

Interpretation: Costs of treatment for femur fractures are driven largely by personnel costs and length of stay. Despite long delays from injury to surgery, the cost of IM nailing was nearly equal to skeletal traction. Reducing time from injury to surgery would make IM nailing cost saving relative to conservative treatment.

Source of Funding: None.

Abstract #: 2.010_HHR

Developing and Refining the MSGH Degree Program: A Theory and Competency-Driven, Multi-Phase Curriculum Development and Alignment Process

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Program/Project Purpose: This paper will discuss a theory-driven, five-phase process for curriculum development and alignment in a Master of Science in Global Health (MSGH) degree program. Northwestern University's MSGH degree is an inter-professional, competency-driven program that prepares students for careers in the field through generalist, leadership-focused, real-world, practical professional education.

Structure/Method/Design: This five (5) phase curricular process included multiple program stakeholders (faculty, staff, students, practitioners and alumni) engaging in a variety of participatory activities. Phases included: 1) Unit Assessment, 2) Literature and Expert Review, 3) Faculty Course Assessment, 4) Program Implementation, and 5) Alignment/Revision. These processes were a) led by a multidisciplinary faculty and staff team, b) anchored in adult education philosophy and theory, and c) aligned with the degree's guiding vision, mission, and values.

Outcome & Evaluation: Curriculum development and ongoing implementation, alignment and refinement efforts highlight the unique opportunity that global health educators and practitioners possess to collaboratively reexamine, evaluate and restructure educative preparations for future leaders in the global health workforce. Twenty (20) lessons learned identifying best practices and areas for improvement from the five phases will be shared.

Going Forward: Future directions for 2016–2017 implementation, a five-year curriculum development planning cycle, and program sustainability will be highlighted.

Source of Funding: None.

Abstract #: 2.012_HHR

Strengthening Health System - Evidence from the use of Bi-directional SMS-based Screening and Feedback System to Improve Efficiency and Quality of Disease Surveillance in Vietnam

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Background: Mobile health (mHealth) has recently become the emerging and feasible practice to strengthen health systems, especially in low-resource settings. However, most mHealth initiatives are pilot efforts and only conceptually illustrate how to address determinants of health interventions using mobile technologies. Therefore, there is still an urgent need of vigorous evidence about mHealth and its use in public health. This study examined the use of bi-directional Short Message Service (SMS) in disease surveillance in Vietnam, and its evidence in improving efficiency and quality of reporting task.

Methods: 80 health staff from 40 communes of Hoa Binh and Hung Yen provinces got training and participated in two 6-month pilots: one with one-way, and one with bi-directional SMS system to report two diseases: influenza and diarrhea using cell phone. After each examination and checking-in onto the paper logbook, participants were asked to report the case by texting an SMS to a designated number and make notes of successfully reported cases. A central data repository server was set up to collect SMS reports, and aggregate reported patient data. Efficiency and quality of the reporting work were assessed by the evaluation of the qualitative questionnaires, and the comparison of the texted SMS reports to the patient logbooks. Data entry was conducted using EpiData, and data analysis were performed using STATA.

Findings: With the use of bi-directional SMS system for assisting in error screening and reminder and feedback provision vs one-way system, participants were 4.62 times more likely (95% CI 3.93–5.44, $p < 0.0001$) to send correctly formatted text reports, and 3.42 times more likely (95% CI 2.72–4.33, $p < 0.0001$) to have precise information in their texted messages. Results also revealed that while positions, ages or gender of participants did not statistically influence the results, ethnicity and management role did.

Interpretation: The deployment of the bi-directional SMS-based reporting system both significantly improved participant's engagement in SMS texting protocol, and greatly enhance their reporting quality. The study demonstrated a robust evidence of a practical utilization of SMS in disease reporting system to replace the traditional paper-based one that has great potential for the scale-up and national-wide implementation.

Source of Funding: Dartmouth College; Institute of Population, Health and Development.

Abstract #: 2.013_HHR

Learning Across Borders: Developing a Pharmacist-Driven Continuing Professional Development Program Through the Baylor College of Medicine International Pediatric AIDS Initiative Pharmacy Network (BIPAI-PN)

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Program/Project Purpose: As the leading provider for pediatric HIV care and treatment in the world, BIPAI has been building

capacity of clinical and non-clinical staff in its Centers of Excellence (COEs) in Romania, Botswana, Lesotho, Swaziland, Malawi, Uganda, and Tanzania. Each COE has pharmacy professionals who play a critical role in patient care. The BIPAI-PN is a community of pharmacy professionals from the COEs that enables opportunities to build capacity, improve operational and clinical pharmacy practice, and share best pharmacy practices. COE pharmacy professionals have identified continuing professional development (CPD) as a top priority and unmet need. The BIPAI-PN thereby developed a CPD program, in which pharmacy professionals can learn and collaborate by creating connections across organizational and geographical boundaries.

