In Search of Better Health

2014 KEMRI PUBLICATIONS

No.	PUBLICATIONS
1.	Hoste EA, Maitland K, Brudney CS, Mehta R, Vincent JL, Yates D, Kellum JA, Mythen MG, Shaw AD; ADQI XII Investigators Group. Four phases of intravenous fluid therapy: a conceptual model. Br J Anaesth. 2014 Nov;113(5):740-7. **Abstract** I.V. fluid therapy plays a fundamental role in the management of hospitalized patients. While the correct use of i.v. fluids can be lifesaving, recent literature demonstrates that fluid therapy is not without risks. Indeed, the use of certain types and volumes of fluid can increase the risk of harm, and even death, in some patient groups. Data from a recent audit show us that the inappropriate use of fluids may occur in up to 20% of patients receiving fluid therapy. The delegates of the 12th Acute Dialysis Quality Initiative (ADQI) Conference sought to obtain consensus on the use of i.v. fluids with the aim of producing guidance for their use. In this article, we review a recently proposed model for fluid therapy in severe sepsis and propose a framework by which it could be adopted for use in most situations where fluid management is required. Considering the dose-effect relationship and side-effects of fluids, fluid therapy should be regarded similar to other drug therapy with specific indications and tailored recommendations for the type and dose of fluid. By emphasizing the necessity to individualize fluid therapy, we hope to reduce the risk to our patients and improve their outcome. **Pubmed link-** https://pubmed.ncbi.nlm.nih.gov/25204700/
2.	Bundi M, Miring'u G, Inoue S, Muriithi B, Ashur S, Wandera E, Kathiiko C, Odoyo E, Narita C, Kwalla A, Galata A, Makumi A, Huka S, Shah M, Karama M, Shimada M, Bii C, Kariuki S, Horio M, Ichinose Y. BSL-3 Laboratory User Training Program at NUITM-KEMRI. Trop Med Health. 2014 Dec;42(4):17-61 **Abstract** Pathogens handled in a Biosafety Level 3 (BSL-3) containment laboratory pose significant risks to laboratory staff and the environment. It is therefore necessary to develop competency and proficiency among laboratory workers and to promote appropriate behavior and practices that enhance safety through biosafety training. Following the installation of our BSL-3 laboratory at the Center for Microbiology Research-Kenya Medical Research Institute in 2006, a biosafety training program was

	developed to provide training on BSL-3 safety practices and procedures. The training program was developed based on World Health Organization specifications, with adjustments to fit our research activities and biosafety needs. The program is composed of three phases, namely initial assessment, a training phase including theory and a practicum, and a final assessment. This article reports the content of our training program. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25589881/
3.	Desai M, Buff AM, Khagayi S, Byass P, Amek N, van Eijk A, Slutsker L, Vulule J, Odhiambo FO, Phillips-Howard PA, Lindblade KA, Laserson KF, Hamel MJ. Age-specific malaria mortality rates in the KEMRI/CDC health and demographic surveillance system in western Kenya, 2003-2010. PLoS One. 2014 Sep 2;9(9):e106197 **Abstract** Recent global malaria burden modeling efforts have produced significantly different estimates, particularly in adult malaria mortality. To measure malaria control progress, accurate malaria burden estimates across age groups are necessary. We determined age-specific malaria mortality rates in western Kenya to compare with recent global estimates. We collected data from 148,000 persons in a health and demographic surveillance system from 2003-2010. Standardized verbal autopsies were conducted for all deaths; probable cause of death was assigned using the InterVA-4 model. Annual malaria mortality rates per 1,000 person-years were generated by age group. Trends were analyzed using Poisson regression. From 2003-2010, in children <5 years the malaria mortality rate decreased from 13.2 to 3.7 per 1,000 person-years; the declines were greatest in the first three years of life. In children 5-14 years, the malaria mortality rate remained stable at 0.5 per 1,000 person-years. In persons ≥15 years, the malaria mortality rate decreased from 1.5 to 0.4 per 1,000 person-years. The malaria mortality rates in young children and persons aged ≥15 years decreased dramatically from 2003-2010 in western Kenya, but rates in older children have not declined. Sharp declines in some age groups likely reflect the national scale up of malaria control interventions and rapid expansion of HIV prevention services. These data highlight the importance of age-specific malaria mortality ascertainment and support current strategies to include all age groups in malaria control interventions. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25180495/
4.	Mwangome MK, Berkley JA. The reliability of weight-for-length/height Z scores in children. Matern Child Nutr. 2014 Oct;10(4):474-80

	Abstract The World Health Organisation (WHO) recommends weight-for-length/height (WFL/H), represented as a Z score for diagnosing acute malnutrition among children aged 0 to 60 months. Under controlled conditions, weight, height and length measurements have high degree of reliability. However, the reliability when combined into a WFL/H Z score, in all settings is unclear. We conducted a systematic review of published studies assessing the reliability of WFL/Hz on PubMed and Google scholar. Studies were included if they presented reliability scores for the derived index of WFL/Hz, for children under 5 years. Meta-analysis was conducted for a pooled estimate of reliability overall, and for children above and below 24 months old. Twenty six studies on reliability of anthropometry were identified but only three, all community-based studies, reported reliability scores for WFL/Hz. The overall pooled intra-class correlation coefficient (ICC) estimate for WFL/Hz among children aged 0 to 60 months was 0.81 (95% CI 0.64 to 0.99). Among children aged less than 24 months the pooled ICC estimate from two studies was 0.72 (95% CI 0.67 to 0.77) while the estimate reported for children above 24 months from one study was 0.97 (95% CI 0.97 to 0.99). Although WFL/Hz is recommended for diagnosis of acute under nutrition among children below 5 years, information on its reliability in all settings is sparse. In community settings, reliability of WFL/Hz is considerably lower than for absolute measures of weight and length/height, especially in younger children. The reliability of WFL/Hz needs further evaluation. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24785183/
5.	Ba-Diop A, Marin B, Druet-Cabanac M, Ngoungou EB, Newton CR, Preux PM. Epidemiology, causes, and treatment of epilepsy in sub-Saharan Africa. Lancet Neurol. 2014 Oct;13(10):1029-44 **Abstract** Epilepsy is a common neurological disease in tropical countries, particularly in sub-Saharan Africa. Previous work on epilepsy in sub-Saharan Africa has shown that many cases are severe, partly a result of some specific causes, that it carries a stigma, and that it is not adequately treated in many cases. Many studies on the epidemiology, aetiology, and management of epilepsy in sub-Saharan Africa have been reported in the past 10 years. The prevalence estimated from door-to-door studies is almost double that in Asia, Europe, and North America. The most commonly implicated risk factors are birth trauma, CNS infections, and traumatic brain injury. About 60% of patients with epilepsy receive no antiepileptic treatment, largely for economic and social reasons. Further epidemiological studies should be a priority to improve understanding of possible risk factors and thereby the prevention of epilepsy in Africa, and action should

	be taken to improve access to treatment. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25231525/
6.	Feikin DR, Scott JA, Gessner BD. Use of vaccines as probes to define disease burden. Lancet. 2014 May 17;383(9930):1762-70. **Abstract** Vaccine probe studies have emerged in the past 15 years as a useful way to characterise disease. By contrast, traditional studies of vaccines focus on defining the vaccine effectiveness or efficacy. The underlying basis for the vaccine probe approach is that the difference in disease burden between vaccinated and unvaccinated individuals can be ascribed to the vaccine-specific pathogen. Vaccine probe studies can increase understanding of a vaccine's public health value. For instance, even when a vaccine has a seemingly low efficacy, a high baseline disease incidence can lead to a large vaccine-preventable disease burden and thus that population-based vaccine introduction would be justified. So far, vaccines have been used as probes to characterise disease syndromes caused by Haemophilus influenzae type b, pneumococcus, rotavirus, and early infant influenza. However, vaccine probe studies have enormous potential and could be used more widely in epidemiology, for example, to define the vaccine-preventable burden of malaria, typhoid, paediatric influenza, and dengue, and to identify causal interactions between different pathogens. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24553294/
7.	Mackinnon MJ. The role of immunity in mosquito-induced attenuation of malaria virulence. Malar J. 2014 Jan 21;13:25. **Abstract** A recent study found that mosquito-transmitted (MT) lines of rodent malaria parasites elicit a more effective immune response than non-transmitted lines maintained by serial blood passage (non-MT), thereby causing lower parasite densities in the blood and less pathology to the host. The authors attribute these changes to higher diversity in expression of antigen-encoding genes in MT cf. non-MT lines. Alternative explanations that are equally parsimonious with these new data, and results from previous studies, suggest that this conclusion may be premature. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24443873/
8.	Abubakar A. Biomedical risk, psychosocial influences, and developmental outcomes: lessons from the pediatric HIV population in Africa. New Dir Child

	Adolesc Dev. 2014 Winter;2014(146):23-41. **Abstract** Sub-Saharan Africa is home to millions of HIV-affected children. These children are likely to experience multiple developmental delays. In this chapter, I present data highlighting compromised neurobehavioral, mental health, and scholastic outcomes for children affected by HIV. Furthermore, I discuss biomedical factors (e.g., disease severity and nutritional status) that may exacerbate the adverse effects of HIV on childhood outcomes. I also present evidence on how psychosocial risk factors such as poor maternal mental health, orphanhood, and poverty may aggravate the effects of HIV. The concluding section of the chapter highlights conceptual and methodological refinements in research on the impact of HIV on child development in Sub-Saharan Africa. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25512044/
9.	Abdi AI, Muthui M, Kiragu E, Bull PC. Measuring soluble ICAM-1 in African populations. PLoS One. 2014 Oct 7;9(10):e108956 **Abstract** The level of plasma soluble ICAM-1 (sICAM-1) has been associated with the pathogenesis of several diseases. Previously, a commercial antibody was reported not to recognize an ICAM-1 allele known as ICAM-1kilifi prevalent among African populations. However, that study was based on 19 samples from African Americans of whom 13 had the wild type allele, five heterozygotes and one homozygote. Here, we compare plasma sICAM-1 measures using three different commercial antibodies in samples from Kenyan children genotyped for ICAM-1kilifi allele. We show that two of these antibodies have some degree of deficiency in detecting the ICAM-1kilifi allele. Consideration of the antibody used to measure sICAM-1 is important as up to 30% of the populations in Africa harbour this allele. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25289635/
10.	Lopez AD, Williams TN, Levin A, Tonelli M, Singh JA, Burney PG, Rehm J, Volkow ND, Koob G, Ferri CP. Remembering the forgotten non-communicable diseases. BMC Med. 2014 Oct 22;12:200. **Abstract** The forthcoming post-Millennium Development Goals era will bring about new challenges in global health. Low- and middle-income countries will have to contend

	with a dual burden of infectious and non-communicable diseases (NCDs). Some of these NCDs, such as neoplasms, COPD, cardiovascular diseases and diabetes, cause much health loss worldwide and are already widely recognised as doing so. However, 55% of the global NCD burden arises from other NCDs, which tend to be ignored in terms of premature mortality and quality of life reduction. Here, experts in some of these 'forgotten NCDs' review the clinical impact of these diseases along with the consequences of their ignoring their medical importance, and discuss ways in which they can be given higher global health priority in order to decrease the growing burden of disease and disability. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25604462/
11.	Seale AC, Blencowe H, Manu AA, Nair H, Bahl R, Qazi SA, Zaidi AK, Berkley JA, Cousens SN, Lawn JE; pSBI Investigator Group. Estimates of possible severe bacterial infection in neonates in sub-Saharan Africa, south Asia, and Latin America for 2012: a systematic review and meta-analysis. Lancet Infect Dis. 2014 Aug;14(8):731-741 **Abstract** **Background:** Bacterial infections are a leading cause of the 2·9 million annual neonatal deaths. Treatment is usually based on clinical diagnosis of possible severe bacterial infection (pSBI). To guide programme planning, we have undertaken the first estimates of neonatal pSBI, by sex and by region, for sub-Saharan Africa, south Asia, and Latin America. **Methods:** We included data for pSBI incidence in neonates of 32 weeks' gestation or more (or birthweight ≥1500 g) with livebirth denominator data, undertaking a systematic review and forming an investigator group to obtain unpublished data. We calculated pooled risk estimates for neonatal pSBI and case fatality risk, by sex and by region. We then applied these risk estimates to estimates of livebirths in sub-Saharan Africa, south Asia, and Latin America to estimate cases and associated deaths in 2012. **Findings:** We included data from 22 studies, for 259 944 neonates and 20 196 pSBI cases, with most of the data (18 of the 22 studies) coming from the investigator group. The pooled estimate of pSBI incidence risk was 7·6% (95% CI 6·1-9·2%) and the case-fatality risk associated with pSBI was 9·8% (7·4-12·2). We estimated that in 2012 there were 6·9 million cases (uncertainty range 5·5 million-8·3 million) of pSBI in neonates needing treatment: 3·5 million (2·8 million-4·2 million) in south Asia, 2·6 million (2·1 million-3·1 million) in sub-Saharan Africa, and 0·8 million (0·7 million-1·0 million) in Latin America. The risk of pSBI was greater in boys (risk ratio 1·12, 95% CI 1·06-1·18) than girls. We estimated that there were 0·68 million (0·46 million-0·92 million)

	neonatal deaths associated with pSBI in 2012. **Interpretation:** The need-to-treat population for pSBI in these three regions is high, with ten cases of pSBI diagnosed for each associated neonatal death. Deaths and disability can be reduced through improved prevention, detection, and case management. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24974250/
12.	Gebreyes WA, Dupouy-Camet J, Newport MJ, Oliveira CJ, Schlesinger LS, Saif YM, Kariuki S, Saif LJ, Saville W, Wittum T, Hoet A, Quessy S, Kazwala R, Tekola B, Shryock T, Bisesi M, Patchanee P, Boonmar S, King LJ. The global one health paradigm: challenges and opportunities for tackling infectious diseases at the human, animal, and environment interface in low-resource settings. PLoS Negl Trop Dis. 2014 Nov 13;8(11):e3257 **Abstract** Zoonotic infectious diseases have been an important concern to humankind for more than 10,000 years. Today, approximately 75% of newly emerging infectious diseases (EIDs) are zoonoses that result from various anthropogenic, genetic, ecologic, socioeconomic, and climatic factors. These interrelated driving forces make it difficult to predict and to prevent zoonotic EIDs. Although significant improvements in environmental and medical surveillance, clinical diagnostic methods, and medical practices have been achieved in the recent years, zoonotic EIDs remain a major global concern, and such threats are expanding, especially in less developed regions. The current Ebola epidemic in West Africa is an extreme stark reminder of the role animal reservoirs play in public health and reinforces the urgent need for globally operationalizing a One Health approach. The complex nature of zoonotic diseases and the limited resources in developing countries are a reminder that the need for implementation of Global One Health in low-resource settings is crucial. The Veterinary Public Health and Biotechnology (VPH-Biotec) Global Consortium launched the International Congress on Pathogens at the Human-Animal Interface (ICOPHAI) in order to address important challenges and needs for capacity building. The inaugural ICOPHAI (Addis Ababa, Ethiopia, 2011) and the second congress (Porto de Galinhas, Brazil, 2013) were unique opportunities to share and discuss issues related to zoonotic infectious diseases worldwide. In addition to strong scientific reports in eight thematic areas that necessitate One Health implementation, the congress identified four key capacity-building needs: (1) development of adequate science-based risk management policies, (2) skilled-personnel capacity building, (3) accredited veterinary and public health diagnostic laboratories with a shared database, and (4) improved use of existing natural resources and implementation. The aim of this review is to highlight advances in

	key zoonotic disease areas and the One Health capacity needs. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25393303/
13.	Morpeth SC, Huggett JF, Murdoch DR, Scott JA. Making standards for quantitative real-time pneumococcal PCR. Biomol Detect Quantif. 2014 Dec 4;2:1-3 **Abstract** Quantitative *lytA* PCR is often performed using in-house standards. We hypothesised equivalence when measuring a standard suspension of *Streptococcus pneumoniae* by colony-forming-units (CFU) or genome-copies. Median (IQR) ratio of CFU/genome-copies was 0.19 (0.1-1.2). Genome-copies were less variable than CFU, but the discrepancy between the methods highlights challenges with absolute quantification. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/27896138/
14.	Bakibinga P, Ettarh R, Ziraba AK, Kyobutungi C, Kamande E, Ngomi N, Osindo J. The effect of enhanced public-private partnerships on Maternal, Newborn and child Health Services and outcomes in Nairobi-Kenya: the PAMANECH quasi-experimental research protocol. BMJ Open. 2014 Oct 23;4(10):e006608 **Abstract** **Introduction:** Rapid urbanisation in Kenya has resulted in growth of slums in urban centres, characterised by poverty, inadequate social services and poor health outcomes. The government's initiatives to improve access to quality healthcare for mothers and children are largely limited to public health facilities, which are few and/or inaccessible in underserved areas such as the slums. The 'Partnership for Maternal, Newborn and Child Health' (PAMANECH) project is being implemented in two Nairobi slums, Viwandani and Korogocho, to assess the impact of strengthening public-private partnerships for the delivery of healthcare on the health of mothers, newborns and young children in two informal settlements in Kenya. **Methods and analysis:** This is a quasi-experimental study; our approach is to support private as well as public health providers and the community to enhance access to and demand for quality healthcare services. Key activities include: infrastructural upgrade of selected Private Not-For-Profit health facilities operating in the two slums, building capacity for healthcare providers as well as the Health Management Teams in Nairobi, facilitating provision of supportive supervision by the local health authorities and forming networks of Community Health Volunteers (CHVs) to create demand for health

	services. To assess the impact of the intervention, the study is utilising multiple data sources using a combination of qualitative and quantitative methods. A baseline survey was conducted in 2013 and an end-line survey will be conducted at least 1 year after full implementation of the intervention. Systematic monitoring and documentation of the intervention is on-going to strengthen the case for causal inference. **Ethics and dissemination:** Ethical approval for the study was obtained from the Kenya Medical Research Institute. Key messages from the results will be packaged and widely disseminated through workshops, conference presentations, reports, factsheets and academic publications to facilitate uptake by policymakers. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25341452/
15.	Opiyo N, Molyneux E, Sinclair D, Garner P, English M. Immediate fluid management of children with severe febrile illness and signs of impaired circulation in low-income settings: a contextualised systematic review. BMJ Open. 2014 Apr 30;4(4):e004934 **Abstract** **Objective:** To evaluate the effects of intravenous fluid bolus compared to maintenance intravenous fluids alone as part of immediate emergency care in children with severe febrile illness and signs of impaired circulation in low-income settings. **Design:** Systematic review of randomised controlled trials (RCTs), and observational studies, including retrospective analyses, that compare fluid bolus regimens with maintenance fluids alone. The primary outcome measure was predischarge mortality. **Data sources and synthesis:** We searched PubMed, The Cochrane Library (to January 2014), with complementary earlier searches on, Google Scholar and Clinical Trial Registries (to March 2013). As studies used different clinical signs to define impaired circulation we classified patients into those with signs of severely impaired circulation, or those with any signs of impaired circulation. The quality of evidence for each outcome was appraised using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. Findings are presented as risk ratios (RRs) with 95% CIs. **Results:** Six studies were included. Two were RCTs, one large trial (n=3141 children) from a low-income country and a smaller trial from a middle-income country. The remaining studies were from middle-income or high-income settings, observational, and with few participants (34-187 children). **Severely impaired circulation:** The large RCT included a small subgroup with

	severely impaired circulation. There were more deaths in those receiving bolus fluids (20-40 mL/kg/h, saline or albumin) compared to maintenance fluids (2.5-4 mL/kg/h; RR 2.40, 95% CI 0.84 to 6.88, p=0.054, 65 participants, low quality evidence). Three additional observational studies, all at high risk of confounding, found mixed effects on mortality (very low quality evidence). **Any signs of impaired circulation:** The large RCT included children with signs of both severely and non-severely impaired circulation. Overall, bolus fluids increased 48 h mortality compared to maintenance fluids with an additional 3 deaths per 100 children treated (RR 1.45, 95% CI 1.13 to 1.86, 3141 participants, high quality evidence). In a second small RCT from India, no difference in 72 h mortality was detected between children who received 20-40 mL/kg Ringers lactate over 15 min and those who received 20 mL over 20 min up to a maximum of 60 mL/kg over 1 h (147 participants, low quality evidence). In one additional observational study, resuscitation consistent with Advanced Paediatric Life Support (APLS) guidelines, including fluids, was not associated with reduced mortality in the small subgroup with septic shock (very low quality evidence). **Signs of impaired circulation, but not severely impaired:** Only the large RCT allowed an analysis for children with some signs of impaired circulation who would not meet the criteria for severe impairment. Bolus fluids increased 48 h mortality compared to maintenance alone (RR 1.36, 95% CI 1.05 to 1.76, high quality evidence). **Conclusions:** Prior to the publication of the large RCT, the global evidence base for bolus fluid therapy in children with severe febrile illness and signs of impaired circulation was of very low quality. This large study provides robust evidence that in low-income settings fluid boluses increase mortality in children with severe febrile illness and impaired circulation, and this increased risk is consistent across children with severe and less severe circulatory impairment. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24785400/
16.	Ghansah A, Amenga-Etego L, Amambua-Ngwa A, Andagalu B, Apinjoh T, Bouyou-Akotet M, Cornelius V, Golassa L, Andrianaranjaka VH, Ishengoma D, Johnson K, Kamau E, Maïga-Ascofaré O, Mumba D, Tindana P, Tshefu-Kitoto A, Randrianarivelojosia M, William Y, Kwiatkowski DP, Djimde AA. Monitoring parasite diversity for malaria elimination in sub-Saharan Africa. Science. 2014 Sep 12;345(6202):1297-8 **Abstract** The African continent continues to bear the greatest burden of malaria and the greatest diversity of parasites, mosquito vectors, and human victims. The evolutionary plasticity

	of malaria parasites and their vectors is a major obstacle to eliminating the disease. Of current concern is the recently reported emergence of resistance to the front-line drug, artemisinin, in South-East Asia in Plasmodium falciparum, which calls for preemptive surveillance of the African parasite population for genetic markers of emerging drug resistance. Here we describe the Plasmodium Diversity Network Africa (PDNA), which has been established across 11 countries in sub-Saharan Africa to ensure that African scientists are enabled to work together and to play a key role in the global effort for tracking and responding to this public health threat. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25214619/
17.	Osier FH, Mackinnon MJ, Crosnier C, Fegan G, Kamuyu G, Wanaguru M, Ogada E, McDade B, Rayner JC, Wright GJ, Marsh K. New antigens for a multicomponent blood-stage malaria vaccine. Sci Transl Med. 2014 Jul 30;6(247):247ra102 **Abstract** An effective blood-stage vaccine against Plasmodium falciparum remains a research priority, but the number of antigens that have been translated into multicomponent vaccines for testing in clinical trials remains limited. Investigating the large number of potential targets found in the parasite proteome has been constrained by an inability to produce natively folded recombinant antigens for immunological studies. We overcame these constraints by generating a large library of biochemically active merozoite surface and secreted full-length ectodomain proteins. We then systematically examined the antibody reactivity against these proteins in a cohort of Kenyan children (n = 286) who were sampled at the start of a malaria transmission season and prospectively monitored for clinical episodes of malaria over the ensuing 6 months. We found that antibodies to previously untested or little-studied proteins had superior or equivalent potential protective efficacy to the handful of current leading malaria vaccine candidates. Moreover, cumulative responses to combinations comprising 5 of the 10 top-ranked antigens, including PF3D7_1136200, MSP2, RhopH3, P41, MSP11, MSP3, PF3D7_0606800, AMA1, Pf113, and MSRP1, were associated with 100% protection against clinical episodes of malaria. These data suggest not only that there are many more potential antigen candidates for the malaria vaccine development pipeline but also that effective vaccination may be achieved by combining a selection of these antigens. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25080477/
18.	Snow RW. Sixty years trying to define the malaria burden in Africa: have we made any progress? BMC Med. 2014 Dec 12;12:227. **Abstract**

	Controversy surrounds the precise numbers of malaria deaths and clinical episodes in Africa. This would not have surprised malariologists working in Africa 60 years ago as they began to unravel the enigma that is 'malaria'. Malaria is a complex disease manifesting as a multitude of symptoms, degrees of severity and indirect morbid consequences. Clinical immunity develops quickly and the presence of infection cannot always be used to distinguish between malaria and other illnesses. During the 1950s and 1960s parasite prevalence was used in preference to statistics on malaria mortality and morbidity. An argument is made for a resurrection of this measure of the quantity of malaria across Africa as a more reliable means to understand the impact of control. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25495076/
19.	Bejon P, Williams TN, Nyundo C, Hay SI, Benz D, Gething PW, Otiende M, Peshu J, Bashraheil M, Greenhouse B, Bousema T, Bauni E, Marsh K, Smith DL, Borrmann S. A micro-epidemiological analysis of febrile malaria in Coastal Kenya showing hotspots within hotspots. Elife. 2014 Apr 24;3:e02130 **Abstract** Malaria transmission is spatially heterogeneous. This reduces the efficacy of control strategies, but focusing control strategies on clusters or 'hotspots' of transmission may be highly effective. Among 1500 homesteads in coastal Kenya we calculated (a) the fraction of febrile children with positive malaria smears per homestead, and (b) the mean age of children with malaria per homestead. These two measures were inversely correlated, indicating that children in homesteads at higher transmission acquire immunity more rapidly. This inverse correlation increased gradually with increasing spatial scale of analysis, and hotspots of febrile malaria were identified at every scale. We found hotspots within hotspots, down to the level of an individual homestead. Febrile malaria hotspots were temporally unstable, but 4 km radius hotspots could be targeted for 1 month following 1 month periods of surveillance.DOI: http://dx.doi.org/10.7554/eLife.02130.001. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24843017/
20.	Omole RA, Gathirwa J, Akala H, Malebo HM, Machocho AK, Hassanali A, Ndiege IO. Bisbenzylisoquinoline and hasubanane alkaloids from Stephania abyssinica (Dillon & A. Rich) (Menispermeceae). Phytochemistry. 2014 Jul;103:123-128 **Abstract** Two bisbenzylisoquinoline and one hasubanane alkaloids: (-)-pseudocurine (1), (-)-pseudoisocurine (2) and (-)-10-oxoaknadinine (3), were isolated from leaf extract of Stephania abyssinica, a plant used in traditional medicine in South Nyanza region of

