

# CLOSING THE KNOW-DO GAP: IMPLEMENTATION, PROGRAM, AND DELIVERY SCIENCE IN GLOBAL HEALTH

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## Evaluation of a village-level safe water treatment and storage intervention in Bassi Pathana, India

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**Background:** Efforts to implement village-level water, sanitation, and hygiene (WaSH) projects often suffer challenges related to appropriate technology, local availability of supplies, and sufficient training and equipping of the implementation team. This study highlights lessons learned from a safe drinking water treatment and storage project undertaken through a community-based participatory research collaboration in rural Punjab, India. Partners include a community-based organization, nine villages, and both a U.S. and Indian public health academic program. A safe water treatment and storage pilot project was initiated in four of the nine villages in Spring 2013. Three project activities were evaluated including the installation of custom-made containers in 180 homes with a piped water supply, the identification of stand-alone and affordable drinking water containers for low-income households without a tap, and point-of-use chlorine treatment and awareness.

**Structure/Method/Design:** Sixty-seven of the custom-made containers were evaluated for technical merits using a checklist. A questionnaire was developed to assess user satisfaction. Market research was conducted to assess container preferences, availability, and affordability for families without a tap. Last, point-of-use chlorine treatment awareness was assessed for all types of containers.

**Results (Scientific Abstract)/Collaborative Partners (Programmatic Abstract):** Mehar Baba Charitable Trust, Post Graduate Institute

**Summary/Conclusion:** Community demand for a safer and more convenient way to store water was evident. Performance of the custom containers was mixed and design and implementation problems included nonsealing lids, leaky spouts, difficult to clean, and proper placement. An external problem included low water pressure resulting in low flow and difficulty in tracking flow, which is required for proper chlorination. Appropriate stand-alone containers were identified in the local market for 250 to 650 rupees. Willingness to chlorinate was high and “keeping children healthy” was an effective educational message. Chlorine tablets were only available in bulk, making it difficult to procure for home use. The team repackaged chlorine tablets for more effective household distribution. Educational materials for point-of-use chlorination were also developed. New water container designs should be fully vetted before widespread implementation, demand for WaSH is increasing due to promotional efforts, and a new way to treat drinking water with chlorine is more acceptable than previously thought.

## Global clinical immersion for primary care training: Learning from the global community

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**Background:** The growing global emphasis on noncommunicable disease prevention along with the opportunity to learn primary health

care methods from diverse areas of the world, initiated the development of a global clinical immersion experience in the primary care nurse practitioner programs at the University of Michigan School of Nursing (UMSN). A pilot clinical immersion program in Nakhon Ratchisima, Thailand for nurse practitioner students to “give and learn” from Thailand’s primary health care system while also demonstrating noncommunicable disease prevention in a country grappling with the rapid rise of these diseases.

**Structure/Method/Design:** The students and faculty spent 2 weeks working in two local health care clinics managed by the Provincial Health Office. Prior to arrival in Thailand, students were surveyed relative to self-perceived cultural competence and self-efficacy. Once in Thailand, each student was coupled with a nursing student from Suranaree University of Technology (SUT). At the clinical site, the couplet worked together to provide acute and primary care to local villagers in the morning. In the afternoon, the groups would travel the village doing community assessment, home visits, and educational programs. On-site clinical conferences consisted of formal community rounds, clinical case review, and review of community-specific epidemiology. Additionally, faculty and students from UM had daily debriefing sessions and two other formal clinical conferences. During the clinical immersion, students blogged about their experiences to share their observations and clinical interactions with other nursing students in the United States and Thailand. Upon completion, the students completed retrospective pre- and post-surveys to evaluate their perception of the influence of socio-cultural factors on health care.

**Results (Scientific Abstract)/Collaborative Partners (Programmatic Abstract):** Oversight, direction, and clinical preceptorship was provided by a local nurse practitioner, an SUT faculty member, and a UM faculty member at each site.

**Summary/Conclusion:** Students and faculty from SUT and UMSN found the experience valuable and unique. UMSN students not only appreciated the sociocultural influence on health care administration and delivery, they underscored several influencing factors that cross cultures and countries: poverty, mental illness, and health literacy. The purpose of this presentation is to discuss the implementation of a global clinical experience, student perceptions/data, and strategies for sustainability.

## Process improvement: A valuable tool for health-system strengthening in developing countries

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**Background:** The burden of orthopaedic trauma at the Komfo Anokye Teaching Hospital in Kumasi, Ghana is significant. Compounding this burden are barriers to getting patients in and through the operating theatre. These barriers are a contributor to infection rates for open fractures by limiting the ability to conduct serial irrigation and debridement as well as delayed primary closures. In collaboration with the Institute for Global Orthopaedics and Traumatology, a process improvement approach, typically used in manufacturing and business, was applied to map out the operating

theatre capacity and patient flow to better identify areas of improvement and impact intervention to improve infection rates for open fractures through academic partnerships.

