Google Trends confirms COVID-19 impact on tourist industry

Sybille Menzel[1], Steffen Springer[2], Michael Zieger[2,*], Artur Strzelecki[3]

[1] FeWo Watzmann-Menzel, Berchtesgaden, Königsseer Straße 10, D-83471 Berchtesgaden, Germany
[2] SRH Wald-Klinikum Gera GmbH, Straße des Friedens 122, D-07548 Gera, Germany
[3] University of Economics in Katowice, Department of Informatics, Katowice 40-287, 1 Maja 50, Poland
* Corresponding author, e-mail: Michael_Zieger@icloud.com

The Version of Record of this manuscript has been published and is available in:
Menzel, S., Zieger, M., Springer, S., & Strzelecki, A. (2022). Google Trends Confirms COVID-19 Impact on Tourist Industry. *Tourism Culture & Communication*. https://doi.org/10.3727/109830422X16600594683418

Abstract

The coronavirus pandemic is having a dramatic impact on human health, societies, the global economy, and also the tourism industry. Google Trends has already been introduced as a study tool for scientific research in various fields, such as tourism. In this study, Google Trends data were collected to confirm the impact of Covid-19 on tourism. Google Trends data were analyzed with a weekly data resolution for the past 5 years. The region was selected as worldwide and all categories were set. Google Trends data were used to compare search interest among the world population for relevant English search topics. The results suggest that Google Trends is a valuable tool for monitoring and confirming the effects of major events of global concern, such as Covid-19. Differences between varied business models within the tourism industry could also be shown. This study supports the results of previous research to better understand the impact of the coronavirus pandemic on the economy. Results underline the importance and duration of the Covid-19 effect in various areas of the global tourism industry.

Keywords: Google Trends, Covid-19, search engine data, online travel agencies

1. Introduction

After the first identification of a previously unknown respiratory disease in Wuhan City, Hubei province (Central China), in December 2019 the spread of a novel coronavirus SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) quickly changed into a 'Public Health Emergency of International Concern' by World Health Organization (WHO) on 30th January 2020 (Lu et al., 2020; Sohrabi et al., 2020; Zhou et al., 2020). The pandemic potential of the coronavirus disease 2019 (Covid-19) resulted in a declaration of a pandemic by WHO on 11th March 2020 (Green, 2020).

The global spread and threat posed by Covid-19 resulted in a number of measures by the affected countries, which were associated with corresponding restrictions. In order to bring the further spread of the coronavirus under control, lockdowns, travel and flight restrictions, accommodation bans for hotels, and restrictions on tourism were imposed (Gössling et al., 2020). As several studies note, this had a dramatic impact on the tourism industry (Farzanegan et al., 2020; Sharma & Nicolau, 2020). While Sharma and Nicolau (2020) have modelled the effects of the pandemic on the travel and tourism industry based on the market valuation of industries, the present study shows the interests of the population. The data from both studies are therefore not directly comparable. But the presented study is suitable to shed a different light on the situation and to round off the resulting overall picture.

2. Data and Methodology

Google Trends has been widely used as a study tool for a variety of scientific investigations, e.g., tourism (Bokelmann & Lessmann, 2019; Mavragani et al., 2018). Google Trends offers a comparison between five search terms or topics and the individual search volume of each particular term or topic is related to the total search volume, as described elsewhere (Zieger &

Springer, 2020). We have collected important results coming from Google Trends about the impact which Covid-19 has on tourism.

Data were collected with the following settings in Google Trends. The period was set for the last 5 years with a weekly data resolution. The 5-year period selected is one of Google Trends' standard Google Trends research periods for analysis, which provides weekly analysis. It was chosen to study the pre-and post-pandemic situation. The starting date is 20th December 2015, and the finishing date is 19th December 2020. The region was selected as worldwide and all thematic categories were set. In this study, topics, not search terms, were used. The difference between search terms and topics is search term shows matches for all terms in the query, in the language of the search term, whereas the topic is a group of terms that share the same concept in any language. The search was conducted using the index from Web Search (Mavragani et al., 2018). In this study, Google Trends data were used to compare search interest in the global population for relevant English search topics to confirm the impact of Covid-19 on the global tourism industry.

