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JAMAICA: The life-changing effects of an early childhood development program

EARLY CHILDHOOD DEVELOPMENT

The importance of children's earliest years, when their brains and bodies are developing, is well-established. Providing children with adequate nutrition and cognitive and psycho-social stimulation during this period can reap benefits not only in their early school years but for many years to come. Extreme poverty and the malnutrition and low levels of stimulation that often come with it, however, prevents approximately 250 million children under five years of age in lower-income countries from reaching their full potential as adults. As evidence grows on this topic, policymakers are showing increasing interest in early childhood development programs to promote healthy early child development. Previous research in high-income countries suggests these programs, when implemented well, can help children go further in their education, earn more, and commit less crime as adults than their disadvantaged peers, but little is known about long-term benefits in low- and middle-income countries.

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The World Bank's Strategic Impact Evaluation Fund supported long-term evaluations of a program in Jamaica for mothers with young children enrolled between the ages of 9 and 24 months who were stunted (too short for their age) due to malnutrition. Community health care workers delivered the program over two years during weekly visits to families' homes. During the visits, mothers received support and guidance on how to encourage their babies' development through play and language. The original evaluation measured impacts of the stimulation program, both with and without nutritional supplements, on children's physical, cognitive, language, and social-emotional development. A twenty-year follow-up supported by SIEF found substantial life-course benefits, with positive effects of early stimulation on earnings, educational attainment, and social-emotional skills.

New data – from when the children were 31 years old – reveals even larger impacts on wages and total earnings. The latest findings also reveal impacts in domains previously not measured, including improvements in "non-cognitive" skills that are also rewarded in the labor market like executive function, grit, and conscientiousness, as well as lower levels of substance use. The results provide rare long-term evidence that an early childhood intervention can have life-changing effects for very disadvantaged kids, and that this already celebrated model should be further researched and adapted to other contexts.

This policy note is based on Walker, Susan P., Susan M. Chang, Amika S. Wright, Rodrigo Pinto, James J. Heckman, and Sally M. Grantham McGregor. "Cognitive, psychosocial, and behaviour gains at age 31 years from the Jamaica early childhood stimulation trial." Journal of Child Psychology and Psychiatry 63:6 (2022), pp 626–635; doi:10.1111/jcpp.13499 and Gertler, Paul, James J. Heckman, Rodrigo Pinto, Susan M. Chang, Sally Grantham-McGregor, Christel Vermeersch, Susan Walker, and Amika Wright. Effect of the Jamaica Early Childhood Stimulation Intervention on Labor Market Outcomes at Age 31. No. w29292. National Bureau of Economic Research, 2021.

Context

Researchers began developing a home-visiting program in Jamaica in the early 1970s. They were spurred by findings from a study suggesting declining development as poor children in Kingston grew from age 1 to age 3. They also observed that children had no books and very few toys, and their mothers had little knowledge of how to promote their child's development. Child health indicators were also very poor. Researchers chose to have health workers visit families in their homes weekly for two years because early childhood development centers were not common or accessible to all. Two of the original researchers recalled in a 2016 paper that they, "thought it would be easier to make close relations with the mothers and be more likely to change their child-rearing practices in home visits. We thought that if we could change the mothers' practices, any benefits to the children were more likely to be sustainable."

This policy note summarizes findings from a follow-up evaluation that took place thirty years after the original program took place. It is the longest ever follow-up of a randomized controlled trial of an early childhood stimulation intervention in a low- or middle-income country.*

Did you know….

Globally,

- 1 in 4 children experience developmental delays, with large inequalities between rich and poor (2020);
- 21 percent or 149 million children under 5 are stunted (too short for their age) (2018);
- 7 percent or 49 million children under 5 suffer from wasting (being too thin for their height) (2018);
- Half of all preschool-aged children – and 4 out of 5 in low-income countries – are not enrolled in preschool (2018)

Sources: World Health Organization, 2018; UNICEF, 2018; Gil, et. al. 2020

Evaluation

The evaluation of the Jamaica Early Childhood Stimulation Program, as it was called, measured the separate and combined benefits of nutritional supplementation and psychosocial stimulation on the development of disadvantaged children. In 1986-1987, researchers enrolled 129 children aged 9-24 months who were living in poor neighborhoods of Jamaica's capitol, Kingston. The children, who were all stunted based on height-for-age measurements, were stratified by age and sex, and then randomly assigned to one of four experimental groups. One group received psychosocial stimulation, one group received nutritional supplements, one received both the stimulation and the supplements, and one group received neither intervention and thus served as a control group. A separate group of children without stunted growth from the same neighborhoods were enrolled as a comparison group, so that researchers could compare the main study participants to more advantaged peers who had higher birth weights, larger head circumferences, higher developmental scores on initial tests, and taller mothers with higher vocabulary scores. Children in all groups received access to free health care.

During the two-year program, households in the psychosocial stimulation treatment group received weekly, hour-long visits from trained community health workers. During the visits, the health workers demonstrated how mothers could play educational games with their children and encouraged the mothers to converse with and praise their children. They emphasized mothers' responsiveness and the integration of demonstrated activities into daily routines. The community health workers also brought homemade toys and simple picture books to each visit which could be exchanged for other materials in subsequent visits. The workers who delivered the stimulation program had some level of secondary education and received four weeks of training on child development, teaching techniques, and toy making in addition to basic training in nutrition and primary health.

