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Google Trends Analysis of Nigerian Public Interest in Common Health Issues

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ABSTRACT

Purpose: This study aims to investigate the trend of the Nigerian population in using the Google search engine on common health issues and explore the spatial pattern of each of the search terms used.

Method: Ten search terms (common health issues) in English were chosen for the study. Google Trend data for the selected search terms from January 2015 to December 2022 were extracted. Trend analysis and correlation analysis between the search terms were performed using Microsoft Excel and IBM-SPSS version 23.

Findings: It was revealed that Google searches for all the search terms of common health issues increased between March and April 2020. Also, the spatial data shed more light on locations to complement Lagos and Abuja that have their peculiarities.

Research Implications: The result can be linked to the heat of the COVID-19 pandemic that was evidenced by travel restrictions, social distancing, and economic lockdown which negatively affected human health conditions, finances and mobility. Also, the spatial data are suitable for government interventions, pivot programmes and health initiatives to address a specific health issue.

Keywords: Public Healthcare; Healthcare; Google Trends; Nigeria

Introduction

In recent times, internet has become more accessible such that many people are obtaining information from internet sources [1]. The nature of information sourced from the internet is dependent on the nature os searches done on the search engine. Among the available search engines, Google is currently most popular. It has become an important source of information for many people [2]. Lately, researchers have been capitalizing on this trend to obtain data on topics of interest, ranging from deep learning to currency exchange rate [1], trip information and others. Similarly, the Google search has become a source of health information to lay persons and healthcare personnel alike [2]. By analysing the trend of Google search, the public interest in various medical problems can be assessed, giving valuable information for proper planning and funding allocation in healthcare [3]. Google Trends is a tool that allows users to freely access Google search data. It provides an in-depth analysis of billions of daily Google search results and provides information on geographical and temporal patterns in search volumes for user-specific terms. Recently, the analysis of Google Trends has been utilised with success in different fields relating to, which ranges from the analysis of COVID-19 to chronic health issues [4]. By comparing the search volume index (SVI), a geographical difference can be determined, making funding allocation much easier [5,6] Despite the fact that Google Trends is being utilised throughout the health-related fields, thus far there is no Google Trends analysis that investigates the Google search of common health issues in Nigeria. Based on literatures surveyed, there was no study conducted on Google Trends analysis of public interest of common health issues in Nigeria. This study aims to examine the public interest of common health issues in Nigeria, using Google search of ten major health issues as search terms.

Methods

Google Trends is a freely accessible tool that uses periodic search volume to offer information on the temporal patterns of search queries that the general population have entered into the Google search engine. For this study, monthly search volume (MSV) was used. MSV represents the total number of searches made during a given month in a particular nation using Google. Google Trends for the period of eight years which is equivalent to ninety-six months (2015-2022) for searches specifically related to ten common health issues in Nigeria. The rationale for the selection of ten common health issues was to gain a better perspective on the trending health issues inflicting Nigerians. The summation of trends in different year were compared, spatial pattern of trends was conducted, and the correlation analysis of trends were conducted using the data for each search terms. These will enhance more robust inference to be drawn. For the purpose of validating the search terms, the authors validated the search terms using Google Trends. In the situation whereby the searches generated for the search term is very low, such search term was removed. A total of ten search terms were retained from January 2015 to December 2022 and they were analysed using Google Trends. The year 2015 was chosen because it was a period when Google unveils a top search list for Nigeria [7]. In order to evaluate the trend of Google searches in Nigeria, we had extracted the score of monthly search volume for each of the selected search term. The scores were tabulated and inserted into SPSS version 23, the periodical and the aggregate scores were compared with each search terms. The search terms were summarized in Table 1 below.

Table 1: Summary of search terms.

Search Terms	Search Terms
Neck Pain	Back pain
Cough	Hypertension
Headache	Abdominal pain
Chest pain	Diarrhea
Insomnia	Vomit

Results

Trend in Google Search for Common Health Issues

The summary of monthly search volume of all the ten search terms from January 2015 to December 2022 is provided in Table 2. Also, the spatial pattern of searches across the entire states in Nigeria for each of the search terms are provided in (Figures 1-10)

Table 2: Summary of monthly search volume of search terms from 2015 to 2022.

	V	D	Ap	Hy	Bp	I	Cp	Hd	Np	C
Jan-15	40	44	48	56	49	36	27	33	39	8
Feb-15	33	31	61	58	48	51	24	40	45	5
Mar-15	7	43	57	58	44	28	22	38	42	4
Apr-15	16	39	54	55	36	34	24	40	48	5
May-15	43	39	47	75	40	41	26	35	34	6
Jun-15	47	35	63	67	51	24	25	37	21	6
Jul-15	26	45	43	76	38	23	26	35	16	8
Aug-15	44	39	39	60	46	26	32	32	22	8
Sep-15	35	38	49	67	41	34	25	31	32	6
Oct-15	29	39	50	53	43	34	27	41	24	7
Nov-15	34	43	44	56	45	24	21	37	23	8
Dec-15	34	41	52	57	50	32	29	37	46	9
Jan-16	34	48	48	61	43	24	23	33	37	7
Feb-16	27	57	42	66	42	26	21	32	23	7
Mar-16	34	45	52	63	39	23	26	32	26	6
Apr-16	35	48	50	64	47	32	21	38	22	6
May-16	39	40	62	67	37	25	32	41	40	6
Jun-16	37	45	45	66	46	24	32	38	34	8
Jul-16	28	36	48	69	47	24	35	45	35	7
Aug-16	46	37	53	56	51	35	29	36	40	5
Sep-16	33	49	49	56	41	28	30	41	44	5
Oct-16	41	54	50	56	47	25	33	38	46	7
Nov-16	42	33	51	46	37	32	32	39	43	7