	Kenya. They were characterized using 1D ((1)H, (13)C and DEPT) and 2D (COSY, NOESY, HMQC and HMBC) NMR techniques. (-)-Pseudocurine (1) and (-)-pseudoisocurine (2) exhibited strong to moderate anti-plasmodial activity while (-)-10-oxoaknadinine (3) showed moderate to mild activity. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24735823/
21.	Kohler PK, Okanda J, Kinuthia J, Mills LA, Olilo G, Odhiambo F, Laserson KF, Zierler B, Voss J, John-Stewart G. Community-based evaluation of PMTCT uptake in Nyanza Province, Kenya. PLoS One. 2014 Oct 31;9(10):e110110 **Abstract** **Introduction:** Facility-based assessments of prevention of mother-to-child HIV transmission (PMTCT) programs may overestimate population coverage. There are few community-based studies that evaluate PMTCT coverage and uptake. **Methods:** During 2011, a cross-sectional community survey among women who gave birth in the prior year was performed using the KEMRI-CDC Health and Demographic Surveillance System in Western Kenya. A random sample (n = 405) and a sample of women known to be HIV-positive through previous home-based testing (n = 247) were enrolled. Rates and correlates of uptake of antenatal care (ANC), HIV-testing, and antiretrovirals (ARVs) were determined. **Results:** Among 405 women in the random sample, 379 (94%) reported accessing ANC, most of whom (87%) were HIV tested. Uptake of HIV testing was associated with employment, higher socioeconomic status, and partner HIV testing. Among 247 known HIV-positive women, 173 (70%) self-disclosed their HIV status. Among 216 self-reported HIV-positive women (including 43 from the random sample), 82% took PMTCT ARVs, with 54% completing the full antenatal, peripartum, and postpartum course. Maternal ARV use was associated with more ANC visits and having an HIV tested partner. ARV use during delivery was lowest (62%) and associated with facility delivery. Eighty percent of HIV infected women reported having their infant HIV tested, 11% of whom reported their child was HIV infected, 76% uninfected, 6% declined to say, 7% did not recall; 79% of infected children were reportedly receiving HIV care and treatment. **Conclusions:** Community-based assessments provide data that complements clinic-based PMTCT evaluations. In this survey, antenatal HIV test uptake was high; most HIV infected women received ARVs, though many women did not self-disclose HIV status to field team. Community-driven strategies that encourage early ANC, partner involvement, and skilled delivery, and provide PMTCT education, may facilitate further

	reductions in vertical transmission. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25360758/
22.	Preston MD, Campino S, Assefa SA, Echeverry DF, Ocholla H, Amambua-Ngwa A, Stewart LB, Conway DJ, Borrmann S, Michon P, Zongo I, Ouédraogo JB, Djimde AA, Doumbo OK, Nosten F, Pain A, Bousema T, Drakeley CJ, Fairhurst RM, Sutherland CJ, Roper C, Clark TG. A barcode of organellar genome polymorphisms identifies the geographic origin of Plasmodium falciparum strains. Nat Commun. 2014 Jun 13;5:4052 **Abstract** Malaria is a major public health problem that is actively being addressed in a global eradication campaign. Increased population mobility through international air travel has elevated the risk of re-introducing parasites to elimination areas and dispersing drug-resistant parasites to new regions. A simple genetic marker that quickly and accurately identifies the geographic origin of infections would be a valuable public health tool for locating the source of imported outbreaks. Here we analyse the mitochondrion and apicoplast genomes of 711 Plasmodium falciparum isolates from 14 countries, and find evidence that they are non-recombining and co-inherited. The high degree of linkage produces a panel of relatively few single-nucleotide polymorphisms (SNPs) that is geographically informative. We design a 23-SNP barcode that is highly predictive (~92%) and easily adapted to aid case management in the field and survey parasite migration worldwide. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24923250/
23.	Malaria Genomic Epidemiology Network; Malaria Genomic Epidemiology Network. Reappraisal of known malaria resistance loci in a large multicenter study. Nat Genet. 2014 Nov;46(11):1197-204 **Abstract** Many human genetic associations with resistance to malaria have been reported, but few have been reliably replicated. We collected data on 11,890 cases of severe malaria due to Plasmodium falciparum and 17,441 controls from 12 locations in Africa, Asia and Oceania. We tested 55 SNPs in 27 loci previously reported to associate with severe malaria. There was evidence of association at $P < 1 \times 10(-4)$ with the HBB, ABO, ATP2B4, G6PD and CD40LG loci, but previously reported associations at 22 other loci did not replicate in the multicenter analysis. The large sample size made it possible to identify authentic genetic effects that are heterogeneous across populations or

	phenotypes, with a striking example being the main African form of G6PD deficiency, which reduced the risk of cerebral malaria but increased the risk of severe malarial anemia. The finding that G6PD deficiency has opposing effects on different fatal complications of P. falciparum infection indicates that the evolutionary origins of this common human genetic disorder are more complex than previously supposed. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25261933/
24.	English M, Gathara D, Mwinga S, Ayieko P, Opondo C, Aluvaala J, Kihuba E, Mwaniki P, Were F, Irimu G, Wasunna A, Mogoa W, Nyamai R. Adoption of recommended practices and basic technologies in a low-income setting. Arch Dis Child. 2014 May;99(5):452-6 **Abstract** **Objective:** In global health considerable attention is focused on the search for innovations; however, reports tracking their adoption in routine hospital settings from low-income countries are absent. **Design and setting:** We used data collected on a consistent panel of indicators during four separate cross-sectional, hospital surveys in Kenya to track changes over a period of 11 years (2002-2012). **Main outcome measures:** Basic resource availability, use of diagnostics and uptake of recommended practices. **Results:** There appeared little change in availability of a panel of 28 basic resources (median 71% in 2002 to 82% in 2012) although availability of specific feeds for severe malnutrition and vitamin K improved. Use of blood glucose and HIV testing increased but remained inappropriately low throughout. Commonly (malaria) and uncommonly (lumbar puncture) performed diagnostic tests frequently failed to inform practice while pulse oximetry, a simple and cheap technology, was rarely available even in 2012. However, increasing adherence to prescribing guidance occurred during a period from 2006 to 2012 in which efforts were made to disseminate guidelines. **Conclusions:** Findings suggest changes in clinical practices possibly linked to dissemination of guidelines at reasonable scale. However, full availability of basic resources was not attained and major gaps likely exist between the potential and actual impacts of simple diagnostics and technologies representing problems with availability, adoption and successful utilisation. These findings are relevant to debates on scaling up in low-income settings and to those developing novel therapeutic or diagnostic

	interventions. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24482351/
25.	Githinji S, Kigen S, Memusi D, Nyandigisi A, Wamari A, Muturi A, Jagoe G, Ziegler R, Snow RW, Zurovac D. Using mobile phone text messaging for malaria surveillance in rural Kenya. Malar J. 2014 Mar 19;13:107 **Abstract** **Background:** Effective surveillance systems are required to track malaria testing and treatment practices. A 26-week study "SMS for Life" was piloted in five rural districts of Kenya to examine whether SMS reported surveillance data could ensure real-time visibility of accurate data and their use by district managers to impact on malaria case-management. **Methods:** Health workers from 87 public health facilities used their personal mobile phones to send a weekly structured SMS text message reporting the counts of four basic surveillance data elements to a web-based system accessed by district managers. Longitudinal monitoring of SMS reported data through the web-based system and two rounds of cross-sectional health facility surveys were done to validate accuracy of data. **Results:** Mean response rates were 96% with 87% of facilities reporting on time. Fifty-eight per cent of surveillance data parameters were accurately reported. Overall mean testing rates were 37% with minor weekly variations ranging from 32 to 45%. Overall test positivity rate was 24% (weekly range: 17-37%). Ratio of anti-malarial treatments to test positive cases was 1.7:1 (weekly range: 1.3:1-2.2:1). District specific trends showed fluctuating patterns in testing rates without notable improvement over time but the ratio of anti-malarial treatments to test positive cases improved over short periods of time in three out of five districts. **Conclusions:** The study demonstrated the feasibility of using simple mobile phone text messages to transmit timely surveillance data from peripheral health facilities to higher levels. However, accuracy of data reported was suboptimal. Future work should focus on improving quality of SMS reported surveillance data. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24642130/
26.	Wakaba M, Mbindyo P, Ochieng J, Kiriinya R, Todd J, Waudo A, Noor A, Rakuom C, Rogers M, English M. The public sector nursing workforce in Kenya: a county-level analysis. Hum Resour Health. 2014 Jan 27;12:6

	Abstract **Background:** Kenya's human resources for health shortage is well documented, yet in line with the new constitution, responsibility for health service delivery will be devolved to 47 new county administrations. This work describes the public sector nursing workforce likely to be inherited by the counties, and examines the relationships between nursing workforce density and key indicators. **Methods:** National nursing deployment data linked to nursing supply data were used and analyzed using statistical and geographical analysis software. Data on nurses deployed in national referral hospitals and on nurses deployed in non-public sector facilities were excluded from main analyses. The densities and characteristics of the public sector nurses across the counties were obtained and examined against an index of county remoteness, and the nursing densities were correlated with five key indicators. **Results:** Of the 16,371 nurses in the public non-tertiary sector, 76% are women and 53% are registered nurses, with 35% of the nurses aged 40 to 49 years. The nursing densities across counties range from 1.2 to 0.08 per 1,000 population. There are statistically significant associations of the nursing densities with a measure of health spending per capita (P value = 0.0028) and immunization rates (P value = 0.0018). A higher county remoteness index is associated with explaining lower female to male ratio of public sector nurses across counties (P value <0.0001). **Conclusions:** An overall shortage of nurses (range of 1.2 to 0.08 per 1,000) in the public sector countrywide is complicated by mal-distribution and varying workforce characteristics (for example, age profile) across counties. All stakeholders should support improvements in human resources information systems and help address personnel shortages and mal-distribution if equitable, quality health-care delivery in the counties is to be achieved. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24467776/
27.	Olotu A, Clement F, Jongert E, Vekemans J, Njuguna P, Ndungu FM, Marsh K, Leroux-Roels G, Bejon P. Avidity of anti-circumsporozoite antibodies following vaccination with RTS,S/AS01E in young children. PLoS One. 2014 Dec 15;9(12):e115126. **Abstract** **Background:** The nature of protective immune responses elicited by immunization with the candidate malaria vaccine RTS,S is still incompletely understood. Antibody levels correlate with protection against malaria infection, but considerable variation in

	outcome is unexplained (e.g., children may experience malaria despite high anti-circumsporozoite [CS] titers). **Methods and findings:** We measured the avidity index (AI) of the anti-CS antibodies raised in subgroup of 5-17 month old children in Kenya who were vaccinated with three doses of RTS,S/AS01E between March and August 2007. We evaluated the association between the AI and the subsequent risk of clinical malaria. We selected 19 cases (i.e., with clinical malaria) and 42 controls (i.e., without clinical malaria), matching for anti-CS antibody levels and malaria exposure. We assessed their sera collected 1 month after the third dose of the vaccine, in March 2008 (range 4-10 months after the third vaccine), and at 12 months after the third vaccine dose. The mean AI was 45.2 (95% CI: 42.4 to 48.1), 45.3 (95% CI: 41.4 to 49.1) and 46.2 (95% CI; 43.2 to 49.3) at 1 month, in March 2008 (4-10 months), and at 12 months after the third vaccination, respectively ($p = 0.9$ by ANOVA test for variation over time). The AI was not associated with protection from clinical malaria (OR = 0.90; 95% CI: 0.49 to 1.66; $p = 0.74$). The AI was higher in children with high malaria exposure, as measured using the weighted local prevalence of malaria, compared to those with low malaria exposure at 1 month post dose 3 ($p = 0.035$). **Conclusion:** Our data suggest that in RTS,S/AS01E-vaccinated children residing in malaria endemic countries, the avidity of anti-circumsporozoite antibodies, as measured using an elution ELISA method, was not associated with protection from clinical malaria. Prior natural malaria exposure might have primed the response to RTS,S/AS01E vaccination. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25506706/
28.	Ngari MM, Waithira N, Chilengi R, Njuguna P, Lang T, Fegan G. Experience of using an open source clinical trials data management software system in Kenya. BMC Res Notes. 2014 Nov 26;7:845 **Abstract** **Background:** Clinical trials data management (CTDM) remains one of the many challenges in running state of the art trials in resource-poor settings since most trials do not allocate, or have available, sufficient resources for CTDM and because of poor internet connectivity. Open-source software like OpenClinica could be a solution in such scenarios. **Findings:** In 2007, the KEMRI-Wellcome Trust Research Programme (KWTRP) adopted OpenClinica (OC) community edition, an open-source software system and we share our experience and lessons learnt since its adoption. We have used OC in three

	different modes; direct remote data entry from sites through Global System for Mobile Communications (GSM) modems, a centralized data centre approach where all data from paper records were entered at a central location and an off-line approach where data entry was done from a copy of database hosted on a field-site server laptop, then data uploaded to a centralized server later. We have used OC in eleven trials/studies with a cumulative number of participants in excess of 6000. These include large and complex trials, with multiple sites recruiting in different regions of East Africa. In the process, we have developed substantial local capacity through hands-on training and mentorship, which we have now begun to share with other institutions in the region. **Conclusions:** Our experience demonstrates that an open source data management system to manage trials' data can be utilized to international industry standards in resource-poor countries. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25424974/
29.	Otieno FO, Ndivo R, Oswago S, Ondiek J, Pals S, McLellan-Lemal E, Chen RT, Chege W, Gray KM. Evaluation of syndromic management of sexually transmitted infections within the Kisumu Incidence Cohort Study. Int J STD AIDS. 2014 Oct;25(12):851-9. **Abstract** While laboratory aetiological diagnosis is considered the gold standard for diagnosis and management of sexually transmitted infections (STIs), syndromic management has been presented as a simplified and affordable approach for STI management in limited resource settings. STI signs and symptoms were collected using staff-administered computer-assisted personal interview and audio computer-assisted self-interview. Participants underwent a medical examination and laboratory testing for common STIs. The performance of syndromic management was assessed on the agreement between interviewing methods as well as accurate diagnosis. We screened 846 participants, of whom 88 (10.4%) received syndromic STI diagnosis while 272 (32.2%) received an aetiological diagnosis. Agreement between syndromic and aetiological diagnoses was very poor (overall kappa = 0.09). The most prevalent STI was herpes simplex virus type 2 and the percentage of persons with any STI was higher among women (48.6%) than men (15.6%, $p < 0.0001$). Agreement between audio computer-assisted self-interview and computer-assisted personal interview interviewing methods for syndromic diagnosis of STIs ranged from poor to good. Our findings suggest that syndromic management of STIs is not a sufficient tool for STI diagnosis in this setting; development and improvement of STI diagnostic capabilities through laboratory confirmation is needed in resource-limited settings. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24516075/

30.	Ibinda F, Wagner RG, Bertram MY, Ngugi AK, Bauni E, Vos T, Sander JW, Newton CR. Burden of epilepsy in rural Kenya measured in disability-adjusted life years. Epilepsia. 2014 Oct;55(10):1626-33 **Abstract** **Objectives:** The burden of epilepsy, in terms of both morbidity and mortality, is likely to vary depending on the etiology (primary [genetic/unknown] vs. secondary [structural/metabolic]) and with the use of antiepileptic drugs (AEDs). We estimated the disability-adjusted life years (DALYs) and modeled the remission rates of active convulsive epilepsy (ACE) using epidemiologic data collected over the last decade in rural Kilifi, Kenya. **Methods:** We used measures of prevalence, incidence, and mortality to model the remission of epilepsy using disease-modeling software (DisMod II). DALYs were calculated as the sum of Years Lost to Disability (YLD) and Years of Life Lost (YLL) due to premature death using the prevalence approach, with disability weights (DWs) from the 2010 Global Burden of Disease (GBD) study. DALYs were calculated with R statistical software with the associated uncertainty intervals (UIs) computed by bootstrapping. **Results:** A total of 1,005 (95% UI 797-1,213) DALYs were lost to ACE, which is 433 (95% UI 393-469) DALYs lost per 100,000 people. Twenty-six percent (113/100,000/year, 95% UI 106-117) of the DALYs were due to YLD and 74% (320/100,000/year, 95% UI 248-416) to YLL. Primary epilepsy accounted for fewer DALYs than secondary epilepsy (98 vs. 334 DALYs per 100,000 people). Those taking AEDs contributed fewer DALYs than those not taking AEDs (167 vs. 266 DALYs per 100,000 people). The proportion of people with ACE in remission per year was estimated at 11.0% in males and 12.0% in females, with highest rates in the 0-5 year age group. **Significance:** The DALYs for ACE are high in rural Kenya, but less than the estimates of 2010 GBD study. Three-fourths of DALYs resulted from secondary epilepsy. Use of AEDs was associated with 40% reduction of DALYs. Improving adherence to AEDs may reduce the burden of epilepsy in this area. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25131901/
31.	Ocholla H, Preston MD, Mipando M, Jensen AT, Campino S, MacInnis B, Alcock D, Terlouw A, Zongo I, Oudraogo JB, Djimde AA, Assefa S, Doumbo OK, Borrmann S, Nzila A, Marsh K, Fairhurst RM, Nosten F, Anderson TJ, Kwiatkowski DP, Craig A,

	Clark TG, Montgomery J. Whole-genome scans provide evidence of adaptive evolution in Malawian Plasmodium falciparum isolates. J Infect Dis. 2014 Dec 15;210(12):1991-2000. **Abstract** **Background:** Selection by host immunity and antimalarial drugs has driven extensive adaptive evolution in Plasmodium falciparum and continues to produce ever-changing landscapes of genetic variation. **Methods:** We performed whole-genome sequencing of 69 P. falciparum isolates from Malawi and used population genetics approaches to investigate genetic diversity and population structure and identify loci under selection. **Results:** High genetic diversity ($\pi = 2.4 \times 10(-4)$), moderately high multiplicity of infection (2.7), and low linkage disequilibrium (500-bp) were observed in Chikhwawa District, Malawi, an area of high malaria transmission. Allele frequency-based tests provided evidence of recent population growth in Malawi and detected potential targets of host immunity and candidate vaccine antigens. Comparison of the sequence variation between isolates from Malawi and those from 5 geographically dispersed countries (Kenya, Burkina Faso, Mali, Cambodia, and Thailand) detected population genetic differences between Africa and Asia, within Southeast Asia, and within Africa. Haplotype-based tests of selection to sequence data from all 6 populations identified signals of directional selection at known drug-resistance loci, including pfcrt, pfdhps, pfmdr1, and pfgch1. **Conclusions:** The sequence variations observed at drug-resistance loci reflect differences in each country's historical use of antimalarial drugs and may be useful in formulating local malaria treatment guidelines. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24948693/
32.	Madan J, Ades AE, Price M, Maitland K, Jemutai J, Revill P, Welton NJ. Strategies for efficient computation of the expected value of partial perfect information. Med Decis Making. 2014 Apr;34(3):327-42 **Abstract** Expected value of information methods evaluate the potential health benefits that can be obtained from conducting new research to reduce uncertainty in the parameters of a cost-effectiveness analysis model, hence reducing decision uncertainty. Expected value of partial perfect information (EVPPI) provides an upper limit to the health gains that can be obtained from conducting a new study on a subset of parameters in the cost-

	effectiveness analysis and can therefore be used as a sensitivity analysis to identify parameters that most contribute to decision uncertainty and to help guide decisions around which types of study are of most value to prioritize for funding. A common general approach is to use nested Monte Carlo simulation to obtain an estimate of EVPPI. This approach is computationally intensive, can lead to significant sampling bias if an inadequate number of inner samples are obtained, and incorrect results can be obtained if correlations between parameters are not dealt with appropriately. In this article, we set out a range of methods for estimating EVPPI that avoid the need for nested simulation: reparameterization of the net benefit function, Taylor series approximations, and restricted cubic spline estimation of conditional expectations. For each method, we set out the generalized functional form that net benefit must take for the method to be valid. By specifying this functional form, our methods are able to focus on components of the model in which approximation is required, avoiding the complexities involved in developing statistical approximations for the model as a whole. Our methods also allow for any correlations that might exist between model parameters. We illustrate the methods using an example of fluid resuscitation in African children with severe malaria. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24449434/
33.	Njue M, Kombe F, Mwalukore S, Molyneux S, Marsh V. What are fair study benefits in international health research? Consulting community members in Kenya. PLoS One. 2014 Dec 3;9(12):e113112. **Abstract** **Background:** Planning study benefits and payments for participants in international health research in low- income settings can be a difficult and controversial process, with particular challenges in balancing risks of undue inducement and exploitation and understanding how researchers should take account of background inequities. At an international health research programme in Kenya, this study aimed to map local residents' informed and reasoned views on the effects of different levels of study benefits and payments to inform local policy and wider debates in international research. **Methods and findings:** Using a relatively novel two-stage process community consultation approach, five participatory workshops involving 90 local residents from diverse constituencies were followed by 15 small group discussions, with components of information-sharing, deliberation and reflection to situate normative reasoning within debates. Framework Analysis drew inductively and deductively on voice-recorded discussions and field notes supported by Nvivo 10 software, and the international research ethics literature. Community members' views on study benefits and payments

	were diverse, with complex contextual influences and interplay between risks of giving 'too many' and 'too few' benefits, including the role of cash. While recognising important risks for free choice, research relationships and community values in giving 'too many', the greatest concerns were risks of unfairness in giving 'too few' benefits, given difficulties in assessing indirect costs of participation and the serious consequences for families of underestimation, related to perceptions of researchers' responsibilities. **Conclusions:** Providing benefits and payments to participants in international research in low-income settings is an essential means by which researchers meet individual-level and structural forms of ethical responsibilities, but understanding how this can be achieved requires a careful account of social realities and local judgment. Concerns about undue inducement in low-income communities may often be misplaced; we argue that greater attention should be placed on avoiding unfairness, particularly for the most-poor. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25470596/
34.	Bisung E, Elliott SJ, Schuster-Wallace CJ, Karanja DM, Bernard A. Social capital, collective action and access to water in rural Kenya. Soc Sci Med. 2014 Oct;119:147-54 **Abstract** Globally, an estimated 748 million people remain without access to improved sources of drinking water and close to 1 billion people practice open defecation (WHO/UNICEF, 2014). The lack of access to safe water and adequate sanitation presents significant health and development challenges to individuals and communities, especially in low and middle income countries. Recent research indicates that aside from financial challenges, the lack of social capital is a barrier to collective action for community based water and sanitation initiatives (Levison et al., 2011; Bisung and Elliott, 2014). This paper reports results of a case study on the relationships between elements of social capital and participation in collective action in the context of addressing water and sanitation issues in the lakeshore village of Usoma, Western Kenya. The paper uses household data (N=485, 91% response rate) collected using a modified version of the social capital assessment tool (Krishna and Shrader, 2000). Findings suggest that investment in building social capital may have some contextual benefits for collective action to address common environmental challenges. These findings can inform policy interventions and practice in water and sanitation delivery in low and middle income countries, environmental health promotion and community development. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25181474/

35.	Wagner RG, Ngugi AK, Twine R, Bottomley C, Kamuyu G, Gómez-Olivé FX, Connor MD, Collinson MA, Kahn K, Tollman S, Newton CR. Prevalence and risk factors for active convulsive epilepsy in rural northeast South Africa. Epilepsy Res. 2014 May;108(4):782-91 **Abstract** **Rationale:** Epilepsy is among the most common neurological disorders worldwide. However, there are few large, population-based studies of the prevalence and risk factors for epilepsy in southern Africa. **Methods:** From August 2008 to February 2009, as part of a multi-site study, we undertook a three-stage, population-based study, embedded within the Agincourt health and socio-demographic surveillance system, to estimate the prevalence and identify risk factors of active convulsive epilepsy (ACE) in a rural South African population. **Results:** The crude prevalence of ACE, after adjusting for non-response and the sensitivity of the screening method, was 7.0/1,000 individuals (95% CI 6.4-7.6) with significant geographic heterogeneity across the study area. Being male (OR=2.3; 95% CI 1.6-3.2), family history of seizures (OR=4.0; 95% CI 2.0-8.1), a sibling with seizures (OR=7.0; 95% CI 1.6-31.7), problems after delivery (OR=5.9; 95% CI 1.2-24.6), and history of snoring (OR=6.5; 95% CI 4.5-9.5) were significantly associated with ACE. For children, their mother's exposure to some formal schooling was protective (OR=0.30; 95% CI 0.11-0.84) after controlling for age and sex. Human immunodeficiency virus was not found to be associated with ACE. **Conclusions:** ACE is less frequent in this part of rural South Africa than other parts of sub-Saharan Africa. Improving obstetric services could prevent epilepsy. The relationship between snoring and ACE requires further investigation, as does the relative contribution of genetic and environmental factors to examine the increased risk in those with a family history of epilepsy. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24582322/
36.	Alegana VA, Wright JA, Nahzat SM, Butt W, Sediqi AW, Habib N, Snow RW, Atkinson PM, Noor AM. Modelling the incidence of Plasmodium vivax and Plasmodium falciparum malaria in Afghanistan 2006-2009. PLoS One. 2014 Jul 17;9(7):e102304. **Abstract** **Background:** Identifying areas that support high malaria risks and where populations

	lack access to health care is central to reducing the burden in Afghanistan. This study investigated the incidence of Plasmodium vivax and Plasmodium falciparum using routine data to help focus malaria interventions. **Methods:** To estimate incidence, the study modelled utilisation of the public health sector using fever treatment data from the 2012 national Malaria Indicator Survey. A probabilistic measure of attendance was applied to population density metrics to define the proportion of the population within catchment of a public health facility. Malaria data were used in a Bayesian spatio-temporal conditional-autoregressive model with ecological or environmental covariates, to examine the spatial and temporal variation of incidence. **Findings:** From the analysis of healthcare utilisation, over 80% of the population was within 2 hours' travel of the nearest public health facility, while 64.4% were within 30 minutes' travel. The mean incidence of P. vivax in 2009 was 5.4 (95% Crl 3.2-9.2) cases per 1000 population compared to 1.2 (95% Crl 0.4-2.9) cases per 1000 population for P. falciparum. P. vivax peaked in August while P. falciparum peaked in November. 32% of the estimated 30.5 million people lived in regions where annual incidence was at least 1 case per 1,000 population of P. vivax; 23.7% of the population lived in areas where annual P. falciparum case incidence was at least 1 per 1000. **Conclusion:** This study showed how routine data can be combined with household survey data to model malaria incidence. The incidence of both P. vivax and P. falciparum in Afghanistan remain low but the co-distribution of both parasites and the lag in their peak season provides challenges to malaria control in Afghanistan. Future improved case definition to determine levels of imported risks may be useful for the elimination ambitions in Afghanistan. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25033452/
37.	Emukule GO, McMorrow M, Ulloa C, Khagayi S, Njuguna HN, Burton D, Montgomery JM, Muthoka P, Katz MA, Breiman RF, Mott JA. Predicting mortality among hospitalized children with respiratory illness in Western Kenya, 2009-2012. PloS One. 2014 Mar 25;9(3):e92968 **Abstract** **Background:** Pediatric respiratory disease is a major cause of morbidity and mortality in the developing world. We evaluated a modified respiratory index of severity in children (mRISC) scoring system as a standard tool to identify children at greater risk of death from respiratory illness in Kenya. **Materials and methods:** We analyzed data from children <5 years old who were

	hospitalized with respiratory illness at Siaya District Hospital from 2009-2012. We used a multivariable logistic regression model to identify patient characteristics predictive for in-hospital mortality. Model discrimination was evaluated using the concordance statistic. Using bootstrap samples, we re-estimated the coefficients and the optimism of the model. The mRISC score for each child was developed by adding up the points assigned to each factor associated with mortality based on the coefficients in the multivariable model. **Results:** We analyzed data from 3,581 children hospitalized with respiratory illness; including 218 (6%) who died. Low weight-for-age [adjusted odds ratio (aOR) = 2.1; 95% CI 1.3-3.2], very low weight-for-age (aOR = 3.8; 95% CI 2.7-5.4), caretaker-reported history of unconsciousness (aOR = 2.3; 95% CI 1.6-3.4), inability to drink or breastfeed (aOR = 1.8; 95% CI 1.2-2.8), chest wall in-drawing (aOR = 2.2; 95% CI 1.5-3.1), and being not fully conscious on physical exam (aOR = 8.0; 95% CI 5.1-12.6) were independently associated with mortality. The positive predictive value for mortality increased with increasing mRISC scores. **Conclusions:** A modified RISC scoring system based on a set of easily measurable clinical features at admission was able to identify children at greater risk of death from respiratory illness in Kenya. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24667695/
38.	Ngugi AK, Bottomley C, Fegan G, Chengo E, Odhiambo R, Bauni E, Neville B, Kleinschmidt I, Sander JW, Newton CR. Premature mortality in active convulsive epilepsy in rural Kenya: causes and associated factors. Neurology. 2014 Feb 18;82(7):582-9. **Abstract** **Objective:** We estimated premature mortality and identified causes of death and associated factors in people with active convulsive epilepsy (ACE) in rural Kenya. **Methods:** In this prospective population-based study, people with ACE were identified in a cross-sectional survey and followed up regularly for 3 years, during which information on deaths and associated factors was collected. We used a validated verbal autopsy tool to establish putative causes of death. Age-specific rate ratios and standardized mortality ratios were estimated. Poisson regression was used to identify mortality risk factors. **Results:** There were 61 deaths among 754 people with ACE, yielding a rate of 33.3/1,000 persons/year. Overall standardized mortality ratio was 6.5. Mortality was higher across all ACE age groups. Nonadherence to antiepileptic drugs (adjusted rate

