In Search of Better Health

KEMRI PUBLICATIONS (2018)

1.	Williams TN, Thein SL Sickle Cell Anemia and Its Phenotypes. Annu Rev Genomics Hum Genet. 2018 Aug 31;19:113-147. **Abstract** In the 100 years since sickle cell anemia (SCA) was first described in the medical literature, studies of its molecular and pathophysiological basis have been at the vanguard of scientific discovery. By contrast, the translation of such knowledge into treatments that improve the lives of those affected has been much too slow. Recent years, however, have seen major advances on several fronts. A more detailed understanding of the switch from fetal to adult hemoglobin and the identification of regulators such as BCL11A provide hope that these findings will be translated into genomic-based approaches to the therapeutic reactivation of hemoglobin F production in patients with SCA. Meanwhile, an unprecedented number of new drugs aimed at both the treatment and prevention of end-organ damage are now in the pipeline, outcomes from potentially curative treatments such as allogeneic hematopoietic stem cell transplantation are improving, and great strides are being made in gene therapy, where methods employing both antisickling β-globin lentiviral vectors and gene editing are now entering clinical trials. Encouragingly, after a century of neglect, the profile of the vast majority of those with SCA in Africa and India is also finally improving. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29641911/
2.	Iro MA, Sell T, Brown N, Maitland K. Rapid intravenous rehydration of children with acute gastroenteritis and dehydration: a systematic review and meta-analysis. BMC Pediatr. 2018 Feb 9;18(1):44. **Abstract** Background: The World Health Organization (WHO) recommends rapid intravenous rehydration, using fluid volumes of 70-100mls/kg over 3-6 h, with some of the initial volume given rapidly as initial fluid boluses to treat hypovolaemic shock for children with acute gastroenteritis (AGE) and severe dehydration. The evidence supporting the safety and efficacy of rapid versus slower rehydration remains uncertain. Methods: We conducted a systematic review of randomised controlled trials (RCTs) on 11th of May 2017 comparing different rates of intravenous fluid therapy in children with AGE and moderate or severe dehydration, using standard search terms. Two authors independently assessed trial quality and extracted data. Non-RCTs and non-English articles were excluded. The primary endpoint was mortality and secondary endpoints included adverse events (safety) and treatment efficacy. Main results: Of the 1390 studies initially identified, 18 were assessed for eligibility. Of these, 3 studies (n = 464) fulfilled a priori criteria for inclusion; most studied children with moderate dehydration and none were conducted in resource-poor settings. Volumes and rates of fluid replacement varied from 20 to 60 ml/kg given over 1-2 h (fast) versus 2-4 h (slow). There was substantial heterogeneity in methodology between the studies

	with only one adjudicated to be of high quality. There were no deaths in any study. Safety endpoints only identified oedema (n = 6) and dysnatraemia (n = 2). Pooled analysis showed no significant difference between the rapid and slow intravenous rehydration groups for the proportion of treatment failures (N = 468): pooled RR 1.30 (95% CI: 0.87, 1.93) and the readmission rates (N = 439): pooled RR 1.39 (95% CI: 0.68, 2.85). Conclusions: Despite wide implementation of WHO Plan C guideline for severe AGE, we found no clinical evaluation in resource-limited settings, and only limited evaluation of the rate and volume of rehydration in other parts of the world. Recent concerns over aggressive fluid expansion warrants further research to inform guidelines on rates of intravenous rehydration therapy for severe AGE. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29426307/
3.	Williams PCM, Berkley JA. Guidelines for the treatment of dysentery (shigellosis): a systematic review of the evidence. Paediatr Int Child Health. 2018 Nov;38(sup1):S50-S65. **Abstract** Background: Shigella remains the primary cause of diarrhoea in paediatric patients worldwide and accounts for up to 40,000 deaths per year. Current guidelines for the treatment of shigellosis are based on data which are over a decade old. In an era of increasing antimicrobial resistance, an updated review of the appropriate empirical therapy for shigellosis in children is necessary, taking into account susceptibility patterns, cost and the risk of adverse events. Methods: A systematic review of the current published literature on the treatment of shigella dysentery was undertaken in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Results: The initial search produced 131 results, of which nine studies met the inclusion criteria. The quality of the studies was assessed as per the Grading of Recommendations Assessment, Development and Evaluation (GRADE) guidelines. International guidelines were also reviewed. There is a lack of current research regarding the clinical treatment of shigellosis in paediatric and adult patients, despite rising antimicrobial resistance worldwide. In particular, there is a lack of studies assessing the non-susceptibility of community-acquired strains, with almost all published research pertaining to microbiological data from hospital-based settings. Discussion: Current WHO guidelines support the use of fluoroquinolones (first-line), β-lactams (second-line) and cephalosporins (second-line) which accords with currently available evidence and other international guidelines, and there is no strong evidence for changing this guidance. Azithromycin is appropriate as a second-line therapy in regions where the rate of non-susceptibility of ciprofloxacin is known to be high, and research suggests that, from a cardiac point of view, azithromycin is safer than other macrolide antibiotics. Cefixime is also a reasonable alternative, although its use must be weighed

	against the risk of dissemination of extended-spectrum β-lactamase-producing organisms. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29790845/
4.	Guarino A, Lo Vecchio A, Dias JA, Berkley JA, Boey C, Bruzzese D, Cohen MB, Cruchet S, Liguoro I, Salazar-Lindo E, Sandhu B, Sherman PM, Shimizu T. Universal Recommendations for the Management of Acute Diarrhea in Nonmalnourished Children. J Pediatr Gastroenterol Nutr. 2018 Nov;67(5):586-593. **Abstract** Objective: Despite a substantial consistency in recommendations for the management of children with acute gastroenteritis (AGE), a high variability in clinical practice and a high rate of inappropriate medical interventions persist in both developing and developed countries.The aim of this study was to develop a set of clinical recommendations for the management of nonseverely malnourished children with AGE to be applied worldwide. Methods: The Federation of International Societies of Pediatric Gastroenterology, Hepatology, and Nutrition (FISPGHAN) Working Group (WG) selected care protocols on the management of acute diarrhea in infants and children aged between 1 month and 18 years. The WG used a 3-step approach consisting of: systematic review and comparison of published guidelines, agreement on draft recommendations using Delphi methodology, and external peer-review and validation of recommendations. Results: A core of recommendations including definition, diagnosis, nutritional management, and active treatment of AGE was developed with an overall agreement of 91% (range 80%-96%). A total of 28 world experts in pediatric gastroenterology and emergency medicine successively validated the set of 23 recommendations with an agreement of 87% (range 83%-95%). Recommendations on the use of antidiarrheal drugs and antiemetics received the lowest level of agreement and need to be tailored at local level. Oral rehydration and probiotics were the only treatments recommended. Conclusions: Universal recommendations to assist health care practitioners in managing children with AGE may improve practitioners' compliance with guidelines, reduce inappropriate interventions, and significantly impact clinical outcome and health care-associated costs. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29901556/
5.	Morgan R, Ayiasi RM, Barman D, Buzuzi S, Ssemugabo C, Ezumah N, George AS, Hawkins K, Hao X, King R, Liu T, Molyneux S, Muraya KW, Musoke D, Nyamhanga T, Ros B, Tani K, Theobald S, Vong S, Waldman L. Gendered health systems: evidence from low- and middle-income countries. Health Res Policy Syst. 2018 Jul 6;16(1):58. **Abstract** Background: Gender is often neglected in health systems, yet health systems are not gender neutral. Within health systems research, gender analysis seeks to understand how gender power relations create inequities in access to resources, the distribution of labour and roles, social norms and values, and decision-making. This paper synthesises findings

	from nine studies focusing on four health systems domains, namely human resources, service delivery, governance and financing. It provides examples of how a gendered and/or intersectional gender approach can be applied by researchers in a range of low- and middle-income settings (Cambodia, Zimbabwe, Uganda, India, China, Nigeria and Tanzania) to issues across the health system and demonstrates that these types of analysis can uncover new and novel ways of viewing seemingly intractable problems. Methods: The research used a combination of mixed, quantitative, qualitative and participatory methods, demonstrating the applicability of diverse research methods for gender and intersectional analysis. Within each study, the researchers adapted and applied a variety of gender and intersectional tools to assist with data collection and analysis, including different gender frameworks. Some researchers used participatory tools, such as photovoice and life histories, to prompt deeper and more personal reflections on gender norms from respondents, whereas others used conventional qualitative methods (in-depth interviews, focus group discussion). Findings from across the studies were reviewed and key themes were extracted and summarised. Results: Five core themes that cut across the different projects were identified and are reported in this paper as follows: the intersection of gender with other social stratifiers; the importance of male involvement; the influence of gendered social norms on health system structures and processes; reliance on (often female) unpaid carers within the health system; and the role of gender within policy and practice. These themes indicate the relevance of and need for gender analysis within health systems research. Conclusion: The implications of the diverse examples of gender and health systems research highlighted indicate that policy-makers, health practitioners and others interested in enhancing health system research and delivery have solid grounds to advance their enquiry and that one-size-fits-all heath interventions that ignore gender and intersectionality dimensions require caution. It is essential that we build upon these insights in our efforts and commitment to move towards greater equity both locally and globally. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29980230/
6.	Muriithi B, Bundi M, Galata A, Miringu G, Wandera E, Kathiiko C, Odoyo E, Kamemba M, Amukoye E, Huqa S, Shah M, Inoue S, Ichinose Y. Biosafety and biosecurity capacity building: insights from implementation of the NUITM-KEMRI biosafety training model. Trop Med Health. 2018 Aug 8;46:30. **Abstract** The NUITM-KEMRI biosafety training program was developed for capacity building of new biosafety level three (BSL-3) laboratory users. The training program comprehensively covers biosafety and biosecurity theory and practice. Its training curriculum is based on the WHO biosafety guidelines, local biosafety standards, and ongoing biosafety level three research activities in the facility, also taking into consideration the emerging public health issues. The program's training approach enhances the participant's biosafety and biosecurity knowledge and builds their skills

	through the hands-on practice sessions and mentorship training. Subsequently, the trainees are able to integrate acquired knowledge and good practices into their routine laboratory procedures. This article describes implementation of the NUITM-KEMRI biosafety training program. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30116141/
7.	Walson JL, Berkley JA. The impact of malnutrition on childhood infections. Curr Opin Infect Dis. 2018 Jun;31(3):231-236. **Abstract** Purpose of review: Almost half of all childhood deaths worldwide occur in children with malnutrition, predominantly in sub-Saharan Africa and South Asia. This review summarizes the mechanisms by which malnutrition and serious infections interact with each other and with children's environments. Recent findings: It has become clear that whilst malnutrition results in increased incidence, severity and case fatality of common infections, risks continue beyond acute episodes resulting in significant postdischarge mortality. A well established concept of a 'vicious-cycle' between nutrition and infection has now evolving to encompass dysbiosis and pathogen colonization as precursors to infection; enteric dysfunction constituting malabsorption, dysregulation of nutrients and metabolism, inflammation and bacterial translocation. All of these interact with a child's diet and environment. Published trials aiming to break this cycle using antimicrobial prophylaxis or water, sanitation and hygiene interventions have not demonstrated public health benefit so far. Summary: As further trials are planned, key gaps in knowledge can be filled by applying new tools to re-examine old questions relating to immune competence during and after infection events and changes in nutritional status; and how to characterize overt and subclinical infection, intestinal permeability to bacteria and the role of antimicrobial resistance using specific biomarkers. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29570495/
8.	Muriuki JM, Atkinson SH. How Eliminating Malaria May Also Prevent Iron Deficiency in African Children. Pharmaceuticals (Basel). 2018 Oct 1;11(4):96. **Abstract** Malaria and iron deficiency are common among children living in sub-Saharan Africa. Several studies have linked a child's iron status to their future risk of malaria infection; however, few have examined whether malaria might be a cause of iron deficiency. Approximately a quarter of African children at any one time are infected by malaria and malaria increases hepcidin and tumor necrosis factor-α concentrations leading to poor iron absorption and recycling. In support of a hypothetical link between malaria and iron deficiency, studies indicate that the prevalence of iron deficiency in children increases over a malaria season and decreases when malaria transmission is interrupted. The link between malaria and iron deficiency can be tested through the use of observational studies, randomized controlled trials and genetic epidemiology studies, each of which has

	its own strengths and limitations. Confirming the existence of a causal link between malaria infection and iron deficiency would readjust priorities for programs to prevent and treat iron deficiency and would demonstrate a further benefit of malaria control. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30275421/
9.	Amek NO, Van Eijk A, Lindblade KA, Hamel M, Bayoh N, Gimnig J, Laserson KF, Slutsker L, Smith T, Vounatsou P. Infant and child mortality in relation to malaria transmission in KEMRI/CDC HDSS, Western Kenya: validation of verbal autopsy. Malar J. 2018 Jan 18;17(1):37. **Abstract** Background: Malaria transmission reduction is a goal of many malaria control programmes. Little is known of how much mortality can be reduced by specific reductions in transmission. Verbal autopsy (VA) is widely used for estimating malaria specific mortality rates, but does not reliably distinguish malaria from other febrile illnesses. Overall malaria attributable mortality includes both direct and indirect deaths. It is unclear what proportion of the deaths averted by reducing malaria transmission are classified as malaria in VA. Methods: Both all-cause, and cause-specific mortality reported by VA for children under 5 years of age, were assembled from the KEMRI/CDC health and demographic surveillance system in Siaya county, rural Western Kenya for the years 2002-2004. These were linked to household-specific estimates of the Plasmodium falciparum entomological inoculation rate (EIR) based on high resolution spatio-temporal geostatistical modelling of entomological data. All-cause and malaria specific mortality (by VA), were analysed in relation to EIR, insecticide-treated net use (ITN), socioeconomic status (SES) and parameters describing space-time correlation. Time at risk for each child was analysed using Bayesian geostatistical Cox proportional hazard models, with time-dependent covariates. The outputs were used to estimate the diagnostic performance of VA in measuring mortality that can be attributed to malaria exposure. Results: The overall under-five mortality rate was 80 per 1000 person-years during the study period. Eighty-one percent of the total deaths were assigned causes of death by VA, with malaria assigned as the main cause of death except in the neonatal period. Although no trend was observed in malaria-specific mortality assessed by VA, ITN use was associated with reduced all-cause mortality in infants (hazard ratio 0.15, 95% CI 0.02, 0.63) and the EIR was strongly associated with both all-cause and malaria-specific mortality. 48.2% of the deaths could be attributed to malaria by analysing the exposure-response relationship, though only 20.5% of VAs assigned malaria as the cause and the sensitivity of VAs was estimated to be only 26%. Although VAs assigned some deaths to malaria even in areas where there was estimated to be no exposure, the specificity of the VAs was estimated to be 85%. Conclusion: Interventions that reduce P. falciparum transmission intensity will not only significantly reduce malaria-diagnosed mortality, but also mortality assigned to other

	causes in under-5 year old children in endemic areas. In this setting, the VA tool based on clinician review substantially underestimates the number of deaths that could be averted by reducing malaria exposure in childhood, but has a reasonably high specificity. This suggests that malaria transmission-reducing interventions such as ITNs can potentially reduce overall child mortality by as much as twice the total direct malaria burden estimated from VAs. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29347942/
10.	Muiva-Mutisya LM, Atilaw Y, Heydenreich M, Koch A, Akala HM, Cheruiyot AC, Brown ML, Irungu B, Okalebo FA, Derese S, Mutai C, Yenesew A. Antiplasmodial prenylated flavanonols from Tephrosia subtriflora. Nat Prod Res. 2018 Jun;32(12):1407-1414. **Abstract** The CH2Cl2/MeOH (1:1) extract of the aerial parts of Tephrosia subtriflora afforded a new flavanonol, named subtriflavanonol (1), along with the known flavanone spinoflavanone B, and the known flavanonols MS-II (2) and mundulinol. The structures were elucidated by the use of NMR spectroscopy and mass spectrometry. The absolute configuration of the flavanonols was determined based on quantum chemical ECD calculations. In the antiplasmodial assay, compound 2 showed the highest activity against chloroquine-sensitive Plasmodium falciparum reference clones (D6 and 3D7), artemisinin-sensitive isolate (F32-TEM) as well as field isolate (KSM 009) with IC50 values 1.4-4.6 μM without significant cytotoxicity against Vero and HEp2 cell lines (IC50 > 100 μM). The new compound (1) showed weak antiplasmodial activity, IC50 12.5-24.2 μM, but also showed selective anticancer activity against HEp2 cell line (CC50 16.9 μM). **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/28714338/
11.	Kazungu JS, Barasa EW, Obadha M, Chuma J. What characteristics of provider payment mechanisms influence health care providers' behaviour? A literature review. Int J Health Plann Manage. 2018 Oct;33(4):e892-e905. **Abstract** Background: Provider payment mechanisms (PPMs) create incentives or signals that influence the behaviour of health care providers. Understanding the characteristics of PPMs that influence health care providers' behaviour is essential for aligning PPM reforms for improving access, quality, and efficiency of health care services. We reviewed empirical literature that examined the characteristics of PPMs that influence the behaviour of health care providers. Methods: We systematically searched for empirical literature in PubMed, Web of Science, and Google Scholar databases and complemented these with physical searching of the references of selected papers for further relevant studies. A total of 16 studies that met our inclusion and exclusion criteria were identified. We analysed data using thematic review.

	Results: We identified seven major characteristics of PPMs that influence health care providers' behaviour. Of these characteristics, payment rate, the sufficiency of payment rate to cover the cost of services, timeliness of payment, payment schedule, performance requirements, and accountability mechanisms were the most important. Conclusions: Our review found that health care providers' behaviour is influenced by the characteristics of PPMs. Provider payment mechanism reforms that optimally structure these characteristics can elicit required incentives for access, equity, quality, and efficiency in service delivery among health care providers towards achieving universal health coverage. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29984422/
12.	Murphy GAV, Omondi GB, Gathara D, Abuya N, Mwachiro J, Kuria R, Tallam-Kimaiyo E, English M. Expectations for nursing care in newborn units in Kenya: moving from implicit to explicit standards. BMJ Glob Health. 2018 Mar 21;3(2):e000645. **Abstract** Neonatal mortality currently accounts for 45% of all child mortality in Kenya, standing at 22 per 1000 live births. Access to basic but high quality inpatient neonatal services for small and sick newborns will be key in reducing neonatal mortality. Neonatal inpatient care is reliant on nursing care, yet explicit nursing standards for such care do not currently exist in Kenya. We reviewed the Nursing Council of Kenya 'Manual of Clinical Procedures' to identify tasks relevant for the care of inpatient neonates. An expert advisory group comprising major stakeholders, policy-makers, trainers, and frontline health-workers was invited to a workshop with the purpose of defining tasks for which nurses are responsible and the minimum standard with which these tasks should be delivered to inpatient neonates in Kenyan hospitals. Despite differences in opinions at the beginning of the process, consensus was reached on the minimum standards of neonatal nursing. The key outcome was a comprehensive list and grouping of neonatal nursing task and the minimum frequency with which these tasks should be performed. Second, a simple categorisation of neonatal patients based on care needs was agreed. In addition, acceptable forms of task sharing with other cadres and the patient's family for the neonatal nursing tasks were agreed and described. The process was found to be acceptable to policy-makers and practitioners, who recognised the value of standards in neonatal nursing to improve the quality of neonatal inpatient care. Such standards could form the basis for audit and quality evaluation. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29616146/
13.	Bitta MA, Bakolis I, Kariuki SM, Nyutu G, Mochama G, Thornicroft G, Newton CRJC. Suicide in a rural area of coastal Kenya. BMC Psychiatry. 2018 Aug 29;18(1):267. **Abstract** Background: Suicide accounts for approximately 1.4% of deaths globally and is the 15th leading cause of death overall. There are no reliable data on the epidemiology of completed suicide in rural areas of many developing countries, yet suicide is an indicator of the sustainable development goals on health.

	Methods: Using data collected between 2008 and 2016 from the Kilifi Health and Demographic Surveillance System in rural Kenya, we retrospectively determined the incidence rate and risk factors for completed suicide. Results: During the period, 104 people died by suicide, contributing to 0.78% (95% CI = 0.74-1.10) of all deaths. The mean annual incidence rate of suicide was 4.61 (95% CI = 3.80-5.58) per 100,000 person years of observation (pyo). The annual incidence rate for men was higher than that of women (IRR = 3.05, 95% CI = 1.98-4.70, p < 0.001) and it increased with age (IRR = 2.73, 95% CI = 2.30-3.24, p < 0.001). People aged > 64 years had the highest mean incidence rate of 18.58 (95% CI = 11.99-28.80) per 100,000 pyo. Completed suicide was associated with age, being male, and living in a house whose wall is made of scrap material, which is a proxy marker of extreme poverty in this region (OR = 5.5, 95% CI = 4.0-7.0, p = 0.02). Most cases (76%) completed suicide by hanging themselves. Spatial heterogeneity of rates of suicides was observed across the enumeration zones of the KHDSS. Conclusions: Suicide is common in this area, but the incidence of completed suicide in rural Kenya may be an underestimate of the true burden. Like in other studies, suicide was associated with older age, being male and poverty, but other medical and neuropsychiatric risk factors should be investigated in future studies. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30157796/
14.	Barasa E, Mbau R, Gilson L. What Is Resilience and How Can It Be Nurtured? A Systematic Review of Empirical Literature on Organizational Resilience. Int J Health Policy Manag. 2018 Jun 1;7(6):491-503. **Abstract** Background: Recent health system shocks such as the Ebola outbreak of 2014-2016 and the global financial crisis of 2008 have generated global health interest in the concept of resilience. The concept is however not new, and has been applied to other sectors for a longer period of time. We conducted a review of empirical literature from both the health and other sectors to synthesize evidence on organizational resilience. Methods: We systematically searched for literature in PubMed, Econlit, EBSCOHOST databases, google, and Google Scholar and manually searched the reference lists of selected papers. We identified 34 papers that met our inclusion criteria. We analysed data from the selected papers by thematic review. Results: Resilience was generally taken to mean a system's ability to continue to meet its objectives in the face of challenges. The concepts of resilience that were used in the selected papers emphasized not just a system's capacity to withstand shocks, but also to adapt and transform. The resilience of organizations was influenced by the following factors: Material resources, preparedness and planning, information management, collateral pathways and redundancy, governance processes, leadership practices, organizational culture, human capital, social networks and collaboration. Conclusion: A common theme across the selected papers is the recognition of resilience as an emergent property of complex adaptive systems. Resilience is both a function of

	planning for and preparing for future crisis (planned resilience), and adapting to chronic stresses and acute shocks (adaptive resilience). Beyond resilience to acute shocks, the resilience of health systems to routine and chronic stress (everyday resilience) is also key. Health system software is as, if not more important, as its hardware in nurturing health system resilience. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29935126/
15.	Ssewanyana D, Mwangala PN, van Baar A, Newton CR, Abubakar A. Health Risk Behaviour among Adolescents Living with HIV in Sub-Saharan Africa: A Systematic Review and Meta-Analysis. Biomed Res Int. 2018 Jan 28;2018:7375831. **Abstract** The burden of health risk behaviour (HRB) among adolescents living with HIV (ALWHIV) in sub-Saharan Africa (SSA) is currently unknown. A systematic search for publications on HRB among ALWHIV in SSA was conducted in PubMed, Embase, PsycINFO, and Applied Social Sciences Index and Abstracts databases. Results were summarized following PRISMA guidelines for systematic reviews and meta-analyses. Heterogeneity was assessed by the DerSimonian and Laird method and the pooled estimates were computed. Prevalence of current condom nonuse behaviour was at 59.8% (95% CI: 47.9-71.3%), risky sexual partnerships at 32.9% (95% CI: 15.4-53.2%), transactional sex at 20.1% (95% CI: 9.2-33.8%), and the experience of sexual violence at 21.4% (95% CI: 16.3-27.0%) among ALWHIV. From this meta-analysis, we did not find statistically significant differences in pooled estimates of HRB prevalence between ALWHIV and HIV uninfected adolescents. However, there was mixed evidence on the occurrence of alcohol and drug use behaviour. Overall, we found that research on HRB among ALWHIV tends to focus on behaviour specific to sexual risk. With such a high burden of HRB for the individuals as well as society, these findings highlight an unmet need for age-appropriate interventions to address the behavioural needs of these adolescents. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29789804/
16.	Williams PCM, Isaacs D, Berkley JA. Antimicrobial resistance among children in sub-Saharan Africa. Lancet Infect Dis. 2018 Feb;18(2):e33-e44. **Abstract** Antimicrobial resistance is an important threat to international health. Therapeutic guidelines for empirical treatment of common life-threatening infections depend on available information regarding microbial aetiology and antimicrobial susceptibility, but sub-Saharan Africa lacks diagnostic capacity and antimicrobial resistance surveillance. We systematically reviewed studies of antimicrobial resistance among children in sub-Saharan Africa since 2005. 18 of 1075 articles reviewed met inclusion criteria, providing data from 67 451 invasive bacterial isolates from inconsistently defined populations in predominantly urban tertiary settings. Among neonates, Gram-negative organisms were the predominant cause of early-onset neonatal sepsis, with a high prevalence of extended-spectrum β-lactamase-producing organisms. Gram-positive bacteria were

	responsible for a high proportion of infections among children beyond the neon atal period, with high reported prevalence of non-susceptibility to treatment advocated by the WHO therapeutic guidelines. There are few up-to-date or representative studies given the magnitude of the problem of antimicrobial resistance, especially regarding community-acquired infections. Research should focus on differentiating resistance in community-acquired versus hospital-acquired infections, implementation of standardised reporting systems, and pragmatic clinical trials to assess the efficacy of alternative treatment regimens. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29033034/
17.	Adetifa IMO, Adamu AL, Karani A, Waithaka M, Odeyemi KA, Okoromah CAN, Bello MM, Abubakar IS, Inem V, Scott JAG. Nasopharyngeal Pneumococcal Carriage in Nigeria: a two-site, population-based survey. Sci Rep. 2018 Feb 22;8(1):3509. **Abstract** Changes in nasopharyngeal (NP) carriage of vaccine-type (VT) Streptococcus pneumoniae can be used to assess the effectiveness of a pneumococcal conjugate vaccine (PCV10). We conducted a baseline carriage survey in rural (Kumbotso, Kano) and urban (Pakoto, Ogun) Nigeria. In this cross-sectional study, we obtained data on demography, clinical history, risk factors, and took NP swabs for pneumococcal culture. We calculated crude and age-standardised carriage prevalence and used log-binomial regression to assess risk factors for carriage. Among children aged <5 years, 92% (95% CI: 88-95%) and 78% (73-82%), respectively, carried any pneumococcus and 48% and 50%, respectively, carried PCV10 serotypes. In Kumbotso, carriage prevalence was >40% across all ages. The age-standardized prevalence of pneumococcal carriage was 66% in Kumbotso and 40% in Pakoto. The most commonly identified serotypes were 19 F, 6 A and 23 F. Risk factors for carriage were young age, recent rhinorrhoea, cohabitation with ≥2 children aged <5 years, and sharing a bed with ≥2 persons. Pneumococcal carriage prevalence is high in this Nigerian population. Persisting prevalence of VT-carriage in older children and adults suggests that PCV10 introduction in children will not eliminate transmission of vaccine serotypes rapidly. High vaccine coverage will therefore be required to ensure full protection of children. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29472635/
18.	Ssewanyana D, Bitanihirwe B. Problem Gambling among Young People in Sub-Saharan Africa. Front Public Health. 2018 Feb 9;6:23. **Abstract** Gambling is a cross-cultural and global activity which typically involves the wagering of money or an item of monetary value on an outcome that is governed by chance. Although gambling is positioned as a legitimate recreational and leisure activity within sub-Saharan Africa (SSA), there is widespread recognition among healthcare professionals and policy-makers that gambling has the capacity to become dysfunctional in a minority. Emerging knowledge suggests that problem gambling is rapidly evolving in to a public health concern in SSA, especially among youth. This article focuses on problem

	gambling among young people in SSA with an emphasis on three key themes: (1) gambling behavior and patterns in SSA; (2) public health and socioeconomic implications of gambling in SSA; and (3) public health policies and interventions for addressing this issue. We believe that collaborative efforts between government, prevention specialists, legislators, researchers, treatment providers, and other stake holders can influence the uptake of research findings necessary to implement social policies and design effective public health intervention options to combat problem gambling and its associated implications among young people in SSA. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29479527/
19.	Macharia AW, Mochamah G, Uyoga S, Ndila CM, Nyutu G, Makale J, Tendwa M, Nyatichi E, Ojal J, Shebe M, Awuondo KO, Mturi N, Peshu N, Tsofa B, Scott JAG, Maitland K, Williams TN. The clinical epidemiology of sickle cell anemia In Africa. Am J Hematol. 2018 Mar;93(3):363-370. **Abstract** Sickle cell anemia (SCA) is the commonest severe monogenic disorders of humans. The disease has been highly characterized in high-income countries but not in sub-Saharan Africa where SCA is most prevalent. We conducted a retrospective cohort study of all children 0-13 years admitted from within a defined study area to Kilifi County Hospital in Kenya over a five-year period. Children were genotyped for SCA retrospectively and incidence rates calculated with reference to population data. Overall, 576 of 18,873 (3.1%) admissions had SCA of whom the majority (399; 69.3%) were previously undiagnosed. The incidence of all-cause hospital admission was 57.2/100 person years of observation (PYO; 95%CI 52.6-62.1) in children with SCA and 3.7/100 PYO (95%CI 3.7-3.8) in those without SCA (IRR 15.3; 95%CI 14.1-16.6). Rates were higher for the majority of syndromic diagnoses at all ages beyond the neonatal period, being especially high for severe anemia (hemoglobin <50 g/L; IRR 58.8; 95%CI 50.3-68.7), stroke (IRR 486; 95%CI 68.4-3,450), bacteremia (IRR 23.4; 95%CI 17.4-31.4), and for bone (IRR 607; 95%CI 284-1,300), and joint (IRR 80.9; 95%CI 18.1-362) infections. The use of an algorithm based on just five clinical features would have identified approximately half of all SCA cases among hospital-admitted children with a number needed to test to identify each affected patient of only fourteen. Our study illustrates the clinical epidemiology of SCA in a malaria-endemic environment without specific interventions. The targeted testing of hospital-admitted children using the Kilifi Algorithm provides a pragmatic approach to early diagnosis in high-prevalence countries where newborn screening is unavailable. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29168218/
20.	Standing JF, Ongas MO, Ogwang C, Kagwanja N, Murunga S, Mwaringa S, Ali R, Mturi N, Timbwa M, Manyasi C, Mwalekwa L, Bandika VL, Ogutu B, Waichungo J, Kipper K, Berkley JA; FLACSAM-PK Study Group. Dosing of Ceftriaxone and Metronidazole for Children With Severe Acute Malnutrition. Clin Pharmacol Ther. 2018 Dec;104(6):1165-1174.

	Abstract Infants and young children with severe acute malnutrition (SAM) are treated with empiric broad-spectrum antimicrobials. Parenteral ceftriaxone is currently a second-line agent for invasive infection. Oral metronidazole principally targets small intestinal bacterial overgrowth. Children with SAM may have altered drug absorption, distribution, metabolism, and elimination. Population pharmacokinetics of ceftriaxone and metronidazole were studied, with the aim of recommending optimal dosing. Eighty-one patients with SAM (aged 2-45 months) provided 234 postdose pharmacokinetic samples for total ceftriaxone, metronidazole, and hydroxymetronidazole. Ceftriaxone protein binding was also measured in 190 of these samples. A three-compartment model adequately described free ceftriaxone, with a Michaelis-Menten model for concentration and albumin-dependent protein binding. A one-compartment model was used for both metronidazole and hydroxymetronidazole, with only 1% of hydroxymetronidazole predicted to be formed during first-pass. Simulations showed 80 mg/kg once daily of ceftriaxone and 12.5 mg/kg twice daily of metronidazole were sufficient to reach therapeutic targets. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29574688/
21.	Magai DN, Malik JA, Koot HM. Emotional and Behavioral Problems in Children and Adolescents in Central Kenya. Child Psychiatry Hum Dev. 2018 Aug;49(4):659-671. **Abstract** Emotional and behavioral problems (EBP) during childhood and adolescence are a common concern for parents and mental health stakeholders. However, little has been documented about their prevalence in Kenyan children and adolescents. This study aimed to close this gap. The study included Child Behavior Checklist reports from 1022 Kenyan parents on their children (ages 6-18 years) and Youth Self-Reports from 533 adolescents (ages 12-18) living in Kenya's Central Province. EBP in Kenya are highly prevalent compared to multi-cultural standards for parent reports, with 27 and 17% scoring in the borderline and clinical range, respectively. Based on parent reports, younger children scored higher on EBP than older children, and higher on internalizing problems. Based on self-reports girls scored higher than boys, particularly on internalizing problems. The study provides evidence on elevated parent-reported EBP in Kenyan youths. Mental health providers should focus on interventions that reduce EBP in Kenyan youths. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29387998/
22.	Onchieku NM, Mogire R, Ndung'u L, Mwitari P, Kimani F, Matoke-Muhia D, Kiboi D, Magoma G. Deciphering the targets of retroviral protease inhibitors in Plasmodium berghei. PLoS One. 2018 Aug 1;13(8):e0201556. **Abstract** Retroviral protease inhibitors (RPIs) such as lopinavir (LP) and saquinavir (SQ) are active against Plasmodium parasites. However, the exact molecular target(s) for these RPIs in the Plasmodium parasites remains poorly understood. We hypothesised that LP

	and SQ suppress parasite growth through inhibition of aspartyl proteases. Using reverse genetics approach, we embarked on separately generating knockout (KO) parasite lines lacking Plasmepsin 4 (PM4), PM7, PM8, or DNA damage-inducible protein 1 (Ddi1) in the rodent malaria parasite Plasmodium berghei ANKA. We then tested the suppressive profiles of the LP/Ritonavir (LP/RT) and SQ/RT as well as antimalarials; Amodiaquine (AQ) and Piperaquine (PQ) against the KO parasites in the standard 4-day suppressive test. The Ddi1 gene proved refractory to deletion suggesting that the gene is essential for the growth of the asexual blood stage parasites. Our results revealed that deletion of PM4 significantly reduces normal parasite growth rate phenotype (P = 0.003). Unlike PM4_KO parasites which were less susceptible to LP and SQ (P = 0.036, P = 0.030), the suppressive profiles for PM7_KO and PM8_KO parasites were comparable to those for the WT parasites. This finding suggests a potential role of PM4 in the LP and SQ action. On further analysis, modelling and molecular docking studies revealed that both LP and SQ displayed high binding affinities (-6.3 kcal/mol to -10.3 kcal/mol) towards the Plasmodium aspartyl proteases. We concluded that PM4 plays a vital role in assuring asexual stage parasite fitness and might be mediating LP and SQ action. The essential nature of the Ddi1 gene warrants further studies to evaluate its role in the parasite asexual blood stage growth as well as a possible target for the RPIs. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30067811/
23.	Stringer EM, Kendall MA, Lockman S, Campbell TB, Nielsen-Saines K, Sawe F, Cu-Uvin S, Wu X, Currier JS. Pregnancy outcomes among HIV-infected women who conceived on antiretroviral therapy. PLoS One. 2018 Jul 18;13(7):e0199555. **Abstract** As antiretroviral therapy (ART) expands in resource-limited settings, understanding the impact of ART on pregnancy outcomes is critical. We analyzed women who became pregnant on ART while enrolled in a clinical trial (HPTN 052, ACTG A5208, and ACTG A5175); the majority of women were from Africa, with a median age of 29 years. Eligible women were on ART at conception and had a documented date of a last menstrual period and a pregnancy outcome. The primary outcome was non-live birth (stillbirth; spontaneous abortion; elective termination; or ectopic pregnancy) versus live birth. Preterm birth (<37 weeks completed gestation) was a secondary outcome. We used Cox proportional hazards regression models with time-varying covariates. 359 women became pregnant, of whom 253 (70%) met inclusion criteria: 127 (50%) were on NNRTI-based ART, 118 (47%) on PI-based ART, and 8 (3%) on 3-NRTIs at conception. There were 160 (63%) live births (76 term and 84 preterm), 11 (4%) stillbirths, 51 (20%) spontaneous abortions, 28 (11%) elective terminations, and 3 (1%) ectopic pregnancies. In multivariable analysis adjusted for region, parent study, and pre-pregnancy ART class, only older age was associated with increased hazard of preterm birth [HR: 2.49 for age 25-30 years; 95% CI: 1.18-5.26; p = 0.017]. Women conceiving on ART had high rates of preterm birth and other adverse pregnancy outcomes. Despite the benefits of ART,

	studies designed to investigate the effects of preconception ART on pregnancy outcomes are needed. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/30020964/
24.	Mackintosh M, Tibandebage P, Karimi Njeru M, Kariuki Kungu J, Israel C, Mujinja PGM. Rethinking health sector procurement as developmental linkages in East Africa. Soc Sci Med. 2018 Mar;200:182-189. **Abstract** Health care forms a large economic sector in all countries, and procurement of medicines and other essential commodities necessarily creates economic linkages between a country's health sector and local and international industrial development. These procurement processes may be positive or negative in their effects on populations' access to appropriate treatment and on local industrial development, yet procurement in low and middle income countries (LMICs) remains under-studied: generally analysed, when addressed at all, as a public sector technical and organisational challenge rather than a social and economic element of health system governance shaping its links to the wider economy. This article uses fieldwork in Tanzania and Kenya in 2012-15 to analyse procurement of essential medicines and supplies as a governance process for the health system and its industrial links, drawing on aspects of global value chain theory. We describe procurement work processes as experienced by front line staff in public, faith-based and private sectors, linking these experiences to wholesale funding sources and purchasing practices, and examining their implications for medicines access and for local industrial development within these East African countries. We show that in a context of poor access to reliable medicines, extensive reliance on private medicines purchase, and increasing globalisation of procurement systems, domestic linkages between health and industrial sectors have been weakened, especially in Tanzania. We argue in consequence for a more developmental perspective on health sector procurement design, including closer policy attention to strengthening vertical and horizontal relational working within local health-industry value chains, in the interests of both wider access to treatment and improved industrial development in Africa. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29421465/
25.	Means AR, van Lieshout L, Brienen E, Yuhas K, Hughes JP, Ndungu P, Singa B, Walson JL. Combined effectiveness of anthelmintic chemotherapy and WASH among HIV-infected adults. PLoS Negl Trop Dis. 2018 Jan 18;12(1):e0005955. **Abstract** Introduction: Current global helminth control guidelines focus on regular deworming of targeted populations for morbidity control. However, water, sanitation, and hygiene (WASH) interventions may also be important for reducing helminth transmission. We evaluated the impact of different potential helminth protective packages on infection prevalence, including repeated treatment with albendazole and praziquantel with and without WASH access.

