

## ED PHARMACOTHERAPY

## Examining Online Traffic Patterns to Popular Direct-To-Consumer Websites for Evaluation and Treatment of Erectile Dysfunction



Joel J. Wackerbarth, MD,<sup>1,2</sup> Richard J. Fantus, MD,<sup>1,2</sup> Annie Darves-Bornoz, MD,<sup>3</sup> Marah C. Hehemann, MD,<sup>2</sup> Brian T. Helfand, MD, PhD,<sup>2</sup> Mary Kate Keeter, MPH,<sup>3</sup> Robert E. Brannigan, MD,<sup>3</sup> Nelson E. Bennett, MD,<sup>3</sup> and Joshua A. Halpern, MD, MS<sup>3</sup>

## ABSTRACT

**Background:** Direct-to-consumer (DTC) Internet-based prescription and pharmacy platforms offer electronic consultation for evaluation and pharmacologic treatment of erectile dysfunction (ED) without a physical exam or in-person visit, presenting a potentially dramatic shift in care for this condition.

**Aim:** To characterize the extent to which DTC prescribing sites for ED generate traffic and attract individual users.

**Methods:** Using SEMRush, a marketing software platform that provides analytics regarding website traffic, we examined online site visits to 6 major DTC prescribing websites offering ED evaluation and treatment from October 2017 through December 2019.

**Outcomes:** We recorded trends in the number of unique visitors over time, visitor referral patterns, and the proportion of overall visitors to individual sites.

**Results:** During the study period, the total number of unique, quarterly visitors increased by 1,688% from 655,733 in the 4th quarter (Q4) 2017 to over 11 million in Q4 2019. In 2019, there were on average 4,971,674 visits to all sites combined each month. For the 2 largest sites (Hims and Roman), visitors predominantly reached the site via direct web address (27.3%) or search engine referral (27.3%).

**Clinical implications:** An increasingly large number of potential patients are utilizing DTC prescribing platforms for the diagnosis and treatment of ED, which do not require physical exams or treatment of other comorbid conditions.

**Strength & Limitations:** Demonstrates high demand for ED DTC prescribing services using independent market research software and characterizes the number of visits for the first time. Limitations include the lack of individual demographics and lack of information regarding what proportion of unique visits lead to evaluation and treatment using the services.

**Conclusion:** The dramatic increase in visits to DTC prescribing sites that treat ED represents a paradigm shift in ED care, and it is imperative that clinicians and researchers work to understand how patients utilize online telemedicine, the safety and efficacy of online management of ED, and the potential downstream implications of its widespread use.

**Wackerbarth JJ, Fantus RJ, Darves-Bornoz A, et al. Examining Online Traffic Patterns to Popular Direct-To-Consumer Websites for Evaluation and Treatment of Erectile Dysfunction. Sex Med 2021;9:100289.**

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**Key Words:** Erectile Dysfunction; Telemedicine; Men's Health

Received August 3, 2020. Accepted November 21, 2020.

<sup>1</sup>Section of Urology, Department of Surgery, University of Chicago Medicine, Chicago, IL, USA;

<sup>2</sup>Department of Surgery, NorthShore University Health System, Evanston, IL, USA;

<sup>3</sup>Department of Urology, Northwestern University Feinberg School of Medicine, Chicago, IL, USA

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<https://doi.org/10.1016/j.esxm.2020.100289>

Sex Med 2021;9:100289

## INTRODUCTION

Erectile dysfunction (ED) is a highly prevalent condition affecting approximately 50% of men 40–70 years old in the United States (US).<sup>1,2</sup> Beyond the immediate impact of ED upon men's physical and psychological health, ED is a known harbinger of underlying comorbidity such as cardiovascular disease, metabolic syndrome, and hypogonadism.<sup>3–6</sup> Men with ED have a significantly higher chance of developing a cardiovascular event in the years following diagnosis, and for this reason,

comprehensive evaluation of men presenting with ED can result in potential life-saving diagnoses and medical interventions.<sup>7,8</sup> The underlying cause of ED is often multifactorial; however, it is commonly a manifestation of poor systemic health due to cardiovascular disease, hypertension, diabetes, psychologic disorders, medication side effects, low testosterone, and sleep disorders.<sup>5,9–11</sup>

