Evaluating Social Media as a Data Source for Patient Experience Measures: A Study Protocol

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PRESENTED AT:

BACKGROUND AND OBJECTIVES

Patient-Reported Measures (PRMs) and Patient-Reported Performance Measures (PR-PMs) have been the primary mechanisms for integrating patient voices into quality measurement for clinical care, quality improvement, and accountability. PRMs can capture data on patient experience of care and outcomes, but they add burden to patients completing surveys and providers and payers for implementation, data collection, and PR-PM calculation (1). Social media may offer an alternative, but untested, data source for capturing patient experiences and outcomes that alleviates burden and broadens measurement capabilities.

Our objective is to test the potential for using social media data to create quality measures by creating a Twitter-based measure of patient hospital rating and comparing performance to the current PR-PM calculated from the Consumer Assessment of Healthcare Providers and Systems Adult Hospital Survey (HCAHPS) (2), a PRM for capturing patient experience.

Recent research has positively associated Yelp data with HCAHPS performance (3), but Twitter data may provide a more balanced impression of patient experience because Twitter is an open forum for unsolicited expression, not a consumer feedback tool.

METHODS

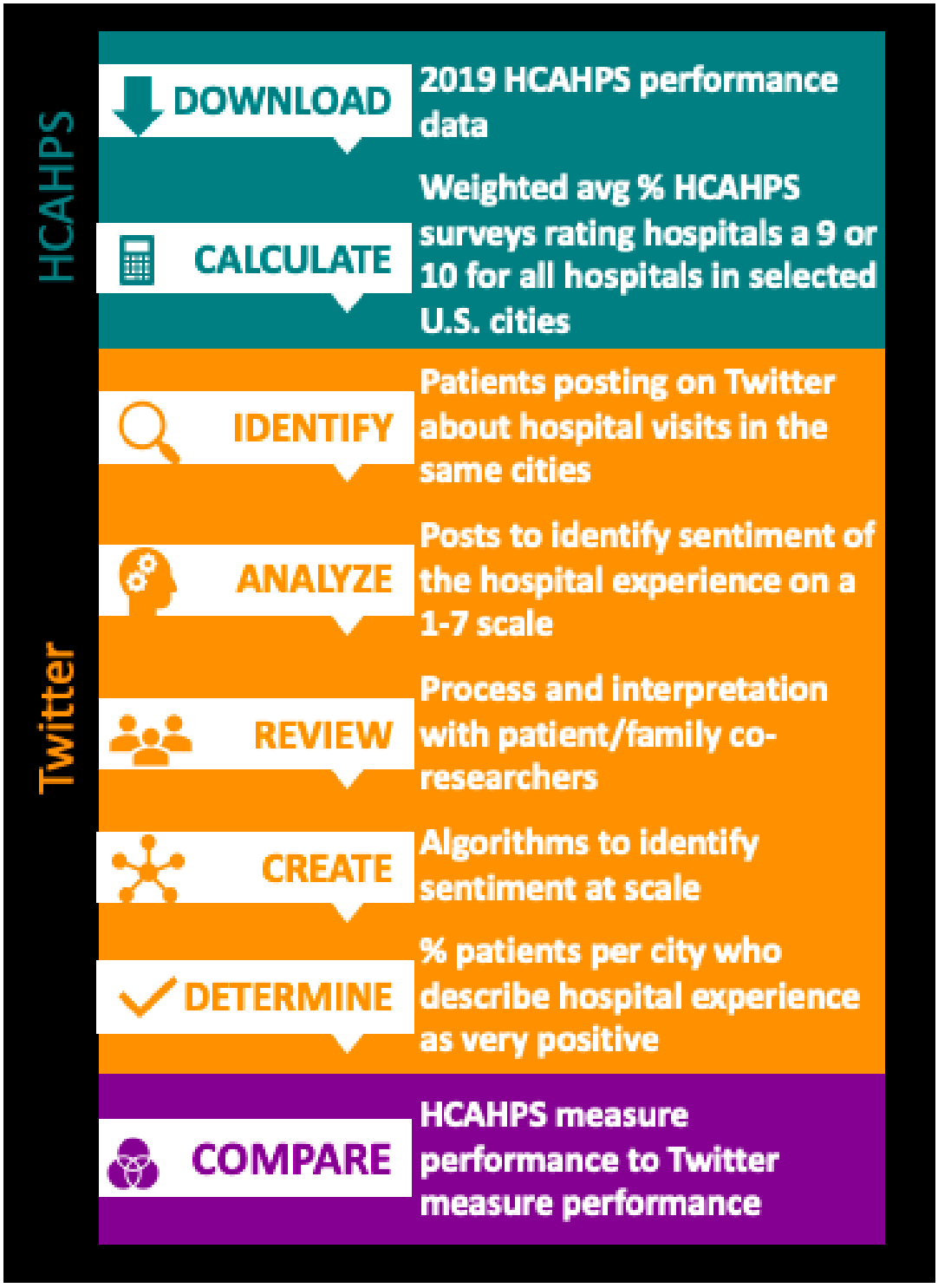
Our unit of analysis will be the city. We will download 2019 HCAHPS performance data for hospitals in selected cities across the United States from the CMS data.medicare.gov website for the Overall Hospital Rating measure, “Patients who gave their hospital a rating of 9 or 10 on a scale from 0 (lowest) to 10 (highest)”. We will calculate the weighted average measure performance of all hospitals within each city to get the average percent of surveys in that city that rated hospitals as a 9 or 10.

