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Geodemographic and GIS Analysis of the Gender Gap in International Tourism: Post-COVID-19 Trends in Male and Female Tourists in South Africa (2021-2022)

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Abstract

Tourism plays a significant role in South Africa's economic and social dynamics. However, gender disparities in travel behaviors, preferences, and patterns remain underexplored, particularly in the context of post-COVID-19 recovery. This study addresses the gender gap in tourism using geospatial and statistical methods to analyze the demographic and regional characteristics of tourism trends between 2021 and 2022.

The study employs a combination of descriptive, analytical, behavioral, and comparative approaches, utilizing official data from the South African Department of Statistics. This dataset includes information on tourist distribution by nationality, gender, travel purpose, and regional destinations. Spatial analysis was conducted using Geographic Information Systems (GIS) tools, specifically ArcMap version 10.8 and ArcGIS Pro, to effectively map and visualize tourist flows. Comparative statistical methods were used to find important patterns and changes, focusing on gender differences and regional variations, while the behavioral approach was utilized to analyze tourist behaviors and preferences to better understand trends and decision-making processes.

The findings indicate a significant increase in overall tourist numbers from 2021 to 2022, with variations in gender distribution and regional preferences. Female tourists showed a notable preference for safer and more accessible destinations, while male tourists displayed more diverse travel patterns. Regions such as Gauteng and the Western Cape experienced the highest influx of tourists. International arrivals showed a strong rebound, particularly from Europe and Asia, driven by increased confidence in safety measures and accessibility.

This study highlights the evolving gender-specific travel behaviors and regional dynamics in South Africa’s tourism industry. The integration of GIS and statistical analysis provides actionable insights for policymakers to address gender disparities, improve tourism strategies, and promote balanced regional development.

Keywords: Gender gap, Tourism, Geographic Information Systems (GIS), South Africa, COVID-19 recovery, Regional Tourism Patterns.

التحليل الجيوديموغرافي باستخدام نظم المعلومات الجغرافية للفجوة بين الجنسين في السياحة الدولية: توجهات السياح الذكور والإناث إلى جنوب أفريقيا بعد جائحة كوفيد-19

مستخلص

تلعب السياحة دورًا حيويًا في الديناميكيات الاقتصادية والاجتماعية في جنوب إفريقيا. ومع ذلك، لا تزال الفجوات بين الجنسين في سلوكيات السفر وتفضيلاته غير مستكشفة بشكل كافٍ، خاصة في سياق التعافي من جائحة كوفيد-19. تهدف هذه الدراسة إلى تسليط الضوء على الفجوة بين الجنسين في السياحة باستخدام الأساليب الجغرافية المكانية والإحصائية لتحليل الخصائص الديموغرافية والإقليمية لاتجاهات السياحة بين عامي 2021 و2022.

اعتمدت الدراسة على كل من المنهج الوصفي والتحليلي باالإضافة للمنهج السلوكي والمقارن ، مستفيدة من البيانات الرسمية الصادرة عن إدارة الإحصاءات في جنوب إفريقيا. تتضمن مجموعة البيانات معلومات عن توزيع السياح حسب الجنسية والجنس والغرض من السفر والمواقع الإقليمية. تم استخدام برنامج نظم المعلومات الجغرافية (GIS) *ArcMap10.8* *بالاضافة ل* *ArcGIS Pro* لإجراء التحليل المكاني ورسم الخرائط لتدفقات السياحة. تم تطبيق الأساليب الإحصائية المقارنة لتحديد الأنماط والتغيرات المهمة، مع التركيز على الفروق بين الجنسين والتباينات الإقليمية، بينما تم استخدام المنهج السلوكي لتحليل سلوكيات وتفضيلات السياح لفهم الاتجاهات وعمليات اتخاذ القرار بشكل أفضل..

تشير النتائج إلى زيادة كبيرة في أعداد السياح الإجمالية بين عامي 2021 و2022، مع وجود تفاوتات في التوزيع بين الجنسين وتفضيلات المناطق. أظهرت السائحات تفضيلًا واضحًا للمناطق الأكثر أمانًا وسهولة في الوصول، بينما أظهر السائحون الذكور أنماط سفر أكثر تنوعًا. شهدت مناطق مثل غاوتينغ وكيب الغربية أعلى تدفقات سياحية. كما شهدت الرحلات الدولية انتعاشًا قويًا، خاصة من أوروبا وآسيا، مدعومة بالثقة المتزايدة في التدابير الأمنية وسهولة الوصول.

