



Commentary

Lessons from using cluster-randomized evaluations to build evidence on large-scale nutrition behavior change interventions



Purnima Menon^{a,*}, Marie T. Ruel^a, Phuong H. Nguyen^a, Sunny S. Kim^a, Karin Lapping^b, Edward A. Frongillo^c, Silvia Alayon^{d,1}

^a International Food Policy Research Institute, Washington, DC, USA

^b Alive & Thrive, FHI360 Washington, DC, USA

^c University of South Carolina, USA

^d John Snow, Inc. (JSI), Arlington, VA USA

ARTICLE INFO

Article history:

Accepted 1 December 2019

ABSTRACT

The recent Nobel Prize in Economics for the use of experimental research to identify solutions to a range of development issues resonates with our work in nutrition. For over a decade, our research team has worked with a global nutrition social and behavior change initiative and used cluster-randomized evaluations, with other methods, to generate lessons about nutrition behaviour change at scale in three countries: Bangladesh, Vietnam, and Ethiopia. We also tested adaptations in other countries. We learned that large-scale behavior change interventions delivered through diverse platforms (government health systems, community-based platforms, and mass media) had substantial impacts but that these impacts differ by context. A body of evidence, based on these evaluations, now informs approaches to shaping nutrition behaviors around the world. Working closely with implementers, sharing research findings and lessons in many forums, and publishing widely, *Alive & Thrive* has benefited millions of women and children and their communities and influenced millions of dollars of spending on nutrition programs. We conclude that carefully done collaborative program evaluations that use randomized controlled trials together with other methods can support effective learning about solutions, even those that operate at scale.

© 2019 Elsevier Ltd. All rights reserved.

1. Introduction

The recent Nobel Prize in Economics recognizes and celebrates the use of experimental methods, especially randomized controlled trials (RCTs), to test solutions to solve development challenges. Much of the work done by the award winners is in the realm of interventions to improve poverty alleviation and education programs around the world, with forays into health and nutrition. Some critics have cautioned that such experimental designs ignore the real-life challenges of complex programs operating at scale. We argue that even complex and large-scale programs *can* intersect with the principles of experimentation using RCTs and that learning is expanded by integrating RCTs with complementary research methods. In this essay, we share how we worked with a global nutrition social and behavior change communication (SBCC) initiative to test proof of concept, sustainability, and adaptation, at scale, in three countries: Bangladesh, Vietnam, and Ethiopia. We

describe how we designed our research and what we learned about impact, pathways of impact, context, and scale-up.

2. How we developed the research program

In 2008, a consortium developed a global initiative called *Alive & Thrive* to deliver SBCC interventions at scale, with funding from the Bill & Melinda Gates Foundation. A key mandate was to develop a “learning initiative”; an explicit focus on learning was built into every facet of the program and evaluation was budgeted to support the use of research findings to inform program design, implementation, and scale-up.

At the time *Alive & Thrive* was being designed, evidence from small-scale randomized control trials indicated that SBCC interventions were effective at improving nutrition, but little was known about how to design and implement these programs at scale. In response, *Alive & Thrive* launched a large-scale SBCC program with common interventions that promoted the same nutrition behaviors, using different platforms to reach targeted populations, in three countries. The interventions included interpersonal coun-

* Corresponding author.

E-mail address: p.menon@cgiar.org (P. Menon).

¹ Previously with Alive & Thrive.

selling by health workers through home visits (Bangladesh and Ethiopia) or at health facilities (Vietnam), along with mass media (television campaigns in Bangladesh and Vietnam and radio in Ethiopia), and policy advocacy (all three countries). The country-specific intervention packages were developed using formative research (Baker, Sanghvi, Hajeebhoy, Martin, & Lapping, 2013).

Working with implementation teams at *Alive & Thrive*, we designed a portfolio of fit-to-purpose impact evaluations (Menon, Rawat, & Ruel, 2013), theory-driven process evaluations (Rawat et al., 2013), and other studies that generated a research base on the impact, scale-up, costs, sustainability, and policy influence of this large-scale initiative. The impact evaluations were designed primarily as cluster randomized trials except in Ethiopia where it was not possible to establish a comparison group.

The impact evaluations used data collection methods such as surveys and anthropometric assessments, while the process evaluations used mixed methods (surveys, ethnographic research, observations of service delivery, and more). After the first phase (2008–2015), the evidence on impact generated additional funding for *Alive & Thrive* (2015 to present), and research continued to be embedded in the work. The evaluation portfolio, to date, has included 8 RCTs, 1 pre-post evaluation, 1 sustainability evaluation, with process evaluations and complementary studies.

3. What we learned about impacts and pathways to impact

The impact evaluations found improvements in several nutrition practices promoted by *Alive & Thrive* – breastfeeding in Bangladesh and Vietnam (Menon, Nguyen, Saha, Khaled, Kennedy, Tran, et al., 2016) and complementary feeding in all countries (Menon, Nguyen, Saha, Khaled, Kennedy, Sanghvi, et al., 2016; Rawat et al., 2017; Kim et al., 2016). Attribution was difficult in Ethiopia given the initial pre-post evaluation design; however, a subsequent RCT assessing impacts of SBCC delivered by health workers and agriculture extension workers found improvements in child dietary diversity and stunting (Kim et al., 2019).

