Googling Allergy in Ireland: Content Analysis

Catherine King¹, MB; Ciaran Judge¹, MB; Aideen Byrne², PhD, FRCPHC; Niall Conlon¹, PhD, FRCPath

¹Department of Clinical and Laboratory Immunology, St. James's Hospital, Dublin, Ireland
²Paediatric Allergy Department, Our Lady's Children's Hospital, Crumlin, Dublin, Ireland

Corresponding Author:
Catherine King, MB
Department of Clinical and Laboratory Immunology
St. James's Hospital
James's Street
Dublin 8
Ireland
Phone: 353 1 410 3000
Email: cathmarionking@gmail.com

Abstract

Background: Internet search engines are increasingly being utilized as the first port of call for medical information by the public. The prevalence of allergies in developed countries has risen steadily over time. There exists significant variability in the quality of health-related information available on the web. Inaccurately diagnosed and mismanaged allergic disease has major downstream effects on patients, general practitioners, and regional allergy services.

Objective: This study aimed to verify whether Ireland has a relatively high rate of web-based allergy-related searches, to establish the proportion of medically accurate web pages encountered by the public, and to compare current search results localized to Dublin, Ireland with urban centers elsewhere.

Methods: Google Trends was used to evaluate regional interest of allergy-related search terms over a 10-year period using terms “allergy,” “allergy test,” “food allergy,” and “food intolerance.” These terms were then inputted into Google search, localizing them to cities in Ireland, the United Kingdom, and the United States. Output for each search was reviewed by two independent clinicians and deemed rational or nonevidence based, as per current best practice guidelines. Searches localized to Dublin were initially completed in 2015 and repeated in 2019 to assess for changes in the quality of search results over time.

Results: Ireland has a persistently high demand for web-based information relating to allergy and ranks first worldwide for “allergy test,” second for “food allergy” and “food intolerance,” and seventh for “allergy” over the specified 10-year timeframe. Results for each of the four subsearches in Dublin (2015) showed that over 60% of websites promoted nonevidence-based diagnostics. A marginal improvement in scientifically robust information was seen in 2019, but results for “allergy test” and “food intolerance” continued to promote alternative testing 57% (8/14) of the time. This strongly contrasted with results localized to Southampton and Rochester, where academic and hospital-affiliated web pages predominantly featured. Government-funded Department of Health websites did not feature in the top five results for Dublin searches “allergy testing,” “food allergy,” or “food intolerance” in either 2015 or 2019.

Conclusions: The Irish public demonstrates a keen interest in seeking allergy-related information on the web. The proportion of evidence-based websites encountered by the Irish public is considerably lower than that encountered by patients in other urban centers. Factors contributing to this are the lack of a specialist register for allergy in Ireland, inadequate funding for allergy centers currently in operation, and insufficient promotion by the health service of their web-based health database, which contains useful patient-oriented information on allergy. Increased funding of clinical allergology services will more meaningfully impact the health of patients if there is a parallel investment by the health service in information and communication technology consultancy to amplify their presence on the web.

(J Med Internet Res 2020;22(5):e16763) doi: 10.2196/16763

KEYWORDS

allergy; food allergy; food intolerance; technology; Ireland; immunology
Introduction

Background

The internet has become a major resource for people seeking information in relation to health. Overall, 57% of Irish adults search for health-related information on the web, and this most often applies to younger people and women [1].

The incidence of allergies has risen steadily in developed countries [2]. Food allergies are thought to affect approximately 1% to 3% of the Irish adult population and are a cause of significant public concern [3,4]. Allergic disease has long been a focus of public attention, with a nationwide questionnaire in 2015 demonstrating that 14% of Irish adults self-report allergic conditions (rhinitis, allergic eye disease, and food allergy, excluding allergic asthma) [5]. The diagnosis of allergic disease is centered upon a detailed clinical history and supported by the judicious use of tests to detect allergic sensitization [6]. Allergic sensitization is determined by skin prick testing or detection of allergen-specific immunoglobulin E (sIgE). When these test results conflict or there is a diagnostic doubt, gold standard investigation is advisable in the form of diagnostic challenges. These time-consuming procedures are only available in specialist centers.