Men with ED often delay, or altogether bypass, presentation to a physician for a variety of reasons. Some men have expressed concern that a physician might dismiss their complaints or fail to offer medical therapy.<sup>12</sup> Others may find it inherently difficult to discuss sexual health due to the privacy of these issues or a feeling of embarrassment regarding sexual dysfunction.<sup>13</sup> One study estimated that less than 25% of patients with sexual dysfunction had sought care with a physician.<sup>14</sup>

The proliferation over the last few years of websites offering remote diagnosis and treatment for ED represents a potential paradigm shift in the way that men seek care for ED.<sup>15</sup> Over 50% of adults in the United States were found to use online tools to look for health information in a 2013 Pew poll on online health activity.<sup>16</sup> The sites in question not only provide health information but additionally promise discrete evaluation and treatment of ED without requiring an in-person visit or physical exam.<sup>16</sup> This may preferentially appeal to men who have already avoided interaction with a healthcare provider and are potentially at higher risk for undiagnosed comorbidity. While widespread digital and television advertising campaigns have led to an increase in visibility of these websites, the extent to which these websites generate traffic has yet to be characterized.<sup>17,18</sup> Given the high propensity of adults in the United States to seek health information online and the sensitive nature of the subject, we hypothesized that there is a rapidly rising interest in direct-to-consumer (DTC) prescribing providers for ED. We sought to quantify the amount of traffic to DTC prescribing websites offering ED treatment and characterize factors associated with website visits in order to elucidate the potential impact of these online DTC businesses upon the diagnosis and treatment of ED in the United States.

## METHODS

SEMrush is an advanced-marketing software platform that provides analytics to companies regarding website traffic. The platform can determine the number of users visiting a particular website in a given time frame. The platform can also discern the point of entry to the website for each user: direct access or referral from another site, search engine, social media, or paid advertisement.

We used SEMrush to generate web traffic reports for popular men's health websites offering direct-to-consumer (DTC) Internet-based ED evaluation and prescription platforms. Users were included if they accessed the sites in question using servers within the United States. We included the following websites

[forhims.com](http://forhims.com) (Hims), [getroman.com](http://getroman.com) (Roman), [bluechew.com](http://bluechew.com) (BlueChew), [healthymale.com](http://healthymale.com) (HealthyMale), [heydoctor.com/services/erectile-dysfunction](http://heydoctor.com/services/erectile-dysfunction) (HeyDoctor), and [lemonaidhealth.com](http://lemonaidhealth.com) (Lemonaid Health). Sites were identified using the first page of a Google search term "Online treatment for erectile dysfunction." We selected sites or paid advertisements for sites on the first 2 pages of results, and we excluded online pharmacies that did not include clinician evaluation and prescription at the time of the query. Market research estimates between 70% and 90% of users click a result on the first page of a search result and 6% on the second, while 15% click on an ad or try a new search.<sup>19,20</sup> With this selection process, we attempted to accurately represent the browsing habits of a prospective user.

We examined site-specific monthly unique visitor web traffic from October 2017 to December 2019. An increase in average monthly visits was calculated from 2018 through 2019, as 3 of the websites were not active in 2017. Visitors were characterized as mobile device or desktop users. Additional data for individual user point of entry was available for the 2 most commonly visited sites, Hims and Roman.

We utilized Google Trends to determine overall trends in search volume for "erectile dysfunction" over time as a comparison.<sup>21</sup> Google Trends utilizes a representative sample of searches over the specified time limit and then normalizes the data allowing for comparison between searches on a 0–100 scale described as relative search volume (RSV) and has been used in a variety of fields as a health research metric.<sup>22</sup>

All descriptive statistics (means, standard deviation) and graphical trends were computed using Microsoft Excel v2019 (Microsoft Corporation, Redmond, WA). The study did not constitute human subjects research using commercially available market data. As such, the study was exempt from the local institutional review board (IRB) approval.

## RESULTS

During the study period, the total number of unique, quarterly visitors to popular men's DTC Internet-based prescription websites increased by 1,688% from 655,733 in the 4th quarter (Q4) 2017 to over 11 million in Q4 2019 (Table 1). The 2 most visited websites, Hims and Roman, had an average of 1.39 million and 1.34 million unique visits per month, respectively (Figure 1). The average monthly visits increased for the following sites over the study period from 2018 to 2019 (Table 2): Roman (120%), BlueChew (435%), Lemonaid Health (65%), and HeyDoctor (1,281%). Average monthly visits decreased for Hims (−4%) from 2018 to 2019, likely due to an earlier peak in user traffic compared to the other sites. Figure 2 demonstrates the proportion of overall visits to each individual site over time, with Hims, Roman, and BlueChew representing roughly 90% of unique visitors by the end of the study period, reaching a peak in total quarterly visits of 19,242,739 in Q1 2019.

