strengthening in low resource settings. Investments in electronic medical record (EMR) systems offer promise for improved information for patient and public health program management. Strong data quality (DQ) is a precursor to strong data use. Routine DQ assessment (DQA) within EMR systems can be resource-intensive when using typical methods of audit and chart review. Automated database queries on the completeness, accuracy and timeliness of data offer an efficient alternative. This DQA focuses on Haiti's national EMR - iSanté - a system deployed in 119 health care facilities and containing longitudinal data for more than 400,000 patients.

Methods: This mixed-methods evaluation focused on data related to HIV care and treatment. We first used a qualitative Delphi process to identify DQ priorities among local HIV experts, followed by a quantitative DQA on these priority data elements. The quantitative DQA examined 13 indicators of completeness, accuracy and timeliness of data using retrospective data from HIV patients, collected during more than 3.5 million encounters from 2005— June 2013. We described levels of DQ for each indicator over time, and examined the consistency of within-site performance. Using generalized linear models (GLM) with logit link and binomial errors for each of the 13 DQ indicators, we examined associations between DQ results and site and system characteristics, such as facility type, urban vs. rural location, and number of iSanté system users.

Findings: Ninety-five sites using the iSanté data system were included in the evaluation. On average, completeness was high for demographic data but low for clinical data, accuracy of age data was low, and timeliness of data entry was low. For most indicators, DQ tended to improve over time, both overall and within specific sites. DQ was highly variable across sites, and sites which performed strongly in some indicators performed weakly in others. In adjusted analyses, site and system factors with generally favorable and statistically significant associations with DQ indicators were University hospital type, private sector governance, presence of more advanced IT infrastructure, greater site experience, greater maturity of the iSanté system, having more overall system users but fewer new users.

Interpretation: The heterogeneity in performance on various priority DQ indicators across sites indicates that excellent DQ is achievable in Haiti, but that many sites have much work to do to improve their DQ performance. A dynamic, interactive "data quality dashboard" within iSanté could bring transparency and motivate improvement. Further investment in the IT infrastructure supporting iSanté, including assuring stable power supply, and in on-going training for new users, is also warranted.

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Abstract #: *02ITIS025*

An analysis of drug stock-outs in rural Western Kenya and subsequent patient impact

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Background: The objective of this study was to first understand root causes of drug stock-outs at primary community level clinics in Western Kenya, and second, to understand the impact on patient health and health-seeking behaviors as a result of stock-outs.

Methods: Data collection took place at 4 different rural dispensaries located in Western Province, Kenya. Data on the types of drugs most commonly out of stock, along with frequency of stock-outs was collected using existing dispensary records for the 3 prior fiscal quarters. Data for patients was collected from randomly selected patients visiting the selected dispensary on a given day. Participants: 20 adult patients of both genders were interviewed from each dispensary with the use of a pre-written questionnaire. Interviews were carried out with the assistance of a translator in either Swahili or Maragoli. Participants were excluded if they were younger than 18. Data regarding drug stock-outs was analyzed using Microsoft Excel to determine length of stock-out, frequency of stock-out, and types of drugs most frequently out of stock. For patient information, data was summarized and categorized to determine how often patients could recall experiencing a drug stock-out, what drug was out of stock, and whether patients sought alternative treatment. Data was analyzed using a t-distribution due to limited sample size. Informed consent was received from participants only if they agreed after an explanation of the study. Approval was given by the University of Toronto ethics board.

Findings: 13 out of 16 essential medicines were found to have been out of stock at least once during the 3 fiscal quarters analyzed. Prevalence of stock-outs ranged from 16% to 77%. Primary causes for drug stock-outs were found to include poor inventory management, delays in order submission, inaccurate order quantities, and unfulfilled orders. Regarding patient impact, it was found that while drug stock-outs do not heavily impact patient health-seeking behaviors, it affected the ability of patients to access treatment. In most cases, when dispensaries did not have the available drugs, patients were advised to go to a chemist to purchase the medication instead. Many patients went without treatment, or purchased a partial portion instead due to their financial situation.

Interpretation: Based on the results, it is clear that drug-stock outs continue to be a pervasive problem at the dispensary level in Western Kenya. This is of significant concern, as it creates financial barriers to healthcare for patients. Lack of treatment, or inappropriate treatment, may result in poor patient health outcomes, as well as future problems regarding drug resistance if patients do not receive full doses. Further analysis should be undertaken to determine this.

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Abstract #: *02ITIS026*

Mixed methods characterization of safety incidents involving children in family practice to inform improvement

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Background: 26% of UK child deaths have identifiable failures in healthcare. Despite children accounting for 40% of family practice doctors' workload, little is known about the safety of care in the community setting. Incident report data can offer insights into the nature and underlying causes of unsafe care. This study aimed to characterize pediatric safety incidents in family practice reported to a national (England and Wales) reporting system.

