

# Paging Dr. Google: Characterizing Direct-to-Consumer Digital Advertisements From Oncology Treatment Centers

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## Abstract

**Purpose:** This study aims to examine the characteristics and accreditations of medical centers with the highest utilization of direct-to-consumer (DTC) marketing based on Google search advertisements.

**Methods:** A total of 817 paid advertisements from 360 simulated Google searches from the 30 most populous U.S. cities were analyzed. They were categorized into National Cancer Institute (NCI)-designated, Commission on Cancer (CoC) accredited, non-CoC accredited, and non-traditional treatment centers and analyzed based on city, region, and search term.

**Results:** Of the cancer treatment center advertisements analyzed, 51.2% were for NCI centers, 12.2% for CoC accredited centers, 26.9% for non-CoC accredited centers, and 9.7% for non-traditional centers. There was significant geographic variation, with the highest percentage of NCI advertisements appearing for the search phrase “best cancer doctor” (74.4%). The majority of NCI centers had no advertisements (59.2%), while two of the centers monopolized the NCI advertisements (80.2%). Non-traditional treatment centers showed significant geographic variation, representing 0-38% of search results.

**Conclusion:** The study reveals a significant presence of NCI-designated cancer centers in the digital DTC marketing space, with substantial regional variations and a disproportionate number of advertisements from a minority of cancer centers.

**Categories:** Other, Public Health, Oncology

**Keywords:** accreditation, advertisements, cancer treatment center, commission on cancer, direct-to-consumer marketing, national cancer institute, oncology

## Introduction

Direct-to-consumer (DTC) marketing in healthcare has been increasing since the early 2000s [1]. Cancer remains the second-leading cause of death, with approximately two million new cancer diagnoses annually in the United States [2].

There is evidence exploring aspects of DTC marketing by cancer centers, including expenditures and the most frequently used platforms [1,3,4]. These studies highlight digital marketing as the fastest-growing DTC platform in terms of advertising expenditures [3]. Digital marketing often gives users a sense of control over their online searches, but these searches are not unbiased [5]. Cancer patients researching treatment options are likely to encounter and be influenced by those who have paid for prominent ad placements. Studies have examined tactics and ethical implications of cancer treatment marketing [4,6,7], yet a noticeable literature gap remains regarding the characterization of treatment centers that contribute to online DTC marketing.

The purpose of this study is to investigate the characteristics and accreditations of the medical centers with the highest utilization of DTC marketing based on Google searches. This project was previously presented as a poster at the ASTRO Annual Meeting in October of 2023.

## Materials And Methods

A series of keyword searches were conducted using the Google search engine on the Google Chrome browser. Search trends were investigated by using the Google Trends™ tool, which provides search volumes based on popular search queries. Three of the top relevant search phrases were identified (“best cancer doctor”, “best cancer treatment”, and “cancer treatment near me”). Modifiers were added to each search term to reflect cancer diagnoses with the highest prevalence: “breast”, “prostate”, and “lung”. This yielded 12 distinct search phrases that were used on a search hub (I Search From) that simulated Google searches from different geographic locations [8].

### How to cite this article

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The 30 most populous U.S. city locations were used for each of the 12 search phrases to originate the searches, resulting in a total of 360 searches conducted. Each search yielded four paid advertisements which appear at the top of the results list, totaling 1,440 total advertisements. The inclusion criteria for analysis were advertisements related to cancer treatment centers. Advertisements for non-cancer center treatments (i.e., pharmacologic or other therapies) were excluded, with 623 advertisements falling under the exclusion criteria. After applying these criteria, 817 advertisements were included in the study for analysis. A flowchart of the above methodology is depicted in Figure 1.

