**Paper 1: The Effect of Online Reviews on Physician Demand: A Structural Model of Patient Choice**

This paper provides empirical evidence on the impact of patient-generated reviews on demand in the outpatient healthcare market. The key challenges of this paper are to integrate the **various sources of social media** (both textual and numeric information), and leverage the aggregated level demand data into a consumer choice model. Goal here is to fill this gap by proposing a patient choice model that allows for doctors to be differentiated along multiple dimensions, contains richer distributions of taste parameters, and incorporates operational factors derived from online user-generated information. Further, estimation of a structural consumer choice model based on a unique data set consisting of actual appointment booking data of doctors in the United States, their demographics, service characteristics, and multiple aspects of review text. The economic value of different operational and review based service characteristics of doctors are taken and also taking into consideration the two sources of consumer heterogeneity introduced by the different healthcare specialties and different doctor characteristics. Using techniques from text mining and sentiment analysis, service characteristics that are implicitly imbedded in the text reviews. Finally, based on the estimates, multiple counterfactual experiments and propose different ways to increase potential market demand for doctors is done

<http://public.kenan-flagler.unc.edu/2017msom/MSOM%20and%20SIG%20Program/Track%207/C/MSOM2017_1_0351.pdf>

# Paper 2: Gender in medicine – an issue for women only? A survey of physician teachers' gender attitudes(Vice versa--- physicians decide if gender plays a role in patient consulting)

# Here, surveying of physician’s attitudes towards the importance of gender in professional relations(patients) is done. Questionnaires were sent to all 468 senior physicians (29 % women), at the clinical departments and in family medicine, engaged in educating medical students at a Swedish university. They were asked to rate, on five visual analogue scales, the importance of physician and patient gender in consultation, of physician and student gender in clinical tutoring, and of physician gender in other professional encounters. The physicians rated gender more important in consultation than in clinical tutoring. There were significant differences between women and men in all investigated areas also when adjusting for speciality, age, academic degree and years in the profession. A higher proportion of women than men assessed gender as important in professional relationships

# <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC305344/>

What’s interesting is in our model too, we found for women docs, sentiments like fear and joy to be significant in determining their sanctionsv

# Paper 3: The Voice of Chinese Health Consumers: A Text Mining Approach to Web-Based Physician Reviews

# Many Web-based health care platforms allow patients to evaluate physicians by posting open-end textual reviews based on their experiences. These reviews are helpful resources for other patients to choose high-quality doctors, especially in countries like China where no doctor referral systems exist. The aim of this paper is to automatically extract hidden topics from Web-based physician reviews using text-mining techniques to examine what Chinese patients have said about their doctors and whether these topics differ across various specialties. We conducted two-fold analyses on the data collected from the “Good Doctor Online” platform, the largest online health community in China. we chose to focus on four major specialty areas that received the most reviews: Internal Medicine, Surgery, Obstetrics/Gynecology and Pediatrics, and Chinese Traditional Medicine. Across the four major areas, the most popular topics reviewers found were the experience of finding doctors, doctors’ technical skills and bedside manner, general appreciation from patients, and description of various symptoms

# <https://www.ncbi.nlm.nih.gov/pubmed/27165558>

# Paper 4: What’s in a Name: Exposing Gender Bias in Student Ratings of Teaching

# Student ratings of teaching play a significant role in career outcomes for higher education instructors. Although instructor gender has been shown to play an important role in influencing student ratings, the extent and nature of that role remains contested. While difficult to separate gender from teaching practices in person, it is possible to disguise an instructor’s gender identity online. In our experiment, assistant instructors in an online class each operated under two different gender identities. Students rated the male identity significantly higher than the female identity, regardless of the instructor’s actual gender, demonstrating gender bias

# <https://link.springer.com/article/10.1007/s10755-014-9313-4>

## **Paper 5: The influence of patient and doctor gender on diagnosing coronary heart disease**

# This paper explores sources of uncertainty and gender bias in primary care doctors’ diagnostic decision‐making about coronary heart disease (CHD). We found differences in male and female doctors’ responses to different types of patient information. Female doctors recall more patient cues overall, particularly about history presentation, and particularly amongst women. Male doctors appear less affected by patient gender but both male and especially female doctors take more account of male patients’ age, and consider more age‐related disease possibilities for men than women.

