Viruses: Africa and the world in viral times

Special Issue edited by: Josiane Tantchou, Frédéric Le Marcis, Noémi Tousignant

Introduction: a viral life

Since late 2019, we have been living in viral times. The rapid spread of the new coronavirus (SARS-CoV-2) has highlighted the density of global circuits of information, transportation, migration, and trade. Yet the virus has also 'associated' (Latour 2020), in very different ways across national or domestic spaces, with distinctive systems of detection, treatment and control, as well as with markets, and formal or family relationships of exchange, duty and care. In biological terms, the virus is a liminal, relational entity that, when outside the cells of other organisms, is viable but not alive. It "comes to life" not through viral *attack*, but when host and virus enter into a relationship (Napier 2012, Brives 2020). As a critical object, the virus thus prompts us to ask: how are viruses and virality brought to life? This is a bio- and eco-social question about the spatial and social relations of transmission and those that make the infection *virulent* (Lowe 2017), as well as about relations between species and habitats that might foster the "emergence" of new viruses (but also the economies of the global South). It is also an epistemological question: by what types of knowledge production and detection strategies are viruses introduced into the social and political spheres, reshaping previous approaches to addressing and managing diseases? It is a socio-cultural question, interrogating the modes of virality we sustain through narratives on pathogens and epidemic outbreaks (Wald 2008, Quammen 2015), as well as through metaphors of computer viruses or of migrants and foreigners viewed as viral vectors, and framings of populations or spaces (often African) as (potential) viral hotspots (Auray and Keck 2015). These questions invite us to rethink Africa in the world, and the world from Africa.

The continent has long been considered a viral threat; as the place of origin of HIV and haemorrhagic viruses, it occupies a dominant place in the neoliberal bio-security worldview

(Cooper 2008, Wald 2008); as an incubator of yet-unknown pathogens, it is a virological "hunting" ground (Lachenal 2015); while to colonial eyes, it not only focused anxieties about "White" vulnerability (Anderson 1996), but required forceful prevention of its own human depopulation (Dozon 1985). Can we critically rethink the terms and frames of Africa's virality, and of virality in/from Africa? The current map of unequal access to vaccines (and its corollary of restricted movement) metaphorically echoes attempts to prevent illegal immigration; is this just a viral-themed replay of older patterns of population control? By flipping our approach to the virus, not as an autonomous threat but rather as an object/agent whose life and pathogenicity must be negotiated, this special issue calls for a rethinking and rewriting of virality from Global Africa. We invite contributions from across and between disciplines, to consider not only viruses as biological realities, but also the nature of information circulating about virality, or how the viral embodies Africa's relationship to the world through constructions of risk, mobilities, natural resource management, knowledge production, or inequalities in living conditions and policies of prevention and care. Taking Africa and the virus as its starting point, this special issue aims to (re)consider how we relate to living worlds, and what this entails with respect to the challenges outlined below.

1- Africa, "land of viruses"

Virality and Africa are mutually constitutive concepts in the Western worldview. From the earliest interactions with explorers and colonial administrators, the continent was viewed as a land of fevers (viral or not) and therefore as the "White man's grave" (Dozon 1995). Africans were considered carriers for a range of pathogens, from yellow fever to malaria, trypanosomiasis (sleeping sickness) and plague. Even when these were recognised as parasitic or microbial, the term "virus reservoirs" was used; a designation that justified racial segregation in cities (M'Bokolo 1982) and militarised campaigns for screening, treatment and prophylaxis, as well as measures of restricted or forced population movement (Lachenal 2014). New viral vaccines were developed through testing on Africans, including for yellow fever - developed in Senegal and Nigeria (Velmet 2020) - and hepatitis B (Moulin, Chabrol and Ouvrier 2018). They were also the subjects of the first large-scale experimental measles vaccination (Reinhardt 2015). Even as Africans continued to serve as vaccine trial populations (Moulin 1996, Couderc 2011, Thiongane 2013), they were accused of "resisting" the eradication of polio (Yahya 2007). Research into the HIV epidemic produced significant innovations in both

