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Peace Research Institute Oslo (PRIO)
PO Box 9229 Grønland, NO-0134 Oslo, Norway
Visiting Address: Hausmanns gate 3

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Does Aid Reduce Infant Mortality? Local-Level Evidence from Nigeria

Foreign aid has been the subject of increasing critique since the 1980s and there has been extensive research on aid effectiveness, particularly focusing on the impact of aid on aggregate economic growth. The scholarly literature remains inconclusive regarding the question of to what extent development aid actually works. One reason for these inconclusive results could be that the large majority of empirical investigations to date have relied on cross-country analyses. As the country-level may be a too highly aggregated unit of analysis to clearly identify effects of development aid, we argue that there is a need for more fine-grained studies. Also, there is a need for studies that address the impact of aid beyond economic growth in the receiving areas. This policy brief summarizes the first systematic attempt to study how development aid affects infant mortality at the subnational level, using the case of Nigeria.

Brief Points

- While there is a vast literature on aid and economic growth, we have less systematic knowledge on how aid affects health.
- We present the first systematic attempt to study how development aid affects infant mortality at the subnational level.
- In Nigeria, the local presence of development aid projects reduces infant mortality. Across the sample, the average reduction in the infant mortality rate due to aid is about 11%.
- Aid can contribute to reduce systematic inequalities in infant mortality between groups.
- But aid does not necessarily reach the populations that are in the greatest need.
- Policymakers should make geocoded data on aid projects available and should invest more in conducting robust studies for evaluating specific interventions and projects.

Andreas Kotsadam *The Ragnar Frisch Centre & PRIO*
Gudrun Østby *Peace Research Institute Oslo (PRIO)*
Siri Aas Rustad *Peace Research Institute Oslo (PRIO)*
Andreas Forø Tollefsen *Peace Research Institute Oslo (PRIO)*
Henrik Urdal *Peace Research Institute Oslo (PRIO)*

The Debate on Aid Effectiveness

The empirical literature on aid effectiveness has yielded unclear and ambiguous results and there is still no consensus as to whether aid plays a positive role for growth and development in recipient countries. Some hold that aid is ineffective in reducing poverty and improving growth, some hold that aid is only effective under certain conditions, such as e.g. only in democracies, whereas others have found evidence for a positive impact of aid on economic growth, possibly shifting the weight of evidence to a positive (albeit moderate) contribution of aid.

Another strand of the aid effectiveness literature focuses on the impact of aid on non-growth outcomes. Proponents of this approach have argued that focusing exclusively on the effect of aid on growth may overlook important benefits from aid on other outcomes, such as health. However, systematic evidence on how aid affects health is surprisingly scarce, and this limited empirical evidence remains inconclusive. Some cross-country studies fail to find that aid spurs improvements in various health indicators, including infant mortality rates (IMR), both considering the overall effect of aid and when using sector-specific aid data. Some find that when the health status of a country deteriorates, health aid at the country level increases, but according to others, aid has been '*following* success, rather than *causing* it.' In other words, they hold that aid has largely gone to countries that have experienced health gains rather than aid promoting those gains. A handful of country-level studies have found that aid has a positive effect on health outcomes, although the effect is modest. However, the estimated effect is nonetheless just an average across a very heterogeneous set of countries. Hence, there is a need for detailed case studies of the effects of health aid in individual countries.

Aid and Infant Mortality

According to the World Bank, the infant mortality rate (IMR) for sub-Saharan Africa as a whole was 56 deaths below the age of one per 1,000 live born in 2015, compared to an average of 6 in the OECD countries.[1] For Nigeria, the IMR score was estimated to be higher than the continent's average, standing at 69 in 2015, however there are large geographical variations within the country.

To what extent can we expect that development aid can contribute to reducing the level of infant mortality? In order to address this question, it is useful to take a step back and look at what the literature says about the determinants of infant mortality in general.