	ratio [aRR] 3.37), cognitive impairment (aRR 4.55), and age (50+ years) (rate ratio 4.56) were risk factors for premature mortality. Most deaths (56%) were directly related to epilepsy, with prolonged seizures/possible status epilepticus (38%) most frequently associated with death; some of these may have been due to sudden unexpected death in epilepsy (SUDEP). Possible SUDEP was the likely cause in another 7%. **Conclusion:** Mortality in people with ACE was more than 6-fold greater than expected. This may be reduced by improving treatment adherence and prompt management of prolonged seizures and supporting those with cognitive impairment. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24443454/
39.	Kagendo D, Magambo J, Agola EL, Njenga SM, Zeyhle E, Mulinge E, Gitonga P, Mbae C, Muchiri E, Wassermann M, Kern P, Romig T. A survey for Echinococcus spp. of carnivores in six wildlife conservation areas in Kenya. Parasitol Int. 2014 Aug;63(4):604-11 **Abstract** To investigate the presence of Echinococcus spp. in wild mammals of Kenya, 832 faecal samples from wild carnivores (lions, leopards, spotted hyenas, wild dogs and silver-backed jackals) were collected in six different conservation areas of Kenya (Meru, Nairobi, Tsavo West and Tsavo East National Parks, Samburu and Maasai Mara National Reserves). Taeniid eggs were found in 120 samples (14.4%). In total, 1160 eggs were isolated and further analysed using RFLP-PCR of the nad1 gene and sequencing. 38 of these samples contained eggs of Echinococcus spp., which were identified as either Echinococcus felidis (n=27) or Echinococcus granulosus sensu stricto (n=12); one sample contained eggs from both taxa. E. felidis was found in faeces from lions (n=20) and hyenas (n=5) while E. granulosus in faeces from lions (n=8), leopards (n=1) and hyenas (n=3). The host species for two samples containing E. felidis could not be identified with certainty. As the majority of isolated eggs could not be analysed with the methods used (no amplification), we do not attempt to give estimates of faecal prevalences. Both taxa of Echinococcus were found in all conservation areas except Meru (only E. felidis) and Tsavo West (only E. granulosus). Host species identification for environmental faecal samples, based on field signs, was found to be unreliable. All samples with taeniid eggs were subjected to a confirmatory host species RLFP-PCR of the cytochrome B gene. 60% had been correctly identified in the field. Frequently, hyena faeces were mistaken for lion and vice versa, and none of the samples from jackals and wild dogs could be confirmed in the tested sub-sample. This is the first molecular study on the distribution of Echinococcus spp. in Kenyan wildlife. The presence of E. felidis is confirmed for lions and newly reported for spotted hyenas. Lions and hyenas are newly recognized hosts for E. granulosus s.s., while the role of leopards remains uncertain. These data provide the basis for further studies on the

	lifecycles and the possible link between wild and domestic cycles of cystic echinococcosis in eastern Africa. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24732034/
40.	Onono MA, Cohen CR, Jerop M, Bukusi EA, Turan JM. HIV serostatus and disclosure: implications for infant feeding practice in rural south Nyanza, Kenya. BMC Public Health. 2014 Apr 23;14:390. **Abstract** **Background:** The World Health Organization (WHO) recommends that HIV-infected women practice exclusive breastfeeding (EBF) for the first 6 months postpartum to reduce HIV transmission. The aim of this study was to determine the effects of HIV/AIDS knowledge and other psychosocial factors on EBF practice among pregnant and postpartum women in rural Nyanza, Kenya, an area with a high prevalence of HIV. **Methods:** Data on baseline characteristics and knowledge during pregnancy, as well as infant feeding practices 4-8 weeks after the birth were obtained from 281 pregnant women recruited from nine antenatal clinics. Factors examined included: fear of HIV/AIDS stigma, male partner reactions, lack of disclosure to family members, knowledge of prevention of mother-to-child transmission (PMTCT) and mental health. In the analysis, comparisons were made using chi-squared and t-test methods as well as logistic multivariate regression models. **Results:** There were high levels of anticipated stigma 171(61.2%), intimate partner violence 57(20.4%) and postpartum depression 29(10.1%) and low levels of disclosure among HIV positive women 30(31.3%). The most significant factors determining EBF practice were hospital delivery (aOR = 2.1 95% CI 1.14-3.95) HIV positive serostatus (aOR 2.5 95% CI 1.23-5.27), and disclosure of HIV-positive serostatus (aOR 2.9 95% CI 1.31-6.79). Postpartum depression and PMTCT knowledge were not associated with EBF (aOR 1.1 95% CI 0.47-2.62 and aOR 1.2 95% CI 0.64-2.24) respectively. **Conclusions:** Health care workers and counselors need to receive support in order to improve skills required for diagnosing, monitoring and managing psychosocial aspects of the care of pregnant and HIV positive women including facilitating disclosure to male partners in order to improve both maternal and child health outcomes. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24754975/
41.	Olack B, Feikin DR, Cosmas LO, Odero KO, Okoth GO, Montgomery JM, Breiman RF. Mortality trends observed in population-based surveillance of an urban slum settlement, Kibera, Kenya, 2007-2010. PLoS One. 2014 Jan 28;9(1):e85913

	Abstract **Background:** We used population based infectious disease surveillance to characterize mortality rates in residents of an urban slum in Kenya. **Methods:** We analyzed biweekly household visit data collected two weeks before death for 749 cases who died during January 1, 2007 to December 31, 2010. We also selected controls matched by age, gender and having a biweekly household visit within two weeks before death of the corresponding case and compared the symptoms reported. **Results:** The overall mortality rate was 6.3 per 1,000 person years of observation (PYO) (females: 5.7; males: 6.8). Infant mortality rate was 50.2 per 1000 PYOs, and it was 15.1 per 1,000 PYOs for children <5 years old. Poisson regression indicates a significant decrease over time in overall mortality from (6.0 in 2007 to 4.0 in 2010 per 1000 PYOs; $p<0.05$) in persons ≥ 5 years old. This decrease was predominant in females (7.8 to 5.7 per 1000 PYOs; $p<0.05$). Two weeks before death, significantly higher prevalence for cough (OR = 4.7 [95% CI: 3.7-5.9]), fever (OR = 8.1 [95% CI: 6.1-10.7]), and diarrhea (OR = 9.1 [95% CI: 6.4-13.2]) were reported among participants who died (cases) when compared to participants who did not die (controls). Diarrhea followed by fever were independently associated with deaths (OR = 14.4 [95% CI: 7.1-29.2]), and (OR = 11.4 [95% CI: 6.7-19.4]) respectively. **Conclusions:** Despite accessible health care, mortality rates are high among people living in this urban slum; infectious disease syndromes appear to be linked to a substantial proportion of deaths. Rapid urbanization poses an increasing challenge in national efforts to improve health outcomes, including reducing childhood mortality rates. Targeting impoverished people in urban slums with effective interventions such as water and sanitation interventions are needed to achieve national objectives for health. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24489678/
42.	Emukule GO, Khagayi S, McMorrow ML, Ochola R, Otieno N, Widdowson MA, Ochieng M, Feikin DR, Katz MA, Mott JA. The burden of influenza and RSV among inpatients and outpatients in rural western Kenya, 2009-2012. PLoS One. 2014 Aug 18;9(8):e105543 **Abstract** **Background:** In Kenya, detailed data on the age-specific burden of influenza and RSV are essential to inform use of limited vaccination and treatment resources. **Methods:** We analyzed surveillance data from August 2009 to July 2012 for

	hospitalized severe acute respiratory illness (SARI) and outpatient influenza-like illness (ILI) at two health facilities in western Kenya to estimate the burden of influenza and respiratory syncytial virus (RSV). Incidence rates were estimated by dividing the number of cases with laboratory-confirmed virus infections by the mid-year population. Rates were adjusted for healthcare-seeking behavior, and to account for patients who met the SARI/ILI case definitions but were not tested. **Results:** The average annual incidence of influenza-associated SARI hospitalization per 1,000 persons was 2.7 (95% CI 1.8-3.9) among children <5 years and 0.3 (95% CI 0.2-0.4) among persons ≥5 years; for RSV-associated SARI hospitalization, it was 5.2 (95% CI 4.0-6.8) among children <5 years and 0.1 (95% CI 0.0-0.2) among persons ≥5 years. The incidence of influenza-associated medically-attended ILI per 1,000 was 24.0 (95% CI 16.6-34.7) among children <5 years and 3.8 (95% CI 2.6-5.7) among persons ≥5 years. The incidence of RSV-associated medically-attended ILI was 24.6 (95% CI 17.0-35.4) among children <5 years and 0.8 (95% CI 0.3-1.9) among persons ≥5 years. **Conclusions:** Influenza and RSV both exact an important burden in children. This highlights the possible value of influenza vaccines, and future RSV vaccines, for Kenyan children. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25133576/
43.	Irungu BN, Orwa JA, Gruhonjic A, Fitzpatrick PA, Landberg G, Kimani F, Midiwo J, Erdélyi M, Yenesew A. Constituents of the roots and leaves of Ekebergia capensis and their potential antiplasmodial and cytotoxic activities. Molecules. 2014 Sep 10;19(9):14235-46 **Abstract** A new triterpenoid, 3-oxo-12β-hydroxy-oleanan-28,13β-olide (1), and six known triterpenoids 2-7 were isolated from the root bark of Ekebergia capensis, an African medicinal plant. A limonoid 8 and two glycoflavonoids 9-10 were found in its leaves. The metabolites were identified by NMR and MS analyses, and their cytotoxicity was evaluated against the mammalian African monkey kidney (vero), mouse breast cancer (4T1), human larynx carcinoma (HEp2) and human breast cancer (MDA-MB-231) cell lines. Out of the isolates, oleanonic acid (2) showed the highest cytotoxicity, i.e., IC50's of 1.4 and 13.3 µM against the HEp2 and 4T1 cells, respectively. Motivated by the higher cytotoxicity of the crude bark extract as compared to the isolates, the interactions of oleanonic acid (2) with five triterpenoids 3-7 were evaluated on vero cells. In an antiplasmodial assay, seven of the metabolites were observed to possess moderate activity against the D6 and W2 strains of P. falciparum (IC50 27.1-97.1 µM), however with a low selectivity index (IC50(vero)/IC50(P. falciparum-D6)<10). The observed moderate antiplasmodial activity may be due to general cytotoxicity of the isolated

	triterpenoids. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25211004/
44.	Odhiambo C, Venter M, Chepkorir E, Mbaika S, Lutomiah J, Swanepoel R, Sang R. Vector Competence of Selected Mosquito Species in Kenya for Ngari and Bunyamwera Viruses. J Med Entomol. 2014 Nov 1;51(6):1248-53 **Abstract** Bunyamwera and Ngari viruses have been isolated from a range of mosquito species in Kenya but their actual role in the maintenance and transmission of these viruses in nature remains unclear. Identification of the mosquito species efficient in transmitting these viruses is critical for estimating the risk of human exposure and understanding the transmission and maintenance mechanism. We determined the vector competence of, Aedes aegypti (L.), Culex quinquefasciatus Say, and Anopheles gambiae Giles for transmission of Bunyamwera and Ngari viruses. Ae. aegypti was moderately susceptible to Bunyamwera virus infection at days 7 and 14. Over 60% of Ae. aegypti with a midgut infection developed a disseminated infection at both time points. Approximately 20% more mosquitoes developed a disseminated infection at day 14 compared with day 7. However, while Ae. aegypti was incompetent for Ngari virus, An. gambiae was moderately susceptible to both viruses with dissemination rates more than double by day 14. Cx. quinquefasciatus was refractory to both Bunyamwera and Ngari viruses. Our results underscore the need to continually monitor emergent arboviral genotypes circulating within particular regions as well as vectors mediating these transmissions to preempt and prevent their adverse effects. The genetic mechanism for species specificity and vector competence owing to reassortment needs further investigation. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/26309314/
45.	Kariuki SM, Abubakar A, Newton CR, Kihara M. Impairment of executive function in Kenyan children exposed to severe falciparum malaria with neurological involvement. Malar J. 2014 Sep 16;13:365. **Abstract** **Background:** Persistent neurocognitive impairments occur in a fifth of children hospitalized with severe falciparum malaria. There is little data on the association between different neurological phenotypes of severe malaria (seizures, impaired consciousness and prostration) and impairments in executive function. **Methods:** Executive functioning of children exposed to severe malaria with different neurological phenotypes (N = 58) and in those unexposed (N = 56) was examined using

	neuropsychological tests such as vigilance test, test for everyday attention test for children (TEA-Ch), contingency naming test (CNT) and self-ordered pointing test (SOPT). Linear regression was used to determine the association between neurological phenotypes of severe malaria and executive function performance scores, accounting for potential confounders. **Results:** Children with complex seizures in severe malaria performed more poorly than unexposed controls in the vigilance (median efficiency scores (interquartile range) = 4.84 (1.28-5.68) vs. 5.84 (4.71-6.42), P = 0.030) and SOPT (mean errors (standard deviation) = 29.50 (8.82) vs. 24.80 (6.50), P = 0.029) tests, but no differences were observed in TEA-Ch and CNT tests. Performance scores for other neurological phenotypes of severe malaria were similar with those of unexposed controls. After accounting for potential confounders, such as child's age, sex, schooling; maternal age, schooling and economic activity; perinatal factors and history of seizures, complex seizures remained associated with efficiency scores in the vigilance test (beta coefficient (β) (95% confidence interval (CI)) = -0.40 (-0.67, -0.13), P = 0.006) and everyday attention scores of the TEA-Ch test (β (95% CI) = -0.57 (-1.04, -0.10), P = 0.019); the association with SOPT error scores was weak (β (95% CI) = 4.57 (-0.73-9.89), P = 0.089). Combined neurological phenotypes were not significantly associated with executive function performance scores. **Conclusion:** Executive function impairment in children with severe malaria is associated with specific neurological phenotypes, particularly complex seizures. Effective prophylaxis and management of malaria-associated acute seizures may improve executive functioning performance scores of children **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25224247/
46.	Angwenyi V, Kamuya D, Mwachiro D, Kalama B, Marsh V, Njuguna P, Molyneux S. Complex realities: community engagement for a paediatric randomized controlled malaria vaccine trial in Kilifi, Kenya. Trials. 2014 Feb 25;15:65 **Abstract** **Background:** Community engagement (CE) is increasingly promoted for biomedical research conducted in resource poor settings for both intrinsic and instrumental purposes. Given the potential importance of CE, but also complexities and possibility of unexpected negative outcomes, there is need for more documentation of CE processes in practice. We share experiences of formal CE for a paediatric randomized controlled malaria vaccine trial conducted in three sites within Kilifi County, Kenya. **Methods:** Social scientists independent of the trial held in-depth individual interviews with trial researchers (n=5), community leaders (n=8) and parents (15 with enrolled

	children and 4 without); and group discussions with fieldworkers (n=6) and facility staff (n=2). We conducted a survey of participating households (n=200) and observed over 150 CE activities. **Results:** The overall CE plan was similar across the three study sites, although less community-based information in site C. Majority perceived CE activities to clear pre-existing concerns and misconceptions; increase visibility, awareness of and trust in trial staff. Challenges included: some community leaders attempting to exert pressure on people to enrol; local wording in information sheets and consent forms feeding into serious anxieties about the trial; and concerns about reduced CE over time. Negative effects of these challenges were mitigated through changes to on-going CE activities, and final information sharing and consent being conducted individually by trained clinical staff. One year after enrolment, 31% (n = 62) of participants' parents reported malaria prevention as the main aim of the activities their children were involved in, and 93% wanted their children to remain involved. **Conclusion:** The trial teams' goals for CE were relatively clear from the outset. Other actors' hopes and expectations (like higher allowances and future employment) were not openly discussed, but emerged over the course of engagements. Encouraging open discussion of all actors' intentions and goals from the outset takes time, risks raising expectations that cannot be met, and is complex. However, doing so in future similar trials may allow successes here to be built upon, and some challenges minimized or avoided. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24565019/
47.	Kihuba E, Gathara D, Mwinga S, Mulaku M, Kosgei R, Mogoa W, Nyamai R, English M. Assessing the ability of health information systems in hospitals to support evidence-informed decisions in Kenya. Glob Health Action. 2014 Jul 31;7:24859. **Abstract** **Background:** Hospital management information systems (HMIS) is a key component of national health information systems (HIS), and actions required of hospital management to support information generation in Kenya are articulated in specific policy documents. We conducted an evaluation of core functions of data generation and reporting within hospitals in Kenya to facilitate interpretation of national reports and to provide guidance on key areas requiring improvement to support data use in decision making. **Design:** The survey was a cross-sectional, cluster sample study conducted in 22 hospitals in Kenya. The statistical analysis was descriptive with adjustment for

	clustering. **Results:** Most of the HMIS departments complied with formal guidance to develop departmental plans. However, only a few (3/22) had carried out a data quality audit in the 12 months prior to the survey. On average 3% (range 1-8%) of the total hospital income was allocated to the HMIS departments. About half of the records officer positions were filled and about half (13/22) of hospitals had implemented some form of electronic health record largely focused on improving patient billing and not linked to the district HIS. Completeness of manual patient registers varied, being 90% (95% CI 80.1-99.3%), 75.8% (95% CI 68.7-82.8%), and 58% (95% CI 50.4-65.1%) in maternal child health clinic, maternity, and pediatric wards, respectively. Vital events notification rates were low with 25.7, 42.6, and 71.3% of neonatal deaths, infant deaths, and live births recorded, respectively. Routine hospital reports suggested slight over-reporting of live births and under-reporting of fresh stillbirths and neonatal deaths. **Conclusions:** Study findings indicate that the HMIS does not deliver quality data. Significant constraints exist in data quality assurance, supervisory support, data infrastructure in respect to information and communications technology application, human resources, financial resources, and integration. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25084834/
48.	Kiti MC, Kinyanjui TM, Koech DC, Munywoki PK, Medley GF, Nokes DJ. Quantifying age-related rates of social contact using diaries in a rural coastal population of Kenya. PLoS One. 2014 Aug 15;9(8):e104786 **Abstract** **Background:** Improved understanding and quantification of social contact patterns that govern the transmission dynamics of respiratory viral infections has utility in the design of preventative and control measures such as vaccination and social distancing. The objective of this study was to quantify an age-specific matrix of contact rates for a predominantly rural low-income population that would support transmission dynamic modeling of respiratory viruses. **Methods and findings:** From the population register of the Kilifi Health and Demographic Surveillance System, coastal Kenya, 150 individuals per age group (<1, 1-5, 6-15, 16-19, 20-49, 50 and above, in years) were selected by stratified random sampling and requested to complete a day long paper diary of physical contacts (e.g. touch or embrace). The sample was stratified by residence (rural-to-semiurban), month (August 2011 to January 2012, spanning seasonal changes in socio-cultural activities), and day of week. Usable diary responses were obtained from 568 individuals (~50% of expected). The mean number of contacts per person per day was 17.7 (95% CI 16.7-

	18.7). Infants reported the lowest contact rates (mean 13.9, 95% CI 12.1-15.7), while primary school students (6-15 years) reported the highest (mean 20.1, 95% CI 18.0-22.2). Rates of contact were higher within groups of similar age (assortative), particularly within the primary school students and adults (20-49 years). Adults and older participants (>50 years) exhibited the highest inter-generational contacts. Rural contact rates were higher than semiurban (18.8 vs 15.6, p = 0.002), with rural primary school students having twice as many assortative contacts as their semiurban peers. **Conclusions and significance:** This is the first age-specific contact matrix to be defined for tropical Sub-Saharan Africa and has utility in age-structured models to assess the potential impact of interventions for directly transmitted respiratory infections. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25127257/
49.	Abdi AI, Fegan G, Muthui M, Kiragu E, Musyoki JN, Opiyo M, Marsh K, Warimwe GM, Bull PC. Plasmodium falciparum antigenic variation: relationships between widespread endothelial activation, parasite PfEMP1 expression and severe malaria. BMC Infect Dis. 2014 Mar 28;14:170. **Abstract** **Background:** Plasmodium falciparum erythrocyte membrane protein 1(PfEMP1) is a family of variant surface antigens (VSA) that mediate the adhesion of parasite infected erythrocytes to capillary endothelial cells within host tissues. Opinion is divided over the role of PfEMP1 in the widespread endothelial activation associated with severe malaria. In a previous study we found evidence for differential associations between defined VSA subsets and specific syndromes of severe malaria: group A-like PfEMP1 expression and the "rosetting" phenotype were associated with impaired consciousness and respiratory distress, respectively. This study explores the involvement of widespread endothelial activation in these associations. **Methods:** We used plasma angiopoietin-2 as a marker of widespread endothelial activation. Using logistic regression analysis, we explored the relationships between plasma angiopoietin-2 levels, parasite VSA expression and the two syndromes of severe malaria, impaired consciousness and respiratory distress. **Results:** Plasma angiopoietin-2 was associated with both syndromes. The rosetting phenotype did not show an independent association with respiratory distress when adjusted for angiopoietin-2, consistent with a single pathogenic mechanism involving widespread endothelial activation. In contrast, group A-like PfEMP1 expression and angiopoietin-2 maintained independent associations with impaired consciousness when adjusted for each other.

	Conclusion: The results are consistent with multiple pathogenic mechanisms leading to severe malaria and heterogeneity in the pathophysiology of impaired consciousness. The observed association between group A-like PfEMP1 and impaired consciousness does not appear to involve widespread endothelial activation. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24674301/
50.	Khagayi S, Burton DC, Onkoba R, Ochieng B, Ismail A, Mutonga D, Muthoni J, Feikin DR, Breiman RF, Mwenda JM, Odhiambo F, Laserson KF. High burden of rotavirus gastroenteritis in young children in rural western Kenya, 2010-2011. Pediatr Infect Dis J. 2014 Jan;33 Suppl 1:S34-40. **Abstract** **Background:** Diarrhea is a leading cause of hospitalization and death in children <5 years of age. **Objectives:** To facilitate evaluation of the impact of rotavirus vaccine introduction in western Kenya, we estimated baseline rates of rotavirus-associated hospitalization and mortality among children <5 years of age. **Methods:** From January 2010 to December 2011, we collected demographic, clinical and laboratory data for children <5 years of age seeking care at the district hospital and 2 outpatient facilities within a Health and Demographic Surveillance System (HDSS). Children with acute gastroenteritis (AGE), defined as ≥3 loose stools and/or ≥1 episode of unexplained vomiting followed by loose stool within a 24-hour period, were asked to provide a stool sample for rotavirus ELISA testing. Rates of rotavirus-associated hospitalization and mortality were estimated using time of residence in the HDSS to calculate person-years of observation. To estimate the rotavirus-associated mortality rate, we applied the percentage positive for rotavirus among AGE hospitalizations to verbal autopsy estimates of diarrhea deaths in the HDSS. **Results:** There were 4991 hospitalizations of children <5 years of age; 1134 (23%) were for AGE and stool specimens were obtained from 790 (70%). Rotavirus was detected in 211 (27%) specimens. Among 4951 <5 outpatient sick visits, 608 (12%) were for AGE; 320 (51%) provided specimens and 62 (20%) were positive for rotavirus. Rotavirus AGE accounted for 501 <5 hospitalizations per 100,000 person-years of observation. Rotavirus-associated <5 mortality was 136 deaths per 100,000 person-years of observation. **Conclusions:** Continued surveillance of rotavirus AGE will provide timely data on the population-level impact of rotavirus vaccine following its likely introduction in 2014.