# <https://onlinelibrary.wiley.com/doi/full/10.1111/j.1467-9566.2007.01025.x>

# Paper 6: Effect of physicians’ gender on communication and consultation length: a systematic review and meta-analysis

# Physician gender may be a source of differences in communication between physicians and their patients, which may in turn contribute to patient satisfaction and other outcomes. Our aim was to review systematically research on gender differences in the length, style and content of communication with patients. Seven electronic databases were searched from inception to September 2010 with no language restrictions (included MEDLINE; PsychINFO; EMBASE; CINAHL; Health Management Information Consortium; Web of Science; and ASSIA). Greater patient engagement by female doctors may reflect a more patient-centred approach, but their longer consultation times will limit the number of consultations they can provide. This has implications for planning and managing services.

# <http://journals.sagepub.com/doi/full/10.1177/1355819613486465>

# Paper 7: The Validity of Online Patient Ratings of Physicians: Analysis of Physician Peer Reviews and Patient Ratings

# The current study sought to determine the validity of online patient ratings of physicians through comparison with physician peer review. Extracted 223,715 reviews of 41,104 physicians from 10 of the largest cities in the United States, including 1142 physicians listed as “America’s Top Doctors” through physician peer review. Differences in mean online patient ratings were tested for physicians who were listed and those who were not. No differences were found between the online patient ratings based upon physician peer review status. However, statistical differences were found for four specialties (family medicine, allergists, internal medicine, and pediatrics), with online patient ratings significantly higher for those physicians listed as a peer-reviewed “Top Doctor” versus those who were not

# <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5913572/>

# Paper 8: Text Mining Patient-Doctor Online Forum Data from the Largest Online Health Community in China

# Here in Good Doctor website (www.haodf.com), the largest online health community in China, there are more than ten thousands doctor answering questions online voluntarily. The present study uses text mining technique to examine what are the major topics that patients and doctors are discussing online, thus to provide a quick summarized information for two purpose: first for patients who may be benefited by the existing online patient-doctor discussion and second for doctors who can learn what are the critical questions that patients care more.

# <https://pdfs.semanticscholar.org/3821/ecf12f6adac9276588bbd24ced6801c7f3ed.pdf>

# Paper 9: The Interplay between Online Reviews and Physician Demand: An Empirical Investigation

# This is study of a unique data set from one of the leading appointment booking websites in the United States, that contains online physicians’ appointments made over a five-month period, along with other online information. We derive from the text reviews the seven most frequently mentioned topics among patients, namely, bedside manner, diagnosis, waiting time, service time, insurance process, physician knowledge, and office environment. We incorporate these service features into our choice model, and find a statistically significant relationship between demand and four service features, namely, bedside manner, diagnosis, waiting time, and service time. Broadly speaking, this paper shows how to incorporate social media information into a choice model to derive relationships between operational factors in healthcare delivery and patient choices

# <http://www.stern.nyu.edu/om/faculty/armony/research/Doctor%20Rating%20R1.pdf>

# Paper 10: Using sentiment analysis to review patient satisfaction data located on the internet

# The purpose of this paper is to test the usefulness of sentiment analysis and time-to-next-complaint methods in quantifying text-based information located on the internet. As important, the authors demonstrate how managers can use time-to-next-complaint techniques to organize sentiment analysis derived data into useful information, which can be shared with doctors and other staff. The authors demonstrated that sentiment analysis and time-to-next-complaint techniques might be useful tools for healthcare managers who are interested in transforming web-based text into meaningful, quantifiable information.  The paper is one of the first to illustrate ways in which administrators at clinics and physicians’ offices can utilize sentiment analysis and time-to-next-complaint methods to analyze web-based patient comments

# <https://www.emeraldinsight.com/doi/abs/10.1108/JHOM-12-2011-0129>

# Article:

# https://www.nytimes.com/2017/12/07/upshot/being-a-doctor-is-hard-its-harder-for-women.html