**Table 1.** Total number of unique visitors to popular direct-to-consumer Internet-based prescription platforms websites, by quarter

Website	2017 Q4	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	Total
forhims.com	282,891	2,252,177	4,310,400	5,698,375	5,943,224	4,461,150	4,863,809	4,267,924	3,828,296	35,908,246
getroman.com	120,746	784,222	1,706,381	3,218,684	5,587,992	10,524,430	4,866,052	4,213,183	5,226,784	36,248,474
bluechew.com	0	0	123,540	509,843	1,768,281	3,368,549	6,759,711	1,372,501	1,356,218	15,258,643
healthymale.com	2,222	7,929	706	5,914	103	4,474	35,097	55,821	107,018	219,284
heydoctor.com	0	0	0*	0	0	43,784	162,885	391,993	337,454	936,116
lemonaidhealth.com	249,874	255,664	347,994	572,443	891,088	840,352	964,884	739,391	868,333	5,730,023
	655,733	3,299,992	6,489,021	10,005,259	14,190,688	19,242,739	17,652,438	11,040,813	11,724,103	94,300,786

\*810 unique visitors tracked during pilot testing (no public access) were excluded.

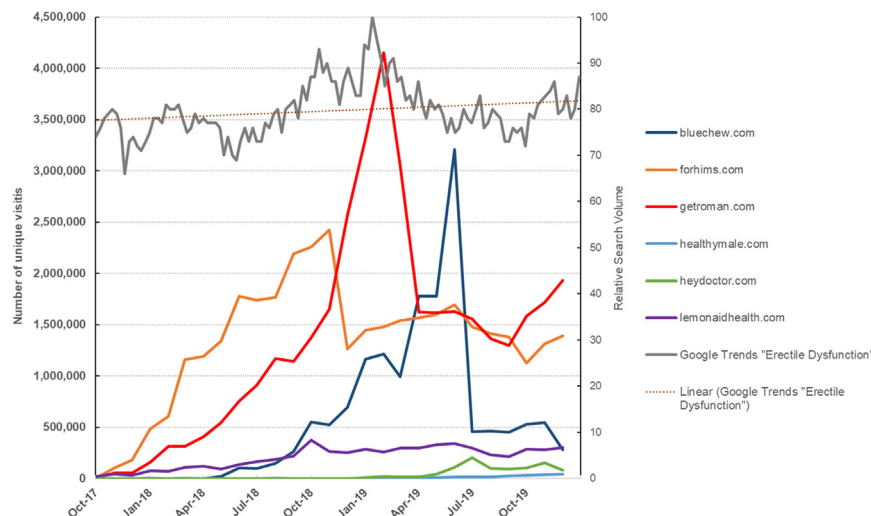
Across the study period, 82% of visits to all sites were conducted using mobile devices. The majority of website visits to Roman and Hims were directed from [google.com](https://www.google.com) (27.3%) or from users directly accessing the website (24.2%). Google comprised 96.2% of all website referrals from search engines, and an additional 7.9% of all users were directed to these websites through paid Google advertisements. The largest referring social media websites were Facebook and YouTube, which only contributed 2.5% and 0.8% of total traffic, respectively. During the same period, Google Trends showed that searches for “erectile dysfunction” were relatively stable with the exception of a slight upward trend coincident with a peak in traffic to Roman in Q1 2019 (Figure 1).

### DISCUSSION

To our knowledge, this is the first study examining website traffic to DTC prescribing websites offering treatment for ED. We found that visits to these websites have increased dramatically over a short period of time, despite stability in Internet search volumes for “erectile dysfunction.” Men using DTC prescribing for ED likely represent a heterogeneous cohort, and the current data cannot provide granularity as to the demographics or health profiles of these men.

The proliferation of men’s DTC prescribing websites has great potential to improve access to evaluation and treatment for ED. Laumann et al found that the majority of men with ED do not seek treatment. Some men may have difficulty discussing sexual health, and others may have concerns that their physician is not knowledgeable regarding ED or may fail to offer treatment; others may not even have an established primary care physician with whom to address their sexual function or may lack health insurance, yet another barrier to access.<sup>12,13,23,24</sup> All of the websites included in the present study offer prompt evaluation with health-screening questions and the ability to obtain affordable prescription medication from a licensed provider who is familiar with pharmacological treatment for ED, which can overcome many of the aforementioned barriers to access.

