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Background: Under the current paradigm, cost-effectiveness studies provide limited value to policy makers in low-resource settings. Studies appear with substantial delays in the academic literature and are often based on large-scale multi-intervention assessments in settings with drastically different infrastructure, resources and cultures. Timely and contextual evidence is rarely available. Given recent developments in standardizing the analysis of the global burden of disease (GBD), we believe a similar approach can be applied to the generation of cost-effectiveness estimates. To achieve this, we are developing a systematic protocol and guidelines for conducting cost-effectiveness analyses based on the integration of information. We are applying this approach to two low-income countries — Kenya and Zambia — as a proof of concept.
Methods: We define cost-effectiveness as a combination of five inputs: incremental costing, the current coverage of interventions, the remaining burden of disease that needs to be addressed, efficacy of interventions, and the gap between efficacy and effectiveness, which we label as quality. The first step is to identify a set of interventions based on highest potential impact and strategic priorities of the two countries involved. The list of interventions for Kenya is currently being finalized. To develop cost functions, we will use data collected through the Access, Bottlenecks, Costs and Equity (ABCE) project that incorporate facility-level efficiency. GBD estimates will be used to determine the burden. We will initially develop first order approximations of coverage based on available survey data, or encounter data for interventions that are not normally included in demographic health surveys. We will map from efficacy in the units reported in the literature to changes in disability-adjusted life years (DALYs) checking for consistency with GBD assumptions regarding prevalence, case-fatality rates, severity distributions and disability weights. To account for the impact of provider quality and consumer behavior on the real-world effectiveness of interventions, we are collaborating with Emory University in developing a framework to estimate effectiveness and its determinants.
Findings: Bringing together data on the five inputs will allow us to produce estimates of the cost-effectiveness of the interventions of interest to policy makers in Kenya and Zambia. We aim to produce our first round of estimates in 2015 for a subset of those interventions.
Interpretation: Developing a system that is able to generate timely, evidence-based, setting-specific and up-to-date estimates of cost-effectiveness for each country will take multiple iterations. Ultimately, the aim is to be able to determine the fraction of each disease that can be averted over a defined period with policies that meet certain threshold definitions of cost per DALY averted, while incorporating uncertainty.
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Determining demographic risk factors for receiving counterfeit cancer drugs

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Background: Context: In 2012, the U.S. FDA reported it had detected counterfeit versions of the anti-cancer drug Avastin in the legitimate drug supply chain. These counterfeit medications had traversed a complex global network of drug distributors, including those in Turkey, Switzerland, Denmark, the United Kingdom, and Canada. Drug safety warnings were sent to U.S. medical clinics where FDA suspected patients may have been exposed to counterfeit Avastin. Why the study was done: This study was done in order to identify demographic risk factors associated with clinics receiving a counterfeit Avastin notice. Aim: The aim of this study was to determine which demographic characteristics are associated with geographic areas that received counterfeit Avastin warning notices.
Methods: Study Design: Geospatial analysis was conducted across 30,431 zip codes in the United States. We also identified zip codes for clinics where legal prosecutions were pursued by the U.S. Department of Justice. Participants: FDA safety notices were received by 781 zip codes. Interventions: N/A Analysis: This research utilizes a multidisciplinary approach to analyze FDA drug safety notifications and legal prosecutions for counterfeit Avastin incidents using geospatial, regulatory, and legal analysis. After geocoding clinics that received an FDA safety warning, we used a basemap from the U.S. Census Bureau linked to 44 demographic characteristics (at the zip code-level) and used multivariate analysis to determine which characteristics were most associated with zip codes where notices were sent. (IRB N/A)
Findings: Participants: Researchers identified 781 zip codes as receiving counterfeit Avastin notices and 29,650 zip codes that had not received these notices. Outcomes: Geospatial analysis provided a visual depiction of where counterfeit Avastin receipt is most likely to occur. Zip codes receiving FDA safety notices were positively associated with demographic characteristics of elderly populations (over the age of 65) and ethnic white populations. These were the demographic variables where Pearson's correlation coefficients were highest. We observed a greater number of counterfeit Avastin incidents in major U.S. states including California (17.7% of all zip codes), Texas (9.2%), Florida (8.5%), and New York (8.2%).
Interpretation General Interpretation: These results identify demographic risk factors that can aid future efforts to proactively respond to detection of counterfeit medicines and efforts to improve patient safety. Limitations and Strengths: The main limitation of this research is that the notices sent to medical clinics correspond to locations where the FDA believed, but had not verified, that counterfeit Avastin was used. The main strength of this research is that it is the first study to analyze how demographic variations correspond geographically and statistically to detection of counterfeit cancer medications.
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Measuring the impact of U.S. global health engagements, an econometric approach

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Program/Project Purpose: The National Defense Authorization Act of FY13 states that the Department of Defense (DoD) "shall develop a process to ensure that health engagements conducted by the Department of Defense are effective and efficient in meeting the national security goals of the United States," including ensuring security, stability, and enduring partnerships in areas of interest throughout the world. Directly addressing this topic, the Measures of Effectiveness in Defense Engagement and Learning (MODEL) study, executed through the Uniformed Services University of the Health Sciences (USUHS) and conducted at the Center for Disaster and Humanitarian Assistance Medicine, was funded in 2013 to determine the effectiveness of Global Health Engagements (GHEs) as a Theater Security Cooperation (TSC) tool.
Structure/Method/Design: The MODEL study employs a hypothesis-based, econometric methodology, retrieving DoD health engagements from the Overseas Humanitarian Assistance Shared Information