تسلط هذه الدراسة الضوء على السلوكيات السياحية المتغيرة بين الجنسين والديناميكيات الإقليمية في صناعة السياحة بجنوب إفريقيا. يوفر دمج نظم المعلومات الجغرافية والتحليل الإحصائي رؤى قابلة للتنفيذ لصانعي السياسات لمعالجة الفجوات بين الجنسين وتحسين استراتيجيات السياحة وتعزيز التنمية الإقليمية المتوازنة.

الكلمات المفتاحية: الفجوة بين الجنسين، السياحة، نظم المعلومات الجغرافية(GIS) ، جنوب إفريقيا، التعافي من كوفيد-19، الأنماط السياحية الإقليمية.

Introduction

General background on tourism and the pandemic

Tourism is undeniably a vital component of global economic sectors, directly contributing to economic growth and sustainable development. The COVID-19 pandemic significantly impacted travel and tourism, resulting in noticeable changes in tourist patterns and destinations. These shifts were particularly evident in the gender gap between males and females in selecting tourist destinations. Consequently, many researchers have explored this gender phenomenon, employing geodemographic analysis and Geographic Information Systems (GIS) tools to investigate the travel trends of male and female tourists in the Republic of South Africa post-pandemic. This analysis aims to provide an accurate and comprehensive picture of the gender gap in the tourism sector and propose solutions to support tourism sustainability.

Before the pandemic, global tourist numbers reached approximately 1.5 billion in 2019 (UNWTO, 2020). However, the advent of COVID-19 delivered a major blow to the tourism sector, causing a global decline of 73% in tourist numbers in 2020 (UNWTO, 2021). Within the study area, tourism was profoundly affected, with the number of tourists dropping from 15.8 million in 2019 to just 2.8 million in 2020 (Statistics South Africa, 2022). These changes restructured travel patterns, especially in terms of destination choices, and revealed notable differences between genders as a response to the crisis. For instance, male tourists accounted for 60.3%, while female tourists made up 39.7% in May 2022 (Statistics South Africa, 2022). In 2020, male tourists still outnumbered female tourists, with 53.8% and 46.2%, respectively. This disparity extended across regional categories: 64.5% of male tourists were from SADC countries, 59.4% from overseas, and 63.6% from 'other' African countries (Statistics South Africa, 2020).

This pronounced gender disparity represents a demographic phenomenon that necessitates analysis and interpretation to understand the underlying factors contributing to the gender gap.

Such analysis is essential within the context of tourism planning to foster recovery and growth in the post-pandemic era.

The Gender Gap and Tourism

Tourist destinations reflect something related to the gender gap, which is the priorities, preferences, and even behaviors of tourists. Studies indicate that male tourists often associate their destinations with a spirit of adventure along with recreational activities, while females prefer to focus more on the availability of safety factors along with cultural activities (Chiang & Jogaratnam, 2006). In addition to factors such as psychological safety, personal and social comfort, the pandemic has affected mental health and was reflected in their travel decisions compared to males (Jin et al., 2021).

The importance of Geographic Information Systems in Tourism Planning and Tourism Sustainability

Geographic information systems are a great and distinctive tool in tourism planning and creating opportunities for tourism sustainability; by providing accurate spatial analysis that helps in making informed decisions about developing tourist destinations and destinations; by integrating geographic area data with tourism information for the same place, planners can identify areas that are suitable as ideal tourist destinations and those that need to improve their infrastructure (McAdam, 1999). Geographic information systems also provide monitoring systems for tourist areas by monitoring the environmental impact resulting from tourism activity, thus achieving a balance between natural resources and attracting tourists to the place (Boers & Cottrell, 2007).

