LITERATURE REVIEW English Version



Public Search Interest in Stunting Interventions as an Effort to Reduce the Incidence of Stunting in Indonesia during 2018-2022: A Google Trends Analysis

Minat Pencarian Masyarakat terhadap Intervensi Stunting Sebagai Upaya Penurunan Kejadian Stunting di Indonesia selama Periode 2018-2022: Analisis Google Trends

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Keywords: Breastfeeding, Complementary Feeding, Immunization, Stunting, Public Interest, Google Trends

ABSTRACT

Background: In 2018, the prevalence of stunting in Indonesia was 30.8%, which has led to renewed focus on targeted interventions. Although specific measures such as exclusive breastfeeding, complementary feeding, and immunization have been prioritized, achieving optimal coverage remains a challenge. Limited knowledge has been identified as a potential barrier to the interventions. This study acknowledges the effectiveness of internet platforms in providing stunting prevention information.

Objectives: To analyze search interest trends for exclusive breastfeeding, complementary feeding, and immunization from 2018 to 2022 using Google Trends.

Methods: Google Trends was used to analyze search trends for the keywords 'exclusive breastfeeding', 'complementary feeding', and 'immunization' in Indonesia and three provinces with the highest number of searches, namely Central Sulawesi, East Nusa Tenggara, Southeast Sulawesi, Yogyakarta, Central Java, Bangka Belitung, and Bengkulu. The data were compared with the prevalence of stunting and coverage of interventions. **Discussion:** Searches for exclusive breastfeeding tended to be stable, while searches for complementary feeding and immunization tended to spike at certain times. Analysis of the provinces with the highest number of searches showed that the high search volume did not necessarily correspond to the trends in the performance of interventions in the regions.

Conclusions: Searches for 'exclusive breastfeeding', 'complementary feeding', and 'immunization' from 2018 to 2022 showed different trends. It's impossible to compare the data with the prevalence of stunting because of different trends. However, the data on search interest can illustrate community perceptions and practices around these interventions.

INTRODUCTION

Stunting is a chronic nutritional problem due to malnutrition that can impair growth and development¹. It results from prolonged inadequate food intake². According to the statistics of Basic Health Research, the

prevalence of stunting in Indonesia in 2018 was 30.8%, which is significantly higher than the threshold of the World Health Organization (WHO) of 20%^{3,4}. Given the high prevalence of stunting in Indonesia, the Indonesian government has developed a program to address

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stunting at the national and regional levels, particularly in villages, with a focus on specific and sensitive nutrition in the first 1000 days of life (HPK)⁵.

Specific interventions address direct causes, while sensitive interventions address indirect causes. Specific interventions target the population in their first 1000 days of life, which includes children aged 0 to 23 months. Interventions in this category include promoting and counseling for breastfeeding, infant feeding, young child feeding, and complementary feeding as well as growth, monitoring supplementation, and immunization⁶. According to Lancet (2013), these interventions can contribute up to 20% of the effectiveness in reducing stunting if their coverage is at least 90%7. To ensure that the national stunting prevalence reaches 14% by 2024, the government has set targets to accelerate stunting interventions, including ensuring that 80% of newborns receive exclusive breastfeeding and 80% of young children receive complementary feeding⁸. However, the statistics of the 2022 Indonesian Nutrition Status Survey show that the coverage of this initiative has not reached its target and has, in fact, decreased. The coverage of exclusive breastfeeding for babies aged 6-11 months decreased from 48.2% to 16.7%, while the coverage of complementary feeding decreased from 53.2% to 47.7%⁹. On the other hand, the overall coverage of basic immunizations for babies aged 0-11 months has reached 92.7%. This is above the target of 90%. Nonetheless, some parents may refuse to provide additional immunizations to their children due to concerns about potential adverse effects that may occur after immunization. This is often due to a lack of understanding about the purpose of booster shots and a lack of information and knowledge about the importance of booster shots¹⁰.