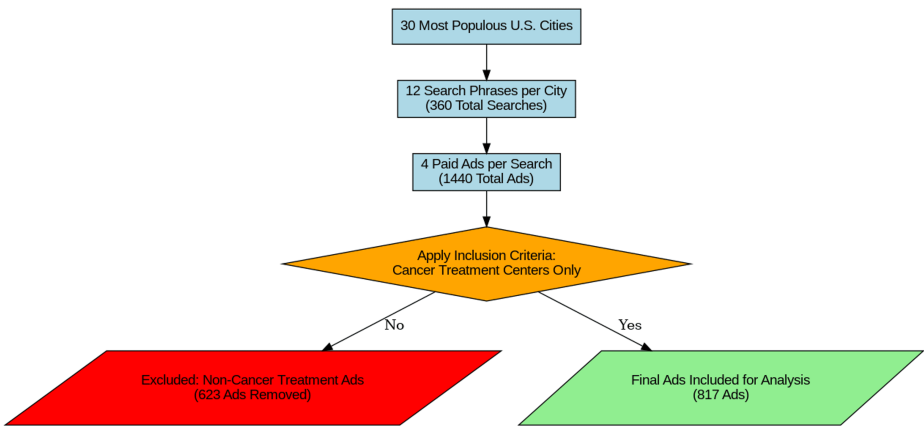


FIGURE 1: Flowchart depicting the study's methodology

An example of the paid advertisements labeled as “sponsored” is shown in Figure 2.

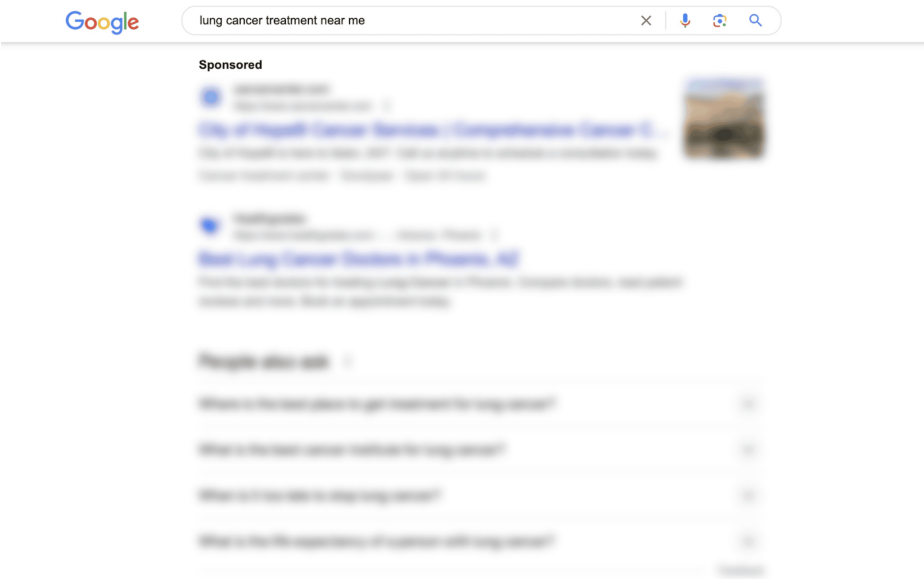


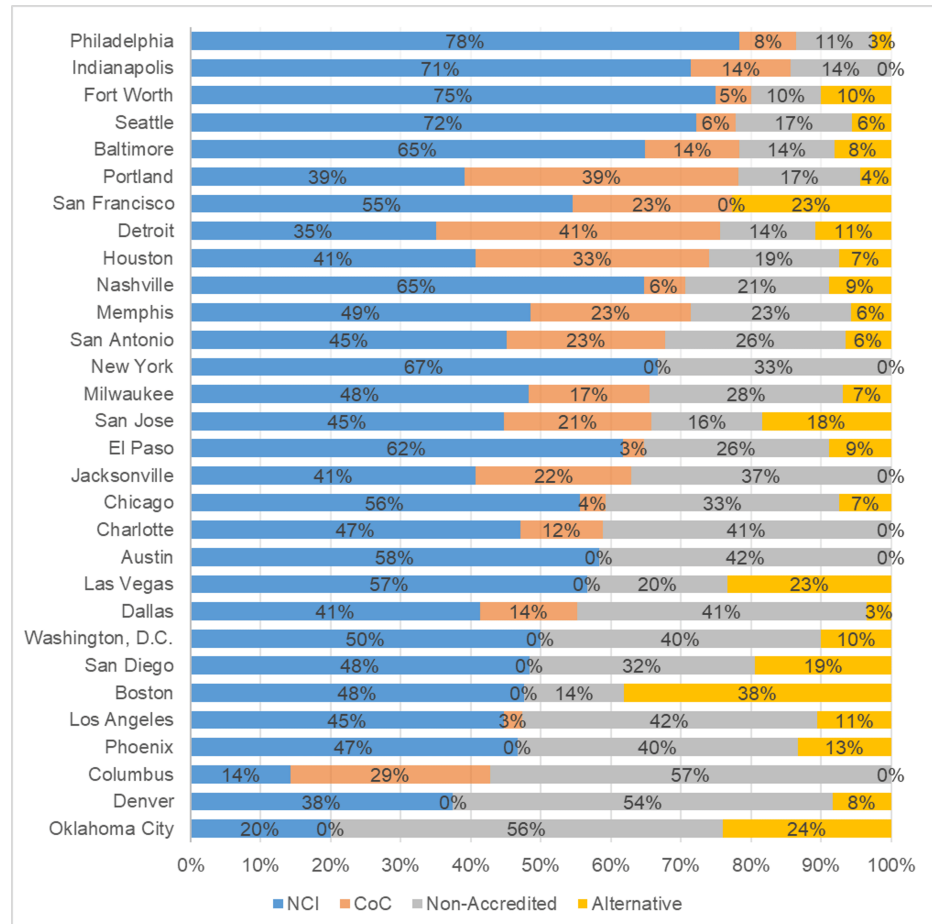
FIGURE 2: “Sponsored” label used to indicate results that represent paid advertisements