Our strategy to studying pathways to impact and context was central to the learning. We used well-developed methods from the field of implementation science to articulate program theory together with implementation teams and to design studies that gathered data on hypothesized pathways to impact using mixed methods (Rawat et al., 2013; Kim et al., 2015; Nguyen et al., 2014).

Across the countries, changes in behavior and adoption of recommended practices did not occur uniformly. A major determinant of change was intervention reach, which in turn was affected by the choice of delivery platform. Reach was highest in Bangladesh, where nutrition workers delivered home-based counselling. In Vietnam, where interventions were delivered at health facilities, reach was lower because of demand-side constraints; in Ethiopia, the use of multipurpose government health workers also led to lower reach. Household factors were important to adoption of behaviors. Constraints to adoption of breastfeeding practices in Bangladesh related to women's work (at home), whereas feeding animal source foods was constrained by low income and food insecurity (Avula et al., 2013). In Vietnam, women's work outside the home and relentless marketing by formula companies often interfered with optimal breastfeeding practices (Henry, 2015). Ethnographic research also highlighted that in Bangladesh not all television spots in the mass media campaign resonated with viewers the same way (Kim, Roopnaraine, et al., 2018). *Alive & Thrive* responded to research findings by making program adjustments or designing additional components to be implemented in future phases.

In Bangladesh, we examined the sustained impacts of the program using a follow-up survey two years after the end of the first

phase. In the two intervening years, the program had been scaled up to several districts, with adjustments to program content and reduced intensity of supervision, monitoring and incentives. Impacts remained but were attenuated compared to endline results (Kim, Nguyen, et al., 2018). Since several changes had been made to the overall package, however, we were unable to assess which program adjustments had contributed to the dilutions in impact. Embedding smaller experimental studies to test the impact of changes to supervision, monitoring, and incentives could have provided more definitive insights.

4. What we learned about designing and doing the research

Our experiences taught us some lessons that can be useful to others implementing RCTs or other program evaluations on biological and behavioral outcomes:

- 1) Ensure that research teams and implementation teams engage early and regularly to learn about each other's approaches and methods, priorities and concerns, and world views. Program implementers should be involved at all stages of the research process, from planning design to developing data collection tools and interpreting findings to ensure that research responds to the needs and questions of the program implementers.
- 2) Draw on multiple disciplines and bring in diverse expertise and experience as needed. Our team included nutritionists, evaluation experts, health systems experts, economists, statisticians, and anthropologists to ensure that there was rigor in both quantitative and qualitative research and that biology was considered in interpretation of nutrition outcomes.
- 3) Have confidence and invest in resolution of issues when they arise. A long-term partnership demands trust and respect, and we learned that investing in relationship building and issue-resolution as part of the research process was critically important.

5. What impact did the research have?

Alive & Thrive has benefited over 16 million women and children (Alive & Thrive, 2019) and influenced millions of dollars of spending on nutrition programs. In Bangladesh, early results from the process evaluation that demonstrated the feasibility of implementing interventions at scale, led to investments from additional donors in scaling up the program. In Vietnam, additional investments came from the government and other donors. The Bill & Melinda Gates Foundation invested substantial additional resources to adapt and replicate the lessons from the first phase to other program areas (maternal nutrition) and other countries (India and Burkina Faso). With donors and implementers recognizing the value of having credible impact and implementation research results, further internal investments were made at *Alive & Thrive* in research and evidence-building in subsequent phases of the program. The learning emphasis of *Alive & Thrive* has stimulated interest among donors and program implementers for better evaluation in nutrition. The body of evidence on large-scale nutrition behaviour change efforts has informed strategies in multiple countries, as well as global guidance on programs and measurement.

6. Conclusions

The research of the Nobel Laureates in Economics in 2019 has sometimes been criticized for testing incremental changes to pro-

grams rather than studying real-life complex programs at scale. Our experience of using RCTs with other research methods has taught us, however, that the intention to learn and an early start make it possible to design and implement fit-to-purpose and relevant evaluations, including RCTs, even in evaluations of large-scale complex programs. This evidence has generated learning on how to design and implement successful behaviour change interventions at scale. RCTs are not necessarily incompatible with the desire to implement programs at scale, nor with understanding and documenting program impact pathways. In our research, what enabled the linking of RCTs to study a set of large-scale programs was a desire – across all partners – to learn about the program together, an early start to the research collaboration, and trust, mutual respect, and a willingness to identify solutions that worked for program design and scale-up and for research. RCTs are a useful tool to evaluate programs, and like other tools, should be used when the context and timing are right. Dismissing them outright is as much a mistake as idolizing them.

Acknowledgements

The global initiative, *Alive & Thrive*, has been funded by the Bill & Melinda Gates Foundation and other donors since 2008. Funding for evaluation research was built into overall program grants. We gratefully acknowledge the partnerships that informed the research that was done under *Alive & Thrive* and the partners who engaged deeply with the research findings. We especially acknowledge the collaborations with BRAC in Bangladesh, the Government of Vietnam, and the Government of Ethiopia. All published journal papers are available at www.aliveandthrive.org.