Geographic information systems have contributed greatly in light of the post-pandemic challenges in analyzing the qualitative variation in choosing tourist destinations, which helps in creating more sustainable comprehensive solutions for tourism. This includes statistical data that showed that most tourists in SADC countries prefer to travel by land at a percentage of 89.2%, while tourists from other countries prefer to travel by air at a percentage of 92.7%, as

will be explained in detail in the results section (Statistics South Africa, 2022). The role of geographic information systems in promoting sustainable tourism is clear: they make tourist attractions easier to find on interactive maps, which in turn helps protect delicate ecosystems from the damage that tourism can cause

(Zhen et al., 2020). The most important of these negative impacts of tourism activities on ecosystems are the disruption of marine ecosystems, soil erosion, and the deterioration of vegetation resulting from practicing hiking and safari.

Regional Context and the Republic of South Africa: An Applied Study

The distinct geographical and cultural diversity of the Republic of South Africa, in addition to its rich natural resources before the pandemic, was the reason for receiving large tourist trips, as reported by the statistics and mentioned above in 2019, which contributed to providing many job opportunities and a significant contribution to its national economy (Statistics South Africa, 2022). Following the pandemic, these numbers decreased significantly (UNWTO, 2021).

Despite the passing of the Corona pandemic crisis and relative recovery from it in 2022, South Africa still needs to develop many of its sectors, especially those related to security, infrastructure services, and regional and local disparities in the distribution of tourism resources (Rogerson & Rogerson, 2020). This was evident from the concentration of tourism services in major cities and their decline in the countryside, which limited the latter's ability to attract tourists (Visser & Hoogendoorn, 2011). This disparity undoubtedly increased the complexity of the tourism planning process in light of the need for sustainable and balanced tourism development in all regions (Ramukumba, 2020). In addition to considerations of fears and personal security, which are among the most prominent obstacles to tourism in South Africa, especially for women, some studies have indicated that crime rates had a clear impact on changing travel destinations toward safer environments (George, 2003). The tourism sector faces another challenge, which is

unemployment and income disparity, which also constitute an obstacle to the tourism sector (Rogerson, 2013). Therefore, it was necessary to change the tourism marketing policy, which helps achieve spatial justice and enhance sustainability in the tourism sector (Mason & Mowforth, 2015).

Significance of the Study

This study derives its importance from analyzing the gender gap in tourism after the Covid-19 pandemic using geodemographic analysis and Geographic Information Systems (GIS). It helps uncover new trends in the behavior of male and female tourists in South Africa, and contributes to understanding how different groups were affected by the pandemic. Furthermore, the study also provides accurate spatial data to support policymakers in developing tourism gender-sensitive tourism strategies that promote equality and sustainability in the tourism sector.

Objectives

1. Analyz the spatial distribution of both genders in the Republic of South Africa following the COVID-19 pandemic using Geographic Information Systems (GIS).

2. Identify geodemographic gender gaps in tourism patterns, including preferred destinations and types of tourism activities for both genders.

3. Assess the impact of the pandemic on tourism behavior of men and women and understanding the factors that have contributed to changing these trends.

4. Propose recommendations that support more inclusive and sustainable tourism policies that promote gender participation in tourism activities while contributing to environmental conservation.

5. Highlight the use of GIS as an effective tool and contributor to tourism planning processes for understanding and analyzing geodemographic tourism trends.

Study Area:

The study area encompasses the Republic of South Africa. It is geographically represented by the easternmost point at the intersection of latitude 27°19′ south and longitude 32°55′ east in the town of Kosi Bay, near the Mozambique border, and the westernmost point at latitude 28°34′ south and longitude 16°30′ east, near the Orange River on the Namibian border. The northernmost point is 22°08′ south and 29°25′ east, near the Zimbabwe border, while the southernmost point is 34°50′ south and 20°00′ east at Cape Agulhas.

Methodology and Tools: The study employs a combination of descriptive, analytical, behavioral, and comparative approaches, utilizing official data from the South African Department of Statistics. This dataset includes information on tourist distribution by nationality, gender, travel purpose, and regional destinations. Spatial analysis was conducted using Geographic Information Systems (GIS) tools, specifically ArcMap version 10.8 and ArcGIS Pro, to effectively map and visualize tourist flows represented in collecting and analyzing statistical data provided by official reports on tourism and migration from the statistical agency of the Republic of South Africa, the aim of which is to describe the phenomenon of tourism and all related and associated factors, demographic interactions and geographical distribution. For the statistical analysis, SPSS was employed to perform various tests, including regression analysis and the T-Test, to explore and understand the relationships between variables. These tools and methodologies aimed to provide an integrated understanding of tourism patterns and their underlying factors.