	Methodology/principal findings: We conducted a cohort study nested within a randomized trial of empiric deworming of HIV-infected adults in Kenya. Helminth infections and infection intensity were diagnosed using semi-quantitative real-time PCR. We conducted a manual forward stepwise model building approach to identify if there are packages of interventions that may be protective against an STH infection of any species (combined outcome) and each helminth species individually. We conducted secondary analyses using the same approach only amongst individuals with no anthelmintis exposure. We used interaction terms to test for potential intervention synergy. Approximately 22% of the 701 stool samples provided were helminth-infected, most of which were of low to moderate intensity. The odds of infection with any STH species were lower for individuals who were treated with albendazole (aOR:0.11, 95%CI: 0.05, 0.20, p<0.001), adjusting for age and sex. Although most WASH conditions demonstrated minimal additional benefit in reducing the probability of infection with any STH species, access to safe flooring did appear to offer some additional protection (aOR:0.34, 95%CI: 0.20, 0.56, p<0.001). For schistosomiasis, only treatment with praziquantel was protective (aOR:0.30 95%CI: 0.14, 0.60, p = 0.001). Amongst individuals who were not treated with albendazole or praziquantel, the most protective intervention package to reduce probability of STH infections included safe flooring (aOR:0.34, 95%CI: 0.20, 0.59, p<0.001) and latrine access (aOR:0.59, 95%CI: 0.35, 0.99, p = 0.05). Across all species, there was no evidence of synergy or antagonism between anthelmintic chemotherapy with albendazole or praziquantel and WASH resources. Conclusions/significance: Deworming is effective in reducing the probability of helminth infections amongst HIV-infected adults. With the exception of safe flooring, WASH offers minimal additional benefit. However, WASH does appear to significantly reduce infection prevalence in adults who are not treated with chemotherapy. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29346385/
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	individual amino acid positions that may contribute to strain-specific immunity. Our results demonstrate that natural host defenses to P. falciparum act in an allele-specific manner to block specific parasite haplotypes from establishing blood-stage infections. This selection partially explains the extreme amino acid diversity of many parasite antigens and suggests that vaccines targeting such proteins should account for allele-specific immunity. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29643376/
27.	Smith AM, Niemeyer KE, Katz DS, Barba LA, Githinji G, Gymrek M, Huff KD,Madan CR, Mayes AC, Moerman KM, Prins P, Ram K, Rokem A, Teal TK, Guimera RV, Vanderplas JT. Journal of Open Source Software (JOSS): design and first-year review. PeerJ Prepr. 2018;4:e147. **Abstract** This article describes the motivation, design, and progress of the Journal of Open Source Software (JOSS). JOSS is a free and open-access journal that publishes articles describing research software. It has the dual goals of improving the quality of the software submitted and providing a mechanism for research software developers to receive credit. While designed to work within the current merit system of science, JOSS addresses the dearth of rewards for key contributions to science made in the form of software. JOSS publishes articles that encapsulate scholarship contained in the software itself, and its rigorous peer review targets the software components: functionality, documentation, tests, continuous integration, and the license. A JOSS article contains an abstract describing the purpose and functionality of the software, references, and a link to the software archive. The article is the entry point of a JOSS submission, which encompasses the full set of software artifacts. Submission and review proceed in the open, on GitHub. Editors, reviewers, and authors work collaboratively and openly. Unlike other journals, JOSS does not reject articles requiring major revision; while not yet accepted, articles remain visible and under review until the authors make adequate changes (or withdraw, if unable to meet requirements). Once an article is accepted, JOSS gives it a digital object identifier (DOI), deposits its metadata in Crossref, and the article can begin collecting citations on indexers like Google Scholar and other services. Authors retain copyright of their JOSS article, releasing it under a Creative Commons Attribution 4.0 International License. In its first year, starting in May 2016, JOSS published 111 articles, with more than 40 additional articles under review. JOSS is a sponsored project of the nonprofit organization NumFOCUS and is an affiliate of the Open Source Initiative (OSI). **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/32704456/
28.	Esterhuizen AI, Carvill GL, Ramesar RS, Kariuki SM, Newton CR, Poduri A, Wilmshurst JM. Clinical Application of Epilepsy Genetics in Africa: Is Now the Time? Front Neurol. 2018 May 2;9:276. **Abstract**

	Over 80% of people with epilepsy live in low- to middle-income countries where epilepsy is often undiagnosed and untreated due to limited resources and poor infrastructure. In Africa, the burden of epilepsy is exacerbated by increased risk factors such as central nervous system infections, perinatal insults, and traumatic brain injury. Despite the high incidence of these etiologies, the cause of epilepsy in over 60% of African children is unknown, suggesting a possible genetic origin. Large-scale genetic and genomic research in Europe and North America has revealed new genes and variants underlying disease in a range of epilepsy phenotypes. The relevance of this knowledge to patient care is especially evident among infants with early-onset epilepsies, where early genetic testing can confirm the diagnosis and direct treatment, potentially improving prognosis and quality of life. In Africa, however, genetic epilepsies are among the most under-investigated neurological disorders, and little knowledge currently exists on the genetics of epilepsy among African patients. The increased diversity on the continent may yield unique, important epilepsy-associated genotypes, currently absent from the North American or European diagnostic testing protocols. In this review, we propose that there is strong justification for developing the capacity to offer genetic testing for children with epilepsy in Africa, informed mostly by the existing counseling and interventional needs. Initial simple protocols involving well-recognized epilepsy genes will not only help patients but will give rise to further clinically relevant research, thus increasing knowledge and capacity. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29770117/
29.	Gilchrist JJ, Rautanen A, Fairfax BP, Mills TC, Naranbhai V, Trochet H, Pirinen M, Muthumbi E, Mwarumba S, Njuguna P, Mturi N, Msefula CL, Gondwe EN, MacLennan JM, Chapman SJ, Molyneux ME, Knight JC, Spencer CCA, Williams TN, MacLennan CA, Scott JAG, Hill AVS. Risk of nontyphoidal Salmonella bacteraemia in African children is modified by STAT4. Nat Commun. 2018 Mar 9;9(1):1014. **Abstract** Nontyphoidal Salmonella (NTS) is a major cause of bacteraemia in Africa. The disease typically affects HIV-infected individuals and young children, causing substantial morbidity and mortality. Here we present a genome-wide association study (180 cases, 2677 controls) and replication analysis of NTS bacteraemia in Kenyan and Malawian children. We identify a locus in STAT4,rs13390936, associated with NTS bacteraemia. rs13390936 is a context-specific expression quantitative trait locus for STAT4 RNA expression, and individuals carrying the NTS-risk genotype demonstrate decreased interferon-γ (IFNγ) production in stimulated natural killer cells, and decreased circulating IFNγ concentrations during acute NTS bacteraemia. The NTS-risk allele at rs13390936 is associated with protection against a range of autoimmune diseases. These data implicate interleukin-12-dependent IFNγ-mediated immunity as a determinant of invasive NTS disease in African children, and highlight the shared genetic architecture of infectious and autoimmune disease. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29523850/

30.	Das D, Grais RF, Okiro EA, Stepniewska K, Mansoor R, van der Kam S, Terlouw DJ, Tarning J, Barnes KI, Guerin PJ. Complex interactions between malaria and malnutrition: a systematic literature review. BMC Med. 2018 Oct 29;16(1):186. **Abstract** Background: Despite substantial improvement in the control of malaria and decreased prevalence of malnutrition over the past two decades, both conditions remain heavy burdens that cause hundreds of thousands of deaths in children in resource-poor countries every year. Better understanding of the complex interactions between malaria and malnutrition is crucial for optimally targeting interventions where both conditions co-exist. This systematic review aimed to assess the evidence of the interplay between malaria and malnutrition. Methods: Database searches were conducted in PubMed, Global Health and Cochrane Libraries and articles published in English, French or Spanish between Jan 1980 and Feb 2018 were accessed and screened. The methodological quality of the included studies was assessed using the Newcastle-Ottawa Scale and the risk of bias across studies was assessed using the GRADE approach. The preferred reporting items for systematic reviews and meta-analyses (PRISMA) guideline were followed. Results: Of 2945 articles screened from databases, a total of 33 articles were identified looking at the association between malnutrition and risk of malaria and/or the impact of malnutrition in antimalarial treatment efficacy. Large methodological heterogeneity of studies precluded conducting meaningful aggregated data meta-analysis. Divergent results were reported on the effect of malnutrition on malaria risk. While no consistent association between risk of malaria and acute malnutrition was found, chronic malnutrition was relatively consistently associated with severity of malaria such as high-density parasitemia and anaemia. Furthermore, there is little information on the effect of malnutrition on therapeutic responses to artemisinin combination therapies (ACTs) and their pharmacokinetic properties in malnourished children in published literature. Conclusions: The evidence on the effect of malnutrition on malaria risk remains inconclusive. Further analyses using individual patient data could provide an important opportunity to better understand the variability observed in publications by standardising both malaria and nutritional metrics. Our findings highlight the need to improve our understanding of the pharmacodynamics and pharmacokinetics of ACTs in malnourished children. Further clarification on malaria-malnutrition interactions would also serve as a basis for designing future trials and provide an opportunity to optimise antimalarial treatment for this large, vulnerable and neglected population. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30371344/
31.	Kiuru CW, Oyieke FA, Mukabana WR, Mwangangi J, Kamau L, Muhia-Matoke D. Status of insecticide resistance in malaria vectors in Kwale County, Coastal Kenya. Malar J. 2018 Jan 5;17(1):3. **Abstract**

	Background: The strategy for malaria vector control in the context of reducing malaria morbidity and mortality has been the scale-up of long-lasting insecticidal nets to universal coverage and indoor residual spraying. This has led to significant decline in malaria transmission. However, these vector control strategies rely on insecticides which are threatened by insecticide resistance. In this study the status of pyrethroid resistance in malaria vectors and it's implication in malaria transmission at the Kenyan Coast was investigated. Results: Using World Health Organization diagnostic bioassay, levels of phenotypic resistance to permethrin and deltamethrin was determined. Anopheles arabiensis showed high resistance to pyrethroids while Anopheles gambiae sensu stricto (s.s.) and Anopheles funestus showed low resistance and susceptibility, respectively. Anopheles gambiae sensu lato (s.l.) mosquitoes were further genotyped for L1014S and L1014F kdr mutation by real time PCR. An allele frequency of 1.33% for L1014S with no L1014F was detected. To evaluate the implication of pyrethroid resistance on malaria transmission, Plasmodium falciparum infection rates in field collected adult mosquitoes was determined using enzyme linked immunosorbent assay and further, the behaviour of the vectors was assessed by comparing indoor and outdoor proportions of mosquitoes collected. Sporozoite infection rate was observed at 4.94 and 2.60% in An. funestus s.l. and An. gambiae s.l., respectively. A higher density of malaria vectors was collected outdoor and this also corresponded with high Plasmodium infection rates outdoor. Conclusions: This study showed phenotypic resistance to pyrethroids and low frequency of L1014S kdr mutation in An. gambiae s.l. The occurrence of phenotypic resistance with low levels of kdr frequencies highlights the need to investigate other mechanisms of resistance. Despite being susceptible to pyrethroids An. funestus s.l. could be driving malaria infections in the area. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29304805/
32.	Malla L, Perera-Salazar R, McFadden E, Ogero M, Stepniewska K, English M. Handling missing data in propensity score estimation in comparative effectiveness evaluations: a systematic review. J Comp Eff Res. 2018 Mar;7(3):271-279. **Abstract** Aim: Even though systematic reviews have examined how aspects of propensity score methods are used, none has reviewed how the challenge of missing data is addressed with these methods. This review therefore describes how missing data are addressed with propensity score methods in observational comparative effectiveness studies. Methods: Published articles on observational comparative effectiveness studies were extracted from MEDLINE and EMBASE databases. Results: Our search yielded 167 eligible articles. Majority of these studies (114; 68%) conducted complete case analysis with only 53 of them stating this in the methods. Only 16 articles reported use of multiple imputation. Conclusion: Few researchers use correct methods for handling missing data or reported missing data methodology which may lead to reporting biased findings.

	Pubmed link- https://pubmed.ncbi.nlm.nih.gov/28980833/
33.	Maia MF, Tenywa FC, Nelson H, Kambagha A, Ashura A, Bakari I, Mruah D, Simba A, Bedford A. Attractive toxic sugar baits for controlling mosquitoes: a qualitative study in Bagamoyo, Tanzania. Malar J. 2018 Jan 10;17(1):22. **Abstract** Background: Malaria elimination is unlikely to be achieved without the implementation of new vector control interventions capable of complementing insecticide-treated nets and indoor residual spraying. Attractive-toxic sugar baits (ATSBs) are considered a new vector control paradigm. They are technologically appropriate as they are simple and affordable to produce. ATSBs kill both female and male mosquitoes attracted to sugar feed on a sugary solution containing a mosquitocidal agent and may be used indoors or outdoors. This study explored the views and perceptions on ATSBs of community members from three Coastal Tanzanian communities. Methods: Three communities were chosen to represent coastal urban, peri-urban and rural areas. Sensitization meetings were held with a total of sixty community members where ATSBs were presented and explained their mode of action. At the end of the meeting, one ATSB was given to each participant for a period of 2 weeks, after which they were invited to participate in focus group discussions (FGDs) to provide feedback on their experience. Results: Over 50% of the participants preferred to use the bait indoors although they had been instructed to place it outdoors. Participants who used the ATSBs indoors reported fewer mosquitoes inside their homes, but were disappointed not to find the dead mosquitoes in the baits, altho ugh they had been informed that this was unlikely to happen. Most participants disliked the appearance of the bait and some thought it to be reminiscent of witchcraft. Neighbours that did not participate in the FGDs or sensitizations were sceptical of the baits. Conclusions: This study delivers insight on how communities in Coastal Tanzania are likely to perceive ATSBs and provides important information for future trials investigating the efficacy of ATSBs against malaria. This new vector control tool will require sensitization at community level regarding its mode of action in order to increase the acceptance and confidence in ATSBs for mosquito control given that most people are not familiar with the new paradigm. A few recommendations for product development and delivery are discussed. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29321011/
34.	Williams PCM, Berkley JA. Guidelines for the management of paediatric cholera infection: a systematic review of the evidence. Paediatr Int Child Health. 2018 Nov;38(sup1):S16-S31. **Abstract** Background Vibrio cholerae is a highly motile Gram-negative bacterium which is responsible for 3 million cases of diarrhoeal illness and up to 100,000 deaths per year,

	with an increasing burden documented over the past decade. Current WHO guidelines for the treatment of paediatric cholera infection (tetracycline 12.5 mg/kg four times daily for 3 days) are based on data which are over a decade old. In an era of increasing antimicrobial resistance, updated review of the appropriate empirical therapy for cholera infection in children (taking account of susceptibility patterns, cost and the risk of adverse events) is necessary. Methods A systematic review of the current published literature on the treatment of cholera infection in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) was undertaken. International clinical guidelines and studies pertaining to adverse effects associated with treatments available for cholera infection were also reviewed. Results The initial search produced 256 results, of which eight studies met the inclusion criteria. Quality assessment of the studies was performed as per the Grading of Recommendations Assessment, Development and Evaluation guidelines. Conclusions In view of the changing non-susceptibility rates worldwide, empirical therapy for cholera infection in paediatric patients should be changed to single-dose azithromycin (20 mg/kg), a safe and effective medication with ease of administration. Erythromycin (12.5 mg/kg four times daily for 3 days) exhibits similar bacteriological and clinical success and should be listed as a second-line therapy. Fluid resuscitation remains the cornerstone of management of paediatric cholera infection, and prevention of infection by promoting access to clean water and sanitation is paramount. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29790841/
35.	Zurovac D, Machini B, Kiptui R, Memusi D, Amboko B, Kigen S, Njiri P, Waqo E. Monitoring health systems readiness and inpatient malaria case-management at Kenyan county hospitals. Malar J. 2018 May 29;17(1):213. **Abstract** Background: Change of severe malaria treatment policy from quinine to artesunate, a major malaria control advance in Africa, is compromised by scarce data to monitor policy translation into practice. In Kenya, hospital surveys were implemented to monitor health systems readiness and inpatient malaria case-management. Methods: All 47 county referral hospitals were surveyed in February and October 2016. Data collection included hospital assessments, interviews with inpatient health workers and retrospective review of patients' admission files. Analysis included 185 and 182 health workers, and 1162 and 1224 patients admitted with suspected malaria, respectively, in all 47 hospitals. Cluster-adjusted comparisons of the performance indicators with exploratory stratifications were performed. Results: Malaria microscopy was universal during both surveys. Artesunate availability increased (63.8-85.1%), while retrospective stock-outs declined (46.8-19.2%). No significant changes were observed in the coverage of artesunate trained (42.2% vs 40.7%) and supervised health workers (8.7% vs 12.8%). The knowledge about treatment policy improved (73.5-85.7%; $p = 0.002$) while correct artesunate dosing knowledge increased for patients < 20 kg (42.7-64.6%; $p < 0.001$) and > 20 kg (70.3-80.8%; p =

	0.052). Most patients were tested on admission (88.6% vs 92.1%; p = 0.080) while repeated malaria testing was low (5.2% vs 8.1%; p = 0.034). Artesunate treatment for confirmed severe malaria patients significantly increased (69.9-78.7%; p = 0.030). No changes were observed in artemether-lumefantrine treatment for non-severe test positive patients (8.0% vs 8.8%; p = 0.796). Among test negative patients, increased adherence to test results was observed for non-severe (68.6-78.0%; p = 0.063) but not for severe patients (59.1-62.1%; p = 0.673). Overall quality of malaria case-management improved (48.6-56.3%; p = 0.004), both for children (54.1-61.5%; p = 0.019) and adults (43.0-51.0%; p = 0.041), and in both high (51.1-58.1%; p = 0.024) and low malaria risk areas (47.5-56.0%; p = 0.029). Conclusion: Most health systems and malaria case-management indicators improved during 2016. Gaps, often specific to different inpatient populations and risk areas, however remain and further programmatic interventions including close monitoring is needed to optimize policy translation. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29843717/
36.	Iwashita H, Higa Y, Futami K, Lutiali PA, Njenga SM, Nabeshima T, Minakawa N. Mosquito arbovirus survey in selected areas of Kenya: detection of insect- specific virus. Trop Med Health. 2018 Jun 4;46:19. **Abstract** Background: Many arboviral outbreaks have occurred in various locations in Kenya. Entomological surveys are suitable methods for revealing information about circulating arboviruses before human outbreaks are recognized. Therefore, mosquitoes were collected in Kenya to determine the distribution of arboviruses. Methods: Various species of mosquitoes were sampled from January to July 2012 using several collection methods. Mosquito homogenates were directly tested by reverse transcription-polymerase chain reaction (RT-PCR) using various arbovirus-targeted primer pairs. Results: We collected 12,569 mosquitoes. Although no human-related arboviruses were detected, Culex flavivirus (CxFV), an insect-specific arbovirus, was detected in 54 pools of 324 Culex quinquefasciatus individuals collected during the rainy season. Of these 54 positive pools, 96.3% (52/54) of the mosquitoes were collected in Busia, on the border of western Kenya and Uganda. The remaining two CxFV-positive pools were collected in Mombasa and Kakamega, far from Busia. Phylogenetic analysis revealed minimal genetic diversity among the CxFVs collected in Mombasa, Kakamega, and Busia, even though these cities are in geographically different regions. Additionally, CxFV was detected in one mosquito pool collected in Mombasa during the dry season. In addition to Culex mosquitoes, Aedes (Stegomyia) and Anopheles mosquitoes were also positive for the Flavivirus genus. Cell fusing agent virus was detected in one pool of Aedes aegypti. Mosquito flavivirus was detected in three pools of Anopheles gambiae s.l. collected in the dry and rainy seasons.

	Conclusions: Although no mosquitoes were positive for human-related arbovirus, insect-specific viruses were detected in various species of mosquitoes. The heterogeneity observed in the number of CxFVs in Culex mosquitoes in different locations in Kenya suggests that the abundance of human-related viruses might differ depending on the abundance of insect-specific viruses. We may have underestimated the circulation of any human-related arbovirus in Kenya, and the collection of larger samples may allow for determination of the presence of human-related arboviruses. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29991925/
37.	Waithaka D, Tsofa B, Barasa E. Evaluating healthcare priority setting at the meso level: A thematic review of empirical literature. Wellcome Open Res. 2018 Jan 8;3:2. **Abstract** Background: Decentralization of health systems has made sub-national/regional healthcare systems the backbone of healthcare delivery. These regions are tasked with the difficult responsibility of determining healthcare priorities and resource allocation amidst scarce resources. We aimed to review empirical literature that evaluated priority setting practice at the meso level of health systems. Methods: We systematically searched PubMed, ScienceDirect and Google scholar databases and supplemented these with manual searching for relevant studies, based on the reference list of selected papers. We only included empirical studies that described and evaluated, or those that only evaluated priority setting practice at the meso-level. A total of 16 papers were identified from LMICs and HICs. We analyzed data from the selected papers by thematic review. Results: Few studies used systematic priority setting processes, and all but one were from HICs. Both formal and informal criteria are used in priority-setting, however, informal criteria appear to be more perverse in LMICs compared to HICs. The priority setting process at the meso-level is a top-down approach with minimal involvement of the community. Accountability for reasonableness was the most common evaluative framework as it was used in 12 of the 16 studies. Efficiency, reallocation of resources and options for service delivery redesign were the most common outcome measures used to evaluate priority setting. Limitations: Our study was limited by the fact that there are very few empirical studies that have evaluated priority setting at the meso-level and there is likelihood that we did not capture all the studies. Conclusions: Improving priority setting practices at the meso level is crucial to strengthening health systems. This can be achieved through incorporating and adapting systematic priority setting processes and frameworks to the context where used, and making considerations of both process and outcome measures during priority setting and resource allocation. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29511741/
38.	Inoue M, Niki M, Ozeki Y, Nagi S, Chadeka EA, Yamaguchi T, Osada-Oka M, Ono K, Oda T, Mwende F, Kaneko Y, Matsumoto M, Kaneko S, Ichinose Y, Njenga SM, Hamano S, Matsumoto S. High-density lipoprotein suppresses tumor necrosis factor

	alpha production by mycobacteria-infected human macrophages. Sci Rep. 2018 Apr 30;8(1):6736. **Abstract** Immune responses to parasitic pathogens are affected by the host physiological condition. High-density lipoprotein (HDL) and low-density lipoprotein (LDL) are transporters of lipids between the liver and peripheral tissues, and modulate pro-inflammatory immune responses. Pathogenic mycobacteria are parasitic intracellular bacteria that can survive within macrophages for a long period. Macrophage function is thus key for host defense against mycobacteria. These basic facts suggest possible effects of HDL and LDL on mycobacterial diseases, which have not been elucidated so far. In this study, we found that HDL and not LDL enhanced mycobacterial infections in human macrophages. Nevertheless, we observed that HDL remarkably suppressed production of tumor necrosis factor alpha (TNF-α) upon mycobacterial infections. TNF-α is a critical host-protective cytokine against mycobacterial diseases. We proved that toll-like receptor (TLR)-2 is responsible for TNF-α production by human macrophages infected with mycobacteria. Subsequent analysis showed that HDL downregulates TLR2 expression and suppresses its intracellular signaling pathways. This report demonstrates for the first time the substantial action of HDL in mycobacterial infections to human macrophages. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29712918/
39.	Bosire E, Mendenhall E, Omondi GB, Ndetei D. When Diabetes Confronts HIV: Biological Sub-citizenship at a Public Hospital in Nairobi, Kenya. Med Anthropol Q. 2018 Dec;32(4):574-592. **Abstract** This article investigates how international donor policies cultivate a form of biological sub-citizenship for those with diabetes in Kenya. We interviewed 100 patients at a public hospital clinic in Nairobi, half with a diabetes diagnosis. We focus on three vignettes that illustrate how our study participants differentially perceived and experienced living with and seeking treatment and care for diabetes compared to other conditions, with a special focus on HIV. We argue that biological sub-citizenship, where those with HIV have consistent and comprehensive free medical care and those with diabetes must pay out-of-pocket for testing and treatment, impedes diabetes testing and treatment. Once diagnosed, many are then systematically excluded from the health care system due to their own inability to pay. We argue that the systematic exclusion from international donor money creates a form of biological sub-citizenship based on neoliberal economic policies that undermine other public health protections, such as universal primary health care. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30117196/
40.	Oliwa JN, Maina J, Ayieko P, Gathara D, Kathure IA, Masini E, Van't Hoog AH, van Hensbroek MB, English M. Variability in distribution and use of tuberculosis diagnostic tests in Kenya: a cross-sectional survey. BMC Infect Dis. 2018 Jul 16;18(1):328. **Abstract**

	Background: Globally, 40% of all tuberculosis (TB) cases, 65% paediatric cases and 75% multi-drug resistant TB (MDR-TB) cases are missed due to underreporting and/or under diagnosis. A recent Kenyan TB prevalence survey found that a significant number of TB cases are being missed here. Understanding spatial distribution and patterns of use of TB diagnostic tests as per the guidelines could potentially help improve TB case detection by identifying diagnostic gaps. Methods: We used 2015 Kenya National TB programme data to map TB case notification rates (CNR) in different counties, linked with their capacity to perform diagnostic tests (chest x-rays, smear microscopy, Xpert MTB/RIF®, culture and line probe assay). We then ran hierarchical regression models for adults and children to specifically establish determinants of use of Xpert® (as per Kenyan guidelines) with county and facility as random effects. Results: In 2015, 82,313 TB cases were notified and 7.8% were children. The median CNR/100,000 amongst 0-14yr olds was 37.2 (IQR 20.6, 41.0) and 267.4 (IQR 202.6, 338.1) for ≥15yr olds respectively. 4.8% of child TB cases and 12.2% of adult TB cases had an Xpert® test done, with gaps in guideline adherence. There were 2,072 microscopy sites (mean microscopy density 4.46/100,000); 129 Xpert® sites (mean 0.31/100,000); two TB culture laboratories and 304 chest X-ray facilities (mean 0.74/100,000) with variability in spatial distribution across the 47 counties. Retreatment cases (i.e. failures, relapses/recurrences, defaulters) had the highest odds of getting an Xpert® test compared to new/transfer-in patients (AOR 7.81, 95% CI 7.33-8.33). Children had reduced odds of getting an Xpert® (AOR 0.41, CI 0.36-0.47). HIV-positive individuals had nearly twice the odds of getting an Xpert® test (AOR 1.82, CI 1.73-1.92). Private sector and higher-level hospitals had a tendency towarrds lower odds of use of Xpert®. Conclusions: We noted under-use and gaps in guideline adherence for Xpert® especially in children. The under-use despite considerable investment undermines cost-effectiveness of Xpert®. Further research is needed to develop strategies enhancing use of diagnostics, including innovations to improve access (e.g. specimen referral) and overcoming local barriers to adoption of guidelines and technologies. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30012092/
41.	Gitari JW, Nzou SM, Wamunyokoli F, Kinyeru E, Fujii Y, Kaneko S, Mwau M. Leishmaniasis recidivans by Leishmania tropica in Central Rift Valley Region in Kenya. Int J Infect Dis. 2018 Sep;74:109-116. **Abstract** Objectives: This study sought to determine the endemic Leishmania species, the clinical features of cutaneous leishmaniasis (CL) in the Central Rift Valley in Kenya and to give an account on unresponsiveness to treatment in the region. Methods: Participants were clinically identified and grouped into untreated, classical and recidivate based on clinical manifestation and clinical data. Leishmaniasis recidivans lesions were scaly hyperemic papules that appeared before the classic lesion had healed or after healing. The demographics and socio-economic data were recorded and lesion

	scraping samples screened through microscopy and Internal Transcribed Spacer 1-PCR. Leishmania species were identified using Restriction Fragment Length Polymorphism. Results: A total of 52 participants were sampled, of which, 44.2% of the cases were recidivate and L. tropica the only species identified. All patients had been treated using sodium stibogluconate (SSG) which is the recommended first-line drug in Kenya. 60% of the patients experienced prolonged exposure to the drug (>30 days). Conclusion: L. tropica is the endemic Leishmania species for CL leading to classical and leishmaniasis recidivans. Treatment of CL in the area is not effective hence, alternative measures/therapy should be considered to cope with the unresponsiveness. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30017946/
42.	Wahome E, Thiong'o AN, Mwashigadi G, Chirro O, Mohamed K, Gichuru E, Mwambi J, Price MA, Graham SM, Sanders EJ. An Empiric Risk Score to Guide PrEP Targeting Among MSM in Coastal Kenya. AIDS Behav. 2018 Jul;22(Suppl 1):35-44. **Abstract** Men who have sex with men (MSM), who have heterogeneous HIV-acquisition risks are not specifically targeted in Kenyan pre-exposure prophylaxis (PrEP) guidelines. We used data from an open cohort, which followed 753 initially HIV-negative MSM participants for more than 1378.5 person-years, to develop an empiric risk score for targeting PrEP delivery. Independent predictors of incident HIV-1 infection in this cohort were an age of 18-24 years, having only male sex partners, having receptive anal intercourse, having any unprotected sex, and having group sex. Poisson model coefficients were used to assign a numeric score to each statistically significant predictor. A risk score of ≥ 1 corresponded to an HIV-1 incidence of ≥ 2.2 [95% confidence interval (CI) 1.2-4.1] and identified 81.3% of the cohort participants as being at high risk for HIV-1 acquisition. The area under the receiver operating characteristic curve was 0.76 (95% CI 0.71-0.80). This empiric risk score may help Kenyan health care providers to assess HIV-1 acquisition risk and encourage PrEP uptake by high-risk MSM. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29767324/
43.	Konongoi SL, Nyunja A, Ofula V, Owaka S, Koka H, Koskei E, Eyase F, Langat D, Mancuso J, Lutomiah J, Sang R. Human and entomologic investigations of chikungunya outbreak in Mandera, Northeastern Kenya, 2016. PLoS One. 2018 Oct 11;13(10):e0205058. **Abstract** Chikungunya is a reemerging vector borne pathogen associated with severe morbidity in affected populations. Lamu, along the Kenyan coast was affected by a major chikungunya outbreak in 2004. Twelve years later, we report on entomologic investigations and laboratory confirmed chikungunya cases in northeastern Kenya. Patient blood samples were received at the Kenya Medical Research Institute (KEMRI) viral hemorrhagic fever laboratory and the immunoglobulin M enzyme linked

	immunosorbent assay (IgM ELISA) was used to test for the presence of IgM antibodies against chikungunya and dengue. Reverse transcription polymerase chain reaction (RT-PCR) utilizing flavivirus, alphavirus and chikungunya specific primers were used to detect acute infections and representative PCR positive samples sequenced to confirm the circulating strain. Immature mosquitoes were collected from water-holding containers indoors and outdoors in the affected areas in northeastern Kenya. A total of 189 human samples were tested; 126 from Kenya and 63 from Somalia. 52.9% (100/189) tested positive for Chikungunya virus (CHIKV) by either IgM ELISA or RT-PCR. Sequence analysis of selected samples revealed that the virus was closely related to that from China (2010). 29% (55/189) of the samples, almost all from northeastern Kenya or with a history of travel to northern Kenya, tested positive for dengue IgM antibodies. Entomologic risk assessment revealed high house, container and Breteau indices of, 14.5, 41.9 and 17.1% respectively. Underground water storage tanks were the most abundant, 30.1%, of which 77.4% were infested with Aedes aegypti mosquitoes. These findings confirm the presence of active chikungunya infections in the northeastern parts of Kenya. The detection of dengue IgM antibodies concurrently with chikungunya virus circulation emphasizes on the need for improved surveillance systems and diagnostic algorithms with the capacity to capture multiple causes of arbovirus infections as these two viruses share common vectors and eco-systems. In addition sustained entomological surveillance and vector control programs targeting most productive containers are needed to monitor changes in vector densities, for early detection of the viruses and initiate vector control efforts to prevent possible outbreaks **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/30308064/
44.	Barasa E, Rogo K, Mwaura N, Chuma J. Kenya National Hospital Insurance Fund Reforms: Implications and Lessons for Universal Health Coverage. Health Syst Reform. 2018;4(4):346-361. **Abstract** This article identifies and describes the reforms undertaken by the National Hospital Insurance Fund (NHIF) and examines their implications for Kenya's quest to achieve universal health coverage (UHC). We undertook a review of published and grey literature to identify key reforms that had been implemented by the NHIF since 2010. We examined the reforms undertaken by the NHIF using a health financing evaluation framework that considers the feasibility, equity, efficiency, and sustainability of health financing mechanisms. We found the following NHIF reforms: (1) the introduction of the Civil Servants Scheme (CSS), (2) the introduction of a stepwise quality improvement system, (3) the health insurance subsidy for the poor (HISP), (4) revision of monthly contribution rates and expansion of the benefit package, and (5) the upward revision of provider reimbursement rates. Though there are improvements in several areas, these reforms raise equity, efficiency, feasibility, and sustainability concerns. The article concludes that though NHIF reforms in Kenya are well intentioned and there has been

	improvement in several areas, design attributes could compromise the extent to which they achieve their intended goal of providing universal financing risk protection to the Kenyan population. **Pubmed link-**https://pubmed.ncbi.nlm.nih.gov/30398396/
45.	Mulinge E, Magambo J, Odongo D, Njenga S, Zeyhle E, Mbae C, Kagendo D, Addy F, Ebi D, Wassermann M, Kern P, Romig T. Molecular characterization of Echinococcus species in dogs from four regions of Kenya. Vet Parasitol. 2018 May 15;255:49-57. **Abstract** Cystic echinococcosis is endemic both in livestock and humans in many parts of Kenya. However, very little data exists on Echinococcus infections in dogs, and therefore their role in maintaining the transmission cycles and environmental contamination with eggs of Echinococcus species is unknown. The study aimed to establish the prevalence and distribution of Echinococcus granulosus sensu lato causing infection in dogs in Kenya. A total of 1621 dog faecal samples were collected from the environment in four different regions and examined microscopically for the presence of taeniid eggs. Up to 20 individual taeniid eggs per faecal sample were picked, lysed and genotyped by polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) and sequencing of the NADH dehydrogenase subunit 1 (nad1) gene. Eleven percent (178/1621) of faecal samples had taeniid eggs, while 4.4% (71/1621) contained Echinococcus spp. eggs. Area-wise, the faecal prevalence of Echinococcus spp. was 9.2% (48/524) in Turkana, 4.0% (20/500) in Maasai Mara, 0.7% (2/294) in Isiolo and 0.3% (1/303) in Meru. E. granulosus sensu stricto (s. s.) was the dominant Echinococcus taxon, followed by E. canadensis (G6/7) that was detected in 51 and 23 faecal samples, respectively. E. ortleppi was detected in only 5 faecal samples. We report for the first time the presence of E. felidis eggs in two dog faecal samples (from Maasai Mara region). Mixed infections of these taxa were also found in faecal samples, including: E. granulosus s. s. and E. canadensis (G6/7) (n = 7), E. granulosus s. s. and E. ortleppi (n = 1) and all three species (n = 1). The dog data presented here confirm the differences in diversity and abundance of Echinococcus spp. between regions of Kenya, correspond well with previously published data from livestock, and tentatively suggest a role of domestic dogs as a link between domestic and sylvatic cycles of Echinococcus spp. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29773136/
46.	Etyang AO, Wandabwa CK, Kapesa S, Muthumbi E, Odipo E, Wamukoya M, Ngomi N, Haregu T, Kyobutungi C, Williams TN, Makale J, Macharia A, Cruickshank JK, Smeeth L, Scott JAG. Blood Pressure and Arterial Stiffness in Kenyan Adolescents With the Sickle Cell Trait. Am J Epidemiol. 2018 Feb 1;187(2):199-205. **Abstract** The potential association between sickle cell trait (SCT) and increased arterial stiffness/blood pressure (BP) has not been evaluated in detail despite its association with stroke, sudden death, and renal disease. We performed 24-hour ambulatory BP

	monitoring and arterial stiffness measurements in adolescents raised in a malaria-free environment in Kenya. Between December 2015 and June 2016, 938 randomly selected adolescents (ages 11-17 years) who had been continuous residents of Nairobi from birth were invited to participate in the study. Standard clinic BP measurement was performed, followed by 24-hour ambulatory BP monitoring and arterial stiffness measurement using an Arteriograph24 (TensioMed Ltd., Budapest, Hungary) device. SCT status was determined using DNA genotyping in contemporaneously collected blood samples. Of the 938 adolescents invited to participate, 609 (65%) provided complete data for analysis. SCT was present in 103 (15%). Mean 24-hour systolic and diastolic BPs were 116 (standard deviation (SD), 11.5) mm Hg and 64 (SD, 7) mm Hg, respectively, in children with SCT and 117 (SD, 11.4) mm Hg and 64 (SD, 6.8) mm Hg, respectively, in non-SCT children. Mean pulse wave velocity (PWV) was 7.1 (SD, 0.8) m/second and 7.0 (SD, 0.8) m/second in SCT and non-SCT children, respectively. We observed no differences in PWV or in any clinic or ambulatory BP-derived measures between adolescents with and without SCT. These data suggest that SCT does not independently influence BP or PWV. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/28992220/
47.	Pyra M, Anderson PL, Hendrix CW, Heffron R, Mugwanya K, Haberer JE, Thomas KK, Celum C, Donnell D, Marzinke MA, Bukusi EA, Mugo NR, Asiimwe S, Katabira E, Baeten JM; Partners Demonstration Study Team. Tenofovir and tenofovir- diphosphate concentrations during pregnancy among HIV-uninfected women using oral preexposure prophylaxis. AIDS. 2018 Aug 24;32(13):1891-1898. **Abstract** Objectives: Pregnancy is a time of increased HIV acquisition risk and pregnancy reduces concentrations of antiretrovirals used for treatment. We assessed whether pregnancy lowers concentrations of tenofovir (TFV) and tenofovir-diphosphate (TFV-DP) among HIV-uninfected women using oral preexposure prophylaxis (PrEP). Methods: We analyzed data from an open-label PrEP study, comparing concentrations of TFV in plasma and TFV-DP in dried blood spots (DBS) among 37 pregnant women and 97 nonpregnant women. Analyses controlled for adherence from daily electronic monitoring. Results: The average plasma concentration of TFV among pregnant women was 34.7 ng/ml with 22.2 average recorded doses over the prior month versus 86.5 ng/ml with 23.1 doses among nonpregnant women. After controlling for adherence, TFV concentrations were 58% lower among pregnant women, a statistically significant difference of -50.4 ng/ml (95% CI -68.3 to -32.5). The average TFV-DP concentration was 450.3 fmol/punch among pregnant women and 636.7 fmol/punch among nonpregnant women. This difference was not statistically significant after adjusting for adherence; however, among those with quantifiable TFV-DP, concentrations were 27% lower during pregnancy [-202 fmol/punch (95% CI -384 to -19)]. Among participants with samples before and during pregnancy, there were significant decreases during pregnancy,

	controlling for adherence: -28.1 ng/ml TFV (95% CI -52.3 to -4.0) and -289.2 fmol/punch TFV-DP (95% CI -439.0 to -139.3). Conclusion: Consistent with studies among HIV-infected women on ART, we found TFV and TFV-DP concentrations were lower during pregnancy. There is no established TFV concentration threshold to achieve HIV prevention. Additional pharmacokinetic studies and studies of PrEP efficacy in pregnancy are needed. **Pubmeb link**- https://pubmed.ncbi.nlm.nih.gov/29894385/
48.	Campbell ZA, Marsh TL, Mpolya EA, Thumbi SM, Palmer GH. Newcastle disease vaccine adoption by smallholder households in Tanzania: Identifying determinants and barriers. PLoS One. 2018 Oct 24;13(10):e0206058. **Abstract** Background: Food security is critical to achieving sustainable growth, poverty reduction, and political and economic stability. Livestock have the potential to improve the food security of smallholder households in developing countries, but livestock productivity is constrained by disease. The extent to which households adopt innovations such as vaccines impacts disease control; however, the behavioral and economic drivers underlying household decisions to adopt or forgo vaccination are not well understood. We address this gap with a study of adoption of Newcastle disease (ND) vaccines by chicken-owning households in Tanzania. Methods: A cross-sectional survey was administered to 535 households owning indigenous chickens in Arusha, Singida, and Mbeya regions in Tanzania. We measured potential predictors of ND vaccine adoption including knowledge, attitudes, and practices. Logistic regression was used to identify predictors correlated with three stages of household adoption: awareness of ND vaccines, previous vaccination, and recent vaccination (within four months) consistent with veterinary guidelines. Results: Eighty percent of households were aware of ND vaccines, 57% had previously vaccinated, and 26% had recently vaccinated. Knowing someone who vaccinated increased the odds of a household previously vaccinating [adjusted odds ratio (AOR): 1.32, 95% CI: 1.1-1.5]. Larger flock size was also associated with higher odds of previous vaccination (AOR: 1.03 for a one chicken increase, 95% CI: 1.01-1.05). Usage of traditional medicine decreased the odds of previously vaccination (AOR: 0.58, 95% CI: 0.36-0.95). Conclusion: Our findings suggest that encouraging the flow of professional-level knowledge within the community by vaccine adopters is a strategy to increase vaccine adoption. Enhancing local chicken productivity through increased vaccine coverage would strengthen a key smallholder household resource for food and economic security. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30356260/

