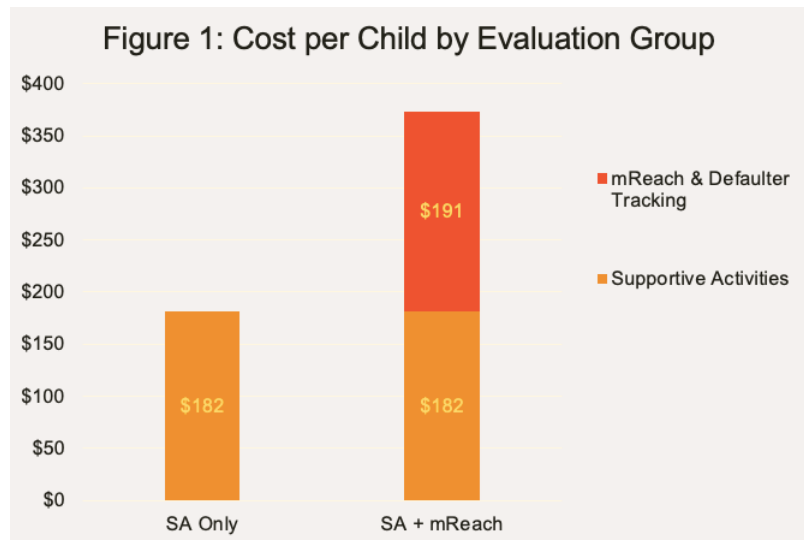
Project Costs

Over 21 months, the IRC spent approximately \$618,500 delivering the Fifth Child intervention to 32 catchment areas in the study.

The total cost for the IRC to deliver supportive activities to the 32 project catchment areas was approximately \$409,000, while the cost of implementing the mReach Data Platform & Defaulter Tracing in the 16 treatment catchment areas was approximately \$215,000.

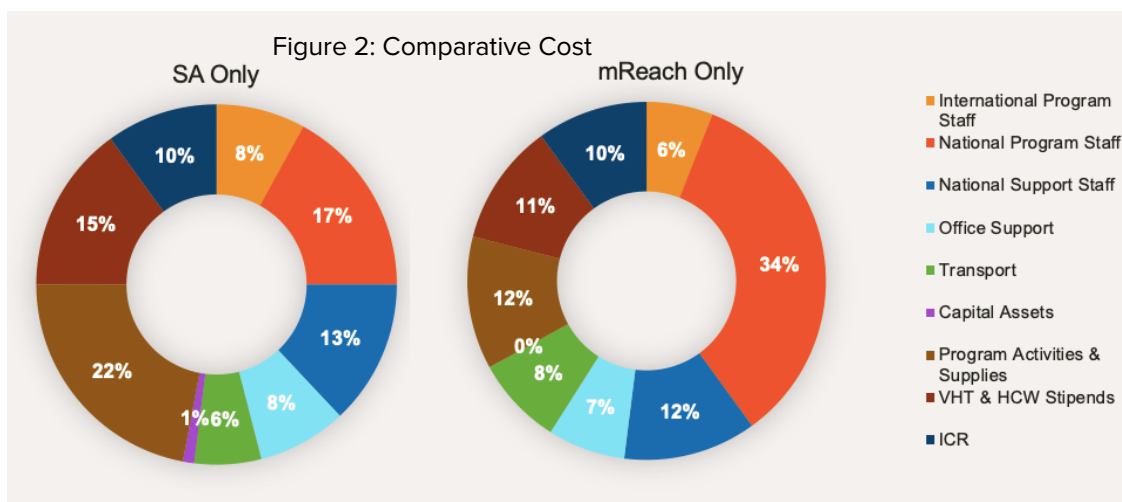
The IRC invested twice as much per child served in areas which also received mReach, compared to those which got only health system support.

When IRC support costs are included, IRC spent \$270 per child in the support services group and \$547 per child in the support services + mReach group. This suggests that, for the mReach program to be more cost-effective than supportive activities alone, it would need to more than double the impact on full immunization rates.



The support activities spent a larger percent of funding on direct inputs (program activities/supplies and CHW/VHT stipends) than the mReach project arm.

The majority of the additional costs to add the mReach program were incurred in the area of national program staff who spent much of their time supporting the mReach platform and training health workers on how to use the platform. This cost increase drove down the percentage of costs spent on program activities and health worker stipends.