Stunting is influenced by a number of factors, including limited maternal understanding and attitudes. In order to increase public awareness of stunting, especially among mothers, digital technologies can be used to provide quick and easy access to information¹¹. According to the 2017 survey conducted by the Indonesian Internet Service Providers Association on internet usage in the health sector, 51.06% of respondents searched the internet for health-related information online¹². Several studies conducted in Indonesia have shown that the use of online media, especially social media, can improve public knowledge and perception of health. For instance, Setyowati's (2022) research showed that digital literacy workshops were effective in raising awareness of stunting¹³. Similarly, Nurhafizha et al. (2023) found a correlation between the use of digital media to search for information and the perception of proper and effective drug use¹⁴. Meanwhile, Syafii's (2021) research found that the dissemination of COVID-19 materials through social media was more successful than through printed media¹⁵. However, few studies have examined the use of the Internet to obtain information on stunting based on Google Trends data in an effort to eliminate stunting in Indonesia.

Based on the previous explanation, this study aims to analyze trends in search interest for exclusive

breastfeeding, complementary feeding, and vaccination from 2018 to 2022 using Google Trends. This study aims to demonstrate the level of public interest and attention dedicated to stunting interventions, specifically exclusive breastfeeding, complementary feeding, and immunizations, in an effort to combat stunting in Indonesia. This study can be used to determine if there is a correlation between the search trends for keywords related to stunting interventions from 2018 and 2022 and the trends in stunting reduction based on the data from the Indonesian Nutrition Status Survey from 2019 to 2022.

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METHODS

This study used a descriptive approach using data from Google Trends (https://trends.google.com/trends) to analyze online search terms related to stunting interventions. Google Trends is a website that allows users to discover search patterns for specific phrases across the Google search platform and other Google partner sites like YouTube. Search patterns may include searches for websites, photos, and news¹⁶. The data provided consist of Relative Search Volume (RSV) data, which is a relative measure obtained by comparing the number of searches for a term to the total number of searches in a given location and period, resulting in a value that ranges from 0 to 100¹⁷. Google Trends enables the tracking of search preferences over time, including specific locations, top searched areas, and common search queries¹⁶.

This study collected data on 'exclusive breastfeeding', 'complementary feeding', and 'immunization', which were the outcomes of website queries from June 2018 to June 2022. The data collected included graphs of search interest from 2018 to 2022, as well as graphs of search interest based on the sub regions or provinces with the highest number of searches for each term. This study also collected data on the most commonly searched queries related to these three keywords. The results are presented using graphs and tables.

The data were collected and evaluated by comparing the graphs of search interest for the terms 'exclusive breastfeeding', 'complementary feeding', and 'immunization' from 2018 to 2022 with the graphs of stunting prevalence from the Indonesian Nutrition Status Survey from 2019 to 2022. In addition, the top three provinces with the highest number of searches for each term were identified according to subregions. According to Table 1, the keyword 'exclusive breastfeeding' was most frequently searched in Central Sulawesi, East Nusa Tenggara, and Southeast Sulawesi. The keyword 'complementary feeding' was most frequently searched in the Special Region of Yogyakarta, Central Java, and Bangka Belitung Islands. Meanwhile, the term 'immunization' was most frequently searched in East Nusa Tenggara, Central Java, and Bengkulu. The search interest for the terms 'exclusive breastfeeding', 'complementary feeding', and 'immunization' was compared with the coverage of exclusive breastfeeding, complementary feeding, and immunization interventions in each province from 2018 to 2022.

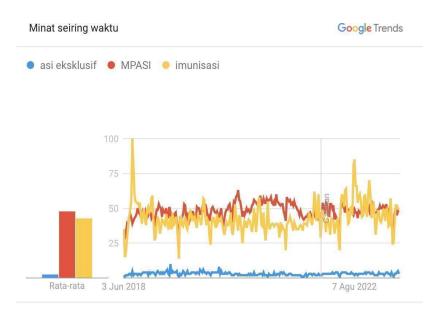
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DISCUSSION



Indonesia. Lima tahun terakhir. Penelusuran Web.