These websites also present significant pitfalls and challenges. ED is a significant risk factor for underlying cardiovascular disease, and a cursory health-screening questionnaire without a physical examination or further adjunct testing may risk missing crucial diagnoses.<sup>25</sup> Beyond cardiovascular disease, ED is associated with a wide range of conditions such as hypogonadism, Peyronie’s disease, and mental health disorders, which are not easily discerned via DTC prescribing websites in their current iterations.<sup>26</sup> A routine physical exam, recommended by the American Urological Association (AUA) for all men presenting with ED, can identify genitourinary pathologies such as phimosis, Peyronie’s plaque, and testicular atrophy that may impact erectile function.<sup>27</sup> Furthermore, evaluation for ED represents an opportunity for other routine health screenings (hyperlipidemia, colon cancer, prostate cancer) or to establish care with a primary



**Figure 1.** Trends in monthly website traffic to major direct-to-consumer Internet-based prescription platform providers. The trend in Google relative search volume for the term “erectile dysfunction” is presented as a comparison.

care physician.<sup>26,28–30</sup> One recent consecutive series of patients under 40 evaluated in an andrology clinic for ED found high rates of prediabetes (20%), dyslipidemia (54%), hypogonadism (20%), and varicoceles (35%). These conditions are all critical to identify in this population and would have been missed if the patient had utilized an online provider.<sup>31</sup>

Beyond concerns regarding accurate diagnosis, there are important considerations regarding the treatment options offered (and omitted) by these websites. On the one hand, there is a clear financial incentive for these websites to prescribe medication. Medication (exclusively phosphodiesterase-5 [PDE-5] inhibitors) is sold directly by most of the websites, and these sales appear to be the primary revenue stream for these companies, aided significantly by direct-to-consumer marketing.<sup>17,32</sup> As such, there could be over-prescription of medication to patients who might not be appropriate candidates for pharmacologic treatment. On the other hand, these websites do not offer the complete range of pharmacologic and non-pharmacologic treatments for ED, and it is not clear if and when a patient would be referred to a men’s health practitioner. As such, there is potential for under-treatment of men who fail PDE-5 inhibitors. In the

forementioned series of young men, over 50% of the patients evaluated eventually were treated with therapies not routinely offered by telehealth providers.<sup>31</sup> Moreover, there are incomplete systems in place for the evaluation and treatment of comorbid conditions that may contribute to ED, such as testosterone deficiency or cardiovascular disease.

Despite these drawbacks, the current study suggests that these websites have quickly gained a significant foothold, indicating what is likely to be a paradigm shift in the access to and delivery of care for ED. Undoubtedly, primary care physicians and urologists will see fewer patients who are naïve to ED treatments as a result of telemedicine prescriptions. Providers should become familiar with the scope of digital options, which will likely translate into changes in clinical practice when patients inquire about the remote services, present to physicians following trial of treatment through DTC prescribing sites, or achieve satisfactory results without ever having an in-person evaluation. Beyond these immediate clinical considerations, further research is needed to better characterize the users of these websites, outcomes of treatment, and systemic downstream consequences for the diagnosis and management of ED throughout healthcare systems.

**Table 2.** Average monthly unique visitors to popular direct-to-consumer Internet-based prescription platform websites

Website	Overall		2017*		2018		2019		2018–2019
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	% Change
bluechew.com	565,135	(739,905)	0	(0)	200,139	(250,643)	1,071,415	(848,006)	435%
forhims.com	1,329,935	(609,387)	94,297	(88,518)	1,517,015	(619,364)	1,451,765	(148,099)	–4%
getroman.com	1,342,148	(1,035,879)	36,757	(25,241)	941,440	(694,405)	2,069,204	(915,099)	120%
healthymale.com	8,062	(12,022)	200	(275)	1,221	(1,883)	16,868	(13,622)	1,281%
heydoctor.com	34,701	(55,774)	0	(0)	0 <sup>†</sup>	(234)	78,010	(60,576)	-
lemonaidhealth.com	206,370	(105,045)	30,615	(10,254)	172,266	(91,770)	284,413	(36,095)	65%

SD = Standard deviation.

\*October through December (Q4);

<sup>†</sup>Average 68 visitors tracked during pilot testing (no public access) were excluded.

