

**Tinker Research Project Final Report**  
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I arrived in Cumbayá, Ecuador in late May with a long to-do list and an ambitious timeline. I hoped to launch a research project that had idled for the past three years due to a novel methodology that spanned multiple disciplines. This project aimed to characterize the socioeconomic determinants of antibiotic use by small-scale food animal producers in Ecuador. [Prior studies](#) have identified the role of small-scale food animal production, rather than solely factory production, as a contributing factor to antimicrobial resistance (AMR). This indicates that small-scale producers' use of antibiotics for their livestock may increase their exposure to antibiotic resistant bacteria. Still, the question of why these individuals are choosing to use antibiotics for their animals remains. In this study, we sought out to evaluate the hypothesis that sales agents play an active role in the promotion of antibiotic use in small-scale food animal production. This study aimed to evaluate this hypothesis via three main project activities. The first two activities, focus groups of small-scale food animal producers and interviews with various key stake holders in food animal production and antibiotic stewardship, were relatively straightforward due to their extensive use in prior studies. The third study procedure, the simulated client methodology, was significantly more complicated due to its novel nature and use of deception.

To our knowledge, this methodology has never been used before. In the simulated client procedure, a member of our research team, a veterinary graduate student, visits a local veterinary pharmacy as if he or she is a customer. The researcher approaches the salesperson, who may be a veterinarian, a shop owner, or a cashier, and presents the salesperson with a specific scenario and requests advice. This scenario aims to evaluate sales agent behavior in two main areas: recommendation of antibiotics for growth promotion and the sale of "last-line" antibiotics that should be reserved for antibiotic resistant infections. This simulated client procedure has been used to examine recommendation practices in human pharmacies, but has never been used in a veterinary pharmacy context. In addition to its novel nature, this procedure was more complex due to its use of deception. In designing this methodology, we had to carefully balance the protection of the sales agents' individual rights with the need to examine sales agent's authentic recommendation practices. While the Berkeley IRB has approved of the two former study procedures, we await the IRB's decision on the simulated client procedure. We hope that the results will provide information on the actual recommendation practices of sales agents in Ecuador, provide data that can inform antibiotic stewardship policy, and can establish a methodology that can be replicated in other low and middle income countries.

Despite the microbiological background of my colleagues, the majority of my summer was spent honing the "soft skills" of managing team members, negotiating methodological details, networking, and navigating IRB approval. My overarching goal of moving the project forward provided a loose framework to my activities. While I was initially hesitant to be assertive in my requests and suggestions, I slowly realized that senior research team members welcomed this ambition and eagerness to be proactive. Though I have previously had rich experience as team member on research projects, this project was my first opportunity to truly gain leadership and independence as a researcher.

Networking with Ecuadorian policymakers was a source of both growth and anxiety throughout the summer. While I have grown confident in my professional Spanish, I was skeptical that I could grasp the nuances of antimicrobial stewardship policy in a second language. Despite the occasional confusion over a legal term or bacteria strain, I was struck by the patience and enthusiasm that I was met with in Ecuador. Every person I met was happy to contribute to the project in any way they could and expressed excitement that these results could help provide fuel to support evidence-based policy. I initially feared that some would be skeptical that I was portraying Ecuador in an unflattering light, but instead I was

encouraged by policymakers who wanted strong evidence of the determinants of public health concerns in their country.

Overall, I had an incredibly positive experience in both my work and home life in Ecuador. After spending my days at the University, I returned to my small apartment in a terraced stone home that was built into the lush mountains overlooking Cumbayá. There were two sweet dogs who greeted me every afternoon, a chicken coop, fruit trees, and more spiders than I have seen in my entire life. Marketed as an “eco-lodge,” the home was a great change of pace from my apartment in Berkeley and allowed me the chance to work from home sitting by the pond on the rare opportunity when the wifi was functioning.

Relative to other cities in Latin America where I have lived (Valparaíso, Chile and Matagalpa, Nicaragua), Cumbayá was much less of a culture shock. It is a college town and affluent suburb east of Quito that was almost always sunnier and 10 degrees warmer than the capital. This pairing made it easy to draw comparisons to Berkeley’s relationship with San Francisco. Filled with beautiful hikes, fantastic restaurants, and fun events, I found myself feeling as if I had just scratched the surface of Cumbayá by the time I was leaving in early August.

Despite my return to Berkeley, this research project will remain a large part of my life in the coming months. We hope to begin data collection in October, and I have the goal to use the results for my Master of Public Health (MPH) Capstone in the Epidemiology and Biostatistics program. I am optimistic that the relationships that I built in Ecuador will allow me to coordinate project activities remotely while I continue my studies here at Berkeley. Balancing the responsibilities of this research project, my coursework, and my role as a Graduate Student Instructor (GSI) will undoubtedly provide me with plenty of work during the final year of my MPH, but I hope that this will help prepare me for the dual researcher-instructor role of a professional in academia.