Of the advertisements, the cancer treatment centers were categorized into centers that are National Cancer Institute-Designated (NCIs) [9], Commission on Cancer (CoC) accredited [10], non-CoC accredited, and non-traditional treatment centers based on their category at the time of the search. Note that NCI and CoC are the major accreditation agencies in regard to cancer care in the United States. In addition, non-traditional treatment centers were defined as facilities that incorporate unconventional approaches to cancer care, often referred to as integrative, complementary, or alternative therapies [11]. The searches were conducted in December of 2022.

The statistical analysis and data aggregation were conducted using Microsoft Excel (version 2208, Microsoft Corp., USA). This software was utilized for all data analysis tasks, including organizing and analyzing the collected data. No additional statistical software was employed.

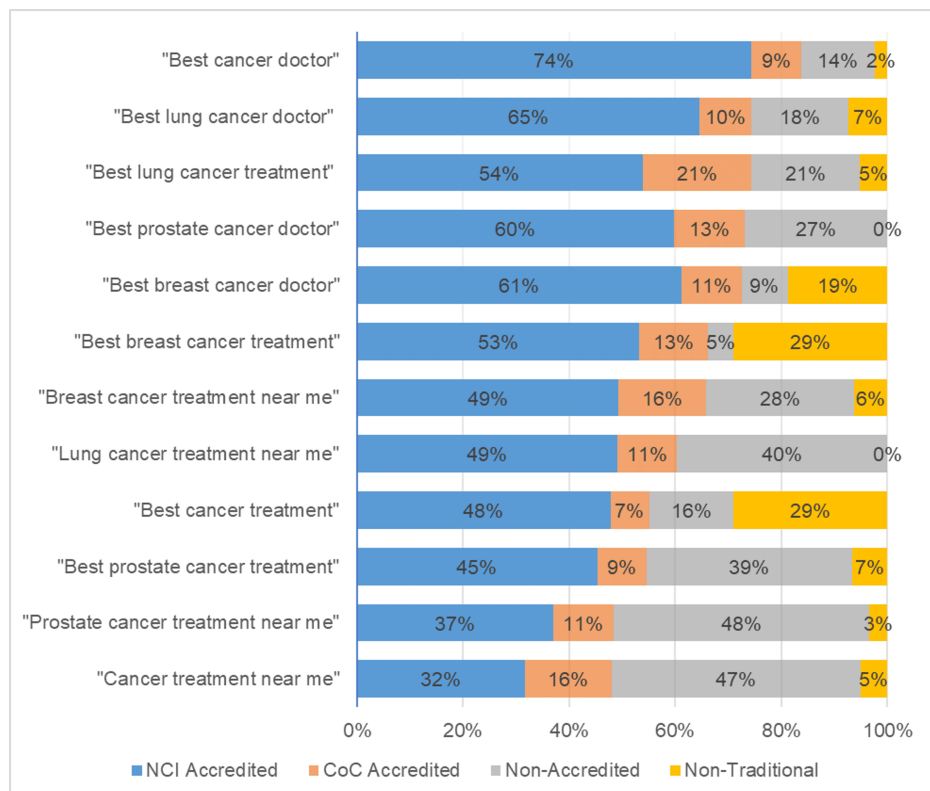
## Results

Of the 360 searches and 817 subsequent cancer treatment center advertisements, 51.2% were for NCI centers, 12.2% were CoC accredited centers, 26.9% were non-CoC accredited centers, and 9.7% were non-traditional treatment centers. The proportions of treatment center advertisements by city that were for NCI-accredited centers ranged from 14.3% to 78.4%, CoC-accredited centers ranged from 0.0% to 40.5%, non-accredited centers ranged from 0% to 57.1%, and non-traditional centers ranged from 0% to 38.1%. (Figure 3).