Notes: Minat seiring waktu (Interest over time); Asi eksklusif (Exclusive breastfeeding); MPASI (Complementary feeding); Imunisasi (Immunization); Rata-rata (Average); Lima tahun terakhir (Last five years); Penelusuran Web (Web Search)

Figure 1. Comparison graph of search interest for the keywords 'exclusive breastfeeding', 'complementary feeding', and 'immunization' from 3 June 2018 to 3 June 2022

According to Google Trends, search interest for the keywords "exclusive breastfeeding," "complementary feeding," and "immunization" fluctuated between 2018 and 2022 (see Figure 1). The keyword "complementary feeding" had the highest average search rate among the three keywords. In contrast, the keyword "exclusive breastfeeding" had the lowest number of searches despite the consistent appearance of the graph. This suggested that public interest in the information on exclusive breastfeeding was lower than that of the other two interventions. Meanwhile, the statistics from the Indonesian Nutrition Status Survey showed a decrease in the prevalence of stunting from 27.7% in 2019 to 24.4% in 2021 and 21.6% in 2022⁹. However, no similar trend was found when comparing the trend in search interest for these three keywords with the trend in the prevalence of stunting.

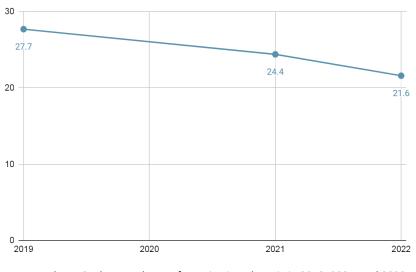


Figure 2. The prevalence of stunting in Indonesia in 2019, 2021, and 2022 (Source: Indonesian Nutrition Status Survey 2022⁹)

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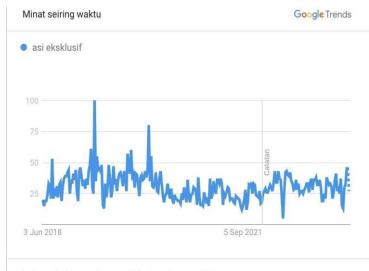


Table 1 shows that searches for the keyword "exclusive breastfeeding" increased in April 2019, with breastfeeding being the most commonly searched query, and the higher number of searches occurring in Central Sulawesi. In addition, searches for the keyword "complementary feeding" peaked in November 2020, with "baby complementary feeding" being the most commonly searched query, and the highest number of searches occurring in the Special Region of Yogyakarta. Meanwhile, searches for the keyword "immunization" peaked in May, August, and November, with the most commonly searched query being "infant immunization," and the highest number of searches occurring in East Nusa Tenggara.

Table 1. Comparison	of trends in	n stunting interventi	ions
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	Google Trends			
Keywords	Google Trends Graph	Top Three Queries	Three Provinces with the Highest Number of Searches	
Exclusive Breastfeeding	Tended to rise in April 2019	"Breastfeeding" "Baby" "Exclusive breastfeeding"	Central Sulawesi, East Nusa Tenggara, Southeast Sulawesi	
Complementary Feeding	Peaked in November 2020	"Baby complementary feeding" "Complementary food for 6-month-olds" "Complementary food recipes"	Special Region of Yogyakarta, Central Java, Bangka Belitung Islands	
Immunization	Tended to increase in May, August, and November	"Baby immunization" "Child immunization" "DPT" (Difteri, Pertusis, Tetanus)	East Nusa Tenggara, Central Java, Bengkulu	

Analysis of the Keyword "Exclusive Breastfeeding"



Indonesia. Lima tahun terakhir. Penelusuran Web.