The umbrella term of allergy is one that frequently attracts input from a variety of alternative medicine practitioners, naturopaths, homeopaths, and acupuncturists both in terms of diagnostic testing and claims to treatment. Despite the existence of scientifically robust and evidence-based allergy tests, alternative approaches to diagnosis are widely used by the public, with attempts at regulatory control being previously described as “woefully inadequate” [2]. Alternative tests, including food-specific immunoglobulin G testing, kinesiology, hair analysis, Vega testing, and leukocytotoxic tests, are widely available, lack scientific basis and diagnostic rigor, and have been discredited by a variety of governmental, professional, and expert bodies internationally [6-9]. The use of complementary and alternative medicine (CAM) as a treatment modality for allergy has also been increasingly reported, with 37% of people with allergic disease using CAM during the preceding 12 months in a recent European study [10]. In 2018, 60% of surveyed allergists in the United States had patients who encountered adverse reactions from the use of CAM, with 81% of respondents encountering patients who discontinued conventional therapy while using CAM, irrespective of medical advice [11]. Despite this, alternative approaches continue to be advocated by some health care professionals, including registered medical practitioners. The risks of a misdiagnosis of food allergy include inappropriate dietary restrictions and negative quality-of-life consequences, the misattribution of symptoms to allergic diseases resulting in delayed assessments, the inappropriate fear of life-threatening reactions, and direct and indirect financial costs related to these risks [12].

Objectives

The volume of easily accessible information available on the web offers an excellent opportunity to provide helpful, evidence-based information and services to the information-seeking public. In this study, we sought to examine the web-based information sources accessible to members of the Irish public who were seeking information on allergy testing. We first interrogated allergy testing search requests by Irish internet users. We then examined the prominent sites presented when searching for allergy tests in an Irish setting and determined whether they promoted rational or alternative testing approaches. We initially reviewed these search requests in 2015 and repeated the study using identical search terms in 2019 to identify whether the standard of information available to internet users had changed over time. Finally, we compared the 2019 Irish results with similar UK and US populations using identical search terms.

Methods

Google Trends was used to evaluate interest by region of allergy-related search terms over a 10-year period (January 1, 2009, to December 31, 2018) [13]. The search terms used were “allergy” and related subsearches “allergy test,” “food allergy,” and “food intolerance.” The period of trend analysis was purposely predated to the start of 2019 so that our subsequent searches in July 2019 did not interfere with the trend results. Google Trends data provide a list of countries ranked by the relative popularity of the specified search term, as a proportion of total searches in each country.

Each of the search terms was inputted into Google search and the output reviewed. Output webpages were reviewed independently by two clinicians and classified as rational, if the services or information offered were based on clinical history and standard sensitization testing, or alternative, if the practitioners offered any non–evidence-based approaches, as outlined in the Irish Food Allergy Network and Irish Association of Allergy and Immunology position statement [7]. Results localized to country level (Ireland) were reviewed initially. Then, a comparison of local results from Dublin, Southampton (United Kingdom), and Rochester (United States) was performed. Sponsored advertisements, forums/discussion groups, duplications, and reports on news or weather were excluded from analysis. Analysis was limited to Google search pages one and two.

Results

Trend Analysis of Allergy-Related Searches Worldwide

Data from Google trends indicate that Ireland has a persistently high demand for information regarding allergy. Trends from 2008 to 2019 demonstrate that Ireland ranks seventh in the world in searches for the term allergy (Table 1). Analysis of data for the subsearch term “allergy test” shows that Ireland is ranked first in the world for this particular search over the timeframe, and second in the world for both other subsearch terms “food allergy” and “food intolerance” [13]. These results demonstrate a high demand for web-based information regarding allergies from the Irish population.
Table 1. Google Trends January 1, 2009, to December 31, 2018, worldwide for the specified search terms.

<table>
<thead>
<tr>
<th>Search term</th>
<th>Ireland ranking</th>
<th>Worldwide ranking</th>
<th>Ireland ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>First place</td>
<td>Second place</td>
</tr>
<tr>
<td>“Allergy”</td>
<td></td>
<td>United States</td>
<td>Canada</td>
</tr>
<tr>
<td>“Allergy test”</td>
<td></td>
<td>Ireland</td>
<td>Singapore</td>
</tr>
<tr>
<td>“Food allergy”</td>
<td></td>
<td>United States</td>
<td>Ireland</td>
</tr>
<tr>
<td>“Food intolerance”</td>
<td></td>
<td>Malta</td>
<td>Ireland</td>
</tr>
</tbody>
</table>

Analysis of localized Google search engine results for Ireland (search term “allergy Ireland”) in 2015 revealed that alternative diagnostic services and information featured highly (Table 2). At that time, 63% (10/16) of included results were from private companies selling non–evidence-based commercial tests, 19% (3/16) were from private medical services with rational testing procedures, and the remaining 19% (3/16) were from organizations offering evidence-based patient information. Regional localization to Dublin and analysis of the subsearch terms also confirmed the prominence of websites endorsing alternative approaches to allergy diagnostics. Furthermore, 69% (11/16) websites listed under an “allergy test Dublin” Google search promoted alternative non–evidence-based approaches to allergy. Use of the search term “food allergy Dublin” provided similar results, with 67% (10/15) of included results relating to alternative health care websites. The disparity was greater again when “food intolerance Dublin” was used as a search term, with just 13% (2/15) of included webpages promoting a rational assessment approach versus 87% (13/15) promoting alternative approaches.