Dec-16	38	43	50	43	43	25	22	37	26	7
Jan-17	37	33	48	49	38	32	24	38	31	7
Feb-17	27	49	46	63	46	26	27	29	27	6
Mar-17	40	48	55	67	43	38	25	33	31	6
Apr-17	37	45	45	43	38	27	28	36	35	5
May-17	31	47	49	65	45	30	26	43	38	6
Jun-17	33	49	58	58	45	30	29	43	44	7
Jul-17	34	43	46	60	43	29	31	44	38	7
Aug-17	44	41	51	52	43	34	29	43	44	6
Sep-17	36	36	52	46	48	35	27	42	52	7
Oct-17	44	39	54	52	44	38	31	45	35	9
Nov-17	42	45	49	63	48	41	32	49	43	9
Dec-17	30	42	53	48	44	31	32	41	48	10
Jan-18	23	44	40	46	45	29	25	36	40	9
Feb-18	38	51	47	57	46	32	32	36	41	8
Mar-18	52	47	57	50	46	36	34	44	39	7
Apr-18	39	51	67	53	48	28	28	44	41	6
May-18	29	40	53	56	46	32	27	50	26	8
Jun-18	53	46	56	69	46	33	35	48	46	8
Jul-18	48	50	47	53	55	39	38	50	43	8
Aug-18	31	49	63	59	54	48	35	51	48	7
Sep-18	50	44	57	55	49	45	28	47	52	8
Oct-18	45	40	60	57	54	33	39	56	56	8
Nov-18	41	52	49	50	49	56	32	50	40	9
Dec-18	64	41	55	36	53	42	30	43	42	10
Jan-19	38	59	61	49	53	48	37	48	45	9
Feb-19	58	62	61	47	50	40	30	50	35	8
Mar-19	38	51	60	55	55	43	32	49	45	8
Apr-19	35	48	72	64	52	46	33	50	37	7
May-19	43	53	57	63	59	45	40	54	46	7
Jun-19	47	58	73	54	63	46	44	63	44	9
Jul-19	58	59	49	65	63	64	41	58	39	9
Aug-19	57	51	66	57	64	57	44	56	48	8
Sep-19	49	47	66	56	62	50	41	53	43	9
Oct-19	61	52	65	67	60	52	45	60	40	10
Nov-19	59	51	67	61	58	48	40	61	62	10
Dec-19	47	47	53	49	56	54	41	54	47	9
Jan-20	60	60	63	50	55	58	36	54	43	11
Feb-20	60	83	67	75	57	49	44	59	54	11
Mar-20	64	90	71	57	66	53	75	73	57	17
Apr-20	68	67	100	50	100	98	100	95	100	12
May-20	54	65	91	53	93	100	84	100	81	10
Jun-20	56	60	74	51	75	75	70	85	56	8
Jul-20	57	60	67	43	72	64	68	70	58	6
Aug-20	51	58	72	50	69	54	56	65	62	7
Sep-20	55	46	63	54	67	50	50	59	64	7

Oct-20	53	43	73	46	58	56	48	64	60	9
Nov-20	59	52	67	47	61	52	51	60	39	9
Dec-20	58	51	60	45	61	50	47	58	53	11
Jan-21	67	69	69	54	69	51	50	66	60	10
Feb-21	55	61	63	64	58	51	52	59	50	10
Mar-21	68	69	68	62	56	71	39	52	45	10
Apr-21	53	72	74	47	58	49	48	55	39	8
May-21	69	65	70	62	55	43	44	55	46	7
Jun-21	64	59	67	60	61	52	51	67	43	9
Jul-21	74	80	72	63	68	59	58	70	53	10
Aug-21	73	63	71	57	63	54	63	71	48	9
Sep-21	66	63	61	58	63	66	49	67	42	9
Oct-21	71	67	67	52	64	66	49	68	63	10
Nov-21	59	68	71	53	62	60	50	63	49	11
Dec-21	74	55	51	43	58	51	45	66	41	15
Jan-22	76	94	80	60	72	83	53	65	41	12
Feb-22	78	99	72	67	67	75	53	63	52	13
Mar-22	85	100	85	72	78	75	60	77	57	10
Apr-22	79	86	87	68	78	76	67	73	76	11
May-22	72	86	84	78	77	87	53	82	51	11
Jun-22	70	89	85	70	77	93	60	96	65	14
Jul-22	85	90	88	67	87	87	70	93	61	14
Aug-22	87	79	86	79	85	90	65	94	60	11
Sep-22	87	87	85	92	86	85	64	86	65	13
Oct-22	100	84	82	100	84	80	61	89	69	100
Nov-22	78	83	81	93	77	81	60	88	70	46
Dec-22	77	90	76	74	76	82	59	85	64	32