49.	Leidich A, Achiro L, Kwena ZA, McFarland W, Neilands TB, Cohen CR, Bukusi EA, Camlin CS. Methods for sampling geographically mobile female traders in an East African market setting. PLoS One. 2018 Jan 11;13(1):e0190395. **Abstract** Background: The role of migration in the spread of HIV in sub-Saharan Africa is well-documented. Yet migration and HIV research have often focused on HIV risks to male migrants and their partners, or migrants overall, often failing to measure the risks to women via their direct involvement in migration. Inconsistent measures of mobility, gender biases in those measures, and limited data sources for sex-specific population-based estimates of mobility have contributed to a paucity of research on the HIV prevention and care needs of migrant and highly mobile women. This study addresses an urgent need for novel methods for developing probability-based, systematic samples of highly mobile women, focusing on a population of female traders operating out of one of the largest open air markets in East Africa. Our method involves three stages: 1.) identification and mapping of all market stall locations using Global Positioning System (GPS) coordinates; 2.) using female market vendor stall GPS coordinates to build the sampling frame using replicates; and 3.) using maps and GPS data for recruitment of study participants. Results: The location of 6,390 vendor stalls were mapped using GPS. Of these, 4,064 stalls occupied by women (63.6%) were used to draw four replicates of 128 stalls each, and a fifth replicate of 15 pre-selected random alternates for a total of 527 stalls assigned to one of five replicates. Staff visited 323 stalls from the first three replicates and from these successfully recruited 306 female vendors into the study for a participation rate of 94.7%. Mobilization strategies and involving traders association representatives in participant recruitment were critical to the study's success. Conclusion: The study's high participation rate suggests that this geospatial sampling method holds promise for development of probability-based samples in other settings that serve as transport hubs for highly mobile populations. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29324780/
50.	Allen ER, Krumm SA, Raghwani J, Halldorsson S, Elliott A, Graham VA, Koudriakova E, Harlos K, Wright D, Warimwe GM, Brennan B, Huiskonen JT, Dowall SD, Elliott RM, Pybus OG, Burton DR, Hewson R, Doores KJ, Bowden TA. A Protective Monoclonal Antibody Targets a Site of Vulnerability on the Surface of Rift Valley Fever Virus. Cell Rep. 2018 Dec 26;25(13):3750-3758.e4. **Abstract** The Gn subcomponent of the Gn-Gc assembly that envelopes the human and animal pathogen, Rift Valley fever virus (RVFV), is a primary target of the neutralizing antibody response. To better understand the molecular basis for immune recognition, we raised a class of neutralizing monoclonal antibodies (nAbs) against RVFV Gn, which exhibited protective efficacy in a mouse infection model. Structural characterization revealed that these nAbs were directed to the membrane-distal domain of RVFV Gn and

	likely prevented virus entry into a host cell by blocking fusogenic rearrangements of the Gn-Gc lattice. Genome sequence analysis confirmed that this region of the RVFV Gn-Gc assembly was under selective pressure and constituted a site of vulnerability on the virion surface. These data provide a blueprint for the rational design of immunotherapeutics and vaccines capable of preventing RVFV infection and a model for understanding Ab-mediated neutralization of bunyaviruses more generally. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30590046/
51.	Waithaka D, Tsofa B, Kabia E, Barasa E. Describing and evaluating healthcare priority setting practices at the county level in Kenya. Int J Health Plann Manage. 2018 Apr 15;33(3):e733–50. **Abstract** Background: Healthcare priority setting research has focused at the macro (national) and micro (patient level), while there is a dearth of literature on meso-level (subnational/regional) priority setting practices. In this study, we aimed to describe and evaluate healthcare priority setting practices at the county level in Kenya. Methods: We used a qualitative case study approach to examine the planning and budgeting processes in 2 counties in Kenya. We collected the data through in-depth interviews of senior managers, middle-level managers, frontline managers, and health partners (n = 23) and document reviews. We analyzed the data using a framework approach. Findings: The planning and budgeting processes in both counties were characterized by misalignment and the dominance of informal considerations in decision making. When evaluated against consequential conditions, efficiency and equity considerations were not incorporated in the planning and budgeting processes. Stakeholders were more satisfied and understood the planning process compared with the budgeting process. There was a lack of shifting of priorities and unsatisfactory implementation of decisions. Against procedural conditions, the planning process was more inclusive and transparent and stakeholders were more empowered compared with the budgeting process. There was ineffective use of data, lack of provisions for appeal and revisions, and limited mechanisms for incorporating community values in the planning and budgeting. Conclusion: County governments can improve the planning and budgeting processes by aligning them, implementing a systematic priority setting process with explicit resource allocation criteria, and adhering to both consequential and procedural aspects of an ideal priority setting process. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29658138/
52.	Swanson M, Ibrahim S, Blat C, Oketch S, Olwanda E, Maloba M, Huchko MJ. Evaluating a community-based cervical cancer screening strategy in Western Kenya: a descriptive study. BMC Womens Health. 2018 Jul 3;18(1):116. **Abstract** Background: The incidence of cervical cancer in Kenya is among the highest in the world. Few Kenyan women are able to access screening, thus fueling the high cervical

	cancer burden. Self-collected human papilloma Virus (HPV) tests, administered during community-health campaigns in rural areas may be a way to expand access to screening. Methods: In December 2015, we carried out a four-day community health campaign (CHC) to educate participants about cervical cancer prevention and offer self-administered HPV screening. Community enumeration, outreach and mobilization preceded the CHC. Samples were sent to Migori County Hospital for HPV DNA testing using careHPV Test Kits. Women were notified of results through their choice of short message service (SMS), phone call, home visit or clinic visit. HPV positive women were referred for cryotherapy following a screen-and-treat strategy. Results: Door-to-door enumeration identified approximately 870 eligible women in Ngodhe Community in Migori County. Among the 267 women attending the campaign, 255 women enrolled and collected samples: 243 tests were successfully resulted and 12 were indeterminate. Of the 243 resulted tests, 47 (19%) were positive for HPV, with young age being the only significant predictor of positivity. In multivariate analysis, each additional year of age conferred about a 4% decrease in the odds of testing positive (95% CI 0.1 to 7%, p = 0.046). Just over three-quarters of all women (195/255), were notified of their results. Those who were unable to be reached were more likely to prefer receiving results from clinic (54/60, 90%) and were less likely to have mobile phones (24/60, 73%). Although 76% of HPV positive women were notified of their results, just half (51%) of those testing positive presented for treatment. HPV positive women who successfully accessed the treatment facility did not differ from their non-presenting counterparts by demographics, health history, desired route of notification or access to a mobile phone. Conclusion: Nearly a third of eligible women in Ngodhe Community attended the CHC and were screened for cervical cancer. Nearly all women who attended the CHC underwent cervical cancer screening by self-collected HPV tests. Three-quarters of all participants received results, but just half of HPV positive participants presented for treatment in a timely fashion, suggesting that linkage to treatment remains a major challenge. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29970063/
53.	Simam J, Rono M, Ngoi J, Nyonda M, Mok S, Marsh K, Bozdech Z, Mackinnon M. Gene copy number variation in natural populations of Plasmodium falciparum in Eastern Africa. BMC Genomics. 2018 May 21;19(1):372. **Abstract** Background: Gene copy number variants (CNVs), which consist of deletions and amplifications of single or sets of contiguous genes, contribute to the great diversity in the Plasmodium falciparum genome. In vitro studies in the laboratory have revealed their important role in parasite fitness phenotypes such as red cell invasion, transmissibility and cytoadherence. Studies of natural parasite populations indicate that CNVs are also

	common in the field and thus may facilitate adaptation of the parasite to its local environment. Results: In a survey of 183 fresh field isolates from three populations in Eastern Africa with different malaria transmission intensities, we identified 94 CNV loci using microarrays. All CNVs had low population frequencies (minor allele frequency < 5%) but each parasite isolate carried an average of 8 CNVs. Nine CNVs showed high levels of population differentiation (FST > 0.3) and nine exhibited significant clines in population frequency across a gradient in transmission intensity. The clearest example of this was a large deletion on chromosome 9 previously reported only in laboratory-adapted isolates. This deletion was present in 33% of isolates from a population with low and highly seasonal malaria transmission, and in < 9% of isolates from populations with higher transmission. Subsets of CNVs were strongly correlated in their population frequencies, implying co-selection. Conclusions: These results support the hypothesis that CNVs are the target of selection in natural populations of P. falciparum. Their environment-specific patterns observed here imply an important role for them in conferring adaptability to the parasite thus enabling it to persist in its highly diverse ecological environment. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29783949/
54.	Morpeth SC, Munywoki P, Hammitt LL, Bett A, Bottomley C, Onyango CO, Murdoch DR, Nokes DJ, Scott JAG. Impact of viral upper respiratory tract infection on the concentration of nasopharyngeal pneumococcal carriage among Kenyan children. Sci Rep. 2018 Jul 23;8(1):11030. **Abstract** Viral upper respiratory tract infection (URTI) predisposes to bacterial pneumonia possibly by facilitating growth of bacteria such as Streptococcus pneumoniae colonising the nasopharynx. We investigated whether viral URTI is temporally associated with an increase in nasopharyngeal pneumococcal concentration. Episodes of symptomatic RSV or rhinovirus URTI among children <5 years were identified from a longitudinal household study in rural Kenya. lytA and alu PCR were performed on nasopharyngeal samples collected twice-weekly, to measure the pneumococcal concentration adjusted for the concentration of human DNA present. Pneumococcal concentration increased with a fold-change of 3.80 (95%CI 1.95-7.40), with acquisition of RSV or rhinovirus, during 51 URTI episodes among 42 children. In repeated swabs from the baseline period, in the two weeks before URTI developed, within-episode variation was broad; within +/-112-fold range of the geometric mean. We observed only a small increase in nasopharyngeal pneumococcal concentration during RSV or rhinovirus URTI, relative to natural variation. Other factors, such as host response to viral infection, may be more important than nasopharyngeal pneumococcal concentration in determining risk of invasive disease. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30038420/
55.	Jost J, Ratsimbazafy V, Nguyen TT, Nguyen TL, Dufat H, Dugay A, Ba A,Sivadier G, Mafilaza Y, Jousse C, Traïkia M, Leremboure M, Auditeau E, Raharivelo A, Ngoungou

	E, Kariuki SM, Newton CR, Preux PM. Quality of antiepileptic drugs in sub-Saharan Africa: A study in Gabon, Kenya, and Madagascar. Epilepsia. 2018 Jul;59(7):1351-1361. **Abstract** Objective: Epilepsy is a major public health issue in low- and middle-income countries, where the availability and accessibility of quality treatment remain important issues, the severity of which may be aggravated by poor quality antiepileptic drugs (AEDs). The primary objective of this study was to measure the quality of AEDs in rural and urban areas in 3 African countries. Methods: This cross-sectional study was carried out in Gabon, Kenya, and Madagascar. Both official and unofficial supply chains in urban and rural areas were investigated. Samples of oral AEDs were collected in areas where a patient could buy or obtain them. Pharmacological analytical procedures and Medicine Quality Assessment Reporting Guidelines were used to assess quality. Results: In total, 102 batches, representing 3782 units of AEDs, were sampled. Overall, 32.3% of the tablets were of poor quality, but no significant difference was observed across sites: 26.5% in Gabon, 37.0% in Kenya, and 34.1% in Madagascar (P = .7). The highest proportions of substandard medications were found in the carbamazepine (38.7%; 95% confidence interval [CI] 21.8-57.8) and phenytoin (83.3%; 95% CI 35.8-99.5) batches, which were mainly flawed by their failure to dissolve. Sodium valproate was the AED with the poorest quality (32.1%; 95% CI 15.8-42.3). The phenobarbital (94.1%; 95% CI 80.3-99.2) and diazepam (100.0%) batches were of better quality. The prevalence of substandard quality medications increased in samples supplied by public facilities (odds ratio [OR] 9.9; 95% CI 1.2-84.1; P < .04) and manufacturers located in China (OR 119.8; 95% CI 8.7-1651.9; P < .001). The prevalence of AEDs of bad quality increased when they were stored improperly (OR 5.4; 95% CI 1.2-24.1; P < .03). Significance: No counterfeiting was observed. However, inadequate AED storage conditions are likely to lead to ineffective and possibly dangerous AEDs, even when good-quality AEDs are initially imported. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29893991/
56.	Ngari MM, Mwalekwa L, Timbwa M, Hamid F, Ali R, Iversen PO, Fegan GW, Berkley JA. Changes in susceptibility to life-threatening infections after treatment for complicated severe malnutrition in Kenya. Am J Clin Nutr. 2018 Apr 1;107(4):626-634. **Abstract** Background: Goals of treating childhood severe acute malnutrition (SAM), in addition to anthropometric recovery and preventing short-term mortality, include reducing the risks of subsequent serious infections. How quickly and how much the risk of serious illness changes during rehabilitation are unknown but could inform improving the design and scope of interventions. Objective: The aim of this study was to investigate changes in the risk of life-threatening events (LTEs) in relation to anthropometric recovery from SAM.

	Design: This was a secondary analysis of a clinical trial including 1778 HIV-uninfected Kenyan children aged 2-59 mo with complicated SAM, enrolled after the inpatient stabilization phase of treatment, and followed for 12 mo. The main outcome was LTEs, defined as infections requiring rehospitalization or causing death. We examined anthropometric variables measured at months 1, 3, and 6 after enrollment in relation to LTEs occurring during the 6 mo after each of these time points. Results: Over 12 mo, there were 823 LTEs (257 fatal), predominantly severe pneumonia and diarrhea. At months 1, 3, and 6, 557 (34%), 764 (49%), and 842 (56%) children had a weight-for-height or -length z score (WHZ) ≥-2, respectively, which, compared with a WHZ <-3, was associated with lower risks of subsequent LTEs [adjusted HRs (95% CIs): 0.50 (0.40, 0.64), 0.30 (0.23, 0.39), and 0.23 (0.16, 0.32), respectively]. However, children with a WHZ ≥-2 at 1, 3, and 6 mo still had 39 (95% CI: 32, 47), 26 (95% CI: 22, 32), and 15 (95% CI: 12, 20) LTEs/100 child-years of observation during the following 6 mo. WHZ at study enrollment predicted subsequent WHZ but not the risk of LTEs. Changes in height-for-age z score did not predict LTEs. Conclusions: Anthropometric response was associated with a rapid and substantial reduction in risk of LTEs. However, reduction in susceptibility lagged behind anthropometric improvement. Disease events, together with anthropometric assessment, may provide a clearer picture of the effectiveness of interventions. Robust protocols for detecting and treating poor anthropometric recovery and addressing broader vulnerabilities that complicated SAM indicates may save lives. This trial was registered at www.clinicaltrials.gov as NCT00934492. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29635501/
57.	Dawa JA, Chaves SS, Nyawanda B, Njuguna HN, Makokha C, Otieno NA, Anzala O, Widdowson MA, Emukule GO. National burden of hospitalized and non-hospitalized influenza-associated severe acute respiratory illness in Kenya, 2012-2014. Influenza Other Respir Viruses. 2018 Jan;12(1):30-37. **Abstract** Background: Influenza-associated respiratory illness was substantial during the emergence of the 2009 influenza pandemic. Estimates of influenza burden in the post-pandemic period are unavailable to guide Kenyan vaccine policy. Objectives: To update estimates of hospitalized and non-hospitalized influenza-associated severe acute respiratory illness (SARI) during a post-pandemic period (2012-2014) and describe the incidence of disease by narrow age categories. Methods: We used data from Siaya County Referral Hospital to estimate age-specific base rates of SARI. We extrapolated these base rates to other regions within the country by adjusting for regional risk factors for acute respiratory illness (ARI), regional healthcare utilization for acute respiratory illness, and the proportion of influenza-positive SARI cases in each region, so as to obtain region-specific rates. Results: The mean annual rate of hospitalized influenza-associated SARI among all ages was 21 (95% CI 19-23) per 100 000 persons. Rates of non-hospitalized influenza-

	associated SARI were approximately 4 times higher at 82 (95% CI 74-90) per 100 000 persons. Mean annual rates of influenza-associated SARI were highest in children <2 years of age with annual hospitalization rates of 147 (95% CI of 134-160) per 100 000 persons and non-hospitalization rates of 469 (95% CI 426-517) per 100 000 persons. For the period 2012-2014, there were between 8153 and 9751 cases of hospitalized influenza-associated SARI and 31 785-38 546 cases of non-hospitalized influenza-associated SARI per year. Conclusions: The highest burden of disease was observed among children <2 years of age. This highlights the need for strategies to prevent influenza infections in this age group **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29243402/
58.	Passmore MR, Byrne L, Obonyo NG, See Hoe LE, Boon AC, Diab SD, Dunster KR, Bisht K, Tung JP, Fauzi MH, Narula M, Pedersen SE, Esguerra-Lallen A, Simonova G, Sultana A, Anstey CM, Shekar K, Maitland K, Suen JY, Fraser JF. Inflammation and lung injury in an ovine model of fluid resuscitated endotoxemic shock. Respir Res. 2018 Nov 22;19(1):231. **Abstract** Background: Sepsis is a multi-system syndrome that remains the leading cause of mortality and critical illness worldwide, with hemodynamic support being one of the cornerstones of the acute management of sepsis. We used an ovine model of endotoxemic shock to determine if 0.9% saline resuscitation contributes to lung inflammation and injury in acute respiratory distress syndrome, which is a common complication of sepsis, and investigated the potential role of matrix metalloproteinases in this process. Methods: Endotoxemic shock was induced in sheep by administration of an escalating dose of lipopolysaccharide, after which they subsequently received either no fluid bolus resuscitation or a 0.9% saline bolus. Lung tissue, bronchoalveolar fluid (BAL) and plasma were analysed by real-time PCR, ELISA, flow cytometry and immunohistochemical staining to assess inflammatory cells, cytokines, hyaluronan and matrix metalloproteinases. Results: Endotoxemia was associated with decreased serum albumin and total protein levels, with activated neutrophils, while the glycocalyx glycosaminoglycan hyaluronan was significantly increased in BAL. Quantitative real-time PCR studies showed higher expression of IL-6 and IL-8 with saline resuscitation but no difference in matrix metalloproteinase expression. BAL and tissue homogenate levels of IL-6, IL-8 and IL-1β were elevated. Conclusions: This data shows that the inflammatory response is enhanced when a host with endotoxemia is resuscitated with saline, with a comparatively higher release of inflammatory cytokines and endothelial/glycocalyx damage, but no change in matrix metalloproteinase levels. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30466423/

59.	Ssewanyana D, Mwangala PN, Marsh V, Jao I, van Baar A, Newton CR, Abubakar A. Young people's and stakeholders' perspectives of adolescent sexual risk behavior in Kilifi County, Kenya: A qualitative study. J Health Psychol. 2018 Feb;23(2):188-205. **Abstract** A lack of research exists around the most common forms of sexual risk behaviors among adolescents, including their underlying factors, in Sub-Saharan Africa. Using an Ecological Model of Adolescent Behavior, we explore the perceptions of 85 young people and 10 stakeholders on sexual risk behavior of adolescents in Kilifi County on the coast of Kenya. Our findings show that transactional sex, early sexual debut, coerced sex, and multiple sexual partnerships are prevalent. An urgent need exists to develop measures to counter sexual risk behaviors. The results contribute to understanding the range of risks and protective factors in differing contexts, tackling underlying issues at individual, family, local institutional, wider socio-economic, and political levels. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29076401/
60.	Otto TD, Böhme U, Sanders M, Reid A, Bruske EI, Duffy CW, Bull PC, Pearson RD, Abdi A, Dimonte S, Stewart LB, Campino S, Kekre M, Hamilton WL, Claessens A, Volkman SK, Ndiaye D, Amambua-Ngwa A, Diakite M, Fairhurst RM, Conway DJ, Franck M, Newbold CI, Berriman M. Long read assemblies of geographically dispersed Plasmodium falciparum isolates reveal highly structured subtelomeres. Wellcome Open Res. 2018 May 3;3:52. **Abstract** Background: Although thousands of clinical isolates of Plasmodium falciparum are being sequenced and analysed by short read technology, the data do not resolve the highly variable subtelomeric regions of the genomes that contain polymorphic gene families involved in immune evasion and pathogenesis. There is also no current standard definition of the boundaries of these variable subtelomeric regions. Methods: Using long-read sequence data (Pacific Biosciences SMRT technology), we assembled and annotated the genomes of 15 P. falciparum isolates, ten of which are newly cultured clinical isolates. We performed comparative analysis of the entire genome with particular emphasis on the subtelomeric regions and the internal var genes clusters. Results: The nearly complete sequence of these 15 isolates has enabled us to define a highly conserved core genome, to delineate the boundaries of the subtelomeric regions, and to compare these across isolates. We found highly structured variable regions in the genome. Some exported gene families purportedly involved in release of merozoites show copy number variation. As an example of ongoing genome evolution, we found a novel CLAG gene in six isolates. We also found a novel gene that was relatively enriched in the South East Asian isolates compared to those from Africa. Conclusions: These 15 manually curated new reference genome sequences with their nearly complete subtelomeric regions and fully assembled genes are an important new resource for the malaria research community. We report the overall conserved structure and pattern of important gene families and the more clearly defined subtelomeric regions.

	Pubmed link- https://pubmed.ncbi.nlm.nih.gov/29862326/
61.	Bigogo G, Cain K, Nyole D, Masyongo G, Auko JA, Wamola N, Okumu A, Agaya J, Montgomery J, Borgdorff M, Burton D. Tuberculosis case finding using population-based disease surveillance platforms in urban and rural Kenya. BMC Infect Dis. 2018 Jun 7;18(1):262. **Abstract** Background: Tuberculosis (TB) case finding is an important component of TB control because it can reduce transmission of Mycobacterium tuberculosis (MTB) through prompt detection and treatment of infectious patients. Methods: Using population-based infectious disease surveillance (PBIDS) platforms with links to health facilities in Kenya we implemented intensified TB case finding in the community and at the health facilities, as an adjunct to routine passive case finding conducted by the national TB program. From 2011 to 2014, PBIDS participants ≥15 years were screened either at home or health facilities for possible TB symptoms which included cough, fever, night sweats or weight loss in the preceding 2 weeks. At home, participants with possible TB symptoms had expectorated sputum collected. At the clinic, HIV-infected participants with possible TB symptoms were invited to produce sputum. Those without HIV but with symptoms lasting 7 days including the visit day had chest radiographs performed, and had sputum collected if the radiographs were abnormal. Sputum samples were tested for the presence of MTB using the Xpert MTB/RIF assay. TB detection rates were calculated per 100,000 persons screened. Results: Of 11,191 participants aged ≥15 years screened at home at both sites, 2695 (23.9%) reported possible TB symptoms, of whom 2258 (83.8%) produced sputum specimens. MTB was detected in 32 (1.4%) of the specimens resulting in a detection rate of 286/100,000 persons screened. At the health facilities, a total of 11,762 person were screened, 7500 (63.8%) had possible TB symptoms of whom 1282 (17.1%) produced sputum samples. MTB was detected in 69 (5.4%) of the samples, resulting in an overall detection rate of 587/100,000 persons screened. The TB detection rate was higher in persons with HIV compared to those without at both home (HIV-infected - 769/100,000, HIV-uninfected 141/100,000, rate ratio (RR) - 5.45, 95% CI 3.25-22.37), and health facilities (HIV-infected 3399/100,000, HIV-uninfected 294/100,000, RR 11.56, 95% CI 6.18-18.44). Conclusion: Facility-based intensified TB case finding detected more TB cases per the number of specimens tested and the number of persons screened, including those with HIV, than home-based TB screening and should be further evaluated to determine its potential programmatic impact. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29879917/
62.	Lajeunesse-Trempe F, Dufour R, du Souich P, Paquette M, Kaduka LU, Christensen DL. Anthropometric measures and their association with risk factors for cardio-metabolic diseases in Kenyan adults. Ann Hum Biol. 2018 Sep-Dec;45(6-8):486-495. **Abstract**

	Background: The prevalence of cardio-metabolic diseases (CMD) is drastically increasing worldwide. Anthropometric measures of fat accumulation are correlated with CMD and Metabolic Syndrome (MS), but few studies have addressed this association in sub-Saharan African populations. Aim: To investigate the association between anthropometric features, MS and other CMD risk factors in a population from Kenya. Subjects and methods: In this cross-sectional study including 1405 Kenyans, anthropometric measurements including visceral adipose tissue (VAT) and abdominal subcutaneous adipose tissue (SAT) were carried out. Fasting blood glucose and standard oral glucose tolerance test, fasting serum insulin and plasma lipids were analysed. Homeostatic model assessment of insulin resistance was calculated. Systolic and diastolic blood pressures were measured. Results: CMD risk factors and MS were associated with all anthropometric features, except for high-density lipoprotein cholesterol levels ($p < 0.05$). The strongest association between MS and anthropometrics was seen with SAT ($\beta = 1.45 \pm 0.32$ in men and 0.88 ± 0.14 in women, both $p < 0.05$). Conclusions: Anthropometric measures, especially features of central obesity such as VAT and SAT, are relevant indicators of cardio-metabolic health in Kenyan populations. SAT is the strongest predictor of MS. These results highlight the need for further research on the pathological implication of VAT and SAT, in order to understand patterns of fat distribution and cardio-metabolic health among different ethnic groups. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30608195/
63.	Mutai WC, Muigai AWT, Waiyaki P, Kariuki S. Multi-drug resistant Salmonella enterica serovar Typhi isolates with reduced susceptibility to ciprofloxacin in Kenya. BMC Microbiol. 2018 Nov 14;18(1):187. **Abstract** Background: Typhoid fever remains a public health concern in developing countries especially among the poor who live in informal settlements devoid of proper sanitation and clean water supply. In addition antimicrobial resistance poses a major challenge in management of the disease. This study assessed the antimicrobial susceptibility patterns of Salmonella enterica serotype Typhi (S. Typhi) isolated from typhoid fever cases (2004-2007). Methods: A cross sectional study was conducted on 144 archived S. Typhi isolates (2004-2007) tested against 11 antimicrobial agents by quality controlled disk diffusion technique. Isolates resistant to ampicillin, chloramphenicol, and cotrimoxazole were considered Multidrug resistant (MDR). Thirty MDR isolates were selected randomly and further tested using minimum inhibitory concentration (MIC) E-test. Results: Sixteen percent (23/144) of the isolates were susceptible to all the antibiotics tested while 68% were resistant to three or more of the 11 antibiotics tested. The isolates showed a high susceptibility to ceftriaxone (94%) and gentamicin (97%). A high percentage of resistance was observed for the conventional first-line antibiotics;

	ampicillin (72%), chloramphenicol (72%), and cotrimoxazole (70%). Sixty-nine percent of the isolates (100/144) showed reduced susceptibility to ciprofloxacin. All the 30 (100%) isolates selected for MIC test were susceptible to amoxicillin-clavulanic acid. All except one of the 30 isolates were susceptible to ceftriaxone while majority 21 (70%) recorded an intermediate susceptibility to ciprofloxacin with MIC of 0.12-0.5 µg/mL. Conclusion: A large proportion of S. Typhi isolates were MDR and also showed reduced susceptibility to ciprofloxacin. Fluoroquinolone resistance is emerging and this may pose a challenge in treatment of typhoid in future. There is need for routine surveillance to monitor this phenotype in clinical settings. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30428828/
64.	Tama E, Molyneux S, Waweru E, Tsofa B, Chuma J, Barasa E. Examining the Implementation of the Free Maternity Services Policy in Kenya: A Mixed Methods Process Evaluation. Int J Health Policy Manag. 2018 Jul 1;7(7):603-613. **Abstract** Background: Kenya introduced a free maternity policy in 2013 to address the cost barrier associated with accessing maternal health services. We carried out a mixed methods process evaluation of the policy to examine the extent to which the policy had been implemented according to design, and positive experiences and challenges encountered during implementation. Methods: We conducted a mixed methods study in 3 purposely selected counties in Kenya. Data were collected through in-depth interviews (IDIs) with policy-makers at the national level, health managers at the county level, and frontline staff at the health facility level (n=60), focus group discussions (FGDs) with community representatives (n=10), facility records, and document reviews. We analysed the data using a framework approach. Results: Rapid implementation led to inadequate stakeholder engagement and confusion about the policy. While the policy was meant to cover antenatal visits, deliveries, and post-natal visits, in practice the policy only covered deliveries. While the policy led to a rapid increase in facility deliveries, this was not matched by an increase in health facility capacity and hence compromised quality of care. The policy led to an improvement in the level of revenues for facilities. However, in all three counties, reimbursements were not made on time. The policy did not have a system of verifying health facility reports on utilization of services. Conclusion: The Kenyan Ministry of Health (MoH) should develop a formal policy on the free maternity services, and provide clear guidelines on its content and implementation arrangements, engage with and effectively communicate the policy to stakeholders, ensure timeliness of payment disbursement to healthcare facilities, and introduce a mechanism for verifying utilization reports prepared by healthcare providers. User fee removal policies such as free maternity programmes should be accompanied by supply side capacity strengthening. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29996580/

65.	de Laurent ZR, Chebon LJ, Ingasia LA, Akala HM, Andagalu B, Ochola-Oyier LI, Kamau E. Polymorphisms in the K13 Gene in Plasmodium falciparum from Different Malaria Transmission Areas of Kenya. Am J Trop Med Hyg. 2018 May;98(5):1360-1366. **Abstract** The development of artemisinin (ART)-resistant parasites in Southeast Asia (SEA) threatens malaria control globally. Mutations in the Kelch 13 (K13)-propeller domain have been useful in identifying ART resistance in SEA. ART combination therapy (ACT) remains highly efficacious in the treatment of uncomplicated malaria in Sub-Saharan Africa (SSA). However, it is crucial that the efficacy of ACT is closely monitored. Toward this effort, this study profiled the prevalence of K13 nonsynonymous mutations in different malaria ecological zones of Kenya and in different time periods, before (pre) and after (post) the introduction of ACT as the first-line treatment of malaria. Nineteen nonsynonymous mutations were present in the pre-ACT samples (N = 64) compared with 22 in the post-ACT samples (N = 251). Eight of these mutations were present in both pre- and post-ACT parasites. Interestingly, seven of the shared single-nucleotide polymorphisms were at higher frequencies in the pre-ACT than the post-ACT parasites. The A578S mutation reported in SSA and the V568G mutation reported in SEA were found in both pre- and post-ACT parasites, with their frequencies declining post-ACT. D584Y and R539K mutations were found only in post-ACT parasites; changes in these codons have also been reported in SEA with different amino acids. The N585K mutation described for the first time in this study was present only in post-ACT parasites, and it was the most prevalent mutation at a frequency of 5.2%. This study showed the type, prevalence, and frequency of K13 mutations that varied based on the malaria ecological zones and also between the pre- and post-ACT time periods. Pubmed link-https://pubmed.ncbi.nlm.nih.gov/29582728/
66.	Adetifa IMO, Karia B, Mutuku A, Bwanaali T, Makumi A, Wafula J, Chome M, Mwatsuma P, Bauni E, Hammitt LL, Mataza C, Tabu C, Kamau T, Williams TN, Scott JAG. Coverage and timeliness of vaccination and the validity of routine estimates: Insights from a vaccine registry in Kenya. Vaccine. 2018 Dec 18;36(52):7965-7974. **Abstract** Background: The benefits of childhood vaccines are critically dependent on vaccination coverage. We used a vaccine registry (as gold standard) in Kenya to quantify errors in routine coverage methods (surveys and administrative reports), to estimate the magnitude of survivor bias, contrast coverage with timeliness and use both measures to estimate population immunity. Methods: Vaccination records of children in the Kilifi Health and Demographic Surveillance System (KHDSS), Kenya were combined with births, deaths, migration and residence data from 2010 to 17. Using inverse survival curves, we estimated up-to-date and age-appropriate vaccination coverage, calculated mean vaccination coverage in

	infancy as the area under the inverse survival curves, and estimated the proportion of fully immunised children (FIC). Results were compared with published coverage estimates. Risk factors for vaccination were assessed using Cox regression models. Results: We analysed data for 49,090 infants and 48,025 children aged 12-23 months in 6 birth cohorts and 6 cross-sectional surveys respectively, and found 2nd year of life surveys overestimated coverage by 2% compared to birth cohorts. Compared to mean coverage in infants, static coverage at 12 months was exaggerated by 7-8% for third doses of oral polio, pentavalent (Penta3) and pneumococcal conjugate vaccines, and by 24% for the measles vaccine. Surveys and administrative coverage also underestimated the proportion of the fully immunised child by 10-14%. For BCG, Penta3 and measles, timeliness was 23-44% higher in children born in a health facility but 20-37% lower in those who first attended during vaccine stock outs. Conclusions: Standard coverage surveys in 12-23 month old children overestimate protection by ignoring timeliness, and survivor and recall biases. Where delayed vaccination is common, up-to-date coverage will give biased estimates of population immunity. Surveys and administrative methods also underestimate FIC prevalence. Better measurement of coverage and more sophisticated analyses are required to control vaccine preventable diseases. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/30416017/
67.	Houston KA, George EC, Maitland K. Implications for paediatric shock management in resource-limited settings: a perspective from the FEAST trial. Crit Care. 2018 May 4;22(1):119. **Abstract** Background: Although the African "Fluid Expansion as Supportive therapy" (FEAST) trial showed fluid resuscitation was harmful in children with severe febrile illness managed in resource-limited hospitals, the most recent evidence reviewed World Health Organization (WHO) guidelines continue to recommend fluid boluses in children with shock according to WHO criteria "WHO shock", arguing that the numbers included in the FEAST trial were too small to provide reasonable certainty. Methods: We re-analysed the FEAST trial results for all international definitions for paediatric shock including hypotensive (or decompensated shock) and the WHO criteria. In addition, we examined the clinical relevance of the WHO criteria to published and unpublished observational studies reporting shock in resource-limited settings. Results: We established that hypotension was rare in children with severe febrile illness complicating only 29/3170 trial participants (0.9%). We confirmed that fluid boluses were harmful irrespective of the definitions of shock including the very small number with WHO shock (n = 65). In this subgroup 48% of bolus recipients died at 48 h compared to 20% of the non-bolus control group, an increased absolute risk of 28%, but translating to an increased relative risk of 240% (p = 0.07 (two-sided Fisher's exact test)). Examining studies describing the prevalence of the stringent WHO shock criteria in

	children presenting to hospital we found this was rare (~ 0.1%) and in these children mortality was very high (41.5-100%). Conclusions: The updated WHO guidelines continue to recommend boluses for a very limited number of children presenting at hospital with the strict definition of WHO shock. Nevertheless, the 3% increased mortality from boluses seen across FEAST trial participants would also include this subgroup of children receiving boluses. Recommendations aiming to differentiate WHO shock from other definitions will invariably lead to "slippage" at the bedside, with the potential of exposing a wider group of children to the harm of fluid-bolus therapy. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29728116/
68.	Masha SC, Cools P, Descheemaeker P, Reynders M, Sanders EJ, Vaneechoutte M. Urogenital pathogens, associated with Trichomonas vaginalis, among pregnant women in Kilifi, Kenya: a nested case-control study. BMC Infect Dis. 2018 Nov 6;18(1):549. **Abstract** Background: Screening of curable sexually transmitted infections is frequently oriented towards the diagnosis of chlamydia, gonorrhea, syphilis and trichomoniasis, whereas other pathogens, sometimes associated with similar urogenital syndromes, remain undiagnosed and/or untreated. Some of these pathogens are associated with adverse pregnancy outcomes. Methods: In a nested case-control study, vaginal swabs from 79 pregnant women, i.e., 28 T. vaginalis-positive (cases) and 51 T. vaginalis-negative (controls), were screened by quantitative PCR for Adenovirus 1 and 2, Cytomegalovirus, Herpes Simplex Virus 1 and 2, Chlamydia trachomatis, Escherichia coli, Haemophilus ducreyi, Mycoplasma genitalium, M. hominis, candidatus M. girerdii, Neisseria gonorrhoeae, Streptococcus agalactiae, Treponema pallidum, Ureaplasma parvum, U. urealyticum, and Candida albicans. Additionally, we determined whether women with pathogens highly associated with T. vaginalis had distinct clinical signs and symptoms compared to women with T. vaginalis mono-infection. Results: M. hominis was independently associated with T. vaginalis (adjusted odds ratio = 6.8, 95% CI: 2.3-19.8). Moreover, M. genitalium and Ca M. girerdii were exclusively detected in women with T. vaginalis (P = 0.002 and P = 0.001), respectively. Four of the six women co-infected with T. vaginalis and Ca M. girerdii complained of vaginal itching, compared to only 4 out of the 22 women infected with T. vaginalis without Ca M. girerdii (P = 0.020). Conclusion: We confirm M. hominis as a correlate of T. vaginalis in our population, and the exclusive association of both M. genitalium and Ca. M. girerdii with T. vaginalis. Screening and treatment of these pathogens should be considered. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30400890/

69.	Kahindi SC, Muriu S, Derua YA, Wang X, Zhou G, Lee MC, Mwangangi J, Atieli H, Githeko AK, Yan G. Efficacy and persistence of long-lasting microbial larvicides against malaria vectors in western Kenya highlands. Parasit Vectors. 2018 Jul 31;11(1):438. **Abstract** Background: Chemical-based malaria vector control interventions are threatened by the development of insecticide resistance and changes in the behavior of the vectors, and thus require the development of alternative control methods. Bacterial-based larvicides have the potential to target both insecticide resistant and outdoor-biting mosquitoes and are safe to use in the environment. However, the currently available microbial larvicide formulations have a short duration of activity requiring frequent re-applications which increase the cost of control interventions. This study was designed to evaluate the efficacy and duration of activity of two long-lasting formulations of Bacillus thuringiensis var. israelensis (Bti) and Bacillus sphaericus (Bs) (LL3 and FourStar®) under field conditions in western Kenya highlands. Methods: Three sites were selected for this study in the highlands of western Kenya. In each site, one hundred anopheline larval habitats were selected and assigned to one of three arms: (i) LL3; (ii) FourStar®; and (iii) untreated control larval habitats. Four types of larval habitats were surveyed: abandoned gold mines, drainage canals, fish ponds and non-fish ponds. The habitats were sampled for mosquito larvae by using a standard dipping technique and collected larvae were recorded according to the larval stages of the different Anopheles species. The larvicides were applied at manufacturers' recommended dosage of 1 briquette per 100 square feet. Both treatment and control habitats were sampled for mosquito larvae immediately before treatment (day 0), and then at 24 hours, 3 days and weekly post-treatment for 5 months. Results: Overall larval density in treatment habitats was significantly reduced after application of the two microbial larvicides as compared to the control habitats. Post-intervention reduction in anopheline larval density by LL3 was 65, 71 and 84% for 1 day, 2 weeks and 4 weeks, respectively. FourStar® reduced anopheline larval density by 60, 66 and 80% for 1 day, 2 weeks and 4 weeks, respectively. Comparisons between the treatments reveal that LL3 and FourStar® were similar in efficacy. A higher reduction in Anopheles larval density was observed in the abandoned goldmines, while drainage canals had the lowest reduction. Conclusions: Both LL3 and FourStar® long-lasting microbial larvicides were effective in reducing immature stages of An. gambiae complex and An. funestus group species, with significant reductions lasting for three months post-application. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30064498/
70.	McCollum R, Taegtmeyer M, Otiso L, Muturi N, Barasa E, Molyneux S, Martineau T, Theobald S. "Sometimes it is difficult for us to stand up and change this": an analysis of power within priority-setting for health following devolution in Kenya. BMC Health Serv Res. 2018 Nov 29;18(1):906. **Abstract**

	Background: Practices of power lie at the heart of policy processes. In both devolution and priority-setting, actors seek to exert power through influence and control over material, human, intellectual and financial resources. Priority-setting arises as a consequence of the needs and demand exceeding the resources available, requiring some means of choosing between competing demands. This paper examines the use of power within priority-setting processes for healthcare resources at sub-national level, following devolution in Kenya. Methods: We interviewed 14 national level key informants and 255 purposively selected respondents from across the health system in ten counties. These qualitative data were supplemented by 14 focus group discussions (FGD) involving 146 community members in two counties. We conducted a power analysis using Gaventa's power cube and Veneklasen's expressions of power to interpret our findings. Results: We found Kenya's transition towards devolution is transforming the former centralised balance of power, leading to greater ability for influence at the county level, reduced power at national and sub-county (district) levels, and limited change at community level. Within these changing power structures, politicians are felt to play a greater role in priority-setting for health. The interfaces and tensions between politicians, health service providers and the community has at times been felt to undermine health related technical priorities. Underlying social structures and discriminatory practices generally continue unchanged, leading to the continued exclusion of the most vulnerable from priority-setting processes. Conclusions: Power analysis of priority-setting at county level after devolution in Kenya highlights the need for stronger institutional structures, processes and norms to reduce the power imbalances between decision-making actors and to enable community participation. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30486867/
71.	Shen J, Olwanda E, Kahn JG, Huchko MJ. Cost of HPV screening at community health campaigns (CHCs) and health clinics in rural Kenya. BMC Health Serv Res. 2018 May 25;18(1):378. **Abstract** Background: Cervical cancer is the most frequent neoplasm among Kenyan women, with 4800 diagnoses and 2400 deaths per year. One reason is an extremely low rate of screening through pap smears, at 13.8% in 2014. Knowing the costs of screening will help planners and policymakers design, implement, and scale programs. Methods: We conducted HPV-based cervical cancer screening via self-collection in 12 communities in rural Migori County, Kenya. Six communities were randomized to community health campaigns (CHCs), and six to screening at government clinics. All HPV-positive women were referred for cryotherapy at Migori County Hospital. We prospectively estimated direct costs from the health system perspective, using micro-

	costing methods. Cost data were extracted from expenditure records, staff interviews, and time and motion logs. Total costs per woman screening included three activities: outreach, HPV-based screening, and notification. Types of inputs include personnel, recurrent goods, capital goods, and services. We costed potential changes to implementation for scaling. Results: From January to September 2016, 2899 women were screened in CHCs and 2042 in clinics. Each CHC lasted for 30 working days, 10 days each for outreach, screening, and notification. The mean cost per woman screened was $25.00 for CHCs [median: $25.09; Range: $22.06-30.21] and $29.56 for clinics [$28.90; $25.27-37.08]. Clinics had higher costs than CHCs for personnel ($14.27 vs. $11.26) and capital ($5.55 vs. $2.80). Screening costs were higher for clinics at $21.84, compared to $17.48 for CHCs. In contrast, CHCs had higher outreach costs ($3.34 vs. $0.17). After modeling a reduction in staffing, clinic per-screening costs ($25.69) were approximately equivalent to CHCs. Conclusions: HPV-based cervical cancer screening through community health campaigns achieved lower costs per woman screened, compared to screening at clinics. Periodic high-volume CHCs appear to be a viable low-cost strategy for implementing cervical cancer screening. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29801496/
72.	Shen J, Olwanda E, Kahn JG, Huchko MJ. Cost of HPV screening at community health campaigns (CHCs) and health clinics in rural Kenya. BMC Health Serv Res. 2018 May 25;18(1):378. **Abstract** Background: Cervical cancer is the most frequent neoplasm among Kenyan women, with 4800 diagnoses and 2400 deaths per year. One reason is an extremely low rate of screening through pap smears, at 13.8% in 2014. Knowing the costs of screening will help planners and policymakers design, implement, and scale programs. Methods: We conducted HPV-based cervical cancer screening via self-collection in 12 communities in rural Migori County, Kenya. Six communities were randomized to community health campaigns (CHCs), and six to screening at government clinics. All HPV-positive women were referred for cryotherapy at Migori County Hospital. We prospectively estimated direct costs from the health system perspective, using micro-costing methods. Cost data were extracted from expenditure records, staff interviews, and time and motion logs. Total costs per woman screening included three activities: outreach, HPV-based screening, and notification. Types of inputs include personnel, recurrent goods, capital goods, and services. We costed potential changes to implementation for scaling. Results: From January to September 2016, 2899 women were screened in CHCs and 2042 in clinics. Each CHC lasted for 30 working days, 10 days each for outreach, screening, and notification. The mean cost per woman screened was $25.00 for CHCs