	PubMed link- https://pubmed.ncbi.nlm.nih.gov/24343611/
51.	Githeko AK, Ogallo L, Lemnge M, Okia M, Ototo EN. Development and validation of climate and ecosystem-based early malaria epidemic prediction models in East Africa. Malar J. 2014 Aug 22;13:329 **Abstract** **Background:** Malaria epidemics remain a serious threat to human populations living in the highlands of East Africa where transmission is unstable and climate sensitive. An existing early malaria epidemic prediction model required further development, validations and automation before its wide use and application in the region. The model has a lead-time of two to four months between the detection of the epidemic signal and the evolution of the epidemic. The validated models would be of great use in the early detection and prevention of malaria epidemics. **Methods:** Confirmed inpatient malaria data were collected from eight sites in Kenya,

	Tanzania and Uganda for the period 1995-2009. Temperature and rainfall data for the period 1960-2009 were collected from meteorological stations closest to the source of the malaria data. Process-based models were constructed for computing the risk of an epidemic in two general highland ecosystems using temperature and rainfall data. The sensitivity, specificity and positive predictive power were used to validate the models. **Results:** Depending on the availability and quality of the malaria and meteorological data, the models indicated good functionality at all sites. Only two sites in Kenya had data that met the criteria for the full validation of the models. The additive model was found most suited for the poorly drained U-shaped valley ecosystems while the multiplicative model was most suited for the well-drained V-shaped valley ecosystem. The +18°C model was adaptable to any of the ecosystems and was designed for conditions where climatology data were not available. The additive model scored 100% for sensitivity, specificity and positive predictive power. The multiplicative model had a sensitivity of 75% specificity of 99% and a positive predictive power of 86%. **Conclusions:** The additive and multiplicative models were validated and were shown to be robust and with high climate-based, early epidemic predictive power. They are designed for use in the common, well- and poorly drained valley ecosystems in the highlands of East Africa. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25149479/
52.	Fujii Y, Kaneko S, Nzou SM, Mwau M, Njenga SM, Tanigawa C, Kimotho J, Mwangi AW, Kiche I, Matsumoto S, Niki M, Osada-Oka M, Ichinose Y, Inoue M, Itoh M, Tachibana H, Ishii K, Tsuboi T, Yoshida LM, Mondal D, Haque R, Hamano S, Changoma M, Hoshi T, Kamo K, Karama M, Miura M, Hirayama K. Serological surveillance development for tropical infectious diseases using simultaneous microsphere-based multiplex assays and finite mixture models. PLoS Negl Trop Dis. 2014 Jul 31;8(7):e3040. **Abstract** **Background:** A strategy to combat infectious diseases, including neglected tropical diseases (NTDs), will depend on the development of reliable epidemiological surveillance methods. To establish a simple and practical seroprevalence detection system, we developed a microsphere-based multiplex immunoassay system and evaluated utility using samples obtained in Kenya. **Methods:** We developed a microsphere-based immuno-assay system to simultaneously measure the individual levels of plasma antibody (IgG) against 8 antigens derived from 6 pathogens: Entamoeba histolytica (C-IgL), Leishmania donovani (KRP42),

	Toxoplasma gondii (SAG1), Wuchereria bancrofti (SXP1), HIV (gag, gp120 and gp41), and Vibrio cholerae (cholera toxin). The assay system was validated using appropriate control samples. The assay system was applied for 3411 blood samples collected from the general population randomly selected from two health and demographic surveillance system (HDSS) cohorts in the coastal and western regions of Kenya. The immunoassay values distribution for each antigen was mathematically defined by a finite mixture model, and cut-off values were optimized. **Findings:** Sensitivities and specificities for each antigen ranged between 71 and 100%. Seroprevalences for each pathogen from the Kwale and Mbita HDSS sites (respectively) were as follows: HIV, 3.0% and 20.1%; L. donovani, 12.6% and 17.3%; E. histolytica, 12.8% and 16.6%; and T. gondii, 30.9% and 28.2%. Seroprevalences of W. bancrofti and V. cholerae showed relatively high figures, especially among children. The results might be affected by immunological cross reactions between W. bancrofti-SXP1 and other parasitic infections; and cholera toxin and the enterotoxigenic E. coli (ETEC), respectively. **Interpretation:** A microsphere-based multi-serological assay system can provide an opportunity to comprehensively grasp epidemiological features for NTDs. By adding pathogens and antigens of interest, optimized made-to-order high-quality programs can be established to utilize limited resources to effectively control NTDs in Africa. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25078404/
53.	Spangler SA, Onono M, Bukusi EA, Cohen CR, Turan JM. HIV-positive status disclosure and use of essential PMTCT and maternal health services in rural Kenya. J Acquir Immune Defic Syndr. 2014 Dec 1;67 Suppl 4(Suppl 4):S235-42 **Abstract** **Background:** In sub-Saharan Africa, women's disclosure of HIV-positive status to others may affect their use of services for prevention of mother-to-child transmission of HIV (PMTCT) of HIV and maternal and child health-including antenatal care, antiretroviral drugs (ARVs) for PMTCT, and skilled birth attendance. **Methods:** Using data from the Migori and AIDS Stigma Study conducted in rural Nyanza Province, Kenya, we compared the use of PMTCT and maternal health services for all women by HIV status and disclosure category (n = 390). Among HIV-infected women (n = 145), associations between disclosure of HIV-positive status and the use of services were further examined with bivariate and multivariate logistic regression analyses. **Results:** Women living with HIV who had not disclosed to anyone had the lowest levels

	of maternity and PMTCT service utilization. For example, only 21% of these women gave birth in a health facility, compared with 35% of HIV-negative women and 49% of HIV-positive women who had disclosed ($P < 0.001$). Among HIV-positive women, the effect of disclosure to anyone on ARV drug use [odds ratio (OR) = 5.8; 95% confidence interval (CI): 1.9 to 17.8] and facility birth (OR = 2.9; 95% CI: 1.4 to 5.7) remained large and significant after adjusting for confounders. Disclosure to a male partner had a particularly strong effect on the use of ARVs for PMTCT (OR = 7.9; 95% CI: 3.7 to 17.1). **Conclusions:** HIV-positive status disclosure seems to be a complex yet critical factor for the use of PMTCT and maternal health services in this setting. The design of interventions to promote such disclosure must recognize the impact of HIV-related stigma on disclosure decisions and protect women's rights, autonomy, and safety. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25436823/
54.	Wendler JP, Okombo J, Amato R, Miotto O, Kiara SM, Mwai L, Pole L, O'Brien J, Manske M, Alcock D, Drury E, Sanders M, Oyola SO, Malangone C, Jyothi D, Miles A, Rockett KA, MacInnis BL, Marsh K, Bejon P, Nzila A, Kwiatkowski DP. A genome wide association study of Plasmodium falciparum susceptibility to 22 antimalarial drugs in Kenya. PLoS One. 2014 May 8;9(5):e96486 **Abstract** **Background:** Drug resistance remains a chief concern for malaria control. In order to determine the genetic markers of drug resistant parasites, we tested the genome-wide associations (GWA) of sequence-based genotypes from 35 Kenyan P. falciparum parasites with the activities of 22 antimalarial drugs. **Methods and principal findings:** Parasites isolated from children with acute febrile malaria were adapted to culture, and sensitivity was determined by in vitro growth in the presence of anti-malarial drugs. Parasites were genotyped using whole genome sequencing techniques. Associations between 6250 single nucleotide polymorphisms (SNPs) and resistance to individual anti-malarial agents were determined, with false discovery rate adjustment for multiple hypothesis testing. We identified expected associations in the pfcrt region with chloroquine (CQ) activity, and other novel loci associated with amodiaquine, quinazoline, and quinine activities. Signals for CQ and primaquine (PQ) overlap in and around pfcrt, and interestingly the phenotypes are inversely related for these two drugs. We catalog the variation in dhfr, dhps, mdr1, nhe, and crt, including novel SNPs, and confirm the presence of a dhfr-164L quadruple mutant in coastal Kenya. Mutations implicated in sulfadoxine-pyrimethamine resistance are at or near fixation in this sample set.

	Conclusions/significance: Sequence-based GWA studies are powerful tools for phenotypic association tests. Using this approach on falciparum parasites from coastal Kenya we identified known and previously unreported genes associated with phenotypic resistance to anti-malarial drugs, and observe in high-resolution haplotype visualizations a possible signature of an inverse selective relationship between CQ and PQ. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24809681/
55.	Pfeil J, Borrmann S, Tozan Y. Dihydroartemisinin-piperaquine vs. artemether-lumefantrine for first-line treatment of uncomplicated malaria in African children: a cost-effectiveness analysis. PLoS One. 2014 Apr 18;9(4):e95681 **Abstract** **Background:** Recent multi-centre trials showed that dihydroartemisinin-piperaquine (DP) was as efficacious and safe as artemether-lumefantrine (AL) for treatment of young children with uncomplicated P. falciparum malaria across diverse transmission settings in Africa. Longitudinal follow-up of patients in these trials supported previous findings that DP had a longer post-treatment prophylactic effect than AL, reducing the risk of reinfection and conferring additional health benefits to patients, particularly in areas with moderate to high malaria transmission. **Methods:** We developed a Markov model to assess the cost-effectiveness of DP versus AL for first-line treatment of uncomplicated malaria in young children from the provider perspective, taking into consideration the post-treatment prophylactic effects of the drugs as reported by a recent multi-centre trial in Africa and using the maximum manufacturer drug prices for artemisinin-based combination therapies set by the Global Fund in 2013. We estimated the price per course of treatment threshold above which DP would cease to be a cost-saving alternative to AL as a first-line antimalarial drug. **Results:** First-line treatment with DP compared to AL averted 0.03 DALYs (95% CI: 0.006-0.07) and 0.001 deaths (95% CI: 0.00-0.002) and saved $0.96 (95% CI: 0.33-2.46) per child over one year. The results of the threshold analysis showed that DP remained cost-saving over AL for any DP cost below $1.23 per course of treatment. **Conclusions:** DP is superior to AL from both the clinical and economic perspectives for treatment of uncomplicated P. falciparum malaria in young children. A paediatric dispersible formulation of DP is under development and should facilitate a targeted deployment of this antimalarial drug. The use of DP as first-line antimalarial drug in paediatric malaria patients in moderate to high transmission areas of Africa merits serious consideration by health policymakers. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24748395/

56.	Kamuyu G, Bottomley C, Mageto J, Lowe B, Wilkins PP, Noh JC, Nutman TB, Ngugi AK, Odhiambo R, Wagner RG, Kakooza-Mwesige A, Owusu-Agyei S, Ae-Ngibise K,Masanja H, Osier FH, Odermatt P, Newton CR; Study of Epidemiology of Epilepsy in Demographic Sites (SEEDS) group. Exposure to multiple parasites is associated with the prevalence of active convulsive epilepsy in sub-Saharan Africa. PloS Negl Trop Dis. 2014 May 29;8(5):e2908 **Abstract** **Background:** Epilepsy is common in developing countries, and it is often associated with parasitic infections. We investigated the relationship between exposure to parasitic infections, particularly multiple infections and active convulsive epilepsy (ACE), in five sites across sub-Saharan Africa. **Methods and findings:** A case-control design that matched on age and location was used. Blood samples were collected from 986 prevalent cases and 1,313 age-matched community controls and tested for presence of antibodies to Onchocerca volvulus, Toxocara canis, Toxoplasma gondii, Plasmodium falciparum, Taenia solium and HIV. Exposure (seropositivity) to Onchocerca volvulus (OR = 1.98; 95%CI: 1.52-2.58, p<0.001), Toxocara canis (OR = 1.52; 95%CI: 1.23-1.87, p<0.001), Toxoplasma gondii (OR = 1.28; 95%CI: 1.04-1.56, p = 0.018) and higher antibody levels (top tertile) to Toxocara canis (OR = 1.70; 95%CI: 1.30-2.24, p<0.001) were associated with an increased prevalence of ACE. Exposure to multiple infections was common (73.8% of cases and 65.5% of controls had been exposed to two or more infections), and for T. gondii and O. volvulus co-infection, their combined effect on the prevalence of ACE, as determined by the relative excess risk due to interaction (RERI), was more than additive (T. gondii and O. volvulus, RERI = 1.19). The prevalence of T. solium antibodies was low (2.8% of cases and 2.2% of controls) and was not associated with ACE in the study areas. **Conclusion:** This study investigates how the degree of exposure to parasites and multiple parasitic infections are associated with ACE and may explain conflicting results obtained when only seropositivity is considered. The findings from this study should be further validated. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24875312/
57.	Ibinda F, Mbuba CK, Kariuki SM, Chengo E, Ngugi AK, Odhiambo R, Lowe B, Fegan G, Carter JA, Newton CR. Evaluation of Kilifi epilepsy education programme: a randomized controlled trial. Epilepsia. 2014 Feb;55(2):344-52.

Abstract

Objectives: The epilepsy treatment gap is largest in resource-poor countries. We evaluated the efficacy of a 1-day health education program in a rural area of Kenya. The primary outcome was adherence to antiepileptic drugs (AEDs) as measured by drug levels in the blood, and the secondary outcomes were seizure frequency and Kilifi Epilepsy Beliefs and Attitudes Scores (KEBAS).

Methods: Seven hundred thirty-eight people with epilepsy (PWE) and their designated supporter were randomized to either the intervention (education) or nonintervention group. Data were collected at baseline and 1 year after the education intervention was administered to the intervention group. There were 581 PWE assessed at both time points. At the end of the study, 105 PWE from the intervention group and 86 from the nonintervention group gave blood samples, which were assayed for the most commonly used AEDs (phenobarbital, phenytoin, and carbamazepine). The proportions of PWE with detectable AED levels were determined using a standard blood assay method. The laboratory technicians conducting the assays were blinded to the randomization. Secondary outcomes were evaluated using questionnaires administered by trained field staff. Modified Poisson regression was used to investigate the factors associated with improved adherence (transition from nonoptimal AED level in blood at baseline to optimal levels at follow-up), reduced seizures, and improved KEBAS, which was done as a post hoc analysis. This trial is registered in ISRCTN register under ISRCTN35680481.

Results: There was no significant difference in adherence to AEDs based on detectable drug levels (odds ratio [OR] 1.46, 95% confidence interval [95% CI] 0.74-2.90, p = 0.28) or by self-reports (OR 1.00, 95% CI 0.71-1.40, p = 1.00) between the intervention and nonintervention group. The intervention group had significantly fewer beliefs about traditional causes of epilepsy, cultural treatment, and negative stereotypes than the nonintervention group. There was no difference in seizure frequency. A comparison of the baseline and follow-up data showed a significant increase in adherence-intervention group (36-81% [p < 0.001]) and nonintervention group (38-74% [p < 0.001])-using detectable blood levels. The number of patients with less frequent seizures (≤3 seizures in the last 3 months) increased in the intervention group (62-80% [p = 0.002]) and in the nonintervention group (67-75% [p = 0.04]). Improved therapeutic adherence (observed in both groups combined) was positively associated with positive change in beliefs about risks of epilepsy (relative risk [RR] 2.00, 95% CI 1.03-3.95) and having nontraditional religious beliefs (RR 2.01, 95% CI 1.01-3.99). Reduced seizure frequency was associated with improved adherence (RR 1.72, 95% CI 1.19-2.47). Positive changes in KEBAS were associated with having tertiary education as compared to none (RR 1.09, 95% CI 1.05-1.14).

	Significance: Health education improves knowledge about epilepsy, but once only contact does not improve adherence. However, sustained education may improve adherence in future studies. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24447063/
58.	Omedo M, Ogutu M, Awiti A, Musuva R, Muchiri G, Montgomery SP, Secor WE, Mwinzi P. The effect of a health communication campaign on compliance with mass drug administration for schistosomiasis control in western Kenya--the SCORE project. Am J Trop Med Hyg. 2014 Nov;91(5):982-8 **Abstract** Compliance with mass drug administration (MDA) can be affected by rumors and mistrust about the drug. Communication campaigns are an effective way to influence attitudes and health behaviors in diverse public health contexts, but there is very little documentation about experiences using health communications in schistosomiasis control programs. A qualitative study was conducted with community health workers (CHWs) as informants to explore the effect of a health communication campaign on their experiences during subsequent praziquantel MDA for schistosomiasis. Discussions were audio-recorded, transcribed verbatim, translated into English where applicable, and analyzed thematically using ATLAS.ti software. According to the CHWs, exposure to mass media messages improved awareness of the MDA, which in turn, led to better treatment compliance. Our findings suggest that communication campaigns influence health behaviors and create awareness of schistosomiasis control interventions, which may ultimately improve praziquantel MDA. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25246690/
59.	Njuguna HN, Caselton DL, Arunga GO, Emukule GO, Kinyanjui DK, Kalani RM, Kinkade C, Muthoka PM, Katz MA, Mott JA. A comparison of smartphones to paper-based questionnaires for routine influenza sentinel surveillance, Kenya, 2011-2012. BMC Med Inform Decis Mak. 2014 Dec 24;14:107 **Abstract** **Background:** For disease surveillance, manual data collection using paper-based questionnaires can be time consuming and prone to errors. We introduced smartphone data collection to replace paper-based data collection for an influenza sentinel surveillance system in four hospitals in Kenya. We compared the quality, cost and timeliness of data collection between the smartphone data collection system and the paper-based system.

	Methods: Since 2006, the Kenya Ministry of Health (MoH) with technical support from the Kenya Medical Research Institute/Centers for Disease Control and Prevention (KEMRI/CDC) conducted hospital-based sentinel surveillance for influenza in Kenya. In May 2011, the MOH replaced paper-based collection with an electronic data collection system using Field Adapted Survey Toolkit (FAST) on HTC Touch Pro2 smartphones at four sentinel sites. We compared 880 paper-based questionnaires dated Jan 2010-Jun 2011 and 880 smartphone questionnaires dated May 2011-Jun 2012 from the four surveillance sites. For each site, we compared the quality, cost and timeliness of each data collection system. **Results:** Incomplete records were more likely seen in data collected using pen-and-paper compared to data collected using smartphones (adjusted incidence rate ratio (aIRR) 7, 95% CI: 4.4-10.3). Errors and inconsistent answers were also more likely to be seen in data collected using pen-and-paper compared to data collected using smartphones (aIRR: 25, 95% CI: 12.5-51.8). Smartphone data was uploaded into the database in a median time of 7 days while paper-based data took a median of 21 days to be entered ($p < 0.01$). It cost USD 1,501 (9.4%) more to establish the smartphone data collection system ($17,500) than the pen-and-paper system (USD $15,999). During two years, however, the smartphone data collection system was $3,801 (7%) less expensive to operate ($50,200) when compared to pen-and-paper system ($54,001). **Conclusions:** Compared to paper-based data collection, an electronic data collection system produced fewer incomplete data, fewer errors and inconsistent responses and delivered data faster. Although start-up costs were higher, the overall costs of establishing and running the electronic data collection system were lower compared to paper-based data collection system. Electronic data collection using smartphones has potential to improve timeliness, data integrity and reduce costs. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25539745/
60.	Olupot-Olupot P, Engoru C, Thompson J, Nteziyaremye J, Chebet M, Ssenyondo T, Dambisya CM, Okuuny V, Wokulira R, Amorut D, Ongodia P, Mpoya A, Williams TN, Uyoga S, Macharia A, Gibb DM, Walker AS, Maitland K. Phase II trial of standard versus increased transfusion volume in Ugandan children with acute severe anemia. BMC Med. 2014 Apr 25;12:67 **Abstract** **Background:** Severe anemia (SA, hemoglobin <6 g/dl) is a leading cause of pediatric hospital admission in Africa, with significant in-hospital mortality. The underlying etiology is often infectious, but specific pathogens are rarely identified. Guidelines developed to encourage rational blood use recommend a standard volume of whole blood (20 ml/kg) for transfusion, but this is commonly associated with a frequent need

	for repeat transfusion and poor outcome. Evidence is lacking on what hemoglobin threshold criteria for intervention and volume are associated with the optimal survival outcomes. **Methods:** We evaluated the safety and efficacy of a higher volume of whole blood (30 ml/kg; Tx30: n = 78) against the standard volume (20 ml/kg; Tx20: n = 82) in Ugandan children (median age 36 months (interquartile range (IQR) 13 to 53)) for 24-hour anemia correction (hemoglobin >6 g/dl: primary outcome) and 28-day survival. **Results:** Median admission hemoglobin was 4.2 g/dl (IQR 3.1 to 4.9). Initial volume received followed the randomization strategy in 155 (97%) patients. By 24-hours, 70 (90%) children in the Tx30 arm had corrected SA compared to 61 (74%) in the Tx20 arm; cause-specific hazard ratio = 1.54 (95% confidence interval 1.09 to 2.18, P = 0.01). From admission to day 28 there was a greater hemoglobin increase from enrollment in Tx30 (global P <0.0001). Serious adverse events included one non-fatal allergic reaction and one death in the Tx30 arm. There were six deaths in the Tx20 arm (P = 0.12); three deaths were adjudicated as possibly related to transfusion, but none secondary to volume overload. **Conclusion:** A higher initial transfusion volume prescribed at hospital admission was safe and resulted in an accelerated hematological recovery in Ugandan children with SA. Future testing in a large, pragmatic clinical trial to establish the effect on short and longer-term survival is warranted. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24767094/
61.	Khagayi S, Tate JE, Onkoba R, Parashar U, Odhiambo F, Burton D, Laserson K, Feikin DR. A sham case-control study of effectiveness of DTP-Hib-hepatitis B vaccine against rotavirus acute gastroenteritis in Kenya. BMC Infect Dis. 2014 Feb 11;14:77. **Abstract** **Background:** In many GAVI-eligible countries, effectiveness of new vaccines will be evaluated by case-control methodology. To inform the design and assess selection bias of a future case-control study of rotavirus vaccine effectiveness (VE) in western Kenya, we performed a sham case-control study evaluating VE of pentavalent vaccine (DTP-Hib-HepB) against rotavirus acute gastroenteritis (AGE). **Methods:** From ongoing rotavirus surveillance, we defined cases as children 12 weeks to 23 months old with EIA-confirmed rotavirus AGE. We enrolled one community-based and two hospital-based control groups. We collected vaccination status from

	cards at enrollment, or later in homes, and evaluated VE by logistic regression. **Results:** We enrolled 91 cases (64 inpatient, 27 outpatient), 252 non-rotavirus AGE facility-based controls (unmatched), 203 non-AGE facility-based controls (age-matched) and 271 community controls (age-matched). Documented receipt of 3 pentavalent doses was 77% among cases and ranged from 81-86% among controls. One percent of cases and 0-2% of controls had no pentavalent doses. The adjusted odds ratio of three versus zero doses for being a case was 3.27 (95% CI 0.01-1010) for community controls and 0.69 (95% CI 0.06-7.75) for non-rotavirus hospital-based AGE controls, translating to VE of -227% and 31%, respectively, with wide confidence intervals. (No facility-based non-AGE controls were unvaccinated.) Similar results were found for ≥2 pentavalent doses and for severe rotavirus AGE. **Conclusions:** The study showed that it is feasible to carry out a real case control in the study area, but this needs to be done as soon as the vaccine is introduced to capture the real impact. Sham case-control or pilot studies before vaccine introduction can be useful in designing case-control VE studies **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24517198/
62.	Munywoki PK, Koech DC, Agoti CN, Lewa C, Cane PA, Medley GF, Nokes DJ. The source of respiratory syncytial virus infection in infants: a household cohort study in rural Kenya. J Infect Dis. 2014 Jun 1;209(11):1685-92. **Abstract** **Background:** Respiratory syncytial virus (RSV) vaccine development for direct protection of young infants faces substantial obstacles. Assessing the potential of indirect protection using different strategies, such as targeting older children or mothers, requires knowledge of the source of infection to the infants. **Methods:** We undertook a prospective study in rural Kenya. Households with a child born after the preceding RSV epidemic and ≥ 1 elder sibling were recruited. Nasopharyngeal swab samples were collected every 3-4 days irrespective of symptoms from all household members throughout the RSV season of 2009-2010 and tested for RSV using molecular techniques. **Results:** From 451 participants in 44 households a total of 15 396 nasopharyngeal swab samples were samples were collected, representing 86% of planned sampling. RSV was detected in 37 households (84%) and 173 participants (38%) and 28 study infants (64%). The infants acquired infection from within (15 infants; 54%) or outside (9 infants; 32%) the household; in 4 households the source of infant infection was inconclusive. Older children were index case patients for 11 (73%) of the within-

	household infant infections, and 10 of these 11 children were attending school. **Conclusion:** We demonstrate that school-going siblings frequently introduce RSV into households, leading to infection in infants. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24367040/
63.	Okanda JO, Borkowf CB, Girde S, Thomas TK, Lecher SL. Exclusive breastfeeding among women taking HAART for PMTCT of HIV-1 in the Kisumu Breastfeeding Study. BMC Pediatr. 2014 Nov 7;14:280 **Abstract** **Background:** One of the most effective ways to promote the prevention of mother-to-child transmission (PMTCT) of HIV-1 in resource-limited settings is to encourage HIV-positive mothers to practice exclusive breastfeeding (EBF) for the first 6 months post-partum while they receive antiretroviral therapy (ARV). Although EBF reduces mortality in this context, its practice has been low. We studied the rate of adherence to EBF and assessed associated maternal and infant characteristics using data from a phase II PMTCT clinical trial conducted in Western Kenya which included a counseling intervention to encourage EBF by all participants. **Methods:** We analyzed data from the Kisumu Breastfeeding Study (KiBS), conducted between July 2003 and February 2009. This study enrolled a total of 522 HIV-1 infected pregnant women. Data on breastfeeding were available for 480 mother-infant pairs. Infant feeding and general nutrition counseling began at 35 weeks gestation and continued throughout the 6 month post-partum intervention period, following World Health Organization (WHO) infant feeding guidelines. Data on infant feeding were collected during routine clinic visits and home visits using food frequency questionnaires and dietary recall methods. Participants were instructed to exclusively breastfeed until initiation of weaning at 5.5 months post-partum. We used Kaplan-Meier methods to estimate the rates of EBF at 5.25 months post-partum, stratified by maternal and infant characteristics measured at enrollment, delivery, and 2 weeks post-partum. **Results:** The estimated EBF rate at 5.25 months post-partum was 80.4%. Only 3% of women introduced other foods (most commonly water with or without glucose, cow's milk, formula, and fruit) by 2 months; this percentage increased to 5% of women by 4 months. Women who had ≥3 previous births ($p < 0.01$) and who were not living with the infant's father ($p = 0.04$) were more likely to exclusively breastfeed. Mixed feeding was more common for male infants than for female infants ($p = 0.04$). **Conclusion:** Exclusive breastfeeding was common in this clinical trial, which emphasized EBF as a best practice until infants reached 5.5 months of age. Counseling

	initiated prior to delivery and continued during the post-partum period provided a consistent message reinforcing the benefits of EBF. The findings from this study suggest high adherence to EBF in resource limited settings can be achieved by a comprehensive counseling intervention that encourages EBF. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25380718/
64.	Opanda SM, Wamunyokoli F, Khamadi S, Coldren R, Bulimo WD. Genetic diversity of human enterovirus 68 strains isolated in Kenya using the hypervariable 3'-end of VP1 gene. PLoS One. 2014 Jul 23;9(7):e102866 **Abstract** Reports of increasing worldwide circulation of human enterovirus-68 (EV68) are well documented. Despite health concerns posed by resurgence of these viruses, little is known about EV68 strains circulating in Kenya. In this study, we characterized 13 EV68 strains isolated in Kenya between 2008 and 2011 based on the Hypervariable 3'-end of the VP1 gene. Viral RNA was extracted from the isolates and partial VP1 gene amplified by RT-PCR, followed by nucleotide sequencing. Alignment of deduced amino acid sequences revealed substitutions in Kenyan EV68 isolates absent in the prototype reference strain (Fermon). The majority of these changes were present in the BC and DE-loop regions, which are associated with viral antigenicity and virulence. The Kenyan strains exhibited high sequence homology with respect to those from other countries. Natural selection analysis based on the VP1 region showed that the Kenyan EV68 isolates were under purifying selection. Phylogenetic analysis revealed that majority (84.6%) of the Kenyan strains belonged to clade A, while a minority belonged to clades B and C. Overall, our results illustrate that although EV68 strains isolated in Kenya were genetically and antigenically divergent from the prototype strain (Fermon), they were closely related to those circulating in other countries, suggesting worldwide transmissibility. Further, the presence of shared mutations by Kenyan EV68 strains and those isolated in other countries, indicates evolution in the VP1 region may be contributing to increased worldwide detection of the viruses. This is the first study to document circulation of EV68 in Kenya. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25054861/
65.	Sanders EJ, Mugo P, Prins HA, Wahome E, Thiong'o AN, Mwashigadi G, van der Elst EM, Omar A, Smith AD, Graham SM. Acute HIV-1 infection is as common as malaria in young febrile adults seeking care in coastal Kenya. AIDS. 2014 Jun 1;28(9):1357-63 **Abstract**