Literature Review

The Impact of Gender and Sex on The Choice of Tourist Destination:

Age plays a pivotal role in determining the priorities of tourist destinations around the world. Young age groups often seek adventure and recreational activities, while older and more mature ages prefer cultural experiences and relaxation. A study was conducted in the Republic of South Africa; it showed that different age groups evaluate the quality of accommodation and services in different ways, which affects their choice of tourist destination (Van Vuuren et al., 2022). Gender also plays a crucial role in shaping the motives and priorities of tourist destinations for males and females, influenced by economic, social, and individual factors. Studies show that males tend to favor adventurous activities and travel for scientific missions, while females often focus on shopping, entertainment, social connections, and renewing spatial experiences as key motivations for their travel destinations. This is evident in the spatial differences in activities chosen, preferred accommodation types, and the overall style of the trip. (Smith & Mograbi, 2021). Economic conditions play a significant role in choosing destination patterns. Globally, low-income women face financial constraints that limit their travel options compared to men (Baum & Hai, 2020). This economic disparity results in women tending to choose nearby and less expensive travel destinations, while men are more inclined towards adventures in remote countries farther from their places of residence and hometown. In more conservative societies, gender differences in travel preferences are further influenced by safety concerns. Consequently, safer and more multicultural destinations are more appealing to women, while men may prefer less popular and riskier destinations (Van Vuuren et al., 2022).

The Impact of the COVID-19 Pandemic on Tourism Patterns

GIS has played a pivotal role in analyzing tourism activity and spatial patterns following the pandemic. Through GIS tools and methodologies, policymakers have been able to create detailed maps

illustrating areas of decline as well as regions showing significant recovery in tourism activity.

The COVID-19 pandemic emphasized these disparities, leading to a noticeable shift in female travel preferences towards destinations perceived as safer and closer to home, focusing on well-being and domestic travel (Fong et al., 2021). As tourism activity recovers and increases, understanding the impact of gender on travel behaviors has become essential for decision-makers to address the diverse needs of each gender, including personal safety concerns and the affordability of travel.

Demographic factors, such as age and gender, also influence tourists' evaluations of the quality of services provided. A study conducted in South Africa revealed that expectations and satisfaction levels varied across different age groups and genders, which significantly shaped tourists' overall experiences (Van Vuuren et al., 2022).

The Importance of Geographic Information Systems in Tourism.

Geographic Information Systems (GIS) are vital in mapping tourist flows to and from various destinations. They provide insights into the origins of tourists, their preferences, and reasons for declines in tourist numbers from specific regions. For South Africa, this is particularly critical, as iconic destinations such as Cape Town and Kruger National Park consistently attract significant numbers of visitors, while rural areas struggle with low tourism competitiveness (Van Vuuren et al., 2022).

GIS enables tourism decision-makers to integrate demographic and economic data into planning processes, helping them address the needs of visitors. For example, GIS can analyze accessibility to tourist sites and identify optimal locations for hotels, transportation hubs, and emergency services (Ajayi et al., 2022). Furthermore, GIS-based strategies can help manage visitor numbers in ecologically sensitive areas, such as the Drakensberg Mountains and

Table Mountain National Park, to minimize environmental impacts (Smith & Mograbi, 2021).

Additionally, GIS supports regional tourism marketing by analyzing tourist arrival patterns locally, regionally, and internationally. These insights allow for the development of targeted marketing strategies, ensuring resources are allocated effectively to attract the most suitable tourists to South Africa (Fong et al., 2021).

Sustainable Tourism and its Impact on Tourist Decisions

Sustainable tourism has emerged as a major factor influencing travelers' decision-making processes regarding tourist destinations. Increasingly, tourists aim to minimize their environmental impact while supporting local communities. Research has shown that environmental policies and sustainable practices act as strong attractions for tourists. These include the role of environmental certifications, labels, and practices in steering decisions toward sustainable cities and destinations (Serio et al., 2024).