3.1 Impact of the Covid-19 on interest in tourist booking sites

Online travel agencies have already grown in importance as part of the tourism industry (Chang et al., 2019; Martin-Fuentes & Mellinas, 2018). Therefore, in the first step data were collected on relative search interest in the following topics: *Booking.com*, *Airbnb*, *Expedia*, and *Skyscanner*. These are popular internet websites used for planning travel and holidays (Reinhold et al., 2020; Trabucchi & Buganza, 2020). We have set the topic for a website, instead of information about the company, which is a similar name in these examples. These websites operate worldwide and have language versions for many countries and markets where they operate. Other websites like *Trivago*, *Kayak*, and *Momondo* were not used for comparison, since they belong to the groups owned by Expedia Group or Booking Holdings Inc. (Liew, 2020; Martin-Fuentes and Mellinas, 2018).

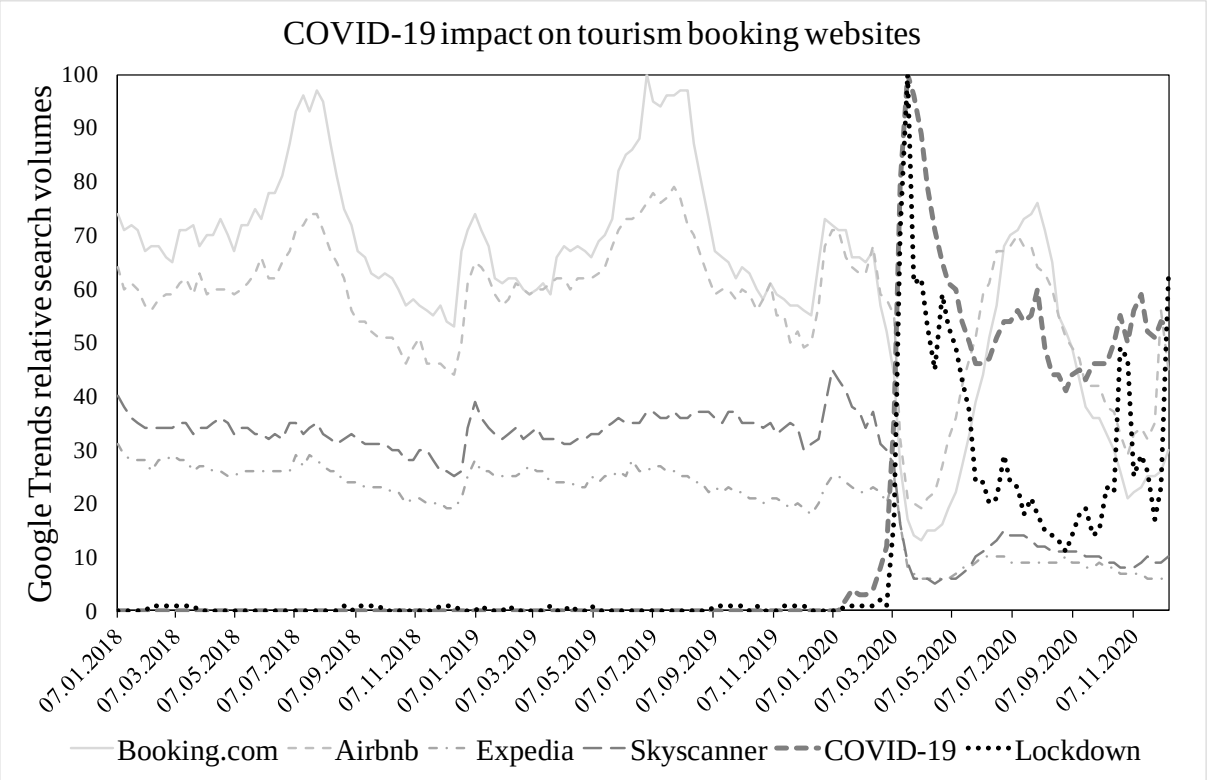

Figure 1: Google Trends reveals impact of COVID-19 on tourism booking websites

Data revealed a significant drop in interest and use of search engines for planning travel and holidays in 2020 (Fig. 1). The relative search interest of the topics examined shows very characteristic annual courses in the period under study, as shown in Figure 1 for the years 2018 and 2019. The interest in *Booking.com* and the interest in *Airbnb*, for example, have annual peaks during the summer of the northern hemisphere. In addition, all of the topics examined usually peaked at the beginning of the year. While the first months of 2020 began analogously to previous years, the occurrence of the coronavirus pandemic in spring 2020 caused a significant decline in relative search interest.

