



REPLY TO MCLEAN ET AL.:

# Collections are critical

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McLean et al. (1) point to biorepositories as important sources of historical information that can successfully inform disease control by identifying potential novel pathogens. They highlight “modern biospecimen infrastructure,” such as museums and independent collections. Indeed, scientists increasingly recognize the need for expertise in taxonomy, curation of specimens, and the treatment of artifacts, expertise that is disappearing as museums close and budgets tighten (2). Collections can document anthropogenic change (3) and serve as reference data, as well as inform infectious disease research (4). One example relevant to studies of plague is the collection of the Kazakh Scientific Center for Quarantine and Zoonotic Diseases (KSCQZD) (Almaty, Kazakhstan), which incorporates insects and mammals collected and curated over the past 60 y. KSCQZD disease control strategies include consulting these collections but rely most heavily on ongoing proactive ground-level surveillance data to chart past, present, and near-future host–vector–pathogen dynamics (5).

McLean et al. focus on biorepository infrastructure, but it is worth broadening this perspective to include

unintentional biorepositories, such as mass graves of humans or animals. Technological developments in the last 2 decades in plague studies have shown the exceptional value of ancient DNA (aDNA) retrieved from plague victims to confirm the presence of *Yersinia pestis* and end debates over the cause of the pandemic (6–8). Such aDNA samples have been effectively used to retrieve and reconstruct the dynamics of plague reaching back on a millennial scale, rather than the decadal scale represented by manmade repository specimens and bacterial cultures (9, 10). While aDNA pathogen reconstruction has focused on recovery from human cases, developing bioarcheological methods of sampling wildlife is an intriguing possibility to retrieve more information on the past dynamics of endemic zoonotic diseases. We still advocate, however, prioritizing the allocation of research resources to support targeted ecological surveillance and modeling in the service of disease control (11), relegating the search for novel pathogens to secondary importance. Fortunately, historical analysis (including of materials in biorepositories) supports both goals.

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