	Background: Febrile adults are usually not tested for acute HIV-1 infection (AHI) in Africa. We assessed a strategy to diagnose AHI among young adult patients seeking care. **Methods:** Young adults (<30 years) who met predefined AHI criteria at care seeking, including fever, sexually transmitted disease symptoms, diarrhoea, body pains or multiple partners were referred from five pharmacies and screened at five health facilities. Prevalent HIV-1 was diagnosed by nationally recommended serial rapid HIV-1 testing. Willing HIV-1-negative patients were evaluated for AHI, defined as a positive p24 antigen test, and subsequent seroconversion or RNA detection. Febrile patients evaluated for AHI were also screened for malaria using a rapid test, with PCR confirmation of positives. **Results:** In 3602 adults seeking care, overall HIV-1 prevalence was 3.9%: 7.6% (68/897) among patients meeting AHI criteria vs. 2.6% (71/2705) among those who did not ($P < 0.001$). AHI was diagnosed in five of 506 HIV-1-negative or discordant patients who met AHI risk criteria and were completely evaluated [prevalence 1.0%, 95% confidence interval (CI) 0.3-2.3%]. Of these five AHI cases, four were diagnosed among the 241 patients with fever (prevalence 1.7%, 95% CI 0.5-4.2%), vs. one among 265 non-febrile patients (prevalence 0.4%, 95% CI 0.0-2.0%, $P = 0.1$). Malaria was confirmed by PCR in four (1.7%) of the 241 febrile patients. **Conclusion:** AHI was as common as confirmed malaria in young febrile adults seeking care. An AHI detection strategy targeting young febrile adults seeking care at pharmacies and health facilities is feasible and should be considered as an HIV-prevention strategy in high-transmission settings. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24556872/
66.	Gitau EN, Tuju J, Karanja H, Stevenson L, Requena P, Kimani E, Olotu A, Kimani D, Marsh K, Bull P, Urban BC. CD4+ T cell responses to the Plasmodium falciparum erythrocyte membrane protein 1 in children with mild malaria. J Immunol. 2014 Feb 15;192(4):1753-61 **Abstract** The immune response against the variant surface Ag Plasmodium falciparum erythrocyte membrane protein 1 (PfEMP1) is a key component of clinical immunity against malaria. We have investigated the development and maintenance of CD4(+) T cell responses to a small semiconserved area of the Duffy binding-like domain (DBL)α-domain of PfEMP1, the DBLα-tag. Young children were followed up longitudinally, and parasites and PBMCs were isolated from 35 patients presenting with an acute case of uncomplicated malaria. The DBLα-tag from the PfEMP1 dominantly expressed by

	the homologous parasite isolate was cloned and expressed as recombinant protein. The recombinant DBLα-tag was used to activate PBMCs collected from each acute episode and from an annual cross-sectional survey performed after the acute malaria episode. In this article, we report that CD4(+) T cell responses to the homologous DBLα-tag were induced in 75% of the children at the time of the acute episode and in 62% of the children at the following cross-sectional survey on average 235 d later. Furthermore, children who had induced DBLα-tag-specific CD4(+)IL-4(+) T cells at the acute episode remained episode free for longer than children who induced other types of CD4(+) T cell responses. These results suggest that a wide range of DBLα-tag-specific CD4(+) T cell responses were induced in children with mild malaria and, in the case of CD4(+)IL-4(+) T cell responses, were associated with protection from clinical episodes. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24453249/
67.	Otieno NA, Nyawanda BO, Audi A, Emukule G, Lebo E, Bigogo G, Ochola R, Muthoka P, Widdowson MA, Shay DK, Burton DC, Breiman RF, Katz MA, Mott JA. Demographic, socio-economic and geographic determinants of seasonal influenza vaccine uptake in rural western Kenya, 2011. Vaccine. 2014 Nov 20;32(49):6699-704 **Abstract** Influenza-associated acute lower respiratory infections cause a considerable burden of disease in rural and urban sub-Saharan Africa communities with the greatest burden among children. Currently, vaccination is the best way to prevent influenza infection and accompanying morbidities. We examined geographic, socio-economic and demographic factors that contributed to acceptance of childhood seasonal influenza vaccination among children living in a population-based morbidity surveillance system in rural western Kenya, where influenza vaccine was offered free-of-charge to children 6 months-10 years old from April to June, 2011. We evaluated associations between maternal and household demographic variables, socio-economic status, and distance from home to vaccination clinics with family vaccination status. 7249 children from 3735 households were eligible for vaccination. Of these, 2675 (36.9%) were fully vaccinated, 506 (7.0%) were partially vaccinated and 4068 (56.1%) were not vaccinated. Children living in households located >5km radius from the vaccination facilities were significantly less likely to be vaccinated (aOR=0.70; 95% CI 0.54-0.91; p=0.007). Children with mothers aged 25-34 and 35-44 years were more likely to be vaccinated than children with mothers less than 25 years of age (aOR=1.36; 95% CI 1.15-1.62; p<0.001; and aOR=1.35; 95% CI 1.10-1.64; p=0.003, respectively). Finally, children aged 2-5 years and >5 years of age (aOR=1.38; 95% CI 1.20-1.59; p<0.001; and aOR=1.41; 95% CI 1.23-1.63; p<0.001, respectively) and who had a sibling hospitalized within the past year (aOR=1.73; 95% CI 1.40-2.14; p<0.001) were more likely to be vaccinated. Shorter distance from the vaccination center, older maternal and

	child age, household administrator's occupation that did not require them to be away from the home, and having a sibling hospitalized during the past year were associated with increased likelihood of vaccination against influenza in western Kenya. These findings should inform the design of future childhood seasonal influenza vaccination campaigns in rural Kenya, and perhaps elsewhere in Africa. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24462406/
68.	Sande CJ, Cane PA, Nokes DJ. The association between age and the development of respiratory syncytial virus neutralising antibody responses following natural infection in infants. Vaccine. 2014 Aug 20;32(37):4726-9 **Abstract** To determine the age at which infants mount significant neutralising antibody responses to both natural RSV infection and live vaccines that mimic natural infection, RSV-specific neutralising antibodies in the acute and convalescent phase sera of infants with RSV infection were assayed. Age-specific incidence estimates for hospitalisation with severe RSV disease were determined and compared to age-specific neutralising antibody response patterns. Disease incidence peaked at between 2 and 3.9 months of life. Following natural infection, relative to the mean acute phase antibody titre, the mean convalescent titre was lower in the 0-1.9 month age class, no different in the 2-3.9 month age class and greater in all age classes greater than 4 months. These data suggest effective vaccination with live vaccines that mimic natural infection may not be achieved before the age of 4 months. Maternal vaccination may be an alternative to direct infant vaccination in order to protect very young babies. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25005882/
69.	Kiboi D, Irungu B, Orwa J, Kamau L, Ochola-Oyier LI, Ngángá J, Nzila A. Piperaquine and Lumefantrine resistance in Plasmodium berghei ANKA associated with increased expression of Ca2+/H+ antiporter and glutathione associated enzymes. Exp Parasitol. 2014 Dec;147:23-32. **Abstract** We investigated the mechanisms of resistance of two antimalarial drugs piperaquine (PQ) and lumefantrine (LM) using the rodent parasite Plasmodium berghei as a surrogate of the human parasite, Plasmodium falciparum. We analyzed the whole coding sequence of Plasmodium berghei chloroquine resistance transporter (Pbcrt) and Plasmodium berghei multidrug resistance gene 1(Pbmdr-1) for polymorphisms. These genes are associated with quinoline resistance in Plasmodium falciparum. No polymorphic changes were detected in the coding sequences of Pbcrt and Pbmdr1 or in

	the mRNA transcript levels of Pbmdr1. However, our data demonstrated that PQ and LM resistance is achieved by multiple mechanisms that include elevated mRNA transcript levels of V-type H(+) pumping pyrophosphatase (vp2), Ca(2+)/H(+) antiporter (vcx1), gamma glutamylcysteine synthetase (ggcs) and glutathione-S-transferase (gst) genes, mechanisms also known to contribute to chloroquine resistance in P. falciparum and rodent malaria parasites. The increase in ggcs and gst transcript levels was accompanied by high glutathione (GSH) levels and elevated activity of glutathione-S-transferase (GST) enzyme. Taken together, these results demonstrate that Pbcrt and Pbmdr1 are not associated with PQ and LM resistance in P. berghei ANKA, while vp2, vcx1, ggcs and gst may mediate resistance directly or modulate functional mutations in other unknown genes. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25448357/
70.	Crawford KW, Njeru D, Maswai J, Omondi M, Apollo D, Kimetto J, Gitonga L, Munyao J, Langat R, Aoko A, Tarus J, Khamadi S, Hamm TE. Occurrence of etravirine/rilpivirine-specific resistance mutations selected by efavirenz and nevirapine in Kenyan patients with non-B HIV-1 subtypes failing antiretroviral therapy. AIDS. 2014 Jan 28;28(3):442-5 **Abstract** Resistance to efavirenz and nevirapine has not been associated with mutations at position 138 of reverse transcriptase. In an evaluation of virologic suppression rates in PEPFAR (President's Emergency Plan For AIDS Relief) clinics in Kenya among patients on first-line therapy (RV288), 63% (617/975) of randomly selected patients on antiretroviral therapy were suppressed (HIV RNA<400 copies/ml). Among those with non-nucleoside reverse transcriptase inhibitor resistance (n = 101), 14 (13.8%) had substitutions at 138 (A, G, K or Q), mutations selected only by etravirine and rilpivirine in subtype B viruses. All 14 patients received efavirenz or nevirapine, not etravirine or rilpivirine, and were predominantly subtype A1. This may be the first report of efavirenz and nevirapine selecting these mutations in these subtypes. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24670527/
71.	Nagi S, Chadeka EA, Sunahara T, Mutungi F, Justin YK, Kaneko S, Ichinose Y, Matsumoto S, Njenga SM, Hashizume M, Shimada M, Hamano S. Risk factors and spatial distribution of Schistosoma mansoni infection among primary school children in Mbita District, Western Kenya. PLoS Negl Trop Dis. 2014 Jul 24;8(7):e2991

	Abstract **Background:** An increasing risk of Schistosoma mansoni infection has been observed around Lake Victoria, western Kenya since the 1970s. Understanding local transmission dynamics of schistosomiasis is crucial in curtailing increased risk of infection. **Methodology/principal findings:** We carried out a cross sectional study on a population of 310 children from eight primary schools. Overall, a total of 238 (76.8%) children were infected with S. mansoni, while seven (2.3%) had S. haematobium. The prevalence of hookworm, Trichuris trichiura and Ascaris lumbricoides were 6.1%, 5.2% and 2.3%, respectively. Plasmodium falciparum was the only malaria parasite detected (12.0%). High local population density within a 1 km radius around houses was identified as a major independent risk factor of S. mansoni infection. A spatial cluster of high infection risk was detected around the Mbita causeway following adjustment for population density and other potential risk factors. **Conclusions/significance:** Population density was shown to be a major factor fuelling schistosome infection while individual socio-economic factors appeared not to affect the infection risk. The high-risk cluster around the Mbita causeway may be explained by the construction of an artificial pathway that may cause increased numbers of S. mansoni host snails through obstruction of the waterway. This construction may have, therefore, a significant negative impact on the health of the local population, especially school-aged children who frequently come in contact with lake water. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25058653/
72.	Kamuya DM, Marsh V, Njuguna P, Munywoki P, Parker M, Molyneux S. "When they see us, it's like they have seen the benefits!": experiences of study benefits negotiations in community-based studies on the Kenyan Coast. BMC Med Ethics. 2014 Dec 24;15:90 **Abstract** **Background:** Benefit sharing in health research has been the focus of international debates for many years, particularly in developing countries. Whilst increasing attention is being given to frameworks that can guide researchers to determine levels of benefits to participants, there is little empirical research from developing countries on the practical application of these frameworks, including in situations of extreme poverty and vulnerability. In addition, the voices of those who often negotiate and face issues related to benefits in practice - frontline researchers and fieldworkers (FWs) - are rarely included in these debates. Against this background, this paper reports on experiences of

	negotiating research participation and benefits as described by fieldworkers, research participants and researchers in two community based studies. **Methods:** The findings reported here are from a broader social science study that explored the nature of interactions between fieldworkers and participants in two community based studies on the Kenyan Coast. Between January and July 2010, data were collected using participant observation, and through group discussions and in-depth interviews with 42 fieldworkers, 4 researchers, and 40 study participants. **Results:** Participants highly appreciated the benefits provided by studies, particularly health care benefits. Fieldworkers were seen by participants and other community members as the gatekeepers and conduits of benefits, even though those were not their formal roles. Fieldworkers found it challenging to ignore participant and community requests for more benefits, especially in situations of extreme poverty. However, responding to requests by providing different sorts and levels of benefits over time, as inadvertently happened in one study, raised expectations of further benefits and led to continuous negotiations between fieldworkers and participants. **Conclusions:** Fieldworkers play an important intermediary role in research; a role imbued with multiple challenges and ethical dilemmas for which they require appropriate support. Further more specific empirical research is needed to inform the development of guidance for researchers on benefit sharing, and on responding to emergency humanitarian needs for this and other similar settings. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25539983/
73.	Ndila C, Bauni E, Mochamah G, Nyirongo V, Makazi A, Kosgei P, Tsofa B, Nyutu G, Etyang A, Byass P, Williams TN. Causes of death among persons of all ages within the Kilifi Health and Demographic Surveillance System, Kenya, determined from verbal autopsies interpreted using the InterVA-4 model. Glob Health Action. 2014 Oct 29;7:25593. **Abstract** **Background:** The vast majority of deaths in the Kilifi study area are not recorded through official systems of vital registration. As a result, few data are available regarding causes of death in this population. **Objective:** To describe the causes of death (CODs) among residents of all ages within the Kilifi Health and Demographic Surveillance System (KHDSS) on the coast of Kenya. **Design:** Verbal autopsies (VAs) were conducted using the 2007 World Health

	Organization (WHO) standard VA questionnaires, and VA data further transformed to align with the 2012 WHO VA instrument. CODs were then determined using the InterVA-4 computer-based probabilistic model. **Results:** Five thousand one hundred and eighty seven deaths were recorded between January 2008 and December 2011. VA interviews were completed for 4,460 (86%) deaths. Neonatal pneumonia and birth asphyxia were the main CODs in neonates; pneumonia and malaria were the main CODs among infants and children aged 1-4, respectively, while HIV/AIDS was the main COD for adult women of reproductive age. Road traffic accidents were more commonly observed among men than women. Stroke and neoplasms were common CODs among the elderly over the age of 65. **Conclusions:** We have established the main CODs among people of all ages within the area served by the KHDSS on the coast of Kenya using the 2007 WHO VA questionnaire coded using InterVA-4. We hope that our data will allow local health planners to estimate the burden of various diseases and to allocate their limited resources more appropriately. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25377342/
74.	Mutuku MW, Dweni CK, Mwangi M, Kinuthia JM, Mwangi IN, Maina GM, Agola LE, Zhang SM, Maranga R, Loker ES, Mkoji GM. Field-derived Schistosoma mansoni and Biomphalaria pfeifferi in Kenya: a compatible association characterized by lack of strong local adaptation, and presence of some snails able to persistently produce cercariae for over a year. Parasit Vectors. 2014 Nov 26;7:533 **Abstract** **Background:** Schistosoma mansoni is widely distributed in sub-Saharan Africa with Biomphalaria pfeifferi being its most widespread and important snail intermediate host. Few studies have examined the compatibility of field-derived B. pfeifferi snails with S. mansoni miracidia derived from human hosts. We investigated compatibility (as defined by shedding of cercariae following exposure to miracidia) of two isolates of S. mansoni from school children from Asao (western Kenya) and Mwea (central Kenya) with B. pfeifferi collected directly from Asao stream or the Mwea rice fields. **Methods:** We exposed snails from both regions to four different doses of miracidia (1, 5, 10 and 25) from sympatric or allopatric S. mansoni, and maintained them in a shaded, screened out-of-doors rearing facility in Kisian, in western Kenya. Both snail survival and the number of snails that became infected were monitored weekly. This was done for 25 weeks post-exposure (PE). Those infected snails which survived beyond this period were monitored until they all died.

	Results: Although overall survival of Mwea snails maintained in western Kenya was generally low, both sympatric and allopatric combinations of parasites and snails exhibited high compatibility (approximately 50% at a dose of one miracidium per snail), with an increase in infection rates as the miracidial dose was increased ($P < 0.002$). Schistosomes were no more compatible with sympatric than allopatric snails, nor were snails less compatible with sympatric than allopatric schistosomes. Snail mortality increased significantly with dose of miracidia ($P < 0.05$). Approximately 3% of Asao snails exposed to a low dose of sympatric miracidia (1 or 5) continued to shed cercariae for as long as 58 weeks post exposure. **Conclusions:** There were no significant local adaptation effects for either schistosomes or snails. Also, the existence of "super-survivor" snails is noteworthy for its implications for current control initiatives that mostly rely on mass drug administration (MDA). Long-term shedders could provide an ongoing source of cercariae to initiate human infections for many months, suggesting care is required in considering how human MDA treatments are timed. Future control programs should incorporate means to eliminate infected snails to complement chemotherapy interventions in controlling schistosomiasis. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25425455/
75.	Ochola LA, Ayieko C, Kisia L, Magak NG, Shabani E, Ouma C, John CC. Changes in antigen-specific cytokine and chemokine responses to Plasmodium falciparum antigens in a highland area of Kenya after a prolonged absence of malaria exposure. Infect Immun. 2014 Sep;82(9):3775-82 **Abstract** Individuals naturally exposed to Plasmodium falciparum lose clinical immunity after a prolonged lack of exposure. P. falciparum antigen-specific cytokine responses have been associated with protection from clinical malaria, but the longevity of P. falciparum antigen-specific cytokine responses in the absence of exposure is not well characterized. A highland area of Kenya with low and unstable malaria transmission provided an opportunity to study this question. The levels of antigen-specific cytokines and chemokines associated in previous studies with protection from clinical malaria (gamma interferon [IFN-γ], interleukin-10 [IL-10], and tumor necrosis factor alpha [TNF-α]), with increased risk of clinical malaria (IL-6), or with pathogenesis of severe disease in malaria (IL-5 and RANTES) were assessed by cytometric bead assay in April 2008, October 2008, and April 2009 in 100 children and adults. During the 1-year study period, none had an episode of clinical P. falciparum malaria. Two patterns of cytokine responses emerged, with some variation by antigen: a decrease at 6 months (IFN-γ and IL-5) or at both 6 and 12 months (IL-10 and TNF-α) or no change over time (IL-6 and

	RANTES). These findings document that P. falciparum antigen-specific cytokine responses associated in prior studies with protection from malaria (IFN-γ, TNF-α, and IL-10) decrease significantly in the absence of P. falciparum exposure, whereas those associated with increased risk of malaria (IL-6) do not. The study findings provide a strong rationale for future studies of antigen-specific IFN-γ, TNF-α, and IL-10 responses as biomarkers of increased population-level susceptibility to malaria after prolonged lack of P. falciparum exposure. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24958707/
76.	Achieng AO, Ingasia LA, Juma DW, Cheruiyot AC, Okudo CA, Yeda RA, Cheruiyot J, Akala HM, Johnson J, Andangalu B, Eyase F, Jura WG, Kamau E. Reduced in vitro doxycycline susceptibility in plasmodium falciparum field isolates from Kenya is associated with PfTetQ KYNNNN sequence polymorphism. Antimicrob Agents Chemother. 2014 Oct;58(10):5894-9. **Abstract** Doxycycline is widely used for malaria prophylaxis by international travelers. However, there is limited information on doxycycline efficacy in Kenya, and genetic polymorphisms associated with reduced efficacy are not well defined. In vitro doxycycline susceptibility profiles for 96 Plasmodium falciparum field isolates from Kenya were determined. Genetic polymorphisms were assessed in P. falciparum metabolite drug transporter (Pfmdt) and P. falciparum GTPase tetQ (PftetQ) genes. Copy number variation of the gene and the number of KYNNNN amino acid motif repeats within the protein encoded by PftetQ were determined. Reduced in vitro susceptibility to doxycycline was defined by 50% inhibitory concentrations (IC50s) of ≥35,000 nM. The odds ratio (OR) of having 2 PfTetQ KYNNNN amino acid repeats in isolates with IC50s of >35,000 nM relative to those with IC50s of <35,000 nM is 15 (95% confidence interval [CI], 3.0 to 74.3; P value of <0.0002). Isolates with 1 copy of the Pfmdt gene had a median IC50 of 6,971 nM, whereas those with a Pfmdt copy number of >1 had a median IC50 of 9,912 nM (P = 0.0245). Isolates with 1 copy of PftetQ had a median IC50 of 6,370 nM, whereas isolates with a PftetQ copy number of >1 had a median IC50 of 3,422 nM (P < 0.0007). Isolates with 2 PfTetQ KYNNNN motif repeats had a median IC50 of 26,165 nM, whereas isolates with 3 PfTetQ KYNNNN repeats had a median IC50 of 3,352 nM (P = 0.0023). PfTetQ sequence polymorphism is associated with a reduced doxycycline susceptibility phenotype in Kenyan isolates and is a potential marker for susceptibility testing. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25070109/
77.	Wafula F, Abuya T, Amin A, Goodman C. The policy-practice gap: describing discordances between regulation on paper and real-life practices among

	specialized drug shops in Kenya. BMC Health Serv Res. 2014 Sep 16;14:394. **Abstract** **Background:** Specialized drug shops (SDSs) are popular in Sub-Saharan Africa because they provide convenient access to medicines. There is increasing interest in how policymakers can work with them, but little knowledge on how their operation relates to regulatory frameworks. This study sought to describe characteristics and predictors of regulatory practices among SDSs in Kenya. **Methods:** The regulatory framework governing the Kenya pharmaceutical sector was mapped, and a list of regulations selected for inclusion in a survey questionnaire. An SDS census was conducted, and survey data collected from 213 SDSs from two districts in Western Kenya. **Results:** The majority of SDSs did not comply with regulations, with only 12% having a refrigerator and 22% having a separate dispensing area for instance. Additionally, less than half had at least one staff with pharmacy qualification (46%), with less than a third of all interviewed operators knowing the name of the law governing pharmacy.Regulatory infringement was more common among SDSs in rural locations; those that did not have staff with pharmacy qualifications; and those whose operator did not know the name of the pharmacy law. Compliance was not significantly associated with the frequency of inspections, with over 80% of both rural and urban SDSs reporting an inspection in the past year. **Conclusion:** While compliance was low overall, it was particularly poor among SDSs operating in rural locations, and those that did not have staff with pharmacy qualification. This suggested the need for policy to introduce levels of practice in recognition of the variations in resource availability. Under such a system, rural SDSs operating in low-resource setting, and selling a limited range of medicines, may be exempted from certain regulatory requirements, as long as their scope of practice is limited to certain essential services only. Future research should also explore why regulatory compliance is poor despite regular inspections. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25227916/
78.	Wong JM, Nyachieo DO, Benzekri NA, Cosmas L, Ondari D, Yekta S, Montgomery JM, Williamson JM, Breiman RF. Sustained high incidence of injuries from burns in a densely populated urban slum in Kenya: an emerging public health priority. Burns. 2014 Sep;40(6):1194-200 **Abstract**

	Introduction: Ninety-five percent of burn deaths occur in low- and middle-income countries (LMICs); however, longitudinal household-level studies have not been done in urban slum settings, where overcrowding and unsafe cook stoves may increase likelihood of injury. **Methods:** Using a prospective, population-based disease surveillance system in the urban slum of Kibera in Kenya, we examined the incidence of household-level burns of all severities from 2006-2011. **Results:** Of approximately 28,500 enrolled individuals (6000 households), we identified 3072 burns. The overall incidence was 27.9/1000 person-years-of-observation. Children <5 years old sustained burns at 3.8-fold greater rate compared to ($p<0.001$) those ≥5 years old. Females ≥5 years old sustained burns at a rate that was 1.35-fold ($p<0.001$) greater than males within the same age distribution. Hospitalizations were uncommon (0.65% of all burns). **Conclusions:** The incidence of burns, 10-fold greater than in most published reports from Africa and Asia, suggests that such injuries may contribute more significantly than previously thought to morbidity in LMICs, and may be increased by urbanization. As migration from rural areas into urban slums rapidly increases in many African countries, characterizing and addressing the rising burden of burns is likely to become a public health priority. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24461306/
79.	Fernandes M, Stein A, Newton CR, Cheikh-Ismail L, Kihara M, Wulff K, de León Quintana E, Aranzeta L, Soria-Frisch A, Acedo J, Ibanez D, Abubakar A, Giuliani F, Lewis T, Kennedy S, Villar J; International Fetal and Newborn Growth Consortium for the 21st Century (INTERGROWTH-21st). The INTERGROWTH-21st Project Neurodevelopment Package: a novel method for the multi-dimensional assessment of neurodevelopment in pre-school age children. PLoS One. 2014 Nov 25;9(11):e113360 **Abstract** **Background:** The International Fetal and Newborn Growth Consortium for the 21st Century (INTERGROWTH-21st) Project is a population-based, longitudinal study describing early growth and development in an optimally healthy cohort of 4607 mothers and newborns. At 24 months, children are assessed for neurodevelopmental outcomes with the INTERGROWTH-21st Neurodevelopment Package. This paper describes neurodevelopment tools for preschoolers and the systematic approach leading

	to the development of the Package. **Methods:** An advisory panel shortlisted project-specific criteria (such as multi-dimensional assessments and suitability for international populations) to be fulfilled by a neurodevelopment instrument. A literature review of well-established tools for preschoolers revealed 47 candidates, none of which fulfilled all the project's criteria. A multi-dimensional assessment was, therefore, compiled using a package-based approach by: (i) categorizing desired outcomes into domains, (ii) devising domain-specific criteria for tool selection, and (iii) selecting the most appropriate measure for each domain. **Results:** The Package measures vision (Cardiff tests); cortical auditory processing (auditory evoked potentials to a novelty oddball paradigm); and cognition, language skills, behavior, motor skills and attention (the INTERGROWTH-21st Neurodevelopment Assessment) in 35-45 minutes. Sleep-wake patterns (actigraphy) are also assessed. Tablet-based applications with integrated quality checks and automated, wireless electroencephalography make the Package easy to administer in the field by non-specialist staff. The Package is in use in Brazil, India, Italy, Kenya and the United Kingdom. **Conclusions:** The INTERGROWTH-21st Neurodevelopment Package is a multi-dimensional instrument measuring early child development (ECD). Its developmental approach may be useful to those involved in large-scale ECD research and surveillance efforts. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25423589/
80.	Echoka E, Makokha A, Dubourg D, Kombe Y, Nyandieka L, Byskov J. Barriers to emergency obstetric care services: accounts of survivors of life threatening obstetric complications in Malindi District, Kenya. Pan Afr Med J. 2014 Jan 18;17 Suppl 1(Suppl 1):4 **Abstract** **Introduction:** Pregnancy-related mortality and morbidity in most low and middle income countries can be reduced through early recognition of complications, prompt access to care and appropriate medical interventions following obstetric emergencies. We used the three delays framework to explore barriers to emergency obstetric care (EmOC) services by women who experienced life threatening obstetric complications in Malindi District, Kenya. **Methods:** A facility-based qualitative study was conducted between November and December 2010. In-depth interviews were conducted with 30 women who experienced

	obstetric "near miss" at the only public hospital with capacity to provide comprehensive EmOC services in the district. **Results:** Findings indicate that pregnant women experienced delays in making decision to seek care and in reaching an appropriate care facility. The "first" delay was due to lack of birth preparedness, including failure to identify a health facility for delivery services regardless of antenatal care and to seek care promptly despite recognition of danger signs. The "second" delay was influenced by long distance and inconvenient transport to hospital. These two delays resulted in some women arriving at the hospital too late to save the life of the unborn baby. **Conclusion:** Delays in making the decision to seek care when obstetric complications occur, combined with delays in reaching the hospital, contribute to ineffective treatment upon arrival at the hospital. Interventions to reduce maternal mortality and morbidity must adequately consider the pre-hospital challenges faced by pregnant women in order to influence decision making towards addressing the three delays. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24643142/
81.	Assefa LM, Crellen T, Kepha S, Kihara JH, Njenga SM, Pullan RL, Brooker SJ. Diagnostic accuracy and cost-effectiveness of alternative methods for detection of soil-transmitted helminths in a post-treatment setting in western Kenya. PLoS Negl Trop Dis. 2014 May 8;8(5):e2843 **Abstract** **Objectives:** This study evaluates the diagnostic accuracy and cost-effectiveness of the Kato-Katz and Mini-FLOTAC methods for detection of soil-transmitted helminths (STH) in a post-treatment setting in western Kenya. A cost analysis also explores the cost implications of collecting samples during school surveys when compared to household surveys. **Methods:** Stool samples were collected from children (n = 652) attending 18 schools in Bungoma County and diagnosed by the Kato-Katz and Mini-FLOTAC coprological methods. Sensitivity and additional diagnostic performance measures were analyzed using Bayesian latent class modeling. Financial and economic costs were calculated for all survey and diagnostic activities, and cost per child tested, cost per case detected and cost per STH infection correctly classified were estimated. A sensitivity analysis was conducted to assess the impact of various survey parameters on cost estimates. **Results:** Both diagnostic methods exhibited comparable sensitivity for detection of any STH species over single and consecutive day sampling: 52.0% for single day Kato-Katz; 49.1% for single-day Mini-FLOTAC; 76.9% for consecutive day Kato-Katz; and

	74.1% for consecutive day Mini-FLOTAC. Diagnostic performance did not differ significantly between methods for the different STH species. Use of Kato-Katz with school-based sampling was the lowest cost scenario for cost per child tested ($10.14) and cost per case correctly classified ($12.84). Cost per case detected was lowest for Kato-Katz used in community-based sampling ($128.24). Sensitivity analysis revealed the cost of case detection for any STH decreased non-linearly as prevalence rates increased and was influenced by the number of samples collected. **Conclusions:** The Kato-Katz method was comparable in diagnostic sensitivity to the Mini-FLOTAC method, but afforded greater cost-effectiveness. Future work is required to evaluate the cost-effectiveness of STH surveillance in different settings. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24810593/
82.	Meyer M, Elmer-DeWitt M, Blat C, Shade SB, Kapule I, Bukusi E, Cohen CR, Abuogi L. Evaluation and Utility of a Family Information Table to Identify and Test Children at Risk for HIV in Kenya. Int J MCH AIDS. 2014;2(2):236-43. PMID: 27621978; PMCID: PMC4948150. **Abstract** **Background:** Effective strategies to identify and screen children at risk for HIV are needed. The objectives of this study were to evaluate the utilization of a family information table (FIT) to identify and test at-risk children in Kenya and identify factors associated with child testing. **Methods:** A cross-sectional study was conducted among HIV-infected adults with children at five Kenyan clinics. HIV testing status for children aged ≤18 years was gathered from the patients' FITs and compared to reports from in-person clinic visits as the gold standard. Generalized estimating equations were used to assess predictors for HIV testing of children adjusted for confounders and within parent correlation. **Results:** Our sample included 384 HIV-infected adults enrolled in care with 933 reported children. Overall, 323 FITs (84%) correctly listed all children in the family and 340 (89%) documented an HIV testing status (including untested) for all children. Seventy-five percent of parents verbally reported all children tested, compared to only 46% of FITs (OR=13.5, 95% CI 6.5-27.8). Verbal reports identified 739 (79%) children tested, with 55 (7.4%) HIV-positive and 17 (2.3%) HIV-exposed infants (HEI). Of 63 adults with HIV-positive children or HEI, 60 (95%) reported enrolling children into care. Likelihood that children had been tested was higher for younger children (≤4y vs. > 4y, aOR=2.0; 95% CI 1.4-2.9) and lower if the partner's serostatus was unknown vs. seropositive (aOR=0.3; 95% CI: 0.1-0.8).