Results of the Impact Evaluation

The impact of the Fifth Child program was measured with a cluster randomized evaluation. The clusters which received only the support activities were considered the control group, while clusters that received both the support activities and the mReach and Defaulter Tracing were considered the intervention group. The evaluation measured the coverage of DPT3 and MCV in children 12-23 months in treatment and control areas. An accompanying process evaluation collected qualitative data on the contextual appropriateness of the intervention and the mechanisms that drove impact.

A significant increase (10.3 percentage point) in coverage rates for both DPT3 and MCV was observed for both treatment and control groups (above a baseline average of 66%). The observed increase in coverage rates between the baseline and endline of this project is encouraging; however, it implies that there was no *incremental* impact of mReach Data Platform & Defaulter Tracing on coverage. Additionally, the lack of a “pure” control group (i.e. clusters that received no support at all), means we cannot be certain that the 10 percent increase in coverage is necessarily due to the supportive activities, rather than unobserved external factors. Further research is needed to determine the causal effect of supportive activities on coverage.

The lack of difference in full immunization coverage between treatment and control clusters may in part be due to treatment spillover of the defaulter tracing activities, as some were observed taking place in control areas. However, it is also possible that the supportive activities were the only driver of the increase in coverage for both treatment and control areas. The process evaluation that accompanied this project identified four possible mechanisms driving the increase in coverage:

1. Improved accessibility of immunization services
2. Increased VHT motivation
3. Utilizing networks of VHTs and community leaders
4. Facilitating monthly meetings between HCWs and VHTs to drive social motivation of VHTs

Cost Effectiveness Findings

Research suggests that health center supportive activities may have driven the observed increase in immunization coverage; thus, supportive activities for health centers are potentially cost-effective.

If we assume the entire 10.3 percentage point change in coverage pre-post was due to supportive activities, then the implied cost per additional child covered would be \$2,616. Because there was no control group for the support activities, this should be interpreted as an upper bound on the possible cost-effectiveness of those activities.

Use of the mReach Data Platform & Defaulter Tracing did not result in improved immunization coverage.

Getting the last quintile of children immunized is clearly a challenge for the Ugandan health system, and the global health community. Unfortunately, the degree to which the Ministry of Health and other health providers should invest in community defaulter tracing programs such as mReach as a strategy to improve

immunization rates is unclear. Identifying the most effective, and ultimately cost effective, strategies for getting defaulters to full immunization status requires further innovation and research.

While paying stipends to VHTs to be engaged in immunization activities is a significant cost driver in the supportive activities, it could be one of the most cost-effective components of the Fifth Child project.

Being expensive doesn't make an activity a bad investment—stipends to incentivize community engagement in immunization may be a key ingredient in interventions that are effective in increasing coverage. Specifically, the qualitative research highlighted that paying village health teams stipends motivated them to engage in immunization activities and likely drove the improvement in immunization coverage. Thus, as future research explores the impact of supportive activities on immunization coverage, health actors should not discount the importance of inputs like stipends and allowances that could drive program effectiveness .

Because the mReach Platform & Defaulter Tracing did not create additional impact on immunization coverage, this study and the associated process evaluation both suggest that Health Center supportive activities are more cost effective at increasing coverage.

The mReach project required heavy investment in training stakeholders and incentivizing meetings & home visits. Since no incremental impact was observed, these activities are not likely to be a cost-effective investment for improving immunization rates.

Health actors should expect to spend substantially more per child to immunize the most under-served populations—in Uganda, it cost approximately four times the current investment of \$44* per child to reach a 10% increase in coverage.

More activities, and thus more resources, are required to get the unimmunized population vaccinated. This principle holds true for humanitarian activities in general: delivering a program to hard-to-reach or vulnerable populations will be more expensive than delivering that same program to a population that is easy to access. Given that supportive activities cost IRC \$182 per child in direct programmatic costs, a local NGO or the Ministry of Health would need to spend at least four times the current investment of \$44* per child to reach a similar 10% increase in vaccine coverage. This is unsurprising, as the last quintile of unimmunized children are the hardest (and most expensive) to serve.

**"Costing and Financing Analyses of Routine Immunization in Uganda" Technical Report by Health & Development Africa (Kinghorn et al, p. 37). On average, the cost per DTP3 child is \$44 (\$12 in delivery costs, \$13 in vaccine costs, and \$20 in salaries). The cost per child for DTP3 varies depending on the type of health facility, with HCII and HCIV being the most expensive, and HCIII being the least expensive.