Table 2. Summary of results of localized internet searches for the specified allergy-related search terms.

<table>
<thead>
<tr>
<th>Search term, by region</th>
<th>Website results, n (%)</th>
<th>Medical facility, rational testing</th>
<th>Evidence-based guidelines, journals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Allergy”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ireland (2015)</td>
<td>10 (63)</td>
<td>3 (19)</td>
<td>3 (19)</td>
</tr>
<tr>
<td>Ireland (2019)</td>
<td>1 (9)</td>
<td>5 (46)</td>
<td>5 (46)</td>
</tr>
<tr>
<td>Southampton, United Kingdom (2019)</td>
<td>1 (11)</td>
<td>4 (44)</td>
<td>4 (44)</td>
</tr>
<tr>
<td>Rochester, United States (2019)</td>
<td>0 (0)</td>
<td>7 (100)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>“Allergy Test”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dublin (2015)</td>
<td>11 (69)</td>
<td>5 (31)</td>
<td>N/A</td>
</tr>
<tr>
<td>Dublin (2019)</td>
<td>8 (57)</td>
<td>5 (36)</td>
<td>1 (7)</td>
</tr>
<tr>
<td>Southampton, United Kingdom (2019)</td>
<td>1 (8)</td>
<td>8 (67)</td>
<td>3 (25)</td>
</tr>
<tr>
<td>Rochester, United States (2019)</td>
<td>0 (0)</td>
<td>7 (70)</td>
<td>3 (30)</td>
</tr>
<tr>
<td>“Food Allergy”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dublin (2015)</td>
<td>10 (67)</td>
<td>5 (33)</td>
<td>N/A</td>
</tr>
<tr>
<td>Dublin (2019)</td>
<td>6 (46)</td>
<td>5 (39)</td>
<td>2 (15)</td>
</tr>
<tr>
<td>Southampton, United Kingdom (2019)</td>
<td>1 (9)</td>
<td>4 (36)</td>
<td>6 (55)</td>
</tr>
<tr>
<td>Rochester, United States (2019)</td>
<td>0 (0)</td>
<td>5 (50)</td>
<td>5 (50)</td>
</tr>
<tr>
<td>“Food Intolerance”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dublin (2015)</td>
<td>13 (87)</td>
<td>2 (13)</td>
<td>N/A</td>
</tr>
<tr>
<td>Dublin (2019)</td>
<td>8 (57)</td>
<td>4 (29)</td>
<td>2 (14)</td>
</tr>
<tr>
<td>Southampton, United Kingdom (2019)</td>
<td>3 (27)</td>
<td>6 (55)</td>
<td>2 (18)</td>
</tr>
<tr>
<td>Rochester, United States (2019)</td>
<td>1 (11)</td>
<td>3 (33)</td>
<td>5 (56)</td>
</tr>
</tbody>
</table>

aThe 2015 search results for “Allergy test Dublin,” “Food allergy Dublin,” and “Food intolerance Dublin” were recorded as either alternative or evidence based only.

bN/A: not available.
The Increasing Burden of Allergic Disease

The incidence of allergic conditions in both developed and developing countries has been increasing for over 50 years. One-third of people in the United Kingdom are estimated to suffer symptoms related to allergy at some stage during their lives [2]. The use of the internet has also risen steadily over recent generations, especially involving the investigation of medical conditions on the web. Over 70% of internet users in the United States have stated that they look on the web for health information [10]. The internet has created a means of positively impacting the lives of many individuals affected by allergies while simultaneously decreasing the pressure on an already burdened health system. However, these potential benefits rely on the availability of accurate, evidence-based, and accessible resources that are endorsed solely to allergy is assumed to be far below the threshold of 1.1% [18]. The ease of access to non–evidence-based medical conditions that attract input from non–evidence-based sources, but allergology has consistently shown itself to be an area of particular interest among CAM practitioners. A study of the websites of over 300 alternative health care providers demonstrated that 85% of naturopaths offer diagnosis, treatment, and an unmet clinical need for allergic disease. The internet has created a means of positively impacting the lives of many individuals affected by allergies while simultaneously decreasing the costs placed on the Irish health service. However, these potential benefits rely on the availability of accurate, evidence-based, and accessible resources that are provided by experts in allergology. There is a wide variation in the amount of allergologists working in different European countries, with a mean of 1.81 specialists per 100,000 inhabitants [22]. Figures for Ireland are not directly comparable to the word “allergy,” which is frequently misappropriated by such websites, a recent study of worldwide internet search results for “anaphylaxis” showed that links to well-established, evidenced-based information were far more often seen [21].

