Pulmonology 28 (2022) 330—332

PULMONOLOGY

www.journalpulmonology.org

COMMENT

Awareness and education in lung diseases: Are we reaching the target?

Ricardo Estêvão Gomes[a,*], **Isabel Saraiva**[b], **Mário Morais-Almeida**[c,d]

[a] *Serviço de Pneumologia, Hospital Garcia de Orta, Avenida Torrado da Silva, 2805-267, Almada, Portugal*
[b] *Associação Portuguesa de Pessoas com DPOC e outras Doenças Respiratórias (RESPIRA), Portugal*
[c] *Centro de Alergia, Hospital CUF Descobertas, Lisboa, Portugal*
[d] *Associação Portuguesa de Asmáticos (APA), Portugal*

Received 13 January 2022; accepted 22 February 2022
Available online 9 May 2022

KEYWORDS
Google trends;
Chronic obstructive pulmonary disease;
Asthma;
Pneumonia;
Tuberculosis;
Lung cancer;
Awareness;
Sensibilization campaign

Google Trends (GT) is a free and publicly accessible tool of Google Inc. that analyses web queries made using the Google search engine and provides the proportion of searches for a user-specific term over a specific geographic region and period.[1] It has been used to study public interest and awareness in various medical topics.[2,3]

The Forum of International Respiratory Societies identified chronic obstructive pulmonary disease (COPD), asthma, pneumonia, tuberculosis, and lung cancer, as the five major lung diseases ("The Big Five") and included them in the group of the biggest killers today.[4] A previous GT search study showed how the emergence of the COVID-19 pandemic has modified online search pattern for these diseases.[5]

Every year, educational campaigns are carried out to supply the population with knowledge on prevention, control, and cure of lung diseases. To evaluate whether awareness campaigns increase public interest in lung diseases, we conducted a GT search of the "big five" measuring the Relative Search Volume (RSV) over time. RSV ranges from 0 to 100, representing search interest in a specific search term relative to its peak of popularity (RSV =100) for the given region and time. Search queries in GT were defined as topics, which includes all terms that have the same idea or semantic in every language. Our search included five topics: "Chronic Obstructive Pulmonary Disease"; "Asthma"; "Pneumonia"; "Tuberculosis"; "Lung Cancer". As awareness campaigns we considered World COPD Day (November 17th, 2021), World Asthma Day (May 3rd, 2021), World Pneumonia Day (November

* Corresponding author.
E-mail address: ricardoegomes@gmail.com (R.E. Gomes).

https://doi.org/10.1016/j.pulmoe.2022.02.011

12th, 2021), World Tuberculosis Day (March 24th, 2021) and World Lung Cancer Day (August 1st, 2021).

We conducted a visual analysis of the "big five" RSV-timelines, from 1st of January to 11th of December 2021, at a worldwide level, in two American (United States of America [USA] and Brazil) and in three European (United Kingdom [UK], Germany and Portugal) countries. Afterwards, we performed an annual trend analysis (Independent samples T-test; IBM SPSS Statistics Version 25.0. Armonk, NY: IBM Corp) comparing the mean RSV in the World Day promotion month for each disease with the mean RSV in the other months.

Worldwide RSV-timelines analysis (Fig. 1) showed that pneumonia and asthma were the most popular lung diseases over the studied period. Pneumonia showed its peak in search interests in January and asthma displayed its peak in May. Tuberculosis was the third most searched with a popularity peak in March. Both COPD and Lung cancer showed a constantly low interest in worldwide searches. Countries'