**FIGURE 3: Percentage of search results that were National Cancer Institute (NCI)-accredited centers, Commission on Cancer (CoC)-accredited centers, non-accredited centers, and non-traditional centers based on city and sorted by the highest percentage of accredited centers**

The search phrase that yielded the highest ratio of NCI centers was “best cancer doctor” at 74.4% and the phrase that yielded the lowest was “cancer treatment near me” at 31.7%. The proportions of search result categories based on search phrases are shown in Figure 4.



**FIGURE 4: Percentage of search results that were National Cancer Institute (NCI)-accredited centers, Commission on Cancer (CoC)-accredited centers, non-accredited centers, and non-traditional centers based on search term used and sorted by the highest percentage of accredited centers**

Of the known 71 NCI centers in the country, 42 (59.2%) did not have any advertisements. Of the 35 NCI centers located in one of the target cities, 12 (34.3%) did not have any advertisements. Notably, two specific NCI centers accounted for 49.5% of the NCI advertisements. The advertisements representing these two NCI centers included 80.2% of advertisement results for cities in which they do not have a physical presence. Similarly, one specific non-traditional treatment center accounted for 38 of the 79 non-traditional center advertisements (48.1%), and 35 of 38 of those advertisements (92.1%) were in cities in which this center had no physical presence.

Regarding non-traditional treatment centers, there was geographic variation in the results. Boston, San Francisco, Las Vegas, Oklahoma City, and San Jose had 38.1%, 23%, 23%, 24%, and 18% of searches yielding non-traditional treatment center advertisements, respectively. By contrast, six cities, i.e., Indianapolis, New York City, Jacksonville, Charlotte, Austin, and Columbus, showed no such advertisements. The ratio of non-traditional treatment center advertisements by region was as follows: Northeast with 13.6%, West with 12.6%, South with 7.7%, and Midwest with 5.0%, as shown in Figure 5. However, when excluding the center that accounted for 48.1% of non-traditional advertisements, the adjusted regional percentages were as follows: Northeast with 4.43%, West with 9.26%, South with 3.12%, and Midwest with 2.52%.

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This study examined

In general, health-care advertising has significant differences from non-health-care marketing. The U.S. Food

and including a privacy VPN. The results were compared with those obtained using the study's standard search methods. The methods showed moderate agreement. This corresponds to a kappa value between 0.41 and 0.60, indicating that while there was some consistency between search results, notable variability remained, potentially influenced by factors such as search personalization, algorithmic differences, or temporal fluctuations in advertisements. Another limitation inherent to digital marketing studies is the dynamic nature of paid advertisement campaigns, which are constantly changing, and thus this study only represents the results of the sample from December 2022.

## Conclusions

This study contributes to the evolving discussion on digital DTC marketing in healthcare by providing insights into its presence in cancer treatment center marketing. By examining the accreditation status of advertised treatment centers, we illuminate patterns that may influence patient perceptions and potentially healthcare decisions. Future research is needed to further understand patient perspectives and decision-making processes influenced by these advertisements, as well as explore the associations between accreditation status and patient outcomes.

## Additional Information

### Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

**Concept and design:** Katie M. Huisman, Gary V. Walker

**Acquisition, analysis, or interpretation of data:** Katie M. Huisman, Mason K. Whitaker, Skyler B. Johnson

**Drafting of the manuscript:** Katie M. Huisman, Mason K. Whitaker, Gary V. Walker

**Critical review of the manuscript for important intellectual content:** Katie M. Huisman, Mason K. Whitaker, Skyler B. Johnson, Gary V. Walker