Note: V = Vomit; D = Diarrhea; Ap = Abdominal pain; Hy = Hypertension; Bp = Back pain; I = Insomnia; Cp = Chest pain; Hd = Headache; Np: = Neck pain; C = Cough

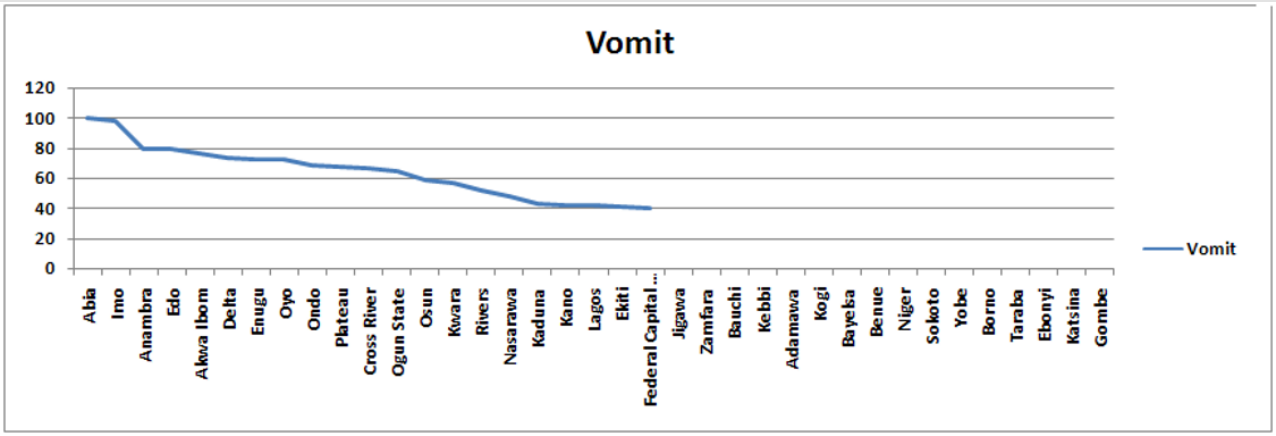

Figure 1: Trend analysis of "vomit" search term based on spatial pattern across all states in Nigeria.

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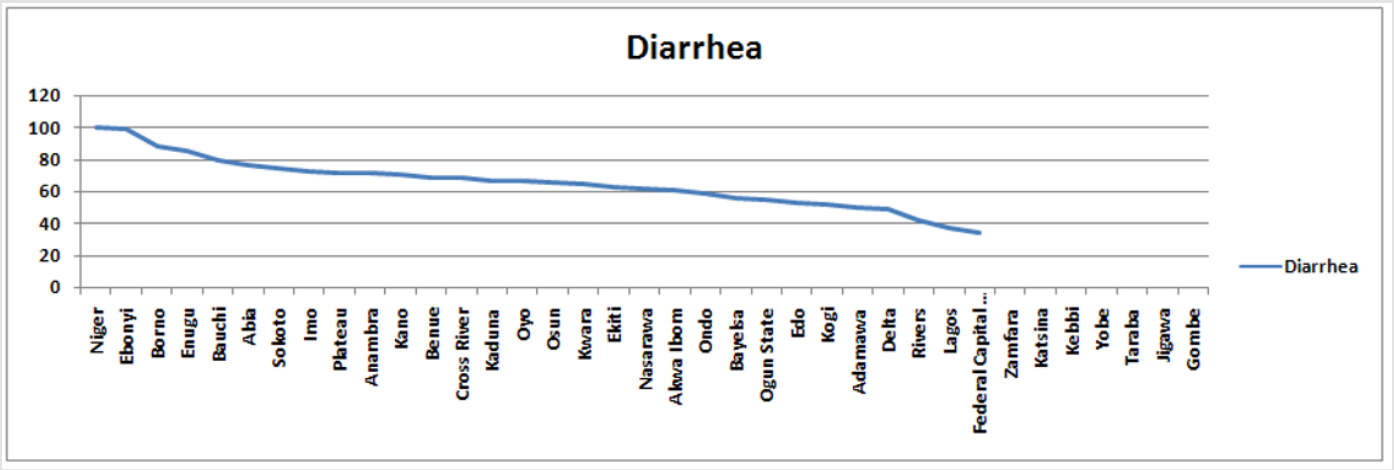

Figure 2: Trend analysis of "diarrhea" search term based on spatial pattern across all states in Nigeria.