	[median: $25.09; Range: $22.06-30.21] and $29.56 for clinics [$28.90; $25.27-37.08]. Clinics had higher costs than CHCs for personnel ($14.27 vs. $11.26) and capital ($5.55 vs. $2.80). Screening costs were higher for clinics at $21.84, compared to $17.48 for CHCs. In contrast, CHCs had higher outreach costs ($3.34 vs. $0.17). After modeling a reduction in staffing, clinic per-screening costs ($25.69) were approximately equivalent to CHCs. Conclusions: HPV-based cervical cancer screening through community health campaigns achieved lower costs per woman screened, compared to screening at clinics. Periodic high-volume CHCs appear to be a viable low-cost strategy for implementing cervical cancer screening. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29801496/
73.	Masyuko S, Mukui I, Njathi O, Kimani M, Oluoch P, Wamicwe J, Mutegi J, Njogo S, Anyona M, Muchiri P, Maikweki L, Musyoki H, Bahati P, Kyongo J, Marwa T, Irungu E, Kiragu M, Kioko U, Ogando J, Were D, Bartilol K, Sirengo M, Mugo N, Baeten JM, Cherutich P, PrEP Technical Working Group OBOT. Pre-exposure prophylaxis rollout in a national public sector program: the Kenyan case study. Sex Health. 2018 Nov;15(6):578-586. **Abstract** Background While advances have been made in HIV prevention and treatment, new HIV infections continue to occur. The introduction of pre-exposure prophylaxis (PrEP) as an additional HIV prevention option for those at high risk of HIV may change the landscape of the HIV epidemic, especially in sub-Saharan Africa, which bears the greatest HIV burden. Methods: This paper details Kenya's experience of PrEP rollout as a national public sector program. The process of a national rollout of PrEP guidance, partnerships, challenges, lessons learnt and progress related to national scale up of PrEP in Kenya, as of 2018, is described. National rollout of PrEP was strongly lead by the government, and work was executed through a multidisciplinary, multi-organisation dedicated team. This required reviewing available evidence, providing guidance to health providers, integration into existing logistic and health information systems, robust communication and community engagement. Mapping of the response showed that subnational levels had existing infrastructure but required targeted resources to catalyse PrEP provision. Rollout scenarios were developed and adopted, with prioritisation of 19 counties focusing on high incidence area and high potential PrEP users to maximise impact and minimise costs. Results: PrEP is now offered in over 900 facilities countrywide. There are currently over 14000 PrEP users 1 year after launching PrEP. Conclusions: Kenya becomes the first African country to rollout PrEP as a national program, in the public sector. This case study will provide guidance for low- and middle-

	income countries planning the rollout of PrEP in response to both generalised and concentrated epidemics. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30408432/
74.	Said Mohammed K, Kibinge N, Prins P, Agoti CN, Cotten M, Nokes DJ, Brand S, Githinji G. Evaluating the performance of tools used to call minority variants from whole genome short-read data. Wellcome Open Res. 2018 Sep 13;3:21. **Abstract** Background: High-throughput whole genome sequencing facilitates investigation of minority virus sub-populations from virus positive samples. Minority variants are useful in understanding within and between host diversity, population dynamics and can potentially assist in elucidating person-person transmission pathways. Several minority variant callers have been developed to describe low frequency sub-populations from whole genome sequence data. These callers differ based on bioinformatics and statistical methods used to discriminate sequencing errors from low-frequency variants. Methods: We evaluated the diagnostic performance and concordance between published minority variant callers used in identifying minority variants from whole-genome sequence data from virus samples. We used the ART-Illumina read simulation tool to generate three artificial short-read datasets of varying coverage and error profiles from an RSV reference genome. The datasets were spiked with nucleotide variants at predetermined positions and frequencies. Variants were called using FreeBayes, LoFreq, Vardict, and VarScan2. The variant callers' agreement in identifying known variants was quantified using two measures; concordance accuracy and the inter-caller concordance. Results: The variant callers reported differences in identifying minority variants from the datasets. Concordance accuracy and inter-caller concordance were positively correlated with sample coverage. FreeBayes identified the majority of variants although it was characterised by variable sensitivity and precision in addition to a high false positive rate relative to the other minority variant callers and which varied with sample coverage. LoFreq was the most conservative caller. Conclusions: We conducted a performance and concordance evaluation of four minority variant calling tools used to identify and quantify low frequency variants. Inconsistency in the quality of sequenced samples impacts on sensitivity and accuracy of minority variant callers. Our study suggests that combining at least three tools when identifying minority variants is useful in filtering errors when calling low frequency variants. Pubmed link-https://pubmed.ncbi.nlm.nih.gov/30483597/
75.	Macpherson L, Ogero M, Akech S, Aluvaala J, Gathara D, Irimu G, English M, Agweyu A. Risk factors for death among children aged 5-14 years hospitalised with pneumonia: a retrospective cohort study in Kenya. BMJ Glob Health. 2019 Sep 3;4(5):e001715. **Abstract** Introduction: There were almost 1 million deaths in children aged between 5 and 14 years in 2017, and pneumonia accounted for 11%. However, there are no validated guidelines for pneumonia management in older children and data to support their

	development are limited. We sought to understand risk factors for mortality among children aged 5-14 years hospitalised with pneumonia in district-level health facilities in Kenya. Methods: We did a retrospective cohort study using data collected from an established clinical information network of 13 hospitals. We reviewed records for children aged 5-14 years admitted with pneumonia between 1 March 2014 and 28 February 2018. Individual clinical signs were examined for association with inpatient mortality using logistic regression. We used existing WHO criteria (intended for under 5s) to define levels of severity and examined their performance in identifying those at increased risk of death. Results: 1832 children were diagnosed with pneumonia and 145 (7.9%) died. Severe pallor was strongly associated with mortality (adjusted OR (aOR) 8.06, 95% CI 4.72 to 13.75) as were reduced consciousness, mild/moderate pallor, central cyanosis and older age (>9 years) (aOR >2). Comorbidities HIV and severe acute malnutrition were also associated with death (aOR 2.31, 95% CI 1.39 to 3.84 and aOR 1.89, 95% CI 1.12 to 3.21, respectively). The presence of clinical characteristics used by WHO to define severe pneumonia was associated with death in univariate analysis (OR 2.69). However, this combination of clinical characteristics was poor in discriminating those at risk of death (sensitivity: 0.56, specificity: 0.68, and area under the curve: 0.62). Conclusion: Children >5 years have high inpatient pneumonia mortality. These findings also suggest that the WHO criteria for classification of severity for children under 5 years do not appear to be a valid tool for risk assessment in this older age group, indicating the urgent need for evidence-based clinical guidelines for this neglected population. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/31544003/
76.	Wandera EA, Mohammad S, Bundi M, Nyangao J, Galata A, Kathiiko C, Odoyo E, Guyo S, Miring'u G, Komoto S, Ichinose Y. Impact of rotavirus vaccination on rotavirus hospitalisation rates among a resource-limited rural population in Mbita, Western Kenya. Trop Med Int Health. 2018 Apr;23(4):425-432. **Abstract** Objectives: A two-dose oral monovalent rotavirus vaccine (RV1) was introduced into the Kenyan National Immunization Program in July 2014. We assessed trends in hospitalisation for rotavirus-specific acute gastroenteritis (AGE) and strain distribution among children <5 years in a rural, resource-limited setting in Kenya before and after the nationwide implementation of the vaccine. Methods: Data on rotavirus AGE and strain distribution were derived from a 5-year hospital-based surveillance. We compared rotavirus-related hospitalisations and strain distribution in the 2-year post-vaccine period with the 3-year pre-vaccine baseline. Vaccine administrative data from the Unit of Vaccines and Immunization Services (UVIS) for Mbita sub-county were used to estimate rotavirus immunisation coverage in the study area. Results: We observed a 48% (95% CI: 27-64%) overall decline in rotavirus-related hospitalisations among children aged <5 years in the post-vaccine period. Coverage with

	the last dose of rotavirus vaccine increased from 51% in year 1% to 72% in year 2 of the vaccine implementation. Concurrently, reductions in rotavirus hospitalisations increased from 40% in the first year to 53% in the second year of vaccine use. The reductions were most pronounced among the vaccine-eligible group, with the proportion of cases in this age group dropping to 14% in post-vaccine years from a high of 51% in the pre-vaccine period. A diversity of rotavirus strains circulated before the introduction of the vaccine with G1P[8] being the most dominant strain. G2P[4] replaced G1P[8] as the dominant strain after the vaccine was introduced. Conclusions: Rotavirus vaccination has resulted in a notable decline in hospital admissions for rotavirus infections in a rural resource-limited population in Kenya. This provides early evidence for continued use of rotavirus vaccines in routine childhood immunisations in Kenya. Our data also underscore the need for expanding coverage on second dose so as to maximise the impact of the vaccine. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29432666/
77.	Zhang Y, Fogel JM, Guo X, Clarke W, Breaud A, Cummings V, Hamilton EL, Ogendo A, Kayange N, Panchia R, Dominguez K, Chen YQ, Sandfort T, Eshleman SH. Antiretroviral drug use and HIV drug resistance among MSM and transgender women in sub-Saharan Africa. AIDS. 2018 Jun 19;32(10):1301-1306. **Abstract** Objective: To analyze antiretroviral drug use and HIV drug resistance among HIV-infected MSM and transgender women who were screened for participation in the HIV Prevention Trials Network 075 study. Methods: A qualitative assay was used to detect 20 antiretroviral drugs in five drug classes; this assay is based on liquid chromatography coupled with high-resolution accurate-mass mass spectrometry. HIV viral load testing was performed using the RealTime HIV-1 Viral Load Assay. HIV drug resistance testing was performed using the ViroSeq HIV-1 Genotyping System. Logistic regression was used to evaluate factors associated with study outcomes. Results: Antiretroviral drugs were detected in 63 (34.4%) of 183 participants who had confirmed HIV infection at screening; 11 (17.5%) of the 63 participants were not virally suppressed. Six (54.5%) of the 11 participants had drug-resistant HIV, including four who had multiclass resistance. Seven (63.6%) of the 11 were at risk of acquiring resistance to additional antiretroviral drugs. In multivariate model, antiretroviral drugs were more frequently detected in older participants, those recruited from Kisumu, Kenya, and those who reported ever having been in HIV care or on antiretroviral therapy (ART). Conclusion: Most of HIV-infected persons screened for participation in HIV Prevention Trials Network 075 were not on ART, and many of those who were on ART were not virally suppressed. Many of those participants had drug-resistant HIV. These findings highlight the need for improved HIV care for African MSM and transgender women. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29794492/

78.	Kamuyu G, Tuju J, Kimathi R, Mwai K, Mburu J, Kibinge N, Chong Kwan M,Hawkings S, Yaa R,Chepsat E, Njunge JM, Chege T, Guleid F, Rosenkranz M, Kariuki CK, Frank R, Kinyanjui SM,Murungi LM, Bejon P, Färnert A, Tetteh KKA, Beeson JG, Conway DJ, Marsh K, Rayner JC, Osier FHA. KILchip v1.0: A Novel Plasmodium falciparum Merozoite Protein Microarray to Facilitate Malaria Vaccine Candidate Prioritization. Front Immunol. 2018 Dec 11;9:2866. **Abstract** Passive transfer studies in humans clearly demonstrated the protective role of IgG antibodies against malaria. Identifying the precise parasite antigens that mediate immunity is essential for vaccine design, but has proved difficult. Completion of the Plasmodium falciparum genome revealed thousands of potential vaccine candidates, but a significant bottleneck remains in their validation and prioritization for further evaluation in clinical trials. Focusing initially on the Plasmodium falciparum merozoite proteome, we used peer-reviewed publications, multiple proteomic and bioinformatic approaches, to select and prioritize potential immune targets. We expressed 109 P. falciparum recombinant proteins, the majority of which were obtained using a mammalian expression system that has been shown to produce biologically functional extracellular proteins, and used them to create KILchip v1.0: a novel protein microarray to facilitate high-throughput multiplexed antibody detection from individual samples. The microarray assay was highly specific; antibodies against P. falciparum proteins were detected exclusively in sera from malaria-exposed but not malaria-naïve individuals. The intensity of antibody reactivity varied as expected from strong to weak across well-studied antigens such as AMA1 and RH5 (Kruskal-Wallis H test for trend: $p < 0.0001$). The inter-assay and intra-assay variability was minimal, with reproducible results obtained in re-assays using the same chip over a duration of 3 months. Antibodies quantified using the multiplexed format in KILchip v1.0 were highly correlated with those measured in the gold-standard monoplex ELISA [median (range) Spearman's R of 0.84 (0.65-0.95)]. KILchip v1.0 is a robust, scalable and adaptable protein microarray that has broad applicability to studies of naturally acquired immunity against malaria by providing a standardized tool for the detection of antibody correlates of protection. It will facilitate rapid high-throughput validation and prioritization of potential Plasmodium falciparum merozoite-stage antigens paving the way for urgently needed clinical trials for the next generation of malaria vaccines. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30619257/
79.	Williams PCM, Berkley JA. Guidelines for the treatment of severe acute malnutrition: a systematic review of the evidence for antimicrobial therapy. Paediatr Int Child Health. 2018 Nov;38(sup1):S32-S49. **Abstract** Background Severe acute malnutrition (SAM) affects nearly 20 million children worldwide and is responsible for up to 1 million deaths per year in children under the age

	of 5 years. Current WHO guidelines recommend oral amoxicillin for children with uncomplicated malnutrition and parenteral benzylpenicillin and gentamicin for those with complicated malnutrition. Because of cost pressures and increasing antimicrobial resistance, the administration of empirical antibiotics for children with SAM has recently been debated. Methods A systematic review of the current published literature was undertaken to assess the efficacy, safety, cost-effectiveness and pharmacokinetics of antimicrobial treatment of children with SAM in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses. Results The initial search found 712 papers, eight of which met the inclusion criteria. Quality assessment of the studies was performed as per the Grading of Recommendations Assessment, Development and Evaluation guidelines. International guidelines and clinical data registries were also reviewed which identified inconsistencies in current first- and second-line therapies and dosing regimens. Conclusion Current evidence supports the continued use of broad-spectrum oral amoxicillin for treating children with uncomplicated SAM as outpatients. There is no strong evidence to justify changing the current parenteral therapy guidelines for children admitted with complicated SAM, although they should be clarified to harmonise the dosage regimen of amoxicillin for the treatment of SAM to 40 mg/kg twice daily, and to continue parenteral antimicrobials beyond 2 days if indicated by the clinical condition. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29790840/
80.	Brent AJ, Mugo D, Musyimi R, Mutiso A, Morpeth SC, Levin M, Scott JAG. Author Correction: Bacteriological diagnosis of childhood TB: a prospective observational study. Sci Rep. 2018 May 3;8(1):7223. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29725073/
81.	Haenssgen MJ, Charoenboon N, Zanello G, Mayxay M, Reed-Tsochas F, Jones COH,Kosaikanont R, Praphattong P, Manohan P, Lubell Y, Newton PN, Keomany S, Wertheim HFL, Lienert J, Xayavong T, Warapikuptanun P, Khine Zaw Y, U-Thong P,Benjaroon P, Sangkham N, Wibunjak K, Chai-In P, Chailert S, Thavethanutthanawin P, Promsutt K, Thepkhamkong A, Sithongdeng N, Keovilayvanh M, Khamsoukthavong N, Phanthasomchit P, Phanthavong C, Boualaiseng S, Vongsavang S, Greer RC, Althaus T, Nedsuwan S, Intralawan D, Wangrangsimakul T, Limmathurotsakul D, Ariana P.Antibiotics and activity spaces: protocol of an exploratory study of behaviour, marginalisation and knowledge diffusion. BMJ Glob Health. 2018 Mar 28;3(2):e000621. **Abstract** Background: Antimicrobial resistance (AMR) is a global health priority. Leading UK and global strategy papers to fight AMR recognise its social and behavioural dimensions, but current policy responses to improve the popular use of antimicrobials (eg, antibiotics) are limited to education and awareness-raising campaigns. In response to conceptual,

	methodological and empirical weaknesses of this approach, we study people's antibiotic-related health behaviour through three research questions.RQ1: What are the manifestations and determinants of problematic antibiotic use in patients' healthcare-seeking pathways?RQ2: Will people's exposure to antibiotic awareness activities entail changed behaviours that diffuse or dissipate within a network of competing healthcare practices?RQ3: Which proxy indicators facilitate the detection of problematic antibiotic behaviours across and within communities? Methods: We apply an interdisciplinary analytical framework that draws on the public health, medical anthropology, sociology and development economics literature. Our research involves social surveys of treatment-seeking behaviour among rural dwellers in northern Thailand (Chiang Rai) and southern Lao PDR (Salavan). We sample approximately 4800 adults to produce district-level representative and social network data. Additional 60 cognitive interviews facilitate survey instrument development and data interpretation. Our survey data analysis techniques include event sequence analysis (RQ1), multilevel regression (RQ1-3), social network analysis (RQ2) and latent class analysis (RQ3). Discussion: Social research in AMR is nascent, but our unprecedentedly detailed data on microlevel treatment-seeking behaviour can contribute an understanding of behaviour beyond awareness and free choice, highlighting, for example, decision-making constraints, problems of marginalisation and lacking access to healthcare and competing ideas about desirable behaviour. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29629190/
82.	Lam NL, Muhwezi G, Isabirye F, Harrison K, Ruiz-Mercado I, Amukoye E, Mokaya T, Wambua M, Bates MN. Exposure reductions associated with introduction of solar lamps to kerosene lamp-using households in Busia County, Kenya. Indoor Air. 2018 Mar;28(2):218-227. **Abstract** Solar lamps are a clean and potentially cost-effective alternative to polluting kerosene lamps used by millions of families in developing countries. By how much solar lamps actually reduce exposure to pollutants, however, has not been examined. Twenty households using mainly kerosene for lighting were enrolled through a secondary school in Busia County, Kenya. Personal PM2.5 and CO concentrations were measured on a school pupil and an adult in each household, before and after provision of 3 solar lamps. PM2.5 concentrations were measured in main living areas, pupils' bedrooms, and kitchens. Usage sensors measured use of kerosene and solar lighting devices. Ninety percent of baseline kerosene lamp use was displaced at 1-month follow-up, corresponding to average PM2.5 reductions of 61% and 79% in main living areas and pupils' bedrooms, respectively. Average 48-h exposure to PM2.5 fell from 210 to 104 μg/m3 (-50%) among adults, and from 132 to 35 μg/m3 (-73%) among pupils. Solar lamps displaced most kerosene lamp use in at least the short term. If sustained, this could mitigate health impacts of household air pollution in some contexts. Achieving safe

	levels of exposure for all family members would likely require also addressing use of solid-fuel stoves. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29028275/
83.	Okungu V, Chuma J, Mulupi S, McIntyre D. Extending coverage to informal sector populations in Kenya: design preferences and implications for financing policy. BMC Health Serv Res. 2018 Jan 9;18(1):13. **Abstract** Background: Universal health coverage (UHC) is important in terms of improving access to quality health care while protecting households from the risk of catastrophic health spending and impoverishment. However, progress to UHC has been hampered by the measures to increase mandatory prepaid funds especially in low- and middle-income countries where there are large populations in the informal sector. Important considerations in expanding coverage to the informal sector should include an exploration of the type of prepayment system that is acceptable to the informal sector and the features of such a design that would encourage prepayment for health care among this population group. The objective of the study was to document the views of informal sector workers regarding different prepayment mechanisms, and critically analyze key design features of a future health system and the policy implications of financing UHC in Kenya. Methods: This was part of larger study which involved a mixed-methods approach. The following tools were used to collect data from informal sector workers: focus group discussions [N = 16 (rural = 7; urban = 9)], individual in-depth interviews [N = 26 (rural = 14; urban = 12)] and a questionnaire survey [N = 455(rural = 129; urban = 326)]. Thematic approach was used to analyze qualitative data while Stata v.11 involving mainly descriptive analysis was used in quantitative data. The tools mentioned were used to collect data to meet various objectives of a larger study and what is presented here constitutes a small section of the data generated by these tools. Results: The findings show that informal sector workers in rural and urban areas prefer different prepayment systems for financing UHC. Preference for a non-contributory system of financing UHC was particularly strong in the urban study site (58%). Over 70% in the rural area preferred a contributory mechanism in financing UHC. The main concern for informal sector workers regardless of the overall design of the financing approach to UHC included a poor governance culture especially one that does not punish corruption. Other reasons especially with regard to the contributory financing approach included high premium costs and inability to enforce contributions from informal sector. Conclusion: On average 47% of all study participants, the largest single majority, are in favor of a non-contributory financing mechanism. Strong evidence from existing literature indicates difficulties in implementing social contributions as the primary financing mechanism for UHC in contexts with large informal sector populations. Non-contributory financing should be strongly recommended to policymakers to be the primary financing mechanism and supplemented by social contributions.

	Pubmed link-https://pubmed.ncbi.nlm.nih.gov/29316925/
84.	Munge K, Mulupi S, Barasa EW, Chuma J. A Critical Analysis of Purchasing Arrangements in Kenya: The Case of the National Hospital Insurance Fund. Int J Health Policy Manag. 2018 Mar 1;7(3):244-254. **Abstract** Background: Purchasing refers to the process by which pooled funds are paid to providers in order to deliver a set of health care interventions. Very little is known about purchasing arrangements in low- and middle-income countries (LMICs), and certainly not in Kenya. This study aimed to critically analyse purchasing arrangements in Kenya, using the National Hospital Insurance Fund (NHIF) as a case study. Methods: We applied a principal-agent relationship framework, which identifies three pairs of principal-agent relationships (government-purchaser, purchaser-provider, and citizen-purchaser) and specific actions required within them to achieve strategic purchasing. A qualitative case study approach was applied. Data were collected through document reviews (statutes, policy and regulatory documents) and in-depth interviews (n=62) with key informants including NHIF officials, Ministry of Health (MoH) officials, insurance industry actors, and health service providers. Documents were summarised using standardised forms. Interviews were recorded, transcribed verbatim, and analysed using a thematic framework approach. Results: The regulatory and policy framework for strategic purchasing in Kenya was weak and there was no clear accountability mechanism between the NHIF and the MoH. Accountability mechanisms within the NHIF have developed over time, but these emphasized financial performance over other aspects of purchasing. The processes for contracting, monitoring, and paying providers do not promote equity, quality, and efficiency. This was partly due to geographical distribution of providers, but also due to limited capacity within the NHIF. There are some mechanisms for assessing needs, preferences, and values to inform design of the benefit package, and while channels to engage beneficiaries exist, they do not always function appropriately and awareness of these channels to the beneficiaries is limited. Conclusion: Addressing the gaps in the NHIF's purchasing performance requires a number of approaches. Critically, there is a need for the government through the MoH to embrace its stewardship role in health, while recognizing the multiplicity of actors given Kenya's devolved context. Relatively recent decentralisation reforms present an opportunity that should be grasped to rewrite the contract between the government, the NHIF and Kenyans in the pursuit of universal health coverage (UHC). **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29524953/
85.	Nyiro JU, Munywoki P, Kamau E, Agoti C, Gichuki A, Etyang T, Otieno G, NokesDJ. Surveillance of respiratory viruses in the outpatient setting in rural coastal Kenya: baseline epidemiological observations. Wellcome Open Res. 2018 Jul 25;3:89. **Abstract**

	Background: Endemic and seasonally recurring respiratory viruses are a major cause of disease and death globally. The burden is particularly severe in developing countries. Improved understanding of the source of infection, pathways of spread and persistence in communities would be of benefit in devising intervention strategies. Methods: We report epidemiological data obtained through surveillance of respiratory viruses at nine outpatient health facilities within the Kilifi Health and Demographic Surveillance System, Kilifi County, coastal Kenya, between January and December 2016. Nasopharyngeal swabs were collected from individuals of all ages presenting with acute respiratory infection (ARI) symptoms (up to 15 swabs per week per facility) and screened for 15 respiratory viruses using real-time PCR. Paediatric inpatient surveillance at Kilifi County Hospital for respiratory viruses provided comparative data. Results: Over the year, 5,647 participants were sampled, of which 3,029 (53.7%) were aged <5 years. At least one target respiratory virus was detected in 2,380 (42.2%) of the samples; the most common being rhinovirus 18.6% (1,050), influenza virus 6.9% (390), coronavirus 6.8% (387), parainfluenza virus 6.6% (371), respiratory syncytial virus (RSV) 3.9% (219) and adenovirus 2.7% (155). Virus detections were higher among <5-year-olds compared to older children and adults (50.3% vs 32.7%, respectively; χ 2(1) =177.3, P=0.0001). Frequency of viruses did not differ significantly by facility (χ 2(8) =13.38, P=0.072). However, prevalence was significantly higher among inpatients than outpatients in <5-year-olds for RSV (22.1% vs 6.0%; χ 2(1) = 159.4, P=0.0001), and adenovirus (12.4% vs 4.4%, χ 2(1) =56.6, P=0.0001). Conclusions: Respiratory virus infections are common amongst ARI outpatients in this coastal Kenya setting, particularly in young children. Rhinovirus predominance warrants further studies on the health and socio-economic implications. RSV and adenovirus were more commonly associated with severe disease. Further analysis will explore epidemiological transmission patterns with the addition of virus sequence data. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/30175247/
86.	Pyra M, Haberer JE, Heffron R, Kidoguchi L, Brown ER, Bukusi EA, Asiimwe S, Celum C, Katabira E, Mugo NR, Baeten JM; Partners Demonstration Project Team. Brief Report: PrEP Use During Periods of HIV Risk Among East African Women in Serodiscordant Relationships. J Acquir Immune Defic Syndr. 2018 Jan 1;77(1):41-45. **Abstract** Background: Pre-exposure prophylaxis (PrEP) is efficacious for African women at risk for HIV, but data on adherence outside clinical trials are sparse. We describe the persistence and execution of PrEP use among women participating in a large open-label PrEP demonstration project, particularly during periods of HIV risk. Setting and methods: Three hundred ten HIV-uninfected women in HIV serodiscordant couples in Kenya and Uganda were offered and accepted PrEP. Electronic monitoring caps were used to measure daily PrEP adherence. Time on PrEP while at risk for HIV (when the HIV-infected partner was on antiretroviral therapy <6 months) and weekly

	adherence while on PrEP were calculated and compared among older and younger (<25 years old) women. Results: As defined above, women were at risk for HIV for an average of 361 days; 54% took PrEP during their entire risk period and 24% stopped but restarted PrEP during their risk period. While on PrEP, women took ≥6 doses/wk for 78% of weeks [67% of weeks for women aged <25 years, 80% of weeks for women aged ≥25 years (P < 0.001)], and ≥4 doses for 88% of weeks [80% for those <25, 90% for those ≥25, (P < 0.001)]. Compared with historical, risk-matched controls, HIV incidence was reduced 93% (95% confidence interval: 77% to 98%) for all women and 91% (95% confidence interval: 29% to 99%) among women aged <25 years. Conclusion: Women, including young women, in HIV-serodiscordant couples took PrEP successfully over sustained periods of risk. Although young women had lower adherence than older women, they achieved strong protection, which suggests that women can align PrEP use to periods of risk and imperfect adherence can still provide substantial benefit. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29016523/
87.	Al Zahrani MH, Omar AI, Abdoon AMO, Ibrahim AA, Alhogail A, Elmubarak M, Elamin YE, AlHelal MA, Alshahrani AM, Abdelgader TM, Saeed I, El Gamri TB, Alattas MS, Dahlan AA, Assiri AM, Maina J, Li XH, Snow RW. Cross-border movement, economic development and malaria elimination in the Kingdom of Saudi Arabia. BMC Med. 2018 Jun 26;16(1):98. **Abstract** Malaria at international borders presents particular challenges with regards to elimination. International borders share common malaria ecologies, yet neighboring countries are often at different stages of the control-to-elimination pathway. Herein, we present a case study on malaria, and its control, at the border between Saudi Arabia and Yemen. Malaria program activity reports, case data, and ancillary information have been assembled from national health information systems, archives, and other related sources. Information was analyzed as a semi-quantitative time series, between 2000 and 2017, to provide a plausibility framework to understand the possible contributions of factors related to control activities, conflict, economic development, migration, and climate. The malaria recession in the Yemeni border regions of Saudi Arabia is a likely consequence of multiple, coincidental factors, including scaled elimination activities, cross-border vector control, periods of low rainfall, and economic development. The temporal alignment of many of these factors suggests that economic development may have changed the receptivity to the extent that it mitigated against surges in vulnerability posed by imported malaria from its endemic neighbor Yemen. In many border areas of the world, malaria is likely to be sustained through a complex congruence of factors, including poverty, conflict, and migration. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29940950/

88.	Kariuki SM, Abubakar A, Kombe M, Kazungu M, Odhiambo R, Stein A, Newton CRJC. Prevalence, risk factors and behavioural and emotional comorbidity of acute seizures in young Kenyan children: a population-based study. BMC Med. 2018 Mar 7;16(1):35. **Abstract** Background: Acute symptomatic seizures and febrile seizures are common in children admitted to hospitals in Africa and may be markers of brain dysfunction. They may be associated with behavioural and emotional problems, but there are no published community-based studies in Africa. Methods: We screened 7047 children aged 1-6 years (randomly sampled from 50,000 in the community) for seizures (using seven questions) and invited those who screened positive and a proportion of negatives for a clinical assessment. Risk factors were identified using a parental questionnaire. Behavioural and emotional problems were examined using the Child Behaviour Checklist (CBCL) in 3273 children randomly selected from 7047. Generalised linear models with appropriate link functions were used to determine risk factors and associations between behavioural or emotional problems and acute seizures. Sobel-Goodman mediation tests were used to investigate if the association between acute seizures and CBCL scores was mediated by co-diagnosis of epilepsy. Results: Acute seizures were identified in 429 (6.1%) preschool children: 3.2% (95% confidence interval CI: 2.9-3.5%) for symptomatic seizures, and 2.9% (95% CI: 2.6-3.3%) for febrile seizures. Risk factors for acute seizures included family history of febrile seizures (odds ratio OR = 3.19; 95% CI: 2.03-5.01) and previous hospitalisation (OR = 6.65; 95% CI: 4.60-9.63). Total CBCL problems occurred more frequently in children with acute seizures (27%; 95% CI: 21-34%) than for those without seizures (11%; 95% CI: 11-12%; chi-squared $p \leq 0.001$). Acute seizures were associated with total CBCL problems (adjusted risk ratio (aRR) = 1.92; 95% CI: 1.34-2.77), externalising problems (aRR = 1.82; 95% CI: 1.21-2.75) and internalising problems (aRR = 1.57; 95% CI: 1.22-2.02), with the proportion of the comorbidity mediated by a co-diagnosis of epilepsy being small (15.3%; 95% CI: 4.5-34.9%). Risk factors for this comorbidity included family history of febrile seizures (risk ratio (RR) = 3.36; 95% CI: 1.34-8.41), repetitive acute seizures ($\beta = 0.36$; 95% CI: 0.15-0.57) and focal acute seizures (RR = 1.80; 95% CI: 1.05-3.08). Conclusions: Acute seizures are common in preschool children in this area and are associated with behavioural and emotional problems. Both conditions should be assessed and addressed in children. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29510713/
89.	Jones C, Talisuna AO, Snow RW, Zurovac D. "We were being treated like the Queen": understanding trial factors influencing high paediatric malaria treatment adherence in western Kenya. Malar J. 2018 Jan 5;17(1):8. **Abstract**

	Background: Adherence to anti-malarial medication is highly variable but frequently suboptimal. Numerous interventions with a variety of methodological approaches have been implemented to address the problem. A recently conducted, randomized, controlled trial in western Kenya evaluated the effects of short message service (SMS) reminders on paediatric adherence to artemether-lumefantrine (AL) and found over 97% adherence rates in both intervention and control arms. The current study was undertaken to explore participants' experiences in the trial and identify the factors contributing to the high adherence rates. Methods: In July 2016, 5 months after the trial completion, focus group discussions (FGDs) were undertaken with caregivers of children who had been treated in the intervention (n = 2) or control (n = 2) arms and who, post-trial, had received malaria treatment from the same facilities. The FGDs explored similarities and differences in perceptions and experiences of the care they received during and after the trial. Results: Intervention-arm participants reported that SMS messages were effective dosing reminders. Participants from both arms reported that trial instructions to keep empty AL packs for verification during a home visit by a health worker affected their dosing and adherence practices. Differences between trial and post-trial treatment experiences included: administration of the first AL dose by health workers with demonstration of dispersible tablets dilution; advice on what to do if a child vomited; clear instructions on timing of dosing with efforts made to ensure understanding; and, information that dose completion was necessary with explanation provided. Participants reported that after the trial AL was not available at facilities, constraining their ability to adhere to recommended malaria treatment. They emphasized receiving respectful and personal treatment from trial health workers contributing to perceptions of high quality care and enhanced readiness to adhere to dosing instructions. Conclusions: This study highlights the complex range of factors that influence AL adherence. The results suggest that in addition to standardized definitions and measurement of adherence, and the influence of enrolment procedures, AL adherence trials need to take account of how intervention impact can be influenced by differences in the quality of care received under trial and routine conditions. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29304798/
90	Gona JK, Newton CR, Hartley S, Bunning K. Persons with disabilities as experts-by experience: using personal narratives to affect community attitudes in Kilifi, Kenya. BMC Int Health Hum Rights. 2018 May 8;18(1):18 **Abstract** Background: The last decade has seen improved public awareness of disability in sub-Saharan Africa. However, negative and stereotypical views of disability still persist in many communities. We conducted a study to promote awareness of disability in rural Kenya, using a process of reflection and education. This paper reports on the second aspect - education. The research question was: How can personal narratives of living with disability affect community attitudes and responses to disability?

	Methods: A qualitative phenomenological approach was adopted. Twenty community-based groups involving 249 participants took part. Each group participated in one focus group discussion at baseline, to explore the members' personal experiences and views of disability. The intervention involved three adults with disabilities sharing their personal narratives with each group. After the intervention, repeat focus group discussions were conducted with each group. Thematic analysis was carried out according to the framework method. Results: The emergent framework consisted of four main themes, organised as opposing constructs: 'burden' and 'agency', 'sub-human' and 'human'. 'Burden' focused on the perceived hopelessness of the situation. Post-intervention revealed greater support for the 'agency' of persons with disabilities, evidenced by what the person could do, rather than their inability, and the relevance of support. The 'sub-human' to 'human' construct captured dehumanising and discriminating practice towards persons with disabilities on one side, and recognition of the person and inclusion in the community on the other. Whilst support and empathy were evident at the pre-intervention stage, post-intervention revealed greater recognition of people with disabilities as fellow human beings. Conclusion: This study provides a proof of concept regarding the deployment of persons with disabilities as agents for change. Exposure to experts-by-experience provided community groups with opportunities to reflect on, examine and adjust their views on disability in this rural part of Kenya. The sharing of personal narratives appeared to resonate with group members, to encourage recognition of the person and not just the disability, and to move their resolve toward ideas for collective action. Further research is needed to assess the effects of such interventions. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29739403/
91.	Khara T, Mwangome M, Ngari M, Dolan C. Children concurrently wasted and stunted: A meta-analysis of prevalence data of children 6-59 months from 84 countries. Matern Child Nutr. 2018 Apr;14(2):e12516. **Abstract** Children can be stunted and wasted at the same time. Having both deficits greatly elevates risk of mortality. The analysis aimed to estimate the prevalence and burden of children aged 6-59 months concurrently wasted and stunted. Data from demographic and health survey and Multi-indicator Cluster Surveys datasets from 84 countries were analysed. Overall prevalence for being wasted, stunted, and concurrently wasted and stunted among children 6 to 59 months was calculated. A pooled prevalence of concurrence was estimated and reported by gender, age, United Nations regions, and contextual categories. Burden was calculated using population figures from the global joint estimates database. The pooled prevalence of concurrence in the 84 countries was 3.0%, 95% CI [2.97, 3.06], ranging from 0% to 8.0%. Nine countries reported a concurrence prevalence greater than 5%. The estimated burden was 5,963,940 children. Prevalence of concurrence was highest in the 12- to 24-month age group 4.2%, 95% CI

	[4.1, 4.3], and was significantly higher among boys 3.54%, 95% CI [3.47, 3.61], compared to girls; 2.46%, 95% CI [2.41, 2.52]. Fragile and conflict-affected states reported significantly higher concurrence 3.6%, 95% CI [3.5, 3.6], than those defined as stable 2.24%, 95% CI [2.18, 2.30]. This analysis represents the first multiple country estimation of the prevalence and burden of children concurrently wasted and stunted. Given the high risk of mortality associated with concurrence, the findings indicate a need to report on this condition as well as investigate whether these children are being reached through existing programmes. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/28944990/
92.	Jones KDJ, Hachmeister CU, Khasira M, Cox L, Schoenmakers I, Munyi C, Nassir HS, Hünten-Kirsch B, Prentice A, Berkley JA. Vitamin D deficiency causes rickets in an urban informal settlement in Kenya and is associated with malnutrition. Matern Child Nutr. 2018 Jan;14(1):e12452. **Abstract** The commonest cause of rickets worldwide is vitamin D deficiency, but studies from sub-Saharan Africa describe an endemic vitamin D-independent form that responds to dietary calcium enrichment. The extent to which calcium-deficiency rickets is the dominant form across sub-Saharan Africa and in other low-latitude areas is unknown. We aimed to characterise the clinical and biochemical features of young children with rickets in a densely populated urban informal settlement in Kenya. Because malnutrition may mask the clinical features of rickets, we also looked for biochemical indices of risk in children with varying degrees of acute malnutrition. Twenty one children with rickets, aged 3 to 24 months, were identified on the basis of clinical and radiologic features, along with 22 community controls, and 41 children with either severe or moderate acute malnutrition. Most children with rickets had wrist widening (100%) and rachitic rosary (90%), as opposed to lower limb features (19%). Developmental delay (52%), acute malnutrition (71%), and stunting (62%) were common. Compared to controls, there were no differences in calcium intake, but most (71%) had serum 25-hydroxyvitamin D levels below 30 nmol/L. These results suggest that rickets in young children in urban Kenya is usually driven by vitamin D deficiency, and vitamin D supplementation is likely to be required for full recovery. Wasting was associated with lower calcium ($p = .001$), phosphate ($p < .001$), 25-hydroxyvitamin D ($p = .049$), and 1,25-dihydroxyvitamin D ($p = 0.022$) levels, the clinical significance of which remain unclear. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/28470840/
93.	Agweyu A, Oliwa J, Gathara D, Muinga N, Allen E, Lilford RJ, English M. Comparable outcomes among trial and nontrial participants in a clinical trial of antibiotics for childhood pneumonia: a retrospective cohort study. J Clin Epidemiol. 2018 Feb;94:1-7. **Abstract** Objectives: We compared characteristics and outcomes of children enrolled in a randomized controlled trial (RCT) comparing oral amoxicillin and benzyl penicillin for

	the treatment of chest indrawing pneumonia vs. children who received routine care to determine the external validity of the trial results. Study design and setting: A retrospective cohort study was conducted among children aged 2-59 months admitted in six Kenyan hospitals. Data for nontrial participants were extracted from inpatient records upon conclusion of the RCT. Mortality among trial vs. nontrial participants was compared in multivariate models. Results: A total of 1,709 children were included, of whom 527 were enrolled in the RCT and 1,182 received routine care. History of a wheeze was more common among trial participants (35.4% vs. 11.2%; P < 0.01), while dehydration was more common among nontrial participants (8.6% vs. 5.9%; P = 0.05). Other patient characteristics were balanced between the two groups. Among those with available outcome data, 14/1,140 (1.2%) nontrial participants died compared to 4/527 (0.8%) enrolled in the trial (adjusted odds ratio, 0.7; 95% confidence interval: 0.2-2.1). Conclusion: Patient characteristics were similar, and mortality was low among trial and nontrial participants. These findings support the revised World Health Organization treatment recommendations for chest indrawing pneumonia. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29097339/
94.	Pyra M, Brown ER, Haberer JE, Heffron R, Celum C, Bukusi EA, Asiimwe S, Katabira E, Mugo NR, Baeten JM; Partners Demonstration Project Team. Patterns of Oral PrEP Adherence and HIV Risk Among Eastern African Women in HIV Serodiscordant Partnerships. AIDS Behav. 2018 Nov;22(11):3718-3725. **Abstract** Understanding how women use PrEP is important for developing successful implementation programs. We hypothesized there are distinct patterns of adherence, related to HIV risk and other factors. We identified patterns of PrEP adherence and HIV risk behavior over the first 6 months of PrEP use, using data from 233 HIV-uninfected women in high-risk serodiscordant couples in a demonstration project in Kenya & Uganda. We modeled PrEP adherence, assessed by daily electronic monitoring, and HIV risk behavior using group-based trajectory models. We tested baseline covariates and risk behavior group as predictors of adherence patterns. There were four distinct adherence patterns: high steady adherence (55% of population), moderate steady (29%), late declining (8%), and early declining (9%). No baseline characteristics significantly differed between adherence patterns. Adherence patterns differed in average weekly doses (6.7 vs 5.4 vs 4.1 vs 1.5, respectively). Two risk behavior groups were identified: steady HIV risk (78% of population) and declining (22%). Compared to women with declining HIV risk behavior, women with steady risk behavior were more likely to have high steady adherence (61% vs 35%) and less likely to have early (6% vs 17%) or late (4% vs 19%) declining adherence. Women's use of PrEP was associated with concurrent HIV risk behavior; higher risk was associated with higher, sustained adherence. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30006791/

95.	Jawara M, Jatta E, Bell D, Burkot TR, Bradley J, Hunt V, Kandeh B, Jones C, Manjang AM, Pinder M, Stone S, D'Alessandro U, Knudsen J, Lindsay SW. New Prototype Screened Doors and Windows for Excluding Mosquitoes from Houses: A Pilot Study in Rural Gambia. Am J Trop Med Hyg. 2018 Dec;99(6):1475-1484. A**bstract** Despite compelling evidence that modern housing protects against malaria, houses in endemic areas are still commonly porous to mosquitoes. The protective efficacy of four prototype screened doors and two windows designs against mosquito house entry, their impact on indoor climate, as well as their use, durability and acceptability was assessed in a Gambian village. A baseline survey collected data on all the houses and discrete household units, each consisting of a front and back room, were selected and randomly allocated to the study arms. Each prototype self-closing screened door and window was installed in six and 12 units, respectively, with six unaltered units serving as controls. All prototype doors reduced the number of house-entering mosquitoes by 59-77% in comparison with the control houses. The indoor climate of houses with screened doors was similar to control houses. Seventy-nine percentage of door openings at night occurred from dusk to midnight, when malaria vectors begin entering houses. Ten weeks after installation the doors and windows were in good condition, although 38% of doors did not fully self-close and latch (snap shut). The new doors and windows were popular with residents. The prototype door with perforated concertinaed screening was the best performing door because it reduced mosquito entry, remained fully functional, and was preferred by the villagers. Screened doors and windows may be useful tools for reducing vector exposure and keeping areas malaria-free after elimination, when investment in routine vector control becomes difficult to maintain. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30350770/
96.	Kabogo J, Muniu E, Wamunyokoli F, Musoke R, Songok E. Evidence of reduced treatment adherence among HIV infected paediatric and adolescent populations in Nairobi at the onset of the UNAIDS Universal Test and Treat Program. BMC Res Notes. 2018 Feb 17;11(1):134. **Abstract** Objective: We conducted a retrospective cohort study to evaluate the efficacy of the World Health Organization (WHO) "Universal Test and Treat" (UTT) policy, initiated in Kenya in September 2016. Under this policy, every human immunodeficiency virus (HIV)-infected person should be initiated on antiretroviral therapy (ART). We compared intra- and inter-group viral suppression and ART adherence rates for pre-UTT (initiated on ART in March-August 2016) and UTT groups (initiated in September 2016). The study was conducted in a community outreach Program in Nairobi with 3500 HIV-infected children enrolled. Results: 122 children and adolescents were initiated on first-line ART pre-UTT, and 197 during the UTT period. The 6 month viral suppression rate was 79.7% pre-UTT versus 76.6% UTT ($P < 0.05$). Suboptimal adherence was higher in the UTT than pre-UTT

	period (88 of 197, 44.7% and 44 of 122, 34%; P < 0.001). The decrease in adherence was greater among orphans (91.7% pre-UTT and 87.2% UTT, P = 0.001) and children 11-18 years. Our results show that successful implementation of the UTT policy in Africa is challenged by an increased risk of suboptimal adherence. There is a need to develop extra strategies to support adherence, especially among orphans and teenagers. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29452597/
97.	Abong'o B, Yu X, Donnelly MJ, Geier M, Gibson G, Gimnig J, Ter Kuile F, Lobo NF, Ochomo E, Munga S, Ombok M, Samuels A, Torr SJ, Hawkes FM. Host Decoy Trap (HDT) with cattle odour is highly effective for collection of exophagic malaria vectors. Parasit Vectors. 2018 Oct 15;11(1):533. **Abstract** Background: As currently implemented, malaria vector surveillance in sub-Saharan Africa targets endophagic and endophilic mosquitoes, leaving exophagic (outdoor blood-feeding) mosquitoes underrepresented. We evaluated the recently developed host decoy trap (HDT) and compared it to the gold standard, human landing catch (HLC), in a 3 × 3 Latin square study design outdoors in western Kenya. HLCs are considered to represent the natural range of Anopheles biting-behaviour compared to other sampling tools, and therefore, in principle, provide the most reliable profile of the biting population transmitting malaria. The HDT incorporates the main host stimuli that attract blood-meal seeking mosquitoes and can be baited with the odours of live hosts. Results: Numbers and species diversity of trapped mosquitoes varied significantly between HLCs and HDTs baited with human (HDT-H) or cattle (HDT-C) odour, revealing important differences in behaviour of Anopheles species. In the main study in Kisian, the HDT-C collected a nightly mean of 43.2 (95% CI: 26.7-69.8) Anopheles, compared to 5.8 (95% CI: 4.1-8.2) in HLC, while HDT-H collected 0.97 (95% CI: 0.4-2.1), significantly fewer than the HLC. Significantly higher proportions of An. arabiensis were caught in HDT-Cs (0.94 ± 0.01; SE) and HDT-Hs (0.76 ± 0.09; SE) than in HLCs (0.45 ± 0.05; SE) per trapping night. The proportion of An. gambiae (s.s.) was highest in HLC (0.55 ± 0.05; SE) followed by HDT-H (0.20 ± 0.09; SE) and least in HDT-C (0.06 ± 0.01; SE). An unbaited HDT placed beside locales where cattle are usually corralled overnight caught mostly An. arabiensis with proportions of 0.97 ± 0.02 and 0.80 ± 0.2 relative to the total anopheline catch in the presence and absence of cattle, respectively. A mean of 10.4 (95% CI: 2.0-55.0) Anopheles/night were trapped near cattle, compared to 0.4 (95% CI: 0.1-1.7) in unbaited HDT away from hosts. Conclusions: The capability of HDTs to combine host odours, heat and visual stimuli to simulate a host provides the basis of a system to sample human- and cattle-biting mosquitoes. HDT-C is particularly effective for collecting An. arabiensis outdoors. The HDT offers the prospect of a system to monitor and potentially control An. arabiensis and other outdoor-biting mosquitoes more effectively.

