Thematic analysis was conducted to determine opportunities and challenges for implementation in resource-limited settings.

Findings: We identified 8 tools and innovations that can be used for health systems monitoring and evaluation, including 3 data visualization tools that can be used for knowledge translation. These sample cases were compiled and described and results of analysis of challenges and opportunities for implementation were summarized. We identified specific requirements for successful utilization of such tools and how its use can be maximized for policymaking.

Interpretation: Different organizations use a large number of assessment tools, but its success for implementation in resource-limited settings have yet to be tested. This study outlines these challenges, as well as the opportunities, that need to be either addressed or tapped by organizations aiming to improve health systems performance and provide better knowledge translation.

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Abstract #: *2.011_TEC*

Digital surveillance of prescription drug abuse: An accessible methodology for collecting and analyzing twitter NUPM data

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Background: Youth and adolescent non-medical use of prescription medications (NUPM) has become a national epidemic. However, little is known about the association between promotion of NUPM behavior and access via the popular social media microblogging site Twitter, which is currently used by 1/3rd of all teens.

Objective: In order to better assess NUPM behavior online, this study conducts surveillance and analysis of Twitter data to characterize the frequency of NUPM-relevant tweets and also identifies illegal access to drugs of abuse via online pharmacies.

Methods: Tweets were collected over a two-week period from April 1–14, 2015 by applying NUPM keyword filters for both generic/chemical and "street" names associated with drugs of abuse using the Twitter public streaming API. Tweets were then analyzed for relevance to NUPM and whether they promoted illegal online access to prescription drugs using a protocol of content coding and supervised machine learning.

Findings: A total of 2,417,662 tweets were collected and analyzed for this study. Tweets filtered for generic drugs names comprised 232,108 tweets (including 22,174 unique associated URLs) and 2,185,554 tweets (376,304 unique URLs) filtered for street names. Applying an iterative process of manual content coding and supervised machine learning, 81.7% of the generic and 12.3% of the street NUPM data sets were predicted as having content relevant to NUPM respectively. By examining hyperlinks associated with NUPM relevant content for the generic Twitter data set, we discovered that 85.5% of the tweets with URLs included a hyperlink to an online marketing affiliate that directly linked to an illicit online pharmacy advertising sale of Valium without a prescription.

Interpretation: This study examines the association between Twitter content, NUPM behavior promotion, and online access to drugs using a broad set of prescription drug keywords. Initial results are concerning, as our study found over 45,000 tweets that directly promoted NUPM by providing a URL that actively marketed illegal online sale to a prescription drug of abuse. Additional research is needed to further establish the link between Twitter content and NUPM, as well as to help inform future technology-based tools, online health promotion, and public policy to combat NUPM online.

Abstract #: *2.012_TEC*

Blended learning in a low-resource environment

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Background: The global burden of surgical disease is a well documented but often under prioritized global health initiative. Deaths due to anesthesia remain a significant contributor to perioperative mortality in developing countries. Most of these deaths are consider avoidable and many anesthesia providers suffer from a lack of training and educational resources.

Blended learning, an old educational concept that has gained recent attention in medical curriculum, combines online learning outside of the lecture hall with an in-class activity. This "flipped classroom" approach allows the student to learn at his or her own pace using the video-based resources, and then reinforces that knowledge in the classroom through interactions with teachers and peers.

This study aims to evaluate the usefulness of a blended learning course in a low-resource setting.

Methods: Through a NIH-funded Medical Education Partnership Initiative grant that partners Stanford University with the University of Zimbabwe College of Health Sciences (UZCHS) to promote medical training and research in developing countries, the anesthesia departments formed a collaboration to increase educational resources for the anesthesia trainees. A needs assessment determined the UZCHS registrars (residents) desired video lectures. A blended learning lecture series was created utilizing video lectures and classroom learning activities for four topics covering anesthetic emergencies. Anonymous knowledge tests and five-point Likert scale surveys evaluating clinical preparedness were distributed to the UZCHS registrars before and after the educational invention. The surveys also evaluated the clinical relevance, usefulness, and adaptability of the learning modules.