biological and socio-historical ways of knowing (Fassin 2006, Nguyen 2010, Pépin 2011); building on the legacy of colonial medical surveillance, the HIV-2 virus was first described in Dakar through monitoring of a cohort of female sex workers by a team led by Souleymane Mboup (Gilbert 2013). At the same time, social and biomedical sciences often "discover" realities – such as viral ones – that populations have long "known" in other terms. These include, for example, the embodied effects of unequal exposure to risk and access to resources for care and protection (measles and malaria are more deadly in Africa due to gaps in vaccination and treatment), but also what has been learned through cumulative experiences of managing pathogenic agents and environments (Hayden 2008, Richards 2016). It is therefore crucial, as the Comaroffs urge us, to develop theories from the South (Comaroff and Comaroff 2012) and to open up ways of thinking that are themselves "viral" in being underpinned by the hegemonic principles – of risk, security and immunity – imposed by the North. This can be done, for example, by considering health, from located experiences, through more holistic, relational frames (Livingstone 2005, 2013), or by tracing the virus as revealing complex and dynamic relations between bodies, species, knowledge and care, thereby resituating its "local biologies" in specific socio-historical contexts (Lock 2017).

2- Questioning the Anthropocene

From Wuhan, Covid 19 spread across the world. Countries of the North discovered that they were vulnerable to viruses and needed to anticipate and prepare seriously for future threats. Based on extrapolation from 380 new viruses identified in bats, the PREDICT programme (Reducing Pandemic Risk, Promoting Global Health)[1] estimated the number of new virus species yet to be discovered (excluding computer viruses) at between 360,000 and 460,000. Pressure on ecosystems from various intensive extraction and production activities interferes with the natural cycles of enzootic or sylvatic micro-organisms, some of which have had little or no exposure to humans. By disrupting ecosystems, especially forest ecosystems, human communities are at risk of coming into contact with pathogens hosted by the animal species who inhabit these ecoystems. According to Jean-François Guégan, large-scale destruction of forests worldwide, particularly in Africa, is leading to cohabitation between wild animals,

[1] PREDICT is a project of the USAID's Emerging Pandemic Threat (EPT) programme launched in 2009 to strengthen global capacity for the detection and discovery of zoonotic viruses with high pandemic potential.

livestock and humans. In other words, “humans have moved closer to microbes" and viruses, thus awakening natural microbial cycles that have rarely or never been exposed to humans (Guégan, Thoisy et al. 2018, Guégan 2020). When disrupted by human activity, these tropical and equatorial forests constitute potential biological time bombs, inviting us to anticipate and prepare for viral threats and make sure that we adopt a "One Health" approach. However, viruses are no longer the prerogative of living organisms and harmful only to bodies, as they also attack technical and technological devices and interfere with modes of processing, transmitting and storing information, including personal data. Whether they are biological or not, viruses often emerge unexpectedly and impose themselves. They must therefore be taken seriously.

The neologism ‘Anthropocene’ was coined to describe humans’ capacity to supplant natural factors and alter the trajectory of the ecosystem through their activities. As emphasized by Michel Magny, while the impact of human activity on natural environments has reached an unprecedented level that characterises the Anthropocene epoch, its origins raise questions about our species and its relationships with other living beings, including viruses (Magny 2021). This issue invites a range of critical engagements with viral emergence in the Anthropocene, which explore the ways in which human activity renders interspecies relations pathogenic but are also attentive to how ecological and zoonotic-focused narratives can obscure other kinds of accounts of politics and history. How, for example, can we reconcile explanatory frameworks focused on “human pressure” with the findings of James Fairhead and Melissa Leach in Guinea-Conakry (1995a; 1995b), showing that “pressure” has eased since the 2000s, due to insecurity linked to rebel incursions from Sierra Leone? Or when Jacques Pépin (2011) clearly demonstrated, using the example of HIV, that the circulation of viruses was linked less to forest exploitation than to health and urban (segregation) colonial policies? Or when recent Ebola epidemics (DRC and Guinea) were not zoonotic but of human origin? In addition to philosophical analyses of the multiple challenges facing the Anthropocene — global warming, loss of biodiversity, generalised environmental pollution, extensive human control of ecosystems and demographic pressure — and its consequences on viral threats, their preparation and anticipation on the African continent, this special issue will feature articles examining case studies of the history and trajectory of specific zoonoses or viruses from animals to humans or from forest to city.

