Access to Doctors and Health Outcomes in Nigeria

Researchers:

Edward Okeke

Sector(s): Health, Social Protection

Sample: 180 primary health service areas, covering about 1.3 million individuals

Target group: Health care providers

Outcome of interest: Mortality Health outcomes

Intervention type: Health care delivery

AEA RCT registration number: AEARCTR-0001958

Data: OpenICPSR

Research Papers: When a Doctor Falls from the Sky: The Impact of Easing Doctor Supply Constraint...

Partner organization(s): National Youth Service Corp (NYSC), National Primary Health Care Development Agency, Kano State Ministry of Health, Jigawa State Ministry of Health, Gombe State Ministry of Health, Bauchi State Ministry of Health and Social Welfare, Akwa Ibom State Ministry of Health, Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)

Over the past decades, low- and middle-income countries around the world have sought to implement policies that expand access to primary health care, often by increasing the quantity of available health services or personnel. But to what extent does the skill level of health care workers matter for patient health outcomes? The researcher conducted a randomized evaluation to better understand how having a doctor on staff in a clinic affected the quality of health care and health outcomes in Nigeria. He found that doctors provided higher quality care than preexisting providers, and this higher quality translated to fewer infant deaths.

Policy issue

Over the past decades, low- and middle-income countries around the world have sought to implement policies that expand access to primary health care, often by increasing the quantity of available health services or personnel. The latest evidence suggests that quality, rather than quantity, may be the main barrier to improving health outcomes. Much of the evidence on how to improve the quality of health care has focused on ways to incentivize health care workers to provide better care. But if health care workers do not have the skills needed to provide care of a desired quality, incentives alone may be insufficient. Holding constant the quantity of health personnel, and the incentives they face, how much does the skill level of health care workers influence patient health outcomes?

Context of the evaluation

In Nigeria, maternal and infant mortality rates are high, even compared to other low- and middle-income countries. There is also subnational variation in the infant mortality rates: in rural areas, the rate is 88 deaths per 1,000 births, compared to 65 deaths per 1,000 births in urban areas. The average life expectancy in Nigeria is 54 years, lower than the 61-year average across sub-Saharan

Africa. Nigeria is also short on doctors, especially in rural areas, having 0.4 doctors for every 1,000 people, and more doctors available in urban areas. Much of the medical care in Nigeria happens at primary health centers, which handle maternal and newborn care, disease prevention and control, health education, and inpatient and outpatient care.

The study was conducted at primary health centers in the Nigerian states of Kano, Jigawa, Gombe, Bauchi, and Akwa Ibom, which are representative of Nigeria's geographic and economic diversity. The participating primary health centers each serve approximately 7,000 patients from their local communities. They are small- to medium-size centers, averaging fifteen beds and five staff on-site. Half have running water and three-quarters have electricity. They usually support 25 births per month, and at the time, the seven-day infant mortality rate among their patients was around 3 percent. Roughly three out of four primary health centers have never had a doctor on staff, and instead rely on mid-level health providers, such as nurses, midwives, and community health workers. Such providers usually receive 3-5 years of training in community health, whereas doctors possess a bachelor of medicine, bachelor of surgery (MBBS) degree, equivalent to a doctor of medicine (MD) degree. The average mid-level provider has a decade of prior experience. In centers absent a doctor, a mid-level health provider serves as the doctor de facto.

To address the rural-urban workforce disparity, Nigeria's National Youth Service Corps (NYSC) is a national community service program that most Nigerians are required to participate in upon graduation, prior to joining the labor force. This includes doctors, who generally complete an additional year of postgraduate medical training before enrolling. The NYSC posts graduates across Nigeria for one year, including six weeks of onboarding and offboarding.



Women holding infants in a hospital in rural Nigeria.

Oni Abimbola, Shutterstock.com

Details of the intervention

The researcher conducted a randomized evaluation to understand how having a doctor in a primary health center affected health care delivery. The researcher randomly assigned 180 primary health centers to one of three groups:

1. *Doctor* (sixty centers): In the randomly assigned primary health centers, the NYSC posted a recently graduated doctor. Doctors received a monthly stipend of approximately US$203. The average doctor had two years of prior experience.
2. *Additional mid-level provider* (sixty centers): To account for any change in health care access and outcomes as a result of increasing the quantity of providers at health centers, partnering state governments hired or deployed a community health worker to each health center for roughly a year. The new mid-level providers also had around two years of prior experience.
3. *Comparison* (sixty centers): Each primary health center continued to operate as usual without an additional health care provider.