Families assigned to the the nutritional supplement received one kilogram of fortified milk-based formula containing 66 percent of daily-recommended calories and 100 percent of daily-recommended protein and micronutrients. To increase the chance that the formula would be given to the children only, families also received supplementary milk powder and cornmeal to mix with the fortified formula. Despite this, sharing of the supplements was common, and use of the supplement decreased significantly over the two-year program period.

*Grantham-McGregor, Sally, and Joanne A. Smith. "Extending the Jamaican early childhood development intervention." Journal of applied research on children: Informing policy for children at risk 7, no. 2 (2016): 4.

Participants were surveyed at baseline, after two years, and again at ages 7, 11, 17, and 22. In 2018, when the original participants were around 31 years old, they were interviewed again.

At 7 years, 52 children without stunted growth, identified in the initial survey, were added to the original 32 comparison children. At 22 years, due to the small sample size and insignificant effects from the supplement intervention (described below), researchers combined the two stimulation arms into a single treatment group and combined the nutritional supplementation-only group and the pure control group into a single control group. Researchers did the same for the 30-year follow-up summarized here.

Researchers were able to find and interview 75 percent of the original sample 30 years after the intervention, with participants living both in Jamaica and abroad. With the informed consent of participants, researchers used a range of standardized questionnaires and tests to measure IQ, executive function, mental health, psychosocial skills, personality traits and risk behaviors. Measurements were conducted by trained enumerators who were blind to whether the participants were in a treatment or control group.

Findings

Nearly 30 years after exposure to the stimulation program, adults had higher IQ scores and more "cognitive flexibility" than their peers who didn't participate the program.

While an initial effect on cognition declined by age 7, the study found significant impacts on IQ scores from age 11 through to age 31 (0.57 SDs). The stimulation program also had a sizable impact on cognitive flexibility (0.61 SDs), or the ability to change perspectives and adjust to new demands, which is considered a key job skill.

Children who received the stimulation program went further in school, compared to their peers who weren't exposed to the program.

The average increase in schooling for program participants was three-fourths of a year, leading to a 14-percentage point increase in college enrollment and 26 percentage point increase in the likelihood of obtaining a higher education diploma.

The stimulation program also led to better mental health, lower substance abuse, and fewer risky behaviors.

Program participants had fewer symptoms of depression (0.61 SDs), increased grit (0.53 SDs) and conscientiousness (0.66 SDs), and lower risk taking (0.64 SDs) related to health and work, as well as less substance abuse than those in the control group. Levels of anxiety and social inhibition were not significantly different between the two groups.

The program also reduced participation in violent crimes at age 22, but those effects faded out by age 31, possibly because the earlier age may be a higher risk period for violence in this population.

The program improved economic outcomes as well, increasing hourly wages and earnings.

Participants in the groups offered the stimulation program had 43 percent higher wages and 37 percent total higher earnings than the control group at age 31. This is a substantial increase over the impact at age 22 when participants had 25 percent higher earnings. Researchers found no effect on levels of employment, suggesting that skill enhancement (via schooling or other training) was responsible for the wage and earnings effects.

Impacts on schooling and income were much larger for women than men.

Women who received the program migrated at higher rates, completed more schooling, and reported less risk-taking. Women also saw larger gains in income. Unlike the men, they were able to not only earn significantly more than the control group, but also catch up with their non-stunted peers.

While the stimulation program was effective in promoting development, the nutritional supplements alone didn't have any long-term impact.

There were no lasting impacts of the nutrition intervention on any measured outcome.

Compared to healthier children who came from more well-off families, the stunted children caught up in schooling and social emotional skills, but not in cognitive development.

For the main study, researchers randomly assigned stunted children to either receive the program or comprise a control group, yet they also followed outcomes for another group: children who weren't stunted as young children. This "comparison group," while not part of the experimental design, gave the researchers a benchmark to see if the stunted children could catch up to their more advantaged set of peers.

They found that adults in this comparison group had considerably higher IQ scores (1.17 SDs) than the children who were stunted and didn't receive the program. Yet they also still had higher IQs scores (0.62 SDs) than the stunted children who received the program. They also had better executive function, lower social inhibition and less risk-taking than the group that was stunted and didn't receive the stimulation program.

Conclusion

Overall, this early childhood intervention yielded lifetime gains across several domains including education, earnings, behavior, and health, and the findings support further expansion of this model. This shows programs that promote stimulation in the early stages in life have long-lasting economic returns later in life and may reduce the intergenerational transmission of poverty.

The original landmark study and the follow-up research on this intervention have inspired many other programs and evaluations around the world. Now, new research – including many evaluations supported by SIEF – are testing whether similar results can scale in different contexts, for example when integrated into existing government programs or when carried out in remote, low-resource contexts, or with children who are even more disadvantaged. Overall, this research is creating a body of applicable knowledge on how to bring a life-changing program – founded on a simple principle of play and interaction – to developmentally at-risk children who can benefit for decades, if not generations.

The Strategic Impact Evaluation Fund, part of the World Bank Group, supports and disseminates research evaluating the impact of development projects to help alleviate poverty. **The goal is to collect and build empirical evidence that can help governments and development organizations design and implement the most appropriate and effective policies for better educational, health, and job opportunities for people in low and middle income countries.** For more information about who we are and what we do, go to: http://www.worldbank.org/sief.

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