3- Circulation

In addition to deforestation leading to inter-species circulation of micro-organisms, growing urban populations and increasing city sizes in inter-tropical regions generate exposure to greater and more frequent microbiological dangers, to which the poor inhabiting these cities are the most vulnerable (Guégan 2020). According to the United Nations (UN), an additional 2.5 billion people will live in urban areas by 2050. In the North, several studies have shown a link between health risks, well-being, mental health and urban development. The anarchic urbanisation of African cities and correlated problems of sanitation and air pollution, inequalities (environmental/health), insecurity, violence, and their impact on the incidence of communicable and non-communicable diseases, have already been highlighted (Mboumba 2007, Barry 2014, AFD 2015, Fourchard 2018, Ongo Nkoa and Song 2019). The (shanty) town environment in Africa is thus seen as both a fertile territory for inventiveness and creativity (Louveau 2013, Mbade Sène 2018) and a breeding ground for illness, unease and viral epidemics due to density and promiscuity (Giulia 2021). This special issue will address how viruses circulate, but also ways in which viral circulations are imagined and managed as threats, for example in the design of interactive maps and predictive models, in the collection and processing of data for/by applications of artificial intelligence, or in embodied techniques and rituals of protection. We aim to question how life/the living circulates globally in different forms and through different means, as well as the production of virulent or attenuated micro-organisms in situ or in laboratories for the purpose of prevention or (bio)terrorism. Although the recent Covid-19 pandemic has, according to some, revealed our “common biological foundation as insensitive to all forms of social condition or cultural belonging" (Garapon 2020),[2] it is also plainly obvious that infrastructural inequalities and a digital divide persist, shaping the material conditions and effects of virality. Moreover, the theory of a laboratory accident as origin of the Covid pandemic is gaining traction. This special issue therefore welcomes articles based, for example, on documented analyses of the production processes of micro-organisms in laboratories using laboratory animals, or the risk of bioterrorism and the challenges it presents on a global scale, especially in the South where infrastructures to ensure the security of laboratory output in closed circuits is sometimes inadequate.

[2] Editors’ translation.

4- Exceptional regimes, protests

When the viral threat shifts from risk to epidemic reality in a specific space-time configuration, it often reveals or exposes embodied processes of structural violence, such as those of racism and/or apartheid (Fassin 2004, Farmer 2005). It also brings out past crises and accumulated resentment (Garapon 2020) and can be viewed as a remembrance: our bodies remember (Fassin 2006). Responses can be read as potentially enduring "moments of exception", marked here and there by the "suspension of time or legality specific to each domain" or "generalised medical prescription" for an entire population, strengthening the power of authoritarian regimes and nationalism, with risks of protests or strong opposition, as "moments of exception" are followed by "moments of truth" (Garapon 2020). Populations and species can be organised in space by creating physical or symbolic borders, relegating certain groups to the margins, and locking up or killing potentially dangerous bodies or carriers to preserve and protect healthy bodies, and encircling and containing the epidemic to stifle its progress, as was seen in the colonial era (Lyons 1985, Lyons 1992) and during recent epidemics (HIV, Ebola, etc.). Similarly, marginalisation and relegation can lead to protests in the form of demands for specific forms of citizenship: therapeutic citizenship, eco-citizenship, global citizenship, etc. This special issue features articles on moments and regimes of exception implemented in Africa to tackle viral threats or epidemics and their ensuing protests. It is open to papers dealing with inequalities and forms of marginality revealed by viruses , as well as with the forms of stigmatisation and protests that emerge in the wake of the management of risks during moments of exception.

5- Viruses, geopolitics, knowledge production

Viruses raise the question of the production and circulation of knowledge, information, technical and technological devices, and the capacity of States to address a viral threat (biological or computer) or epidemic, whether it is a question of access to molecules, securing borders, computer security, data management, or protection of personal data in a datasphere vulnerable to cyber-attacks, etc. When applied to these domains, a critical focus on viruses could provide new frameworks for the understanding of geopolitics seen from Africa where, against a backdrop of humanitarian aid, health policies, etc., countries of the North roll out various strategies to gain access to bodies for therapeutic trials (Petryna 2009) or to ecosystems, fauna, etc. What we are witnessing is a form of colonisation that is no longer about human