The new doctors and mid-level providers were posted throughout 2017.

To understand the effect of each intervention on access to a doctor and on infant mortality, the researcher surveyed pregnant women living in the communities served by these clinics. Women were surveyed once around the time the new provider started, and a final time three months after birth. Because women gave birth irrespective of when the new providers started, some women had more of their health appointments with the new providers than others.

Given the differences in experience and education between the new doctors and existing mid-level providers, it was not clear which would provide higher quality care, or if there would even be a difference. To measure access and quality, the researcher collected administrative data, surveyed providers and their supervisors, observed patient interactions, and conducted random audits. The administrative data detailed whether pregnant women received care from a doctor or different provider at each of their appointments. Shortly after new health providers started, and shortly before their term ended, the researcher surveyed and directly observed them to assess their medical knowledge and management of patient interactions. In these visits, the researcher also surveyed a different health provider and the health provider in charge of the center. Finally, the research team conducted three unannounced audits at each health center to assess how often centers were open and had the posted provider on-site.

Ethical approval for the study was given by RAND's Human Subjects Protection Committee and by the Ethics Committee of Aminu Kano Teaching Hospital, Nigeria. The researcher also sought and received approvals from all of the participating state governments.

Results and policy lessons

Providing primary health centers with a doctor increased patient access to skilled medical professionals. Doctors also provided care of higher quality than mid-level providers, as seen in observations of patient interactions. This higher quality translated to fewer infant deaths in centers with a doctor on staff.

Doctor supply and access: The number of health care providers increased by roughly one in both intervention groups, relative to the comparison centers. Similarly, the probability of a doctor being available in additional doctor centers increased to 94 percent.

Unannounced audits indicated that doctors were present at their assigned center 74 percent of the time. Patients at centers with a doctor were 22 percentage points more likely to receive care from a doctor (a 723 percent increase from a baseline of 0.3 percentage points in comparison centers).

Quality of care: Doctors provided higher-quality care to patients than preexisting mid-level providers at their health centers and the new mid-level providers. The new mid-level providers did not perform differently from the preexisting mid-level providers. Meanwhile, the new doctors were 15 percentage points more likely than preexisting mid-level providers to follow standard clinical guidelines, 11 percentage points more likely to conduct a physical examination for their patient, 24 percentage points more likely

to make a diagnosis, and 6 percentage points more likely to communicate clearly to their patient. They also spent 2.74 minutes longer on each appointment (a 35 percent increase from a baseline of 8.13 minutes), and were 8 and 12 percentage points less likely to prescribe unnecessary injections and antibiotics. The health providers in charge of each center also rated doctors as more likely to improve the overall functioning of health centers or other staff.

Infant mortality: Providing centers with an additional mid-level provider did not alter infant mortality rates. However, the probability of infant mortality within seven days of birth decreased by 0.78 percentage points among patients at centers that had access to a doctor (a 21 percent decrease from a baseline infant mortality rate of 3.6 percent). In other words, doctors prevented between seven and eight infant deaths per 1,000 births. The researcher highlights that this effect was sufficient to close the aforementioned rural-urban gap in infant mortality rates in Nigeria.

Moreover, this impact was driven by infants whose mothers had access to doctors for at least four months prior to birth. Among this group, infant mortality fell by 1.1 percentage points (a 42 percent decrease). If infant mortality in all of Nigeria declined by this amount, Nigeria's global ranking on infant mortality would shift up from 188 out of 194 countries to 158.

Cost analysis: Researchers estimate doctors' salaries in Nigeria range from US$400 to US$700 per month. Estimating that an additional doctor led to 115 infant deaths averted per primary health center, assuming doctors' salaries are on the higher end, and estimating administrative overhead at 30 percent of the salaries, the cost-effectiveness of the program was US$4,650 per life saved. Given the lower salaries of doctors participating in the NYSC, the cost-effectiveness of the program as implemented is likely higher.

Increasing the supply of doctors in low- and middle-income countries, or taking steps to improve the quality of care preexisting health providers can give to patients, may be a path towards reducing infant mortality and improving people's health. The researcher mentions that questions remain about whether the impacts would persist for a more permanent posting, and how best to go about increasing the supply of doctors or care quality of current providers.

Okeke, Edward N. 2023. "When a Doctor Falls from the Sky: The Impact of Easing Doctor Supply Constraints on Mortality." American Economic Review 113 (3): 585–627. https://doi.org/10.1257/aer.20210701.