	Pubmed link- https://pubmed.ncbi.nlm.nih.gov/30318015/
98.	EA, Nambati Kiarie WC, Kimani F, Kimotho JH, Otinga MS, Too E, Kaniaru S, Limson J, Bulimo W. Unclear association between levels of Plasmodium falciparum lactate dehydrogenase (PfLDH) in saliva of malaria patients and blood parasitaemia: diagnostic implications? Malar J. 2018 Jan 5;17(1):9. **Abstract** Background: The use of saliva in diagnosis of infectious diseases is an attractive alternative to procedures that involve blood drawing. It promises to reduce risks associated with accidental needle pricks and improve patient compliance particularly in malaria survey and drug efficacy studies. Quantification of parasitaemia is useful in establishing severity of disease and in assessing individual patient response to treatment. In current practice, microscopy is the recommended technique, despite its limitations. This study measured the levels of Plasmodium falciparum lactate dehydrogenase (PfLDH) in saliva of malaria patients and investigated the relationship with blood parasitaemia. Methods: Matched pre-treatment blood and saliva samples were collected from patients at Msambweni District Hospital, Kenya. Parasitaemia was determined and only those confirmed to be Plasmodium falciparum mono-infected were recruited. PfLDH was quantified in saliva using a commercial ELISA kit. A total of 175 samples were collected. Relationship between blood parasitaemia and concentration of PfLDH in saliva was determined using Pearson correlation statistics. F test was used to determine whether there is a significant difference between levels of PfLDH in saliva of patients with moderate to high parasitaemia and those with low parasitaemia. Results: One-hundred and seventy-five patient samples were positive for malaria by microscopy. Of these, 62 (35%) tested positive for PfLDH in saliva, 113 (65%) were false negatives. For those that tested positive, (53) 85% were from patients with moderate to high parasitaemia while 9 (15%) were from patients with low parasitaemia. A correlation co-efficient of 0.18 indicated a weak positive relationship between the concentration of PfLDH in saliva and blood parasitaemia. There was a marginal difference between levels of PfLDH in saliva of patients with moderate to high parasitaemia and those with low parasitaemia [F (1, 59) = 1.83, p = 0.1807]. Conclusion: The results indicate that there is a weak correlation between levels of PfLDH in saliva and blood parasitaemia. This is weak association could be as a result of low sensitivity of the assay used as well as presence of inhibitors and proteases in saliva. Further studies should be focused towards reducing the number of false negatives and developing a customised assay that is specific for detection of PfLDH in saliva. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29304786/
99.	English M, Mwaniki P, Julius T, Chepkirui M, Gathara D, Ouma PO, Cherutich P, Okiro EA, Snow RW. Hospital Mortality - a neglected but rich source of information supporting the transition to higher quality health systems in low and middle income countries. BMC Med. 2018 Mar 1;16(1):32.

	Abstract Background: There is increasing focus on the strength of primary health care systems in low and middle-income countries (LMIC). There are important roles for higher quality district hospital care within these systems. These hospitals are also sources of information of considerable importance to health systems, but this role, as with the wider roles of district hospitals, has been neglected. Key messages: As we make efforts to develop higher quality health systems in LMIC we highlight the critical importance of district hospitals focusing here on how data on hospital mortality offers value: i) in understanding disease burden; ii) as part of surveillance and impact monitoring; iii) as an entry point to exploring system failures; and iv) as a lens to examine variability in health system performance and possibly as a measure of health system quality in its own right. However, attention needs paying to improving data quality by addressing reporting gaps and cause of death reporting. Ideally enabling the collection of basic, standardised patient level data might support at least simple case-mix and case-severity adjustment helping us understand variation. Better mortality data could support impact evaluation, benchmarking, exploration of links between health system inputs and outcomes and critical scrutiny of geographic variation in quality and outcomes of care. Improved hospital information is a neglected but broadly valuable public good. Conclusion: Accurate, complete and timely hospital mortality reporting is a key attribute of a functioning health system. It can support countries' efforts to transition to higher quality health systems in LMIC enabling national and local advocacy, accountability and action. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29495961/
100.	Kendagor A, Gathecha G, Ntakuka MW, Nyakundi P, Gathere S, Kiptui D, Abubakar H, Ombiro O, Juma P, Ngaruiya C. Prevalence and determinants of heavy episodic drinking among adults in Kenya: analysis of the STEPwise survey, 2015. BMC Public Health. 2018 Nov 7;18(Suppl 3):1216. **Abstract** Background: Globally, alcohol consumption contributes to 3.3 million deaths and 5.1% of Disability Adjusted Life Years (DALYs), and its use is linked with more than 200 disease and injury conditions. Our study assessed the frequency and patterns of Heavy Episodic Drinking (HED) in Kenya. HED is defined as consumption of 60 or more grams of pure alcohol (6+ standard drinks in most countries) on at least one single occasion per month. Understanding the burden and patterns of heavy episodic drinking will be helpful to inform strategies that would curb the problem in Kenya. Methods: Using the WHO STEPwise approach to surveillance (STEPS) tool, a nationally representative household survey of 4203 adults aged 18-69 years was conducted in Kenya between April and June 2015. We used logistic regression analysis to assess factors associated with HED among both current and former alcohol drinkers. We

	included the following socio-demographic variables: age, sex, and marital status, level of education, socio-economic status, residence, and tobacco as an interaction factor. Results: The prevalence of HED was 12.6%. Men were more likely to engage in HED than women (unadjusted OR 9.9 95%, CI 5.5-18.8). The highest proportion of HED was reported in the 18-29-year age group (35.5%). Those currently married/ cohabiting had the highest prevalence of HED (60%). Respondents who were separated had three times higher odds of HED compared to married counterparts (OR 2.7, 95% CI 1.3-5.7). Approximately 16.0% of respondents reported cessation of alcohol use due to health reasons. Nearly two thirds reported drinking home-brewed beers or wines. Tobacco consumption was associated with higher odds of HED (unadjusted OR 6.9, 95% CI 4.4-10.8); those that smoke (34.4%) were more likely to engage in HED compared to their non-smoking counterparts. Conclusion: Our findings highlight a significant prevalence of HED among alcohol drinkers in Kenya. Young males, those with less education, married people, and tobacco users were more likely to report heavy alcohol use, with male sex as the primary driving factor. These findings are novel to the country and region; they provide guidance to target alcohol control interventions for different groups in Kenya. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30400910/
101.	Afulani P, Kusi C, Kirumbi L, Walker D. Companionship during facility-based childbirth: results from a mixed-methods study with recently delivered women and providers in Kenya. BMC Pregnancy Childbirth. 2018 May 10;18(1):150. **Abstract** Background: Research suggests that birth companionship, and in particular, continuous support during labor and delivery, can improve women's childbirth experience and birth outcomes. Yet, little is known about the extent to which birth companionship is practiced, as well as women and providers' perceptions of it in low-resource settings. This study aimed to assess the prevalence and determinants of birth companionship, and women and providers' perceptions of it in health facilities in a rural County in Western Kenya. Methods: We used quantitative and qualitative data from 3 sources: surveys with 877 women, 8 focus group discussions with 58 women, and in-depth interviews with 49 maternity providers in the County. Eligible women were 15 to 49 years old and delivered in the 9 weeks preceding the study. Results: About 88% of women were accompanied by someone from their social network to the health facility during their childbirth, with 29% accompanied by a male partner. Sixty-seven percent were allowed continuous support during labor, but only 29% were allowed continuous support during delivery. Eighteen percent did not desire companionship during labor and 63% did not desire it during delivery. Literate, wealthy, and employed women, as well as women who delivered in health centers and did not experience birth complications, were more likely to be allowed continuous support during labor. Most women desired a companion during labor to attend to their needs.

	Reasons for not desiring companions included embarrassment and fear of gossip and abuse. Most providers recommended birth companionship, but stated that it is often not possible due to privacy concerns and other reasons mainly related to distrust of companions. Providers perceive companions' roles more in terms of assisting them with non-clinical tasks than providing emotional support to women. Conclusion: Although many women desire birth companionship, their desires differ across the labor and delivery continuum, with most desiring companionship during labor but not at the time of delivery. Most, however, don't get continuous support during labor and delivery. Interventions with women, companions, and providers, as well as structural and health system intervent ions, are needed to promote continuous support during labor and delivery. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29747593/
102.	Ssewanyana D, Abubakar A, van Baar A, Mwangala PN, Newton CR. Perspectives on Underlying Factors for Unhealthy Diet and Sedentary Lifestyle of Adolescents at a Kenyan Coastal Setting. Front Public Health. 2018 Feb 9;6:11. **Abstract** Unhealthy diet and physical inactivity are among the key modifiable risk factors for non-communicable diseases, such as diabetes and cardiovascular disease. Although such diseases often only appear in adulthood, these behaviors are typically initiated or reinforced already during adolescence. However, knowledge on underlying factors for adolescents' unhealthy dieting and physical inactivity in sub-Saharan Africa (SSA) is poor. We conducted in-depth interviews and focus group discussions to explore the perceptions of a diverse group of 78 young people of 10-19 years of age, which also included some adolescents living with HIV, as this is an emerging group in the HIV/AIDS epidemic in many parts of SSA. In addition, 10 stakeholders, such as teachers, clinicians, and staff from organizations at the Kenyan coast and seven young adult community representatives informed us on: (a) adolescents' unhealthy food choices and their forms of sedentary behavior; (b) predisposing factors; and (c) protective factors against unhealthy food choices and sedentary behavior of adolescents living in Kilifi County. The findings reveal that adolescents occasionally access nutritious foods, such as fruits, vegetables, and animal protein. However, there is a growing tendency to consume unbalanced diets with high intake of carbohydrates, oily foods, and consumption of sugar dense processed foods and drinks. Sports and domestic chores were found to be major sources of physical activity. Sedentary lifestyles characterized by a long-time sitting and chatting, watching sports games and movies were described. Adolescents living with HIV did not indicate any divergent perceptions from those of other adolescents relating to diet and physical activity, but mentioned health-related conditions, such as medication, asthma, and low body weight, as a risk factors for sedentary lifestyle. Using a Socio-Ecological model, our findings suggest that risk factors are numerous and interrelated, especially at intrapersonal, interpersonal, and community level. The negative influences at an intrapersonal level were as follows: body image concerns, attitudes and

	misconceptions, substance use behavior, and taste for unhealthy foods. In the interpersonal domain, household poverty and parenting practices that condone unhealthy habits were identified risk factors. Availability of affordable unhealthy foods, high prices for nutritious food, farming practices, gambling, and influx of transportation alternatives in the community were interrelated but also had relationships with intrapersonal and interpersonal risk factors. Modernization and poor implementation of policies were discussed as enabling factors especially by stakeholders from a societal perspective. Seasonality and farming practices, school attendance, community-based services, and regulations mitigating adolescents' engagement in gambling were identified as potential protective factors. Our findings provide a unique qualitative insight of the factors underlying adolescents' dietary and sedentary lifestyle and highlight the need for ecological intervention approaches to address these forms of health risk behavior in a rural African setting. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29479525/
103.	Okanda J, Otieno G, Kinuthia J, Kohler P, John-Stewart G. Higher likelihood of 6-months exclusive breastfeeding among HIV infected than uninfected mothers: a household survey in Kenya. Int Breastfeed J. 2018 Nov 29;13:51. **Abstract** Background: Exclusive breastfeeding (EBF) (breast milk feeding without additional food or drink, except medicine) is associated with deceased risk of postnatal transmission of HIV from mother to child. Methods: This analysis used data from a household survey in Western Kenya in 2011. Participants were mothers with HIV and uninfected mothers, aged ≥14 years who gave birth in the prior year (ever breastfed) within the Kenya Medical Research Institute/US Centers for Disease Control and Prevention (KEMRI/CDC) Health and Demographic Surveillance System. Data on breastfeeding counseling and knowledge and practices regarding breastfeeding were collected. Rates and correlates of EBF were determined using multivariable logistic regression. Results: Of 652 mothers enrolled in the study, 435 were included in this analysis. Median age was 28 years among 154 mothers with HIV and 25 years among 281 uninfected mothers. Mothers with HIV were more likely than uninfected mothers to report breastfeeding counseling at a health facility (88.9% vs. 51.6%, respectively, $p < 0.001$) and EBF for 6-months (64.9% versus 34.5%, $p < 0.001$). Premastication (pre-chewing of food by adults prior to feeding to children) was less prevalent among mothers with HIV (3.9% vs. 13.2% $p = 0.001$) who were also more knowledgeable about potential risk of HIV transmission through premastication (83.1% vs 71.2% $p = 0.005$). Mothers with HIV who EBF for six months were 3.68-fold more likely to report counseling on EBF (aOR 3.68; 95% CI: 1.00,13.70). Uninfected mothers with polygamous marriage, any antenatal care visit, unskilled delivery and delayed breastfeeding initiation (> 1 h) were less likely to practice EBF for six months 62% (aOR 0.38; 95%CI: 0.20,0.94), 72% (aOR

	0.28; 95%CI: 0.10,1.00), 54% (aOR 0.46; 95% CI: 0.22,1.00) and 46% (aOR 0.54; 95%CI: 0.30,1.00) respectively. Conclusions: Mothers with HIV were more likely to report breastfeeding counseling at a health facility, EBF for six months and less likely to practice premastication than uninfected mothers. Lessons learned from breastfeeding counseling in mothers with HIV could be used to improve awareness and change breastfeeding practices for all mothers. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30519276/
104.	Dumas SE, Maranga A, Mbullo P, Collins S, Wekesa P, Onono M, Young SL. "Men Are in Front at Eating Time, but Not When It Comes to Rearing the Chicken": Unpacking the Gendered Benefits and Costs of Livestock Ownership in Kenya. Food Nutr Bull. 2018 Mar;39(1):3-27. **Abstract** Background: Livestock can promote resilience in low-income communities through a number of pathways. Livestock development programs seek to amplify these benefits but often fail to consider the costs to intended beneficiaries or the effect of prevailing gender norms. Objective: To explore perceptions of livestock ownership among female smallholder livestock keepers in Nyanza Region, Kenya, and unpack how the distribution of livestock benefits and investments varies by gender within households. Methods: We used multiple ethnographic techniques, including Photovoice, a photo-elicitation interview method, focus group discussions, and pile sorts, with female smallholder livestock owners (n = 18) participating in an ongoing cohort study. Transcripts were coded using a combination of a priori constructs and grounded theory. Results: We found that livestock benefited households by providing financial security, food security, social benefits, and human time and labor savings. However, these benefits largely promoted long-term household resilience rather than immediate gains. Livestock ownership also had major costs to household time and labor, which were overwhelmingly borne by women and children. Despite this investment, women had limited livestock ownership rights, decision-making power, control over income, or access to meat. Conclusions: Our findings suggest that livestock ownership requires significant investments of household time and labor, which disproportionately burden women. Prevailing gender inequalities may therefore constrain the net benefit of livestock ownership for many women and their households in some contexts. Livestock development programs must assess both program benefits and costs at multiple levels to ensure that women's participation in livestock production leads to improved individual and household outcomes. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29226708/
105.	Molla M, Negussie H, Ngari M, Kivaya E, Njuguna P, Enqueselassie F, Berkley JA, Davey G. Pragmatism in practice: lessons learned during screening and enrollment for a

	randomised controlled trial in rural northern Ethiopia. BMC Med Res Methodol. 2018 Mar 7;18(1):26. **Abstract** Background: We use the example of the Gojjam Lymphoedema Best Practice Trial (GoLBeT), a pragmatic trial in a remote rural setting in northern Ethiopia, to extract lessons relevant to other investigators balancing the demands of practicality and community acceptability with internal and external validity in clinical trials. Methods: We explain in detail the preparation for the trial, its setting in northern Ethiopia, the identification and selection of patients (inclusion and exclusion criterion, identifying and screening of patients at home, enrollment of patients at the health centres and health posts), and randomisation. Results: We describe the challenges met, together with strategies employed to overcome them. Conclusions: Examples given in the previous section are contextualised and general principles extracted where possible. We conclude that it is possible to conduct a trial that balances approaches that support internal validity (e.g. careful design of proformas, accurate case identification, control over data quality and high retention rates) with those that favour generalisability (e.g. 'real world' setting and low rates of exclusion). Strategies, such as Rapid Ethical Assessment, that increase researchers' understanding of the study setting and inclusion of hard-to-reach participants are likely to have resource and time implications, but are vital in achieving an appropriate balance. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29514613/
106.	McGann PT, Williams TN, Olupot-Olupot P, Tomlinson GA, Lane A, Luís Reis da Fonseca J, Kitenge R, Mochamah G, Wabwire H, Stuber S, Howard TA, McElhinney K, Aygun B, Latham T, Santos B, Tshilolo L, Ware RE; REACH Investigators. Realizing effectiveness across continents with hydroxyurea: Enrollment and baseline characteristics of the multicenter REACH study in Sub-Saharan Africa. Am J Hematol. 2018 Aug;93(4):537-545. **Abstract** Despite its well-described safety and efficacy in the treatment of sickle cell anemia (SCA) in high-income settings, hydroxyurea remains largely unavailable in sub-Saharan Africa, where more than 75% of annual SCA births occur and many comorbidities exist. Realizing Effectiveness Across Continents with Hydroxyurea (REACH, ClinicalTrials.gov NCT01966731) is a prospective, Phase I/II open-label trial of hydroxyurea designed to evaluate the feasibility, safety, and benefits of hydroxyurea treatment for children with SCA in four sub-Saharan African countries. Following comprehensive training of local research teams, REACH was approved by local Ethics Committees and achieved full enrollment ahead of projections with 635 participants enrolled over a 30-month period, despite half of families living >12 km from their clinical site. At enrollment, study participants (age 5.4 ± 2.4 years) had substantial morbidity, including a history of vaso-occlusive pain (98%), transfusion (68%), malaria

	(85%), and stroke (6%). Significant differences in laboratory characteristics were noted across sites, with lower hemoglobin concentrations ($P < .01$) in Angola (7.2 ± 1.0 g/dL) and the DRC (7.0 ± 0.9 g/dL) compared to Kenya (7.4 ± 1.1 g/dL) and Uganda (7.5 ± 1.1 g/dL). Analysis of known genetic modifiers of SCA demonstrated a high frequency of α-thalassemia (58.4% with at least a single α-globin gene deletion) and G6PD deficiency (19.7% of males and 2.4% of females) across sites. The CAR β-globin haplotype was present in 99% of participants. The full enrollment to REACH confirms the feasibility of conducting high-quality SCA research in Africa; this study will provide vital information to guide safe and effective dosing of hydroxyurea for children with SCA living in Africa. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29318647/
107.	Odhiambo Sewe M, Bunker A, Ingole V, Egondi T, Oudin Åström D, Hondula DM, Rocklöv J, Schumann B. Estimated Effect of Temperature on Years of Life Lost: A Retrospective Time-Series Study of Low-, Middle-, and High-Income Regions. Environ Health Perspect. 2018 Jan 12;126(1):017004. **Abstract** Background: Numerous studies have reported a strong association between temperature and mortality. Additional insights can be gained from investigating the effects of temperature on years of life lost (YLL), considering the life expectancy at the time of death. Objectives: The goal of this work was to assess the association between temperature and YLL at seven low-, middle-, and high-income sites. Methods: We obtained meteorological and population data for at least nine years from four Health and Demographic Surveillance Sites in Kenya (western Kenya, Nairobi), Burkina Faso (Nouna), and India (Vadu), as well as data from cities in the United States (Philadelphia, Phoenix) and Sweden (Stockholm). A distributed lag nonlinear model was used to estimate the association of daily maximum temperature and daily YLL, lagged 0-14 d. The reference value was set for each site at the temperature with the lowest YLL. Results: Generally, YLL increased with higher temperature, starting day 0. In Nouna, the hottest location, with a minimum YLL temperature at the first percentile, YLL increased consistently with higher temperatures. In Vadu, YLL increased in association with heat, whereas in Nairobi, YLL increased in association with both low and high temperatures. Associations with cold and heat were evident for Phoenix (stronger for heat), Stockholm, and Philadelphia (both stronger for cold). Patterns of associations with mortality were generally similar to those with YLL. Conclusions: Both high and low temperatures are associated with YLL in high-, middle-, and low-income countries. Policy guidance and health adaptation measures might be improved with more comprehensive indicators of the health burden of high and low temperatures such as YLL. https://doi.org/10.1289/EHP1745. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29342452/
108.	Chongwo E, Ssewanyana D, Nasambu C, Mwangala PN, Mwangi PM, Nyongesa MK, Newton CR, Abubakar A. Validation of a Swahili version of the World Health

	Organization 5-item well-being index among adults living with HIV and epilepsy in rural coastal Kenya. Glob Health Res Policy. 2018 Sep 10;3:26. **Abstract** Objective: The purpose of this study was to evaluate the psychometric properties of the World Health Organization's five item well-being index (WHO-5) when administered to adults living with HIV or epilepsy in a rural setting at the coast of Kenya. Methods: A case control study design was conducted among 230 adults aged 18-50 years, who comprised 147 cases (63 living with epilepsy and 84 living with HIV) and 83 healthy controls. The participants were administered to a face-to-face interview during which they completed the Swahili version of WHO-5 well-being index, the Major Depression Inventory (MDI) and responded to some items on their socio-demographic characteristics. Analysis to assess internal consistency, construct validity, discriminant validity, and convergent validity of the Swahili version of WHO-5 well-being index was conducted. A multivariate regression was carried out to assess the association between psychological wellbeing (assessed using Swahili version of WHO-5 well-being index) and having a chronic illness (HIV or epilepsy). Results: The Swahili version of WHO-5 well-being index demonstrated good internal consistency with Cronbach alpha ranges of 0.86-0.88 among the three study groups. The tool had good discriminant validity. A one factor structure of the tool was obtained from confirmatory factor analysis (overall Comparative Fit Index = 1.00, Tuckler Lewis Index = 1.01, Root Mean Square of Error Approximation = 0.00). Living with HIV or epilepsy in comparison to being a healthy control was significantly associated with greater odds of having sub-optimal psychological wellbeing. Conclusion: Our findings demonstrate that the Swahili version of WHO-5 well-being index has good psychometric properties and is appropriate for use to evaluate psychological well-being among adults living with chronic conditions such as HIV or epilepsy from a rural low resource setting in Kenya. Given its brevity and ease of use, the Swahili version of WHO-5 well-being index could potentially be used by lay workers and other paraprofessional to monitor psychological well-being among chronically ill adults in resource poor settings. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30214943/
109.	Hassan AS, Esbjörnsson J, Wahome E, Thiong'o A, Makau GN, Price MA, Sanders EJ. HIV-1 subtype diversity, transmission networks and transmitted drug resistance amongst acute and early infected MSM populations from Coastal Kenya. PLoS One. 2018 Dec 18;13(12):e0206177. **Abstract** Background: HIV-1 molecular epidemiology amongst men who have sex with men (MSM) in sub-Saharan Africa remains not well characterized. We aimed to determine HIV-1 subtype distribution, transmission clusters and transmitted drug resistance (TDR) in acute and early infected MSM from Coastal Kenya.

	Methods: Analysis of HIV-1 partial pol sequences from MSM recruited 2005-2017 and sampled within six months of the estimated date of infection. Volunteers were classified as men who have sex with men exclusively (MSME) or with both men and women (MSMW). HIV-1 subtype and transmission clusters were determined by maximum-likelihood phylogenetics. TDR mutations were determined using the Stanford HIV drug resistance database. Results: Of the 97 volunteers, majority (69%) were MSMW; 74%, 16%, 9% and 1% had HIV-1 subtypes A1, D, C or G, respectively. Overall, 65% formed transmission clusters, with substantial mixing between MSME and MSMW. Majority of volunteer sequences were either not linked to any reference sequence (56%) or clustered exclusively with sequences of Kenyan origin (19%). Eight (8% [95% CI: 4-16]) had at least one TDR mutation against nucleoside (n = 2 [2%]) and/or non-nucleoside (n = 7 [7%]) reverse transcriptase inhibitors. The most prevalent TDR mutation was K103N (n = 5), with sequences forming transmission clusters of two and three taxa each. There were no significant differences in HIV-1 subtype distribution and TDR between MSME and MSMW. Conclusions: This HIV-1 MSM epidemic was predominantly sub-subtype A1, of Kenyan origin, with many transmission clusters and having intermediate level of TDR. Targeted HIV-1 prevention, early identification and care interventions are warranted to break the transmission cycle amongst MSM from Coastal Kenya. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30562356/
110.	Haaland RE, Otieno K, Martin A, Katana A, Dinh C, Slutsker L, Menendez C, Gonzalez R, Williamson J, Heneine W, Desai M. Short Communication: Reduced Nevirapine Concentrations Among HIV-Positive Women Receiving Mefloquine for Intermittent Preventive Treatment for Malaria Control During Pregnancy. AIDS Res Hum Retroviruses. 2018 Nov;34(11):912-915. **Abstract** Clinical trials demonstrated intermittent preventive treatment in pregnancy with mefloquine (MQ) reduced malaria rates among pregnant women, yet an unexpected higher risk of mother-to-child transmission (MTCT) of HIV among HIV-positive women receiving MQ has also been observed. To determine if interactions between antiretroviral drugs (ARVs) and MQ could contribute to the increased MTCT observed in women receiving MQ, we performed a retrospective cross-sectional analysis of ARV plasma concentrations in peripheral blood (maternal plasma) and cord blood (cord plasma) collected at delivery from 186 mothers participating in a randomized clinical trial of MQ (n = 102) compared with placebo (n = 84) in Kenya. Plasma zidovudine (AZT), lamivudine (3TC), and nevirapine (NVP) concentrations were measured by high-performance liquid chromatography-tandem mass spectrometry. Although only 4% (7/186) reported not using these ARVs, AZT, 3TC, and NVP were all below the limit of detection in 44% of maternal plasma and 42% of cord plasma samples, and proportions were similar between the two study arms. Median concentrations of AZT and 3TC were

	not significantly lower in the MQ arm compared with the placebo arm for maternal plasma and cord plasma ($p > .05$). However, median NVP concentrations were significantly lower in the MQ study arm compared with the placebo study arm in both maternal plasma (1,597 ng/mL vs. 2,353 ng/mL, Mann-Whitney Rank Sum, $p = .023$) and cord plasma (2,038 ng/mL vs. 2,434 ng/mL, $p = .048$). Reduced NVP concentrations in maternal and cord plasma of women receiving MQ suggest MQ may affect NVP metabolism for both mother and infant. These results highlight the need to evaluate potential drug-drug interactions between candidate antimalarials and ARVs for use in pregnant women. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30173559/
111.	Kleinschmidt I, Bradley J, Knox TB, Mnzava AP, Kafy HT, Mbogo C, Ismail BA, Bigoga JD, Adechoubou A, Raghavendra K, Cook J, Malik EM, Nkuni ZJ, Macdonald M, Bayoh N, Ochomo E, Fondjo E, Awono-Ambene HP, Etang J, Akogbeto M, Bhatt RM, Chourasia MK, Swain DK, Kinyari T, Subramaniam K, Massougbodji A, Okê-Sopoh M, Ogouyemi-Hounto A, Kouambeng C, Abdin MS, West P, Elmardi K, Cornelie S, Corbel V, Valecha N, Mathenge E, Kamau L, Lines J, Donnelly MJ. Implications of insecticide resistance for malaria vector control with long-lasting insecticidal nets: a WHO-coordinated, prospective, international, observational cohort study. Lancet Infect Dis. 2018 Jun;18(6):640-649. Abstract Background: Scale-up of insecticide-based interventions has averted more than 500 million malaria cases since 2000. Increasing insecticide resistance could herald a rebound in disease and mortality. We aimed to investigate whether insecticide resistance was associated with loss of effectiveness of long-lasting insecticidal nets and increased malaria disease burden. Methods: This WHO-coordinated, prospective, observational cohort study was done at 279 clusters (villages or groups of villages in which phenotypic resistance was measurable) in Benin, Cameroon, India, Kenya, and Sudan. Pyrethroid long-lasting insecticidal nets were the principal form of malaria vector control in all study areas; in Sudan this approach was supplemented by indoor residual spraying. Cohorts of children from randomly selected households in each cluster were recruited and followed up by community health workers to measure incidence of clinical malaria and prevalence of infection. Mosquitoes were assessed for susceptibility to pyrethroids using the standard WHO bioassay test. Country-specific results were combined using meta-analysis. Findings: Between June 2, 2012, and Nov 4, 2016, 40 000 children were enrolled and assessed for clinical incidence during 1·4 million follow-up visits. 80 000 mosquitoes were assessed for insecticide resistance. Long-lasting insecticidal net users had lower infection prevalence (adjusted odds ratio [OR] 0·63, 95% CI 0·51-0·78) and disease incidence (adjusted rate ratio [RR] 0·62, 0·41-0·94) than did non-users across a range of

	resistance levels. We found no evidence of an association between insecticide resistance and infection prevalence (adjusted OR 0·86, 0·70-1·06) or incidence (adjusted RR 0·89, 0·72-1·10). Users of nets, although significantly better protected than non-users, were nevertheless subject to high malaria infection risk (ranging from an average incidence in net users of 0·023, [95% CI 0·016-0·033] per person-year in India, to 0·80 [0·65-0·97] per person year in Kenya; and an average infection prevalence in net users of 0·8% [0·5-1·3] in India to an average infection prevalence of 50·8% [43·4-58·2] in Benin). Interpretation: Irrespective of resistance, populations in malaria endemic areas should continue to use long-lasting insecticidal nets to reduce their risk of infection. As nets provide only partial protection, the development of additional vector control tools should be prioritised to reduce the unacceptably high malaria burden. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29650424/
112.	McCollum R, Theobald S, Otiso L, Martineau T, Karuga R, Barasa E, Molyneux S, Taegtmeyer M. Priority setting for health in the context of devolution in Kenya: implications for health equity and community-based primary care. Health Policy Plan. 2018 Jul 1;33(6):729-742. **Abstract** Devolution changes the locus of power within a country from central to sub-national levels. In 2013, Kenya devolved health and other services from central government to 47 new sub-national governments (known as counties). This transition seeks to strengthen democracy and accountability, increase community participation, improve efficiency and reduce inequities. With changing responsibilities and power following devolution reforms, comes the need for priority-setting at the new county level. Priority-setting arises as a consequence of the needs and demand for healthcare resources exceeding the resources available, resulting in the need for some means of choosing between competing demands. We sought to explore the impact of devolution on priority-setting for health equity and community health services. We conducted key informant and in-depth interviews with health policymakers, health providers and politicians from 10 counties (n = 269 individuals) and 14 focus group discussions with community members based in 2 counties (n = 146 individuals). Qualitative data were analysed using the framework approach. We found Kenya's devolution reforms were driven by the need to demonstrate responsiveness to county contexts, with positive ramifications for health equity in previously neglected counties. The rapidity of the process, however, combined with limited technical capacity and guidance has meant that decision-making and prioritization have been captured and distorted for political and power interests. Less visible community health services that focus on health promotion, disease prevention and referral have been neglected within the prioritization process in favour of more tangible curative health services. The rapid transition in power carries a degree of risk of not meeting stated objectives. As Kenya moves forward, decision-makers need to address the community health gap and lay down institutional structures, processes and norms which promote health equity for all Kenyans.

	Pubmed link-https://pubmed.ncbi.nlm.nih.gov/29846599/
113.	Kamau A, Mwangangi JM, Rono MK, Mogeni P, Omedo I, Midega J, Scott JAG, Bejon P. Variation in the effectiveness of insecticide treated nets against malaria and outdoor biting by vectors in Kilifi, Kenya. Wellcome Open Res. 2018 Dec 3;2:22. **Abstract** Background: Insecticide treated nets (ITNs) protect humans against bites from the Anopheles mosquito vectors that transmit malaria, thereby reducing malaria morbidity and mortality. It has been noted that ITN use leads to a switch from indoor to outdoor feeding among these vectors. It might be expected that outdoor feeding would undermine the effectiveness of ITNs that target indoors vectors, but data are limited. Methods: We linked homestead level geospatial data to clinical surveillance data at a primary healthcare facility in Kilifi County in order to map geographical heterogeneity in ITN effectiveness and observed vector feeding behaviour using landing catches and CDC light traps in six selected areas of varying ITN effectiveness. We quantified the interaction between mosquitoes and humans to evaluate whether outdoor vector biting is a potential explanation for the variation in ITN effectiveness. Results: We observed 37% and 46% visits associated with positive malaria slides among ITN users and non-ITN-users, respectively; ITN use was associated with 32% protection from malaria (crude OR = 0.68, 95% CI: 0.64, 0.73). We obtained modification of ITN effectiveness by geographical area (p=0.016), and identified 6 hotspots using the spatial scan statistic. Majority of mosquitoes were caught outdoor (60%) and were of the An. funestus group (75%). The overall propensity to feed at times when most people were asleep was high; the vast majority of the Anopheles mosquitoes were caught at times when most people are indoors asleep. Estimates for the proportion of human-mosquito contact between the first and last hour when most humans were asleep was consistently high across all locations, ranging from 0.83 to 1.00. Conclusion: Our data do not provide evidence of an epidemiological association between microgeographical variations in ITN effectiveness and variations in the microgeographical distribution of outdoor biting. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30542660/
114.	Kimani BW, Mbugua AK, Kihara JH, Ng'ang'a M, Njomo DW. Safety, efficacy and acceptability of praziquantel in the treatment of Schistosoma haematobium in pre-school children of Kwale County, Kenya. PLoS Negl Trop Dis. 2018 Oct 17;12(10):e0006852. **Abstract** Background: The recommended strategy for control of schistosomiasis is preventive chemotherapy with praziquantel (PZQ). Pre-school children (PSC) are excluded from population treatment programs. In high endemic areas, these children are also at risk, and require treatment with PZQ. The Government of Kenya initiated the National School-Based Deworming Programme (NSBDP) where PSC in Early Childhood Development Education (ECDE) Centers are only eligible for treatment with albendazole (ABZ) but not with PZQ.