Booking.com and *Airbnb* showed a recovery until the second wave of coronavirus infections worldwide in combination with renewed restrictions in the tourism industry led to another decline. The topics *Skyscanner* and *Expedia* could barely trace the restoration of the other two topics and remained at an indicative low level. *Booking.com* and *Airbnb* have a similar correlation. These online marketplaces for vacation rentals offer travel and accommodation services for rental apartments, rooms, and apartments (Trabucchi & Buganza,

2020). *Skyscanner* and *Expedia* show similar behavior in Google Trends (Fig. 1). To illustrate the impact of restrictions caused by the global pandemic on tourism websites we also present data for two additional search topics in Figure 1: *Covid-19 and Lockdown*. We have estimated the Pearson coefficient correlation for tourism booking sites search topics and pandemic search topics. The results are presented in Table 1.

Table 1. Pearson coefficient correlation for search on tourism booking sites and pandemic search topics.

	Booking.com	*Airbnb*	*Expedia*	*Skyscanner*	*COVID-19*	*Lockdown*
Booking.com	1					
Airbnb	0,87	1				
Expedia	0,59	0,28	1			
Skyscanner	0,75	0,63	0,78	1		
COVID-19	-0,58	-0,32	-0,88	-0,84	1	
Lockdown	-0,61	-0,40	-0,76	-0,74	0,92	1

Table 1 shows a significant negative correlation for *Expedia* and *Skyscanner* with search topics showing interest in *COVID-19* and *Lockdown*. The score is very high and confirms when there is an increasing trend for search information on the disease and restrictions, the relative interest in both websites decreases, as shown in Google Trends. *Booking.com* and *Airbnb* also have a negative correlation. However, the impact is moderate for *Booking.com* and low to moderate for *Airbnb*.

3.2 Impact of the corona pandemic on interest in general tourism topics

In the second step, data were collected on general tourism topics expressed in search engines like: *Hotel*, *Travel*, *Flight*, and *Car Rental*. The relative search interest in the topic '*Hotel'* remained on course in the period under study, as shown in Figure 2 for the years 2018 and 2019. The interest in *Hotel* has an annual peak in the northern hemisphere summertime. In addition, *Travel* and *Flight*, for example, show a high level of interest in the summer months,

as well as a peak around the turn of the year. The first months of 2020 began analogously to previous years.