	Conclusions: Although the FIT may be a useful tool to identify children at risk for HIV, this study found underutilization by providers. To maximize impact of this tool, documentation of follow-up for untested and positive children is essential. **Global health implications:** Through early documentation of at-risk children and follow up of untested and infected children, the FIT may serve as an effective resource for improving HIV testing and linkage to care. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/27621978/
83.	Andagalu B, Mativo J, Kamau E, Ogutu B. Longitudinal study on Plasmodium falciparum gametocyte carriage following artemether-lumefantrine administration in a cohort of children aged 12-47 months living in Western Kenya, a high transmission area. Malar J. 2014 Jul 9;13:265 **Abstract** **Background:** The effects that artemether-lumefantrine (AL) has on gametocyte dynamics in the short-term have recently been described. However there is limited long-term longitudinal data on the effect of AL on gametocyte dynamics in asymptomatic children. **Methods:** An epidemiological study was conducted in Kombewa, Western Kenya, in which 270 asymptomatic children aged between 12 and 47 months were enrolled. The subjects were randomized to receive either a course of AL or placebo at enrolment. Active follow-up was conducted for one year. **Results:** The gametocyte prevalence and density dynamics throughout the study period mirrored that of the asexual forms. The proportion of initially parasitaemic subjects becoming gametocytaemic was significantly lower in the AL arm for the first 12 weeks following randomization. The geometric mean gametocyte density was lower in the AL arm for 2 weeks following randomization. None of the variables of interest had a statistically significant effect on the duration of gametocytaemia. There is no effect seen in subjects who are not parasitaemic at the time of drug administration. **Conclusions:** The treatment of asymptomatic parasitaemic subjects with AL results in a significant reduction in the proportion of subjects who become gametocytaemic for at least 12 weeks. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25007860/

84.	Lutomiah J, Omondi D, Masiga D, Mutai C, Mireji PO, Ongus J, Linthicum KJ, Sang R. Blood meal analysis and virus detection in blood-fed mosquitoes collected during the 2006-2007 Rift Valley fever outbreak in Kenya. Vector Borne Zoonotic Dis. 2014 Sep;14(9):656-64 **Abstract** **Background:** Rift Valley fever (RVF) is a zoonosis of domestic ruminants in Africa. Blood-fed mosquitoes collected during the 2006-2007 RVF outbreak in Kenya were analyzed to determine the virus infection status and animal source of the blood meals. **Materials and methods:** Blood meals from individual mosquito abdomens were screened for viruses using Vero cells and RT-PCR. DNA was also extracted and the cytochrome c oxidase 1 (CO1) and cytochrome b (cytb) genes amplified by PCR. Purified amplicons were sequenced and queried in GenBank and Barcode of Life Database (BOLD) to identify the putative blood meal sources. **Results:** The predominant species in Garissa were Aedes ochraceus, (n=561, 76%) and Ae. mcintoshi, (n=176, 24%), and Mansonia uniformis, (n=24, 72.7%) in Baringo. Ae. ochraceus fed on goats (37.6%), cattle (16.4%), donkeys (10.7%), sheep (5.9%), and humans (5.3%). Ae. mcintoshi fed on the same animals in almost equal proportions. RVFV was isolated from Ae. ochraceus that had fed on sheep (4), goats (3), human (1), cattle (1), and unidentified host (1), with infection and dissemination rates of 1.8% (10/561) and 50% (5/10), respectively, and 0.56% (1/176) and 100% (1/1) in Ae. mcintoshi. In Baringo, Ma. uniformis fed on sheep (38%), frogs (13%), duikers (8%), cattle (4%), goats (4%), and unidentified hosts (29%), with infection and dissemination rates of 25% (6/24) and 83.3% (5/6), respectively. Ndumu virus (NDUV) was also isolated from Ae. ochraceus with infection and dissemination rates of 2.3% (13/561) and 76.9% (10/13), and Ae. mcintoshi, 2.8% (5/176) and 80% (4/5), respectively. Ten of the infected Ae. ochraceus had fed on goats, sheep (1), and unidentified hosts (2), and Ae. mcintoshi on goats (3), camel (1), and donkey (1). **Conclusion:** This study has demonstrated that RVFV and NDUV were concurrently circulating during the outbreak, and sheep and goats were the main amplifiers of these viruses respectively. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25229704/
85.	Biswas S, Choudhary P, Elias SC, Miura K, Milne KH, de Cassan SC, Collins KA, Halstead FD, Bliss CM, Ewer KJ, Osier FH, Hodgson SH, Duncan CJ, O'Hara GA, Long CA, Hill AV, Draper SJ. Assessment of humoral immune responses to blood-stage malaria antigens following ChAd63-MVA immunization, controlled human malaria infection and natural exposure. PLoS One. 2014 Sep 25;9(9):e107903

	Abstract The development of protective vaccines against many difficult infectious pathogens will necessitate the induction of effective antibody responses. Here we assess humoral immune responses against two antigens from the blood-stage merozoite of the Plasmodium falciparum human malaria parasite--MSP1 and AMA1. These antigens were delivered to healthy malaria-naïve adult volunteers in Phase Ia clinical trials using recombinant replication-deficient viral vectors--ChAd63 to prime the immune response and MVA to boost. In subsequent Phase IIa clinical trials, immunized volunteers underwent controlled human malaria infection (CHMI) with P. falciparum to assess vaccine efficacy, whereby all but one volunteer developed low-density blood-stage parasitemia. Here we assess serum antibody responses against both the MSP1 and AMA1 antigens following i) ChAd63-MVA immunization, ii) immunization and CHMI, and iii) primary malaria exposure in the context of CHMI in unimmunized control volunteers. Responses were also assessed in a cohort of naturally-immune Kenyan adults to provide comparison with those induced by a lifetime of natural malaria exposure. Serum antibody responses against MSP1 and AMA1 were characterized in terms of i) total IgG responses before and after CHMI, ii) responses to allelic variants of MSP1 and AMA1, iii) functional growth inhibitory activity (GIA), iv) IgG avidity, and v) isotype responses (IgG1-4, IgA and IgM). These data provide the first in-depth assessment of the quality of adenovirus-MVA vaccine-induced antibody responses in humans, along with assessment of how these responses are modulated by subsequent low-density parasite exposure. Notable differences were observed in qualitative aspects of the human antibody responses against these malaria antigens depending on the means of their induction and/or exposure of the host to the malaria parasite. Given the continued clinical development of viral vectored vaccines for malaria and a range of other diseases targets, these data should help to guide further immuno-monitoring studies of vaccine-induced human antibody responses. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25254500/
86.	Maes P, Harries AD, Van den Bergh R, Noor A, Snow RW, Tayler-Smith K, Hinderaker SG, Zachariah R, Allan R. Can timely vector control interventions triggered by atypical environmental conditions prevent malaria epidemics? A case-study from Wajir County, Kenya. PLoS One. 2014 Apr 3;9(4):e92386 **Abstract** **Background:** Atypical environmental conditions with drought followed by heavy rainfall and flooding in arid areas in sub-Saharan Africa can lead to explosive epidemics of malaria, which might be prevented through timely vector-control interventions.

	Objectives: Wajir County in Northeast Kenya is classified as having seasonal malaria transmission. The aim of this study was to describe in Wajir town the environmental conditions, the scope and timing of vector-control interventions and the associated resulting burden of malaria at two time periods (1996-1998 and 2005-2007). **Methods:** This is a cross-sectional descriptive and ecological study using data collected for routine program monitoring and evaluation. **Results:** In both time periods, there were atypical environmental conditions with drought and malnutrition followed by massive monthly rainfall resulting in flooding and animal/human Rift Valley Fever. In 1998, this was associated with a large and explosive malaria epidemic (weekly incidence rates peaking at 54/1,000 population/week) with vector-control interventions starting over six months after the massive rainfall and when the malaria epidemic was abating. In 2007, vector-control interventions started sooner within about three months after the massive rainfall and no malaria epidemic was recorded with weekly malaria incidence rates never exceeding 0.5 per 1,000 population per week. **Discussion and conclusion:** Did timely vector-control interventions in Wajir town prevent a malaria epidemic? In 2007, the neighboring county of Garissa experienced similar climatic events as Wajir, but vector-control interventions started six months after the heavy un-seasonal rainfall and large scale flooding resulted in a malaria epidemic with monthly incidence rates peaking at 40/1,000 population. In conclusion, this study suggests that atypical environmental conditions can herald a malaria outbreak in certain settings. In turn, this should alert responsible stakeholders about the need to act rapidly and preemptively with appropriate and wide-scale vector-control interventions to mitigate the risk. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24699034/
87.	Maes P, Harries AD, Van den Bergh R, Noor A, Snow RW, Tayler-Smith K, Hinderaker SG, Zachariah R, Allan R. Can timely vector control interventions triggered by atypical environmental conditions prevent malaria epidemics? A case-study from Wajir County, Kenya. PLoS One. 2014 Apr 3;9(4):e92386 **Abstract** **Background:** Atypical environmental conditions with drought followed by heavy rainfall and flooding in arid areas in sub-Saharan Africa can lead to explosive epidemics of malaria, which might be prevented through timely vector-control interventions. **Objectives:** Wajir County in Northeast Kenya is classified as having seasonal malaria transmission. The aim of this study was to describe in Wajir town the environmental

	conditions, the scope and timing of vector-control interventions and the associated resulting burden of malaria at two time periods (1996-1998 and 2005-2007). **Methods:** This is a cross-sectional descriptive and ecological study using data collected for routine program monitoring and evaluation. **Results:** In both time periods, there were atypical environmental conditions with drought and malnutrition followed by massive monthly rainfall resulting in flooding and animal/human Rift Valley Fever. In 1998, this was associated with a large and explosive malaria epidemic (weekly incidence rates peaking at 54/1,000 population/week) with vector-control interventions starting over six months after the massive rainfall and when the malaria epidemic was abating. In 2007, vector-control interventions started sooner within about three months after the massive rainfall and no malaria epidemic was recorded with weekly malaria incidence rates never exceeding 0.5 per 1,000 population per week. **Discussion and conclusion:** Did timely vector-control interventions in Wajir town prevent a malaria epidemic? In 2007, the neighboring county of Garissa experienced similar climatic events as Wajir, but vector-control interventions started six months after the heavy un-seasonal rainfall and large scale flooding resulted in a malaria epidemic with monthly incidence rates peaking at 40/1,000 population. In conclusion, this study suggests that atypical environmental conditions can herald a malaria outbreak in certain settings. In turn, this should alert responsible stakeholders about the need to act rapidly and preemptively with appropriate and wide-scale vector-control interventions to mitigate the risk. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24699034/
88.	Onono M, Blat C, Miles S, Steinfeld R, Wekesa P, Bukusi EA, Owuor K, Grossman D, Cohen CR, Newmann SJ. Impact of family planning health talks by lay health workers on contraceptive knowledge and attitudes among HIV-infected patients in rural Kenya. Patient Educ Couns. 2014 Mar;94(3):438-41 **Abstract** **Objective:** To determine if a health talk on family planning (FP) by community clinic health assistants (CCHAs) will improve knowledge, attitudes and behavioral intentions about contraception in HIV-infected individuals. **Methods:** A 15-min FP health talk was given by CCHAs in six rural HIV clinics to a sample of 49 HIV-infected men and women. Effects of the health talk were assessed through a questionnaire administered before the health talk and after completion of the

	participant's clinic visit. **Results:** Following the health talk, there was a significant increase in knowledge about contraceptives (p<.0001), side-effects (p<.0001), and method-specific knowledge about IUCDs (p<.001), implants (p<.0001), and injectables (p<.05). Out of 31 women and 18 men enrolled, 14 (45%) women and 6 (33%) men intended to try a new contraceptive. Participant attitudes toward FP were high before and after the health talk (median 4 of 4). **Conclusion:** A health talk delivered by CCHAs can increase knowledge of contraception and promote the intention to try new more effective contraception among HIV-infected individuals. **Practice implications:** FP health talks administered by lay-health providers to HIV-infected individuals as they wait for HIV services can influence FP knowledge and intention to use FP. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24316053/
89.	Ndila C, Bauni E, Nyirongo V, Mochamah G, Makazi A, Kosgei P, Nyutu G, Macharia A, Kapesa S, Byass P, Williams TN. Verbal autopsy as a tool for identifying children dying of sickle cell disease: a validation study conducted in Kilifi district, Kenya. BMC Med. 2014 Apr 22;12:65. **Abstract** **Background:** Sickle cell disease (SCD) is common in many parts of sub-Saharan Africa (SSA), where it is associated with high early mortality. In the absence of newborn screening, most deaths among children with SCD go unrecognized and unrecorded. As a result, SCD does not receive the attention it deserves as a leading cause of death among children in SSA. In the current study, we explored the potential utility of verbal autopsy (VA) as a tool for attributing underlying cause of death (COD) in children to SCD. **Methods:** We used the 2007 WHO Sample Vital Registration with Verbal Autopsy (SAVVY) VA tool to determine COD among child residents of the Kilifi Health and Demographic Surveillance System (KHDSS), Kenya, who died between January 2008 and April 2011. VAs were coded both by physician review (physician coded verbal autopsy, PCVA) using COD categories based on the WHO International Classification of Diseases 10th Edition (ICD-10) and by using the InterVA-4 probabilistic model after extracting data according to the 2012 WHO VA standard. Both of these methods were validated against one of two gold standards: hospital ICD-10 physician-assigned COD for children who died in Kilifi District Hospital (KDH) and, where available, laboratory

	confirmed SCD status for those who died in the community. **Results:** Overall, 6% and 5% of deaths were attributed to SCD on the basis of PCVA and the InterVA-4 model, respectively. Of the total deaths, 22% occurred in hospital, where the agreement coefficient (AC1) for SCD between PCVA and hospital physician diagnosis was 95.5%, and agreement between InterVA-4 and hospital physician diagnosis was 96.9%. Confirmatory laboratory evidence of SCD status was available for 15% of deaths, in which the AC1 against PCVA was 87.5%. **Conclusions:** Other recent studies and provisional data from this study, outlining the importance of SCD as a cause of death in children in many parts of the developing world, contributed to the inclusion of specific SCD questions in the 2012 version of the WHO VA instruments, and a specific code for SCD has now been included in the WHO and InterVA-4 COD listings. With these modifications, VA may provide a useful approach to quantifying the contribution of SCD to childhood mortality in rural African communities. Further studies will be needed to evaluate the generalizability of our findings beyond our local context. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24755265/
90.	Bigogo G, Amolloh M, Laserson KF, Audi A, Aura B, Dalal W, Ackers M, Burton D, Breiman RF, Feikin DR. The impact of home-based HIV counseling and testing on care-seeking and incidence of common infectious disease syndromes in rural western Kenya. BMC Infect Dis. 2014 Jul 8;14:376. **Abstract** **Background:** In much of Africa, most individuals living with HIV do not know their status. Home-based counseling and testing (HBCT) leads to more HIV-infected people learning their HIV status. However, there is little data on whether knowing one's HIV-positive status necessarily leads to uptake of HIV care, which could in turn, lead to a reduction in the prevalence of common infectious disease syndromes. **Methods:** In 2008, Kenya Medical Research Institute (KEMRI) in collaboration with the Centers for Disease Control and Prevention (CDC) offered HBCT to individuals (aged ≥13 years) under active surveillance for infectious disease syndromes in Lwak in rural western Kenya. HIV test results were linked to morbidity and healthcare-seeking data collected by field workers through bi-weekly home visits. We analyzed changes in healthcare seeking behaviors using proportions, and incidence (expressed as episodes per person-year) of acute respiratory illness (ARI), severe acute respiratory illness (SARI), acute febrile illness (AFI) and diarrhea among first-time HIV testers in the year before and after HBCT, stratified by their test result and if HIV-positive, whether they

	sought care at HIV Patient Support Centers (PSCs). **Results:** Of 9,613 individuals offered HBCT, 6,366 (66%) were first-time testers, 698 (11%) of whom were HIV-infected. One year after HBCT, 50% of HIV-infected persons had enrolled at PSCs - 92% of whom had started cotrimoxazole and 37% of those eligible for antiretroviral treatment had initiated therapy. Among HIV-infected persons enrolled in PSCs, AFI and diarrhea incidence decreased in the year after HBCT (rate ratio [RR] 0.84; 95% confidence interval [CI] 0.77 - 0.91 and RR 0.84, 95% CI 0.73 - 0.98, respectively). Among HIV-infected persons not attending PSCs and among HIV-uninfected persons, decreases in incidence were significantly lower. While decreases also occurred in rates of respiratory illnesses among HIV-positive persons in care, there were similar decreases in the other two groups. **Conclusions:** Large scale HBCT enabled a large number of newly diagnosed HIV-infected persons to know their HIV status, leading to a change in care seeking behavior and ultimately a decrease in incidence of common infectious disease syndromes through appropriate treatment and care. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25005353/
91.	Okungu V, Gilson L. "…still waiting for chloroquine": the challenge of communicating changes in first-line treatment policy for uncomplicated malaria in a remote Kenyan district. Malar J. 2014 Jul 8;13:258 **Abstract** **Background:** Widespread parasite resistance to first-line treatment for uncomplicated malaria leads to introduction of new drug interventions. Introducing such interventions is complex and sensitive because of stakeholder interests and public resistance. To enhance take up of such interventions, health policy communication strategies need to deliver accurate and accessible information to empower communities with necessary information and address problems of cultural acceptance of new interventions. **Objectives:** To explore community understanding of policy changes in first-line treatment for uncomplicated malaria in Kenya; to evaluate the potential role of policy communication in influencing responses to changes in first-line treatment policy. **Methods:** Data collection involved qualitative strategies in a remote district in the Kenyan Coast: in-depth interviews (n = 29), focus group discussions (n = 14), informal conversations (n = 11) and patient narratives (n = 8). Constant comparative method was used in the analysis. Being malaria-prone and remotely located, the district offered an ideal area to investigate whether or not and how policy communication about a matter

	as critical as change of treatment policy reaches vulnerable populations. **Results:** Three years after initial implementation (2009), there was limited knowledge or understanding regarding change of first-line treatment from sulphadoxine-pyrimethamine (SP) to artemether-lumefantrine (AL) for treatment of uncomplicated malaria in the study district. The print and electronic media used to create awareness about the drug change appeared to have had little impact. Although respondents were aware of the existence of AL, the drug was known neither by name nor as the official first-line treatment. Depending on individuals or groups, AL was largely viewed negatively. The weaknesses in communication strategy surrounding the change to AL included poor choice of communication tools, confusing advertisements of other drugs and conflicts between patients and providers. **Conclusion:** Effective health policy communication is important for the uptake of new drug interventions and adherence to treatment regimens. Besides, prompt access to effective treatment may not be achieved if beneficiaries are not adequately informed about treatment policy changes. Future changes in treatment policy should ensure that the communication strategy is designed to pass sustained, accurate and effective messages that account for local contexts. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25005337/
92.	Tchouassi DP, Bastos AD, Sole CL, Diallo M, Lutomiah J, Mutisya J, Mulwa F, Borgemeister C, Sang R, Torto B. Population genetics of two key mosquito vectors of Rift Valley Fever virus reveals new insights into the changing disease outbreak patterns in Kenya. PLoS Negl Trop Dis. 2014 Dec 4;8(12):e3364 **Abstract** Rift Valley fever (RVF) outbreaks in Kenya have increased in frequency and range to include northeastern Kenya where viruses are increasingly being isolated from known (Aedes mcintoshi) and newly-associated (Ae. ochraceus) vectors. The factors contributing to these changing outbreak patterns are unclear and the population genetic structure of key vectors and/or specific virus-vector associations, in particular, are under-studied. By conducting mitochondrial and nuclear DNA analyses on >220 Kenyan specimens of Ae. mcintoshi and Ae. ochraceus, we uncovered high levels of vector complexity which may partly explain the disease outbreak pattern. Results indicate that Ae. mcintoshi consists of a species complex with one of the member species being unique to the newly-established RVF outbreak-prone northeastern region of Kenya, whereas Ae. ochraceus is a homogeneous population that appears to be undergoing expansion. Characterization of specimens from a RVF-prone site in Senegal, where Ae. ochraceus is a primary vector, revealed direct genetic links between

	the two Ae. ochraceus populations from both countries. Our data strongly suggest that unlike Ae. mcintoshi, Ae. ochraceus appears to be a relatively recent, single 'introduction' into Kenya. These results, together with increasing isolations from this vector, indicate that Ae. ochraceus will likely be of greater epidemiological importance in future RVF outbreaks in Kenya. Furthermore, the overall vector complexity calls into question the feasibility of mosquito population control approaches reliant on genetic modification. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25474018/
93.	Njenga SM, Mutungi FM, Wamae CN, Mwanje MT, Njiru KK, Bockarie MJ. Once a year school-based deworming with praziquantel and albendazole combination may not be adequate for control of urogenital schistosomiasis and hookworm infection in Matuga District, Kwale County, Kenya. Parasit Vectors. 2014 Feb 19;7:74 **Abstract** **Background:** Neglected tropical diseases (NTDs) predominantly occur in resource poor settings where they often present a serious public health burden. Sustained global advocacy has been important in raising awareness of NTDs and the relatively low cost for control of helminthic NTDs using preventive chemotherapy. This enthusiasm was boosted at the London declaration on NTDs in 2012 through commitments by different partners to avail resources required for control of NTDs particularly those that employ preventive chemotherapy as the major intervention strategy. Subsequently, national NTD programmes are responding to these new opportunities by implementing preventive chemotherapy including school-based deworming (SBD). Further, with the availability of increased resources, both financial and pharma, the optimal strategies for implementing preventive chemotherapy in highly endemic settings are under debate and this paper goes some way to addressing this issue in a specific setting in coastal Kenya. **Methods:** We conducted a repeated cross-sectional study in Matuga District, Kwale County, Kenya to evaluate the effect of school-based co-administration of praziquantel and albendazole against urogenital schistosomiasis and soil-transmitted helminth (STH) infections. A total of 1022 school children in 5 study schools were tested for the infections in urine and stool samples during a baseline survey in September 2009. The presence of Schistosoma haematobium infection was determined by the urine filtration method while STH infections were determined by Kato-Katz technique. **Results:** Urogenital schistosomiasis and hookworm infection were the major parasitic infections among the children in the study area. There was significant decrease in both prevalence and intensity of S. haematobium infection after treatment but varying levels of rebound were observed during the period between the treatments. The school-based treatment, however, did not have any significant effect on both the prevalence and

	intensity of hookworm infection. **Conclusions:** Once per year SBD programmes may not be adequate for controlling hookworm infection and urogenital schistosomiasis in rural areas of Kwale County. There is a need to consider expanded preventive chemotherapy strategies that will allow inclusion of the adult populations. Community-based health education campaigns focusing on increasing household latrine ownership and use, as a complementary measure to control STH and urogenital schistosomiasis in similar settings, may also be useful. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24552246/
94.	Sanders EJ, Wahome E, Okuku HS, Thiong'o AN, Smith AD, Duncan S, Mwambi J, Shafi J, McClelland RS, Graham SM. Evaluation of WHO screening algorithm for the presumptive treatment of asymptomatic rectal gonorrhoea and chlamydia infections in at-risk MSM in Kenya. Sex Transm Infect. 2014 Mar;90(2):94-9 **Abstract** **Objectives:** The WHO recommends that men who have sex with men (MSM) reporting unprotected receptive anal intercourse (RAI) and either multiple partners or a partner with a sexually transmitted infection (STI) in the past 6 months should be presumptively treated for asymptomatic rectal Neisseria gonorrhoeae (NG) and Chlamydia trachomatis (CT) infections. We evaluated this recommendation in a cohort of 'high-risk' MSM in Coastal Kenya. **Methods:** We assessed presence of genitourinary and rectal symptoms, and determined prevalence and 3-month incidence of rectal NG and CT infections. We performed nucleic acid amplification testing of urine and rectal swab samples collected from MSM followed prospectively, and assessed predictive values of the WHO algorithm at baseline screening. **Results:** Of 244 MSM screened, 240 (98.4%) were asymptomatic, and 147 (61.3%) reported any RAI in the past 6 months. Among 85 (35.4%) asymptomatic MSM meeting criteria for the WHO presumptive treatment (PT) recommendation, we identified 20 with rectal infections (six NG, 12 CT and two NG-CT co-infections). Among 62 asymptomatic MSM who did not meet criteria, we identified seven who were infected. The sensitivity and specificity of the WHO algorithm were 74.1% (95% CI 53.7% to 88.9%) and 45.8% (95% CI 36.7% to 55.2%), respectively. The 3-month incidence of any rectal NG or CT infection in asymptomatic men reporting any RAI was 39.7 (95% CI 24.3 to 64.8) per 100 person-years.

