

Studying the Way People Rate Their Physicians *Online*

[Extended Abstract]

Author 1^{*}
author school
author email

Author 2
author school
author email

1. ABSTRACT

- Many patients turn to rating websites to share their experience with a health care provider they just visited.
- There are various factors that matter to a reviewer while reviewing a health care provider.
- Even though there are many websites that allow people to rate their health care providers online, questions arise when it comes to believing the truthfulness of the reviewer.
- We identify the states with Highest and lowest prostate cancer mortality rate and group ten states with lowest prostate cancer mortality rate and ten states with highest prostate cancer mortality rate.
- We use the reviews of health care providers of those twenty states who specialize in prostate cancer and erectile dysfunction on Google and Yelp.
- We will collect and analyze each individual ratings and comments of urologists posted by their patients. We will use API(Application Programming interface) to collect the available information about the physician, reviewer and the review posted. These collected information will be studied and analyzed using....
- States with Highest prostate cancer mortality rate have less information about the health care providers online.
- States with lowest prostate cancer mortality rate have more reviews and more health care providers in comparison to states with lowest prostate cancer mortality rate.

2. INTRODUCTION

With an increase in number of people investigating health related issues online, [5] online rating sites have become more influential then ever. These internet rating sites give patients an opportunity to rate a health care provider they know or visited. Rating websites can benefit both physicians and patients because the ratings provide patient perspective that health care providers can use to improve their practice and prospective patients can choose a suitable physician by analyzing the reviews and ratings posted online. [7] If on-line ratings reflect patient care and health care provider's treatment, are there differences in how patients rate health care providers when outcomes are not similar. Health care providers argue that these reviews may not represent an accurate appraisal of surgeon quality. [4] For example, the prostate cancer is high in Mississippi and Louisiana where the incidence is greater than 24%, than Colorado and Alaska, where the incidence is under 20%. [3] Does the type of health care people receive make any impact on the rate of prostate cancer mortality rate ? Are there any differences in opinion of the people who receive their health care in states with high prostate cancer mortality rates and the people who live in states with low prostate cancer mortality rates ? In this study, we investigate if health care provider ratings give insights into how health care providers treat their patients which may impact their willingness to be seen for screening and treatment. By studying the ratings and reviews of the patients from different states we can get a brief idea of the type of health care they receive.

Researchers have analyzed the online ratings of health care professionals and found that it is difficult to identify reviews based on actual experiences [10]. In addition, with the exception of [8, 9], most research on health care professional ratings have not documented the locations where the reviews were collected - which is important because outcomes and care may vary based on location. We analyzed ratings and reviews from Yelp and Google in the field of Urologists in states with high prostate cancer mortality rates. To this end, we used an Application Programming Interface (API) to collect information about the health care provider, patient demographics, reviews, ratings and metadata. .

The contributions of this paper are:

- A work flow that utilize APIs to collect, store, and analyze health care provider reviews
- A qualitative analysis of how patients perceive their

care from health care providers in areas with high and low incidence of male-oriented health conditions

- A discussion about how incidence may impact patient treatment and willingness to be diagnosed

3. RELATED WORK

Online health care provider rating websites play a vital role when it comes to choosing a suitable health care provider. [4]. There has been debates on the issue that whether the patients should be allowed to rate their health care providers online. A study by Emmert showed that patients are highly influenced by the information presented on an online rating site [2]. Physicians argue that the health care providers should not be reviewed like the way grocery stores or restaurants are reviewed online [?]. There are no any means to figure out if the review is posted by a real customer or someone who wants to rip off the physician [7] and in some cases even the real review doesn't reflect the quality of the health care provider [?]. But, policy makers believe that these sort of rating websites help to create a transparency in health care sector by circulating enough information about the health care providers [6].

Study shows that most reviewers give good ratings to their health care providers. Researchers analyzed the reviews of 23 health care providers in 25 major U.S. cities from 10 of the most used doctor rating sites based on Google Trend data. They found out that more than 65% of the reviews were positive [8]. It is found that the people who write reviews are comparatively more educated, younger and healthier than the ones who don't [9]. When it comes to health care providers, younger physicians without malpractice claims and physicians who graduated from top -50 medical schools had somewhat higher ratings than the other physicians [6]. Rosenbaum found that negative reviews can adversely impact the practice of highly qualified cardiologists [10], thus review accuracy and ratings are important to patients and health care providers.

4. METHODS

We have divided the methods into two sections, in the first section we will talk about the types of research that has been done so far, our data collection process and the factors that mattered throughout the process. Whereas, in the second part we will explain how we analyzed the collected data.

