

**Findings:** Process mapping identified barriers of the inner setting (frequent nursing turnover, ineffective communication between OT staff and administration, inconsistency in standards for both autoclave use and scrubbing practices, and unclarified responsibility for antibiotic administration); outer setting (increasing social unrest); and resources (lack of running water and adequate skin prep in obstetrics, lack of distilled water for autoclave use, and lack of sterilization certification methods).

**Interpretation:** Many perioperative infection prevention norms are complex and challenging to measure; in particular, sterile processing, skin decontamination, and antibiotic administration. Process mapping identified resource constraints and communication factors associated with inefficient processes. Implementation science, especially process mapping of complex perioperative processes, is a valuable tool for surgical safety quality improvement.

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### Traditional Music as a Sustainable Social Technology for Community Health Promotion in Africa: “Singing and Dancing for Health” in Rural Northern Ghana

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**Program/Project Purpose:** This project and accompanying implementation research aim to promote rural health in northern Ghana—specifically, to reduce incidence of malaria and sanitation-related illnesses, using local expressive arts both in professional performances and subsequently sustainably embedded in rural communities.

**Structure/Method/Design:** The project was designed in five phases and carried out by a collaborative team based in Ghana and Canada, using a participatory action research methodology. Phase 1 entailed formation of the team, and production of musical dance-dramas, deploying traditional music and dance resources within dramatic narratives highlighting key health issues, and underscoring proper and improper attitudes and behaviours. In Phase 2 we administered KAP surveys in three rural communities to gauge attitudes and practices regarding malaria and sanitation. In Phase 3 we held professional dance drama performances in the same communities. In Phase 4 we repeated surveys to evaluate impact. Finally, in Phase 5 we established, equipped and trained amateur performance groups in the rural communities themselves, to promote public health messaging through performances on special traditional, civic and school occasions. Our hypothesis was that these groups would be more sustainable and effective since they are embedded in their communities, and that their health messaging repertoires would enter into local oral tradition.

**Outcome & Evaluation:** Assessments (Phases 2 & 4) demonstrated the positive impact of professional performances in fostering positive health behaviours and also preparing communities to enthusiastically support the new amateur performance groups of Phase 5.

While the high cost of professional performers in Phase 3 was unsustainable, amateur rural performance groups have continued to thrive over the past year and a half.

**Going Forward:** Further longitudinal research over the coming years will be required in order to determine the sustainability of the engaged community approach, including the longevity of amateur performance groups, their impact, and their ability to sustain themselves and their health repertoire messaging through oral transmission. Such research will also clarify the extent to which outside support is still required, and the best means of establishing such groups. Meanwhile we seek resources to replicate this model in other villages.

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### Knowledge and Skill Retention of a Novel Lay-Provider Trauma Training Curriculum in Rural Peru: A Longitudinal Study

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**Background:** The World Health Organization (WHO) recognizes that up to 50 million individuals suffer non-fatal injuries annually due to road traffic accidents and predicts that by 2030 road traffic injuries will be the eighth leading cause of death worldwide. While the burden of road traffic injuries is decreasing in high-income countries (HIC), low- and middle-income countries (LMIC) are disproportionately affected with 90% of road traffic deaths worldwide and only 20% of the world's vehicles. The majority of these deaths occur pre-hospital, however many LMIC frequently lack formal pre-hospital systems or Emergency Medical Services (EMS). Our current ongoing initiative in the Sacred Valley found that over 70% of trauma patients utilize non-EMS methods to arrive at receiving hospitals in Cusco, Peru. Subsequently, a novel lay-provider first-responder training course was developed and implemented in rural communities surrounding Cusco, Peru. The current project established a longitudinal study to evaluate course efficacy.

**Methods:** A novel pre-hospital trauma course was developed from local trauma trends and current WHO guidelines. The course utilized an illustrative flipbook and focused skill sessions intended for lay-providers with limited formal education. By partnering with Sacred Valley Health, a local non-governmental organization, five course participants provided longitudinal data regarding knowledge and skill retention. A standardized 14 point test was administered pre-course, post-course, and at 3, 6, 9, and 12-month intervals. Individual and mean test scores were used for comparison.

**Findings:** The test scores significantly increased pre-course and post-course administration, with respective mean scores of 7 and 11. Additionally, course participants demonstrated knowledge and skill retention at 3 months after course completion, with a mean

test score of 11.6. Data is still being collected for 6, 9, and 12 months post-course completion.