Unmet Clinical Need in Allergic Disease

The internet has created a means of positively impacting the lives of many individuals affected by allergies while simultaneously decreasing the costs placed on the Irish health service. However, these potential benefits rely on the availability of accurate, evidence-based, and accessible resources that are provided by experts in allergology. There is a wide variation in the amount of allergologists working in different European countries, with a mean of 1.81 specialists per 100,000 inhabitants [22]. Figures for Ireland are not directly comparable to the word “allergy,” which is frequently misappropriated by such websites, a recent study of worldwide internet search results for “anaphylaxis” showed that links to well-established, evidenced-based information were far more often seen [21].

Complementary and Alternative Medicine Practitioners

When members of the Irish public search for guidance on the web regarding allergic disease, they are faced with a large volume of alternative testing approaches, often taking precedence over results for rational services. This is rightly a cause for concern. Previous studies in North America show that 91.5% of users will select a website from the first page and that the likelihood of a user clicking a result on the third page is 1.1% [18]. The ease of access to non–evidence-based information has the potential to promote costly practices and to increase the pressure on an already burdened health system through mismanagement of allergic diseases. There are countless medical conditions that attract input from non–evidence-based sources, but allergology has consistently shown itself to be an area of particular interest among CAM practitioners. A study of the websites of over 300 alternative health care providers demonstrated that 85% of naturopaths offer diagnosis, treatment, and an unmet clinical need for allergic disease. The internet has created a means of positively impacting the lives of many individuals affected by allergies while simultaneously decreasing the costs placed on the Irish health service. However, these potential benefits rely on the availability of accurate, evidence-based, and accessible resources that are provided by experts in allergology. There is a wide variation in the amount of allergologists working in different European countries, with a mean of 1.81 specialists per 100,000 inhabitants [22]. Figures for Ireland are not directly comparable to the word “allergy,” which is frequently misappropriated by such websites, a recent study of worldwide internet search results for “anaphylaxis” showed that links to well-established, evidenced-based information were far more often seen [21].

Unmet Clinical Need in Allergic Disease

The internet has created a means of positively impacting the lives of many individuals affected by allergies while simultaneously decreasing the costs placed on the Irish health service. However, these potential benefits rely on the availability of accurate, evidence-based, and accessible resources that are provided by experts in allergology. There is a wide variation in the amount of allergologists working in different European countries, with a mean of 1.81 specialists per 100,000 inhabitants [22]. Figures for Ireland are not directly comparable to the word “allergy,” which is frequently misappropriated by such websites, a recent study of worldwide internet search results for “anaphylaxis” showed that links to well-established, evidenced-based information were far more often seen [21].

Complementary and Alternative Medicine Practitioners

When members of the Irish public search for guidance on the web regarding allergic disease, they are faced with a large volume of alternative testing approaches, often taking precedence over results for rational services. This is rightly a cause for concern. Previous studies in North America show that 91.5% of users will select a website from the first page and that the likelihood of a user clicking a result on the third page is 1.1% [18]. The ease of access to non–evidence-based information has the potential to promote costly practices and to increase the pressure on an already burdened health system through mismanagement of allergic diseases. There are countless medical conditions that attract input from non–evidence-based sources, but allergology has consistently shown itself to be an area of particular interest among CAM practitioners. A study of the websites of over 300 alternative health care providers demonstrated that 85% of naturopaths offer diagnosis, treatment, and an unmet clinical need for allergic disease. The internet has created a means of positively impacting the lives of many individuals affected by allergies while simultaneously decreasing the costs placed on the Irish health service. However, these potential benefits rely on the availability of accurate, evidence-based, and accessible resources that are provided by experts in allergology. There is a wide variation in the amount of allergologists working in different European countries, with a mean of 1.81 specialists per 100,000 inhabitants [22]. Figures for Ireland are not directly comparable to the word “allergy,” which is frequently misappropriated by such websites, a recent study of worldwide internet search results for “anaphylaxis” showed that links to well-established, evidenced-based information were far more often seen [21].