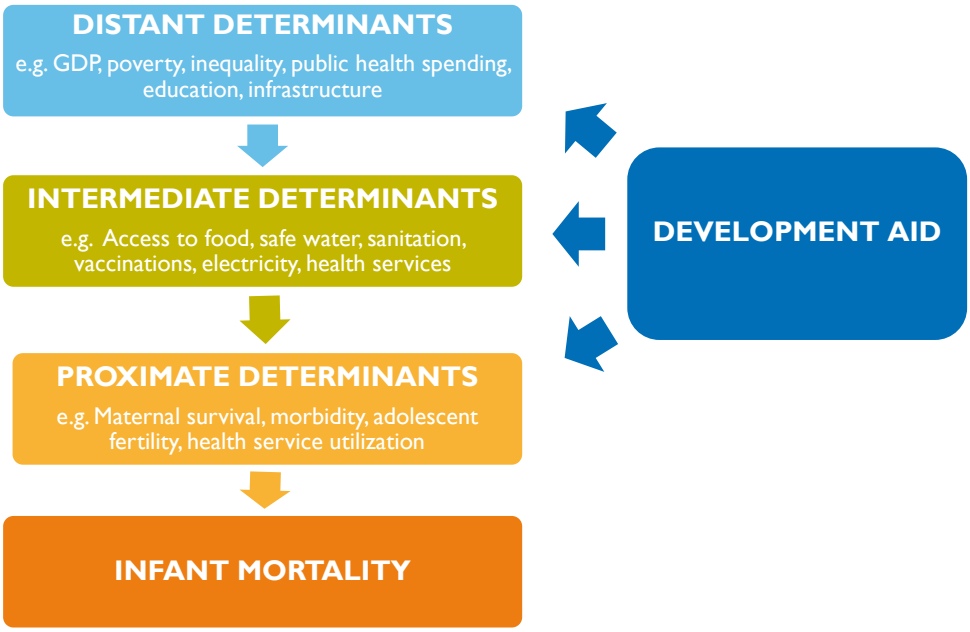

Figure 1: Conceptual Framework of The Hierarchy Determining Infant Mortality.

The chance that an infant makes it to her or his first birthday depends on a variety of direct and indirect determinants, as illustrated in Figure 1. Among the proximate determinants are the health of the mother, infections, accidents, and use of health services, such as immunizations. Examples of intermediate determinants are access to food, safe water, sanitation, and electricity. More distal but yet important determinants include broader socioeconomic conditions like household poverty, infrastructure, sanitation, clean water, and the education of the parents, in particular the mother.

Since so many factors may be determinants of health in developing countries, there may be benefits in considering the impact of the provision of aid more broadly rather than focusing narrowly on aid within the health sector. Arguably, projects aimed at increasing literacy, female empowerment, electricity, safe water, infrastructure or agricultural productivity may all positively impact child survival. Furthermore, existing literature suggests that the relevance of different types of aid could further differ depending on context, such as rural vs. urban residence.

Our study addresses the following assumption:

The geographical proximity of any aid project is associated with a greater chance of survival for children born after the establishment of the project, than for children born prior to the establishment of the project.

Data on Aid and Infant Mortality in Nigeria

To explore the effects of aid on infant mortality, we link novel data from the AidData[2] project on the precise location, type, and time frame of bilateral and multilateral aid projects in Nigeria to individual-level information on infant mortality from household surveys. The AidData covers 621 aid projects in Nigeria, covering 1,843 projects based on a rich selection of sources including OECD's Creditor Reporting System, annual reports and project documents and data published or obtained directly from donor agencies. In our analysis, we only include projects that have a recoded planned starting date, and a precisely coded location (at the level of the local government area). These criteria yield a total of 97 projects distributed among 761 locations for Nigeria. As Table 1 shows, AidData covers multiple types of aid projects.

The demographic data are taken from the Demographic Health Surveys (DHS), nationally representative surveys of women aged 15–49,

and record detailed questions about topic such as sexual and reproductive health, access to health services, and nutrition. They are typically conducted every four to five years in most countries, with the same questions asked in each survey to facilitate comparisons across time and space. Several of the DHS surveys include detailed information about the exact location of each sample cluster, providing geographical coordinates for each surveyed town and village. For our study, we use data from the five DHS survey rounds that were conducted in Nigeria in 1990, 2003, 2008, 2010 and 2013, totaling 2,686 survey clusters, in which 67,396 mothers who had given birth to 294,835 live children were interviewed. These children constitute our units of analysis.

In order to assess whether infant mortality is affected by aid we need to link each child to nearby aid projects. More specifically, we use the starting date and the specific location of each aid project, and link these with the location of the households of the live-born children under the age of one year, within 25 km and 50 km from an aid project. Figure 2 shows the distribution of the aid projects and the DHS clusters in North-West Nigeria. It illustrates how the data are structured with aid project 'buffer zones', indicating which DHS clusters (black dots) are within the relevant distances of the aid projects (red crosses) and which are not. The light gray circles around the projects indicate a 50km buffer zone, while the darker circles represent a 25km buffer zone.

Among the 294,835 children included in the dataset, 26,927 died before turning one year, representing 9.2% of all children, and producing an infant mortality rate (IMR) of 92 per 1,000 live births.