Moreover, incorporating sustainability indicators such as CO2 emissions and seasonality into tourism recommendation systems has been found to guide tourists toward sustainable travel choices, particularly in urban environments (Banerjee et al., 2024). These findings highlight the growing demand for sustainable tourism and its pivotal role in shaping traveler behavior.

Regional disparities in tourism

Tourism in South Africa is marked by pronounced regional disparities, with spatial factors playing a decisive role alongside economic, social, and cultural influences. Major urban centers like Johannesburg, Cape Town, and Durban consistently attract the largest number of both local and international tourists. This is largely attributed to their advanced infrastructure and well-known attractions (Smith & Rogerson, 2021).

In contrast, rural areas, despite their rich cultural heritage and scenic beauty, face challenges in attracting tourists. Key factors include underdeveloped infrastructure, limited tourism marketing, and concerns about safety and security (Van der Merwe et al., 2020). These disparities are further exacerbated by inadequate transportation networks in rural areas, which limit accessibility compared to the well-connected urban centers (Rogerson & Baum, 2021). Consequently, rural regions often miss out on the economic benefits associated with tourism.

GIS has proven to be a valuable tool in addressing these challenges by visualizing spatial patterns of tourist arrivals and identifying areas of high and low tourism activity. For example, a GIS-based study in South Africa highlighted popular attractions like Kruger National Park and underutilized regions such as Limpopo and the Eastern Cape, calling for targeted investments to unlock their potential (Williams et al., 2022).

Additionally, GIS provides insights into the optimal areas for infrastructure development and emphasizes the need for community tourism initiatives. These initiatives can enhance awareness of rural areas through cultural and environmental tourism, while also diversifying sustainable tourism offerings in economically deprived regions (Smith & Rogerson, 2021).

Discussion

1. Comparison of Results with Previous Studies:

The results of this study align significantly with previous research, particularly studies that have addressed the gender gap in tourism. For example, prior findings, such as those by Brown (2015) and Taylor (2019) in *Socio-Demographic Profiles in Travel Behavior*, emphasize that women tend to prioritize safety and convenience when selecting modes of transportation. This aligns with the current study's results, which reveal a noticeable preference among female tourists for travel options perceived as safer, more secure, and reliable.

However, despite these consistencies, the study also revealed some differences from earlier research on gender-related travel behaviors. For instance, Yip et al. (2010) suggested that females are less likely to travel alone. Contrarily, the present study shows a significant tendency among female tourists, particularly within certain age groups, to travel alone. This discrepancy may be attributed to the unique cultural characteristics and advanced infrastructure of the study area, which offer safer options for solo female travelers.

Furthermore, the study provides insights into the age structure of tourists that were not explored in previous research. For instance, younger tourists (aged 18–19 years) exhibit a more balanced distribution of travel preferences between genders compared to older age groups, where the gender gap becomes more pronounced. This finding adds depth to the existing literature, which has often generalized results across all age groups without delving into age-specific trends.

These results underscore the importance of considering cultural and demographic variables when studying gender-related travel behavior. The alignment and divergence between the current study and previous literature not only validate the study's findings but also highlight its unique contribution to understanding the complex dynamics of gender and tourism.