**Supervision:** Gary V. Walker

### Disclosures

**Human subjects:** All authors have confirmed that this study did not involve human participants or tissue.

**Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue.

**Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

## References

- Schwartz LM, Woloshin S: Medical marketing in the United States, 1997-2016. *JAMA*. 2019, 321:80-96. [10.1001/jama.2018.19320](https://doi.org/10.1001/jama.2018.19320)
- Siegel RL, Giaquinto AN, Jemal A: Cancer statistics, 2024. *CA Cancer J Clin*. 2024, 74:12-49. [10.3322/caac.21820](https://doi.org/10.3322/caac.21820)
- Vater LB, Donohue JM, Park SY, Schenker Y: Trends in cancer-center spending on advertising in the United States, 2005 to 2014. *JAMA Intern Med*. 2016, 176:1214-6. [10.1001/jamainternmed.2016.0780](https://doi.org/10.1001/jamainternmed.2016.0780)
- Gray SW, Abel GA: Update on direct-to-consumer marketing in oncology. *J Oncol Pract*. 2012, 8:124-7. [10.1200/JOP.2011.000513](https://doi.org/10.1200/JOP.2011.000513)
- Wenning S: Use and effect of Google ads for marketing success. *IJMH*. 2021, 6:23-6. [10.35940/ijmh.B1402.116321](https://doi.org/10.35940/ijmh.B1402.116321)
- Hlubocky FJ, McFarland DF, Spears PA, Smith L, Patten B, Peppercorn J, Holcombe R: Direct-to-consumer advertising for cancer centers and institutes: ethical dilemmas and practical implications. *Am Soc Clin Oncol Educ Book*. 2020, 40:1-11. [10.1200/EDBK\\_279963](https://doi.org/10.1200/EDBK_279963)
- Larson RJ, Schwartz LM, Woloshin S, Welch HG: Advertising by academic medical centers. *Arch Intern Med*. 2005, 165:645-51. [10.1001/archinte.165.6.645](https://doi.org/10.1001/archinte.165.6.645)
- Google search from a different location and device. (2023). Accessed: September 3, 2023: <http://isearchfrom.com/>.
- NCI-designated cancer centers. (2023). Accessed: September 5, 2023: <https://www.cancer.gov/research/infrastructure/cancer-centers>.
- Commission on Cancer Accreditation. (2023). Accessed: September 5, 2023: <https://www.facs.org/quality-programs/cancer-programs/commission-on-cancer/coc-accreditation>.
- Complementary, alternative, or integrative health: what's in a name. (2021). Accessed: July 10, 2024:

- <https://www.nccih.nih.gov/health/complementary-alternative-or-integrative-health-whats-in-a-name>.
12. Phutrakool P, Pongpirul K: Acceptance and use of complementary and alternative medicine among medical specialists: a 15-year systematic review and data synthesis. *Syst Rev*. 2022, 11:10. [10.1186/s13643-021-01882-4](https://doi.org/10.1186/s13643-021-01882-4)
  13. Wang X, Cohen RA: Health information technology use among adults: United States, July-December 2022 . NCHS Data Brief, no 482.. National Center for Health Statistics, Hyattsville, MD; 2023. 10:133700. [10.15620/cdc:133700](https://doi.org/10.15620/cdc:133700)
  14. Johnson SB, Park HS, Gross CP, Yu JB: Complementary medicine, refusal of conventional cancer therapy, and survival among patients with curable cancers. *JAMA Oncol*. 2018, 4:1375-81. [10.1001/jamaoncol.2018.2487](https://doi.org/10.1001/jamaoncol.2018.2487)
  15. Johnson SB, Park HS, Gross CP, Yu JB: Use of alternative medicine for cancer and its impact on survival . *J Natl Cancer Inst*. 2018, 110:[10.1093/jnci/djx145](https://doi.org/10.1093/jnci/djx145)
  16. Basics of drug ads. (2015). Accessed: April 28, 2024: <https://www.fda.gov/drugs/prescription-drug-advertising/basics-drug-ads>.
  17. DiStefano MJ, Markell JM, Doherty CC, Alexander GC, Anderson GF: Association between drug characteristics and manufacturer spending on direct-to-consumer advertising. *JAMA*. 2023, 329:386-92. [10.1001/jama.2022.23968](https://doi.org/10.1001/jama.2022.23968)
  18. Holcombe R: The ethics of marketing cancer. *J Cancer Policy*. 2015, 3:1-2. [10.1016/j.jcpo.2014.11.001](https://doi.org/10.1016/j.jcpo.2014.11.001)