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TRENDS IN SOCIOECONOMIC-RELATED HEALTH INEQUALITY IN RURAL WESTERN KENYA: DATA FROM REPEATED HOUSEHOLD MALARIA SURVEYS 2006-2013

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Socio-economic disparity is well recognized as a barrier to achieving health-related international development goals. Socio-economic data are not always analysed or fully utilised for guiding decisions or monitoring the impact of health interventions and programs. In malaria-endemic western Kenya, we examined the trends in malaria parasitemia, malaria medication usage, and care-seeking behaviour at the household level by socio-economic status. We analysed data from annual malaria cross-sectional surveys from 2006 to 2013 based on systematic, cluster, and stratified sampling of 7,253 households in rural western Kenya. Data collected included socioeconomic status (SES), demographics, malaria parasitemia by microscopy, medication usage and care-seeking behaviour. A composite SES score was created from multiple correspondence analyses of household assets, and households were classified as poor (i.e., lowest three quintiles) or less-poor (i.e., highest two quintiles). The gap in the odds of malaria between poor and less-poor (for all ages) was significant in 2007 (OR=1.86, 95% CI: 1.1–3.1, p=0.016) but not in 2013 (OR=1.2, 95% CI: 0.9–1.6, p=0.331). Overall, the declining equity gap in the odds of malaria from 2006–2013 formed a polynomial curve ($R^2=0.99$; trend $p<0.001$). Amongst children aged <5 years, the trend in the odds of malaria gap between poor and less-poor was not significant over the study period ($p=0.688$). The trends in the inequalities in medication usage ($p=0.876$) and care-seeking behaviour ($p=0.181$) were not statistically significant over the study period. In western Kenya, substantial inequalities in health indicators, such as malaria parasitemia prevalence, medication usage and care-seeking behaviour, continue to exist. However, the health inequality gap in malaria parasitemia prevalence has decreased over time. These findings provide evidence that targeted malaria prevention and control efforts can help reduce health inequalities among the poorest households in western Kenya.

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ASSESSING URBANIZATION TRENDS FOR PUBLIC HEALTH: MODELLING NIGHTTIME LIGHTS IMAGERY IN AFRICA: 2000 - 2013

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The growth of urban centers and the transition of rural settlements to urban environments has a broad range of public health implications. Sub-Saharan Africa currently has the world's highest urban growth rate of any continent at roughly 4.2% annually and better understanding the spatiotemporal evolution of this process is key to many geospatial disease modelling and burden estimation efforts. Nighttime lights imagery (NTL) captured by National Oceanic and Atmospheric Administration's satellites offer a unique viewpoint for studying urban trends. These data, available as annual composites from 1992-2013 at 1 km resolution,

provide a means for spatiotemporal analysis on a global basis. However, inter- and intra-annual differences between satellites make the raw imagery unsuitable for temporal analysis. The objective of this study was to generate a time series of annual inter-calibrated NTL images (2000-2013) to describe patterns of urbanization in Africa and provide input for studies on the relationship between urban land cover and electrification on malaria transmission. Processing included a regression based procedure for inter-calibration of images from different satellite/years. This method used a 1999 image as a reference and values in all other images were adjusted to match its data range. Subsequently, a weighted 5-year moving average was used to reduce annual variability. Low-light thresholding was also used to remove 'overflow', an exaggeration of brightness in urban peripheries. Urban agglomerations were identified using a region grouping function to detect contiguous lighted pixels. Urban cluster sizes were grouped into 6 categories on a log scale (1-100K km²) and trends in total area assessed temporally. The maximum size and frequency of agglomerations increased in the 10K-100K and 100-1K km² categories for densely and sparsely populated countries, respectively. The processed NTL time series will be made openly available to global health researchers as well as the broader scientific community.

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THE ACT CONSORTIUM AND THE GLOBAL HEALTH NETWORK: COLLABORATING TO PROVIDE AN ONLINE, OPEN-ACCESS, COMPREHENSIVE PHARMACOVIGILANCE RESOURCE FOR THOSE WORKING IN TROPICAL INFECTIOUS DISEASES AND GLOBAL HEALTH

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Drug safety signals may remain undetected in resource-poor settings due to a lack of infrastructure for surveillance, under-developed regulatory oversight and poor access to guidance on research methods. Online resources are available but may be unaffordable. Moreover some websites lack maintenance, or provide guidelines and regulations without support for implementation. Few facilitate interaction about the successes and challenges in assessing harm. More tools, discussion and learning opportunities would advance drug safety research in these areas. The ACT Consortium (ACTc) took a comprehensive approach to antimalarial pharmacovigilance (PV); trials on the effects of repeated exposures of artemisinin-based combination therapies (ACTs), and interactions between ACTs and antiretrovirals; the participatory design of adverse event data collection tools; qualitative exploration of influences on participant safety data reports; and a web-based Drug Safety Repository (www.actconsortium.org). Sharing these experiences and resources should benefit others interested in drug safety in tropical infectious diseases and global health, particularly those struggling to access relevant information. As such, ACTc researchers have collaborated with the online open-access science park, The Global Health Network, TGHN (www.tghn.org), to develop a dedicated space for this field. Aside from creating a comprehensive PV resource of relevant information within TGHN, www.globalpharmacovigilance.org brings useful, high quality, up-to-date external resources together in one place. In addition there are original articles on pertinent PV topics, interviews with experts, and fora for discussing drug safety research in the real world. Links are provided to education and training providers, while new free eLearning courses are being developed in-house. The website coordinators make periodic contact with its user group to explore experiences and needs. By engaging

the website community, this contribution to global drug safety will develop iteratively to improve the practice of safety evaluations in resource-poor settings.

