

“The slippery geographies of polio”

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The 2013 deadline for the worldwide goal to eradicate polio has come and gone, with a new endgame set for 2018.^{1,2} Although cases of polio have decreased by 99% worldwide since 1988, geopolitical conflicts have exacerbated its spread—Syria, Ethiopia, and Kenya have reported polio infections, and Afghanistan, Nigeria, and Pakistan remain endemic.^{3,4} The virus has resurfaced in Israel, and might be linked to use of intravenous inactivated polio vaccine (IPV).⁵ Transnational mobility also contributes to polio’s persistence, and circulating vaccine-derived poliovirus (cVDPV) in Yemen, Mozambique, and Madagascar is further complicating eradication efforts.⁶

We know that the spatial distribution of polio (where polio exists in some places, is contained in others, is detected but not virulent, has gained virulence through mutation, or is a threat) is very complex. The distribution is complex because the diffusion of poliovirus is associated with different types of polio, bodies, ecologies, and geopolitical realities. Polio can be biomedically engineered polioviruses (IPV), degraded versions of the virus (oral polio vaccine [OPV]), mutating viruses, or the so-called wild polio virus and its various strains; bodies can have no poliovirus, wild polio resistance, symptomatic polio, IPV, OPV, cVDPV, or be subclinical; ecologies vary across landscapes of built and natural environments; and geopolitical realities create different regulatory structures, biomedical accessibilities, conflicts, migrations, and tensions. This complexity means that eradication of polio in some places for some people with certain forms of a vaccine might not be possible in the immediate future. We thus have to better imagine how different types of viruses, bodies, built and natural ecologies, and geopolitical realities interact to produce the present landscape of infectious disease.⁷

As health geographers, we argue that such complexity demands a different spatial imaginary and concomitant vocabulary to understand polio.⁸ A set of assumptions in standard epidemiological practice suggest that control can happen through geographical containment in particular places and bodies.⁹ Polio containment leads to the elimination of wild or mutated viruses in particular places—a process that provides the promise of biomedical science’s capacity to eradicate and then extinguish these uncontrolled forms of life. Although we are fully supportive of all efforts to eliminate human suffering, including vaccination, we also believe in the need to be more realistic about the capacities of the virus;¹⁰ the assumptions embedded in vaccination efforts do not appreciate the ontological position of viruses circulating through ecosystems.^{11,12} Polioviruses are not bound to the humanly produced built and natural ecologies in which they exist nor the political or natural boundaries; the interest of polioviruses is survival, and this depends on their ability to find a human host.

Polioviruses, therefore, do not rely on the ocularcentric spatial imagination of human beings. People need to see polioviruses to know how to eradicate and control them, including the viruses used in vaccines and laboratory studies. Polioviruses know how to negotiate the negative spaces between human vision and the bodies and ecological landscapes that afford them their capacity for life. Put another way, polioviruses maintain themselves by seeping through the boundaries—real or imagined—we use to contain them. In view of this, we need a more cautious approach to our thinking, and might need to reduce our expectations of global eradication efforts.

New strategies for understanding disease are needed. We need to be more vigilant about infectious disease virology and epidemiology, even as the world seems to be shifting from societies dominated by infectious diseases to societies dominated by chronic ones. We can no longer assume that vaccinated or unvaccinated bodies in one place will all respond similarly to viruses, even when we account for statistical risks, herd immunity, and people who are immunocompromised.¹³ We have to appreciate that vaccination efforts are mediated by not only biomedical reasoning but also politicoeconomic and sociocultural processes. We must recognise that our global ecologies and geopolitical realities are so highly integrated that viruses, such as polio,

can take advantage of this integration to survive.

Polioviruses' adaptive capacities already outstrip the pace of intervention—since we have been able to see them they have probably already a new pathway that is not yet visible to the human geographical imagination. We should continue to try to manage all polioviruses in relation to the various bodies, ecologies, and geopolitical realities through which those viruses circulate to mitigate human suffering. But we must also be aware that polioviruses are already locating openings for survival, and creating new viral geographies. The endgame is not eradication, but mitigation and adaptation.

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