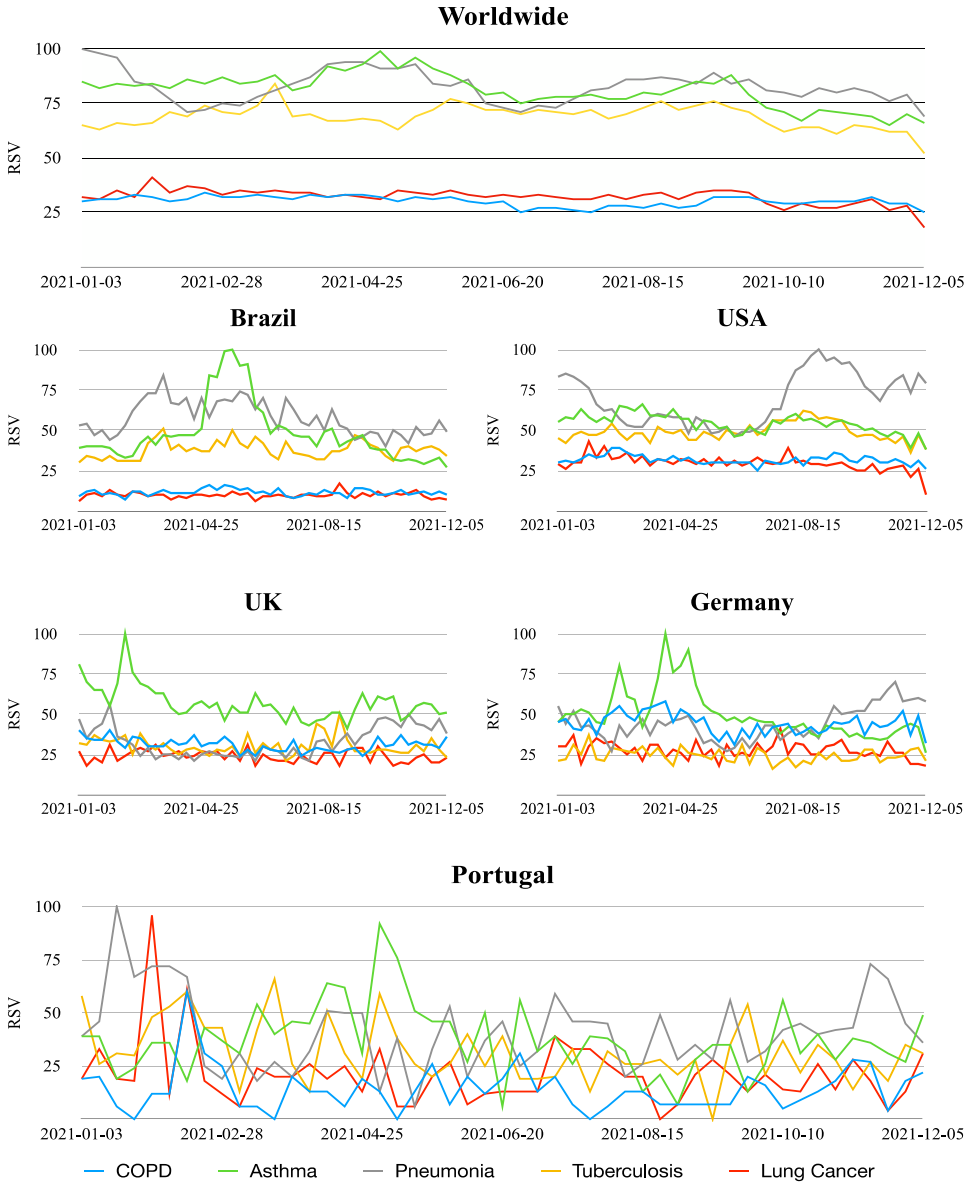

Fig. 1 RSV over time (1st January 2021 to 11th December 2021). At a worldwide level, pneumonia was the most popular disease (maximum RSV of 100, mean ± SD 86.7 ± 7.5), followed by asthma (99, 81.1 ± 7.8), tuberculosis (84, 68.9 ± 5.3), lung cancer (41, 32.1 ± 3.5) and COPD (34, 30.1 ± 2.3). World and country trend analysis showed that awareness campaigns significantly increased the mean RSV for pneumonia in November, compared to other months, in the USA (80.8 vs. 68.3, $p = 0.007$), UK (43.5 vs. 32.0, $p<0.001$) and Germany (61.8 vs. 42.7, $p<0.001$); for asthma in May at a worldwide level (93.0 vs. 79.7, $p<0.001$), Brazil (91.2 vs. 43.1, $p<0.001$), Germany (63.2 vs. 48.1, $p = 0.033$) and Portugal (62.2 vs. 34.6, $p<0.001$); and for tuberculosis in March at a worldwide level (74.3 vs. 68.4, $p = 0.033$) and Brazil (44.3 vs. 37.2, $p = 0.009$). Lines indicate the relative daily RSV for each disease: blue (COPD); green (asthma); grey (pneumonia); yellow (tuberculosis); red (lung cancer). COPD = chronic obstructive pulmonary disease; RSV = relative search volume; UK = United Kingdom; USA = United States of America. Data source: Google Trends (https://www.google.com/trends).

RSV-timelines have different patterns in disease search over time between countries (Fig. 1).

In the trend analysis (Fig. 1), we observed that World Day awareness campaigns resulted in a significant increase in research for pneumonia in the USA, UK, and Germany; for asthma worldwide, in Brazil, Germany, and Portugal; and for tuberculosis worldwide and in Brazil. Campaigns focusing on COPD and lung cancer did not result in RSV variation.

Our analysis revealed popularity peaks related to awareness campaigns for pneumonia, asthma, and tuberculosis in some countries, and no impact in search for COPD and lung cancer. The highest worldwide RSV was seen in January for pneumonia, probably associated with the increasing number of COVID-19 cases at that time.[6] This has been previously shown by Barbosa et al.[5] and may translate people's reaction during disease outbreaks.