Unmet Clinical Need in Allergic Disease

The internet has created a means of positively impacting the lives of many individuals affected by allergies while simultaneously decreasing the costs placed on the Irish health service. However, these potential benefits rely on the availability of accurate, evidence-based, and accessible resources that are provided by experts in allergology. There is a wide variation in the amount of allergologists working in different European countries, with a mean of 1.81 specialists per 100,000 inhabitants [22]. Figures for Ireland are not directly comparable to the word “allergy,” which is frequently misappropriated by such websites, a recent study of worldwide internet search results for “anaphylaxis” showed that links to well-established, evidenced-based information were far more often seen [21].
published on how best to alleviate the pressure on chronically underresourced tertiary allergy departments [24]. A common theme throughout these (predominantly UK-based) reports is improved support and education of primary care physicians in the field of allergy. Proposed interventions have included development of a network of GPs with special interest in allergy [25,26], a core allergy curriculum for all GPs [27], and better training of nurses, pharmacists, and dieticians to enable them to advise patients in the community [28].

Future Directions in Allergic Disease Management: Investment in Information Technology Resources

Although these proposals are commendable and steps should certainly be taken in their establishment, there can be no doubt that these are long-term investments and change will be slow to occur. There has also been growing interest in the use of information technology (IT)–based interventions, such as telemedicine assessments in adult allergy [29], app-based monitoring of allergic rhinitis [30], and a pilot program of email communication between allergists and nonspecialists for new referrals to allergy clinics [31], with further prospective studies required. Innovative and accessible approaches to delivering allergy services are required in the setting of an inadequately resourced system, where the lack of timely care for patients has undoubtedly contributed to people seeking out alternative practitioners. There is an undeniable need for increased support and funding for dedicated allergy services currently in operation in Ireland. However, to create a meaningful impact on patients’ health-seeking behaviors, we need a parallel investment in IT services currently in use by the Irish health service.

In 2019, the information and communication technology capital allocation for the Irish health service was €85 million (US $92 million), making up approximately 0.5% of the total health care budget of over €16 billion (US $17 billion) [32]. The Health Service Executive (HSE) website was given a radical overhaul in 2013, which included development of a web-based database of over 600 health conditions and treatments. This database (entitled Health A-Z) contains useful information on the diagnosis and management of allergy and highlights the existence of alternative testing approaches, unambiguously describing them as unproven, unreliable, and best avoided by the public [33]. The content for this sizeable information resource was provided to the HSE completely free of charge from the NHS Choices website in the United Kingdom. Details on the volume of internet traffic to the HSE Health A-Z are not readily accessible to the public on the web. In our subsearch results for Dublin in 2019 (for “allergy test,” “food allergy,” and “food intolerance”), the HSE website never featured within the top 5 results. The question of cost efficacy and suboptimal internet traffic is certainly an issue that has been raised regarding the prototypic NHS Choices website in the past. A report published several years after its launch evaluated the NHS Choices website against the average website of a US company at the time (with a similar volume of monthly visitors) and found that the UK Department of Health was spending nearly four times more on site management, hosting costs, and development than their counterparts [34]. The downstream effect of this was the NHS entering a partnership with a digital marketing agency in 2012, which was specializing in analysis of consumer behaviors. This led to a significant improvement in their volume of web-based traffic [35]. The Irish health system, having saved huge costs in the development of their web-based health database, would undoubtedly benefit from external IT consultancy to improve their reach and strengthen their web-based presence. A public that is well informed and empowered in matters of their own health is a worthy long-term investment, and this applies to all areas of medicine, not solely allergology.

Conclusions

This study provides a snapshot of the information obtained when searching for information relating to allergy on the internet. There is great potential to provide accurate and evidence-based guidance to an increasing population, which would maximize the appropriate use of allergy services in Ireland. Unfortunately, this is not currently the case. Results for costly, non–evidence-based services predominate when searching on the web in Ireland, which differs relative to the United Kingdom and United States. There is a great need to improve the provision of allergy services in Ireland and to educate the Irish public on allergic disease, and investment in local internet resources is central to this endeavor.

Conflicts of Interest

None declared.

References


34. UKFast. NHS Choices Website Costs More Than £27m A Year URL: https://www.ukfast.co.uk/hosting-news/more-than-pound27m-spent-annually-on-nhs-choices-website.html [accessed 2019-09-20]


**Abbreviations**

CAM: complementary and alternative medicine
GP: general practitioner
HSE: Health Service Executive
IT: information technology
NHS: National Health Service

©Catherine King, Ciaran Judge, Aideen Byrne, Niall Conlon. Originally published in the Journal of Medical Internet Research (http://www.jmir.org), 13.05.2020. This is an open-access article distributed under the terms of the Creative Commons Attribution License (https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work, first published in the Journal of Medical Internet Research, is properly cited. The complete bibliographic information, a link to the original publication on http://www.jmir.org/, as well as this copyright and license information must be included.