Structure/Method/Design: The BIPAI-PN conducted a needs-assessment to characterize the pharmacy practice within each COE, identify educational and training needs, and assess the type of engagement desired within the BIPAI-PN. Based on the assessment, a pilot curriculum was developed focusing on three core components: supply chain management, clinical pharmacy practice, and pharmacy management and policy. The curriculum consists of 17 pre-recorded learning modules and 10 corresponding live, web-based learning components designed to promote exchange of information and develop practice skills (e.g. facilitated discussion, case studies, journal club). In addition, there are five elective modules that participants may choose based on their needs and interests. The curriculum was developed by U.S.-based pharmacists specialized in HIV, global health, and pediatrics with input and review of COE pharmacy professionals. The curriculum will begin November 2016 and run through September 2017.

Outcome & Evaluation: Quantitative outcomes will include curriculum activity tracking (e.g. number of participants, modules, and live learning components), participant pre- and post-test scores, and curriculum completion rates. Qualitative outcomes will be measured by surveying participants about individual learning modules and interactive components and also about their overall professional development.

Going Forward: This CPD program will serve as the basis for growth of the BIPAI-PN, and it will enhance the knowledge and skills of pharmacy professionals at the COEs as they continue to serve children.

Source of Funding: This program is supported by Baylor College of Medicine.

Abstract #: 2.014_HHR

Health System Predictors of Access to Maternal Health Medicines in Low and Middle Income Countries

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Background: An approximate 800 women die every day from pregnancy related complications like postpartum hemorrhage (PPH) and pre-eclampsia and eclampsia. These complications can be prevented by appropriate use of essential maternal health medicines – which are not readily available in low and middle income countries. Researchers attribute these to gaps in structure and functions of multiple health system building blocks. But little is known about the relative impact of each building block on access to

essential maternal health medicines. The main objective of this study was to determine the relative impact of select health systems building blocks (herein referred to as health system factors) on access to these medicines in low and middle income countries.

Methods: We carried out a quantitative cross-sectional analysis of data from 37 USAID Maternal and Child Health Integration Program (MCHIP) survey reports published in 2011–2012. These reports summarized country-wide assessments of access to essential medicines for maternal health in 37 countries. We used the fishbone (Ishikawa) diagram as analytic framework to determine the relationship between access (measured by availability, affordability and accessibility) and health system factors in six levels: government/regulatory, pharmaceutical supply, health facility, health resources, health financing, data reporting.

Findings: High access to essential medicines for maternal health were significantly associated with health system factors at the government/regulatory and health professional level. A majority of countries had these medicines listed in their essential medicines lists. However, for many countries, standard treatment guidelines were not available, updated, or standardized. Lack of demand by health professionals at the health facility level and a lack of in-service training in the use of these medicines also predicted poor access even though awareness of the medicines was generally high among health professionals.

Interpretation: Findings from this study highlights the complexities that underlie making essential medicines for maternal health available and accessible. The fishbone diagram is a useful theoretical framework for illustrating the complexity of translating research findings into practice and describing predictors of access to essential medicines for maternal health across countries. Strong predictors identified should enable policy makers and stakeholders prioritize, develop and implement tailored interventions to improve availability, affordability and accessibility of these life-saving maternal health medicines in LMICs.

Source of Funding: None.

Abstract #: 2.015_HHR

Status of Primary Health Workforce in a Nigerian State: Findings from Enrollment into a Digital Health Workforce Registry

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Program/Project Purpose: Classified alongside 57 countries by the WHO as experiencing a health workforce (HW) crisis, Nigeria's health system dysfunction is aggravated by mal-distributed and lopsided skill mix of available personnel. For effective health system planning, comprehensive and accurate data on the distribution, mix and migration dynamics of HW is required. An integrated human resources information system (iHRIS) is a valuable digital repository that eases the collection, maintenance and analysis of HW data. To improve HW management, the Institute of Human Virology Nigeria, an NGO that supports states to provide quality HIV services, assisted Nasarawa state to enroll primary health care (PHC) employees into the iHRIS-based state HW registry.