	Methodology/principal findings: 400 PSC were enrolled, from 10 randomly selected ECDE Centers in Kwale County, Kenya where children were treated with crushed PZQ tablets mixed with orange juice, at a single dose of 40 mg/kg. Adverse events were assessed 24 hours post-treatment through questionnaires administered to the parents or guardians. Acceptability was determined by observing if the child spat and/ or vomited all or part of the PZQ dose immediately after treatment. Efficacy was assessed by examining urine samples for Schistosoma haematobium eggs in the 5 weeks post-treatment follow-up. Children testing negative for S. haematobium during the follow-up were considered cured. Egg reduction rate (ERR) was calculated as the decrement in the infection intensity (group's geometric mean egg counts per 10 ml of urine) following treatment expressed as a proportion of the pre-treatment infection intensity. Before treatment, 80 out of the 400 children enrolled in the study tested positive for S. haematobium (20.0% (95% confidence interval (CI) 16.4-24.2%). Of these, 41 had infections of heavy intensity (51.3%) while the rest (48.7%) were of light intensity. Five weeks post-treatment, 10 children who had heavy intensity infection were diagnosed with S. haematobium (prevalence: 2.5% (95% CI 1.5-4.9%). Infection intensities decreased significantly from 45.9 (95% CI: 31.0-68.0) eggs/ 10 ml urine to1.4 (95% CI: 1.1-1.7) eggs/ 10 ml urine during pre-and post-treatment respectively. The ERR was 96.9%. There were no severe adverse events during follow up 24 hours post treatment. Treatment tolerability among the 400 children was high as none of the children spat and/ or vomited as observed in this study. Conclusion/significance: The study revealed that crushed PZQ is safe and effective in the treatment of urogenital schistosomiasis in this age group. It is therefore recommended that PZQ should be administered to the PSC in Kwale County. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30332403/
115.	Ngari MM, Thitiri J, Mwalekwa L, Timbwa M, Iversen PO, Fegan GW, Berkley JA. The impact of rickets on growth and morbidity during recovery among children with complicated severe acute malnutrition in Kenya: A cohort study. Matern Child Nutr. 2018 Apr;14(2):e12569. **Abstract** The effects of rickets on children recovery from severe acute malnutrition (SAM) are unknown. Rickets may affect both growth and susceptibility to infectious diseases. We investigated the associations of clinically diagnosed rickets with life-threatening events and anthropometric recovery during 1 year following inpatient treatment for complicated SAM. This was a secondary analysis of clinical trial data among non-human immunodeficiency virus-infected Kenyan children with complicated SAM (2-59 months) followed for 1 year posthospital discharge (ClinicalTrials.gov ID NCT00934492). The outcomes were mortality, hospital readmissions, and growth during 12 months. The main exposure was clinically diagnosed rickets at baseline. Of 1,778 children recruited, 230 (12.9%, 95% CI [11.4, 14 .6]) had clinical signs of rickets at baseline. Enrolment at an

	urban site, height-for-age and head circumference-for-age z scores were associated with rickets. Rickets at study enrolment was associated with increased mortality (adjusted Hazard Ratio [aHR] 1.61, 95% CI [1.14, 2.27]), any readmission (aHR 1.37, 95% CI [1.09, 1.72]), readmission for severe pneumonia (aHR 1.37, 95% CI [1.05, 1.79]), but not readmission with diarrhoea (aHR 1.05, 95% CI [0.73, 1.51]). Rickets was associated with increased height gain (centimetres), adjusted regression coefficient 0.19 (95% CI [0.10, 0.28]), but not changes in head circumference, mid-upper arm circumference, or weight. Rickets was common among children with SAM at urban sites and associated with increased risks of severe pneumonia and death. Increased height gain may have resulted from vitamin D and calcium treatment. Future work should explore possibility of other concurrent micronutrient deficiencies and optimal treatment of rickets in this high-risk population. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29178404/
116.	Weetman D, Wilding CS, Neafsey DE, Müller P, Ochomo E, Isaacs AT, Steen K, Rippon EJ, Morgan JC, Mawejje HD, Rigden DJ, Okedi LM, Donnelly MJ. Candidate-gene based GWAS identifies reproducible DNA markers for metabolic pyrethroid resistance from standing genetic variation in East African Anopheles gambiae. Sci Rep. 2018 Feb 13;8(1):2920. **Abstract** Metabolic resistance to pyrethroid insecticides is widespread in Anopheles mosquitoes and is a major threat to malaria control. DNA markers would aid predictive monitoring of resistance, but few mutations have been discovered outside of insecticide-targeted genes. Isofemale family pools from a wild Ugandan Anopheles gambiae population, from an area where operational pyrethroid failure is suspected, were genotyped using a candidate-gene enriched SNP array. Resistance-associated SNPs were detected in three genes from detoxification superfamilies, in addition to the insecticide target site (the Voltage Gated Sodium Channel gene, Vgsc). The putative associations were confirmed for two of the marker SNPs, in the P450 Cyp4j5 and the esterase Coeae1d by reproducible association with pyrethroid resistance in multiple field collections from Uganda and Kenya, and together with the Vgsc-1014S (kdr) mutation these SNPs explained around 20% of variation in resistance. Moreover, the >20 Mb 2La inversion also showed evidence of association with resistance as did environmental humidity. Sequencing of Cyp4j5 and Coeae1d detected no resistance-linked loss of diversity, suggesting selection from standing variation. Our study provides novel, regionally-validated DNA assays for resistance to the most important insecticide class, and establishes both 2La karyotype variation and humidity as common factors impacting the resistance phenotype. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29440767/
117.	Kadima J, Patterson E, Mburu M, Blat C, Nyanduko M, Bukusi EA, Cohen C, Oyaro P, Abuogi L. Adoption of routine virologic testing and predictors of virologic failure among

	HIV-infected children on antiretroviral treatment in western Kenya. PLoS One. 2018 Nov 9;13(11):e0200242. **Abstract** Background: Access to routine virologic monitoring, critical to ensuring treatment success, remains limited in low- and middle-income countries. We report on implementation of routine viral load (VL) monitoring and risk factors for virologic failure among HIV-infected children on antiretroviral treatment (ART) in Western Kenya. Methods: Routine VL testing was introduced in western Kenya in November 2013. We performed a case-control study among 1190 HIV-infected children ≤15 years on ART who underwent routine VL testing June 2014-May 2015. A random sample of 98 cases (virologic failure define as VL >1000 cps/mL) and 201 controls (VL <1000 cps/mL) from five facilities in three high HIV prevalence counties in Kenya were followed for a minimum of 12 months. Data from patient charts were analyzed using logistic regression to determine factors associated with failure to attain virologic suppression at initial routine and subsequent VL testing among cases. Results: Overall, 1190 (94%) children with a median age of 8 years underwent routine VL testing of whom (37%) had virological failure. Among the 299 cases and controls, WHO stage, baseline CD4 count and time since ART initiation were not associated with virologic failure during the follow-up period. In multivariable analysis, unsuppressed children at initial test were more likely to be male (adjusted Odds Ratio (aOR) 2.1, 95% Confidence Interval (CI) 2.1-3.6) and have had an ART regimen change (aOR 2.0, CI 1.0-3.7) than controls. Of the two-thirds of children 201/299 who had a subsequent VL performed, VL suppression was greater among those suppressed at initial test 126/135 (93.3%) compared to children with virologic failure 15/66 (22.7%, p<0.0001). Among those failing at first test who achieved viral suppression in follow up, 12/15 (80%) were on a protease inhibitor (PI)-based regimen. In the multivariable analysis of children with subsequent VL testing, children on PI-based 2nd line regimens were 10-fold more likely to achieve viral suppression than children on first-line NNRTI-based ART (adjusted Odds Ratio [aOR] 0.1; 95%CI 0.0-0.4). Conclusion: Coverage of initial routine viral load testing among children on ART in western Kenya is high. However, subsequent testing and virologic suppression are low in children with virologic failure on initial routine viral load test. There is an urgent need to improve management and viral load monitoring of children living with HIV experiencing treatment failure to ensure improved long-term outcomes. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30412576/
118.	Afolabi MO, Rennie S, Hallfors DD, Kline T, Zeitz S, Odongo FS, Amek NO, Luseno WK. An adapted instrument to assess informed consent comprehension among youth and parents in rural western Kenya: a validation study. BMJ Open. 2018 Jul 12;8(7):e021613. **Abstract**

	Objective: To adapt and validate a questionnaire originally developed in a research setting for assessment of comprehension of consent information in a different cultural and linguistic research setting. Design: The adaptation process involved development and customisation of a questionnaire for each of the three study groups, modelled closely on the previously validated questionnaire. The three adapted draft questionnaires were further reviewed by two bioethicists and the developer of the original questionnaire for face and content validity. The revised questionnaire was subsequently programmed into an audio computerised format, with translations and back translations in three widely spoken languages by the study participants: Luo, Swahili and English. Setting: The questionnaire was validated among adolescents, their parents and young adults living in Siaya County, a rural region of western Kenya. Participants: Twenty-five-item adapted questionnaires consisting of close-ended, multiple-choice and open-ended questions were administered to 235 participants consisting of 107 adolescents, 92 parents and 36 young adults. Test-retest was conducted 2-4 weeks after first questionnaire administration among 74 adolescents, young adults and parents. Outcome measure: Primary outcome measures included ceiling/floor analysis to identify questions with extremes in responses and item-level correlation to determine the test-retest relationships. Given the data format, tetrachoric correlations were conducted for dichotomous items and polychoric correlations for ordinal items. The qualitative validation assessment included face and content validity evaluation of the adapted instrument by technical experts. Results: Ceiling/floor analysis showed eight question items for which >80% of one or more groups responded correctly, while for nine questions, including all seven open-ended questions,<20% responded correctly. Majority of the question items had moderate to strong test-retest correlation estimates indicating temporal stability. Conclusions: Our study demonstrates that cross-cultural adaptation and validation of an informed consent comprehension questionnaire is feasible. However, further research is needed to develop a tool which can estimate a quantifiable threshold of comprehension thereby serving as an objective indicator of the need for interventions to improve comprehension. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30002013/
119.	Kotlyar S, Olupot-Olupot P, Nteziyaremye J, Akech SO, Uyoga S, Muhindo R, Moore CL, Maitland K. Assessment of Myocardial Function and Injury by Echocardiography and Cardiac Biomarkers in African Children With Severe Plasmodium falciparum Malaria. Pediatr Crit Care Med. 2018 Mar;19(3):179-185. **Abstract** Objectives: Perturbed hemodynamic function complicates severe malaria. The Fluid Expansion as Supportive Therapy trial demonstrated that fluid resuscitation, involving children with severe malaria, was associated with increased mortality, primarily due to

	cardiovascular collapse, suggesting that myocardial dysfunction may have a role. The aim of this study was to characterize cardiac function in children with severe malaria. Design: A prospective observational study with clinical, laboratory, and echocardiographic data collected at presentation (T0) and 24 hours (T1) in children with severe malaria. Cardiac index and ejection fraction were calculated at T0 and T1. Cardiac troponin I and brain natriuretic peptide were measured at T0. We compared clinical and echocardiographic variables in children with and without severe malarial anemia (hemoglobin < 5 mg/dL) at T0 and T1. Setting: Mbale Regional Referral Hospital. Patients: Children 3 months to 12 years old with severe falciparum malaria. Interventions: Usual care. Measurements and main results: We enrolled 104 children, median age 23.3 months, including 61 children with severe malarial anemia. Cardiac troponin I levels were elevated (> 0.1 ng/mL) in n equals to 50, (48%), and median brain natriuretic peptide was within normal range (69.1 pg/mL; interquartile range, 48.4-90.8). At T0, median Cardiac index was significantly higher in the severe malarial anemia versus nonsevere malarial anemia group (6.89 vs 5.28 L/min/m) (p = 0.001), which normalized in both groups at T1 (5.60 vs 5.13 L/min/m) (p = 0.452). Cardiac index negatively correlated with hemoglobin, r equals to -0.380 (p < 0.001). Four patients (3.8%) had evidence of depressed cardiac systolic function (ejection fraction < 45%). Overall, six children died, none developed pulmonary edema, biventricular failure, or required diuretic treatment. Conclusions: Elevation of cardiac index, due to increased stroke volume, in severe malaria is a physiologic response to circulatory compromise and correlates with anemia. Following whole blood transfusion and antimalarial therapy, cardiac index in severe malarial anemia returns to normal. The majority (> 96%) of children with severe malaria have preserved myocardial systolic function. Although there is evidence for myocardial injury (elevated cardiac troponin I), this does not correlate with cardiac dysfunction. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29206727/
120.	Arafat Y, Islam MM, Connell N, Mothabbir G, McGrath M, Berkley JA, Ahmed T, Kerac M. Perceptions of Acute Malnutrition and Its Management in Infants Under 6 Months of Age: A Qualitative Study in Rural Bangladesh. Clin Med Insights Pediatr. 2018 May 3;12:1179556518771698. **Abstract** Background: World Health Organization guidelines advise community-based care (CBC) for "uncomplicated" severe acute malnutrition (SAM) infants <6 months old (u6m), whereas current national protocols refer to inpatient care. Our aim was to inform and shape future management strategies by understanding caregivers' and different stakeholders' perceptions on malnutrition among infants u6m on barriers/facilitators to future CBC.

	Methods: The methods used in this study are as follows: in-depth interviews and focus group discussions (FGDs) in southern Bangladesh, thematic analysis of transcripts, and sample size by data saturation. Results: We conducted 5 FGDs with 29 caregivers, 4 with 29 health care workers, 4 key informant interviews each with community leaders and health supervisors. Five themes emerged. 1) Identification of SAM infants and care-seeking behavior: malnutrition was not noticed until severe, caregivers focused on clinical symptoms. Both allopathic and traditional healers were consulted. (2) Perceived causes of infant malnutrition: underlying illness, poor feeding practices, poverty, and local superstitions. (3) Views and preferences on treatment: hospitals and doctors were perceived as offering the best treatment, health care workers were also important, and respondents highlighted the need care of the caregiver/mother along with the infant. (4) Perceived benefits and risks of CBC: lower cost and greater accessibility were appreciated but worried about quality. (5) Community networks: wider family and social support networks were considered important aspects of care. Conclusions: There is considerable potential for CBC but needs to be better and earlier identification of at-risk infants, strengthening of health systems to avoid community options being perceived as "second best," engagement with families and communities to tackle "upstream" determinants of SAM, and care for mother-infant pairs. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29760577/
121.	Ubillos I, Ayestaran A, Nhabomba AJ, Dosoo D, Vidal M, Jiménez A, Jairoce C, Sanz H, Aguilar R, Williams NA, Díez-Padrisa N, Mpina M, Sorgho H, Agnandji ST, Kariuki S, Mordmüller B, Daubenberger C, Asante KP, Owusu-Agyei S, Sacarlal J, Aide P, Aponte JJ, Dutta S, Gyan B, Campo JJ, Valim C, Moncunill G, Dobaño C. Baseline exposure, antibody subclass, and hepatitis B response differentially affect malaria protective immunity following RTS,S/AS01E vaccination in African children. BMC Med. 2018 Oct 31;16(1):197. **Abstract** Background: The RTS,S/AS01E vaccine provides partial protection against malaria in African children, but immune responses have only been partially characterized and do not reliably predict protective efficacy. We aimed to evaluate comprehensively the immunogenicity of the vaccine at peak response, the factors affecting it, and the antibodies associated with protection against clinical malaria in young African children participating in the multicenter phase 3 trial for licensure. Methods: We measured total IgM, IgG, and IgG1-4 subclass antibodies to three constructs of the Plasmodium falciparum circumsporozoite protein (CSP) and hepatitis B surface antigen (HBsAg) that are part of the RTS,S vaccine, by quantitative suspension array technology. Plasma and serum samples were analyzed in 195 infants and children from two sites in Ghana (Kintampo) and Mozambique (Manhiça) with different transmission intensities using a case-control study design. We applied regression models

	and machine learning techniques to analyze immunogenicity, correlates of protection, and factors affecting them. Results: RTS,S/AS01E induced IgM and IgG, predominantly IgG1 and IgG3, but also IgG2 and IgG4, subclass responses. Age, site, previous malaria episodes, and baseline characteristics including antibodies to CSP and other antigens reflecting malaria exposure and maternal IgGs, nutritional status, and hemoglobin concentration, significantly affected vaccine immunogenicity. We identified distinct signatures of malaria protection and risk in RTS,S/AS01E but not in comparator vaccinees. IgG2 and IgG4 responses to RTS,S antigens post-vaccination, and anti-CSP and anti-P. falciparum antibody levels pre-vaccination, were associated with malaria risk over 1-year follow-up. In contrast, antibody responses to HBsAg (all isotypes, subclasses, and timepoints) and post-vaccination IgG1 and IgG3 to CSP C-terminus and NANP were associated with protection. Age and site affected the relative contribution of responses in the correlates identified. Conclusions: Cytophilic IgG responses to the C-terminal and NANP repeat regions of CSP and anti-HBsAg antibodies induced by RTS,S/AS01E vaccination were associated with malaria protection. In contrast, higher malaria exposure at baseline and non-cytophilic IgG responses to CSP were associated with disease risk. Data provide new correlates of vaccine success and failure in African children and reveal key insights into the mode of action that can guide development of more efficacious next-generation vaccines. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30376866/
122.	Byrd KA, Williams TN, Lin A, Pickering AJ, Arnold BF, Arnold CD, Kiprotich M, Dentz HN, Njenga SM, Rao G, Colford JM Jr, Null C, Stewart CP. Sickle Cell and α+-Thalassemia Traits Influence the Association between Ferritin and Hepcidin in Rural Kenyan Children Aged 14-26 Months. J Nutr. 2018 Dec 1;148(12):1903-1910. **Abstract** Background: The relation between subclinical hemoglobinopathies and concentrations of the iron-regulatory hormone hepcidin is not well characterized. Objective: We investigated the relation of hepcidin concentration with hemoglobinopathies among young children in Kenya. Methods: We quantified serum hepcidin and ferritin in 435 Kenyan children aged 14-20 mo in a subsample of the Water, Sanitation, and Handwashing (WASH) Benefits Trial. Blood samples were genotyped for α+-thalassemia and for sickle cell disorder. Hepcidin was compared across sickle cell and α+-thalassemia genotypes separately by using generalized linear models, and children who were normozygous for both conditions were also compared with those who had either of these conditions. In the association between hepcidin and ferritin, we assessed effect modification by genotype. Results: In this population, we found that 16.2% had sickle cell trait and 0.2% had sickle cell disorder, whereas 40.0% were heterozygous for α+-thalassemia and 8.2% were homozygous. Hepcidin concentration did not differ by genotype, but effect modification

	was found by genotype in the association between hepcidin and ferritin ($P < 0.1$). Among normozygous sickle cell children (HbAA), there was an association between hepcidin and ferritin ($\beta = 0.92$; 95% CI: 0.72, 1.10). However, among those with sickle cell trait (HbAS), the association was no longer significant ($\beta = 0.31$; 95% CI: -0.04, 0.66). Similarly, among children who were normozygous (αα/αα) or heterozygous (-α/αα) for α+-thalassemia, hepcidin and ferritin were significantly associated [$\beta = 0.94$ (95% CI: 0.68, 1.20) and $\beta = 0.77$ (95% CI: 0.51, 1.03), respectively]; however, in children who were homozygous for α+-thalassemia (-α/-α), there was no longer a significant association ($\beta = 0.45$; 95% CI: -0.10, 1.00). Conclusion: Hepcidin was not associated with hemoglobin genotype, but there may be a difference in the way hepcidin responds to iron status among those with either sickle cell trait or homozygous α+-thalassemia in young Kenyan children. This trial was registered at clinicaltrials.gov as NCT01704105. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30517728/
123.	Taylor WR, Naw HK, Maitland K, Williams TN, Kapulu M, D'Alessandro U, Berkley JA, Bejon P, Okebe J, Achan J, Amambua AN, Affara M, Nwakanma D, van Geertruyden JP, Mavoko M, Lutumba P, Matangila J, Brasseur P, Piola P,Randremanana R, Lasry E, Fanello C, Onyamboko M, Schramm B, Yah Z, Jones J, Fairhurst RM, Diakite M, Malenga G, Molyneux M, Rwagacondo C, Obonyo C, Gadisa E, Aseffa A, Loolpapit M, Henry MC, Dorsey G, John C, Sirima SB, Barnes KI, Kremsner P, Day NP, White NJ, Mukaka M. Single low-dose primaquine for blocking transmission of Plasmodium falciparum malaria - a proposed model-derived age- based regimen for sub-Saharan Africa. BMC Med. 2018 Jan 18;16(1):11. **Abstract** Background: In 2012, the World Health Organization recommended blocking the transmission of Plasmodium falciparum with single low-dose primaquine (SLDPQ, target dose 0.25 mg base/kg body weight), without testing for glucose-6-phosphate dehydrogenase deficiency (G6PDd), when treating patients with uncomplicated falciparum malaria. We sought to develop an age-based SLDPQ regimen that would be suitable for sub-Saharan Africa. Methods: Using data on the anti-infectivity efficacy and tolerability of primaquine (PQ), the epidemiology of anaemia, and the risks of PQ-induced acute haemolytic anaemia (AHA) and clinically significant anaemia (CSA), we prospectively defined therapeutic-dose ranges of 0.15-0.4 mg PQ base/kg for children aged 1-5 years and 0.15-0.5 mg PQ base/kg for individuals aged ≥6 years (therapeutic indices 2.7 and 3.3, respectively). We chose 1.25 mg PQ base for infants aged 6-11 months because they have the highest rate of baseline anaemia and the highest risks of AHA and CSA. We modelled an anthropometric database of 661,979 African individuals aged ≥6 months (549,127 healthy individuals, 28,466 malaria patients and 84,386 individuals with other infections/illnesses) by the Box-Cox transformation power exponential and tested PQ doses of 1-15 mg base, selecting dosing groups based on calculated mg/kg PQ doses.

	Results: From the Box-Cox transformation power exponential model, five age categories were selected: (i) 6-11 months (n = 39,886, 6.03%), (ii) 1-5 years (n = 261,036, 45.46%), (iii) 6-9 years (n = 20,770, 3.14%), (iv) 10-14 years (n = 12,155, 1.84%) and (v) ≥15 years (n = 328,132, 49.57%) to receive 1.25, 2.5, 5, 7.5 and 15 mg PQ base for corresponding median (1st and 99th centiles) mg/kg PQ base of: (i) 0.16 (0.12-0.25), (ii) 0.21 (0.13-0.37), (iii) 0.25 (0.16-0.38), (iv) 0.26 (0.15-0.38) and (v) 0.27 (0.17-0.40). The proportions of individuals predicted to receive optimal therapeutic PQ doses were: 73.2 (29,180/39,886), 93.7 (244,537/261,036), 99.6 (20,690/20,770), 99.4 (12,086/12,155) and 99.8% (327,620/328,132), respectively. Conclusions: We plan to test the safety of this age-based dosing regimen in a large randomised placebo-controlled trial (ISRCTN11594437) of uncomplicated falciparum malaria in G6PDd African children aged 0.5 - 11 years. If the regimen is safe and demonstrates adequate pharmacokinetics, it should be used to support malaria elimination. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29347975/
124.	Nxumalo N, Gilson L, Goudge J, Tsofa B, Cleary S, Barasa E, Molyneux S. Accountability mechanisms and the value of relationships: experiences of front- line managers at subnational level in Kenya and South Africa. BMJ Glob Health. 2018 Jul 6;3(4):e000842. **Abstract** Resource constraints, value for money debates and concerns about provider behaviour have placed accountability 'front and centre stage' in health system improvement initiatives and policy prescriptions. There are a myriad of accountability relationships within health systems, all of which can be transformed by decentralisation of health system decision-making from national to subnational level. Many potential benefits of decentralisation depend critically on the accountability processes and practices of front-line health facility providers and managers, who play a central role in policy implementation at province, county, district and facility levels. However, few studies have examined these responsibilities and practices in detail, including their implications for service delivery. In this paper we contribute to filling this gap through presenting data drawn from broader ongoing research collaborations between researchers and health managers in Kenya and South Africa. These collaborations are aimed at understanding and strengthening day-to-day micropractices of health system governance, including accountability processes. We illuminate the multiple directions and forms of accountability operating at the subnational level across three sites. Through detailed illustrative examples we highlight some of the unintended consequences of bureaucratic forms of accountability, the importance of relational elements in enabling effective bureaucratic accountability, and the ways in which front-line managers can sometimes creatively draw upon one set of accountability requirements to challenge another set to meet their goals. Overall, we argue that interpersonal interactions are key to appropriate functioning of many accountability mechanisms, and that policies and interventions

	supportive of positive relationships should complement target-based and/or audit-style mechanisms to achieve their intended effects. Where this is done systematically and across key elements and actors of the health system, this offers potential to build everyday health system resilience. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30002921/
125.	Kinyoki DK, Moloney GM, Uthman OA, Odundo EO, Kandala NB, Noor AM, Snow RW, Berkley JA. Co-morbidity of malnutrition with falciparum malaria parasitaemia among children under the aged 6-59 months in Somalia: a geostatistical analysis. Infect Dis Poverty. 2018 Jul 6;7(1):72. Abstract Background: Malnutrition and malaria are both significant causes of morbidity and mortality in African children. However, the extent of their spatial comorbidity remains unexplored and an understanding of their spatial correlation structure would inform improvement of integrated interventions. We aimed to determine the spatial correlation between both wasting and low mid upper arm circumference (MUAC) and falciparum malaria among Somalian children aged 6-59 months. Methods: Data were from 49 227 children living in 888 villages between 2007 to 2010. We developed a Bayesian geostatistical shared component model in order to determine the common spatial distributions of wasting and falciparum malaria; and low-MUAC and falciparum malaria at 1 × 1 km spatial resolution. Results: The empirical correlations with malaria were 0.16 and 0.23 for wasting and low-MUAC respectively. Shared spatial residual effects were statistically significant for both wasting and low-MUAC. The posterior spatial relative risk was highest for low-MUAC and malaria (range: 0.19 to 5.40) and relatively lower between wasting and malaria (range: 0.11 to 3.55). Hotspots for both wasting and low-MUAC with malaria occurred in the South Central region in Somalia. Conclusions: The findings demonstrate a relationship between nutritional status and falciparum malaria parasitaemia, and support the use of the relatively simpler MUAC measurement in surveys. Shared spatial distribution and distinct hotspots present opportunities for targeted seasonal chemoprophylaxis and other forms of malaria prevention integrated within nutrition programmes. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29986753/
126.	Mwangi IN, Agola EL, Mugambi RM, Shiraho EA, Mkoji GM. Development and Evaluation of a Loop-Mediated Isothermal Amplification Assay for Diagnosis of Schistosoma mansoni Infection in Faecal Samples. J Parasitol Res. 2018 Jun 14;2018:1267826. **Abstract** Human intestinal schistosomiasis is caused by the blood fluke, Schistosoma mansoni. With intensified efforts to control schistosomiasis by mass drug administration using praziquantel (PZQ), there is an urgent need to have accessible, quality-assured diagnostic

	tests for case detection and disease surveillance and for monitoring efficacy of treatment and other interventions. Current diagnostic tools are limited by suboptimal sensitivity, slow turn-around-time, affordability, and inability to distinguish current from past infections. We describe a simple and rapid diagnostic assay, based on the loop-mediated isothermal amplification (LAMP) technology for diagnosis of S. mansoni infection in human faecal samples. The LAMP primers used in this assay were previously described and they target a 121-bp DNA repeat sequence in S. mansoni. The LAMP assay was optimized at an isothermal temperature of 63°C for 1 hour. The amplified DNA was either visualized under ultraviolet light after electrophoresis or by directly observing the color change after staining the amplicons with CYBR Green dye. The LAMP assay was evaluated against the microscopy-based procedure and the results were analysed using Cohen's kappa coefficient to determine the degree of agreement between the two techniques. The LAMP assay reliably detected S. mansoni ova DNA in faecal samples and parasite DNA in amounts as low as 32fg. When the assay was tested for specificity against other faecal-based soil-transmitted helminths (STH), no cross-reactivity was observed. The LAMP assay was superior to the Kato-Katz assay with a 97% specificity; a high positivity score reliably detecting S. mansoni and a Kappa Coefficient of 0.9 suggested an exceptional agreement between the two techniques. The LAMP assay developed has great potential for application in field settings to support S. mansoni control and elimination campaigns. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30013798/
127	Shung-King M, Gilson L, Mbachu C, Molyneux S, Muraya KW, Uguru N, Govender V. Leadership experiences and practices of South African health managers: what is the influence of gender? -a qualitative, exploratory study. Int J Equity Health. 2018 Sep 18;17(1):148. Abstract Background: The importance of strong and transformative leadership is recognised as essential to the building of resilient and responsive health systems. In this regard, Sustainable Development Goals (SDG) 5 prioritises a current gap, by calling for women's full and effective participation and equal opportunities for leadership, including in the health system. In South Africa, pre-democracy repressive race-based policies, coupled with strong patriarchy, led to women and especially black women, being 'left behind' in terms of career development and progression into senior health leadership positions. Methods: Given limited prior inquiry into this subject, we conducted a qualitative exploratory study employing case study design, with the individual managers as the cases, to examine the influence of gender on career progression and leadership perceptions and experiences of senior managers in South Africa in five geographical districts, located in two provinces. We explored this through in-depth interviews, including life histories, career pathway mapping and critical incident analysis. The study sample selection was purposive and included 14 female and 5 male senior-managers in district and provincial health departments.

	Results: Our findings suggest that women considerably lag behind their male counterparts in advancing into management- and senior positions. We also found that race strongly intersected with gender in the lived experiences and career pathways of black female managers and in part for some black male managers. Professional hierarchy further compounded the influence of gender and race for black women managers, as doctors, who were frequently male, advanced more rapidly into management and senior management positions, than their female counterparts. Although not widespread, other minority groups, such as male managers in predominantly female departments, also experienced prejudice and marginalisation. Affirmative employment policies, introduced in the new democratic dispensation, addressed this discriminatory legacy and contributed to a number of women being the 'first' to occupy senior management positions. In one of the provinces, these pioneering female managers assumed role-modelling and mentoring roles and built strong networks of support for emerging managers. This was aided by an enabling, value-based, organisational culture. Conclusion: This study has implications for institutionalising personal and organisational development that recognise and appropriately advances women managers, paying attention to the intersections of gender, race and professional hierarchy. It is important in the context of national and global goals, in particular SDG 5, that women and in particular black women, are prioritised for training and capacity development and ensuring that transformative health system policies and practices recognise and adapt, supporting the multiple social and work roles that managers, in particular women, play. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30227872/
128	Zhang SM, Bu L, Laidemitt MR, Lu L, Mutuku MW, Mkoji GM, Loker ES. Complete mitochondrial and rDNA complex sequences of important vector species of Biomphalaria, obligatory hosts of the human-infecting blood fluke, Schistosoma mansoni. Sci Rep. 2018 May 9;8(1):7341. **Abstract** Using high throughput Illumina sequencing technology, we determined complete sequences for the mitochondrial genome (mitogenome) and nuclear ribosomal DNA (rDNA) complex for three African freshwater snail taxa within the genus Biomphalaria, B. pfeifferi, B. sudanica and B. choanomphala, and for two laboratory strains of B. glabrata originating from the Neotropics. Biomphalaria snails are obligate vectors of the blood fluke Schistosoma mansoni, a major etiologic agent of human intestinal schistosomiasis. Our data show that mitogenomes from African and Neotropical Biomphalaria are highly conserved. With respect to rDNA, the two internal transcribed spacers (ITS1 and 2) were found to be highly variable whereas the three ribosomal RNA genes (28S, 5.8S and 18S rRNA) exhibited no or very limited variation. Our analyses reveal that the two taxa inhabiting Lake Victoria, B. sudanica and B. choanomphala, are very similar to one another relative to the similarity either shows to B. pfeifferi or B. glabrata. This new sequence information may prove useful for developing new markers for snail identification, environmental detection/monitoring purposes or for tracking

	epidemiology and snail dependencies of S. mansoni in endemic areas. It also provides new information pertinent to still unresolved questions in Biomphalaria systematics and nomenclature. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29743617/
129.	Muinga N, Magare S, Monda J, Kamau O, Houston S, Fraser H, Powell J, English M, Paton C. Implementing an Open Source Electronic Health Record System in Kenyan Health Care Facilities: Case Study. JMIR Med Inform. 2018 Apr 18;6(2):e22. **Abstract** Background: The Kenyan government, working with international partners and local organizations, has developed an eHealth strategy, specified standards, and guidelines for electronic health record adoption in public hospitals and implemented two major health information technology projects: District Health Information Software Version 2, for collating national health care indicators and a rollout of the KenyaEMR and International Quality Care Health Management Information Systems, for managing 600 HIV clinics across the country. Following these projects, a modified version of the Open Medical Record System electronic health record was specified and developed to fulfill the clinical and administrative requirements of health care facilities operated by devolved counties in Kenya and to automate the process of collating health care indicators and entering them into the District Health Information Software Version 2 system. Objective: We aimed to present a descriptive case study of the implementation of an open source electronic health record system in public health care facilities in Kenya. Methods: We conducted a landscape review of existing literature concerning eHealth policies and electronic health record development in Kenya. Following initial discussions with the Ministry of Health, the World Health Organization, and implementing partners, we conducted a series of visits to implementing sites to conduct semistructured individual interviews and group discussions with stakeholders to produce a historical case study of the implementation. Results: This case study describes how consultants based in Kenya, working with developers in India and project stakeholders, implemented the new system into several public hospitals in a county in rural Kenya. The implementation process included upgrading the hospital information technology infrastructure, training users, and attempting to garner administrative and clinical buy-in for adoption of the system. The initial deployment was ultimately scaled back due to a complex mix of sociotechnical and administrative issues. Learning from these early challenges, the system is now being redesigned and prepared for deployment in 6 new counties across Kenya. Conclusions: Implementing electronic health record systems is a challenging process in high-income settings. In low-income settings, such as Kenya, open source software may offer some respite from the high costs of software licensing, but the familiar challenges of clinical and administration buy-in, the need to adequately train users, and the need for the provision of ongoing technical support are common across the North-South divide.

	Strategies such as creating local support teams, using local development resources, ensuring end user buy-in, and rolling out in smaller facilities before larger hospitals are being incorporated into the project. These are positive developments to help maintain momentum as the project continues. Further integration with existing open source communities could help ongoing development and implementations of the project. We hope this case study will provide some lessons and guidance for other challenging implementations of electronic health record systems as they continue across Africa. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/29669709/
130.	Macharia PM, Giorgi E, Noor AM, Waqo E, Kiptui R, Okiro EA, Snow RW. Spatio-temporal analysis of Plasmodium falciparum prevalence to understand the past and chart the future of malaria control in Kenya. Malar J. 2018 Sep 26;17(1):340. **Abstract** Background: Spatial and temporal malaria risk maps are essential tools to monitor the impact of control, evaluate priority areas to reorient intervention approaches and investments in malaria endemic countries. Here, the analysis of 36 years data on Plasmodium falciparum prevalence is used to understand the past and chart a future for malaria control in Kenya by confidently highlighting areas within important policy relevant thresholds to allow either the revision of malaria strategies to those that support pre-elimination or those that require additional control efforts. Methods: Plasmodium falciparum parasite prevalence (PfPR) surveys undertaken in Kenya between 1980 and 2015 were assembled. A spatio-temporal geostatistical model was fitted to predict annual malaria risk for children aged 2-10 years (PfPR2-10) at 1 × 1 km spatial resolution from 1990 to 2015. Changing PfPR2-10 was compared against plausible explanatory variables. The fitted model was used to categorize areas with varying degrees of prediction probability for two important policy thresholds PfPR2-10 < 1% (non-exceedance probability) or ≥ 30% (exceedance probability). Results: 5020 surveys at 3701 communities were assembled. Nationally, there was an 88% reduction in the mean modelled PfPR2-10 from 21.2% (ICR: 13.8-32.1%) in 1990 to 2.6% (ICR: 1.8-3.9%) in 2015. The most significant decline began in 2003. Declining prevalence was not equal across the country and did not directly coincide with scaled vector control coverage or changing therapeutics. Over the period 2013-2015, of Kenya's 47 counties, 23 had an average PfPR2-10 of < 1%; four counties remained ≥ 30%. Using a metric of 80% probability, 8.5% of Kenya's 2015 population live in areas with PfPR2-10 ≥ 30%; while 61% live in areas where PfPR2-10 is < 1%. Conclusions: Kenya has made substantial progress in reducing the prevalence of malaria over the last 26 years. Areas today confidently and consistently with < 1% prevalence require a revised approach to control and a possible consideration of strategies that support pre-elimination. Conversely, there remains several intractable areas where current levels and approaches to control might be inadequate. The modelling approaches presented here allow the Ministry of Health opportunities to consider data-driven model certainty in defining their future spatial targeting of resources.

	Pubmed link- https://pubmed.ncbi.nlm.nih.gov/30257697/
131.	Sande CJ, Mutunga M, Muteti J, Berkley JA, Nokes DJ, Njunge J. Untargeted analysis of the airway proteomes of children with respiratory infections using mass spectrometry based proteomics. Sci Rep. 2018 Sep 14;8(1):13814. **Abstract** The upper airway - which consists mainly of the naso- and oro-pharynx - is the first point of contact between the respiratory system and microbial organisms that are ubiquitous in the environment. It has evolved highly specialised functions to address these constant threats whilst facilitating seamless respiratory exchange with the lower respiratory tract. Dysregulation of its critical homeostatic and defence functions can lead to ingress of pathogens into the lower respiratory tract, potentially leading to serious illness. Systems-wide proteomic tools may facilitate a better understanding of mechanisms in the upper airways in health and disease. In this study, we aimed to develop a mass spectrometry based proteomics method for characterizing the upper airways proteome. Naso- and oropharyngeal swab samples used in all our experiments had been eluted in the Universal Transport Media (UTM) containing significantly high levels of bovine serum albumin. Our proteomic experiments tested the optimal approach to characterize airway proteome on swab samples eluted in UTM based on the number of proteins identified without BSA depletion (Total proteome: Protocol A) and with its depletion using a commercial kit; Allprep, Qiagen (cellular proteome: Protocol B, Ci, and Cii). Observations and lessons drawn from protocol A, fed into the design and implementation of protocol B, and from B to protocol Ci and finally Cii. Label free proteome quantification was used in Protocol A (n = 6) and B (n = 4) while commercial TMT 10plex reagents were used for protocols Ci and ii (n = 83). Protocols Ci and ii were carried out under similar conditions except for the elution gradient: 3 h and 6 h respectively. Swab samples tested in this study were from infants and children with and without upper respiratory tract infections from Kilifi County Hospital on the Kenyan Coast. Protocol A had the least number of proteins identified (215) while B produced the highest number of protein identifications (2396). When Protocol B was modified through sample multiplexing with TMT to enable higher throughput (Protocol Ci), the number of protein identified reduced to 1432. Modification of protocol Ci by increasing the peptide elution time generated Protocol Cii that substantially increased the number of proteins identified to 1875. The coefficient of variation among the TMT runs in Protocol Cii was <20%. There was substantial overlap in the identity of proteins using the four protocols. Our method was were able to identify marker proteins characteristically expressed in the upper airway. We found high expression levels of signature nasopharyngeal and oral proteins, including BPIFA1/2 and AMY1A, as well as a high abundance of proteins related to innate and adaptive immune function in the upper airway. We have developed a sensitive systems-level proteomic assay for the systematic quantification of naso-oro-pharyngeal proteins. The assay will advance mechanistic studies of respiratory pathology, by providing an untargeted and hypothesis-free approach of examining the airway proteome.