4.1 Review Selection

- Give overview of two areas - we selected a women's health issue and a men's health issue that was intensely episodic in nature. In addition, the care would be personal and require a hospitalization with invasive procedures.

4.1.1 Prostate Cancer

We obtained the state wise and county wise data related to prostate cancer from two websites: jamanet-work.com and cdc.gov. JAMA(Journal of Medical Association) is a medical journal that publishes research and reviews. cdc.gov is a website of center for disease control and prevention which is a national public health institute of United states. At first, we collected

county wise data of highest and lowest prostate cancer mortality rate in USA using the data from . We used google to collect the list of cities in each county. Then, we used google and yelp to get the total number of urologists in each cities.

But, the total number of reviews that were collected using county wise data was insufficient, we decided to collect state wise data instead. We used the website cdc.gov to obtain the data for prostate cancer mortality rate in USA. We selected ten states that had 17.8 or lower prostate cancer mortality rate and other ten states that had a 21.1 or higher rates.

4.1.2 Obstetrics

Discuss why obstetrics and how states/cities were selected.

4.2 Data Collection

The following tables represent the work that has been done so far by other researchers in this field. We found out that most of the researchers used websites like Yelp, RateMd, Healthgrades to analyze the ratings and reviews of the health care providers. Some researchers conducted cross sectional survey where as some used data from non-profit news room like Propublica. When it comes to type of research most of the researchers conducted both qualitative and quantitative analysis, few of them did qualitative analysis. None of the papers mentioned how the data were collected. Most of the researchers were focused on common health care providers which may or may not include all specialties and very few researchers were focused in categorizing the data according to specialization of health care providers. All the data are included in the table below.

We collected the ratings and reviews of the health care providers posted by their patients. Reviews were collected from two popular rating websites Google and Yelp. Our research solely is based on the diseases like Prostate cancer and [fill in] that are mostly abundant in male population, we narrowed down the research area to twenty states. We used the data from the website of Center for Disease Control(CDC) [3] and selected the ten states each for highest and lowest prostate cancer mortality rates. WE used Yelp API and Google API to access the information from Yelp and Google. Google allows us to pull all of the business reviews. [1] Yelp has some restrictions when it comes to allowing the users to access their data. Yelp only allows three reviews and each review is restricted to 160 characters [12]. Then, we wrote different python scripts for Yelp and Google that would pull the ratings and reviews of health care providers and write them in a csv file. Scripts were written in such a way that they would only pull the information of those health care providers that have at least one rating.

4.3 Data Analysis

Qualitative Analysis

- Developed a code book based on CITE the article, but enhanced the code book to add [FILL IN]

Paper	Google	Facebook	Yelp	RateMD	other
Kadry et al. [8]			*	*	healthgrades,vitals, checkbook, angleslist, ratemd
Lopez, et al. [9]			*	*	
Gao et al. [6]				*	Physician's database of Virginia
sciencedaily et al [4]				*	vitals, health grades
Emmert et al. [2]					cross-sectional survey
Sorrel et al. [11]			*		
Jain et al. [7]					vitals
Gebauer et al			*		propublica
Rosenbaum et al. [10]					propublica
Fox et al [5]					

Table 1: Sites Used

Paper	Qualitative Analysis	Quantitative Analysis	API	Web Scraping
Kadry et al.[8]	mostly positive ratings	average rating = 77%	-	-
Lopez et al. [9]		61% positive and 39 % negative	-	-
Gao et al. [6]	most reviews were positive	46% got 5/5 12% got below 2	-	-
sciencedaily et al. [4]	female surgeons and surgeons with affiliation got good ratings		-	-
Emmert.[2]	more people are using doctor rating sites in Germany	23% of internet users look for physicians online		
Sorrel et al. [11]			-	-
Jain et al. [7]	most people are positive on using internet for health purposes		-	-
Gabeuer et al.	physician rating sites should be more systematic		-	-
Rosenbaum et al. [10]	there is no transparency in online rating sites		-	-
Fox et al [5]	positive	72% of internet users use internet for health info	-	-

Table 2: Type of Analysis

- Discuss the thematic analysis

STILL TO FILL IN

Quantitative Analysis. Possibly use NLP

color

5. LIMITATIONS

- Sampling Issue - worse care associated with income and possibly this demographic is not online
- Sampling Issue - some areas, (if we go with erectile dysfunction), are for higher socioeconomic status groups; some health outcomes may be impacted by socioeconomic status (e.g., people only go to the doctor when they are really sick and, in some cases for cancer, this may be too late for treatment)
- Among all the reviews of an urologist, very few of them were posted by the patients who had issues related to prostate cancer. Most reviews were posted by the people who have been to an urologist but not necessarily because of prostate cancer.
- www.reviewtrackers.com, a website that monitors reviews from multiple sources and provides the ability to easily respond to reviews, notes that the company can "improve your reviews by 400%, thus positive reviews may not necessarily indicate a positive experience. For example, www.reviewtrackers.com notes HealthGrades, Vitals, and RateMDs are clients.