Boehm et al.[2] showed an annual increase in COPD search in November. Still, COPD was under-represented in Google search queries, compared to other diseases. They also observed a decrease in public's interest in lung cancer over the years, a tendency that is confirmed by our results. Lastly, they refer to breast cancer campaigns and the pink ribbon concept as a role model in awareness promotion since they have resulted in annual cyclic RSV peaks during October for breast cancer, which have increased over the years.

In conclusion, the data here presented suggest that sensibilization campaigns do not consistently increase population's interest in lung diseases. The low level of population interest and the lack of effect of COPD and lung cancer awareness campaigns is of particular concern, as both diseases are highly preventable, but their prevalence and mortality remain high. We must strive to elaborate new strategies to increase the effectiveness of sensibilization campaigns, and consequently, population's awareness in lung diseases.

References

1. Google Trends. https://trends.google.pt/trends/?geo=PT. Published 2021. [accessed December 13 2021].
2. Boehm A, Pizzini A, Sonnweber T, et al. Assessing global COPD awareness with Google Trends. Eur. Respir. J. 2019;53(6). https://doi.org/10.1183/13993003.00351-2019.
3. Schootman M, Toor A, Cavazos-Rehg P, et al. The utility of Google Trends data to examine interest in cancer screening. BMJ Open. 2015;5(6):1—8. https://doi.org/10.1136/bmjopen-2014-006678.
4. Forum of International Respiratory Societies. The Global Impact of Respiratory Disease. Third Edition. European Respiratory Society; 2021. Accessed 22 Sept 2021 *firsnet.org/images/publications/FIRS_Master_09202021.pdf*.
5. Barbosa MT, Morais-Almeida M, Sousa CS, Bousquet J. The "Big Five" Lung Diseases in CoViD-19 Pandemic — a Google Trends analysis. Pulmonology. 2021;27(1):71—2. https://doi.org/10.1016/j.pulmoe.2020.06.008.
6. World Health Organization. WHO Coronavirus (COVID-19) Dashboard. https://covid19.who.int. Published 2021. [accessed December 23 2021].