	Pubmed link- https://pubmed.ncbi.nlm.nih.gov/30217988/
132.	Hercik C, Cosmas L, Mogeni OD, Wamola N, Kohi W, Houpt E, Liu J, Ochieng C, Onyango C, Fields B, Mfinanga S, Montgomery JM. A Combined Syndromic Approach to Examine Viral, Bacterial, and Parasitic Agents among Febrile Patients: A Pilot Study in Kilombero, Tanzania. Am J Trop Med Hyg. 2018 Feb;98(2):625-632. **Abstract** The use of fever syndromic surveillance in sub-Saharan Africa is an effective approach to determine the prevalence of both malarial and nonmalarial infectious agents. We collected both blood and naso/oro-pharyngeal (NP/OP) swabs from consecutive consenting patients ≥ 1 year of age, with an axillary temperature ≥ 37.5°C, and symptom onset of ≤ 5 days. Specimens were analyzed using both acute febrile illness (AFI) and respiratory TaqMan array cards (Resp TAC) for multiagent detection of 56 different bloodstream and respiratory agents. In addition, we collected epidemiologic data to further characterize our patient population. We enrolled 205 febrile patients, including 70 children (1 < 15 years of age; 34%) and 135 adults (≥ 15 years of age; 66%). AFI TAC and Resp TAC were performed on 191 whole blood specimens and 115 NP/OP specimens, respectively. We detected nucleic acid for Plasmodium (57%), Leptospira (2%), and dengue virus (1%) among blood specimens. In addition, we detected 17 different respiratory agents, most notably, Haemophilus influenzae (64%), Streptococcus pneumonia (56%), Moraxella catarrhalis (39%), and respiratory syncytial virus (11%) among NP/OP specimens. Overall median cycle threshold was measured at 26.5. This study provides a proof-of-concept for the use of a multiagent diagnostic approach for exploratory research on febrile illness and underscores the utility of quantitative molecular diagnostics in complex epidemiologic settings of sub-Saharan Africa. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29280432/
133.	Ojal J, Goldblatt D, Tigoi C, Scott JAG. Effect of Maternally Derived Anti- protein and Anticapsular IgG Antibodies on the Rate of Acquisition of Nasopharyngeal Carriage of Pneumococcus in Newborns. Clin Infect Dis. 2018 Jan 6;66(1):121-130. **Abstract** Background: In developing countries, introduction of pneumococcal conjugate vaccine has not eliminated circulation of vaccine serotypes. Vaccinating pregnant mothers to increase antibody concentrations in their newborn infants may reduce the acquisition of pneumococcal carriage and subsequent risk of disease. We explored the efficacy of passive immunity, attributable to anti-protein and anticapsular pneumococcal antibodies, against acquisition of carriage. Methods: We examined the rate of nasopharyngeal acquisition of pneumococci in the first 90 days of life associated with varying anticapsular and anti-protein antibody concentrations in infant cord/maternal venous blood in Kilifi, Kenya. We used multivariable Cox proportional hazard models to estimate continuous functions relating

	acquisition of nasopharyngeal carriage to the concentration of maternally derived antibody. Results: Cord blood or maternal venous samples were collected from 976 mother-infant pairs. Pneumococci were acquired 561 times during 33,905 person-days of follow-up. Increasing concentrations of anti-protein antibodies were associated with either a reduction (PhtD1, PspAFam2, Spr0096, StkP) or, paradoxically, an increase (CbpA, LytC, PcpA, PiaA, PspAFam1, RrgBT4) in acquisition rate. We observed a nonsignificant reduction in the incidence of homologous carriage acquisition with high concentrations of maternally derived anticapsular antibodies to 5 serotypes (6A, 6B, 14, 19F, and 23F). Conclusion: The protective efficacy of several anti-protein antibodies supports the strategy of maternal vaccination to protect young infants from carriage and invasive disease. We were not able to demonstrate that passive anticapsular antibodies were protective against carriage acquisition at naturally occurring concentrations though it remains possible they may do so at the higher concentrations elicited by vaccination. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29020230/
134.	Ominde M, Sande J, Ooko M, Bottomley C, Benamore R, Park K, Ignas J, Maitland K, Bwanaali T, Gleeson F, Scott A. Reliability and validity of the World Health Organization reading standards for paediatric chest radiographs used in the field in an impact study of Pneumococcal Conjugate Vaccine in Kilifi, Kenya. PLoS One. 2018 Jul 25;13(7):e0200715. **Abstract** Background: Radiologically-confirmed pneumonia (RCP) is a specific end-point used in trials of Pneumococcal Conjugate Vaccine (PCV) to estimate vaccine efficacy. However, chest radiograph (CXR) interpretation varies within and between readers. We measured the repeatability and reliability of paediatric CXR interpretation using percent agreement and Cohen's Kappa and the validity of field readings against expert review in a study of the impact of PCV on pneumonia. Methods: CXRs were obtained from 2716 children admitted between 2006 and 2014 to Kilifi County Hospital, Kilifi, Kenya, with clinically-defined severe or very-severe pneumonia. Five clinicians and radiologists attended a three-day training course on CXR interpretation using a WHO standard. All CXRs were read once by two local primary readers. Discordant readings and 13% of concordant readings were arbitrated by a panel of three expert radiologists. To assess repeatability, a 5% median random sample was presented twice. Sensitivity and specificity of the primary readers' interpretations was estimated against the 'gold-standard' of the arbitrators' results. Results: Of 2716 CXRs, 2 were uninterpretable and 159 were evaluated twice. The percent agreement and Kappa for RCP were 89% and 0.68 and ranged between 84-97% and 0.19-0.68, respectively, for all pathological findings. Intra-observer repeatability was

	similar to inter-observer reliability. Sensitivities of the primary readers to detect RCP were 69% and 73%; specificities were 96% and 95%. Conclusion: Intra- and inter-observer agreements on interpretations of radiologically-confirmed pneumonia are fair to good. Reasonable sensitivity and high specificity make radiologically-confirmed pneumonia, determined in the field, a suitable measure of relative vaccine effectiveness. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30044834/
135.	Nyongesa MK, Mwangala PN, Mwangi P, Kombe M, Newton CRJC, Abubakar AA. Neurocognitive and mental health outcomes and association with quality of life among adults living with HIV: a cross-sectional focus on a low-literacy population from coastal Kenya. BMJ Open. 2018 Sep 17;8(9):e023914. **Abstract** Objectives: Our aim was to compare the neurocognitive performance and mental health outcome of adults living with HIV on antiretroviral therapy with that of community controls, all of low literacy. Furthermore, we also wanted to explore the relationship of these outcomes with quality of life among adults living with HIV. Study design: This was a descriptive cross-sectional study. Setting: The study was conducted in Kilifi County, a region located at the Kenyan coast. Participants: The participants consisted of a consecutive sample of 84 adults living with HIV and 83 randomly selected community controls all with ≤8 years of schooling. All participants were assessed for non-verbal intelligence, verbal working memory and executive functioning. The Major Depression Inventory and a quality of life measure (RAND SF-36) were also administered. Results: Using analysis of covariance, we found no statistically significant group differences between adults living with HIV and community controls in all the neurocognitive tests except for a marginal difference in the non-verbal intelligence test ($F(1, 158)=3.83$, $p=0.05$). However, depressive scores of adults living with HIV were significantly higher than those of controls ($F(1, 158)=11.56$, $p<0.01$). Also, quality of life scores of adults living with HIV were significantly lower than those of controls ($F(1, 158)=4.62$, $p=0.03$). For the HIV-infected group, results from multivariable linear regression analysis showed that increasing depressive scores were significantly associated with poorer quality of life ($\beta=-1.17$, 95% CI -1.55 to -0.80; $p<0.01$). Conclusion: Our findings suggest that adults of low-literacy levels living with HIV and on antiretroviral medication at the Kenyan coast do not have significant cognitive deficits compared with their uninfected counterparts. However, their mental health, compared with that of HIV-uninfected adults, remains poorer and their quality of life may deteriorate when HIV and depressive symptoms co-occur. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30224402/
136.	Musoke P, Hatcher A, Rogers AJ, Achiro L, Bukusi E, Darbes L, Kwena Z, Oyaro P, Weke E, Turan JM. Men's hopes, fears and challenges in engagement in perinatal health

	and the prevention of mother-to-child transmission of HIV in rural Kenya. Cult Health Sex. 2018 Nov;20(11):1259-1272. **Abstract** Male involvement in antenatal care has been shown to improve health outcomes for women and infants. However, little is known about how best to encourage male partners to support essential perinatal health activities. We explored men's perceptions of facilitators and barriers to involvement in antenatal care and HIV prevention including fears, hopes and challenges. Forty in-depth interviews were conducted with the male partners of HIV-positive and HIV-negative pregnant women in southwest Kenya. Most male partners believed engaging in pregnancy health-related activities was beneficial for keeping families healthy. However, thematic analysis revealed several obstacles that hindered participation. Poor couple relationship dynamics seemed negatively to influence male engagement. Some men were apprehensive that clinic staff might force them to test for HIV and disclose the results; if HIV-positive, men feared being labelled as 'victimisers' in situations of serodiscordancy, and described fears of abandonment by their wives. Some men avoided accompanying their wives, citing local culture as rationale for avoiding the 'effeminate' act of antenatal care attendance. Amidst these obstacles, some men chose to use their partners' HIV status as proxy for their own. Findings suggest that improving male engagement in essential maternal and child health-related activities will require addressing both structural and interpersonal barriers. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29465291/
137.	Maina M, Aluvaala J, Mwaniki P, Tosas-Auguet O, Mutinda C, Maina B, Schultsz C, English M. Using a common data platform to facilitate audit and feedback on the quality of hospital care provided to sick newborns in Kenya. BMJ Glob Health. 2018 Sep 19;3(5):e001027. **Abstract** Essential interventions to reduce neonatal deaths that can be effectively delivered in hospitals have been identified. Improving information systems may support routine monitoring of the delivery of these interventions and outcomes at scale. We used cycles of audit and feedback (A&F) coupled with the use of a standardised newborn admission record (NAR) form to explore the potential for creating a common inpatient neonatal data platform and illustrate its potential for monitoring prescribing accuracy. Revised NARs were introduced in a high volume, neonatal unit in Kenya together with 13 A&F meetings over a period of 3 years from January 2014 to November 2016. Data were abstracted from medical records for 15 months before introduction of the revised NAR and A&F and during the 3 years of A&F. We calculated, for each patient, the percentage of documented items from among the total recommended for documentation and trends calculated over time. Gentamicin prescribing accuracy was also tracked over time. Records were examined for 827 and 7336 patients in the pre-A&F and post-A&F periods, respectively. Documentation scores improved overall. Documentation of gestational age improved from <15% in 2014 to >75% in 2016. For five recommended

	items, including temperature, documentation remained <50%. 16.7% (n=1367; 95% CI 15.9 to 17.6) of the admitted babies had a diagnosis of neonatal sepsis needing antibiotic treatment. In this group, dosing accuracy of gentamicin improved over time for those under 2 kg from 60% (95%36.1 to 80.1) in 2013 to 83% (95% CI 69.2 to 92.3) in 2016. We report that it is possible to improve routine data collection in neonatal units using a standardised neonatal record linked to relatively basic electronic data collection tools and cycles of A&F. This can be useful in identifying potential gaps in care and tracking outcomes with an aim of improving the quality of care. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30258654/
138.	Ogero M, Ayieko P, Makone B, Julius T, Malla L, Oliwa J, Irimu G, English M ; Clinical Information Network author group. An observational study of monitoring of vital signs in children admitted to Kenyan hospitals: an insight into the quality of nursing care? J Glob Health. 2018 Jun;8(1):010409. **Abstract** Background: Measurement and correct interpretation of vital signs is part of routine clinical care. Repeated measurement enhances early recognition of deterioration, may help prevent morbidity and mortality and is a standard of care in most countries. Objective: To examine documentation of vital signs by clinicians for admissions to paediatric wards in Kenyan hospitals, to describe monitoring frequency by nurses and explore factors influencing frequency. Methods: Vital signs information (temperature, respiratory and pulse rate) for the first 48 hours of admission was collected from case records of children admitted with non-surgical conditions to 13 Kenyan county hospitals between September 2013 and April 2016. A mixed effect negative binomial regression model was used to explore whether the severity of illness (indicated by danger signs or severe diagnostic episodes) is associated with increased vital signs observation frequency. Results: We examined 54 800 admission episodes with an overall mortality 6.1%. Nurse to bed ratios were very low (1:10 to 1:41 across hospitals). Admitting clinicians documented all or no vital signs in 57.0% and 8.4% cases respectively. For respiratory and pulse rates there was pronounced even end-digit preference (an indicator of incorrect information) and high frequency recording of specific values ($P < 0.001$) suggesting approximation. Monitoring frequency was explored in 41 738 children. Those with inpatient stays ≥48 hours were expected to have a vital signs count of 18, hospitals varied but most did not achieve this benchmark (median 9, range 2-30). There were clinically small but significant associations between vital signs count and presence of multiple severe illnesses or presence of severe pallor (adjusted relative risk ratio = 1.04, $P < 0.01$, 95% confidence interval CI = 1.02-1.06 and 1.05, $P = 0.02$, 95% CI = 1.01-1.09, respectively). Conclusions: Data suggest accurate admission measures are sometimes missing especially for pulse and respiratory rates, possibly linked to manual measurement.

	Monitoring frequency is often low in the high risk population studied probably indicating how quality of nursing care is undermined by considerable human resource shortages. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29497504/
139.	Akama E, Mburu M, Mutegi E, Nyanaro G, Otieno JP, Ndolo S, Ochanda B,Ojwang' L, Lewis-Kulzer J, Abuogi L, Oyaro P, Cohen CR, Bukusi EA, Onono M. Impact of a Rapid Results Initiative Approach on Improving Male Partner Involvement in Prevention of Mother to Child Transmission of HIV in Western Kenya. AIDS Behav. 2018 Sep;22(9):2956-2965. **Abstract** A rapid results initiative (RRI) aimed at increasing male involvement in prevention of mother-to-child transmission (PMTCT) and service uptake among pregnant women at 116 antenatal clinics in Western Kenya was compared at baseline, during the RRI, and 3-months post-RRI. Male involvement increased from 7.4 to 54.2% during RRI (risk difference [RD] 0.47, CI 0.45-0.48) then 43.4% post-RRI (RD 0.36, CI 0.35-0.37). Among HIV-infected women, facility delivery increased from 40.0 to 49.9% (RD 0.10, 95% CI 0.06-0.13) and 65.0% post-RRI (RD 0.25, 95% CI 0.22-0.28). HIV-infected pregnant women linkage to HIV care increased from 58.6 to 85.9% (RD 0.27, CI 0.24-0.30) and 97.3% post-RRI (RD 0.39, CI 0.36-0.41). Time to ART initiation reduced from 29 days (interquartile range [IQR] 6-56) to 14 days (IQR 0-28) to 7 days (IQR 0-20). A male-centered RRI can significantly increase men's engagement in antenatal care leading to improved partner utilization of- PMTCT and antenatal services **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29948337/
140.	Toda M, Zurovac D, Njeru I, Kareko D, Mwau M, Morita K. Health worker knowledge of Integrated Disease Surveillance and Response standard case definitions: a cross-sectional survey at rural health facilities in Kenya. BMC Public Health. 2018 Jan 17;18(1):146. **Abstract** Background: The correct knowledge of standard case definition is necessary for frontline health workers to diagnose suspected diseases across Africa. However, surveillance evaluations commonly assume this prerequisite. This study assessed the knowledge of case definitions for health workers and their supervisors for disease surveillance activities in rural Kenya. Methods: A cross-sectional survey including 131 health workers and their 11 supervisors was undertaken in two counties in Kenya. Descriptive analysis was conducted to classify the correctness of knowledge into four categories for three tracer diseases (dysentery, measles, and dengue). We conducted a univariate and multivariable logistic regression analyses to explore factors influencing knowledge of the case definition for dysentery. Results: Among supervisors, 81.8% knew the correct definition for dysentery, 27.3% for measles, and no correct responses were provided for dengue. Correct knowledge was observed for 50.4% of the health workers for dysentery, only 12.2% for measles, and none for dengue. Of 10 examined factors, the following were significantly associated

	with health workers' correct knowledge of the case definition for dysentery: health workers' cadre (aOR 2.71; 95% CI 1.20-6.12; p = 0.017), and display of case definition poster (aOR 2.24; 95% CI 1.01-4.98; p = 0.048). Health workers' exposure to the surveillance refresher training, supportive supervision and guidelines were not significantly associated with the knowledge. Conclusion: The correct knowledge of standard case definitions was sub-optimal among health workers and their supervisors, which is likely to impact the reliability of routine surveillance reports generated from health facilities. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29343225/
141.	Riley C, Dellicour S, Ouma P, Kioko U, Omar A, Kariuki S, Ng'ang'a Z, DesaiM, Buff AM, Gutman JR. Knowledge and Adherence to the National Guidelines for Malaria Diagnosis in Pregnancy among Health-Care Providers and Drug-Outlet Dispensers in Rural Western Kenya. Am J Trop Med Hyg. 2018 May;98(5):1367-1373. **Abstract** Prompt diagnosis and effective treatment of acute malaria in pregnancy (MiP) is important for the mother and fetus; data on health-care provider adherence to diagnostic guidelines in pregnancy are limited. From September to November 2013, a cross-sectional survey was conducted in 51 health facilities and 39 drug outlets in Western Kenya. Provider knowledge of national diagnostic guidelines for uncomplicated MiP were assessed using standardized questionnaires. The use of parasitologic testing was assessed in health facilities via exit interviews with febrile women of childbearing age and in drug outlets via simulated-client scenarios, posing as pregnant women or their spouses. Overall, 93% of providers tested for malaria or accurately described signs and symptoms consistent with clinical malaria. Malaria was parasitologically confirmed in 77% of all patients presenting with febrile illness at health facilities and 5% of simulated clients at drug outlets. Parasitological testing was available in 80% of health facilities; 92% of patients evaluated at these facilities were tested. Only 23% of drug outlets had malaria rapid diagnostic tests (RDTs); at these outlets, RDTs were offered in 17% of client simulations. No differences were observed in testing rates by pregnancy trimester. The study highlights gaps among health providers in diagnostic knowledge and practice related to MiP, and the lack of malaria diagnostic capacity, particularly in drug outlets. The most important factor associated with malaria testing of pregnant women was the availability of diagnostics at the point of service. Interventions that increase the availability of malaria diagnostic services might improve malaria case management in pregnant women. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29512480/
142.	Uzochukwu B, Onwujekwe E, Mbachu C, Okeke C, Molyneux S, Gilson L. Accountability mechanisms for implementing a health financing option: the case of the basic health care provision fund (BHCPF) in Nigeria. Int J Equity Health. 2018 Jul 11;17(1):100. **Abstract**

	Background: The Nigerian National Health Act proposes a radical shift in health financing in Nigeria through the establishment of a fund - Basic Healthcare Provision Fund, (BHCPF). This Fund is intended to improve the functioning of primary health care in Nigeria. Key stakeholders at national, sub-national and local levels have raised concerns over the management of the BHCPF with respect to the roles of various stakeholders in ensuring accountability for its use, and the readiness of the implementers to manage this fund and achieve its objectives. This study explores the governance and accountability readiness of the different layers of implementation of the Fund; and it contributes to the generation of policy implementation guidelines around governance and accountability for the Fund. Methods: National, state and LGA level respondents were interviewed using a semi structured tool. Respondents were purposively selected to reflect the different layers of implementation of primary health care and the levels of accountability. Different accountability layers and key stakeholders expected to implement the BHCPF are the Federal government (Federal Ministry of Health, NPHCDA, NHIS, Federal Ministry of Finance); the State government (State Ministry of Health, SPHCB, State Ministry of Finance, Ministry of Local Government); the Local government (Local Government Health Authorities); Health facilities (Health workers, Health facility committees (HFC) and External actors (Development partners and donors, CSOs, Community members). Results: In general, the strategies for accountability encompass planning mechanisms, strong and transparent monitoring and supervision systems, and systematic reporting at different levels of the healthcare system. Non-state actors, particularly communities, must be empowered and engaged as instruments for ensuring external accountability at lower levels of implementation. New accountability strategies such as result-based or performance-based financing could be very valuable. Conclusion: The key challenges to accountability identified should be addressed and these included trust, transparency and corruption in the health system, political interference at higher levels of government, poor data management, lack of political commitment from the State in relation to release of funds for health activities, poor motivation, mentorship, monitoring and supervision, weak financial management and accountability systems and weak capacity to implement suggested accountability mechanisms due to political interference with accountability structures. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29996838/
143.	Graham SM, Micheni M, Secor A, van der Elst EM, Kombo B, Operario D, Amico KR, Sanders EJ, Simoni JM. HIV care engagement and ART adherence among Kenyan gay, bisexual, and other men who have sex with men: a multi-level model informed by qualitative research. AIDS Care. 2018 Aug;30(sup5):S97-S105. **Abstract** Gay, bisexual, and other men who have sex with men (GBMSM) are highly stigmatized and male-male sex is often criminalized in sub-Saharan Africa, impeding access to quality care for sexual health, HIV prevention, and treatment. To better understand HIV

	care engagement and antiretroviral therapy (ART) adherence among GBMSM in this context, a conceptual model incorporating sociocultural factors is needed. We conducted a qualitative study of barriers to and facilitators of HIV care engagement and ART adherence among Kenyan GBMSM, informed by a conceptual model based on an access, information, motivation, and behavioral skills(access-IMB) model, with trust in providers and stigma and discrimination as a priori factors of interest. We conducted 30 semi-structured interviews with HIV-positive Kenyan GBMSM, of whom 20 were taking ART and 10 had not yet initiated treatment. A deductive approach was used to confirm the relevance of basic concepts of the access-IMB model, while an inductive approach was used to identify content that emerged from men's lived experiences. Access-related information, motivation, and behavioral skills appeared relevant to HIV care engagement and ART adherence, with stigma and discrimination appearing consistently across discourse exploring facilitators and barriers. Trusted providers and supportive family and friends helped many men, and resilience-related concepts such as selective disclosure of GBMSM status, connection to lesbian, gay, bisexual, and transgender (LGBT) organizations, self-acceptance, goal-setting, social identity and altruism emerged as important facilitators. Findings suggest a need to increase support from providers and peers for Kenyan GBMSM living with HIV infection. In addition, they point toward the potential value of interventions that provide opportunities to build or enhance one's sense of community belonging in order to improve HIV care engagement and promote ART adherence for this vulnerable population. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30668136/
144.	Ginsburg C, Bocquier P, Béguy D, Afolabi S, Kahn K, Obor D, Tanser F,Tomita A, Wamukoya M, Collinson MA. Association between internal migration and epidemic dynamics: an analysis of cause-specific mortality in Kenya and South Africa using health and demographic surveillance data. BMC Public Health. 2018 Jul 27;18(1):918. **Abstract** Background: Many low- and middle-income countries are facing a double burden of disease with persisting high levels of infectious disease, and an increasing prevalence of non-communicable disease (NCD). Within these settings, complex processes and transitions concerning health and population are underway, altering population dynamics and patterns of disease. Understanding the mechanisms through which changing socioeconomic and environmental contexts may influence health is central to developing appropriate public health policy. Migration, which involves a change in environment and health exposure, is one such mechanism. Methods: This study uses Competing Risk Models to examine the relationship between internal migration and premature mortality from AIDS/TB and NCDs. The analysis employs 9 to 14 years of longitudinal data from four Health and Demographic Surveillance Systems (HDSS) of the INDEPTH Network located in Kenya and South Africa (populations ranging from 71 to 223 thousand). The study tests whether the

	mortality of migrants converges to that of non-migrants over the period of observation, controlling for age, sex and education level. Results: In all four HDSS, AIDS/TB has a strong influence on overall deaths. However, in all sites the probability of premature death (45q15) due to AIDS/TB is declining in recent periods, having exceeded 0.39 in the South African sites and 0.18 in the Kenyan sites in earlier years. In general, the migration effect presents similar patterns in relation to both AIDS/TB and NCD mortality, and shows a migrant mortality disadvantage with no convergence between migrants and non-migrants over the period of observation. Return migrants to the Agincourt HDSS (South Africa) are on average four times more likely to die of AIDS/TB or NCDs than are non-migrants. In the Africa Health Research Institute (South Africa) female return migrants have approximately twice the risk of dying from AIDS/TB from the year 2004 onwards, while there is a divergence to higher AIDS/TB mortality risk amongst female migrants to the Nairobi HDSS from 2010. Conclusion: Results suggest that structural socioeconomic issues, rather than epidemic dynamics are likely to be associated with differences in mortality risk by migrant status. Interventions aimed at improving recent migrant's access to treatment may mitigate risk. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30049267/
145.	Camlin CS, Akullian A, Neilands TB, Getahun M, Eyul P, Maeri I, Ssali S, Geng E, Gandhi M, Cohen CR, Kamya MR, Odeny T, Bukusi EA, Charlebois ED. Population mobility associated with higher risk sexual behaviour in eastern African communities participating in a Universal Testing and Treatment trial. J Int AIDS Soc. 2018 Jul;21 Suppl 4(Suppl Suppl 4):e25115. **Abstract** Introduction: There are significant knowledge gaps concerning complex forms of mobility emergent in sub-Saharan Africa, their relationship to sexual behaviours, HIV transmission, and how sex modifies these associations. This study, within an ongoing test-and-treat trial (SEARCH, NCT01864603), sought to measure effects of diverse metrics of mobility on behaviours, with attention to gender. Methods: Cross-sectional data were collected in 2016 from 1919 adults in 12 communities in Kenya and Uganda, to examine mobility (labour/non-labour-related travel), migration (changes of residence over geopolitical boundaries) and their associations with sexual behaviours (concurrent/higher risk partnerships), by region and sex. Multilevel mixed-effects logistic regression models, stratified by sex and adjusted for clustering by community, were fitted to examine associations of mobility with higher-risk behaviours, in past 2 years/past 6 months, controlling for key covariates. Results: The population was 45.8% male and 52.4% female, with mean age 38.7 (median 37, IQR: 17); 11.2% had migrated in the past 2 years. Migration varied by region (14.4% in Kenya, 11.5% in southwestern and 1.7% in eastern and Uganda) and sex (13.6% of men and 9.2% of women). Ten per cent reported labour-related travel and 45.9% non-labour-related travel in past 6 months-and varied by region and sex: labour-related

	mobility was more common in men (18.5%) than women (2.9%); non-labour-related mobility was more common in women (57.1%) than men (32.6%). In 2015 to 2016, 24.6% of men and 6.6% of women had concurrent sexual partnerships; in past 6 months, 21.6% of men and 5.4% of women had concurrent partnerships. Concurrency in 2015 to 2016 was more strongly associated with migration in women [aRR = 2.0, 95% CI(1.1 to 3.7)] than men [aRR = 1.5, 95% CI(1.0 to 2.2)]. Concurrency in past 6 months was more strongly associated with labour-related mobility in women [aRR = 2.9, 95% CI(1.0 to 8.0)] than men [aRR = 1.8, 95% CI(1.2 to 2.5)], but with non-labour-related mobility in men [aRR = 2.2, 95% CI(1.5 to 3.4)]. Conclusions: In rural eastern Africa, both longer-distance/permanent, and localized/shorter-term forms of mobility are associated with higher-risk behaviours, and are highly gendered: the HIV risks associated with mobility are more pronounced for women. Gender-specific interventions among mobile populations are needed to combat HIV in the region. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30027668/
146.	Birdthistle I, Schaffnit SB, Kwaro D, Shahmanesh M, Ziraba A, Kabiru CW, Phillips-Howard P, Chimbindi N, Ondeng'e K, Gourlay A, Cowan FM, Hargreaves JR, Hensen B, Chiyaka T, Glynn JR, Floyd S. Evaluating the impact of the DREAMS partnership to reduce HIV incidence among adolescent girls and young women in four settings: a study protocol. BMC Public Health. 2018 Jul 25;18(1):912. **Abstract** Background: HIV risk remains unacceptably high among adolescent girls and young women (AGYW) in southern and eastern Africa, reflecting structural and social inequities that drive new infections. In 2015, PEPFAR (the United States President's Emergency Plan for AIDS Relief) with private-sector partners launched the DREAMS Partnership, an ambitious package of interventions in 10 sub-Saharan African countries. DREAMS aims to reduce HIV incidence by 40% among AGYW over two years by addressing multiple causes of AGYW vulnerability. This protocol outlines an impact evaluation of DREAMS in four settings. Methods: To achieve an impact evaluation that is credible and timely, we describe a mix of methods that build on longitudinal data available in existing surveillance sites prior to DREAMS roll-out. In three long-running surveillance sites (in rural and urban Kenya and rural South Africa), the evaluation will measure: (1) population-level changes over time in HIV incidence and socio-economic, behavioural and health outcomes among AGYW and young men (before, during, after DREAMS); and (2) causal pathways linking uptake of DREAMS interventions to 'mediators' of change such as empowerment, through to behavioural and health outcomes, using nested cohort studies with samples of ~ 1000-1500 AGYW selected randomly from the general population and followed for two years. In Zimbabwe, where DREAMS includes an offer of pre-exposure HIV prophylaxis (PrEP), cohorts of young women who sell sex will be followed for two years to measure the impact of 'DREAMS+PrEP' on HIV incidence among young women at highest risk

	of HIV. In all four settings, process evaluation and qualitative studies will monitor the delivery and context of DREAMS implementation. The primary evaluation outcome is HIV incidence, and secondary outcomes include indicators of sexual behavior change, and social and biological protection. Discussion: DREAMS is, to date, the most ambitious effort to scale-up combinations or 'packages' of multi-sectoral interventions for HIV prevention. Evidence of its effectiveness in reducing HIV incidence among AGYW, and demonstrating which aspects of the lives of AGYW were changed, will offer valuable lessons for replication. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30045711/
147.	Okello G, Gerrets R, Zakayo S, Molyneux S, Jones C. "Every day they keep adding new tools but they don't take any away": Producing indicators for intermittent preventive treatment for malaria in pregnancy (IPTp) from routine data in Kenya. PLoS One. 2018 Jan 3;13(1):e0189699. **Abstract** Background: Intermittent preventive treatment for malaria in pregnancy (IPTp) is part of a multi-pronged strategy aimed at preventing malaria in pregnancy in areas of moderate to high transmission in sub-Saharan Africa. Despite being formally adopted as a malaria prevention policy over a decade ago, IPTp coverage has remained low. Recent demands for action have incorporated calls to strengthen IPTp monitoring and evaluation systems, including the use of routine data, to measure coverage, track implementation and identify roadblocks to improving uptake. Concerns about the quality of malaria indicators reported through routine information systems are well recognized, but there are few data on the realities of IPTp recording practices in frontline facilities or their entry into District Health Information Software (DHIS2). Methods: Drawing on fieldwork conducted in two malaria endemic sub-counties in Kenya, we explore how local adaptations and innovations employed by health workers and sub-country managers to cope with a range of health system constraints, shape recording practices and in turn, the measurement of IPTp. Data were collected through observations, interviews, and document reviews. Data analysis and interpretation was guided by thematic analysis approach. Results: Measurement of IPTp was undermined by health system constraints such as stock-out of drugs and human resource shortages. Coping strategies adopted by health workers to address these challenges ensured continuity in service delivery and IPTp data generation but had variable consequences on IPTp data quality. Unclear recording and reporting instructions also led to lack of standardization in IPTp data generation. The use of redundant tools created significant data burdens which undermined service delivery in general. Conclusions: There is need to integrate monthly reporting forms so as to remove redundancies which exacerbates workload for health workers and disrupts service delivery. Similarly, data collection instructions in registers and reporting forms need to be clarified to standardize IPTp data generation across health facilities. There is also need

	to address broader contextual factors such as stock-out of commodities and human resource shortages which undermine IPTp data generation process. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29298303/
148.	Nabwera HM, Moore SE, Mwangome MK, Molyneux SC, Darboe MK, Camara-Trawally N, Sonko B, Darboe A, Singhateh S, Fulford AJ, Prentice AM. The influence of maternal psychosocial circumstances and physical environment on the risk of severe wasting in rural Gambian infants: a mixed methods approach. BMC Public Health. 2018 Jan 6;18(1):109. **Abstract** Background: Severe wasting affects 16 million under 5's and carries an immediate risk of death. Prevalence remains unacceptably high in sub-Saharan Africa and early infancy is a high-risk period. We aimed to explore risk factors for severe wasting in rural Gambian infants. Methods: We undertook a case-control study from November 2014 to June 2015, in rural Gambia. Cases had WHO standard weight-for-length z-scores (WLZ) < -3 on at least 1 occasion in infancy. Controls with a WLZ > -3 in the same interval, matched on age, gender, village size and distance from the clinic were selected. Standard questionnaires were used to assess maternal socioeconomic status, water sanitation and hygiene and maternal mental health. Conditional logistic regression using a multivariable model was used to determine the risk factors for severe wasting. Qualitative in depth interviews were conducted with mothers and fathers who were purposively sampled. A thematic framework was used to analyse the in-depth interviews. Results: Two hundred and eighty (77 cases and 203 controls) children were recruited. In-depth interviews were conducted with 16 mothers, 3 fathers and 4 research staff members. The mean age of introduction of complementary feeds was similar between cases and controls (5.2 [SD 1.2] vs 5.1 [SD 1.3] months). Increased odds of severe wasting were associated with increased frequency of complementary feeds (range 1-8) [adjusted OR 2.06 (95%: 1.17-3.62), p = 0.01]. Maternal adherence to the recommended infant care practices was influenced by her social support networks, most importantly her husband, by infant feeding difficulties and maternal psychosocial stressors that include death of a child or spouse, recurrent ill health of child and lack of autonomy in child spacing. Conclusion: In rural Gambia, inappropriate infant feeding practices were associated with severe wasting in infants. Additionally, adverse psychosocial circumstances and infant feeding difficulties constrain mothers from practising the recommended child care practices. Interventions that promote maternal resilience through gender empowerment, prioritising maternal psychosocial support and encouraging the involvement of fathers in

	infant and child care promotion strategies, would help prevent severe wasting in these infants. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29304780/
149.	Mwangi W, Gachuno O, Desai M, Obor D, Were V, Odhiambo F, Nyaguara A, Laserson KF. Uptake of skilled attendance along the continuum of care in rural Western Kenya: selected analysis from Global Health initiative survey-2012. BMC Pregnancy Childbirth. 2018 May 16;18(1):175. **Abstract** Background: Examining skilled attendance throughout pregnancy, delivery and immediate postnatal period is proxy indicator on the progress towards reduction of maternal and neonatal mortality in developing countries. Methods: We conducted a cross-sectional baseline survey of households of mothers with at least 1 child under-5 years in 2012 within the KEMRI/CDC health and demographic surveillance system (HDSS) area in rural western Kenya. Results: Out of 8260 mother-child pairs, data on antenatal care (ANC) in the most recent pregnancy was obtained for 89% (n = 8260); 97% (n = 7387) reported attendance. Data on number of ANC visits was available for 89% (n = 7140); 52% (n = 6335) of mothers reported ≥4 ANC visits. Data on gestation month at first ANC was available for 94% (n = 7140) of mothers; 14% (n = 6690) reported first visit was in1sttrimester (0-12 weeks), 73% in 2nd trimester (14-28 weeks) and remaining 13% in third trimester. Forty nine percent (n = 8259) of mothers delivered in a Health Facility (HF), 48% at home and 3% en route to HF. Forty percent (n = 7140) and 63% (n = 4028) of mothers reporting ANC attendance and HF delivery respectively also reported receiving postnatal care (PNC). About 36% (n = 8259) of mothers reported newborn assessment (NBA). Sixty eight percent (n = 3966) of mothers that delivered at home reported taking newborn for HF check-up, with only 5% (n = 2693) doing so within 48 h of delivery. Being ≤34 years (OR 1.8; 95% CI 1.4-2.4) and at least primary education (OR 5.3; 95% CI 1.8-15.3) were significantly associated with ANC attendance. Being ≤34 years (OR 1.7; 95% CI 1.5-2.0), post-secondary vs primary education (OR 10; 95% CI 4.4-23.4), ANC attendance (OR 4.5; 95% CI 3.2-6.1), completing ≥4 ANC visits (OR 2.0; 95% CI 1.8-2.2), were strongly associated with HF delivery. The continuum of care was such that 97% (n = 7387) mothers reported ANC attendance, 49% reported both ANC and HF delivery attendance, 34% reported ANC, HF delivery and PNC attendance and only 18% reported ANC, HF delivery, PNC and NBA attendance. Conclusion: Uptake of services drastically declined from antenatal to postnatal period, along the continuum of care. Age and education were key determinants of uptake. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29769047/
150.	Murphy GAV, Gathara D, Mwachiro J, Abuya N, Aluvaala J, English M; Health Services that Deliver for Newborns Expert Group. Effective coverage of essential inpatient care for small and sick newborns in a high mortality urban setting: a cross-sectional study in Nairobi City County, Kenya. BMC Med. 2018 May 22;16(1):72.

	Abstract Background: Effective coverage requires that those in need can access skilled care supported by adequate resources. There are, however, few studies of effective coverage of facility-based neonatal care in low-income settings, despite the recognition that improving newborn survival is a global priority. Methods: We used a detailed retrospective review of medical records for neonatal admissions to public, private not-for-profit (mission) and private-for-profit (private) sector facilities providing 24×7 inpatient neonatal care in Nairobi City County to estimate the proportion of small and sick newborns receiving nationally recommended care across six process domains. We used our findings to explore the relationship between facility measures of structure and process and estimate effective coverage. Results: Of 33 eligible facilities, 28 (four public, six mission and 18 private), providing an estimated 98.7% of inpatient neonatal care in the county, agreed to partake. Data from 1184 admission episodes were collected. Overall performance was lowest (weighted mean score 0.35 [95% confidence interval or CI: 0.22-0.48] out of 1) for correct prescription of fluid and feed volumes and best (0.86 [95% CI: 0.80-0.93]) for documentation of demographic characteristics. Doses of gentamicin, when prescribed, were at least 20% higher than recommended in 11.7% cases. Larger (often public) facilities tended to have higher process and structural quality scores compared with smaller, predominantly private, facilities. We estimate effective coverage to be 25% (estimate range: 21-31%). These newborns received high-quality inpatient care, while almost half (44.5%) of newborns needed care but did not receive it and a further 30.4% of newborns received an inadequate service. Conclusions: Failure to receive services and gaps in quality of care both contribute to a shortfall in effective coverage in Nairobi City County. Three-quarters of small and sick newborns do not have access to high-quality facility-based care. Substantial improvements in effective coverage will be required to tackle high neonatal mortality in this urban setting with high levels of poverty. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29783977/
151.	Mujugira A, Baeten J, Kidoguchi L, Haberer J, Celum C, Donnell D, Ngure K,Bukusi E, Mugo N, Asiimwe S, Odoyo J, Tindimwebwa E, Bulya N, Katabira E, Heffron R. High levels of viral suppression among East African HIV-infected women and men in serodiscordant partnerships initiating antiretroviral therapywith high CD4 counts and during pregnancy. AIDS Res Hum Retroviruses. 2018 Feb;34(2):140-147. **Abstract** Background: People who are asymptomatic and feel healthy, including pregnant women, may be less motivated to initiate ART or achieve high adherence. We assessed whether ART initiation, and viral suppression 6, 12 and 24-months after ART initiation, were lower in HIV-infected members of serodiscordant couples who initiated during pregnancy or with higher CD4 counts.

	Methods: We used data from the Partners Demonstration Project, an open-label study of the delivery of integrated PrEP and ART (at any CD4 count) for HIV prevention among high-risk HIV serodiscordant couples in Kenya and Uganda. Differences in viral suppression (HIV RNA <400 copies/ml) among people initiating ART at different CD4 count levels (≤350, 351-500, and >500 cells/mm3) and during pregnancy were estimated using Poisson regression. Results: Of 865 HIV-infected participants retained after becoming eligible for ART during study follow-up, 95% initiated ART. Viral suppression 24-months after ART initiation was high overall (97%), and comparable among those initiating ART at CD4 counts >500, 351-500 and ≤350 cells/mm3 (96% vs 97% vs 97%; relative risk [RR] 0.98; 95% CI: 0.93-1.03 for CD4 >500 vs <350 and RR 0.99; 95% CI: (0.93-1.06) for CD4 351-500 vs ≤350). Viral suppression was as likely among women initiating ART primarily to prevent perinatal transmission as ART initiation for other reasons (p=0.9 at 6 months and p=0.5 at 12 months). Conclusions: Nearly all HIV-infected partners initiating ART were virally suppressed by 24 months, irrespective of CD4 count or pregnancy status. These findings suggest that people initiating ART at high CD4 counts or due to pregnancy can adhere to ART as well as those starting treatment with symptomatic HIV disease or low CD4 counts. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/28899162/
152.	Omondi GB, Serem G, Abuya N, Gathara D, Stanton NA, Agedo D, English M, Murphy GAV. Neonatal nasogastric tube feeding in a low-resource African setting using ergonomics methods to explore quality and safety issues in task sharing.BMC Nurs. 2018 Nov 16;17:46. **Abstract** Background: Sharing tasks with lower cadre workers may help ease the burden of work on the constrained nursing workforce in low- and middle-income countries but the quality and safety issues associated with shifting tasks are rarely critically evaluated. This research explored this gap using a Human Factors and Ergonomics (HFE) method as a novel approach to address this gap and inform task sharing policies in neonatal care settings in Kenya. Methods: We used Hierarchical Task Analysis (HTA) and the Systematic Human Error Reduction and Prediction Approach (SHERPA) to analyse and identify the nature and significance of potential errors of nasogastric tube (NGT) feeding in a neonatal setting and to gain a preliminary understanding of informal task sharing. Results: A total of 47 end tasks were identified from the HTA. Sharing, supervision and risk levels of these tasks reported by subject matter experts (SMEs) varied broadly. More than half of the tasks (58.3%) were shared with mothers, of these, 31.7% (13/41) and 68.3% were assigned a medium and low level of risk by the majority (≥4) of SMEs respectively. Few tasks were reported as 'often missed' by the majority of SMEs. SHERPA analysis suggested omission was the commonest type of error, however, due to the low risk nature, omission would potentially result in minor consequences. Training

	and provision of checklists for NGT feeding were the key approaches for remedying most errors. By extension these strategies could support safer task shifting. Conclusion: Inclusion of mothers and casual workers in care provided to sick infants is reported by SMEs in the Kenyan neonatal settings. Ergonomics methods proved useful in working with Kenyan SMEs to identify possible errors and the training and supervision needs for safer task-sharing. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30479560/
153.	Njue M, Njuguna P, Kapulu MC, Sanga G, Bejon P, Marsh V, Molyneux S, KamuyaD. Ethical considerations in Controlled Human Malaria Infection studies in low resource settings: Experiences and perceptions of study participants in a malaria Challenge study in Kenya. Wellcome Open Res. 2018 Oct 29;3:39. **Abstract** Background: The range and amount of volunteer infection studies, known as Controlled Human Infection Model (CHMI) studies, in Low-Middle Income Countries (LMICs) is increasing with rapid technological advancement, world-class laboratory facilities and increasing capacity development initiatives. However, the ethical issues these studies present in LMICs have not been empirically studied. We present findings of a descriptive social science study nested within a malaria volunteer infection study, on-going at the time of writing, at the KEMRI-Wellcome Trust Research Programme (KWTRP) on the Kenyan Coast. Methods: The study included non-participant observations, five group discussions with more than half of the CHMI study participants, two in-depth interviews with study team members, and an exit questionnaire administered to the participants. Results: Participants understood the key elements of the study, including that they would be deliberately infected with malaria parasites and may get malaria as a result, there would be regular blood draws, and they would spend up to 24 days in a residence facility away from their homes. The greatest motivation for participation was the monetary compensation of 20 USD per overnight stay given as a lump-sum at the end of their residency stay. Also appreciated were the health screening tests prior to enrolment and the positive relations with the study team. Concerns raised included the amount and regularity of blood draws experienced, and concerns that this type of research may feed into on-going rumours about research generally. Conclusion: With the increasing range and number of CHMI studies being conducted in LMICs, current ethical guidance are inadequate. This study highlights some of the ethical issues that could emerge in these settings, emphasizing the heavy responsibility placed on research review and regulatory systems, researchers and funders, as well as the importance of carefully tailored community engagement and consent processes. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29806038/
154.	Odeny TA, Onono M, Owuor K, Helova A, Wanga I, Bukusi EA, Turan JM, Abuogi LL. Maximizing adherence and retention for women living with HIV and their infants in Kenya (MOTIVATE! study): study protocol for a randomized controlled trial. Trials. 2018 Jan 29;19(1):77.