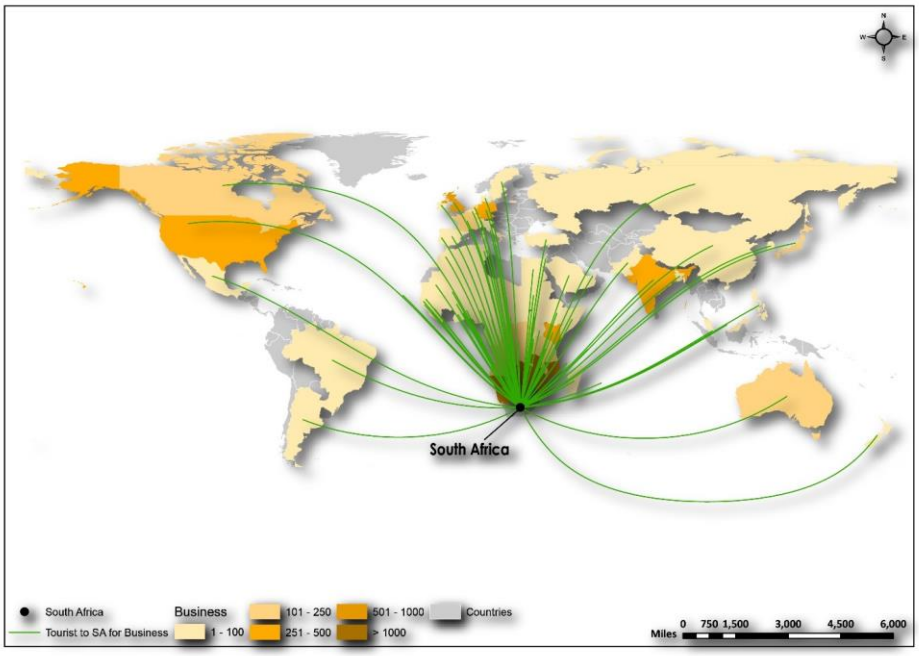
2. Analysis of Travel Purpose and Regional Demand:

The study's results provided insights into tourist flows following the pandemic, revealing significant differences in travel purposes and regional demand. Leisure tourism emerged as the primary driver of post-pandemic travel in 2022, surpassing the tourism objectives observed in 2021. This shift aligns with Taylor's (2019) findings, which confirmed that leisure travel typically recovers faster than business travel due to its resilience to economic fluctuations and its strong association with personal well-being.

The study also highlighted a notable recovery in business travel, accompanied by a strong desire to resume such activities, although it

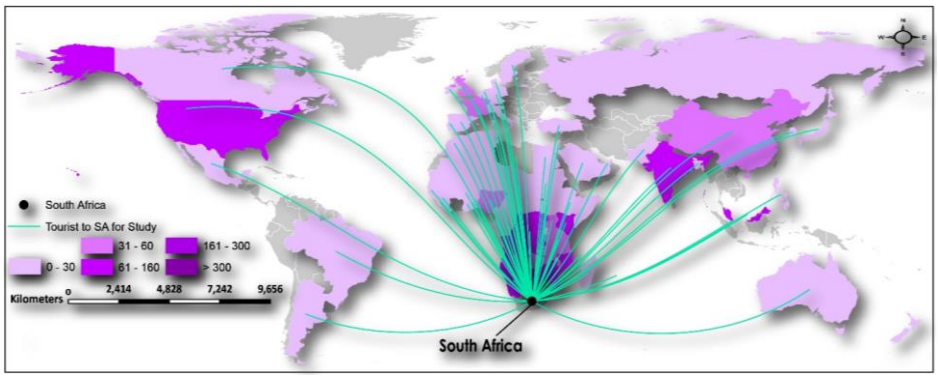
has yet to reach pre-pandemic levels. This finding is consistent with Lurie et al. (2020), who observed that business travel recovery tends to be slower, often constrained by financial challenges, particularly for travelers from regions like Central and South America. This trend indicates a renewed focus on international partnerships.

Additionally, the study identified the emergence of new tourism destinations in regions with limited cultural history, such as Central and East Africa. This aligns with Harper et al. (2020), who emphasized that systematic marketing and efforts to improve accessibility can significantly enhance tourism flows from previously untapped areas. This finding underscores the critical role that South Africa's marketing campaigns have played in driving tourism growth and attracting visitors from non-traditional markets.



Source of the map: The map was prepared by the researcher based on data from www.statssa.gov.za

Figure (1) Global Distribution of Tourists Traveling to South Africa for Business Purposes 2022



Source of the map: The map was prepared by the researcher based on data from www.statssa.gov.za

Figure (2) Global Distribution of Tourists Traveling to South Africa for Educational Purposes 2022

Results:

First, it is essential to examine the developments and rate of change in the volume of tourism activity during the timeframe of 2021–2022. The trends observed were as follows:

The highest global rate of change was recorded in Madagascar (2785%) and New Zealand (1140%). From Asia, Singapore showed a remarkable increase, while the United Arab Emirates led the Middle East, as illustrated in Maps 1 and 2. An analysis of variance (ANOVA) of the data on South African residents and foreign travelers by travel direction revealed statistically significant differences between traveler groups, with a p-value of 0.005 indicating a significant variation. The results demonstrated clear differences, particularly in categories such as arrivals and departures (foreign travelers). Notably, the highest percentage change between May 2021 and May 2022 was 139.1%, favoring visitor arrivals.

