

Comparative Analysis of Online Health Information Search by Device Type

Ashutosh Jadhav, MS^{*1}, Jyotishman Pathak, PhD²

¹Wright State University, Dayton, OH; ²Mayo Clinic, Rochester, MN

Abstract

To study online health information search behavior from smart devices (smartphones, tablets) and personal computers (desktop, laptop), we performed a comparative analysis of large-scale health search queries from Web search engines to Mayo Clinic's consumer health information website.

Introduction and Background

Since last decade, percentage of people using Internet to search and learn from the health-related information is increasing exponentially. According to Online Health 2013 Pew Survey, one in three American adults searched online to get information about a medical condition. With recent exponential increment in smart devices ('SD': smartphones and tablets) usage, percentage of people using smart devices for health information search is also growing rapidly. User experience for online information search varies with device used for search such as smart devices and personal computers ('PC': desktop, laptop). Understanding the effect of device used (SD vs. PC) for health information search would help us to learn more insights about health search behavior. Such knowledge can be applied to improve the search experience, as well as develop more advanced next-generation knowledge and content delivery systems.

Methods

Based on the number of visits and the type of device used (PC or SD), we have collected top one million health search queries between June 2011 – May 2013 that direct Online Health Information Seekers (OHIS) to Mayo Clinic.com web pages. MayoClinic.com is one of the top online health information providers and highly ranked (often in top 3) in online health/medical information search. We performed the following analysis on this data: 1) Identify top search queries 2) Categorization of the search queries into health categories such as symptoms, causes, treatment, diet, etc. 3) Average number of words, characters used in the search queries and their range distribution 4) Usage of query operators (such as 'and', 'or', etc.) and special characters in the search queries 5) Expression of information need (using keywords, Wh-questions, Yes/No questions) while formulating search queries, and 6) Misspellings in the search queries.

Results and Discussion

Our analysis leads to the following observations: Google is a leader in online search and our analysis confirms Google's dominance in health information search. Health information searched via different device differs as much as 65%. In one year, health information searched changes by 50% and the change is even higher considering device type. Symptoms, causes and treatments & drugs are top searched health categories respectively. Health search queries are longer than general search queries, which imply that OHIS describes health information need in more detail. Interestingly, health search queries from SD are longer than that from PC. Usage of special characters is limited and it is more for health search queries from PC than from SD. Use of query operator in health queries is less and variation of AND (AND, &, +) is used more often followed by OR and '+'. Operator usage is slightly higher in health queries from SD as compared to that from PC. OHIS formulate search queries primarily using keywords followed by Wh-Questions and Yes/No Questions. OHIS ask more health questions from SD than PC. In Wh-questions, OHIS mostly use What and How in search queries and both of them generally signify more descriptive information need. OHIS ask more temporal questions (When) from SD than PC. OHIS generally use Yes/No questions to check some factual information and most of them start search queries with Can, Does and Is. OHIS ask more Yes/No questions starting with 'Can' using SD than PC. Approximately 1 in every 4 queries has at least one spelling mistake and spelling mistakes in health queries are slightly higher from SD than that from PC.

Conclusion

We observed that health information search behavior differs with device used for search (smart device vs. personal computer.) This study extends our knowledge about online health information search behavior and provides interesting and valuable insights useful for Web search engines, health websites and health providers; and eventually to empower OHIS.

* This work was done during author's internship at Mayo Clinic, Rochester, MN, United States.