

Structure/Method/Design: Between March and July 2016, a 5-member core team of IT-engineers and program staff was set up. Stakeholder sessions were held to reinforce advocacy, project goals and streamline data tools. Public IT administrators, quality control supervisors and data clerks were trained. Laptops and internet modems were provided and the existing paper records of HW per facility was entered into the iHRIS database.

Outcome & Evaluation: A total of 5376 records (3481 new and 1895 updated) representing staff of the state's 728 PHCs was entered into the registry. Preliminary analysis showed median age of 42.5 years and 49.6% of HW were female. Only 68.17% (3665/5376) of HW records had assigned cadres, with 39.7% of these as health attendants (HA) and 27.6% as community health extension workers (CHEW). Laboratory personnel was 6.3%, clinicians (doctors, nurses and pharmacists) and records staff were 3.1% and 1.2% respectively. Only CHEWs and HA met national minimum staffing standards of 1 and 2 per PHC respectively. Incomplete, absent or misplaced fields in HW paper records were challenges.

Going Forward: HW data management using iHRIS in this resource limited setting was successful in terms of storage and generating quick trends. Poor data quality in source documents were major barriers. Future directions include routine updates of all records and the use of iHRIS data to guide decision on cadre, postings and numbers to be recruited. Policymakers have also opted to physically verify each digital entry and cross-referenced with payroll information.

Source of Funding: US government PEPFAR grant to Institute of Human Virology Nigeria.

Abstract #: 2.016_HHR

Sustainable PEPFAR Funded In Service HIV Training Delivery Models: A Training Impact Evaluation from Nigeria

A.E. Nwandu¹, T. Madubuko², E. Onu³, D. Olutola³, K. Nike³, U. Okonkwo², J. Ilozumba², J. Egharevba⁴, A. Ehoche⁵, J. Apata⁶; ¹University of Maryland, Baltimore, MD, USA, ²Center for Clinical Care Research Nigeria, Enugu, Nigeria, ³Center for Clinical Care and Research Nigeria, Abuja, Nigeria, ⁴Center for Clinical Care and Research Nigeria, Abakaliki, Nigeria, ⁵University of Maryland, Enugu, Nigeria, ⁶Morgan State University, Baltimore, USA

Program/Project Purpose: PEPFAR has invested significant resources in strengthening the healthcare workforce in Nigeria. In-service training for health care workers is a key strategic approach to scaling up and sustaining health-related services in response to the HIV/AIDS epidemic. Center for Clinical Care Clinical Research (CCCRN) in partnership with University of Maryland Baltimore implemented a CDC funded training award to build sustainable models for In service training delivery. Training hubs at tertiary health care academic facilities in 9 states were established. Instructional technique of faculty member was strengthened through Trainer of Trainers and HIV update workshops. There is limited post course evaluation data demonstrating effectiveness of health care worker trainings on job performance.

Structure/Method/Design: We conducted a level 3 Kirkpatrick post course training evaluation of a sample of 228 health care

workers trained in Adult and Pediatric ART, PMTCT and TB/HIV at these training hubs between 2012 and 2015. A participatory evaluation team based approach was employed with evaluators from training hubs, state lead implementing partners and CCCRN. Data collection tools included checklists for on the job observation of key tasks and questionnaires. Quantitative Data was analyzed using Strata and Qualitative data was grouped into common themes.

Outcome & Evaluation: The healthcare workers were very cooperative with the evaluation process and keen to contribute towards improving training quality. The training received was found to be useful and applicable in all the program areas evaluated. Evaluators' observation revealed that 94% of respondents ordered appropriate tests and drugs for initiation and monitoring of HIV infected patients according to National Guidelines. In PMTCT under training usefulness 92% stated that they found it useful, in adult ART over 90% of respondents reported appropriate ART initiation had improved.

Going Forward: This study demonstrated that PEPFAR resources invested in training health care workers has demonstrable outcomes on their capacity to perform key HIV service delivery tasks at their work places. Post course level 3 training evaluation should be part of In service training evaluation strategies to identify areas for improvement and identify barriers to real work application. Resources should be allocated for this and further evaluation of return on investment of PEPFAR training funds on population level outcomes of specific HIV related health indicators.

Source of Funding: PEPFAR.

Abstract #: 2.017_HHR

Identifying the Needs and Barriers to Patient-Family Education to Design Educational Interventions that will Improve Neurosurgery Patient Outcomes in Mulago Hospital, Uganda

C. Nwosu¹, S. Batakana², J. Vissoci³, S. Vaca⁴, S. Lim², E. Smith³, A. Fuller², M. Haglund²; ¹Duke University, Durham, North Carolina, USA, ²Duke University, Durham, USA, ³Duke University, Durham, USA, ⁴Stanford Medical School, Stanford, USA, ⁵Duke University Medical Center, Durham, USA

Background: Family members are the primary caregivers for patients at Mulago National Referral Hospital (MNRH), Uganda. They take on responsibilities with little or no knowledge of the patient's illness, key and critical observations to report to hospital staff, and proper overall health management. This ultimately results in poor medication management, high infection rates, and longer hospital stays which negatively impact patients' health outcomes. The objective of this study was to evaluate the needs and barriers to patient-family education in the neurosurgical ward at MNRH.

Methods: A mixed methods approach was used to determine the needs and barriers that family-members face in caring for neurosurgical patients, and the challenges hospital staff encounter in educating family members, through interviews and surveys. The quantitative data collected demographic information about each participant. The qualitative data, guided by standardized interview questions, collected responses from family members and staff about their experiences in the ward. Surveys were collected from 10 staff

and 30 family members and patients and interviews were conducted for 7 nurses and 6 family members during the summer of 2016.