	Abstract Background: Successful completion and retention throughout the multi-step cascade of prevention of mother-to-child HIV transmission (PMTCT) remains difficult to achieve. The Mother and Infant Visit Adherence and Treatment Engagement study aims to evaluate the effect of mobile text messaging, community-based mentor mothers (cMMs), or both on increasing antiretroviral therapy (ART) adherence, retention in HIV care, maternal viral load suppression, and mother-to-child HIV transmission for mother-infant pairs receiving lifelong ART. Methods/design: This study is a cluster randomized, 2 × 2 factorial, controlled trial. The trial will be undertaken in the western Kenyan counties of Migori, Kisumu, and Homa Bay. Study sites will be randomized into one of four groups: six sites will implement both text messaging and cMM, six sites will implement cMM only, six sites will implement text messaging only, and six sites will implement the existing standard of care. The primary analysis will be based on the intention-to-treat principle and will compare maternal ART adherence and maternal retention in care. Discussion: This study will determine the impact of long-term (up to 12 months postpartum) text messaging and cMMs on retention in and adherence to ART among pregnant and breastfeeding women living with HIV in Kenya. It will address key gaps in our understanding of what interventions may successfully promote long-term retention in the PMTCT cascade of care. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29378622/
155.	Elliott AM, Roestenberg M, Wajja A, Opio C, Angumya F, Adriko M, Egesa M, Gitome S, Mfutso-Bengo J, Bejon P, Kapulu M, Seager Z, Lutalo T, Nazziwa WB, Muwumuza A, Yazdanbakhsh M, Kaleebu P, Kabatereine N, Tukahebwa E. Ethical andscientific considerations on the establishment of a controlled human infection model for schistosomiasis in Uganda: report of a stakeholders' meeting held in Entebbe, Uganda. AAS Open Res. 2018 Aug 6;1:2. **Abstract** Controlled human infection (CHI) models are gaining recognition as an approach to accelerating vaccine development, for use in both non-endemic and endemic populations: they can facilitate identification of the most promising candidate vaccines for further trials and advance understanding of protective immunity. Helminths present a continuing health burden in sub-Saharan Africa. Vaccine development for these complex organisms is particularly challenging, partly because protective responses are akin to mechanisms of allergy. A CHI model for Schistosoma mansoni (CHI-S) has been developed at Leiden University Medical Centre, the Netherlands. However, responses to schistosome infections, and candidate vaccines, are likely to be different among people from endemic settings compared to schistosome-naïve Dutch volunteers. Furthermore, among volunteers from endemic regions who have acquired immune responses through prior exposure, schistosome challenge can be used to define responses associated with clinical protection, and thus to guide vaccine development. To explore the possibility of

	establishing the CHI-S in Uganda, a Stakeholders' Meeting was held in Entebbe in 2017. Regulators, community members, researchers and policy-makers discussed implementation challenges and recommended preparatory steps: risk assessment; development of infrastructure and technical capacity to produce the infectious challenge material in Uganda; community engagement from Parliamentary to grass-roots level; pilot studies to establish approaches to assuring fully informed consent and true voluntariness, and strategies for selection of volunteers who can avoid natural infection during the 12-week CHI-S; the building of regulatory capacity; and the development of study protocols and a product dossier in close consultation with ethical and regulatory partners. It was recommended that, on completion, the protocol and product dossier be reviewed for approval in a joint meeting combining ethical, regulatory and environment management authorities. Most importantly, representatives of schistosomiasis-affected communities emphasised the urgent need for an effective vaccine and urged the research community not to delay in the development process. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30714021/
156.	Otieno P, Waiswa P, Butrick E, Namazzi G, Achola K, Santos N, Keating R, Lester F, Walker D. Strengthening intrapartum and immediate newborn care to reduce morbidity and mortality of preterm infants born in health facilities in Migori County, Kenya and Busoga Region, Uganda: a study protocol for a randomized controlled trial. Trials. 2018 Jun 5;19(1):313. **Abstract** Background: Preterm birth (birth before 37 weeks of gestation) and its complications are the leading contributors to neonatal and under-5 mortality. The majority of neonatal deaths in Kenya and Uganda occur during the intrapartum and immediate postnatal period. This paper describes our study protocol for implementing and evaluating a package of facility-based interventions to improve care during this critical window. Methods/design: This is a pair-matched, cluster randomized controlled trial across 20 facilities in Eastern Uganda and Western Kenya. The intervention facilities receive four components: (1) strengthening of routine data collection and data use activities; (2) implementation of the WHO Safe Childbirth Checklist modified for preterm birth; (3) PRONTO simulation training and mentoring to strengthen intrapartum and immediate newborn care; and (4) support of quality improvement teams. The control facilities receive both data strengthening and introduction of the modified checklist. The primary outcome for this study is 28-day mortality rate among preterm infants. The denominator will include all live births and fresh stillbirths weighing greater than 1000 g and less than 2500 g; all live births and fresh stillbirths weighing between 2501 and 3000 g with a documented gestational age less than 37 weeks. Discussion: The results of this study will inform interventions to improve personnel and facility capacity to respond to preterm labor and delivery, as well as care for the preterm infant. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29871696/

157.	Kwambai TK, Dhabangi A, Idro R, Opoka R, Kariuki S, Samuels AM, Desai M, van Hensbroek MB, John CC, Robberstad B, Wang D, Phiri K, Ter Kuile FO. Malaria chemoprevention with monthly dihydroartemisinin-piperaquine for the post-discharge management of severe anaemia in children aged less than 5 years in Uganda and Kenya: study protocol for a multi-centre, two-arm, randomised, placebo-controlled, superiority trial. Trials. 2018 Nov 6;19(1):610. **Abstract** Background: Children hospitalised with severe anaemia in malaria endemic areas in Africa are at high risk of readmission or death within 6 months post-discharge. Currently, no strategy specifically addresses this period. In Malawi, 3 months of post-discharge malaria chemoprevention (PMC) with monthly treatment courses of artemether-lumefantrine given at discharge and at 1 and 2 months prevented 30% of all-cause readmissions by 6 months post-discharge. Another efficacy trial is needed before a policy of malaria chemoprevention can be considered for the post-discharge management of severe anaemia in children under 5 years of age living in malaria endemic areas. Objective: We aim to determine if 3 months of PMC with monthly 3-day treatment courses of dihydroartemisinin-piperaquine is safe and superior to a single 3-day treatment course with artemether-lumefantrine provided as part of standard in-hospital care in reducing all-cause readmissions and deaths (composite primary endpoint) by 6 months in the post-discharge management of children less than 5 years of age admitted with severe anaemia of any or undetermined cause. Methods/design: This is a multi-centre, two-arm, placebo-controlled, individually randomised trial in children under 5 years of age recently discharged following management for severe anaemia. Children in both arms will receive standard in-hospital care for severe anaemia and a 3-day course of artemether-lumefantrine at discharge. At 2 weeks after discharge, surviving children will be randomised to receive either 3-day courses of dihydroartemisinin-piperaquine at 2, 6 and 10 weeks or an identical placebo and followed for 26 weeks through passive case detection. The trial will be conducted in hospitals in malaria endemic areas in Kenya and Uganda. The study is designed to detect a 25% reduction in the incidence of all-cause readmissions or death (composite primary outcome) from 1152 to 864 per 1000 child years (power 80%, $\alpha = 0.05$) and requires 520 children per arm (1040 total children). Results: Participant recruitment started in May 2016 and is ongoing. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/30400934/
158.	Okoyo C, Simiyu E, Njenga SM, Mwandawiro C. Comparing the performance of circulating cathodic antigen and Kato-Katz techniques in evaluating Schistosomamansoni infection in areas with low prevalence in selected counties of Kenya: a cross-sectional study. BMC Public Health. 2018 Apr 11;18(1):478. **Abstract**

	Background: Kato-Katz technique has been the mainstay test in Schistosoma mansoni diagnosis in endemic areas. However, recent studies have documented its poor sensitivity in evaluating Schistosoma mansoni infection especially in areas with lower rates of transmission. It's the primary diagnostic tool in monitoring impact of the Kenya national school based deworming program on infection transmission, but there is need to consider a more sensitive technique as the prevalence reduces. Therefore, this study explored the relationship between results of the stool-based Kato-Katz technique with urine-based point-of-care circulating cathodic antigen (POC-CCA) test in view to inform decision-making by the program in changing from Kato-Katz to POC-CCA test. Methods: We used two cross-sectional surveys conducted pre- and post- mass drug administration (MDA) using praziquantel in a representative random sample of children from 18 schools across 11 counties. A total of 1944 children were randomly sampled for the study. Stool and urine samples were tested for S. mansoni infection using Kato-Katz and POC-CCA methods, respectively. S. mansoni prevalence using each technique was calculated and 95% confidence intervals obtained using binomial regression model. Specificity (Sp) and sensitivity (Sn) were determined using 2 × 2 contingency tables and compared using the McNemar's chi-square test. Results: A total of 1899 and 1878 children were surveyed at pre- and post-treatment respectively. S. mansoni infection prevalence was 26.5 and 21.4% during pre- and post-treatment respectively using POC-CCA test, and 4.9 and 1.5% for pre- and post-treatment respectively using Kato-Katz technique. Taking POC-CCA as the gold standard, Kato-Katz was found to have significantly lower sensitivity both at pre- and post-treatment, Sn = 12.5% and Sn = 5.2% respectively, McNemar test $\chi 2m = 782.0$, $p < 0.001$. In overall, the results showed a slight/poor agreement between the two methods, kappa index (k) = 0.11, $p < 0.001$, inter-rater agreement = 77.1%. Conclusions: Results showed POC-CCA technique as an effective, sensitive and accurate screening tool for Schistosoma mansoni infection in areas of low prevalence. It was up to 14-fold accurate than Kato-Katz which had extremely inadequate sensitivity. We recommend usage of POC-CCA alongside Kato-Katz examinations by Schistosomiasis control programs in low prevalence areas. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29642875/
159.	Ondigo BN, Muok EMO, Oguso JK, Njenga SM, Kanyi HM, Ndombi EM, Priest JW, Kittur N, Secor WE, Karanja DMS, Colley DG. Impact of Mothers' Schistosomiasis Status During Gestation on Children's IgG Antibody Responses to Routine Vaccines 2 Years Later and Anti-Schistosome and Anti-Malarial Responses by Neonates in Western Kenya. Front Immunol. 2018 Jun 18;9:1402. **Abstract** The potential consequences of parasitic infections on a person's immune responsiveness to unrelated antigens are often conjectured upon in relationship to allergic responses and autoimmune diseases. These considerations sometimes extend to whether parasitic infection of pregnant women can influence the outcomes of responses by their offspring

	to the immunizations administered during national Expanded Programs of Immunization. To provide additional data to these discussions, we have enrolled 99 close-to-term pregnant women in western Kenya and determined their Schistosoma mansoni and Plasmodium falciparum infection status. At 2 years of age, when the initial immunization schedule was complete, we determined their children's IgG antibody levels to tetanus toxoid, diphtheria toxoid, and measles nucleoprotein (N-protein) antigens using a multiplex assay. We also monitored antibody responses during the children's first 2 years of life to P. falciparum MSP119 (PfMSP119), S. mansoni Soluble Egg Antigen (SEA), Ascaris suum hemoglobin (AsHb), and Strongyloides stercoralis (SsNIE). Mothers' infections with either P. falciparum or S. mansoni had no impact on the level of antibody responses of their offspring or the proportion of offspring that developed protective levels of antibodies to either tetanus or diphtheria antigens at 2 years of age. However, children born of S. mansoni-positive mothers and immunized for measles at 9 months of age had significantly lower levels of anti-measles N-protein antibodies when they were 2 years old ($p = 0.007$) and a lower proportion of these children (62.5 vs. 90.2%, OR = 0.18, 95% CI = 0.04-0.68, $p = 0.011$) were considered positive for measles N-protein antibodies. Decreased levels of measles antibodies may render these children more susceptible to measles infection than children whose mothers did not have schistosomiasis. None of the children demonstrated responses to AsHb or SsNIE during the study period. Anti-SEA and anti-PfMSP119 responses suggested that 6 and 70% of the children acquired schistosomes and falciparum malaria, respectively, during the first 2 years of life. Pubmed link-https://pubmed.ncbi.nlm.nih.gov/29967622/
160	Otieno JR, Kamau EM, Oketch JW, Ngoi JM, Gichuki AM, Binter Š, Otieno GP, Ngama M, Agoti CN, Cane PA, Kellam P, Cotten M, Lemey P, Nokes DJ. Whole genome analysis of local Kenyan and global sequences unravels the epidemiological andmolecular evolutionary dynamics of RSV genotype ON1 strains. Virus Evol. 2018 Sep 24;4(2):vey027. **Abstract** The respiratory syncytial virus (RSV) group A variant with the 72-nucleotide duplication in the G gene, genotype ON1, was first detected in Kilifi in 2012 and has almost completely replaced circulating genotype GA2 strains. This replacement suggests some fitness advantage of ON1 over the GA2 viruses in Kilifi, and might be accompanied by important genomic substitutions in ON1 viruses. Close observation of such a new virus genotype introduction over time provides an opportunity to better understand the transmission and evolutionary dynamics of the pathogen. We have generated and analysed 184 RSV-A whole-genome sequences (WGSs) from Kilifi (Kenya) collected between 2011 and 2016, the first ON1 genomes from Africa and the largest collection globally from a single location. Phylogenetic analysis indicates that RSV-A circulation in this coastal Kenya location is characterized by multiple introductions of viral lineages from diverse origins but with varied success in local transmission. We identified

	signature amino acid substitutions between ON1 and GA2 viruses' surface proteins (G and F), polymerase (L), and matrix M2-1 proteins, some of which were positively selected, and thereby provide an enhanced picture of RSV-A diversity. Furthermore, five of the eleven RSV open reading frames (ORFs) (G, F, L, N, and P) formed distinct phylogenetic clusters for the two genotypes. This might suggest that coding regions outside of the most frequently studied G ORF also play a role in the adaptation of RSV to host populations, with the alternative possibility that some of the substitutions are neutral and provide no selective advantage. Our analysis provides insight into the epidemiological processes that define RSV spread, highlights the genetic substitutions that characterize emerging strains, and demonstrates the utility of large-scale WGS in molecular epidemiological studies. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30271623/
161.	Bett B, Lindahl J, Sang R, Wainaina M, Kairu-Wanyoike S, Bukachi S, Njeru I, Karanja J, Ontiri E, Kariuki Njenga M, Wright D, Warimwe GM, Grace D. Association between Rift Valley fever virus seroprevalences in livestock and humans and their respective intra-cluster correlation coefficients, Tana River County, Kenya. Epidemiol Infect. 2018 Dec 5;147:e67. **Abstract** We implemented a cross-sectional study in Tana River County, Kenya, a Rift Valley fever (RVF)-endemic area, to quantify the strength of association between RVF virus (RVFv) seroprevalences in livestock and humans, and their respective intra-cluster correlation coefficients (ICCs). The study involved 1932 livestock from 152 households and 552 humans from 170 households. Serum samples were collected and screened for anti-RVFv immunoglobulin G (IgG) antibodies using inhibition IgG enzyme-linked immunosorbent assay (ELISA). Data collected were analysed using generalised linear mixed effects models, with herd/household and village being fitted as random variables. The overall RVFv seroprevalences in livestock and humans were 25.41% (95% confidence interval (CI) 23.49-27.42%) and 21.20% (17.86-24.85%), respectively. The presence of at least one seropositive animal in a household was associated with an increased odds of exposure in people of 2.23 (95% CI 1.03-4.84). The ICCs associated with RVF virus seroprevalence in livestock were 0.30 (95% CI 0.19-0.44) and 0.22 (95% CI 0.12-0.38) within and between herds, respectively. These findings suggest that there is a greater variability of RVF virus exposure between than within herds. We discuss ways of using these ICC estimates in observational surveys for RVF in endemic areas and postulate that the design of the sentinel herd surveillance should consider patterns of RVF clustering to enhance its effectiveness as an early warning system for RVF epidemics. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30516123/

162.	Ssewanyana D, van Baar A, Newton CR, Abubakar A. A contextually relevant approach to assessing health risk behavior in a rural sub-Saharan Africa setting: the Kilifi health risk behavior questionnaire. BMC Public Health. 2018 Jun 20;18(1):774. **Abstract** Background: Health risk behavior (HRB) is of concern during adolescence. In sub-Saharan Africa, reliable, valid and culturally appropriate measures of HRB are urgently needed. This study aims at assembling and psychometrically evaluating a comprehensive questionnaire on HRB of adolescents in Kilifi County at the coast of Kenya. Methods: The Kilifi Health Risk Behavior Questionnaire (KRIBE-Q) was assembled using items on HRB identified from a systematic review and by consulting 85 young people through 11 focus group discussions and in-depth interviews with 10 key informants like teachers and employees of organizations providing various services to young people in Kilifi County. The assembled list of HRB items were back and forward translated from English to Swahili and harmonized by a panel of experts. A total of 164 adolescents completed the assembled Swahili questionnaire at baseline and two weeks later 85 of them completed the questionnaire again. A classical test theory approach was utilized for psychometric evaluation. We computed the amount of missing data at item-level to verify data quality. Scaling evaluation was assessed by spread of responses across options at an item-level. Using Gwet's AC1 coefficient, test-retest reliability was assessed using data from the 85 adolescents who answered the questionnaire twice. Observations and completion of a brief questionnaire were done for non-psychometric evaluation of the KRIBE-Q administered via audio-computer assisted self-interview (ACASI) in Swahili language to 40 adolescents. Results: The KRIBE-Q showed high data quality, good spread of responses across options and a very good test-retest reliability (Gwet's AC1 = 0.82). It comprised 8 components with acceptable test-retest reliability: behavior resulting in unintentional injury and violence (0.85); tobacco use (0.85); alcohol and drug use (0.96); sexual behaviors (0.94); dietary behaviors (0.60); physical activity (0.74); gambling (0.73); and hygiene behavior (0.89). About 96% of the adolescents found the ACASI private and easy to use. Prevalence of bullying (32%), physical fights (40%) and engagement in gambling (26%) was high. Conclusion: The KRIBE-Q assembled in this study is a psychometrically sound instrument for adolescents in rural coastal Kenya and feasible to administer via ACASI. This measure may be useful for surveys and planning interventions in similar settings. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29925359/
163	Larson BA, Bii M, Tsikhutsu I, Halim N, Wolfman V, Coakley P, Sugut W, Sawe F. The Enhanced Mentor Mother ProgrAm (EMMA) for the prevention of mother-to-child transmission of HIV in Kenya: study protocol for a cluster randomized controlled trial. Trials. 2018 Oct 30;19(1):594. Abstract

	Background: As of September 2014, Kenya implemented the WHO recommended Option B+ guidelines in which all newly diagnosed HIV-infected pregnant women are immediately eligible for triple antiretroviral therapy (ART) for life regardless of CD4 count. In addition, Kenya previously established the Kenya Mentor Mother Program (KMMP) in 2012 to improve peer education and psychosocial support services within the national prevention of mother-to-child transmission (PMTCT) program. The primary objectives of the study described in the current protocol are: (1) to evaluate implementation of these new guidelines (Option B+ with Mentor Mothers) as part of routine service delivery; and (2) to evaluate potential benefits of a package of services within the KMMP (called EMMA) to improve PMTCT service delivery. Methods: We will conduct a cluster randomized controlled trial in western Kenya. We will allocate 12 clinics providing PMTCT services including ART to two study arms using pair matching: the standard of care (SOC) arm, which includes the KMMP as implemented by the clinics; and the intervention arm, which is the SOC (including KMMP) with the EMMA package of services (a targeted exit interview, visit reminders, and targeted follow-up). At the intervention clinics, the EMMA package of services is implemented as part of routine service delivery. A total of 360 (180 in each arm) pregnant women will be enrolled in the study at or near their first visit for antenatal care for prospective records review through 72 weeks post-partum. The primary and secondary outcomes are uninterrupted supplies of ART medications throughout the PMTCT cascade of care as well as infants completing HIV testing on schedule. Discussion: The EMMA package of services provides specific structure to the use of Mentor Mothers within PMTCT programs. This strategy was developed in collaboration with local health facility and PMTCT program staff based on their experience providing PMTCT services within the integrated ART-MCH facilities. If successful, this approach has the potential to improve dramatically PMTCT service delivery with minor additional costs beyond the basic mother-mentor program and support global goals to eliminate mother-to-child transmission. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30376872/
164	Kaduka L, Korir A, Oduor CO, Kwasa J, Mbui J, Wabwire S, Gakunga R, Okerosi N, Opanga Y, Kisiang'ani I, Chepkurui MR, Muniu E, Remick SC. Stroke distribution patterns and characteristics in Kenya's leading public health tertiary institutions: Kenyatta National Hospital and Moi Teaching and Referral Hospital. Cardiovasc J Afr. 2018 Mar/Apr;29(2):68-72. **Abstract** Background: Cardiovascular diseases are the second leading cause of morbidity and mortality in Kenya. However, there is limited clinic-epidemiological data on stroke to inform decision making. This study sought to establish stroke distribution patterns and characteristics in patients seeking care at Kenyatta National Hospital (KNH) and Moi

	Teaching and Referral Hospital (MTRH), with the ultimate aim of establishing the first national stroke registry in Kenya. Methods: This was a prospective multicentre cohort study among stroke patients. The study used a modified World Health Organisation STEP-wise approach to stroke surveillance tool in collecting data on incidence, major risk factors and mortality rate. The Cochran's Mantel-Haenszel chisquared test of conditional independence was used with p-value set at 0.05. Results: A total of 691 patients with confirmed stroke were recruited [KNH 406 (males: 40.9%; females: 59.1%); MTRH 285 (males: 44.6%; females: 55.4%)] and followed over a 12-month period. Overall, ischaemic stroke accounted for 55.6% of the stroke cases, with women being the most affected (57.5%). Mortality rate at day 10 was 18.0% at KNH and 15.5% at MTRH, and higher in the haemorrhagic cases (20.3%). The most common vascular risk factors were hypertension at 77.3% (males: 75.7%; females: 78.5%), smoking at 16.1% (males: 26.6% females: 8.3%) and diabetes at 14.9% (males: 15.7%; females: 14.4%). Ischaemic stroke was conditionally independent of gender after adjusting for age. Conclusion: To our knowledge this is the first pilot demonstration establishing a stroke registry in sub-Saharan Africa and clearly establishes feasibility for this approach. It also has utility to both inform and potentially guide public policy and public health measures on stroke in Kenya. Important and unexpected observations included the preponderance of women affected by cerebrovascular disease and that cigarette smoking was the second most common risk factor. The latter, over time, will further impact on the clinico-epidemiological profile of cerebrovascular disease in Kenya. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29745965/
165.	Kaduka L, Korir A, Oduor CO, Kwasa J, Mbui J, Wabwire S, Gakunga R, Okerosi N, Opanga Y, Kisiang'ani I, Chepkurui MR, Muniu E, Remick SC. Stroke distribution patterns and characteristics in Kenya's leading public health tertiary institutions: Kenyatta National Hospital and Moi Teaching and Referral Hospital. Cardiovasc J Afr. 2018 Mar/Apr;29(2):68-72. Abstract Background: Cardiovascular diseases are the second leading cause of morbidity and mortality in Kenya. However, there is limited clinic-epidemiological data on stroke to inform decision making. This study sought to establish stroke distribution patterns and characteristics in patients seeking care at Kenyatta National Hospital (KNH) and Moi Teaching and Referral Hospital (MTRH), with the ultimate aim of establishing the first national stroke registry in Kenya. Methods: This was a prospective multicentre cohort study among stroke patients. The study used a modified World Health Organisation STEP-wise approach to stroke surveillance tool in collecting data on incidence, major risk factors and mortality rate. The Cochran's Mantel-Haenszel chisquared test of conditional independence was used with p-value set at 0.05.

	Results: A total of 691 patients with confirmed stroke were recruited [KNH 406 (males: 40.9%; females: 59.1%); MTRH 285 (males: 44.6%; females: 55.4%)] and followed over a 12-month period. Overall, ischaemic stroke accounted for 55.6% of the stroke cases, with women being the most affected (57.5%). Mortality rate at day 10 was 18.0% at KNH and 15.5% at MTRH, and higher in the haemorrhagic cases (20.3%). The most common vascular risk factors were hypertension at 77.3% (males: 75.7%; females: 78.5%), smoking at 16.1% (males: 26.6% females: 8.3%) and diabetes at 14.9% (males: 15.7%; females: 14.4%). Ischaemic stroke was conditionally independent of gender after adjusting for age. Conclusion: To our knowledge this is the first pilot demonstration establishing a stroke registry in sub-Saharan Africa and clearly establishes feasibility for this approach. It also has utility to both inform and potentially guide public policy and public health measures on stroke in Kenya. Important and unexpected observations included the preponderance of women affected by cerebrovascular disease and that cigarette smoking was the second most common risk factor. The latter, over time, will further impact on the clinico-epidemiological profile of cerebrovascular disease in Kenya. Pubmed link- https://pubmed.ncbi.nlm.nih.gov/29745965/
166	Kugo M, Keter L, Maiyo A, Kinyua J, Ndemwa P, Maina G, Otieno P, Songok EM. Fortification of Carica papaya fruit seeds to school meal snacks may aid Africa mass deworming programs: a preliminary survey. BMC Complement Altern Med. 2018 Dec 7;18(1):327. **Abstract** Background: Soil transmitted helminths (STHs) are among the world's neglected tropical diseases. Morbidity due to STHs is greatest in school-age children who typically have the highest burden of infection. In 2001, WHO passed a resolution for the use of large-scale mass drug administration (MDA) to deworm vulnerable children through school based programs. Though effective, there is concern that MDA might not be sustainable over extended periods. Additionally the current MDA strategy does not consider child malnutrition, a very common malady in resource limited countries. We report a pilot evaluation of an innovation that bundles school feeding and deworming. Methods: We designed a maize (corn) flour fortified with grounded dried papaya (Carica papaya) seeds and used it to prepare porridge as per the usual school meal recipe Children from three primary schools from Nandi County in Kenya were randomized into three arms: One school received 300 ml papaya fortified porridge daily (papaya group), the second school received similar serving of plain porridge without the pawpaw ingredient (control group) and the third school received plain porridge and the conventional MDA approach of one time 400 mg dosage of albendazole (albendazole arm). Prior to the randomization, an initial baseline stool microscopy analysis was done to determine presence and intensity of intestinal worms. Core indicators of nutrition-height, weight and hemoglobin counts were also assessed. The children were monitored daily for two months and final stool sample analysis and clinical monitoring done at the

	end of the study. Baseline and follow-up data were analyzed and compared through SAS version 9.1 statistical package. Results: A total of 326 children participated in the trial. The overall prevalence of Ascaris lumbricoides was 29.4% (96), Trichuris Trichura 5.2% (17) and hookworm 1 (0.3%). Papaya seed fortified porridge reduced the Ascaris lumbricoides egg count by 63.9% after the two month period (mean 209.7epg to 75.7 $p < 0.002$) as compared to the albendazole arm 78.8% (129.5 epg to 27.5, p value 0.006). The control group showed an increase in egg count (42.epg to 56.3) though it was not statistically significant. Hemoglobin counts in the papaya group increased from a mean of 2 g/dL (11.5 g/dL to 13.5 g/dL, $p < 0.001$), as compared to the albendazole arm that increased by 1 g/dL (12.8-13.9, $p < 0.001$). No significant change was observed in the placebo arm (13.2 to 13.1). Interestingly the papaya group showed a significant reduction of children with Tinea capitis (ringworms) (54.4 to 34%, $p < 0.002$) as compared to the albendazole arm that showed an increase in ringworm infestation though not statistically significant (39.7 to 64.7% $p = 0.608$). Conclusion: Papaya seed fortified porridge had a significant effect on reduction of Ascaris lumbricoides burden. It had a better nutritional outcome and effect on child fungal infections than albendazole. Its application as a routine school meal may aid current national school based nutrition and deworming programs in Africa. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30526582/
167.	Carron M, Chang YM, Momanyi K, Akoko J, Kiiru J, Bettridge J, Chaloner G, Rushton J, O'Brien S, Williams N, Fèvre EM, Häsler B. Campylobacter, a zoonotic pathogen of global importance: Prevalence and risk factors in the fast-evolving chicken meat system of Nairobi, Kenya. PLoS Negl Trop Dis. 2018 Aug 13;12(8):e0006658. **Abstract** Campylobacteriosis is a leading foodborne zoonosis worldwide, and is frequently associated with handling and consumption of poultry meat. Various studies indicate that Campylobacter causes a substantial human disease burden in low to middle-income countries, but data regarding the organism's epidemiology in countries like Kenya are scarce. In sub-Saharan Africa, 3.8 million deaths of children under-5 years of age are reported annually. Of those, 25% are caused by diarrheal diseases, and Campylobacter is one of the most frequently isolated bacteria from diarrheic children. With the growth of urban conglomerates, such as Kenya's capital, Nairobi, changes in diets, food production systems, and retailing dynamics, it is likely that exposure and susceptibility to this pathogen will change. Therefore, the importance of Campylobacter disease burden in Kenya may increase further. The objectives of this study were: 1) to determine the prevalence of Campylobacter spp. in Nairobi's small-scale chicken farms and meat retailers, and 2) to identify potential risk factors associated with its presence in those sites. The prevalence data provides the first detailed baseline for this pathogen in the urban Kenyan context. The risk factors provide context-specific insights for disease managers. A cross-sectional study of broiler, indigenous chicken farms, and chicken

	meat retailers, was conducted in a peri-urban, low to middle-income area (Dagoretti), and a very-low income informal settlement (Kibera) of Nairobi. Chicken faeces were collected using one pair of boot socks per farm, and 3 raw chicken meat samples were purchased per retailer. Samples were cultured for viable Campylobacter spp. using mCCDA, followed by blood agar plates in aerobic/microaerobic conditions for prevalence calculations. A questionnaire-based survey on sanitary, sourcing and selling practices was conducted at each site for risk factor identification using logistic regression analyses. A total of 171 farm premises and 53 retailers were sampled and interviewed. The prevalence results for Campylobacter spp. were between 33 to 44% for broiler and indigenous chicken farms, 60% and 64% for retailers, in Dagoretti and Kibera, respectively. Univariable logistic regression showed an association between Campylobacter spp. presence and the easiness of cleaning the display material used by the retailer. Restricting access to the flock was also associated with the pathogen's presence. Multivariable logistic regression identified the selling of defrosted meat as a retailer risk factor (OR: 4.69; 95% CI: 1.31-19.97), calling for more investigation of the reported repetitive freezing-thawing processes and cold chain improvement options. At the farm-level, having a pen floor of material not easy to clean was found to increase the risk (OR: 2.31; 95%CI: 1.06-5.37). The relatively high prevalence of Campylobacter spp. across different areas and value chain nodes indicates a clear human exposure risk. The open nature of both small-scale broiler and indigenous chicken production practices with low biosecurity, hygiene and informal transactions, likely plays a role in this. While gradual improvement of farm biosecurity is recommended, risk factors identified suggest that consumer education and enforcement of basic food safety principles at the retailer end of the food continuum represent key targets for risk reduction in informal settings. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/30102697/
168.	Okoi C, Anderson STB, Antonio M, Mulwa SN, Gehre F, Adetifa IMO. Publisher Correction: Non-tuberculous Mycobacteria isolated from Pulmonary samples in sub-Saharan Africa - A Systematic Review and Meta Analyses. Sci Rep. 2018 May 14;8(1):7771. **Pubmed link**- https://pubmed.ncbi.nlm.nih.gov/29760399/
169.	Kleczka B, Musiega A, Rabut G, Wekesa P, Mwaniki P, Marx M, Kumar P. Rubber stamp templates for improving clinical documentation: A paper-based, m-Health approach for quality improvement in low-resource settings. Int J Med Inform. 2018 Jun;114:121-129. **Abstract** Background: The United Nations' Sustainable Development Goal #3.8 targets 'access to quality essential healthcare services'. Clinical practice guidelines are an important tool for ensuring quality of clinical care, but many challenges prevent their use in low-resource settings. Monitoring the use of guidelines relies on cumbersome clinical audits of paper records, and electronic systems face financial and other limitations. Here we

describe a unique approach to generating digital data from paper using guideline-based templates, rubber stamps and mobile phones.
Intervention: The Guidelines Adherence in Slums Project targeted ten private sector primary healthcare clinics serving informal settlements in Nairobi, Kenya. Each clinic was provided with rubber stamp templates to support documentation and management of commonly encountered outpatient conditions. Participatory design methods were used to customize templates to the workflows and infrastructure of each clinic. Rubber stamps were used to print templates into paper charts, providing clinicians with checklists for use during consultations. Templates used bubble format data entry, which could be digitized from images taken on mobile phones. Besides rubber stamp templates, the intervention included booklets of guideline compilations, one Android phone for digitizing images of templates, and one data feedback/continuing medical education session per clinic each month. In this paper we focus on the effect of the intervention on documentation of three non-communicable diseases in one clinic.
Methods: Seventy charts of patients enrolled in the chronic disease program (hypertension/diabetes, n=867; chronic respiratory diseases, n=223) at one of the ten intervention clinics were sampled. Documentation of each individual patient encounter in the pre-intervention (January-March 2016) and post-intervention period (May-July) was scored for information in four dimensions - general data, patient assessment, testing, and management. Control criteria included information with no counterparts in templates (e.g. notes on presenting complaints, vital signs). Documentation scores for each patient were compared between both pre- and post-intervention periods and between encounters documented with and without templates (post-intervention only).
Results: The total number of patient encounters in the pre-intervention (282) and post-intervention periods (264) did not differ. Mean documentation scores increased significantly in the post-intervention period on average by 21%, 24% and 17% for hypertension, diabetes and chronic respiratory diseases, respectively. Differences were greater (47%, 43% and 27%, respectively) when documentation with and without templates was compared. Changes between pre- vs.post-intervention, and with vs.without template, varied between individual dimensions of documentation. Overall, documentation improved more for general data and patient assessment than in testing or management.
Conclusion: The use of templates improves paper-based documentation of patient care, a first step towards improving the quality of care. Rubber stamps provide a simple and low-cost method to print templates on demand. In combination with ubiquitously available mobile phones, information entered on paper can be easily and rapidly digitized. This 'frugal innovation' in m-Health can empower small, private sector facilities, where large numbers of urban patients seek healthcare, to generate digital data on routine outpatient care. These data can form the basis for evidence-based quality improvement efforts at large scale, and help deliver on the SDG promise of quality essential healthcare services for all.

	Pubmed link- https://pubmed.ncbi.nlm.nih.gov/29107565/
170.	Onyango CG, Ogonda L, Guyah B, Okoth P, Shiluli C, Humwa F, Opollo V. Correction to: Seroprevalence and determinants of transfusion transmissible infections among voluntary blood donors in Homabay, Kisumu and Siaya counties in western Kenya. BMC Res Notes. 2018 Jun 26;11(1):410. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29945668/
171.	Huttner A, Agnandji ST, Combescure C, Fernandes JF, Bache EB, Kabwende L, Ndungu FM, Brosnahan J, Monath TP, Lemaître B, Grillet S, Botto M, Engler O, Portmann J, Siegrist D, Bejon P, Silvera P, Kremsner P, Siegrist CA; VEBCON; VSV-EBOVAC; VSV-EBOPLUS Consortia. Determinants of antibody persistence across doses and continents after single-dose rVSV-ZEBOV vaccination for Ebola virus disease: an observational cohort study. Lancet Infect Dis. 2018 Jul;18(7):738-748. **Abstract** Background: The recombinant vesicular stomatitis virus (rVSV) vaccine expressing the Zaire Ebola virus (ZEBOV) glycoprotein is efficacious in the weeks following single-dose injection, but duration of immunity is unknown. We aimed to assess antibody persistence at 1 and 2 years in volunteers who received single-dose rVSV-ZEBOV in three previous trials. Methods: In this observational cohort study, we prospectively followed-up participants from the African and European phase 1 rVSV-ZEBOV trials, who were vaccinated once in 2014-15 with 300 000 (low dose) or 10-50 million (high dose) plaque-forming units (pfu) of rVSV-ZEBOV vaccine to assess ZEBOV glycoprotein (IgG) antibody persistence. The primary outcome was ZEBOV glycoprotein-specific IgG geometric mean concentrations (GMCs) measured yearly by ELISA compared with 1 month (ie, 28 days) after immunisation. We report GMCs up to 2 years (Geneva, Switzerland, including neutralising antibodies up to 6 months) and 1 year (Lambaréné, Gabon; Kilifi, Kenya) after vaccination and factors associated with higher antibody persistence beyond 6 months, according to multivariable analyses. Trials and the observational study were registered at ClinicalTrials.gov (Geneva: NCT02287480 and NCT02933931; Kilifi: NCT02296983) and the Pan-African Clinical Trials Registry (Lambaréné PACTR201411000919191). Findings: Of 217 vaccinees from the original studies (102 from the Geneva study, 75 from the Lambaréné study, and 40 from the Kilifi study), 197 returned and provided samples at 1 year (95 from the Geneva study, 63 from the Lambaréné, and 39 from the Kilifi study) and 90 at 2 years (all from the Geneva study). In the Geneva group, 44 (100%) of 44 participants who had been given a high dose (ie, 10-50 million pfu) of vaccine and who were seropositive at day 28 remained seropositive at 2 years, whereas 33 (89%) of 37 who had been given the low dose (ie, 300 000 pfu) remained seropositive for 2 years (p=0·042). In participants who had received a high dose, ZEBOV

	glycoprotein IgG GMCs decreased significantly between their peak (at 1-3 months) and month 6 after vaccination in Geneva (p<0·0001) and Lambaréné (p=0·0298) but not in Kilifi (p=0·5833) and subsequently remained stable at all sites apart from Geneva, where GMC in those given a high dose of vaccine increased significantly between 6 months and 1 year (p=0·0264). Antibody persistence was similar at 1 year and at 6 months in those who had received a low dose of vaccine, with lower titres among participants from the Geneva study at 2 years than at 1 year after vaccination (GMC ratio 0·61, 95% CI 0·49-0·77; p<0·0001). In multivariable analyses, predictors of increased IgG GMCs beyond 6 months included high-dose versus low-dose vaccination (Geneva p=0·0133; Lambaréné p=0·008) and vaccine-related arthritis (p=0·0176), but not sex, age, or baseline seropositivity (all p>0·05). Neutralising antibodies seem to be less durable, with seropositivity dropping from 64-71% at 28 days to 27-31% at 6 months in participants from the Geneva study. Interpretation: Antibody responses to single-dose rVSV-ZEBOV vaccination are sustained across dose ranges and settings, a key criterion in countries where booster vaccinations would be impractical. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29627147/
172.	Mallewa J, Szubert AJ, Mugyenyi P, Chidziva E, Thomason MJ, Chepkorir P, Abongomera G, Baleeta K, Etyang A, Warambwa C, Melly B, Mudzingwa S, Kelly C, Agutu C, Wilkes H, Nkomani S, Musiime V, Lugemwa A, Pett SL, Bwakura-Dangarembizi M, Prendergast AJ, Gibb DM, Walker AS, Berkley JA; REALITY trial team. Effect of ready-to-use supplementary food on mortality in severely immunocompromised HIV-infected individuals in Africa initiating antiretroviral therapy (REALITY): an open-label, parallel-group, randomised controlled trial. Lancet HIV. 2018 May;5(5):e231-e240. **Abstract** Background: In sub-Saharan Africa, severely immunocompromised HIV-infected individuals have a high risk of mortality during the first few months after starting antiretroviral therapy (ART). We hypothesise that universally providing ready-to-use supplementary food (RUSF) would increase early weight gain, thereby reducing early mortality compared with current guidelines recommending ready-to-use therapeutic food (RUTF) for severely malnourished individuals only. Methods: We did a 2 × 2 × 2 factorial, open-label, parallel-group trial at inpatient and outpatient facilities in eight urban or periurban regional hospitals in Kenya, Malawi, Uganda, and Zimbabwe. Eligible participants were ART-naive adults and children aged at least 5 years with confirmed HIV infection and a CD4 cell count of fewer than 100 cells per μL, who were initiating ART at the facilities. We randomly assigned participants (1:1) to initiate ART either with (RUSF) or without (no-RUSF) 12 weeks' of peanut-based RUSF containing 1000 kcal per day and micronutrients, given as two 92 g packets per day for adults and one packet (500 kcal per day) for children aged 5-12 years,

	regardless of nutritional status. In both groups, individuals received supplementation with RUTF only when severely malnourished (ie, body-mass index [BMI] <16-18 kg/m2 or BMI-for-age Z scores <-3 for children). We did the randomisation with computer-generated, sequentially numbered tables with different block sizes incorporated within an online database. Randomisation was stratified by centre, age, and two other factorial randomisations, to 12 week adjunctive raltegravir and enhanced anti-infection prophylaxis (reported elsewhere). Clinic visits were scheduled at weeks 2, 4, 8, 12, 18, 24, 36, and 48, and included nurse assessment of vital status and symptoms and dispensing of all medication including ART and RUSF. The primary outcome was mortality at week 24, analysed by intention to treat. Secondary outcomes included absolute changes in weight, BMI, and mid-upper-arm circumference (MUAC). Safety was analysed in all randomly assigned participants. Follow-up was 48 weeks. This trial is registered with ClinicalTrials.gov (NCT01825031) and the ISRCTN registry (43622374). Findings: Between June 18, 2013, and April 10, 2015, we randomly assigned 1805 participants to treatment: 897 to RUSF and 908 to no-RUSF. 56 (3%) were lost-to-follow-up. 96 (10·9%, 95% CI 9·0-13·1) participants allocated to RUSF and 92 (10·3%, 8·5-12·5) to no-RUSF died within 24 weeks (hazard ratio 1·05, 95% CI 0·79-1·40; log-rank p=0·75), with no evidence of interaction with the other randomisations (both p>0·7). Through 48 weeks, adults and adolescents aged 13 years and older in the RUSF group had significantly greater gains in weight, BMI, and MUAC than the no-RUSF group (p=0·004, 0·004, and 0·03, respectively). The most common type of serious adverse event was specific infections, occurring in 90 (10%) of 897 participants assigned RUSF and 87 (10%) of 908 assigned no-RUSF. By week 48, 205 participants had serious adverse events in both groups (p=0·81), and 181 had grade 4 adverse events in the RUSF group compared with 172 in the non-RUSF group (p=0·45). Interpretation: In severely immunocompromised HIV-infected individuals, providing RUSF universally at ART initiation, compared with providing RUTF to severely malnourished individuals only, improved short-term weight gain but not mortality. A change in policy to provide nutritional supplementation to all severely immunocompromised HIV-infected individuals starting ART is therefore not warranted at present. **Pubmed link**-https://pubmed.ncbi.nlm.nih.gov/29653915/