**Interpretation:** As part of an ongoing initiative, a novel lay-provider trauma course was developed and implemented in rural Peru to address disparities of pre-hospital care in LMIC. Initial data indicates course efficacy with adequate knowledge and skill retention. Future project goals include completing longitudinal course evaluation, expanding training capacity, transitioning to in-country leadership, and collecting end-point data regarding patient outcomes in the Cusco region of Peru.

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### Does the Measure Matter? Observed Quality of Care Score and Child Mortality in a Multi-Country Analysis

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**Background:** As interest grows on what occurs within the “black box” of health care service delivery in lower and middle income countries, rigorous metrics are necessary to measure the quality of care that a health facility provides. Face validity of a quality metric for health administrators and policy makers requires that higher quality scores be associated with better health outcomes in the population the facility serves. This analysis aims to validate a metric of sick child care quality adapted from the Integrated Management of Childhood Illnesses (IMCI) guidelines by assessing its association with under-5 mortality rates.

**Methods:** We use nationally representative health facility and population data in Kenya, Malawi, Namibia and Senegal. The quality of sick child care is defined as the proportion of 24 clinical care items from the IMCI guidelines that a provider completes during a sick child visit, averaged across the facility. Under-5 mortality is calculated in each sampled facility’s catchment area. We use negative binomial models to examine the unadjusted association between facility quality and mortality. We stratify the association at median utilization of care for children under 5 to examine areas where quality is most likely to contribute to mortality, and we examine how the association differs based on underlying regional mortality risk.

**Findings:** Among the 1,454 facilities in the sample, IMCI quality score averaged 0.37 (SD 0.15) and median mortality in the catchment area was 0 deaths per 1000 (IQR 0–58). Quality and mortality were negatively but not significantly associated overall and in strata of utilization; the association was stronger within high utilization areas (IRR -0.50; 95% CI -1.44, 0.63 vs. IRR -0.24; 95% CI -1.56, 1.08), as hypothesized. Quality was most strongly associated with mortality in regions with moderate mortality (IRR -0.89; 95% CI -1.71, -0.07) in comparison with regions with low or high mortality risk.

**Interpretation:** This analysis suggests that a score of adherence to IMCI guidelines in a facility may be associated with catchment area under-5 mortality rates, particularly in areas where people frequently utilize care and have average baseline mortality risk. Further research

is needed to validate this quality of care metric as a predictor of child mortality.

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### Collaborative Methods to Prioritize Oral Health and Healthcare in Kenya

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**Program/Project Purpose:** With only one dentist for every 42,000 people, Kenya falls below the World Health Organization’s (WHO) recommendation of one dentist for every 7,000 individuals. Despite a well-trained dental and public health workforce, oral health is not included in the country’s health policy framework and donors do not target oral health. A cross-national partnership (Columbia University, the University of Nairobi, the Kenya Ministry of Health, Kenya Dental Association), is using collaborative methods to bring visibility to oral health and develop a framework to prioritize and inform oral health policy and advocacy in Kenya. These methods may be modified for other sites/settings.

**Structure/Method/Design:** A six-month planning phase that included in-country and phone meetings culminated in a two-day Oral Health Summit (Summit) designed to discuss oral health needs, resources and gaps in oral health policy, care and funding. Participants included medical/dental professionals and educators, public health experts, policy makers, funders, pharmaceutical/dental products manufacturers, community health workers, and community-based organizations. Key stakeholder presentations, data from a recently concluded national oral health (WHO Pathfinder) survey, SWOT analysis and consensus building exercises were used to develop shared goals and vision. A modified Delphi Method conducted among an expanded group of collaborative members was used to prioritize needs and develop a framework to inform health policy.

**Outcome & Evaluation:** Over 80 participants attended the Summit. Data suggest high levels of disease, and rural/urban disparity in service delivery, but policy and public resources are inadequate to address needs. Stakeholders identified priorities within five topical areas: policy, training, data/surveillance, integration with non-dental healing and helping professions, and collaboration with the private sector. As a direct result of the Summit, The Ministry of Health provides weekly oral health social media outputs, and the Inter-religious Council of Kenya has mobilized resources for oral health outreach.

**Going Forward:** The partnership has put in motion plans for participatory demonstration projects that can inform policy. The potential of the partnership will be used to build capacity and seek funding for future initiatives, but integration with existing care