Figure 3 indicates that there are significant variations within the country. The map shows the rate of children who died before 12 months within each grid cell, darker colors indicate a higher IMR. The data in each grid cell is based on the DHS clusters that fall within each cell. We see that the level of infant mortality is generally higher in the northern areas, and in particular in the North-East.

Empirical Findings: Does Aid Work?

Does aid work? Or more specifically, does proximity to aid projects reduce infant mortality?

We use two strategies to explore this question. First, since we know when and where aid projects are established, we can compare the level of infant mortality in areas close to projects before and after the projects have started to infant mortality in areas further away from projects. Second, we isolate the effect of aid even further by only comparing the death rates of siblings born of the same mother before and after the start of an aid project in their vicinity.

First, we find that it is indeed not random where aid is allocated in the first place. Our data reveal that children born in areas that we know will receive an aid project at a later point in time have lower mortality than children born in areas that will *not* receive an aid project. This suggests that aid projects are established in areas that on average have lower mortality than the average non-aid location. In other words, **we find that aid is not primarily reaching those that need it the most**.

Type of project	Number of projects	Number of locations
Health	18	64
Agriculture	31	144
Government and civil society	14	32
Energy generation and supply	6	21
Banking and financing	2	14
Commodity aid and general programme assistance	4	7
Water and sanitation	2	3
Trade policy and regulations	2	3
Education	2	2
Communication	1	1
Unspecified	29	470

Table 1: Overview of aid project types in Nigeria.

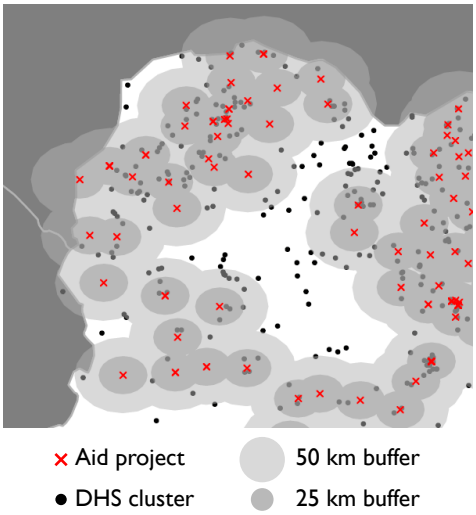

Figure 2. Aid Projects and Health Survey Data: Snapshot of The North-West Region. Source: Nigerian DHS surveys, various years, AidData.

There could be many possible explanations for such a bias. For example, it is likely that aid projects may be established predominantly in urban areas with high population densities, or more generally in areas with better infrastructure or due to political priorities.

Second, **we find that proximity to aid projects reduces infant mortality**. More specifically, living 50 km or closer to an on-going aid project reduces an infant's likelihood of dying before his/her first birthday. The results suggest that aid decreases the infant mortality rate by 1 percentage point, or more directly by 10 children per 1,000 born. As compared to the average share of infant mortality in the sample, which is 92 children dying per 1,000 born, the effect of aid corresponds to a reduction of about 11%.

Third, when looking at specific sub-groups, we find that aid is particularly effective in reducing mortality among children born in rural areas, among Muslim children, and among children born in Muslim areas. This suggests that **the effect of aid seems to be strongest for the most disadvantaged groups**. However, as aid projects are disproportionately allocated to areas with less infant mortality, the total effect on inequality is uncertain.

Finally, we assess other effects of aid and find effects on wealth, female employment, and female education for Muslim mothers, but not for Christian mothers. These factors are likely to explain the heterogeneity in effects that we observe with regard to infant mortality.