bodies, but about living organisms and materials with strong economic and epidemic potential, and on the basis of which a virtual war or a bioterrorist attack could be organised. Thus, Africa can be thought of as the stage of real, possible and virtual battles over the circulation of living organisms within and between species, and the prevention and anticipation of viral and epidemic threats on a global scale. This issue welcomes contributions that analyze how the virus, whether biological or computer-based, redefines geopolitics from Africa while creating a continent that evolves at different speeds depending on the interests of nations, foundations and specific countries. This form of geopolitics makes certain places visible, while rendering others invisible (Brown, Craddock et al. 2012). Lastly, viruses invite us to question death, biological "life" and intermediate states in which the virus is not dead but inactive, while biological and social life carries on in a form of normality, at least in appearance. It invites us to address the representations and meanings given to the sudden irruption of a deadly virus, in a context where the uses of digital technology allows real-time tracking of interactions and subsequent analyses for marketing, surveillance, repression, sanctions (Sadin 2015, Sadin 2016, Douzet 2020), or isolation or waiting (for a negative or positive test) for prevention and/or control purposes.

6- Unlocking Africa

The life of viruses and their effects on biological and social bodies are different in the North and the South: we are not all equal in the face of viruses. Means of prevention and responses to contagion are unevenly distributed and are governed by rationalities that are specific to each context. Thus, when an epidemic breaks out at a global scale, restrictions on travels and interactions, hypercirculation of information (infodemic) and the speed at which pharmaceutical companies can produce molecules, all reveal the geography of inequalities. Consequently, while we all live with viruses, the terms on which we negotiate this co-existence vary according to geographical, technological and economic factors. The concept of "local biologies" (Lock and Kaufert 2001) helpfully reminds us that the body is not purely biological, but the product of history, economic and social context. As a result, our relations with viruses are necessarily local, but this locality is shaped by unstable paradigms (Giles-Vernick and Webb 2013). Over the past two decades, we have moved from a global approach to international health - global health - to an integrated one - One Health. The world is rounding up (Moulin 2014). However, this does not prevent the implementation of hegemonic, authoritarian and often

violent responses. In this context, Africa is often considered the seat of a viral threat to be contained. As mentioned above, Africa was once dubbed the "white man's grave" and has often been thought of as a land of danger, from human African trypanosomiasis to malaria, from AIDS to Ebola. With Covid-19, representations initially seemed to be reversed when, during the first few months, the North was a threat to Africa. However, the lack of vaccination capacity is once again labelling the continent as the site of future viral threat(s). In this special issue, focusing on viruses as critical objects, we aim to tackle the long-term relations that have been built between Africa and viruses, in relation to other experiences, and to analyse the ways in which the continent is perceived by the North. Looking beyond viruses as biological entities, this special issue aims to question the virality of representations that circulate on the continent once considered the "white man's grave" (Dozon 1995), and the European continent that no longer appears to be an *Eldorado*, but rather the black man's grave, as a result of various necropolitical strategies (Mbembe, 2006).

Paper proposals of a maximum length of 1500 characters can be submitted in English, Arabic, French, Swahili, or another African language. The abstract must specify how the article fall within the scope of this call and why this work is important and timely.

Proposals should be sent to the following address: redaction@globalafrica.ac no later than 30th November 2021.

Bibliography

Anderson, W. (1996). Immunities of empire: Race, disease, and the new tropical medicine, 1900–1920. Bulletin of the History of Medicine, *70*(1), 94-118.

Auray, Nicolas et Frédéric Keck (dir) 2015 « Virus », *Terrain* [Document papier et électronique], 64| 2015, URL : http://terrain.revues.org/15561

Barry, A. (2014). "Version féminine du malaise juvénile dans les villes africaines. Réflexions cliniques et anthropologiques autour d'un nouveau « phénomène social »." Essaim **2**(33) : 91-105.

Brives, C. (2020) "The politics of Amphibiosis:the war against viruses will not take place," April 19 2020, Somatosphere http://somatosphere.net/2020/the-politics-of-amphibiosis.html/

Brown, T., S. Craddock and A. Ingram (2012). "Critical Interventions in Global Health: Governmentality, Risk, and Assemblage." Annales of the Association of American Geographers **102**(5): 1182-1189.

Cooper, M. (2008) Life as Surplus: Biotechnology and Capitalism in the Neoliberal Era, Seattle, University of Washington Press.

Couderc, M. (2011) Enjeux et pratiques de la recherche médicale transnationale en Afrique. Analyse anthropologique d'un centre de recherche clinique sur le VIH à Dakar (Sénégal). Thèse de doctorat en anthropologie sous la direction du Pr Alice Desclaux, Université Aix-Marseille III, 506p.