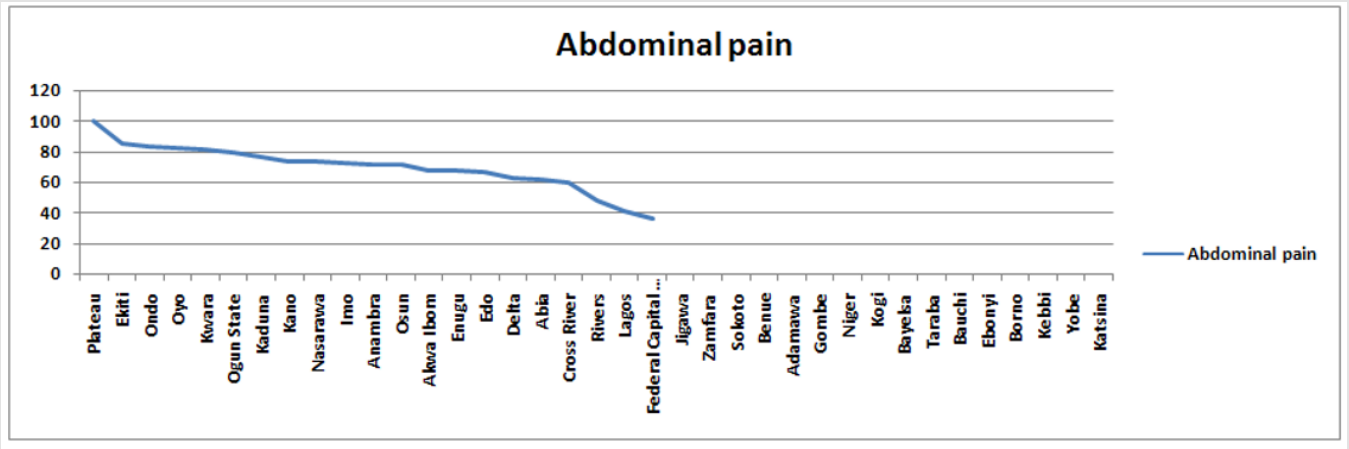

Figure 3: Trend analysis of "abdominal pain" search term based on spatial pattern across all states in Nigeria.

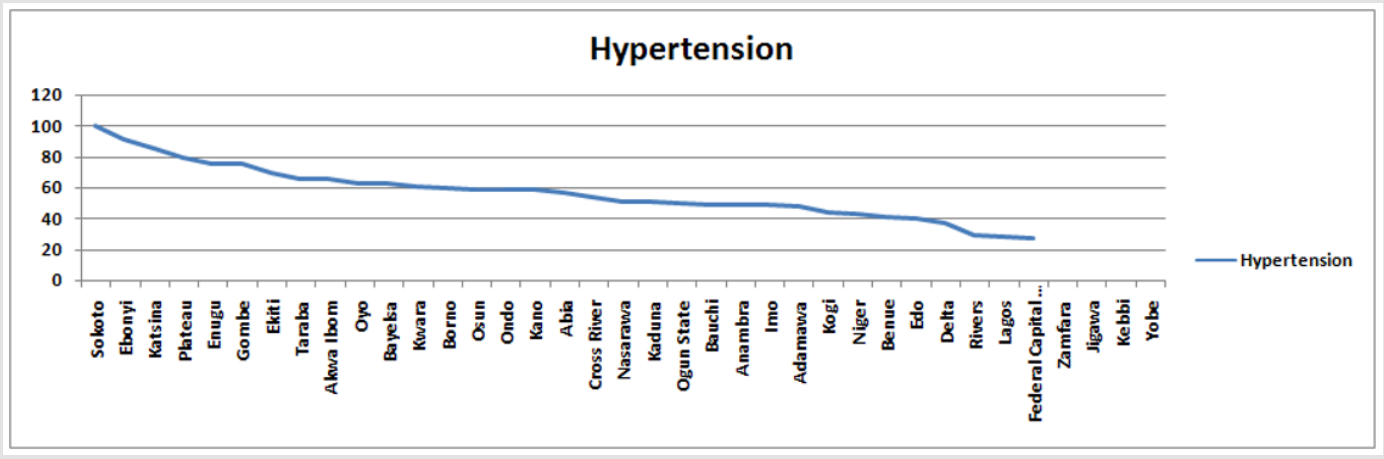

Figure 4: Trend analysis of "hypertension" search term based on spatial pattern across all states in Nigeria.