Notes: Minat seiring waktu (Interest over time); Asi eksklusif (Exclusive breastfeeding); Rata-rata (Average); Lima tahun terakhir (Last five years); Penelusuran Web (Web Search)

Figure 3. Search interest for the keyword 'exclusive breastfeeding' from 2018 to 2022

The highest number of searches for the keyword "exclusive breastfeeding" occurred in April 2019. This increase in searches coincided with the Indonesian general election, which took place at the same time. During elections, candidates use political campaigns to communicate their ideas to voters. One type of campaign is a social change campaign, which aims to address societal issues such as acquired immunodeficiency

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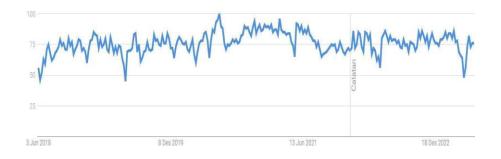
syndrome (AIDS), blood donation, family planning, and breastfeeding¹⁸. Candidates running for regional leadership or legislative positions are campaigning using a variety of methods, including sharing their vision and mission through social media. Social media is a form of media that offers advantages over traditional media, particularly in its ability to provide open, accessible, inexpensive, and rapidly disseminated information, thereby exposing more people to its presence¹⁹. This suggests that election campaigns can generate public interest in learning about exclusive breastfeeding.

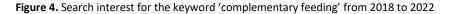
Table 1 shows that Central Sulawesi, East Nusa Tenggara, and Southeast Sulawesi had the highest number of searches for the term "exclusive breastfeeding" between 2018 and 2022. In Central Sulawesi, the percentage of infants aged under six months who received only breast milk was 57.7%, 54.7%, 61.9%, 53.5%, and 54% from 2018 to 2022, respectively²⁰. Meanwhile, the percentage of infants aged under six months who received only breast milk in East Nusa Tenggara was 62.17%, 75.05%, 76.41%, 81.18%, and 78.56% from 2018 to 2022, respectively²¹. In Southeast Sulawesi, the percentage of infants aged under six months who received only breast milk was 34.96%, 55.77%, 60.48%, 62.54%, and 61.68% from 2018 to 2022, respectively²¹. When comparing the coverage of exclusive breastfeeding among the three provinces, East Nusa Tenggara had the highest rate at approximately 80%. This may have been influenced by the breastfeeding counseling program implemented by the Regional Health Office of East Nusa Tenggara Province²². The program provides comprehensive guidance and extensive information on exclusive breastfeeding, resulting in a greater desire to practice breastfeeding properly²³. Hikma's (2022) research showed that 61.2% of participants had high exposure to information, while 38.8% had limited exposure. This study found that mothers who received extensive information on exclusive breastfeeding were 6.219 % more likely to breastfeed exclusively than those who did not receive as much information²⁴.

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Meanwhile, Humba's (2022) research showed a positive correlation between maternal understanding of exclusive breastfeeding and the coverage of exclusive breastfeeding. Mothers with greater knowledge were more likely to successfully provide exclusive breastfeeding for their children²⁵. Access to digital media also makes it easier for mothers to seek up-to-date information on exclusive breastfeeding from anywhere and at any time, which can improve their knowledge on the subject²⁶. Moreover, regional government health centers and hospitals implement the Information, Education Communication, and program for breastfeeding mothers. The program raises mothers' awareness of how they can independently broaden their horizons to best provide exclusive breastfeeding for their children²⁷. This is supported by the fact that the search interest for the keyword "exclusive breastfeeding" on Google Trends shows an understanding of independent information seeking.

Analysis of the Keyword "Complementary Feeding"





The keyword "complementary feeding" ranked second only to "immunization" in terms of search interest, indicating a significant level of interest in this intervention. Mothers used various media, including the Internet, to obtain information on complementary food recipes for their children²⁸. Numerous social media and digital sites provided food recipes that mother could use as a reference when preparing complementary foods for breastfeeding²⁸. This ease of access to information on

complementary feeding led to the high level of search interest that is reflected in the results of the Google Trends analysis. The largest spike in complementary feeding searches occurred in November 2020, coinciding with the COVID-19 pandemic, which indirectly led to an increase in the public's use of the Internet for information-seeking purposes²⁹.