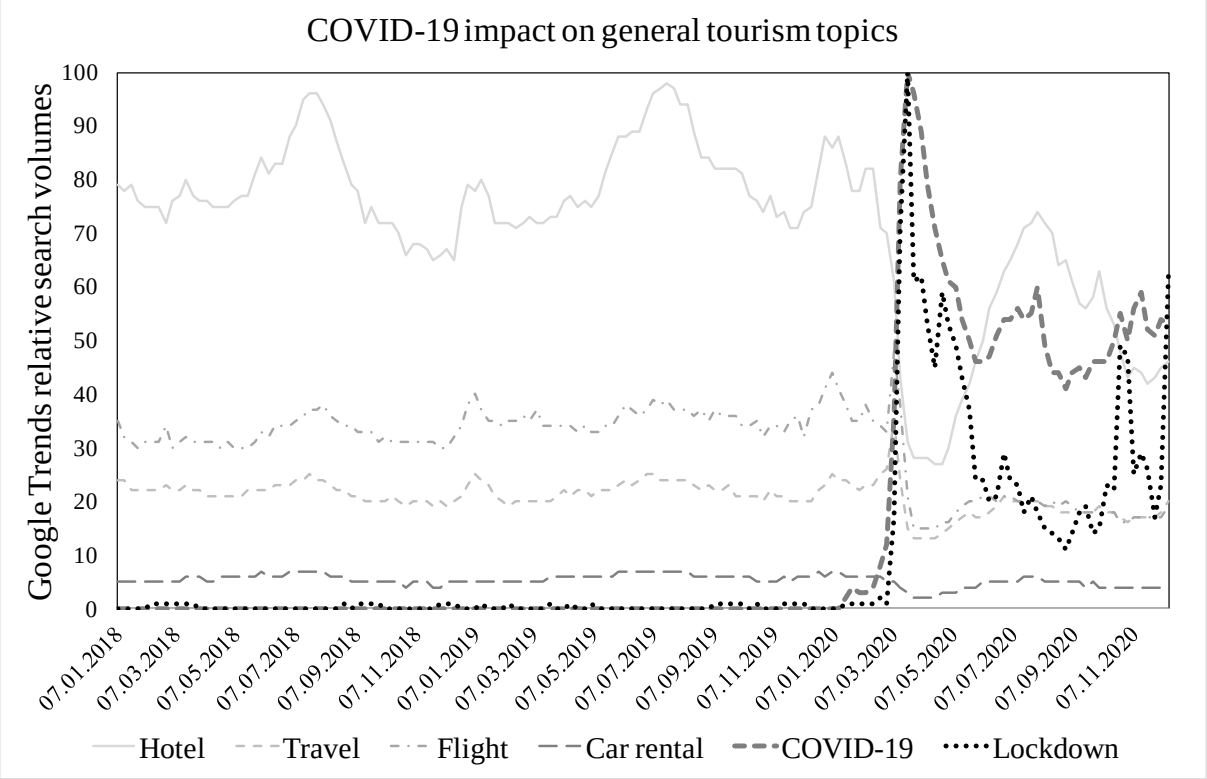

Figure 2: Google Trends reveals impact of COVID-19 on general tourism topics

Significant changes reported in the data are noticeable for the rest of 2020. We observe an immediate drop after coronavirus spread and locking down the economy in the first half of the year. After easing lockdown, the topic *Hotel* noticed significantly increased interest during northern hemisphere summertime, whereas *Flight* showed only a slight recovery and remained on a similar level as *Travel* (Fig. 2). Although, *Hotel* reacted positively during summertime, when the second wave of coronavirus disease appeared – it collapses again.

Interest in *Travel* and *Flight* remained relatively low, after the first decrease. We observed also a short temporary increase in the first half of March, when governments announce locking borders and countries. It can be assumed, for example, that people wanted to get home quickly – thus increased interest in *Travel* and *Flight*, right before locking down. To illustrate the impact of restrictions caused by the global pandemic to tourism-general

topics we present data for additional two search topics: *Covid-19* and *Lockdown*. We have estimated the Pearson coefficient correlation for tourism general topics and pandemic search topics. The results are presented in Table 2.

Table 2. Pearson coefficient correlation for search on general tourism topics and pandemic search topics.

	Hotel	*Travel*	*Flight*	*Car rental*	*COVID-19*	*Lockdown*
Hotel	1					
Travel	0,77	1				
Flight	0,76	0,81	1			
Car rental	0,88	0,73	0,67	1		
COVID-19	-0,74	-0,50	-0,70	-0,53	1	
Lockdown	-0,76	-0,49	-0,60	-0,56	0,92	1

Table 2 presents a significant negative correlation for general tourism topics *Hotel* and *Flight* with search topics showing interest in *Covid-19* and *Lockdown*. The score is moderate to high and explains, when there is an increasing trend for search information on the disease and restrictions, both topics lose their interest in Google Trends. *Travel* and *Car rental* also have a negative correlation. However, the impact is moderate for both of them. It could be explained that governments actions had a larger impact on *Hotels* and *Flights* (e.g., closing borders and hotels) whereas, travel was not forbidden (e.g., inside the country) and car rental companies remained operational, however, companies felt decreased interest, due to lower number of customers from other countries and lockdown restrictions. There are some limitations to this study based on Google Trends data as described elsewhere (Springer et al., 2021). Among other things, the use of Google as a search engine varies from region to region. The results may be more representative in regions where Google is used more often (Springer et al., 2021). With our approach of the worldwide evaluation of the global pandemic, some regions can therefore be more represented than others.

4. Conclusions

Our results suggest that Google Trends is a valuable tool to monitor and confirm the impact of major events of global importance, e.g., Covid-19 pandemic, on various industries. It was also possible to show differences between different business models within the tourism industry. Sharma and Nicolau (2020), who analyzed market valuation, showed significant valuation drops for each of the four industries examined - hotels, airlines, cruise lines, and car rentals. With this study, the results of analysis by Sharma and Nicolau could be essentially supported for booking sites and general tourism topics in order to better understand the effects of the coronavirus pandemic on the economy. Our results underline the importance and duration of the Covid-19 effect on various areas of the tourism industry.