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EVALUATION OF CAPACITY BUILDING FOR LEADERSHIP AND GOVERNANCE IN ORDER TO STRENGTHEN HEALTH SYSTEMS IN DEVELOPING COUNTRIES

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In many countries, teaching the topic of leadership is not part of the medical curriculum, however with the recent Ebola outbreak, it clearly showed how a lack of leadership can be a threat to an entire health system. A training course in leadership was taught to 24 medical doctors from eight sub-Saharan countries. The aim of the project was to evaluate the leadership training course and its application in the context of health systems strengthening in developing countries. The evaluation study was designed using a qualitative methodology whereby individual interviews with all the participants and trainers from the leadership training course were conducted. Focus group discussions were organised in four countries. Questions from the individual interviews were designed following the Kirkpatrick Model for evaluating training programmes, which include, the reaction to the training; learning uptake; behaviour change; and results of the training. The themes generated from the interviews which were highlighted as important to effective leading and governing of health systems in developing countries were, enthusiasm; being a better leader; need for a change; communication; teamwork; personal development; process of implementation of activities; responsibility and governance. During the focus group discussions the themes discussed were non-governmental organizations and representation at the ministry level. The presenter will explore these themes further and demonstrate subsequent changes following the capacity building initiative. The discussion will include positive reaction from all the trained participants, which has enabled them to keep track of their progress through their actions. Training also determined the essential skills required for a leader in healthcare and how participants are able to apply the knowledge gained during the training to their work setting. Additional factors to improve healthcare services by increasing collaboration with Governments and the MOH in order to increase sustainability of healthcare services were addressed.

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HEALTH CARE WORKER MOTIVATION ONE YEAR AFTER THE EBOLA OUTBREAK IN LIBERIA

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Staff motivation is an often overlooked ingredient of quality health services. After a crisis like Ebola, particular attention should be paid to helping health care workers recover. During the Ebola Virus Disease (EVD) outbreak in Liberia, Redemption Hospital, the only free secondary care facility in the city, became the physical and emotional epicentre of the disease. Twenty health care workers became infected and twelve died. The hospital ceased providing most services and was transformed into a holding unit for suspected Ebola cases. In January 2015, Redemption Hospital resumed comprehensive health services with the support of the International Rescue Committee (IRC). Initially it lacked the systems to maintain proper IPC, physical infrastructure for safe waste disposal,

personal protective gear, and a sufficient number of skilled staff. Staff morale had been destroyed by the trauma of the outbreak; many did not return and those that did expressed fear and distress. From the outset, the IRC prioritized the mental and physical safety of staff, in addition to focusing on quality services. A year after the resumption of health services, the IRC assessed perceptions of change and factors affecting motivation for staff at Redemption. The qualitative findings revealed that staff expressed an improved sense of safety coming to work, increased confidence in their ability to deliver quality care to patients, and improved sense of pride and value as individuals. A quantitative survey verified these findings: the most important motivating factors reported by staff included commitment to the job (94%), smooth working relationship among staff (86%), and availability of PPE (83%). The least significant factors were monthly salary (27%) and transportation to work (31%). While monetary incentives are important, these findings show that they are not the primary motivator for health care workers at Redemption Hospital, a year after it resumed full services after being closed due to Ebola.

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ESTIMATING THE POTENTIAL DEMAND OF A DENGUE VACCINE TO INFORM VACCINE INTRODUCTION IN THE YUCATAN PENINSULA: CASE STUDY FOR MEXICO

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Dengue has become a disease of growing importance in Mexico with disease prevalence in endemic areas as high as 80%. In 2015, Sanofi Pasteur's Dengvaxia® became the first dengue vaccine to be licensed for use in Mexico in the 9-45 year olds. As governments at the national and state levels discuss and plan strategies in response to dengue fever and the industry develops and prepares to scale up the production of vaccines, there is a need for estimates of the demand for dengue vaccine and for insights on where the introduction of the vaccine would have strong social and economic impact. In this perspective, strategic demand forecasts can be used to accelerate vaccine access by providing stakeholders with vital information on supply, potential demand, and vaccine costs of vaccine introduction scenarios. Demand estimates will be presented to accelerate vaccine access in the Yucatan peninsula. We will estimate the potential demand, costs, and impact of introducing a dengue vaccine in the Yucatan peninsula based on key stakeholder preferences for 35-year analytic horizon. The Yucatan Peninsula is formed by three states (Yucatan, Campeche and Quintana Roo) in Mexico where dengue fever is on the increase with 2,117 and 2,990 confirmed cases, 8,459 and 31,559 probable cases and 729 and 785 hospitalized cases reported in 2014 and 2015, respectively. We developed an Excel-based model to estimate the potential demand in the Yucatan peninsula from the public and private healthcare perspectives. Introduction scenarios are developed along with model algorithms to model the 35-year analytic horizon based on stakeholder interviews. Model assumptions are derived from government, funders and industry stakeholder interviews and from administrative and surveillance data produced by the Federal Government of Mexico.

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ESTIMATING THE POTENTIAL DEMAND FOR DENGUE VACCINES IN HONDURAS AND PARAGUAY: PRELIMINARY FINDINGS

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Honduras and Paraguay, both Latin American countries with a national GDP per capita below \$US31 billion, continue to report growing incidence of and morbidity attributed to dengue fever. The increasing burden of dengue in these countries and the recent approval of the first Dengue vaccine, Dengvaxia®, in neighboring Latin American countries