	Conclusions: About one-third of asymptomatic MSM were eligible to receive PT for NG and CT infections. Among MSM who would qualify for PT of rectal STIs, the number needed to treat in order to treat one infection was four. Our results support the value of the WHO screening algorithm and recommended PT strategy in this population. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24327758/
95.	Otieno G, Githinji S, Jones C, Snow RW, Talisuna A, Zurovac D. The feasibility, patterns of use and acceptability of using mobile phone text-messaging to improve treatment adherence and post-treatment review of children with uncomplicated malaria in western Kenya. Malar J. 2014 Feb 3;13:44 **Abstract** **Background:** Trials evaluating the impact of mobile phone text-messaging to support management of acute diseases, such as malaria, are urgently needed in Africa. There has been however a concern about the feasibility of interventions that rely on access to mobile phones among caregivers in rural areas. To assess the feasibility and inform development of an intervention to improve adherence to malaria medications and post-treatment review, mobile phone network, access, ownership and use among caregivers in western Kenya was assessed. **Methods:** A cross-sectional survey based on outpatient exit interviews was undertaken among caregivers of children with malaria at four trial facilities. The main outcomes were proportions of caregivers that have mobile signal at home; have access to mobile phones; are able to read; and use text-messaging. Willingness to receive text-message reminders was also explored. Descriptive analyses were performed. **Results:** Of 400 interviewed caregivers, the majority were female (93.5%), mothers of the sick children (87.8%) and able to read (97.3%). Only 1.7% of caregivers were without any education. Nearly all (99.8%) reported access to a mobile signal at home. 93.0% (site range: 89-98%) had access to a mobile phone within their household while 73.8% (site range: 66-78%) possessed a personal phone. Among caregivers with mobile phone access, 93.6% (site range: 85-99%) used the phone to receive text-messages. Despite only 19% having electricity at home nearly all (99.7%) caregivers reported that they would be able to have permanent phone access to receive text-messages in the next 28 days. Willingness to receive text-message reminders was nearly universal (99.7%) with 41.7% of caregivers preferring texts in English, 32.3% in Kiswahili and 26.1% in Dholuo. **Conclusions:** Despite concerns that the feasibility of text-messaging interventions targeting caregivers may be compromised in rural high malaria risk areas in Kenya, very

	favourable conditions were found with respect to mobile network, access and ownership of phones, use of text-messaging and minimum literacy levels required for successful intervention delivery. Moreover, there was a high willingness of caregivers to receive text-message reminders. Impact evaluations of carefully tailored text-messaging interventions targeting caregivers of children with malaria are timely and justified. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24490872/
96.	Tuyisenge L, Kyamanya P, Van Steirteghem S, Becker M, English M, Lissauer T. Knowledge and skills retention following Emergency Triage, Assessment and Treatment plus Admission course for final year medical students in Rwanda: a longitudinal cohort study. Arch Dis Child. 2014 Nov;99(11):993-7 **Abstract** **Aim:** To determine whether, after the Emergency Triage, Assessment and Treatment plus Admission (ETAT+) course, a comprehensive paediatric life support course, final year medical undergraduates in Rwanda would achieve a high level of knowledge and practical skills and if these were retained. To guide further course development, student feedback was obtained. **Methods:** Longitudinal cohort study of knowledge and skills of all final year medical undergraduates at the University of Rwanda in academic year 2011-2012 who attended a 5-day ETAT+ course. Students completed a precourse knowledge test. Knowledge and clinical skills assessments, using standardised marking, were performed immediately postcourse and 3-9 months later. Feedback was obtained using printed questionnaires. **Results:** 84 students attended the course and re-evaluation. Knowledge test showed a significant improvement, from median 47% to 71% correct answers ($p<0.001$). For two clinical skills scenarios, 98% passed both scenarios, 37% after a retake, 2% failed both scenarios. Three to nine months later, students were re-evaluated, median score for knowledge test 67%, not significantly different from postcourse ($p>0.1$). For clinical skills, 74% passed, with 32% requiring a retake, 8% failed after retake, 18% failed both scenarios, a significant deterioration ($p<0.0001$). **Conclusions:** Students performed well on knowledge and skills immediately after a comprehensive ETAT+ course. Knowledge was maintained 3-9 months later. Clinical skills, which require detailed sequential steps, declined, but most were able to perform them satisfactorily after feedback. The course was highly valued, but several short courses and more practical teaching were advocated. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24925893/

97.	Kajungu DK, Erhart A, Talisuna AO, Bassat Q, Karema C, Nabasumba C, Nambozi M, Tinto H, Kremsner P, Meremikwu M, D'Alessandro U, Speybroeck N. Paediatric pharmacovigilance: use of pharmacovigilance data mining algorithms for signal detection in a safety dataset of a paediatric clinical study conducted in seven African countries. PLoS One. 2014 May 1;9(5):e96388 **Abstract** **Background:** Pharmacovigilance programmes monitor and help ensuring the safe use of medicines which is critical to the success of public health programmes. The commonest method used for discovering previously unknown safety risks is spontaneous notifications. In this study we examine the use of data mining algorithms to identify signals from adverse events reported in a phase IIIb/IV clinical trial evaluating the efficacy and safety of several Artemisinin-based combination therapies (ACTs) for treatment of uncomplicated malaria in African children. **Methods:** We used paediatric safety data from a multi-site, multi-country clinical study conducted in seven African countries (Burkina Faso, Gabon, Nigeria, Rwanda, Uganda, Zambia, and Mozambique). Each site compared three out of four ACTs, namely amodiaquine-artesunate (ASAQ), dihydroartemisinin-piperaquine (DHAPQ), artemether-lumefantrine (AL) or chlorproguanil/dapsone and artesunate (CD+A). We examine two pharmacovigilance signal detection methods, namely proportional reporting ratio and Bayesian Confidence Propagation Neural Network on the clinical safety dataset. **Results:** Among the 4,116 children (6-59 months old) enrolled and followed up for 28 days post treatment, a total of 6,238 adverse events were reported resulting into 346 drug-event combinations. Nine signals were generated both by proportional reporting ratio and Bayesian Confidence Propagation Neural Network. A review of the manufacturer package leaflets, an online Multi-Drug Symptom/Interaction Checker (DoubleCheckMD) and further by therapeutic area experts reduced the number of signals to five. The ranking of some drug-adverse reaction pairs on the basis of their signal index differed between the two methods. **Conclusions:** Our two data mining methods were equally able to generate suspected signals using the pooled safety data from a phase IIIb/IV clinical trial. This analysis demonstrated the possibility of utilising clinical studies safety data for key pharmacovigilance activities like signal detection and evaluation. This approach can be applied to complement the spontaneous reporting systems which are limited by under reporting. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24787710/

98.	Odeny TA, Bukusi EA, Cohen CR, Yuhas K, Camlin CS, McClelland RS. Texting improves testing: a randomized trial of two-way SMS to increase postpartum prevention of mother-to-child transmission retention and infant HIV testing. AIDS. 2014 Sep 24;28(15):2307-12. **Abstract** **Objective:** Many sub-Saharan African countries report high postpartum loss to follow-up of mother-baby pairs. We aimed to determine whether interactive text messages improved rates of clinic attendance and early infant HIV testing in the Nyanza region of Kenya. **Design:** Parallel-group, unblinded, randomized controlled trial. **Methods:** HIV-positive pregnant women at least 18 years old and enrolled in the prevention of mother-to-child transmission of HIV programme were randomized to receive either text messages (SMS group, n = 195) or usual care (n = 193). Messages were developed using formative focus group research informed by constructs of the Health Belief Model. The SMS group received up to eight text messages before delivery (depending on gestational age), and six messages postpartum. Primary outcomes included maternal postpartum clinic attendance and virological infant HIV testing by 8 weeks postpartum. The primary analyses were intention-to-treat. **Results:** Of the 388 enrolled women, 381 (98.2%) had final outcome information. In the SMS group, 38 of 194 (19.6%) women attended a maternal postpartum clinic compared to 22 of 187 (11.8%) in the control group (relative risk 1.66, 95% confidence interval 1.02-2.70). HIV testing within 8 weeks was performed in 172 of 187 (92.0%) infants in the SMS group compared to 154 of 181 (85.1%) in the control group (relative risk 1.08, 95% confidence interval 1.00-1.16). **Conclusions:** Text messaging significantly improved maternal postpartum visit attendance, but overall return rates for these visits remained low. In contrast, high rates of early infant HIV testing were achieved in both arms, with significantly higher testing rates in the SMS compared to the control infants. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25313586/
99.	Komoto S, Wandera Apondi E, Shah M, Odoyo E, Nyangao J, Tomita M, Wakuda M, Maeno Y, Shirato H, Tsuji T, Ichinose Y, Taniguchi K. Whole genomic analysis of human G12P[6] and G12P[8] rotavirus strains that have emerged in Kenya: identification of porcine-like NSP4 genes. Infect Genet Evol. 2014 Oct;27:277-93.

	Abstract G12 rotaviruses are globally emerging rotavirus strains causing severe childhood diarrhea. However, the whole genomes of only a few G12 strains have been fully sequenced and analyzed, of which only one G12P[4] and one G12P[6] are from Africa. In this study, we sequenced and characterized the complete genomes of three G12 strains (RVA/Human-tc/KEN/KDH633/2010/G12P[6], RVA/Human-tc/KEN/KDH651/2010/G12P[8], and RVA/Human-tc/KEN/KDH684/2010/G12P[6]) identified in three stool specimens from children with acute diarrhea in Kenya, Africa. On whole genomic analysis, all three Kenyan G12 strains were found to have a Wa-like genetic backbone: G12-P[6]-I1-R1-C1-M1-A1-N1-T1-E1-H1 (strains KDH633 and KDH684) and G12-P[8]-I1-R1-C1-M1-A1-N1-T1-E1-H1 (strain KDH651). Phylogenetic analysis showed that most genes of the three strains examined in this study were genetically related to globally circulating human G1, G9, and G12 strains. Of note is that the NSP4 genes of strains KDH633 and KDH684 appeared to be of porcine origin, suggesting the occurrence of reassortment between human and porcine strains. Furthermore, strains KDH633 and KDH684 were very closely related to each other in all the 11 gene segments, indicating derivation of the two strains from a common origin. On the other hand, strain KDH651 consistently formed distinct clusters of 10 of the 11 gene segments (VP1-2, VP4, VP6-7, and NSP1-5), indicating a distinct origin of strain KDH651 from that of strains KDH633 and KDH684. To our knowledge, this is the first report on whole genome-based characterization of G12 strains that have emerged in Kenya. Our observations will provide important insights into the evolutionary dynamics of emerging G12 rotaviruses in Africa. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25111611/
100.	Juma DW, Omondi AA, Ingasia L, Opot B, Cheruiyot A, Yeda R, Okudo C, Cheruiyot J, Muiruri P, Ngalah B, Chebon LJ, Eyase F, Johnson J, Bulimo WD, Akala HM, Andagalu B, Kamau E. Trends in drug resistance codons in Plasmodium falciparum dihydrofolate reductase and dihydropteroate synthase genes in Kenyan parasites from 2008 to 2012. Malar J. 2014 Jul 2;13:250 **Abstract** **Background:** Sulphadoxine-pyrimethamine (SP), an antifolate, was replaced by artemether-lumefantrine as the first-line malaria drug treatment in Kenya in 2004 due to the wide spread of resistance. However, SP still remains the recommended drug for intermittent preventive treatment in pregnant women and infants (IPTP/I) owing to its safety profile. This study assessed the prevalence of mutations in dihydrofolate reductase (Pfdhfr) and dihydropteroate synthase (Pfdhps) genes associated with SP

	resistance in samples collected in Kenya between 2008 and 2012. **Methods:** Field isolates collected from Kisumu, Kisii, Kericho and Malindi district hospitals were assessed for genetic polymorphism at various loci within Pfdhfr and Pfdhps genes by sequencing. **Results:** Among the Pfdhfr mutations, codons N51I, C59R, S108N showed highest prevalence in all the field sites at 95.5%, 84.1% and 98.6% respectively. Pfdhfr S108N prevalence was highest in Kisii at 100%. A temporal trend analysis showed steady prevalence of mutations over time except for codon Pfdhps 581 which showed an increase in mixed genotypes. Triple Pfdhfr N51I/C59R/S108N and double Pfdhps A437G/ K540E had high prevalence rates of 86.6% and 87.9% respectively. The Pfdhfr/Pfdhps quintuple, N51I/C59R/S108N/A437G/K540E mutant which has been shown to be the most clinically relevant marker for SP resistance was observed in 75.7% of the samples. **Conclusion:** SP resistance is still persistently high in western Kenya, which is likely due to fixation of key mutations in the Pfdhfr and Pfdhps genes as well as drug pressure from other antifolate drugs being used for the treatment of malaria and other infections. In addition, there is emergence and increasing prevalence of new mutations in Kenyan parasite population. Since SP is used for IPTP/I, molecular surveillance and in vitro susceptibility assays must be sustained to provide information on the emergence and spread of SP resistance. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24989984/
101.	Pullan RL, Freeman MC, Gething PW, Brooker SJ. Geographical inequalities in use of improved drinking water supply and sanitation across Sub-Saharan Africa: mapping and spatial analysis of cross-sectional survey data. PLoS Med. 2014 Apr 8;11(4):e1001626 **Abstract** **Background:** Understanding geographic inequalities in coverage of drinking-water supply and sanitation (WSS) will help track progress towards universal coverage of water and sanitation by identifying marginalized populations, thus helping to control a large number of infectious diseases. This paper uses household survey data to develop comprehensive maps of WSS coverage at high spatial resolution for sub-Saharan Africa (SSA). Analysis is extended to investigate geographic heterogeneity and relative geographic inequality within countries. **Methods and findings:** Cluster-level data on household reported use of improved drinking-water supply, sanitation, and open defecation were abstracted from 138

	national surveys undertaken from 1991-2012 in 41 countries. Spatially explicit logistic regression models were developed and fitted within a Bayesian framework, and used to predict coverage at the second administrative level (admin2, e.g., district) across SSA for 2012. Results reveal substantial geographical inequalities in predicted use of water and sanitation that exceed urban-rural disparities. The average range in coverage seen between admin2 within countries was 55% for improved drinking water, 54% for use of improved sanitation, and 59% for dependence upon open defecation. There was also some evidence that countries with higher levels of inequality relative to coverage in use of an improved drinking-water source also experienced higher levels of inequality in use of improved sanitation (rural populations r = 0.47, p = 0.002; urban populations r = 0.39, p = 0.01). Results are limited by the quantity of WSS data available, which varies considerably by country, and by the reliability and utility of available indicators. **Conclusions:** This study identifies important geographic inequalities in use of WSS previously hidden within national statistics, confirming the necessity for targeted policies and metrics that reach the most marginalized populations. The presented maps and analysis approach can provide a mechanism for monitoring future reductions in inequality within countries, reflecting priorities of the post-2015 development agenda. Please see later in the article for the Editors' Summary. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24714528/
102.	Njenga SM, Ng'ang'a PM, Mwanje MT, Bendera FS, Bockarie MJ. A school-based cross-sectional survey of adverse events following co-administration of albendazole and praziquantel for preventive chemotherapy against urogenital schistosomiasis and soil-transmitted helminthiasis in Kwale County, Kenya. PLoS One. 2014 Feb 10;9(2):e88315 **Abstract** **Background:** Soil-transmitted helminths and schistosomiasis are mostly prevalent in developing countries due to poor sanitation and lack of adequate clean water. School-age children tend to be the target of chemotherapy-based control programmes because they carry the heaviest worm and egg burdens. The present study examines adverse events (AEs) experienced following co-administration of albendazole and praziquantel to school-age children in a rural area in Kwale County, Kenya. **Methods:** Children were treated with single doses of albendazole and praziquantel tablets and then interviewed using a questionnaire for post treatment AEs. **Results:** Overall, 752 children, 47.6% boys, participated in the study. Their median (interquartile range) age was 12.0 (10.0-14.0) years. A total of 190 (25.3%) children reportedly experienced at least one AE. In total, 239 cases of AEs were reported with

	the most frequent being abdominal pains (46.3%), dizziness (33.2%) and nausea (21.1%). Majority of the reported AEs (80.8%) resolved themselves while 12.1% and 6.3% were countered by, respectively, self-medication and visiting a nearby health facility. More girls (60.5%) than boys (39.5%) reported AEs (P = 0.027). **Conclusions:** The AEs were mild and transient, and were no worse than those expected following monotherapy. The current study adds to the evidence base that dual administration of albendazole and praziquantel in school-based mass drug administration is safe with only mild adverse events noted. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/24520365/
103.	Turan B, Stringer KL, Onono M, Bukusi EA, Weiser SD, Cohen CR, Turan JM. Linkage to HIV care, postpartum depression, and HIV-related stigma in newly diagnosed pregnant women living with HIV in Kenya: a longitudinal observational study. BMC Pregnancy Childbirth. 2014 Dec 3;14:400 **Abstract** **Background:** While studies have suggested that depression and HIV-related stigma may impede access to care, a growing body of literature also suggests that access to HIV care itself may help to decrease internalized HIV-related stigma and symptoms of depression in the general population of persons living with HIV. However, this has not been investigated in postpartum women living with HIV. Furthermore, linkage to care itself may have additional impacts on postpartum depression beyond the effects of antiretroviral therapy. We examined associations between linkage to HIV care, postpartum depression, and internalized stigma in a population with a high risk of depression: newly diagnosed HIV-positive pregnant women. **Methods:** In this prospective observational study, data were obtained from 135 HIV-positive women from eight antenatal clinics in the rural Nyanza Province of Kenya at their first antenatal visit (prior to testing HIV-positive for the first time) and subsequently at 6 weeks after giving birth. **Results:** At 6 weeks postpartum, women who had not linked to HIV care after testing positive at their first antenatal visit had higher levels of depression and internalized stigma, compared to women who had linked to care. Internalized stigma mediated the effect of linkage to care on depression. Furthermore, participants who had both linked to HIV care and initiated antiretroviral therapy reported the lowest levels of depressive symptoms. **Conclusions:** These results provide further support for current efforts to ensure that women who are newly diagnosed with HIV during pregnancy become linked to HIV

	care as early as possible, with important benefits for both physical and mental health. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25467187/
104.	Mwaniki P, Ayieko P, Todd J, English M. Assessment of paediatric inpatient care during a multifaceted quality improvement intervention in Kenyan district hospitals--use of prospectively collected case record data. BMC Health Serv Res. 2014 Jul 18;14:31 **Abstract** **Background:** In assessing quality of care in developing countries, retrospectively collected data are usually used given their availability. Retrospective data however suffer from such biases as recall bias and non-response bias. Comparing results obtained using prospectively and retrospectively collected data will help validate the use of the easily available retrospective data in assessing quality of care in past and future studies. **Methods:** Prospective and retrospective datasets were obtained from a cluster randomized trial of a multifaceted intervention aimed at improving paediatric inpatient care conducted in eight rural Kenyan district hospitals by improving management of children admitted with pneumonia, malaria and diarrhea and/or dehydration. Four hospitals received a full intervention and four a partial intervention. Data were collected through 3 two weeks surveys conducted at baseline, after 6 and 18 months. Retrospective data was sampled from paediatric medical records of patients discharged in the preceding six months of the survey while prospective data was collected from patients discharged during the two week period of each survey. Risk Differences during post-intervention period of 16 quality of care indicators were analyzed separately for prospective and retrospective datasets and later plotted side by side for comparison. **Results:** For the prospective data there was strong evidence of an intervention effect for 8 of the indicators and weaker evidence of an effect for one indicator, with magnitude of effect sizes varying from 23% to 60% difference. For the retrospective data, 10 process (these include the 8 indicators found to be statistically significant in prospective data analysis) indicators had statistically significant differences with magnitude of effects varying from 10% to 42%. The bar-graph comparing results from the prospective and retrospective datasets showed similarity in terms of magnitude of effects and statistical significance for all except two indicators. **Conclusion:** Multifaceted interventions can help improve adoption of clinical guidelines and hence improve the quality of care. The similar inference reached after analyses based on prospective assessment of case management is a useful finding as it supports the utility of work based on examination of retrospectively assembled case

	records allowing longer time periods to be studied while constraining costs. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25035114/
105.	Echoka E, Dubourg D, Makokha A, Kombe Y, Olsen OE, Mwangi M, Evjen-Olsen B, Byskov J. Using the unmet obstetric needs indicator to map inequities in life-saving obstetric interventions at the local health care system in Kenya. Int J Equity Health. 2014 Dec 12;13:112 **Abstract** **Background:** Developing countries with high maternal mortality need to invest in indicators that not only provide information about how many women are dying, but also where, and what can be done to prevent these deaths. The unmet Obstetric Needs (UONs) concept provides this information. This concept was applied at district level in Kenya to assess how many women had UONs and where the women with unmet needs were located. **Methods:** A facility based retrospective study was conducted in 2010 in Malindi District, Kenya. Data on pregnant women who underwent a major obstetric intervention (MOI) or died in facilities that provide comprehensive Emergency Obstetric Care (EmOC) services in 2008 and 2009 were collected. The difference between the number of women who experienced life threatening obstetric complications and those who received care was quantified. The main outcome measures in the study were the magnitude of UONs and their geographical distribution. **Results:** 566 women in 2008 and 724 in 2009 underwent MOI. Of these, 185 (32.7%) in 2008 and 204 (28.1%) in 2009 were for Absolute Maternal Indications (AMI). The most common MOI was caesarean section (90%), commonly indicated by Cephalopelvic Disproportion (CPD)-narrow pelvis (27.6% in 2008; 26.1% in 2009). Based on a reference rate of 1.4%, the overall MOI for AMI rate was 1.25% in 2008 and 1.3% in 2009. In absolute terms, 22 (11%) women in 2008 and 12 (6%) in 2009, who required a life saving intervention failed to get it. Deficits in terms of unmet needs were identified in rural areas only while urban areas had rates higher than the reference rate (0.8% vs. 2.2% in 2008; 0.8% vs. 2.1% in 2009). **Conclusions:** The findings, if used as a proxy to maternal mortality, suggest that rural women face higher risks of dying during pregnancy and childbirth. This indicates the need to improve priority setting towards ensuring equity in access to life saving interventions for pregnant women in underserved areas. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25495052/

106.	González R, Desai M, Macete E, Ouma P, Kakolwa MA, Abdulla S, Aponte JJ, Bulo H, Kabanywanyi AM, Katana A, Maculuve S, Mayor A, Nhacolo A, Otieno K, Pahlavan G, Rupérez M, Sevene E, Slutsker L, Vala A, Williamsom J, Menéndez C. Intermittent preventive treatment of malaria in pregnancy with mefloquine in HIV-infected women receiving cotrimoxazole prophylaxis: a multicenter randomized placebo-controlled trial. PLoS Med. 2014 Sep 23;11(9):e1001735. **Abstract** **Background:** Intermittent preventive treatment in pregnancy (IPTp) with sulfadoxine-pyrimethamine (SP) is recommended for malaria prevention in HIV-negative pregnant women, but it is contraindicated in HIV-infected women taking daily cotrimoxazole prophylaxis (CTXp) because of potential added risk of adverse effects associated with taking two antifolate drugs simultaneously. We studied the safety and efficacy of mefloquine (MQ) in women receiving CTXp and long-lasting insecticide treated nets (LLITNs). **Methods and findings:** A total of 1,071 HIV-infected women from Kenya, Mozambique, and Tanzania were randomized to receive either three doses of IPTp-MQ (15 mg/kg) or placebo given at least one month apart; all received CTXp and a LLITN. IPTp-MQ was associated with reduced rates of maternal parasitemia (risk ratio [RR], 0.47 [95% CI 0.27-0.82]; p=0.008), placental malaria (RR, 0.52 [95% CI 0.29-0.90]; p=0.021), and reduced incidence of non-obstetric hospital admissions (RR, 0.59 [95% CI 0.37-0.95]; p=0.031) in the intention to treat (ITT) analysis. There were no differences in the prevalence of adverse pregnancy outcomes between groups. Drug tolerability was poorer in the MQ group compared to the control group (29.6% referred dizziness and 23.9% vomiting after the first IPTp-MQ administration). HIV viral load at delivery was higher in the MQ group compared to the control group (p=0.048) in the ATP analysis. The frequency of perinatal mother to child transmission of HIV was increased in women who received MQ (RR, 1.95 [95% CI 1.14-3.33]; p=0.015). The main limitation of the latter finding relates to the exploratory nature of this part of the analysis. **Conclusions:** An effective antimalarial added to CTXp and LLITNs in HIV-infected pregnant women can improve malaria prevention, as well as maternal health through reduction in hospital admissions. However, MQ was not well tolerated, limiting its potential for IPTp and indicating the need to find alternatives with better tolerability to reduce malaria in this particularly vulnerable group. MQ was associated with an increased risk of mother to child transmission of HIV, which warrants a better understanding of the pharmacological interactions between antimalarials and antiretroviral drugs. **Trial registration:** ClinicalTrials.gov NCT 00811421; Pan African Clinical Trials

	Registry PACTR 2010020001813440 Please see later in the article for the Editors' Summary. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25247995/
107.	Ong'ang'o JR, Mwachari C, Kipruto H, Karanja S. The effects on tuberculosis treatment adherence from utilising community health workers: a comparison of selected rural and urban settings in Kenya. PLoS One. 2014 Feb 18;9(2):e88937. **Abstract** **Introduction:** Community Health Workers (CHWs) have been utilised for various primary health care activities in different settings especially in developing countries. Usually when utilised in well defined terms, they have a positive impact. To support Kenya's policy on engagement of CHWs for tuberculosis (TB) control, there is need to demonstrate effects of utilising them. **Objectives:** This study assessed TB treatment adherence among patients who utilised CHWs in management of their illness in comparison to those who did not in urban and rural settings. **Methods:** A retrospective cohort study was conducted in selected health facilities using standard clinical records for each TB patient registered for treatment between 2005 to 2011. Qualitative data was collected from CHWs and health care providers. **Results:** The study assessed 2778 tuberculosis patients and among them 1499 (54%) utilized CHWs for their TB treatment. The urban setting in comparison with the rural setting contributed 70% of patients utilising the CHWs ($p<0.001$). Overall treatment adherence of the cohort was 79%. Categorizing by use of CHWs, adherence among patients who had utilized CHWs was 83% versus 68% among those that had not ($p<0.001$). In comparison between the rural and urban settings adherence was 76% and 81.5% ($p<0.001$) respectively and when categorized by use of CHWs it was 73% and 90% ($p<0.001$) for the rural and urban set ups respectively. Utilisation of CHWs remained significant in enhancing treatment adherence in the cohort with unadjusted and adjusted ORs; OR 2.25, (95% 1.86-2.73) $p<0.001$ and OR 1.98 (95% 1.51-2.5) $p<0.001$ respectively. It was most effective in the urban set-up, OR 2.65 (95% 2.02-3.48, $p<0.001$) in comparison to the rural set up, OR 0.74 (95% 0.56-0.97) $p = 0.032$. **Conclusion:** Utilisation of CHWs enhanced TB treatment adherence and the best effects were in the urban set-up. **PubMed link- https://pubmed.ncbi.nlm.nih.gov/24558452/**

108.	Odeny TA, Bailey RC, Bukusi EA, Simoni JM, Tapia KA, Yuhas K, Holmes KK, McClelland RS. Effect of text messaging to deter early resumption of sexual activity after male circumcision for HIV prevention: a randomized controlled trial. J Acquir Immune Defic Syndr. 2014 Feb 1;65(2):e50-7 **Abstract** **Background:** Resumption of sex before complete wound healing after male circumcision may increase risk of postoperative surgical complications, and HIV acquisition and transmission. We aimed to determine the effect of text messaging to deter resumption of sex before 42 days postcircumcision. **Methods:** We conducted a randomized trial where men older than18 years who owned mobile phones and had just undergone circumcision were randomized to receive a series of text messages (n = 600) or usual care (n = 600). The primary outcome was self-reported resumption of sex before 42 days. **Results:** Sex before 42 days was reported by 139 of 491 (28.3%) men in the intervention group and 124 of 493 (25.2%) men in the control group [relative risk = 1.13, 95% confidence interval (CI): 0.91 to 1.38, P = 0.3]. Men were more likely to resume early if they were married or had a live-in sexual partner [adjusted relative risk (aRR) 1.57, 95% CI: 1.18 to 2.08, P < 0.01]; in the month before circumcision had 1 (aRR: 1.50, 95% CI: 1.07 to 2.12, P = 0.02) or more than 1 (aRR: 1.81, 95% CI: 1.24 to 2.66, P < 0.01) sexual partner(s); had primary school or lower education (aRR: 1.62, 95% CI: 1.33 to 1.97, P< 0.001); were employed (aRR: 1.35, 95% CI: 1.05 to 1.72, P = 0.02); or were 21-30 years old (aRR: 1.58, 95% CI: 1.01 to 2.47, P = 0.05), 31-40 years old (aRR: 1.91, 95% CI: 1.18 to 3.09, P < 0.01), or older than 40 years (aRR: 1.76, 95% CI: 1.04 to 2.97, P = 0.03) compared with younger than 21 years. **Conclusions:** Text messaging as used in this trial did not reduce early resumption of sex after circumcision. We identified key risk factors for early resumption that need to be considered in circumcision programs. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/23846561/
109.	Lelo AE, Mburu DN, Magoma GN, Mungai BN, Kihara JH, Mwangi IN, Maina GM, Kinuthia JM, Mutuku MW, Loker ES, Mkoji GM, Steinauer ML. No apparent reduction in schistosome burden or genetic diversity following four years of school-based mass drug administration in mwea, central kenya, a heavy transmission area. PLoS Negl Trop Dis. 2014 Oct 9;8(10):e3221 **Abstract**