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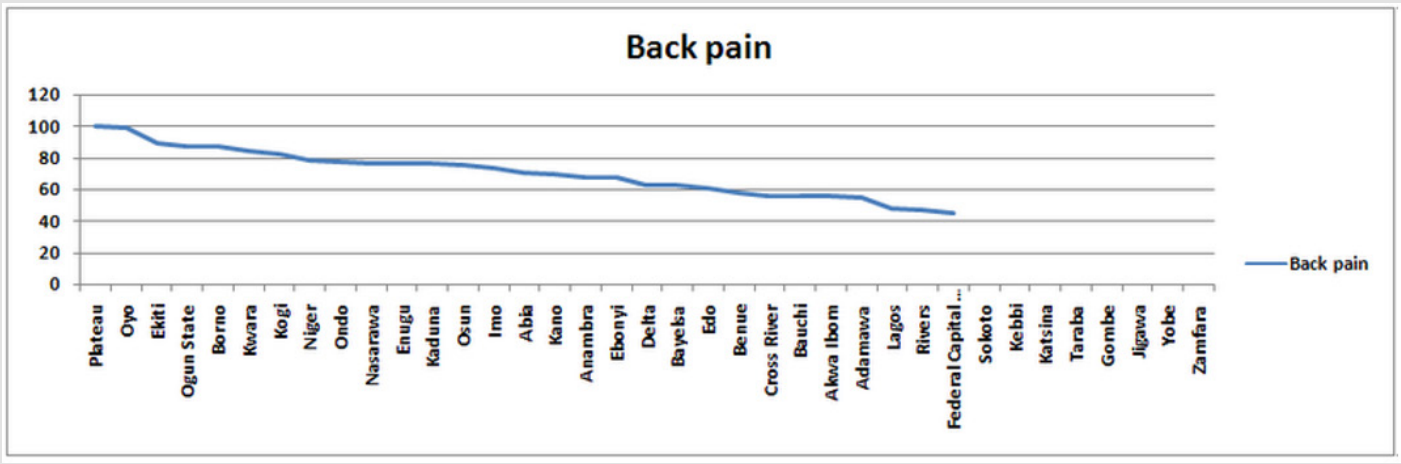

Figure 5: Trend analysis of "back pain" search term based on spatial pattern across all states in Nigeria.

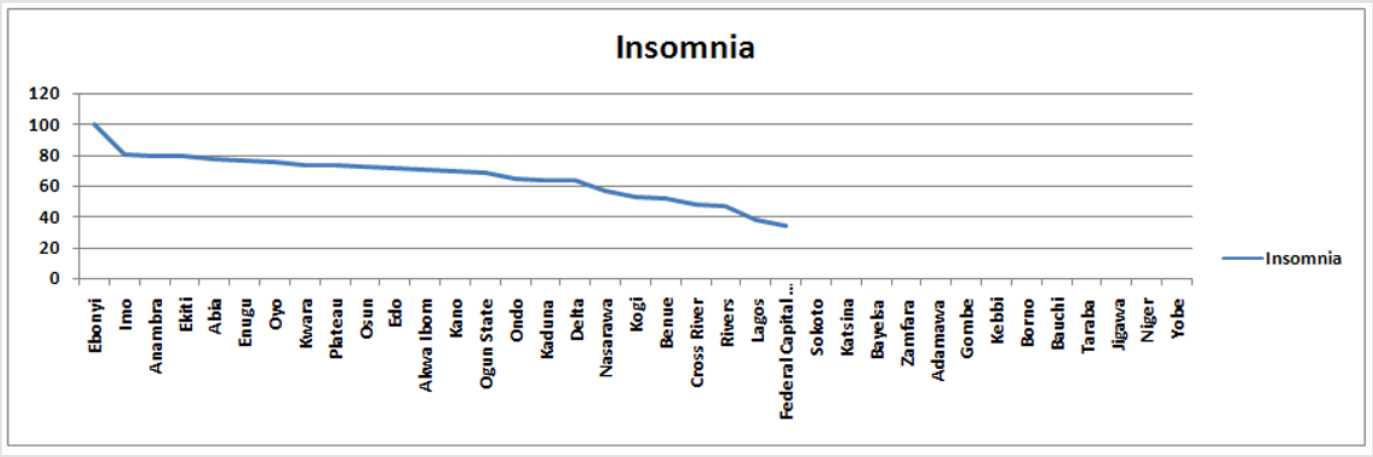

Figure 6: Trend analysis of "insomnia" search term based on spatial pattern across all states in Nigeria.