6. FINDINGS

- The findings are in table 6 below.[still to fill in]

7. RESULTS AND DISCUSSIONS

- We decided to collect more reviews.
- Earlier we were collecting reviews using place id , now we are collecting data using longitude and latitude.

8. REFERENCES

- [1] G. API. Google Places API | Google Developers.
- [2] M. Emmert, F. Meier, F. Pisch, and U. Sander. Physician choice making and characteristics associated with using physician-rating websites: Cross-sectional study. *Journal of Medical Internet Research*, 15(8), 2013.
- [3] C. for disease control and prevention. CDC - Prostate Cancer Rates by State, 2013.
- [4] H. for special surgery. Study Finds Little Consistency in Doctor Reviews on Three Physician Ratings Websites, 2017.
- [5] S. Fox. The Social Life of Health Information, 2011 | Pew Research Center, 2011.
- [6] G. Gao, J. S. McCullough, R. Agarwal, and A. K. Jha. Are doctors created equal? An investigation of online ratings by patients.
- [7] S. Jain. Googling Ourselves â What Physicians Can Learn from Online Rating Sites. *New England Journal of Medicine*, 362(1):6â7, jan 2010.
- [8] B. Kadry, L. F. Chu, B. Kadry, D. Gammas, and A. MacArio. Analysis of 4999 online physician ratings indicates that most patients give physicians a favorable rating. *Journal of Medical Internet Research*, 13(4), 2011.
- [9] A. L pez, A. Detz, N. Ratanawongsa, and U. Sarkar. What patients say about their doctors online: A qualitative content analysis, 2012.
- [10] L. Rosenbaum. Scoring No Goal â Further Adventures in Transparency. *New England Journal of Medicine*, 373(15):1385â1388, oct 2015.
- [11] A. L. Sorrel. Negative online reviews leave doctors with little recourse - amednews.com, 2010.
- [12] Yelp Fusion. Documentation - Yelp Fusion.

website	Real Name	Pseudoname	Location	Age	Past Reviews	Gender	Pictures	Date reviewed
Yelp	*	*	*	-	*	-	*	*
Google	*	-X	X	X	*	-	-	*
RateMDs	X	X	X	X	X	X	X	*
Healthgrades	X	X	*	X	X	X	X	*
Angieslist	X	X	X	X	X	X	X	*
Facebook	*	-	*	-	X			

Table 3: Reviewer Data by API where * indicates most likely available; - indicates may be available; and X indicates not available

website	Doctor Name	Location	Edu History	Star Rating	Review Text	Reviewer Name	Review post Date	Reply to Review	Liking/ Useful	API
Yelp	*	*	X	*	*	*	*	-	*	*
Google	*	*	X	-	-	*	*	-	-	*
RateMDs	*	-	*	*	*	*	*	-	*	X
health grades	*	*	*	*	*	*	*	-	*	X
Angieslist	*	*	X	*	*	X	*	-	X	X
Facebook										*

Table 4: Review Data by API where * indicates most likely available; - indicates may be available; and X indicates not available

paper	no.reviews/ review- ers	no.doctors	rural	sub- urban	urban	speciality
Kadry et al[8]	4999 re- views				*	23 special- ities
Lopez et al [9]	712 reviews	445			*	
Gao et al [6]		18,174				fam/ped, ob/gy, surgery, hospital, other
Science daily et al [4]	2,813 re- views	275				sports medicine surgeons
Emmert et al. [2]	3052 re- viewers.					
Negative online reviews leave doctors with little re- course [11]						
Jain, Googling ourselves- what physicians can learn from from online rating sites. [7]						
Gabeuer, Is it time for HIPPA physicians						
Rosenbaum, scoring no goal further adventures in transparency. [10]						cardiologists
Fox, Social life of health in- formation .Fox2011						

Table 5: Number of Doctors and Demographics

State	Google	Yelp	State	Google	Yelp
Mississippi	17		Arizona		
Louisiana	16		Wyoming		
Alabama	14		North Dakota		
Georgia	45		Missouri		
South Carolina	41		West Virginia		
Oklahoma	15		Connecticut		
Nevada	43		Alaska		
Idaho	21		Florida		
Nebraska	6		Delaware		
Maine	14		Hawaii		

Table 6: Total number of reviews by website and states[STILL TO FILL IN]