

Study of polio in Pakistan shows insecurity a barrier to eradication

January 30 2018, by Bob Yirka



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A team of researchers from Canada, the U.S. and the U.K. has found that insecurity in a country or region can be a barrier to eradication of a disease such as polio. In their paper published in *Proceedings of the*

National Academy of Sciences, the team describes their study and what they found about the relationship between social insecurity and polio incidence in northwest Pakistan.

Polio is a crippling viral disease transmitted through feces, generally under unsanitary conditions. It has been nearly eradicated due to an effective vaccine developed in the 1950s. Today, the disease exists in just three countries, Pakistan, Afghanistan and Nigeria—all of which have populations living with [insecurity](#) due to violence from militants. Despite health worker efforts, the disease has persisted. In this new effort, the researchers sought to find if it truly was insecurity preventing the eradication of [polio](#) in Pakistan by comparing eradication campaigns with military casualty records and polio infections rates in northwest Pakistan—militants there have been waging a war against government soldiers since 2004.

The team compiled polio infection rates on a district-by-district basis for the years 2007 to 2014, and eradication campaign data for the years 2007 to 2009. They compared what they found against reports of armed violence in the [region](#) for roughly the same time periods. They found that when eradication campaigns were carried out during times of higher insecurity (due to military conflict), vaccination rates declined by 5.3 percent on average, which resulted in an increase in polio rates of 73 percent. The team noted that in many cases, eradication teams continued with their efforts in spite of the danger, though there were times when the danger was too great, resulting in cancellation of efforts. The team estimates that up to 250,000 children in the region have missed out on being vaccinated due to insecurity. They note also that there is room for error in their statistics due to the tendency of some eradication officials to falsify records to improve their apparent results.

The researchers conclude that insecurity does, indeed, appear to be a factor in preventing the eradication of polio in Pakistan, which suggests

the [disease](#) will not be eradicated until armed conflict in the region ends.

More information: Amol A. Verma et al. Insecurity, polio vaccination rates, and polio incidence in northwest Pakistan, *Proceedings of the National Academy of Sciences* (2018). [DOI: 10.1073/pnas.1711923115](https://doi.org/10.1073/pnas.1711923115)

Abstract

Pakistan is one of three countries in which endemic transmission of poliovirus has never been stopped. Insecurity is often cited but poorly studied as a barrier to eradicating polio. We analyzed routinely collected health data from 32 districts of northwest Pakistan and constructed an index of insecurity based on journalistic reports of the monthly number of deaths and injuries resulting from conflict-related security incidents. The primary outcomes were the monthly incidence of paralytic polio cases within each district between 2007 and 2014 and the polio vaccination percentage from 666 district-level vaccination campaigns between 2007 and 2009, targeting ~5.7 million children. Multilevel Poisson regression controlling for time and district fixed effects was used to model the association between insecurity, vaccinator access, vaccination rates, and polio incidence. The number of children inaccessible to vaccinators was 19.7% greater (95% CI: 19.2–20.2%), and vaccination rates were 5.3% lower (95% CI: 5.2–5.3%) in "high-insecurity" campaigns compared with "secure" campaigns. The unadjusted mean vaccination rate was 96.3% (SD = 8.6) in secure campaigns and 88.3% (SD = 19.2) in high-insecurity campaigns. Polio incidence was 73.0% greater (95% CI: 30–131%) during high-insecurity months (unadjusted mean = 0.13 cases per million people, SD = 0.71) compared with secure months (unadjusted mean = 1.23 cases per million people, SD = 4.28). Thus, insecurity was associated with reduced vaccinator access, reduced polio vaccination, and increased polio incidence in northwest Pakistan. These findings demonstrate that insecurity is an important obstacle to global polio eradication.

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Citation: Study of polio in Pakistan shows insecurity a barrier to eradication (2018, January 30)
retrieved 3 May 2024 from

<https://medicalxpress.com/news/2018-01-polio-pakistan-insecurity-barrier-eradication.html>

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