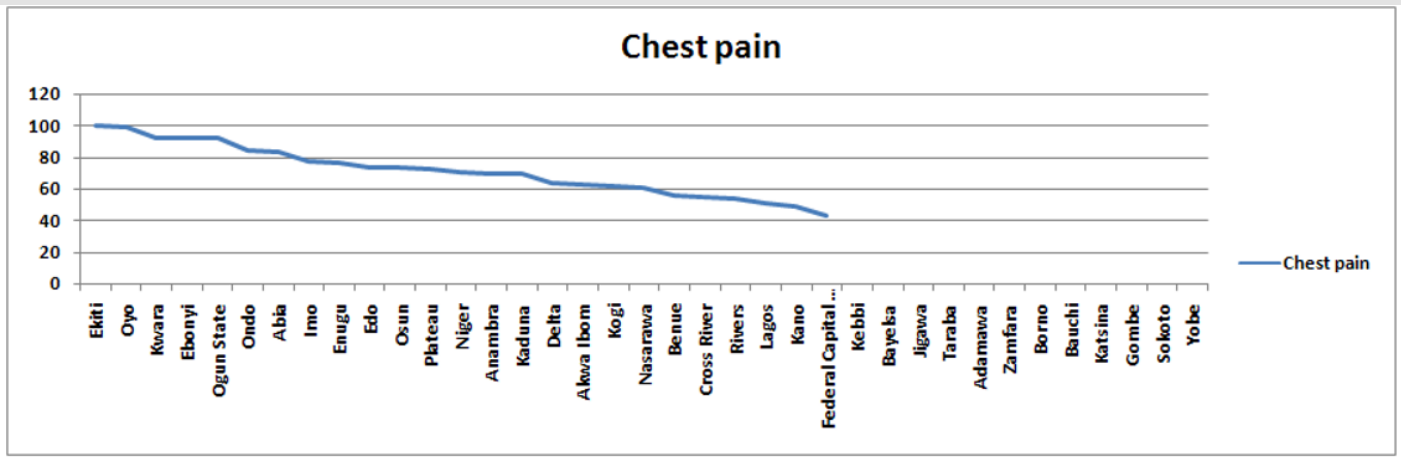

Figure 7: Trend analysis of "chest pain" search term based on spatial pattern across all states in Nigeria.

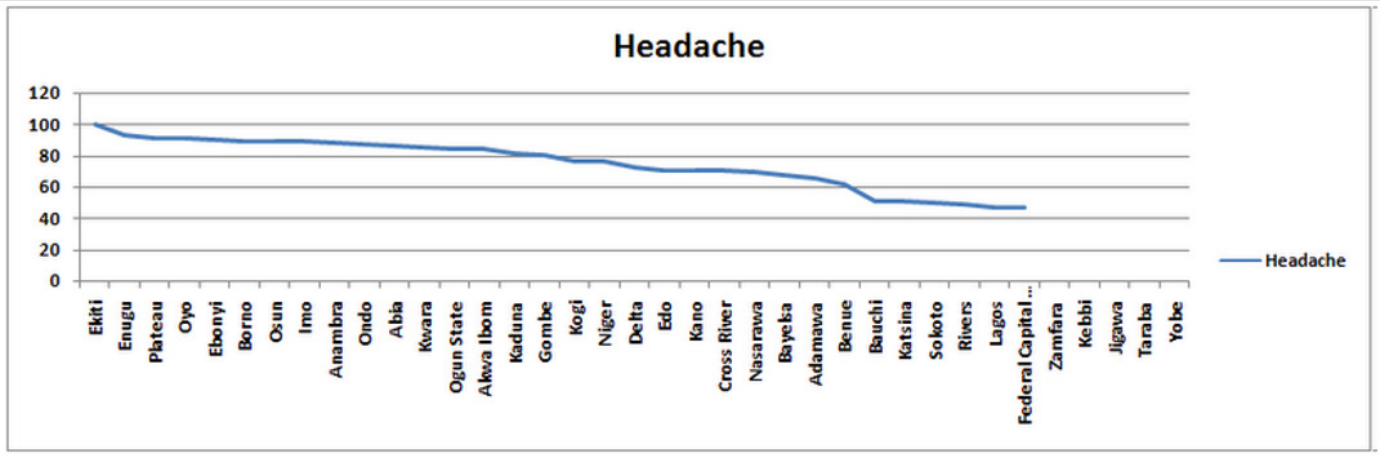

Figure 8: Trend analysis of "headache" search term based on spatial pattern across all states in Nigeria.

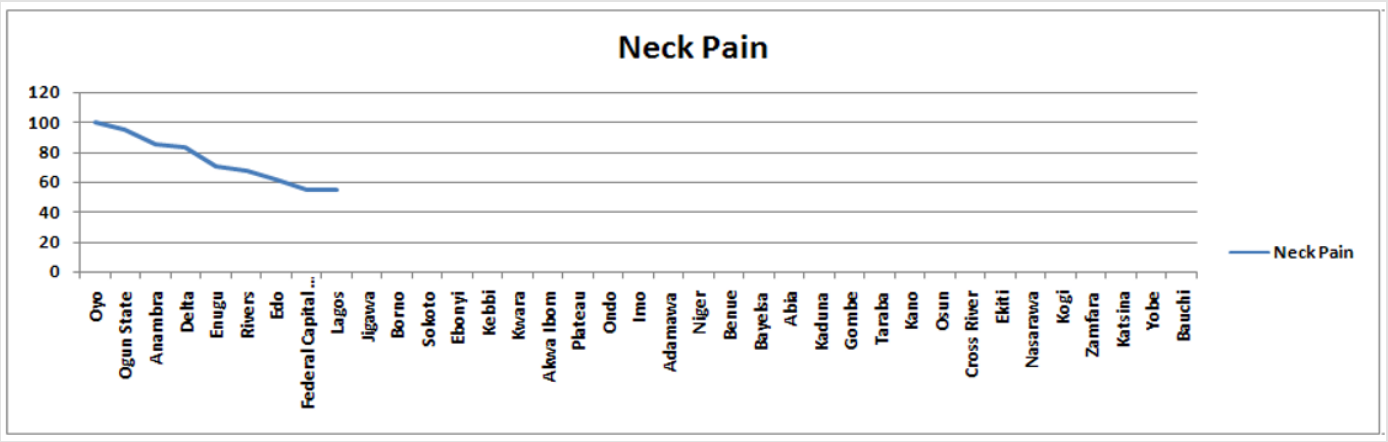

Figure 9: Trend analysis of "neck pain" search term based on spatial pattern across all states in Nigeria.