References

- Alive & Thrive. (2019). Changing Behaviors, Improving Lives. Scaling up nutrition. <https://www.aliveandthrive.org/wp-content/uploads/2018/07/Overview-brief-final.pdf>.
- Avula, R., Menon, P., Saha, K. K., Bhuiyan, M. I., Chowdhury, A. S., Siraj, S., et al. (2013). A program impact pathway analysis identifies critical steps in the implementation and utilization of a behavior change communication intervention promoting infant and child feeding practices in Bangladesh. *Journal of Nutrition*, *143*, 2029–2037.
- Baker, J., Sanghvi, T., Hajeerhoy, N., Martin, L., & Lapping, K. (2013). Using an evidence-based approach to design large-scale programs to improve infant and young child feeding. *Food and Nutrition Bulletin*, *34*, S146–S155.
- Henry, M. E. (2015). *Formula use in a breastfeeding culture: Changing perceptions and patterns of young infant feeding in Vietnam*. Thesis dissertation: Johns Hopkins University <https://jscholarship.library.jhu.edu/handle/1774.2/37947>.
- Kim, S. S., Ali, D., Kennedy, A., Tesfaye, R., Tadesse, A. W., Abrha, T. H., et al. (2015). Assessing implementation fidelity of a community-based infant and young child feeding intervention in Ethiopia identifies delivery challenges that limit reach to communities: A mixed-method process evaluation study. *BMC Public Health*, *15*, 316.
- Kim, S. S., Nguyen, P. H., Tran, L. M., Sanghvi, T., Mahmud, Z., Haque, M. R., et al. (2018). Large-scale social and behavior change communication interventions have sustained impacts on infant and young child feeding knowledge and practices: Results of a 2-year follow-up study in Bangladesh. *Journal of Nutrition*, *148*, 1605–1614.
- Kim, S. S., Nguyen, P. H., Yohannes, Y., Abebe, Y., Tharane, M., Drummond, E., et al. (2019). Behavior Change Interventions Delivered through Interpersonal Communication, Agricultural Activities, Community Mobilization, and Mass Media Increase Complementary Feeding Practices and Reduce Child Stunting in Ethiopia. *Journal of Nutrition*, *149*(8), 1470–1481. <https://doi.org/10.1093/jn/nxz087>.
- Kim, S. S., Rawat, R., Mwangi, E. M., Tesfaye, R., Abebe, Y., Baker, J., et al. (2016). Exposure to large-scale social and behavior change communication interventions is associated with improvements in infant and young child feeding practices in Ethiopia. *PLoS ONE*, *11*, e0164800.
- Kim, S. S., Roopnaraine, T., Nguyen, P. H., Saha, K. K., Bhuiyan, M. I., & Menon, P. (2018). Factors influencing the uptake of a mass media intervention to improve child feeding in Bangladesh. *Maternal & Child Nutrition*, *14*, e12603.
- Menon, P., Nguyen, P. H., Saha, K. K., Khaled, A., Kennedy, A., Tran, L. M., et al. (2016). Impacts on breastfeeding practices of at-scale strategies that combine intensive interpersonal counseling, mass media, and community mobilization: Results of cluster-randomized program evaluations in Bangladesh and Viet Nam. *PLoS Medicine*, *13*, e1002159.
- Menon, P., Nguyen, P. H., Saha, K. K., Khaled, A., Sanghvi, T., Baker, J., et al. (2016). Combining intensive counseling by frontline workers with a nationwide mass media campaign has large differential impacts on complementary feeding practices but not on child growth: Results of a cluster-randomized program evaluation in Bangladesh. *Journal of Nutrition*, *146*, 2075–2084.
- Menon, P., Rawat, R., & Ruel, M. (2013). Bringing rigor to evaluations of large-scale programs to improve infant and young child feeding and nutrition: The evaluation designs for the Alive & Thrive initiative. *Food and Nutrition Bulletin*, *34*, S195–S211.
- Nguyen, P. H., Menon, P., Keithly, S. C., Kim, S. S., Hajeerhoy, N., Tran, L. M., et al. (2014). Program impact pathway analysis of a social franchise model shows potential to improve infant and young child feeding practices in Vietnam. *Journal of Nutrition*, *144*, 1627–1636.
- Rawat, R., Nguyen, P. H., Ali, D., Saha, K., Alayon, S., Kim, S. S., et al. (2013). Learning how programs achieve their impact: Embedding theory-driven process evaluation and other program learning mechanisms in Alive & Thrive. *Food and Nutrition Bulletin*, *34*, S212–S225.
- Rawat, R., Nguyen, P. H., Tran, L. M., Hajeerhoy, N., Nguyen, H. V., Baker, J., et al. (2017). Social franchising and a nationwide mass media campaign increased the prevalence of adequate complementary feeding in Vietnam: A cluster-randomized program evaluation. *Journal of Nutrition*, *147*, 670–679.