We will then identify a population of patients posting on Twitter that mirrors the population of HCAHPS respondents (leveraging prior research). We will select a sample of patient posts that describe a hospital visit and perform a qualitative analysis to identify lexical indicators of patient sentiment towards their experiences on a 1 (lowest) to 7 (highest) scale validated in other social media projects (4).

We will review the resulting coding schema with patient and family co-researchers to ensure face-validity. Then, we will create algorithms to identify the sentiment expressed in relevant posts. We will parse the results by city, calculating the percent of patients posting about their hospital visits within the city who describe their hospital experience as very positive.

We will conduct statistical analysis to assess the convergent validity of the new Twitter measure with the HCAHPS measure. Following other projects, we plan to evaluate convergent validity by determining the correlation between the two measures (5).

STUDY PROCESS FLOW



CONCLUSIONS

This protocol is not designed to fully test validity and reliability of the Twitter measure, but focuses on face validity, construct validity, and convergent validity. Other testing will need to be done to fully assess scientific acceptability as outlined by the Centers for Medicare & Medicaid Services Measures Blueprint (6), the National Quality Forum measure evaluation criteria (7), the work of the CAHPS Consortium (8) (overseen by the Agency for Healthcare Quality and Research), and other measurement resources.

If increases in the Twitter-based measure are strongly correlated with increases in the HCAHPS-based measure, we can conclude that social media is a promising avenue for measurement. If performance is not correlated, we plan to conduct further research to explore the reasons.

One potential result would be that some locations have a stronger relationship between Twitter and HCAHPS performance than others. This could be related to the demographic characteristics or size of the populations being measured. Further analysis would be needed to determine the causes of this divergence of results.

Future testing will also be needed to address potential bias that results from the characteristics of patients posting on Twitter: their demographics and experiences may not always represent the broader population. For example, not all patients have internet access, Twitter accounts, or post regularly on Twitter. Prior research has also documented demographic differences in both completing PRMs (9) and rating healthcare providers (10), (11). The HCAHPS measures have multiple modes of administration and are risk adjusted for mode and patient-mix to help balance results (12). Likewise, risk adjustment may need to be explored for a social media-derived measure to make it acceptable for many use cases.

DISCUSSION

A primary challenge in creating a social media measure is the same as creating a traditional measure: determining whether it is a valid and reliable indicator of the concept being measured. This project is designed to offer a proof of concept by comparing results of a social media measure to a PR-PM already in use.

The primary benefit for using social media as a data source may be expanding our ability to measure concepts not well tailored to measurement via traditional PRM-PMs, like barriers to access or financial constraints. Social media could also be a good data source for measures of disease burden and caregiver burden outside of medical encounters. Further research will be needed to explore how Twitter data compares to data from other social media sites, like Facebook or Instagram, and data on Yelp and other crowdsourcing sites designed for consumer feedback.

Another measurement challenge is ensuring measures are meaningful. Just because a measure is patient-reported or derived from patient posts does not mean that it is meaningful to patients (1). Involving patient/family co-researchers in measure development can help contextualize and interpret the social data for this project and assess whether both social measures and PRMs are meaningful.

A final consideration in future measure development is the level of accountability and how a social media-based measure might be used. Some options include public health surveillance, provider education, policymaking, and research (13).

ABSTRACT

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Overview: This study protocol describes research to compare Twitter as an alternative quality measures data source to the Consumer Assessment of Healthcare Providers and Systems Adult Hospital Survey (HCAHPS).

Background and Objectives: Patient-Reported Measures (PRMs) and Patient-Reported Performance Measures (PR-PMs) have been the primary mechanisms for integrating patient voices into quality measurement for clinical care, quality improvement, and accountability. PRMs can capture data on patient experience of care and outcomes, but they add burden to patients completing surveys and providers and payers for implementation, data collection, and PR-PM calculation (1). Social media may offer an alternative, but untested, data source for capturing patient experiences and outcomes that alleviates burden and broadens measurement capabilities.

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Methods: Our unit of analysis will be the city. We will download 2019 HCAHPS performance data for hospitals in selected cities across the United States from the CMS data.medicare.gov website for the Overall Hospital Rating measure, “Patients who gave their hospital a rating of 9 or 10 on a scale from 0 (lowest) to 10 (highest)”. We will calculate the weighted average measure performance of all hospitals within each city to get the average percent of surveys in that city that rated hospitals as a 9 or 10.

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Conclusions: This protocol is not designed to fully test validity and reliability of the Twitter measure, but focuses on face validity, construct validity, and convergent validity. Other testing will need to be done to fully assess scientific acceptability as outlined by the Centers for Medicare & Medicaid Services Measures Blueprint (6), the National Quality Forum measure evaluation criteria (7), the work of the CAHPS Consortium (8) (overseen by the Agency for Healthcare Quality and Research), and other measurement resources.

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