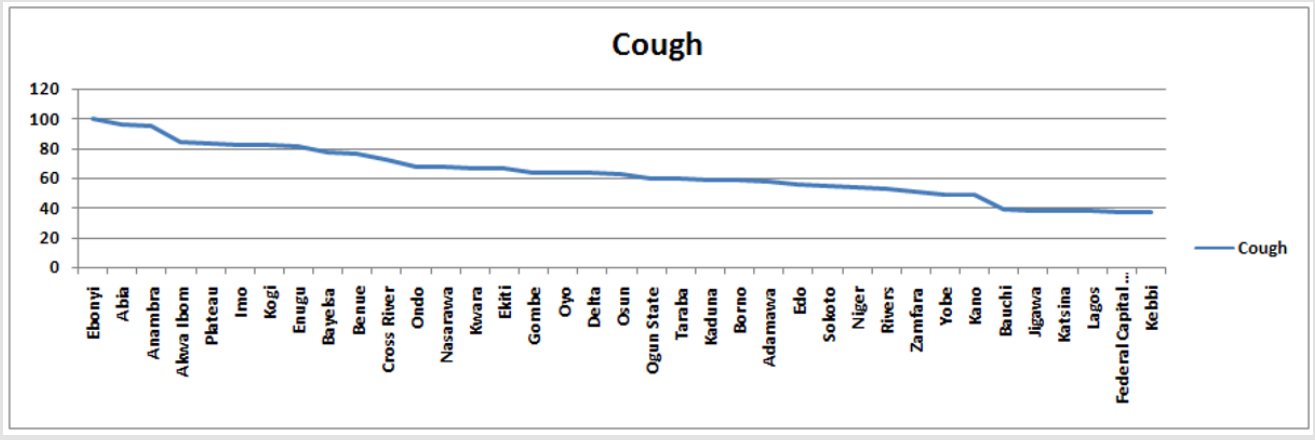

Figure 10: Trend analysis of "cough" search term based on spatial pattern across all states in Nigeria.

Discussion

As the internet has become increasingly accessible in Nigeria, people turn to the web to seek information regarding their health challenges. In this study, the increasing popularity of Google search as a tool to obtain information on common health challenges in Nigeria were captured. The values shown in Table 2 revealed the trend of search terms on Google for vomit, diarrhea, and abdominal pain, hypertension, back pain and insomnia, and chest pain, headache, neck pain, and cough between January 2015 and December, 2022. On the graph, it was shown that there were flunctuations for all the ten search terms. All the searches for the entire search terms increased between March and April 2020, and between February and March 2022. It is pertinent to note that the increase in searches for the period of March and July 2020 can be linked to the heat of COVID-19 pandemic. Given the increased worldwide media coverage of the pandemic, Starcevic, et al. [8,9] noted that it is not unexpected that Google searches related to health issues during the COVID-19 pandemic rose in March and April 2020; this is because the heat of the COVID-19 pandemic was evidenced by travel restrictions, social distancing, and economic lockdown which negatively affected human health conditions, finances and mobility.

This increasing trend is consistent with other studies in the literature [10,11]. As shown in Figure 1, the search term for "Vomit" is mostly searched on Google in Abia and Imo states. This implies that vomit is a serious health condition in Abia and Imo states such that people in the two states do consider "vomit" as a serious health issue. As shown in Figure 2, the search term for "Diarrhea" is mostly searched on Google in Niger and Eboyi states. This implies that diarrhea is a serious health issue in Niger and Eboyi states. As shown in Figure 3, the search term for "Abdominal pain" is mostly searched on Google in Plateau state. This implies that abdominal pain is usually a serious health issue in Plateau state. As shown in Figure 4, the search term for "Hypertension" is mostly searched on Google in Sokoto and Eboyi states. Unlike Table 2 which has many states that does not have representation of people Google searched for the search terms, the case of hypertension is different because it was virtually searched in most of the states in Nigeria except Zamfara, Jigawa, Kebbi, and Yobe. Aside from these four states, the search term of hypertension has representatives of Google search from the remaining states in Nigeria. As shown in 5, the search term for "Back pain" is mostly searched on Google in Plateau and Oyo states.

This implies that back pain is usually a serious health issue in Plateau and Oyo states. As shown in Figure 6, the search term for "Insomnia" is mostly searched on Google in Eboyi state. This implies that insomnia is a serious health issue in Eboyi state. As shown in Figure 7, the search term for "Chest pain" is mostly searched on Google in Ekiti and Oyo states which are situated in the southwestern part of Nigeria. This implies that chest pain is a serious health issue in Ekiti and Oyo states. As shown in Figure 8, the search term for "Headache" is mostly searched on Google in Ekiti state. This implies that headache is usually a serious health issue in Ekiti state such that people in the state do consider it as a serious health issue which demand searching Google for its nature, causes, and treatment.

