

The effect of an integrated multisector model for achieving the Millennium Development Goals and improving child survival in rural sub-Saharan Africa: a non-randomised controlled assessment.

Pronyk PM, Muniz M, Nemsler B et al. The Lancet 379: 2179-88; 2012. <http://press.thelancet.com/mv.pdf>

Introduction

In the year 2000, world leaders committed their nations to achieving the Millennium Development Goals (MDGs), by establishing a new global partnership to reduce extreme poverty and address a series of related health and development issues. One of the MDGs is to reduce child mortality by two-thirds between 1990 and 2015. The Millennium Villages Project (MVP) was designed as a 10-year initiative to support the integrated delivery of a package of scientifically proven interventions. The primary aim of the MVP is to accomplish MDGs across a diverse set of rural, sub-Saharan African sites. Local partnerships were forged among the MVP staff members, representatives of local communities, and government personnel to coordinate activities across multiple sectors, including health, agriculture, the environment, education, business and infrastructure development. The aim of the paper reviewed in this month's edition of NNA was to assess the effects of the project on MDG-related outcomes, including child mortality, 3 years after its implementation.

Methods

The Millennium Village sites were chosen to represent a broad range of agro-ecological conditions in nine sub-Saharan African countries. The average population size of the rural intervention villages was ~35,000 residents, who were characterized by high levels of poverty and undernutrition. Starting in 2006, simultaneous investments were made in the aforementioned sectors at a planned total annual cost of 120 USD per person. In agriculture, interventions were designed to increase crop yields and enhance food security by promoting subsidized fertilizers and improved seeds for major staple crops. Additional efforts to improve nutrition via agriculture included support for cultivation of nutritious crops in home gardens, fish farming, and livestock and small animal rearing (1). Direct nutrition interventions included child-growth monitoring, vitamin A supplementation and treatment of acute malnutrition. Community-health workers were also trained to promote exclusive breastfeeding for the first 6 months of life and encourage locally appropriate complementary foods and continued breast feeding thereafter (1). Nutrition-related efforts also focused on improving maternal access to prenatal care, including iron and folic acid supplementation. All interventions were adapted and flexibly implemented in response to local conditions after consultations with government leaders and local community representatives (2).

The current MVP assessment included measurement of selected MDG-related outcomes before and 3 years after the intervention was initiated. Both sets of assessments were conducted during pre-harvest periods. Local comparison village sites were identified for the follow-up assessment to enhance the plausibility that any recorded changes in the intervention villages were due to exposure to the interventions. The comparison sites were randomly selected from up to three candidate villages matched on community-level parameters that were deemed to be possibly associated with the child mortality and other MDG outcomes. Efforts were made to ensure adequate distance between Millennium Village sites and comparison sites to minimize spillover effects (average distance 40 km). At each assessment round a household survey was completed to gather information on demographic characteristics, education,

employment assets, land ownership, agricultural practices, food security, bednet usage, and access to basic services including water, sanitation, energy, transport, and communication. An additional questionnaire was administered to an adult aged 15-49 years to examine health-related MDGs, nutrition and common causes of child mortality. Blood smears were collected to assess malaria parasitemia, and anthropometric assessments were done for children younger than 5 years of age.

Results and conclusions

Spending levels on MDG-related activities by governments, non-governmental organizations, and the communities were estimated to be 27 USD per person at baseline. Average annual spending in the third year of the project increased to about 116 USD per person, of which 25 USD was spent on health. After 3 years of intervention, reductions were reported in poverty, food insecurity, stunting prevalence and malaria parasitemia across the nine Millennium Village sites. No changes were reported in access to antenatal care or prevalence of wasting and underweight in children younger than 2 years of age. Mortality rates in children younger than 5 years of age decreased by 22% in Millennium Village sites relative to baseline (absolute decrease 25 deaths per 1000 live births, $p=0.015$) and 32% relative to the matched comparison sites (30 deaths per 1000 live births, $p=0.033$). Regrettably, no information was reported on exclusive breastfeeding rates or timely introduction of complementary feeding. The authors concluded that the integrated, multi-sectoral approach produced a rapid decline in child mortality in the study communities.

Program and Policy Implications

These results provide encouraging evidence that accelerated progress in achieving the MDGs, including reductions in child mortality, is possible in rural areas of sub-Saharan Africa. The authors suggest that integrated approaches that deliver health-sector inputs alongside broader investments in agriculture, nutrition, environment, and basic infrastructure hold great potential. Major challenges for the health-related interventions were related to commodity procurement and supply chain management, improving health-worker performance at clinical facilities and building the capacity of community-based, front-line health-workers. The authors hypothesized that these systemic weaknesses prevented major shifts in health-sector outcomes, which require a continuum of skilled health care personnel who are capable of providing diarrhea and pneumonia case management, antenatal care and postnatal examinations. Because no information was reported from in-depth nutritional assessments, little is known about the impact of the interventions on breastfeeding behaviors, age-appropriate complementary feeding practices, and specific aspects of young children's nutritional status.

NNA Editors' comments*

Integrating nutrition interventions into a multi-sectoral development program, such as that applied in the Millennium Village Project, is promising; and nutritionists should seek opportunities for promoting the nutrition agenda within this type of broad-based development projects. More information is needed on the impact and effectiveness of these integrated programs on nutritional outcomes. Ideally, the impact assessment of any new program should be planned prior to the implementation of the intervention, so that the evaluation can be designed to strengthen the study conclusions. In the present study, no comparison villages were included initially because of ethical concerns regarding the inclusion of these communities without offering any additional programmatic inputs. However, because the intervention and comparison villages were not randomly assigned initially, a true baseline comparison was not possible, which leaves the current findings open to criticism (3). It is possible that the reported effects may not be specifically or entirely related to the intervention.

Because all interventions of the MVP were implemented at about the same time in all nine sites, it is not possible to evaluate which of the multiple interventions were most effective and whether any specific interventions might need further improvement. Considering the high investment costs and concerns raised about their sustainability (3), better understanding of the cost-effectiveness of the different program components would be useful. As new programs are being considered, program managers, public health experts and scientists should work closely with each other to optimize the program implementation and ensure suitable evaluations are planned to guide ongoing and future programs.

References

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*These comments have been added by the editorial team and are not part of the cited publication.

Announcements and documents received this month:

The UNICEF-Cornell University e-learning course on "Programming for Infant and Young Child Feeding" is now open and is free of charge. The link to register for the course is: www.nutritionworks.cornell.edu/unicef/about.

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Editorial Office:

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