Analysis Method: Cost-Effectiveness at the IRC

The IRC is committed to maximizing the impact of each dollar spent to improve our clients' lives. Cost effectiveness analysis compares the costs of a program to the outcomes it achieved (e.g., cost per diarrheal incident avoided, cost per reduction in intra-family violence). Conducting cost effectiveness analysis of a program requires two types of information:

- 1) An impact evaluation on what a specific program achieved, in terms of outcomes
- 2) Data on how much it cost to produce that outcome

Teams across the IRC produce a wide range of outcomes, but cost effectiveness analysis requires that we know - based on impact research - exactly which outcomes were achieved and how much they changed, for a given program. For example, an impact evaluation might show a village that received IRC latrines and hygiene promotion had a 50 percent lower incidence of diarrhea than a village next to it which did not receive the IRC intervention. If so, we know the impact of our program: 50 percent decrease in diarrhea incidence. Cost effectiveness analysis becomes possible only when there is an impact study that quantifies the change in outcomes as a result of the IRC project.

At the same time IRC runs impact evaluations, we gather data on how much the evaluated program costs. First, IRC staff build a list of inputs that were necessary to implement the evaluated program. If one thinks of a program as a recipe, the inputs are all the 'ingredients' necessary to make that dish. Budgets contain a great deal of information about the ingredients used and in what quantities, so reviewing the program budget is the first place to start. However, many of the line items in grant budgets are shared costs, such as finance staff or office rent, which contribute to multiple programs, not just the one included in the impact evaluation. When costs are shared across multiple programs, it is necessary to further specify what proportion of the input was used for the particular program. Specifying such costs in detail, while time-consuming, is important because it provides lessons about the structure of a program's inputs. We can divide costs into categories and determine whether resources are being allocated to the most important functions of program management and enable us to model alternative program structures and quantify the cost implications of different decisions.

¹ Uganda Bureau of Statistics (UBOS) and ICF International Inc. 2012. Uganda Demographic and Health Survey 2011. Kampala, Uganda: UBOS and Calverton, Maryland: ICF International Inc. <https://dhsprogram.com/pubs/pdf/FR264/FR264.pdf>

This work was conducted by the Best Use of Resources Initiative at the IRC. For questions or more information please contact us at airbel@rescue.org.

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Annex: Ingredients List

Uganda | 2017 USD

Program Costs	Supportive Activities in \$	mReach Platform in \$
International Staff	24,239	11,983
Technical Advisor	24,239	11,983
National Staff	66,608	72,252
Health Coordinator	4,780	3,675
Health Officer	17,538	8,777
Immunization Officer	-	32,228
Immunization Research Manager ⁱ	33,075	24,300
M&E Officer	4,732	1,449
Mhealth Specialist	-	1,823
Office Cleaner	25	-
Health Manager	6,225	-
Travel	32,286	16,384
Technical Advisor Travel	8,763	4,332
Vehicle Rental & Maintenance	10,763	5,301
Staff per diem	9,373	4,617
Local Transport	-	2,135
Repair & Maintenance of EPI Outreach Vehicles	3,387	-
Capital Assets	2,032	1,001
Laptop	2,032	1,001
Supplies & Activities	12,053	43,295
Monitoring & Evaluation	400	-
District Support Supervision & Program Review Meetings	4,432	-
Integrated Outreach	26,165	-
Village Health Team- CHW Monthly Meetings	59,701	-
DHT Monitoring of Supply Management Info System	3,587	-

Facilitate Child Health Days	3,348	-
Family Planning Supplies & Equipment	299	-
IEC Materials & Tools on Family Planning & Immunization	976	-
EPI & Family Planning Advocacy/Awareness	20,507	-
Maintenance & Repair of Equipment	9,636	-
Allowances & Stipends	-	23,509
Stationary	-	5,105
Data & Airtime	-	4,969
Immunization Form/One Ent	-	3,957
Other	-	5,756
Trainings	17,799	4,070
Vaccine Management & Interpersonal Comms Skills	2,180	-
Vaccinator Training on Integrated Package & Immunization	2,096	-
Health Worker Training on Family Planning/Immunization	8,096	-
Village Health Team Training on Family Planning/Immunization	5,427	-
Meals & Hall Rental for Training	-	4,070
Shared Costs	131,130	66,335
TOTAL	403,148	215,321
Cost per Child (SA = 1,492; mReach = 778)	270	277

¹ Within impact evaluations, research staff may sometimes contribute to program implementation--for instance, assembling beneficiary lists or analyzing monitoring data for supervision. In such cases, where the activities of research staff were integral for implementation, we have included only the relevant portion of research staff time on the assumption that equivalent capacity would be needed on a non-research project.