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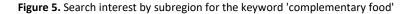
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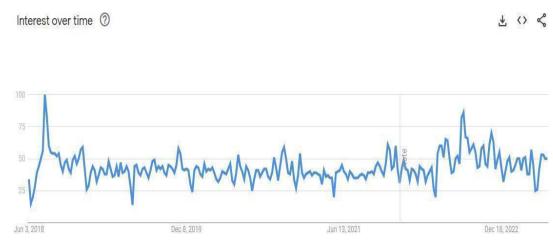


Minat menurut subwilayah ②	Sub	wilayah 🔹 🛃 <> <
	1 Daerah Istimewa Yogyakarta	100
	2 Jawa Tengah	95
	3 Kepulauan Bangka Belitung	84
and the second sec	4 Jawa Barat	83
	5 Banten	82

Notes: Minat menurut sub wilayah (Interests by subregion); Daerah Istimewa Yogyakarta (Special Region of Yogyakarta); Jawa Tengah (Central Java); Kepulauan Bangka Belitung (Bangka Belitung Islands); Jawa Barat (West Java); Banten (Banten)



According to Figure 5, the provinces with the highest number of searches for the keyword "complementary feeding" were the Special Region of Yogyakarta, Central Java, and Bangka Belitung Islands. The Special Region of Yogyakarta and Central Java are among the top five provinces with the highest level of digital literacy in Indonesia in 2022³⁰. Wardani's (2022) research in the Special Region of Yogyakarta found that 94.6% of mothers took appropriate measures to provide complementary feeding for their infants. Complementary feeding is a well-known practice for children aged 6-24 months, with 86.5% of mothers being familiar with it³¹. However, research conducted by Rosiyah (2023) in Central Java showed that only 58.3% had sufficient knowledge about complementary feeding. The practice of complementary feeding can be described as (1) time of provision according to standards (85.4%); (2) frequency of provision according to standards (81.3%); (3) variations in provision according to standards (68.8%); (4) portions according to standards (33.3%); and (5) texture according to standards (70.8%)²². These data suggested that the increased interest in searching for the keyword "complementary feeding" could be associated with maternal beliefs about appropriate child feeding practices in a particular area, especially if accompanied by sufficient digital literacy skills. This finding is consistent with Nurhafizha et al.'s (2023) research, which identified a correlation between attitudes and behavior in searching for health information online during the COVID-19 pandemic among residents in Semarang City¹⁴.



Analysis of the Keyword "Immunization"

Figure 6. Search interest for the keyword 'immunization' from 2018 to 2022

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A risk factor for stunting is poor health during the first 1000 days of life ³³. Repeated infections can cause a child's health to deteriorate, which can affect their growth and development, resulting in stunting. Since 1956, the Indonesian government has implemented an immunization program to limit the spread of infectious diseases. According to the Regulation of the Minister of Health Number 12 of 2017, children aged under one year must receive basic immunizations against hepatitis B, poliomyelitis, tuberculosis, diphtheria, pertussis, tetanus, pneumonia, and meningitis caused by *Haemophilus influenzae* type b (Hib), as well as measles immunization³⁴. Immunization is also a crucial component of 11 targeted programs aimed at combating stunting in Indonesia.

However, the implementation of the immunization program is still below expectations. Several factors contribute to low immunization coverage, including mothers' lack of knowledge about the benefits of complete basic immunization, lack of public awareness about the importance of preventing infectious diseases in children, and mothers' education level, age, beliefs, and religion^{35,36}. The success rate of the immunization program during the COVID-19 pandemic was also reported to have declined due to restrictions on social activities.

According to Google Trends, the keyword "Immunization" was more popular from 2018 to 2022 than in previous years. Search spikes were observed in May, August, and November, coinciding with the National Child Immunization Month and School Children Immunization Month programs. It was expected that searches for immunization information would continue to increase by the end of 2022. During this period, the Ministry of Health expanded the National Child Immunization Month program due to a decline in immunization coverage during the COVID-19 pandemic³⁷.