Conflicts of interest

S.M. is the owner of holiday homes and uses Booking.com for rentals. The other authors declare no conflicts of interest.

Declaration of funding

This research did not receive any specific funding.

References

Bokelmann, B., & Lessmann, S. (2019). Spurious patterns in Google Trends data - An analysis of the effects on tourism demand forecasting in Germany. *Tourism Management*, *75*, 1–12. https://doi.org/10.1016/j.tourman.2019.04.015

Chang, Y.W., Hsu, P.Y., & Lan, Y.-C. (2019). Cooperation and competition between online travel agencies and hotels. *Tourism Management*, *71*, 187–196. https://doi.org/10.1016/j.tourman.2018.08.026

Farzanegan, M. R., Gholipour, H. F., Feizi, M., Nunkoo, R., & Andargoli, A. E. (2020). International Tourism and Outbreak of Coronavirus (COVID-19): A Cross-Country Analysis. *Journal of Travel Research*, 60(3), *687-692*. https://doi.org/10.1177/0047287520931593

Gössling, S., Scott, D., & Hall, C. M. (2020). Pandemics, tourism and global change: a rapid assessment of COVID-19. *Journal of Sustainable Tourism*, *29*(1), 1–20. https://doi.org/10.1080/09669582.2020.1758708

Green M. S. (2020). Did the hesitancy in declaring COVID-19 a pandemic reflect a need to redefine the term?. *Lancet*, 395(10229), 1034–1035. https://doi.org/10.1016/S0140-6736(20)30630-9

Liew, V. K. S. (2020). The effect of novel coronavirus pandemic on tourism share prices. *Journal of Tourism Futures*, (ahead-of-print). https://doi.org/10.1108/JTF-03-2020-0045

Lu, H., Stratton, C. W., & Tang, Y. (2020). Outbreak of pneumonia of unknown etiology in Wuhan, China: The mystery and the miracle. *Journal of Medical Virology*, *92*(4), 401–402. https://doi.org/10.1002/jmv.25678

Martin-Fuentes, E., & Mellinas, J. P. (2018). Hotels that most rely on Booking.com – online travel agencies (OTAs) and hotel distribution channels. *Tourism Review*, *73*(4), 465–479. https://doi.org/10.1108/TR-12-2017-0201

Mavragani, A., Ochoa, G., & Tsagarakis, K. P. (2018). Assessing the Methods, Tools, and Statistical Approaches in Google Trends Research: Systematic Review. *Journal of Medical Internet Research*, *20*(11), e270. https://doi.org/10.2196/jmir.9366

Reinhold, S., Zach, F. J., & Laesser, C. (2020). E-Business Models in Tourism. In C. Xiang, M. Fuch, U. Gretzel, & W. Höpken (Eds), *Handbook of e-Tourism* (pp. 1–30). Springer International Publishing. https://doi.org/10.1007/978-3-030-05324-6_71-1

Sharma, A., & Nicolau, J. L. (2020). An open market valuation of the effects of COVID-19 on the travel and tourism industry. *Annals of Tourism Research*, 83(July 2020*)*. https://doi.org/10.1016/j.annals.2020.102990

Sohrabi, C., Alsafi, Z., O'Neill, N., Khan, M., Kerwan, A., Al-Jabir, A., &Agha, R. (2020). World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). *International Journal of Surgery*, *76*, 71–76. https://doi.org/10.1016/j.ijsu.2020.02.034

Springer, S., Zieger, M., & Strzelecki, A. (2021). The rise of infodemiology and infoveillance during COVID-19 crisis. One Health, 13. https://doi.org/10.1016/j.onehlt.2021.100288

Trabucchi, D., & Buganza, T. (2020). Fostering digital platform innovation: From two to multi-sided platforms. *Creativity and Innovation Management*, *29*(2), 345–358. https://doi.org/10.1111/caim.12320

Zhou, P., Yang, X.L., Wang, X.G., Hu, B., Zhang, L., Zhang, W. & Shi, Z. L. (2020). A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*, *579*(7798), 270–273. https://doi.org/10.1038/s41586-020-2012-7

Zieger, M., & Springer, S. (2020). Thylacine and Tasmanian devil: between hope and reality – a lesson to be learnt from Google Trends search data. Australian Journal of Zoology, 67(4), 221-225. https://doi.org/10.1071/ZO20073