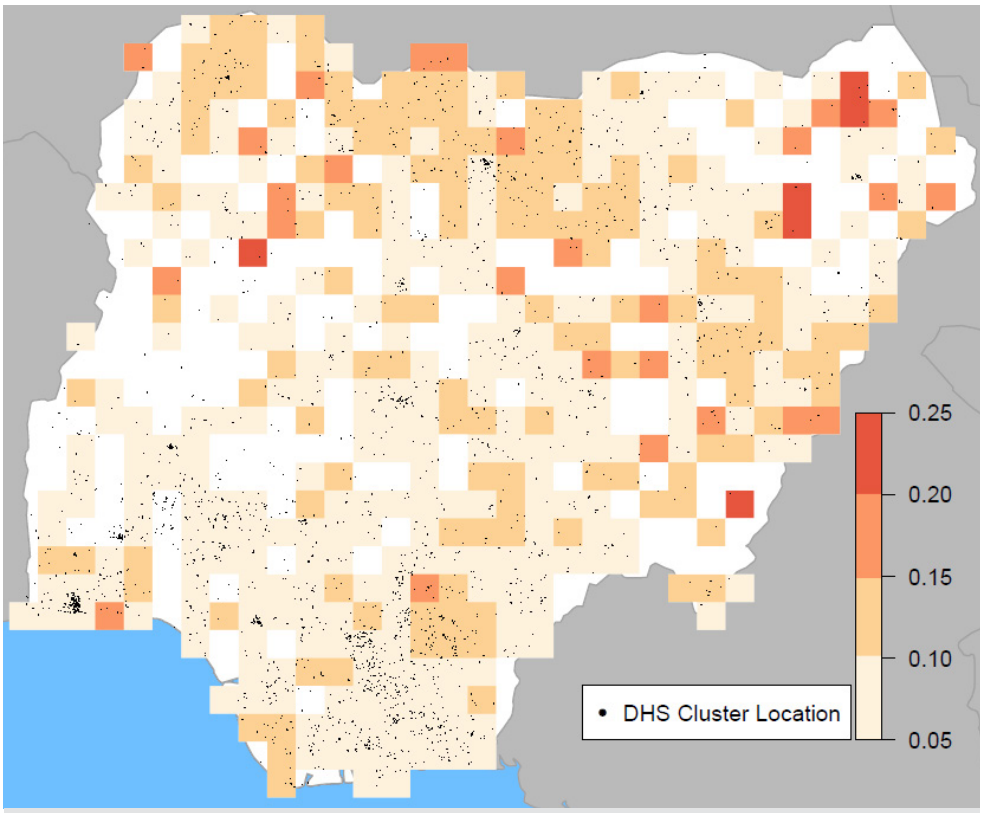

Figure 3: Infant Mortality in Nigeria. Source: Nigerian DHS surveys, various years (1990–2013).

Summary and Recommendations for Research and Policy

To date, most research on aid effectiveness has been conducted at the country level. This is not ideal, given that both the distribution of aid projects and various health outcomes tend to vary strongly within countries. This policy brief summaries the findings from what we believe is the first systematic attempt to study how development aid impacts infant mortality at the local level, with the application to the Nigerian case.

Our results show quite clearly that geographical proximity to active aid projects reduces infant mortality. Moreover, overall aid contributes to reduce systematic inter-group inequalities in a setting where such differences loom large. However, our study only covers Nigeria, and in order to ensure evidence-based policies, there is a need to examine the local effects of aid in a larger set of countries to explore the extent to which our results are generalizable beyond Nigeria. Also, due to the relatively small sample sizes, we are restricted in how deep we can go into different mechanisms of the effects of aid. We hence urge future studies to investigate the local effects of aid across several countries in order to dig deeper into the details of which projects work best.

Based on our findings, we propose the following recommendations for policymakers and practitioners. First, **more resources should be invested in conducting robust studies for evaluating specific interventions and projects**. The superior method here is so-called randomized controlled studies (RCTs) or field experiments. Such studies are resource-intensive but they are also the best method for telling us what concrete interventions work best on the ground.

Second, our study shows that evaluation of aid effectiveness is possible also without RCTs if there exist a sufficient amount of geocoded data. **We hence urge policymakers to make geocoded data on aid projects available**.

Third, our study shows that the aid is often not targeting those in most need. This is perhaps not so surprising given that the most deprived areas are often also the least accessible. However, **policymakers should consider alternative ways to reach the most marginalized areas and populations, such as for example increasing the use of mobile clinics**.

Finally, there should be a greater focus on how to sustain the effects of aid projects after they end, as well as ensuring their quality, such as through training of local capacities, creating long-term infrastructures and ensuring better coordination across aid agencies. ■

Notes

This Policy Brief is based on the following 2018 article: Kotsadam, Andreas, Gudrun Østby, Siri Aas Rustad, Andreas Forø Tollefsen and Henrik Urdal (2018) 'Development aid and infant mortality. Micro-level evidence from Nigeria', *World Development* 105: 59–69.

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2. AidData: aiddata.org/

THE AUTHORS

Andreas Kotsadam is Research Professor at PRIO and at The Ragnar Frisch Centre for Economic Research, Gudrun Østby is Senior Researcher at PRIO and Editor of *Journal of Peace Research*, Siri Aas Rustad is Senior Researcher at PRIO, Andreas Forø Tollefsen is Senior Researcher at PRIO, and Henrik Urdal is Research Professor and Director at PRIO.

THE PROJECT

The Conflict Trends project aims to answer questions related to the causes of, consequences of and trends in conflict. This policy brief is based on a 2018 article by the authors published in *World Development* funded by the two RCN projects Armed Conflict and Maternal Health in Sub-Saharan Africa and Development Aid, Effectiveness, and Inequalities in Conflict-Affected Societies.

PRIO

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