When analyzed by subregion, East Nusa Tenggara, Central Java, and Bengkulu showed the highest search trend for the keyword "immunization". In 2019, infants in Central Java had a complete basic immunization coverage of 98.5%, which decreased to 94.3% in 2020, and 86.7% in 2021. Meanwhile, in 2022, 99.60% of children aged under five years (toddlers) in Central Java were immunized²⁷. In East Nusa Tenggara, the percentage of fully immunized children was 51.59% in 2020, decreased to 33.52% in 2021, and increased to 67.11% in 2022³⁸. In Bengkulu, the complete immunization coverage was 60.26% in 2020, 72.07% in 2021, and 72.39% in 2022³⁹. Although the trend was increasing, the immunization coverage remained low. Upon examining the immunization coverage of the three provinces, distinct patterns were observed. According to statistics from these three provinces, Central Java had the highest vaccine coverage exceeding 90%. Bengkulu experienced an increase in their coverage from 2020 to 2022, while the percentage of immunization coverage in East Nusa Tenggara varied.

The high volume of searches for the keyword "immunization" in the three subregions did not necessarily reflect the success of their respective immunization programs, which exhibited varying patterns. Information search behavior on the Internet is influenced by several factors, including digital literacy skills, education level, and age. Sari and Nadjib (2019) found that there was no statistically significant variation in the frequency of complete basic immunization based on internet access³⁶.

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Google Trends is a cost-effective and userfriendly tool for collecting data on public search interest in a particular topic. While it has the potential to reflect a population's health-related behavior, it is important to consider the accuracy of the data^{40,41}. This study suggested that a surge in search interest for a term might indicate various factors, such as growing public awareness about an issue, momentum, and improved digital literacy in a specific region. Increasing awareness and knowledge of stunting-specific treatments can enhance program implementation and coverage rates. The effectiveness of stunting-specific interventions can help reduce stunting by up to 30%⁷.

However, this study has limitations. First, it employed a descriptive approach, providing only an overview of search interest data for the terms 'exclusive breastfeeding', 'complementary feeding', and 'immunization'. Therefore, it is unclear whether there is a correlation or statistical difference between the search queries in relation to stunting interventions and prevalence in Indonesia. Statistical analysis is required to establish a correlation. Second, the data provided on the Google Trends page are based on weekly searches, which makes it highly variable and impossible to compare with yearly stunting data from the Indonesian government. Furthermore, the data on search interest are presented as Relative Search Volume (RSV) or percentage (%) rather than total search volume, making it difficult to determine the exact number of increases or decreases in searches. The use of Google Trends to depict people's behavior also raises concerns about bias because not everyone in the community has adequate resources and accessibility to the internet, devices, or uses Google as a search engine.

CONCLUSION

According to the analysis of trends, search interest in "complementary feeding" and "immunization" remained relatively consistent between 2018 and 2022. However, searches for "exclusive breastfeeding" appeared to be lower. This suggested that public interest in exclusive breastfeeding was lower than in the other two interventions. From 2018 to 2022, the provinces with the highest Google Trends search interest in stunting interventions using the keywords "exclusive breastfeeding", "complementary feeding", and "immunization" were Central Sulawesi, East Nusa Tenggara, Southeast Sulawesi, the Special Region of Yogyakarta, Central Java, Bangka Belitung, and Bengkulu. It is important to note that the data on search interest for these three keywords could not be compared to the statistics of stunting prevalence in Indonesia due to different trend patterns. Nevertheless, analyzing search interest for exclusive breastfeeding, complementary feeding, and immunization interventions can provide insight into how individuals perceive and approach these interventions.

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The widespread use of the Internet to obtain health-related information must be complemented by strong digital literacy skills and the adequate availability of accurate and reliable information. The government, in collaboration with health services providers in each region, is expected to evaluate the existing health promotion programs. This includes programs aimed at preventing stunting by improving the quality of educational media and information delivery processes to increase curiosity and interest, as well as promote community empowerment in practicing good health behaviors in their daily life.

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CONFLICTS OF INTEREST AND FUNDING SOURCES

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