**Structure/Method/Design:** The process mapping techniques used followed the framework and principles outlined in *Workflow Modeling: Tools for Process Improvement and Application Development* (2nd ed.) by Alec Sharp and Patrick McDermott. The steps include defining the scope of the operating theatre, identifying key personnel, and conducting interviews over a 3-week period to develop a process map. The process map was validated by shadowing all key personnel and operating theatre daily workflow and presented to key stakeholders.

**Results (Scientific Abstract)/Collaborative Partners (Programmatic Abstract):** This is a partnership between KATH leadership and IGOT.

**Summary/Conclusion:** A map of the theatre was produced starting with the “decision to operate” and ending with the patient being transported to the wards after surgery. This map identified in a visual way the complexity of workflow necessary to get a patient in and thru the operating theatre. Key areas for streamlining and improving communication were outlined and presented to key stakeholders. The framework used for recommendations suggested seven opportunities that are possible without any additional funds, personnel, or resources.

The process map and methodology used is dynamic and if embraced can serve as a practical and simple tool to advocate and facilitate change in the system. Those involved in the process, at any level, can refer to the process map for clarification of workflow, contribute to feedback on improvement and solutions for limitations, as well as identify data collection points. This same approach can be used to advocate for why a solution should be supported using cost-effectiveness comparison and outcome measures. By systematically approaching improvements and documenting progress you ensure sustainability in the system. Process mapping can be a valuable tool to apply in a resource-constrained setting to ensure appropriate and sustainable interventions.

### Building community trust through quality assurance of malaria diagnosis and management at a rural clinic in Uganda

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**Background:** At a rural primary care clinic in Uganda, a patient survey indicated that the community members feel it provides a high, trustworthy quality of care. However, no quality assurance studies have been conducted to characterize the quality of care provided. Malaria remains a leading cause of morbidity and mortality in Uganda. Widespread efforts have been made by the public sector to build capacity in diagnosis and treatment of the disease. This study aims to evaluate the quality of care provided by the clinic by examining malaria diagnosis and treatment patterns and assessing the degree of adherence by the clinic staff to national malaria treatment guidelines.

**Structure/Method/Design:** A retrospective chart review of patients seen at a rural clinic in Uganda in a 12-month period from June 2012 to June 2013 was conducted to determine the rates of appropriate diagnosis and treatment of malaria. Deidentified data on demographics, presenting

symptoms, given diagnoses, medications, blood smear results, and notes on management decisions were recorded in a database. After excluding charts with missing data points, a final sample of 1001 patients was analyzed using SAS and Microsoft Excel.

**Results (Scientific Abstract)/Collaborative Partners (Programmatic Abstract):** Of the total 390 positive blood smears, only 3 (0.8%) were not started on malaria treatment. Of patients documented to have a negative smear (572 or 57.1%), 83 (14.5%) were started on empiric malaria treatment. Of the 21 patients started on second-line quinine-based treatment, 11 (52.4%) had a documented and appropriate indication. Five patients that were documented to have a diagnosis of malaria and a presenting symptom of seizures, qualifying them as severely ill, were not started on parenteral treatment or referred for higher-level care. Of all patients documented to have a positive smear, in addition to appropriate malaria treatment, 7 (1.8%) were concurrently started on an antibiotic (i.e., doxycycline), documented as malaria treatment.

**Summary/Conclusion:** Overall, clinic staff demonstrate a high index of suspicion for malaria infection. Nearly all patients with positive diagnostic tests were appropriately started on treatment and a small number were started on empiric treatment despite a negative test. Further training is needed in identifying and documenting cases of severe malarial illness and the appropriate management sequence. This may significantly impact mortality and morbidity. Additionally, second-line treatment is being overprescribed, and some inappropriate antibiotic regimens are being prescribed to supplement malaria treatments that are not only ineffective but may contribute to antimicrobial resistance and unnecessary medication side effects.

### Development and implementation of a sustainable monitoring and evaluation protocol for a malnutrition rehabilitation program in Lima, Peru

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**Background:** In Peru, UNICEF estimates the prevalence of malnutrition in children less than 5 years old at 18% in urban areas, and up to 33% in rural regions of the country. In 2009, researchers from Peru’s Universidad Peruana Cayetano Heredia established El Comedor as a malnutrition-rehabilitation program in the impoverished neighborhood of Ermañito Alto in Lima, Peru to combat multiple risk factors for childhood malnutrition. This program provides direct nutritional support to at-risk children and nutritional education programs to their caregivers. Since its inception, El Comedor has lacked a sustainable monitoring and evaluation protocol. This project describes an approach to the development and implementation of such a protocol in a resource-limited setting.

**Structure/Method/Design:** To inform the development of a monitoring and evaluation (M&E) protocol, a thorough literature review was performed to identify successful, low-cost strategies to quantify a program’s impact. This resulted in the design of a tripartite approach, including the collection of anthropometric data, the creation of a user-friendly, comprehensive database for extensive data collection, and the development of a novel knowledge, attitudes, and practices caregiver schedule. The implementation of the protocol was carried out via individual home visits by a research team composed of local community health workers and UTMB students. These teams collected anthropometric measurements on children who previously participated in El Comedor and administered the schedule to the children’s caregivers. The anthropometric values measured will be assessed in conjunction with the children’s baseline data recorded