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The Legacy of Colonial Medicine in Central Africa

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Between the 1920s and 1950s, French colonial governments undertook extensive medical campaigns in sub-Saharan Africa aimed at managing tropical diseases. In Cameroon and former French Equatorial Africa (comprised of the present-day Central African Republic, Chad, Republic of the Congo, and Gabon), the colonial governments organized campaigns against a variety of diseases, including sleeping sickness, leprosy, yaws, syphilis, and malaria. The most extensive of these campaigns focused on sleeping sickness, a lethal disease spread by the tsetse fly. Over the course of several decades, millions of individuals were subjected to medical examinations and forced to receive injections of medications with dubious efficacy and serious side effects, including blindness, gangrene, and death. The sleeping sickness campaigns constituted some of the largest colonial health investments, and for many, these campaigns were their first exposure to modern medicine.

There is a large body of anecdotal evidence from Africa of mistrust in medicine leading to underutilization of health care. Relatedly, research in developing countries has highlighted that even when there is access to high-quality preventive and therapeutic tools, demand remains puzzlingly low. Motivated by work from anthropology and history, which links colonial medical campaigns against sleeping sickness and mistrust in medicine, we hypothesize that the colonial medical campaigns may have had a series of unintended effects on both beliefs about modern medicine and the success of modern health interventions. The campaigns may have affected trust in medicine because villagers were forced to receive injections, many of the medications had serious negative side effects, and the medications were ineffective. Additionally, the campaigns may have also caused the spread of contagious diseases because of the reuse of unsanitary needles during the campaigns. Thus, we examine the effects of historical colonial medical campaigns on present-day trust in medicine, vaccination rates of children, and the success of World Bank health projects.

To measure exposure to colonial medical campaigns, we construct a novel data set from more than 30 years of archival data from French military archives for five countries. We digitize hundreds of tables documenting the locations of sleeping sickness campaign visits at a granular geographic level—either the ethnicity-district or subdistrict level—between 1921 and 1956. We measure exposure to the medical campaigns as the share of years that a location is visited during the years of the campaigns. The digitization and compilation of this historical data is itself a unique and valuable contribution to understanding the history of sub-Saharan Africa.

We focus on two key outcomes. First, we examine vaccination rates using data from the Demographic and Health Surveys (DHS) program for our sample countries. Vaccinations are an important and effective tool for preventing many diseases. In our area of interest, vaccination rates are low, often below herd immunity rates. We construct a vaccination index, which is the share of completed vaccines of nine

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possible vaccines for children under five. We find that greater exposure to the campaigns is associated with lower vaccination rates for children. Being visited all the years of the campaigns is associated with a 10 percentage point decrease in the vaccination index relative to a mean of having completed about half the nine vaccinations.

We measure trust in medicine by whether individuals consent to a free and noninvasive blood test for either anemia or HIV in the DHS. We consider consent to the blood tests to be a revealed preference measure of trust. We find that increased exposure to colonial medical campaigns is correlated with lower levels of trust in medicine today. Approximately 4.7 percent of the sample refuse the blood tests. Being visited by the colonial medical campaigns for 15 years, the average number of visits in our regions of interest increases refusals by 5.1 percentage points. Equivalently, a one-standard-deviation increase in the times a region was visited by the medical campaigns increases refusal rates by 0.1 standard deviations. The results are robust to a variety of geographic, colonial, precolonial, and individual-level controls. The strong correlation remains when we examine anemia blood test refusals or HIV blood test refusals separately.

After presenting the correlations between medical campaign exposure and vaccinations and trust in medicine, we address concerns of reverse causality and omitted variable bias.

The reverse-causality concern is that the medical campaigns targeted places to visit based on their initial propensity to vaccinate or levels of trust in medicine (or trust more broadly, given that many of these places would have had little to no exposure to modern medicine prior to these campaigns). For this to bias upward the magnitude of the observed effects, the medical campaigns would need to have targeted less-trusting places. The second concern is that some other variable is jointly determining both trust in medicine and the number and intensity of campaign visits.

A natural instrument, which will help us account for potential reverse causation, might be the tsetse fly suitability index, which predicts where the tsetse fly is able to live and therefore is correlated with the prevalence of animal and human sleeping sickness. However, our areas of interest are all highly suitable for the tsetse fly, so it does not strongly predict the campaign exposure. Thus, we include it as a disease-suitability control in our specifications.

We construct an instrument for exposure to the medical campaigns based on geographic features that increase human exposure to the tsetse fly habitat and that may have led to greater perceived prevalence of sleeping sickness, despite equally suitable tsetse fly conditions. The instrument uses soil suitability for cassava, a New World crop, relative to millet, an Old World crop. Colonial administrators had noted a correlation between growing cassava and sleeping sickness. This is likely due to two features of growing cassava. First, the processing of cassava, which requires soaking the cassava in water, increases the risk of exposure to the tsetse fly. Second, cassava produces more calories per hectare than Old World crops, so less land needs to be cleared to produce a fixed amount of calories; this leads to more tsetse-fly-harboring "brush." Thus, the suitability for cassava relative to millet captures the perceived need for medical campaign visits because of the increased potential for human interaction with the tsetse fly habitat. With the instrumental variable specifications, we find that being visited by the colonial medical campaigns for 15 years decreases the vaccination index by 24 percentage points and increases refusals by 21 percentage points.

Our work contributes to several strands of economic literature. First, we contribute to the broader literature on how historical events are important for understanding Africa's comparative development. We build on this work by compiling a novel historical data set on colonial medical activity that has yet to be studied, testing how colonial health investments affect present-day trust in medicine in a setting where trust in medicine is low, and testing to see whether historical exposure to colonial medical campaigns can partially explain the success of present-day health projects in the region.

Second, our work relates to the literature exploring how culture and history can inform development policy by presenting evidence that historical experiences affect trust in modern medicine and that this has implications for the success of health policies. Third, we address the economic impacts of historical health interventions, providing the first quantitative evidence of the effects of the extensive efforts to treat and prevent sleeping sickness during the colonial era. Fourth, we examine unintended consequences of aid interventions, specifically by providing detailed empirical evidence on how even well-intentioned colonial policies can have counterintuitive and long-lasting negative effects on health. We find that these campaigns negatively affect present-day health-seeking behavior and important health outcomes such as vaccination rates.

Finally, our project is also related to a broader literature on the historical origins of trust. First, we demonstrate that historical negative experiences with the health sector can affect the health-seeking behavior of subsequent generations (i.e., that the effect can persist across generations). Second, we then demonstrate the relevance this has for health policy

by examining the success of World Bank projects across our sample. Finally, the campaigns were not an isolated incident; we examine a "treatment" that was relevant among many sub-Saharan African countries and in which millions of individuals were forcibly treated for sleeping sickness.

NOTE:

This research brief is based on Sara Lowes and Eduardo Montero, "The Legacy of Colonial Medicine in Central Africa," January 31, 2020, https://scholar.harvard.edu/files/slowes/files/lowes_montero_colonialmedicine.pdf.