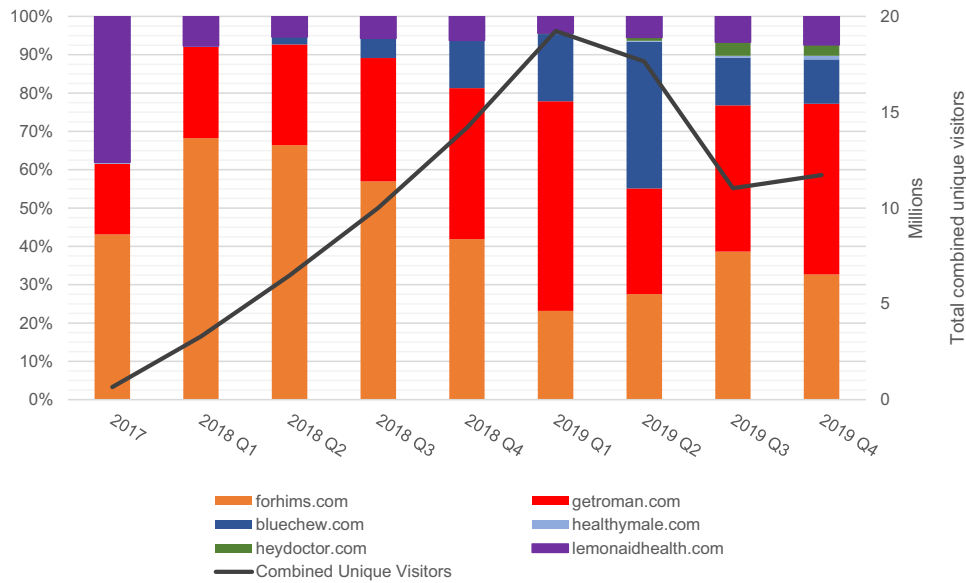


Figure 2. Unique visitors to each individual site by quarter.

The study findings must be interpreted within the context of certain limitations. First, the data presented only capture unique visitors to a particular website, which we interpreted as a surrogate for interest in ED treatment. However, the proportion of visitors who proceed to consultation and treatment cannot be discerned from these data. Second, these data do not discriminate individual users across websites; that is, an individual visiting multiple websites is considered to be a unique visitor for each website, which could lead to overestimation of the total monthly visits. Third, while the majority of the studied websites were initially marketed towards men with ED, the websites offer evaluation and treatment for other conditions, and in some cases, sell a variety of other products, particularly toward the end of the study period. The current study could not discern visitors seeking ED care versus those seeking other goods and services on some of the sites and cannot assess demographic information about individual users beyond the country of origin and platform used for access. Additionally, the metrics are limited to the 6 specific websites and one search engine (Google), which may not capture the entirety of the DTC Internet-based prescription platform users in this space. However, these websites are the most popular among the lay press and contain the highest marketing visibility, and as such, the current study is likely an accurate portrayal.<sup>33</sup> Likewise, Google constitutes the majority of all Internet searches, rendering this an adequate representation of all Internet search volume.<sup>34,35</sup>

## CONCLUSION

Over the past 2 years, there has been a dramatic increase in online traffic to men’s DTC prescribing websites offering treatment for ED. Up to 4 million unique users visit these websites monthly. This rapid increase represents a paradigm shift in ED care, and it is imperative that clinicians and researchers work to

understand how patients utilize online resources, the safety and efficacy of DTC prescribing for management of ED, and the potential downstream implications of its widespread use.

**Corresponding Author:** Joshua A. Halpern, MD, MS, 676 North St. Claire Street, Ste 2300, Chicago, IL 60611. Tel: 312-695-8146; Fax: 312-695-7030; E-mail: [joshua.halpern@northwestern.edu](mailto:joshua.halpern@northwestern.edu)

*Conflicts of interest:* The authors report no conflicts of interest.

*Funding:* None.

## STATEMENT OF AUTHORSHIP

Joel J. Wackerbarth: Data Analysis, Original Draft; Richard J. Fantus: Conception and Design, Data Analysis, Interpretation of Data, Original Draft; Annie Darves-Bornoz: Original Draft; Marah C. Hehemann: Interpretation of Data, Critical Revision and Editing; Brian T. Helfand: Critical Revision and Editing; Mary Kate Keeter: Critical Revision and Editing; Robert E. Brannigan: Critical Revision and Editing; Nelson E. Bennett: Interpretation of Data, Critical Revision and Editing; Joshua A. Halpern: Conception and Design, Data Analysis, Interpretation of Data, Critical Revision and Editing.

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