

SHE IS WORKING WITH THE CONGOLESE TO BUILD A DISEASE SURVEILLANCE SYSTEM THAT HAS ALREADY REVEALED THE SURPRISINGLY DRAMATIC GROWTH OF HUMAN MONKEYPOX.



ANNE RIMOIN: Bringing Emerging Diseases Above the Radar

Although her specific focus is studying the epidemiology of human monkeypox in the Democratic Republic of the Congo (DRC), Dr. Anne Rimoin also has an eye on the bigger picture: working with the Congolese government and local investigators to develop an infrastructure that will enable the Central African nation to conduct proper surveillance of all emerging infectious diseases. “To me, if you’re a researcher working in a low-resource setting, you have a moral obligation not just to collect your data and leave, but to build capacity and collaborate with the people who, by their good graces, are allowing you to do this work in their country,” she says.

Over the last six years, Rimoin, assistant professor of epidemiology at the school, has established a research site in central DRC that now serves as headquarters for a variety of studies of cross-species transmission of disease. Heading an all-Congolese team, Rimoin collaborates closely with the DRC Ministry of Health, the Kinshasa School of Public Health and the National Laboratory to improve disease surveillance capacity in a nation that is one of the world’s poorest, and has been devastated by civil war. “There is a long way to go – what we’ve done so far represents just a drop in the bucket – but I’m pleased just to be able to contribute as I can,” Rimoin says.

Already, though, Rimoin and her Congolese collaborators have produced tangible evidence of the critical nature of building a disease surveillance infrastructure. In August, they published the first results of their human monkeypox study in the *Proceedings of the National Academy of Science*, showing that rates of the disease had increased by an astounding 20-fold in the DRC since 1980.

Ironically, Rimoin's group noted, one of public health's greatest success stories opened the door for the dramatic increase. The eradication of smallpox, announced in 1980, spelled the end of a vaccination program that had also provided protective immunity against monkeypox, a related virus believed to be carried primarily by squirrels and other rodents. (Although generally less lethal than smallpox, monkeypox can cause serious symptoms, including severe eruptions on the skin, fever, headaches, swollen lymph nodes and, in some cases, blindness and death.) Particularly in rural areas, where displaced populations rely to a greater extent on bushmeat, the growing number of unvaccinated individuals over time led to a gradual increase in the rate of infection. But in the absence of any surveillance, Rimoin notes, monkeypox "fell under the radar." (For more on the study, see page 23.)

Growing up in Los Angeles, Rimoin always had positive associations with Africa. In a home adorned with African art, her father would recall fondly his research experiences working with a Pygmy population in the Central African Republic. At Middlebury College in Vermont, Rimoin earned her undergraduate degree in African History. It was only after graduating and going into the Peace Corps that she became interested in science, and particularly epidemiology. In Benin, West Africa, Rimoin spent two years as a volunteer coordinator for the guinea worm eradication effort. "It was a perfect public health program that taught me to do disease surveillance," she says. "It really brought home the importance of using basic epidemiologic methods to solve a problem."

Upon completing the program, Rimoin enrolled at the UCLA School of Public Health, where she received her M.P.H. in 1996. For her internship she worked in Nepal doing disease surveillance for the World Health Organization's polio eradication program. Rimoin was then hired by the WHO as a logistics officer, assisting in the expanded polio surveillance and eradication program in Ethiopia and Eritrea. She also initiated a collaborative relationship between the WHO and the Peace Corps, including development of a program and training materials for health-oriented Peace Corps volunteers to carry out disease surveillance activities in Africa and Nepal.

After completing her Ph.D. at the Johns Hopkins Bloomberg School of Public Health in 2003, Rimoin worked as a program scientist for the National Institute of Child Health and Human Development, coordinating clinical studies in Africa. While at a meeting at the DRC Ministry of Health, she was part of a discussion in which it was noted that there had been an increase in reported cases of human

monkeypox in the country. Rimoin's interest was piqued. "It made sense to me that given the lack of infrastructure and absence of disease surveillance, if there were any significant reports of monkeypox out there it was likely a much bigger problem than anyone was anticipating," she says. Rimoin promptly proposed to head the first epidemiologic study assessing the burden of human monkeypox in DRC, and received funding to begin setting up her program in 2004.

Ever since, Rimoin and her team have been training local health workers in identifying and reporting cases as well as interviewing monkeypox patients to learn about their potential exposures. The workers collect biological samples that are transported to the project's field station and then to Kinshasa, as well as to collaborators in the United States who conduct laboratory analyses and report back to the Congolese field workers.

One reason the DRC was in such dire need of a disease surveillance program is that there are tremendous logistical challenges to implementing one. From the beginning, Rimoin's team has faced problems such as how to collect and preserve biological specimens in settings that often lacked electricity, running water and refrigeration sources. A country of 900,000 square kilometers has only about 300 kilometers worth of roads. Given the expense of gasoline and the DRC's scarce economic resources, cost is never far from Rimoin's mind. "Our supervisors have motorcycles, but for day-to-day surveillance we give our health care workers bicycles so they can take supplies from the headquarters to their village," she says. "That can be as many as 200-300 kilometers away, but it's a sustainable approach."

At the UCLA School of Public Health, where she has been a member of the faculty since 2004, Rimoin teaches her students the importance of working with local collaborators, understanding the socio-cultural and political context in which problems occur, and designing and implementing interventions that are practical and feasible, particularly in low-resource settings. "Emerging infectious diseases are definitely out there," she says. "You just need to identify the populations at the highest risk and make sure you're asking the right questions or you're going to miss important events that signal the early emergence of a disease."

Rimoin, who spends roughly a third of her time working in the field in the DRC, is committed to being there for the long haul. "My goal is sustainable research," she says. "I am fully invested in my work in the DRC and intend to have a long relationship with my Congolese collaborators."

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