Methods: We undertook a mixed methods study combining a detailed data coding process of reports, a descriptive statistical analysis, and a thematic analysis of a theoretical and special-case sample of reports. An inductive, grounded approach was used to apply codes to each incident report from a codebook containing two distinct multi-axial coding frameworks to describe the type of safety incident (administration, medication, etc.) and contributory factors (patient, staff, environmental, etc.), as well as harm severity. Cross-tabulations identified relationships between incident types and contributory factors. New ideas and hypotheses emerged throughout each step of analysis for later corroboration. All reports of moderate harm, severe harm, or death were qualitative analysed. Thematic analysis of reports provided in-depth contextual insights. Subject matter experts discussed findings and identified primary and secondary drivers for improvement and to raise recommendations for practice.
Findings: 1788 reports were identified with 765 (42.8%) describing harm to children. Priority areas (most harmful incidents) and common contributory factors were identified. Vaccine-delivery errors such as administering the wrong vaccine resulted from failures and discrepancies in documentation. Errors of medication provision such as prescribing were frequently the result of inadequate double-checking. Delays or failures to refer to hospitals were commonly underpinned by poor understanding of referral protocols. Treatment and procedure failures such as not providing lifesaving care identified further training needs of practitioners. Knowledge issues also underpinned diagnosis and assessment errors, for example diabetic emergencies. Qualitative analysis identified poor referral and treatment decisions in severely unwell or vulnerable children (e.g. under care of social services) as well as system several system failures contributing to a delayed diagnosis and assessment of such children; these featured prominently in incidents with severe harm outcomes.
Interpretation: The most frequent and severe sources of reported iatrogenic harm were identified. Priority areas to mitigate harm to children have been identified; in addition recommendations for improvement, include: improving processes relating to vaccine documentation; mandatory pediatric training for all family physicians; and utilizing human factors awareness to minimize mistakes in error-prone areas of practice. These recommendations for improvement can form the basis of improvement projects or initiatives, and collectively contribute to the design of logic models for further development and testing using improvement methods in clinical practice.
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Abstract #: *02ITIS027*

Identifying drivers for improvement using a mixed methods analysis of pediatric vaccine-related safety incidents from England and Wales (2003-2013)

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Background: Immunization has saved millions of lives from vaccine-preventable disease worldwide. Around 14 million vaccines are administered to children annually in the UK alone. Benefits of immunization for the individual and the public are clear, and whilst adverse reactions following vaccination are rare, little is known about the safety of their delivery. The aim of this study was to characterize immunization error-related incidents involving children in family practice reported to a national reporting system. The objective was to identify concepts and content of a change model for safer, effective, timely and equitable vaccine delivery to children.
Methods: A multi-axial coding (incident descriptors, contributory factors, harm outcomes) was applied to safety incident reports from family practice in England and Wales. Frequency distribution, cross-tabulation, discriminatory and cluster analyses explored the relationship between incident types and respective contributory factors. New ideas and hypotheses emerged throughout each step of analysis for later corroboration. 'Hunches' during the coding process were documented. A theoretical sample reports supporting and disconfirming these 'hunches' were selected for thematic analysis to provide in-depth contextual insights. Subject matter experts identified key primary and secondary drivers for improvement.
Findings: Most reports described harm (n=1070; 59.8%) including 3 deaths, 68 reports of moderate harm and 1009 reports of low harm. Failure of timely vaccination was the potential cause of three child deaths from meningitis and pneumonia, and described by a further 113 reports. Vaccine administration errors included the wrong number of doses (n=479), wrong vaccine (n=317), and wrong timing (n=177). Discrepancies between documents such as personal held records and child health records frequently contributed to these incidents. An empirical, grounded model summarizes opportunities to improve vaccine-delivery. Key components include process failures at: the staff level such as making mistakes during vaccine delivery (e.g. confusing siblings for each other or selecting the wrong vaccine); the parent level such as failing to bring personal held vaccine records; and, the system level such as sending appointments for the wrong vaccine.
Interpretation: Recommendations for improvement are targeted at education, policy, manufacture and practice. Example recommendations include: creating a unified documentation system to prevent record discrepancies; encouraging a renewed commitment from vaccine manufacturers not to produce vaccines with similar packaging; and utilizing human factors awareness in practice to reduce administration mistakes. This is the largest analysis of vaccine-related pediatric safety incidents to date and demonstrates the value of utilizing incident reports to generate ideas for improvement. These recommendations can form the basis of improvement projects, and collectively contribute to the design of logic models for further development and testing using improvement methods. Important lessons for improvement and recommendations have been generated to mitigate harm to children.
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Mobile solutions for public health supply Chains

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Program/Project Purpose: In many countries, cumbersome paper-based information systems provide late or incomplete information about stock levels of health commodities at health facilities, making it difficult for program managers to make informed decisions about stock positioning and resupply. From 2010-2014, JSI has worked across several projects in Sub-Saharan Africa to develop and and scale mobile technology to improve visibility of stock levels nationwide.
Structure/Method/Design: JSI has deployed three mobile supply chain solutions to improve visibility into stock availability at health facilities. The ILSGateway, operating on an open-source platform in all