Comaroff, J., et J. L. Comaroff.(2012). Theory from the South, Or, How Euro-America is Evolving Toward Africa. Paradigm Publishers.

Douzet, F. (2020). "Editorial. Du cyberespace à la datasphère. Enjeux stratégiques de la révolution numérique." Héorodote **2**(177-178) : 3-15.

Dozon, J.-P. (1995). "D'un tombeau à l'autre." Cahiers d'Etudes Africaines **XXXI(1-2)**(121-122) : 136-157.

Fairhead, J. et Leach, M. (1995a). Reading Forest History Backwards: The Interaction of Policy and Local Land Use in Guinea's Forest-Savanna Mosaic, 1893-1993, Environment and History, Vol. 1 (1), 55-91.

Fairhead, J. et Leach, M. (1995b). False Forest History, Complicit Social Analysis: Rethinking Some West African Environmental Narratives, World Development, Vol. 23 (6), 1023-1035.

Farmer, P. (2005). Pathologies of power. Health, human rights, and the new war on the poor. Berkeley-Los Angeles-London, University of California Press.

Fassin, D. (2004). Afflictions. L'Afrique du Sud, de l'apartheid au Sida. Paris, Karthala.

Fassin, D. (2006). Quand les corps se souviennent. Expériences et politiques du sida en Afrique du Sud. Paris, La Découverte.

Fourchard, L. (2018). Trier, exclure et policer. Vies urbaines en Afrique du Sud et au Nigeria. Paris, Presses de Sciences Po.

Garapon, A. (2020). "Moment d'exception." Esprit **5** : 87-92.

Gilbert, H. (2013). Re-visioning local biologies: HIV-2 and the pattern of differential valuation in biomedical research. Medical anthropology, *32*(4), 343-358.

Giles-Vernick, T. and J. L. A. Webb, JR (2013). Global health in Africa. Historial perspectives on disease control. Athens, Ohio University Press.

Giulia, G. (2021). Bamako war ikna: Kel Tamasheq, Bamako and the politics of wellbeing. Bien-être au Nord et au Sud : explorations. J. Tantchou, F. Louveau and M. E. Gruénais. Louvain-la-Neuve, Academia.

Guégan, J.-F. (2020). "Virus : quand les activités humaines sèment la pandémie." The conversation.

Guégan, J.-F., B. d. Thoisy, A. Ayouba and J. Cappelle (2018). "Forêts tropicales, changements d'usages des sols et risques infectieux émergents." Rev. For. Fr. **LXX**: 209-230.

Graboyes, M. (2015). The Experiment must continue. Medical Research and Ethics in East Africa, 1940-2014, Athens, Ohio University Press

Hayden, C. E. (2008). Of Medicine and Statecraft. Smallpox and Early Colonial Vaccination in French West Africa (Senegal-Guinea). Evanston, Northwestern University, PhD.

Lachenal, G. (2015). « Lessons in medical nihilism. Virus hunters, neoliberalism and the AIDS crisis in Cameroon », in Wenzel Geissler ed., Para-States and Medical Science : Making African Global Health, Durham, Duke University Press, 2015, p.103-141.

Latour, B. (2020) « La crise sanitaire incite à se préparer à la mutation climatique » Le Monde, 25 mars 2020, https://www.lemonde.fr/idees/article/2020/03/25/la-crise-sanitaire-incite-a-se-preparer-a-la-mutation-climatique_6034312_3232.html

Livingstone, J. (2005). Debility and the moral imagination in Botswana. Indiana UP.

Livingstone, J. (2013). « Cancer in the shadow of the AIDS epidemic in southern Africa. » The oncologist, *18*(7), 783–786. https://doi.org/10.1634/theoncologist.2013-0215

Lock, M. (2017). « Recovering the Body » Annual Review of Anthropology. 46(1) : 1-14, https://doi.org/10.1146/annurev-anthro-102116-041253

Lock, M. and P. Kaufert (2001). "Menopause, local biologies, and cultures of aging." Am J Hum Biol. **13**(4) : 494-504.

Louveau, F. (2013). "Sukyo Mahikari et la quête du bonheur : un mouvement religieux japonais en Afrique de l'Ouest et en France " Cahier de l'Institut Religioscope(10) : http://religion.info/french/articles/article_632.shtml.