	Background: Schistosomiasis is a debilitating neglected tropical disease that infects over 200 million people worldwide. To combat this disease, in 2012, the World Health Organization announced a goal of reducing and eliminating transmission of schistosomes. Current control focuses primarily on mass drug administration (MDA). Therefore, we monitored transmission of Schistosoma mansoni via fecal egg counts and genetic markers in a typical school based MDA setting to ascertain the actual impacts of MDA on the targeted schistosome population. **Methods:** For 4 years, we followed 67 children enrolled in a MDA program in Kenya. Infection status and egg counts were measured each year prior to treatment. For 15 of these children, for which there was no evidence of acquired resistance, meaning they became re-infected following each treatment, we collected microsatellite genotype data from schistosomes passed in fecal samples as a representation of the force of transmission between drug treatments. We genotyped a total of 4938 parasites from these children, with an average of 329.2 parasites per child for the entire study, and an average of 82.3 parasites per child per annual examination. We compared prevalence, egg counts, and genetic measures including allelic richness, gene diversity (expected heterozygosity), adult worm burdens and effective number of breeders among time points to search for evidence for a change in transmission or schistosome populations during the MDA program. **Findings:** We found no evidence of reduced transmission or schistosome population decline over the course of the program. Although prevalence declined in the 67 children as it did in the overall program, reinfection rates were high, and for the 15 children studied in detail, schistosome egg counts and estimated adult worm burdens did not decline between years 1 and 4, and genetic diversity increased over the course of drug treatment. **Interpretation:** School based control programs undoubtedly improve the health of individuals; however, our data show that in an endemic area, such a program has had no obvious effect on reducing transmission or of significantly impacting the schistosome population as sampled by the children we studied in depth. Results like these, in combination with other sources of information, suggest more integrated approaches for interrupting transmission and significantly diminishing schistosome populations will be required to achieve sustainable control. **PubMed link**- https://pubmed.ncbi.nlm.nih.gov/25299057/
110.	Njomo DW, Mukoko DA, Nyamongo NK, Karanja J. Increasing coverage in mass drug administration for lymphatic filariasis elimination in an urban setting: a study of Malindi Town, Kenya. PLoS One. 2014 Jan 14;9(1):e83413

	Abstract **Introduction:** Implementation of Mass Drug Administration (MDA) in urban settings is an obstacle to Lymphatic Filariasis (LF) elimination. No urban-specific guidelines on MDA in urban areas exist. Malindi district urban area had received 4 MDA rounds by the time the current study was implemented. Programme data showed average treatment coverage of 28.4% (2011 MDA), far below recommended minimum of 65-80%. **Methods:** To identify, design and test strategies for increased treatment coverage in urban areas, a quasi-experimental study was conducted in Malindi urban area. Three sub-locations with lowest treatment coverage in 2011 MDA were purposively selected. In the pre-test phase, 947 household heads sampled using systematic random method were interviewed for quantitative data. For qualitative data, 12 Focus Group Discussions (FGDs) with single sex adult and youth male and female groups and 3 with community drug distributors (CDDs) were conducted. Forty in-depth interviews with opinion leaders and self-administered questionnaires with District Public Health officers purposively selected were carried out. The quantitative data were analyzed using SPSS version 16 and statistical significance assessed by $\chi(2)$ test.The qualitative data were analyzed manually according to study's themes. **Results and discussion:** The identified strategies were implemented prior to and during 2012 MDA in two sub-locations (experimental) while in the third (control), usual MDA strategies were applied. In the post-test phase, 2012 MDA coverage in experimental and control sub-locations was comparatively assessed for effect of the newly designed strategies on urban MDA. Results indicated improved treatment coverage in experimental sub-locations, 77.1% in Shella and 66.0% in Barani. Central (control) sub-location also attained high coverage, 70.4% indicating average treatment coverage of 71%. **Conclusion:** The identified strategies contributed to increased treatment coverage in experimental sites and should be applied in urban areas. Due to closeness of sites, spillover effects may have contributed to increased coverage in the control site. **PubMed link- https://pubmed.ncbi.nlm.nih.gov/24454703/**
111.	Wafula F, Agweyu A, Macintyre K. Trends in procurement costs for HIV commodities: a 7-year retrospective analysis of global fund data across 125 countries. J Acquir Immune Defic Syndr. 2014 Apr 1;65(4):e134-9 **Abstract**

	Background: Nearly 40% of Global Fund money goes toward procurement. However, no analyses have been published to show how costs vary across regions and time, despite the availability of procurement data collected through the Global Fund's price and quality reporting system. **Methodology:** We analyzed data for the 3 most widely procured commodities for the prevention, diagnosis, and treatment of HIV. These were male condoms, HIV rapid tests, and the antiretroviral (ARV) combination of lamivudine/nevirapine/zidovudine. The compared costs, first across time (2005-2012), then across regions, and finally, between individual procurement reported through the price and quality reporting and pooled procurement reported through the Global Fund's voluntary pooled procurement system. All costs were adjusted for inflation and reported in US dollars. **Key findings:** There were 2337 entries from 578 grants in 125 countries. The procurement cost for the ARV dropped substantially over the period, whereas those for condoms and HIV tests remained relatively stable. None of the commodity prices increased. Regional variations were pronounced for HIV tests, but minimal for condoms and the ARV. The unit cost for the 3-table ARV combination, for instance, varied between US$0.15 and US$0.23 in South Asia and the Eastern Europe/Central Asia regions, respectively, compared with a range of $0.23 (South Asia)-$1.50 (Eastern Europe/Central Asia) for a single diagnostic test. Pooled procurement lowered costs for condoms but not the other commodities. **Conclusions:** We showed how global procurement costs vary by region and time. Such analyses should be done more often to identify and correct market insufficiencies. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24189152/
112.	Prins A, Chengo E, Mung'ala Odera V, Sadarangani M, Seaton C, Holding P, Fegan G, Newton CR. Long-term survival and outcome in children admitted to kilifi district hospital with convulsive status epilepticus. Epilepsy Res Treat. 2014;2014:643747 **Abstract** Objectives. The incidence of convulsive status epilepticus (CSE) is high in Africa but the long-term outcome is unknown. We examined the neurocognitive outcome and survival of children treated for CSE in a Kenyan hospital 3 to 4 years after discharge. Methods. The frequency and nature of neurological deficits among this group of children were determined and compared to a control group. The children were screened with the Ten Questions Questionnaire for neurodevelopmental impairment if alive and those that screened positive were invited for further assessment to determine the pattern and extent of their impairment. A verbal autopsy was performed to determine the cause

	of death in those that died. Results. In the 119 cases followed-up, 9 (8%) died after discharge, with the majority having seizures during their fatal illness. The 110 survivors (median age 5 years) had significantly more neurological impairments on the screening compared to 282 controls (34/110 (30.9%) versus 11/282 (3.9%), OR = 11.0, 95% CI 5.3-22.8). Fifteen percent of the cases had active epilepsy. Conclusions. This study demonstrates the considerable burden of CSE in African children. Strategies to manage children with CSE that are acceptable to the community need to be explored to improve the longer-term outcome. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24627807/
113.	Chang J, Omuomo K, Anyango E, Kingwara L, Basiye F, Morwabe A, Shanmugam V, Nguyen S, Sabatier J, Zeh C, Ellenberger D. Field evaluation of Abbott Real Time HIV-1 Qualitative test for early infant diagnosis using dried blood spots samples in comparison to Roche COBAS Ampliprep/COBAS TaqMan HIV-1 Qual test in Kenya. J Virol Methods. 2014 Aug;204:25-30 **Abstract** Timely diagnosis and treatment of infants infected with HIV are critical for reducing infant mortality. High-throughput automated diagnostic tests like Roche COBAS AmpliPrep/COBAS TaqMan HIV-1 Qual Test (Roche CAPCTM Qual) and the Abbott Real Time HIV-1 Qualitative (Abbott Qualitative) can be used to rapidly expand early infant diagnosis testing services. In this study, the performance characteristics of the Abbott Qualitative were evaluated using two hundred dried blood spots (DBS) samples (100 HIV-1 positive and 100 HIV-1 negative) collected from infants attending the antenatal facilities in Kisumu, Kenya. The Abbott Qualitative results were compared to the diagnostic testing completed using the Roche CAPCTM Qual in Kenya. The sensitivity and specificity of the Abbott Qualitative were 99.0% (95% CI: 95.0-100.0) and 100.0% (95% CI: 96.0-100.0), respectively, and the overall reproducibility was 98.0% (95% CI: 86.0-100.0). The limits of detection for the Abbott Qualitative and Roche CAPCTM Qual were 56.5 and 6.9copies/mL at 95% CIs (p=0.005), respectively. The study findings demonstrate that the Abbott Qualitative test is a practical option for timely diagnosis of HIV in infants. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24726703/
114.	Breiman RF, Cosmas L, Audi A, Mwiti W, Njuguna H, Bigogo GM, Olack B, Ochieng JB, Wamola N, Montgomery JM, Williamson J, Parashar UD, Burton DC, Tate JE, Feikin DR. Use of population-based surveillance to determine the incidence of rotavirus gastroenteritis in an urban slum and a rural setting in Kenya. Pediatr Infect Dis J. 2014 Jan;33 Suppl 1(0 1):S54-61

	Abstract **Background:** Rotavirus gastroenteritis is a major cause of mortality among children <2 years of age. Disease burden data are important for introducing and sustaining new rotavirus vaccines in immunization programs. **Methods:** We analyzed population-based infectious disease surveillance data from 2007 to 2010 from Kenyan sites in rural and urban slum areas. Stool specimens were collected from patients of all ages presenting to study clinics with diarrheal disease and tested for rotavirus by enzyme immunoassay. Incidence rates were adjusted using data on healthcare utilization (from biweekly home visits) and proportion of stools collected at study clinics from patients meeting case definitions. **Results:** Rotavirus was detected in 285 (9.0%) of 3174 stools tested, including 122 (11.9%) from children <5 years of age and 162 (7.6%) from participants ≥5 years of age. Adjusted incidence rates for infants were 13,419 and 12,135 per 100,000 person-years of observation in rural and urban areas, respectively. Adjusted incidence rates were high in adults across age ranges. The rates suggest that annually, among children <5 years of age, there are >54,500 cases of rotavirus-associated gastroenteritis in rural Nyanza Province and >16,750 cases in Nairobi urban slums. **Conclusions:** Community-based surveillance in urban and rural Kenya suggests that rotavirus plays an important role as a cause of acute gastroenteritis in adults, as well as in children. In addition to substantially preventing illness and complications from diarrheal disease in children, rotavirus infant immunization has the potential of indirectly preventing diarrheal disease in older children and adults, assuming children are the predominant sources of transmission. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24343615/
115.	Hassan AS, Nabwera HM, Mwaringa SM, Obonyo CA, Sanders EJ, Rinke de Wit TF, Cane PA, Berkley JA. HIV-1 virologic failure and acquired drug resistance among first-line antiretroviral experienced adults at a rural HIV clinic in coastal Kenya: a cross-sectional study. AIDS Res Ther. 2014 Jan 23;11(1):9. **Abstract** **Background:** An increasing number of people on antiretroviral therapy (ART) in sub-Saharan Africa has led to declines in HIV related morbidity and mortality. However, virologic failure (VF) and acquired drug resistance (ADR) may negatively affect these gains. This study describes the prevalence and correlates of HIV-1 VF and ADR among

	first-line ART experienced adults at a rural HIV clinic in Coastal Kenya. **Methods:** HIV-infected adults on first-line ART for ≥6 months were cross-sectionally recruited between November 2008 and March 2011. The primary outcome was VF, defined as a one-off plasma viral load of ≥400 copies/ml. The secondary outcome was ADR, defined as the presence of resistance associated mutations. Logistic regression and Fishers exact test were used to describe correlates of VF and ADR respectively. **Results:** Of the 232 eligible participants on ART over a median duration of 13.9 months, 57 (24.6% [95% CI: 19.2 - 30.6]) had VF. Fifty-five viraemic samples were successfully amplified and sequenced. Of these, 29 (52.7% [95% CI: 38.8 - 66.3]) had at least one ADR, with 25 samples having dual-class resistance mutations. The most prevalent ADR mutations were the M184V (n = 24), K103N/S (n = 14) and Y181C/Y/I/V (n = 8). Twenty-six of the 55 successfully amplified viraemic samples (47.3%) did not have any detectable resistance mutation. Younger age (15-34 vs. ≥35 years: adjusted odd ratios [95% CI], p-value: 0.3 [0.1-0.6], p = 0.002) and unsatisfactory adherence (<95% vs. ≥95%: 3.0 [1.5-6.5], p = 0.003) were strong correlates of VF. Younger age, unsatisfactory adherence and high viral load were also strong correlates of ADR. **Conclusions:** High levels of VF and ADR were observed in younger patients and those with unsatisfactory adherence. Youth-friendly ART initiatives and strengthened adherence support should be prioritized in this Coastal Kenyan setting. To prevent unnecessary/premature switches, targeted HIV drug resistance testing for patients with confirmed VF should be considered. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24456757/
116.	Mohamed AH, Dalal W, Nyoka R, Burke H, Ahmed J, Auko E, Shihaji W, Ndege I, Breiman RF, Eidex RB. Health care utilization for acute illnesses in an urban setting with a refugee population in Nairobi, Kenya: a cross-sectional survey. BMC Health Serv Res. 2014 May 2;14:200 **Abstract** **Background:** Estimates place the number of refugees in Nairobi over 100,000. The constant movement of refugees between countries of origin, refugee camps, and Nairobi poses risk of introduction and transmission of communicable diseases into Kenya. We assessed the care-seeking behavior of residents of Eastleigh, a neighborhood in Nairobi with urban refugees. **Methods:** During July and August 2010, we conducted a Health Utilization Survey in Section II of Eastleigh. We used a multistage random cluster sampling design to identify

	households for interview. A standard questionnaire on the household demographics, water and sanitation was administered to household caretakers. Separate questionnaires were administered to household members who had one or more of the illnesses of interest. **Results:** Of 785 households targeted for interview, data were obtained from 673 (85.7%) households with 3,005 residents. Of the surveyed respondents, 290 (9.7%) individuals reported acute respiratory illness (ARI) in the previous 12 months, 222 (7.4%) reported fever in the preceding 2 weeks, and 54 (1.8%) reported having diarrhea in the 30 days prior to the survey. Children <5 years old had the highest frequency of all the illnesses surveyed: 17.1% (95% CI 12.2-21.9) reported ARI, 10.0% (95% CI 6.2-13.8) reported fever, and 6.9% (3.8-10.0) reported diarrhea during the time periods specified for each syndrome. Twenty-nine [7.5% (95% CI 4.3-10.7)] hospitalizations were reported among all age groups of those who sought care. Among participants who reported ≥1 illness, 330 (77.0%) sought some form of health care; most (174 [59.8%]) sought health care services from private health care providers. Fifty-five (18.9%) participants seeking healthcare services visited a pharmacy. Few residents of Eastleigh (38 [13.1%]) sought care at government-run facilities, and 24 (8.2%) sought care from a relative, a religious leader, or a health volunteer. Of those who did not seek any health care services (99 [23.0%]), the primary reason was cost (44.8%), followed by belief that the person was not sick enough (34.6%). **Conclusion:** Health care utilization in Eastleigh is high; however, a large proportion of residents opt to seek care at private clinics or pharmacies, despite the availability of accessible government-provided health care services in this area. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24885336/
117.	Okombo J, Kamau AW, Marsh K, Sutherland CJ, Ochola-Oyier LI. Temporal trends in prevalence of Plasmodium falciparum drug resistance alleles over two decades of changing antimalarial policy in coastal Kenya. Int J Parasitol Drugs Drug Resist. 2014 Aug 7;4(3):152-63 **Abstract** Molecular surveillance of drug resistance markers through time provides crucial information on genomic adaptations, especially in parasite populations exposed to changing drug pressures. To assess temporal trends of established genotypes associated with tolerance to clinically important antimalarials used in Kenya over the last two decades, we sequenced a region of the pfcrt locus encompassing codons 72-76 of the Plasmodium falciparum chloroquine resistance transporter, full-length pfmdr1 - encoding multi-drug resistance protein, P-glycoprotein homolog (Pgh1) and pfdhfr encoding dihydrofolate reductase, in 485 archived Plasmodium falciparum positive

	blood samples collected in coastal Kenya at four different time points between 1995 and 2013. Microsatellite loci were also analyzed to compare the genetic backgrounds of parasite populations circulating before and after the withdrawal of chloroquine and sulfadoxine/pyrimethamine. Our results reveal a significant increase in the prevalence of the pfcrt K76 wild-type allele between 1995 and 2013 from 38% to 81.7% ($p < 0.0001$). In contrast, we noted a significant decline in wild-type pfdhfr S108 allele ($p < 0.0001$) culminating in complete absence of this allele in 2013. We also observed a significant increase in the prevalence of the wild-type pfmdr1 N86/Y184/D1246 haplotype from 14.6% in 1995 to 66.0% in 2013 ($p < 0.0001$) and a corresponding decline of the mutant pfmdr1 86Y/184Y/1246Y allele from 36.4% to 0% in 19 years ($p < 0.0001$). We also show extensive genetic heterogeneity among the chloroquine-sensitive parasites before and after the withdrawal of the drug in contrast to a selective sweep around the triple mutant pfdhfr allele, leading to a mono-allelic population at this locus. These findings highlight the importance of continual surveillance and characterization of parasite genotypes as indicators of the therapeutic efficacy of antimalarials, particularly in the context of changes in malaria treatment policy. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25516825/
118.	Mwita CC, Kajia D, Gwer S, Etyang A, Newton CR. Accuracy of clinical stroke scores for distinguishing stroke subtypes in resource poor settings: A systematic review of diagnostic test accuracy. J Neurosci Rural Pract. 2014 Oct;5(4):330-9. **Abstract** **Background:** Stroke is the second leading cause of death globally. Computerized tomography is used to distinguish between ischemic and hemorrhagic subtypes, but it is expensive and unavailable in low and middle income countries. Clinical stroke scores are proposed to differentiate between stroke subtypes but their reliability is unknown. **Materials and methods:** We searched online databases for studies written in English and identified articles using predefined criteria. We considered studies in which the Siriraj, Guy's Hospital, Besson and Greek stroke scores were compared to computerized tomography as the reference standard. We calculated the pooled sensitivity and specificity of the clinical stroke scores using a bivariate mixed effects binomial regression model. **Results:** In meta-analysis, sensitivity and specificity for the Siriraj stroke score, were 0.69 (95% CI 0.62-0.75) and 0.83 (95% CI 0.75-0.88) for ischemic stroke and 0.65 (95% CI 0.56-0.73) and 0.88 (95% CI 0.83-0.91) for hemorrhagic stroke. For the Guy's hospital stroke score overall sensitivity and specificity were 0.70 (95% CI 0.53-0.83) and 0.79 (95% CI 0.68-0.87) for ischemic stroke and 0.54 (95% CI 0.42-0.66) and 0.89

	(95% CI 0.83-0.94) for hemorrhagic stroke. **Conclusions:** Clinical stroke scores are not accurate enough for use in clinical or epidemiological settings. Computerized tomography is recommended for differentiating stroke subtypes. Larger studies using different patient populations are required for validation of clinical stroke scores. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/25288833/
119.	Prentice HA, Price MA, Porter TR, Cormier E, Mugavero MJ, Kamali A, Karita E, Lakhi S, Sanders EJ, Anzala O, Amornkul PN, Allen S, Hunter E, Kaslow RA, Gilmour J, Tang J; IAVI Africa HIV Prevention Partnership. Dynamics of viremia in primary HIV-1 infection in Africans: insights from analyses of host and viral correlates. Virology. 2014 Jan 20;449:254-62. **Abstract** In HIV-1 infection, plasma viral load (VL) has dual implications for pathogenesis and public health. Based on well-known patterns of HIV-1 evolution and immune escape, we hypothesized that VL is an evolving quantitative trait that depends heavily on duration of infection (DOI), demographic features, human leukocyte antigen (HLA) genotypes and viral characteristics. Prospective data from 421 African seroconverters with at least four eligible visits did show relatively steady VL beyond 3 months of untreated infection, but host and viral factors independently associated with cross-sectional and longitudinal VL often varied by analytical approaches and sliding time windows. Specifically, the effects of age, HLA-B(∗)53 and infecting HIV-1 subtypes (A1, C and others) on VL were either sporadic or highly sensitive to time windows. These observations were strengthened by the addition of 111 seroconverters with 2-3 eligible VL results, suggesting that DOI should be a critical parameter in epidemiological and clinical studies. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24418560/
120.	Grinsztejn B, Hosseinipour MC, Ribaudo HJ, Swindells S, Eron J, Chen YQ, Wang L, Ou SS, Anderson M, McCauley M, Gamble T, Kumarasamy N, Hakim JG, Kumwenda J, Pilotto JH, Godbole SV, Chariyalertsak S, de Melo MG, Mayer KH, Eshleman SH, Piwowar-Manning E, Makhema J, Mills LA, Panchia R, Sanne I, Gallant J, Hoffman I, Taha TE, Nielsen-Saines K, Celentano D, Essex M, Havlir D, Cohen MS; HPTN 052-ACTG Study Team. Effects of early versus delayed initiation of antiretroviral treatment on clinical outcomes of HIV-1 infection: results from the phase 3 HPTN 052 randomised controlled trial. Lancet Infect Dis. 2014 Apr;14(4):281-90.

Abstract

Background: Use of antiretroviral treatment for HIV-1 infection has decreased AIDS-related morbidity and mortality and prevents sexual transmission of HIV-1. However, the best time to initiate antiretroviral treatment to reduce progression of HIV-1 infection or non-AIDS clinical events is unknown. We reported previously that early antiretroviral treatment reduced HIV-1 transmission by 96%. We aimed to compare the effects of early and delayed initiation of antiretroviral treatment on clinical outcomes.

Methods: The HPTN 052 trial is a randomised controlled trial done at 13 sites in nine countries. We enrolled HIV-1-serodiscordant couples to the study and randomly allocated them to either early or delayed antiretroviral treatment by use of permuted block randomisation, stratified by site. Random assignment was unblinded. The HIV-1-infected member of every couple initiated antiretroviral treatment either on entry into the study (early treatment group) or after a decline in CD4 count or with onset of an AIDS-related illness (delayed treatment group). Primary events were AIDS clinical events (WHO stage 4 HIV-1 disease, tuberculosis, and severe bacterial infections) and the following serious medical conditions unrelated to AIDS: serious cardiovascular or vascular disease, serious liver disease, end-stage renal disease, new-onset diabetes mellitus, and non-AIDS malignant disease. Analysis was by intention-to-treat. This trial is registered with ClinicalTrials.gov, number NCT00074581.

Findings: 1763 people with HIV-1 infection and a serodiscordant partner were enrolled in the study; 886 were assigned early antiretroviral treatment and 877 to the delayed treatment group (two individuals were excluded from this group after randomisation). Median CD4 counts at randomisation were 442 (IQR 373-522) cells per μL in patients assigned to the early treatment group and 428 (357-522) cells per μL in those allocated delayed antiretroviral treatment. In the delayed group, antiretroviral treatment was initiated at a median CD4 count of 230 (IQR 197-249) cells per μL. Primary clinical events were reported in 57 individuals assigned to early treatment initiation versus 77 people allocated to delayed antiretroviral treatment (hazard ratio 0·73, 95% CI 0·52-1·03; p=0·074). New-onset AIDS events were recorded in 40 participants assigned to early antiretroviral treatment versus 61 allocated delayed initiation (0·64, 0·43-0·96; p=0·031), tuberculosis developed in 17 versus 34 patients, respectively (0·49, 0·28-0·89, p=0·018), and primary non-AIDS events were rare (12 in the early group vs nine with delayed treatment). In total, 498 primary and secondary outcomes occurred in the early treatment group (incidence 24·9 per 100 person-years, 95% CI 22·5-27·5) versus 585 in the delayed treatment group (29·2 per 100 person-years, 26·5-32·1; p=0·025). 26 people died, 11 who were allocated to early antiretroviral treatment and 15 who were assigned to the delayed treatment group.

Interpretation: Early initiation of antiretroviral treatment delayed the time to AIDS

	events and decreased the incidence of primary and secondary outcomes. The clinical benefits recorded, combined with the striking reduction in HIV-1 transmission risk previously reported, provides strong support for earlier initiation of antiretroviral treatment. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24602844/
121.	Muinga N, Ayieko P, Opondo C, Ntoburi S, Todd J, Allen E, English M. Using health worker opinions to assess changes in structural components of quality in a Cluster Randomized Trial. BMC Health Serv Res. 2014 Jun 28;14:282 **Abstract** **Background:** The 'resource readiness' of health facilities to provide effective services is captured in the structure component of the classical Donabedian paradigm often used for assessment of the quality of care in the health sector. Periodic inventories are commonly used to confirm the presence (or absence) of equipment or drugs by physical observation or by asking those in charge to indicate whether an item is present or not. It is then assumed that this point observation is representative of the everyday status. However the availability of an item (consumables) may vary. Arguably therefore a more useful assessment for resources would be one that captures this fluctuation in time. Here we report an approach that may circumvent these difficulties. **Methods:** We used self-administered questionnaires (SAQ) to seek health worker views of availability of key resources supporting paediatric care linked to a cluster randomized trial of a multifaceted intervention aimed at improving this care conducted in eight rural Kenyan district hospitals. Four hospitals received a full intervention and four a partial intervention. Data were collected pre-intervention and after 6 and 18 months from health workers in three clinical areas asked to score item availability using an 11-point scale. Mean scores for items common to all 3 areas and mean scores for items allocated to domains identified using exploratory factor analysis (EFA) were used to describe availability and explore changes over time. **Results:** SAQ were collected from 1,156 health workers. EFA identified 11 item domains across the three departments. Mean availability scores for these domains were often <5/10 at baseline reflecting lack of basic resources such as oxygen, nutrition and second line drugs. An improvement in mean scores occurred in 8 out of 11 domains in both control and intervention groups. A calculation of difference in difference of means for intervention vs. control suggested an intervention effect resulting in greater changes in 5 out of 11 domains. **Conclusion:** Using SAQ data to assess resource availability experienced by health

	workers provides an alternative to direct observations that provide point prevalence estimates. Further the approach was able to demonstrate poor access to resources, change over time and variability across place **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/24974166/
122.	Fiorella KJ, Hickey MD, Salmen CR, Nagata JM, Mattah B, Magerenge R, Cohen CR, Bukusi EA, Brashares JS, Fernald LH. Fishing for Food? Analyzing links between fishing livelihoods and food security around Lake Victoria, Kenya. Food Secur. 2014 Dec;6(6):851-860. **Abstract** Food-producing livelihoods have the potential to improve food security and nutrition through direct consumption or indirectly through income. To better understand these pathways, we examined if fishing households ate more fish and had higher food security than non-fishing households around Lake Victoria, Kenya. In 2010, we randomly sampled 111 households containing 583 individuals for a cross-sectional household survey in a rural fishing community. We modeled the associations between fish consumption and food security and fishing household status, as well as socio-economic variables (asset index, monthly income, household size) for all households and also for a subset of households with adult male household members (76% of households). Participating in fishing as a livelihood was not associated with household fish consumption or food security. Higher household fish consumption was associated with higher household income and food security, and was weakly associated with lower household morbidity. Household food security was associated with higher incomes and asset index scores. Our results suggest socioeconomic factors may be more important than participation in food-producing livelihoods for predicting household consumption of high quality foods. **PubMed link-** https://pubmed.ncbi.nlm.nih.gov/33897914/