Findings: Quantitatively, most patients had over two caretakers who spoke mainly Luganda, Swahili, and/or English. Feeding, medication monitoring and turning the patient to avoid bed sores were the most performed tasks by caretakers. The symptoms most caretakers were aware of included fever/high temperature, change in breathing and headaches/pain. Qualitatively, the main themes from the interview transcripts were the need for educational materials, ward space limitations that leads to overcrowding, barriers to patient care such as the limited number of nurses, medication management, and staff-caretaker relationships.

Interpretation: Our findings suggest that future interventions should focus on the use of educational materials like posters with pictures, pamphlets and possibly mobile technology (SMS) in Luganda, Swahili, and English for patient-family education in the MNRH neurosurgical ward. These materials should be highly informative on the main tasks required of caretakers such as feeding, medication management and reporting symptoms to hospital staff. There is also a critical need for fewer caretakers in the ward and for hospital staff to lead patient-family education efforts to assist family members in caring for the patients and improving their health outcomes.

Source of Funding: Duke Bass Connections.

Abstract #: 2.018_HHR

A Global Analysis of the Proportion of Surgical Specialists in Relation to Overall Human Resources for Health

K. Nyberger¹, H. Holmer², L. Hagander³, S. Mukhopadhyay⁴;
¹Program in Global Surgery and Social Change, Boston, MA, USA,
²Faculty of Medicine, Lund, Sweden, ³Lund University, Lund, Sweden,
⁴The Program in Global Surgery and Social Change, Boston, USA

Background: Today, five billion people lack access to safe, affordable surgical and anesthesia care. A major reason for this is the pandemic shortage of surgical workforce. In 2015, the Lancet Commission on Global Surgery estimated that at least 20–40 surgeons, anesthesiologists, and obstetricians (SAO) are needed per 100,000 people. This is far from the case in many countries. However, in those countries, there is often also a general lack of physicians and overall health workforce, but thus far, there are no studies on the relationship between the number of specialist SAO and the total physicians and health workforce, and its impact on health outcomes. Our aim is therefore to address this gap.

Methods: In this ongoing study, we use available national level data to calculate the ratio of total SAO to physicians (SAO/physician ratio, in %) for each country with available data. We then investigate the association between the SAO/physician ratio to national health expenditure and gross national income per capita in US\$, maternal mortality ratio per 100,000 (MMR), number of surgical procedures, number of cesarean sections, number of non-physician health workers, and number of medical graduates. We use univariate and multivariate regression analysis. Data sources include published reports, the World Bank, WHO, and OECD databases.

Findings: We calculated the SAO/physician ratio for 148 countries with available data. The SAO/physician ratio ranged from 0.1% in

Afghanistan to 71.6% in Bolivia with a median of 17.5% (interquartile range 10.4%–26.5%) globally. Generally, a higher SAO/physician ratio was associated with a higher MMR. Some countries, such as Qatar and Bosnia and Herzegovina, however, have low MMR despite a low SAO/physician ratio. The association between the SAO/physician ratio and additional variables remains to be assessed.

Interpretation: In this ongoing study, preliminary results indicate inverse correlation of the SAO/physician ratio to MMR. Next steps include a full assessment of all selected variables, as well as assessment of the cadres of surgeons, anesthesiologists, and obstetricians separately. Assessing the variation in proportion of SAO to total physician workforce will contribute to an improved understanding of the role of surgery in health systems worldwide.

Source of Funding: None.

Abstract #: 2.019_HHR

Training Healthcare Workers on the Use of Electronic Medical Records in HIV clinics in Kenya: An Evaluation of Three Training Models

C. O'Brien-Carelli; University of Washington, Seattle, NY, USA

Background: There is substantial evidence that use of electronic medical records (EMR) can improve the quality of health services and mitigate the overburdening of healthcare workers, yet a number of recent studies have identified inadequate training in health informatics as a persistent barrier to the implementation of EMR in low-resource settings. From September 2012 to September 2014, The International Training and Education Center for Health (I-TECH) trained 1,423 Kenyan healthcare workers in Western Kenya on the use of EMR for point-of-care data entry and clinical decision-making using three distinct training models.

Methods: The study is a quantitative program evaluation of the three training models comparing cost, geographic coverage, and quality of training, as measured by pre- and post-tests administered before and after the trainings. Paired t-tests were conducted to examine the changes in score from pre-test to post-test within periods, and multiple linear regression was used to examine the associations between mean post-test scores variable by the training models and adjusted for pre-test score, age, sex, province, and cadre. Test questions were also divided into categories based on adult learning theory, including *Knowledge*, *Computer Skills*, and *Attitudes* towards EMR systems.

Findings: Cost differed by training model, with a substantial reduction in cost per trainee when the three-day, on-site model was administered. For the quality outcome, pre-test scores differed by training model, age, and gender, with females scoring lower than males on the pre-test in all categories. There was no statistically significant difference in total mean change scores by training model. However, these scores were primarily composed of the Knowledge Category. When the Computer Skills Category was evaluated separately, the three-day training models showed statistically significant ($p < 0.001$) learning loss when compared to a five-day training model.

Interpretation: The three-day, on-site model was the least expensive, and quality of training, as measured by pre- and post-test scores, did not differ by training model. Shorter trainings are associated with