As shown in Figure 9, the search term for "Neck pain" is mostly searched on Google in Oyo state, which implies that neck pain is a serious health issue in Oyo state. As shown in Figure 10, the search term for "Cough" is mostly searched on Google in Eboyi state. This implies that cough is usually a serious health issue in Eboyi state. Based on the intercorrelation analysis shown in Table 3, all the variables were significant at p-values less than 0.01 and correlated between 0.299 and 0.943, except Chest pain and Hypertension. From the analysis, Vomit is correlated with Headache (r = 0.812), Back pain (r = 0.810), and Insomnia (r = 0.807). Diarrhea is correlated with Insomnia (0.787), Headache (r = 0.774), and Back pain (r = 0.774). Abdominal pain is correlated with Back pain (r = 0.886), Headache (r = 0.884), Insomnia (r = 0.863), and Chest pain (r = 0.850). Hypertension is correlated with Cough (r = 0.514). Back pain is correlated with Headache (r = 0.943), Chest pain (r = 0.927), and Insomnia (r = 0.923). Insomnia is correlated with Headache (r = 0.922) and Chest pain (r = 0.858). Chest pain is correlated with Headache (r = 0.925) and Neck pain (r = 0.813). Headache is correlated with Neck pain (r = 0.798). This study found strong and positive relationship between Vomit and Headache, Back pain and Insomnia. This corroborates the findings of Mainyar, et al. [12] which found a relationship between Vomit and Headache. Sheena, et al. [13] found a relationship between abdominal pain and headache.

Table 3: Intercorrelation Analysis between the Entire Search Terms.

		V	D	Ap	Hy	Bp	I	Cp	Hd	Np	C
V	Pearson Correlation	1	.799(**)	.753(**)	.349(**)	.810(**)	.807(**)	.767(**)	.812(**)	.609(**)	.494(**)
D	Pearson Correlation		1	.756(**)	.445(**)	.774(**)	.787(**)	.735(**)	.774(**)	.559(**)	.413(**)
Ap	Pearson Correlation			1	.304(**)	.886(**)	.863(**)	.850(**)	.884(**)	.772(**)	.342(**)
Hy	Pearson Correlation				1	.299(**)	.304(**)	0.188	.305(**)	0.136	.514(**)
Bp	Pearson Correlation					1	.923(**)	.927(**)	.943(**)	.797(**)	.411(**)
I	Pearson Correlation						1	.858(**)	.922(**)	.756(**)	.391(**)
Cp	Pearson Correlation							1	.925(**)	.813(**)	.334(**)
Hd	Pearson Correlation								1	.798(**)	.439(**)
Np	Pearson Correlation									1	.357(**)
C	Pearson Correlation										1

Note: **Correlation is significant at the 0.01 level (2-tailed)

Kelman and Tanis [14] found a relationship between that abdominal pain and vomiting. In addition, a strong and positive relationship between Diarrhea, Insomnia, Headache, and Back pain was found. This corroborates the findings of Hartvigsen, Hancock and Kongsted [15] which found a positive relationship between back pain, Insomnia and Headache. Furthermore, there is a strong and positive relationship between Abdominal pain, Back pain, Headache, Insomnia, and Chest pain. This agrees with the findings of Yoon, et al. [16] which found the relationship between headache, back pain and headache. It found a strong and positive relationship between Hypertension and Cough. This agrees with the findings of Rachel, et al. [17] which found a positive relationship between cough and increased risk of hypertension. Finally, there is a strong and positive relationship between Chest pain, Headache and Neck pain. This agrees with the study of Roldan [18] which found a relationship between Chest pain, Headache and Neck pain. There is a strong and positive relationship between Back pain Headache, Insomnia, Chest pain. This agrees with the study of Korabelnikova, et al. [19] which found a complex relationship between Headache and Insomnia disorders.

Conclusions and Recommendations

It is concluded from the findings that the entire search terms increased between March and April 2020, which can be linked to the heat of COVID-19 pandemic that was evidenced by travel restrictions, social distancing, and economic lockdown which negatively affected human health conditions, finances and mobility. Furthermore, based on the spatial data, it is pertinent to note that pivot programmes and health initiatives to address specific health challenges in Nigeria are usually carried in Lagos which has the population and cultural strengths, and Abuja which is the seat of federal power; however, there is need to include more states that has major hit of specific health issues. Such as Abie and Imo states for vomit, Niger and Eboyi states for diarrhea, Plateau state for abdominal pain, Sokoto and Eboyi states for hypertension, Plateau and Oyo states for back pain, Eboyi state for insomnia, cough, Ekiti and Oyo states for chest pain, and Oyo state for neck pain, and Ekiti state for head ache.

Declarations

Competing Interests

The authors declare no competing interest.

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Not Applicable.

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