Lowe, C. (2017). Viral Ethnography : Metaphors for Writing Life. RCC Perspectives, (1), 91-96.

Lyons, M. (1985). "From "death camps" to cordon sanitaire: the development of sleeping sickness policy in the Uele district of the Belgian Congo, 1903-1914." The journal of African History **26**(1): 69-91.

Lyons, M. (1992). The colonial disease. A social history of sleeping sickness in northern Zaire, 1900-1940. Cambridge, Cambridge University Press.

Mbade Sène, A. (2018). " L'urbanisation de l'Afrique : davantage de bidonvilles ou des villes intelligentes ?" Population & Avenir **4**(739) : 14-16.

Mbembe, A. (2006). Necropolitique. Raisons politiques, *2006/1*(21), 29-60.

M'Bokolo, E. (1982). Peste et société urbaine à Dakar : l'épidémie de 1914 (The Plague and Urban Society in Dakar: The 1914 Epidemic). Cahiers d'études africaines, 13-46.

Mboumba, A. (2007). "Gestion urbaine et équité socio-spatiale : les inégalités dans les services de base à Libreville (Gabon)." L'Espace géographique **2**(36) : 131-140.

Moulin, Anne-Marie, Chabrol, Fanny, and Ashley Ouvrier. 2018. 'Histoire d'un Vaccin pas Comme les Autres : Les Premiers pas du Vaccin Contre l'Hépatite B au Sénégal'. Delauney, Valérie, Alice Desclaux, and Cheikh Sokhna (eds). Niakhar Mémoires et Perspectives : Recherches Pluridisciplinaires sur le Changement en Afrique. Marseille et Dakar : L'harmattan & IRD Editions, 489–510.

Magny, M. (2021). *L'Anthropocène*. Paris: Presses Universitaires de France.

Moulin, A.-M. (2014). "Quand la terre s'arrondit. L'horizon convergent des épidémies d'Orient et d'Occident." Extrême-Orient Extrême-Occident **2**(37) : 233-240.

Moulin, A-M. (1996). L'Aventure de la vaccination, Paris : Fayard.

Napier, A. D. (2012). Nonself help: How immunology might reframe the enlightenment. Cultural Anthropology, *27*(1), 122-137.

Nguyen, V-K. (2010). The Republic of Therapy. Triage and Sovereignty in West Africa's Time of AIDS, Durham et Londres, Duke University Press.

Ongo Nkoa, B. E. and J. S. S. Song (2019). "Urbanisation et inégalités en Afrique : une étude à partir des indices désagrégés." Revue d'Économie Régionale & Urbaine(3) : 447-484

Packard, R. M. (2016). A History of Global Health: Interventions into the Lives of Other Peoples. Baltimore, MD: Johns Hopkins University Press.

Pépin, J. (2011). The Origins of AIDS, Cambridge, Cambridge University Press.

Quammen, D. (2012). Spillover: Animal Infections and the Next Human Pandemic, New York: Norton.

Petryna, A. (2009). When experiments travel. Clinial trials and the global search for human subjects. Princeton and Oxford, Princeton University Press.

Reinhardt, B. H. (2015). The end of a global pox: America and the eradication of smallpox in the Cold War era. UNC Press Books.

Richards, P. (2016). Ebola: How a People's Science Helped End an Epidemic, London: Zed Books ISBN 978 1 78360 858 4

Sadin, E. (2015). La vie algorithmique. Critique de la raison numérique. Paris, Editions l'Echappée.

Sadin, E. (2016). La silicolonisation du monde. L'irrésistible expansion du libéralisme numérique. Paris, Editions l'Echappée.

Thiongane O. (2013). Anthropologie de la méningite au Niger. Espaces épidémiques, mobilisations scientifiques et conceptions de la maladie. Thèse de doctorat sous la direction de MahamanTidjani Alou et Anne Marie Moulin, EHESS, 412 p.

Velmet, A. (2020). Pasteur's Empire: Bacteriology and Politics in France, Its Colonies, and the World. Oxford University Press, USA.

Wald, P. (2008). Contagious: Cultures, Carriers, and the Outbreak Narrative. Durham, North Carolina, Duke University Press.

Yahya, M. (2007). Polio vaccines—"no thank you!" barriers to polio eradication in Northern Nigeria. African Affairs, *106*(423), 185-204.