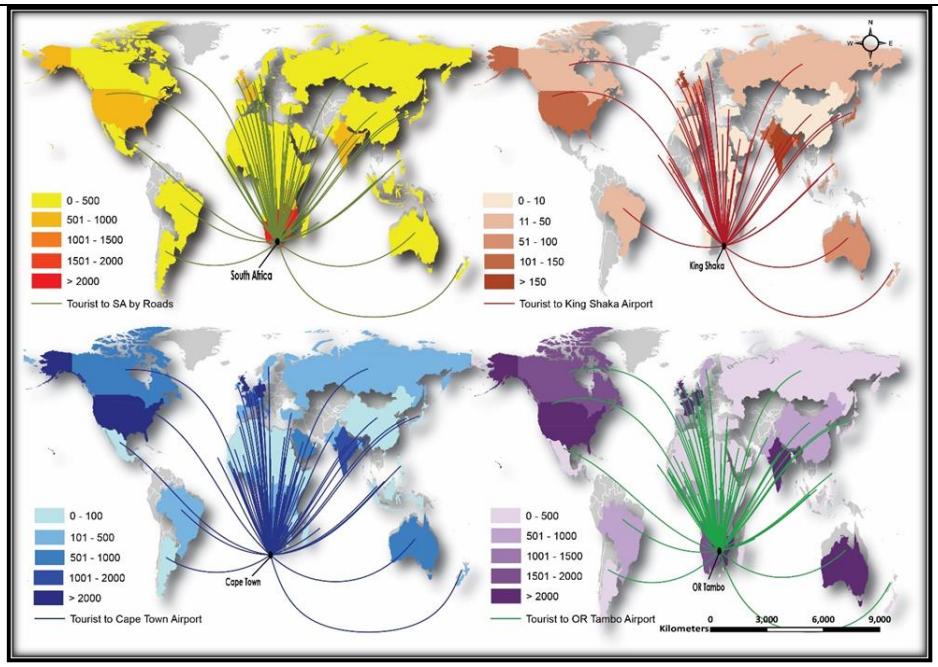
Additionally, as shown in Table 1, the analysis by travel direction and mode of transportation revealed that air and sea travel displayed statistically significant differences between groups (p-values < 0.05). Conversely, road travel did not exhibit statistically significant differences (p-value = 0.076).

These findings are likely due to the speed and efficiency of air travel, which makes it the preferred mode of transportation, particularly for long distances. High-income countries tend to favor air travel because of their ability to afford its costs, while low-income countries often rely on less expensive alternatives (Gössling & Humpe, 2020).

Table (1) Chi-Square Test Results for the Relationship Between Countries and Modes of Transport

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	720602.016[a]	150	.000
Likelihood Ratio	754926.387	150	.000
N of Valid Cases	1626152		

a. 64 cells (28.1%) have expected count less than 5. The minimum expected count is .00.



Source of the map: The map was prepared by the researcher based on data from www.statssa.gov.za

Figure (3) Distribution and Flow of International Tourists to South Africa via Roads and Major Airports

The low significance level indicates a statistically significant relationship between countries and modes of transport (air, road, sea). This result suggests that the distribution of tourists among different countries and modes of transport is not random; rather, significant differences exist in travel preferences based on the country of origin, as shown in Table 2.

Regarding the differences between incoming tourists in 2022 based on gender, the mean number of male tourists (33,930) is higher than that of female tourists (23,115.57). However, with a significance level of 0.413 (p-value > 0.05), the difference is not statistically significant.

Table (2) ANOVA Analysis of Tourist Transportation Modes: Air, Road, and Sea

		Sum of Squares	df	Mean Square	F	Sig.
Air	Between Groups	304421595826.417	8	38052699478.302	105.011	.001
	Within Groups	1087108464.500	3	362369488.167		
	Total	305508704290.917	11			
Road	Between Groups	993558266465.750	8	124194783308.219	6.489	.076
	Within Groups	57420344546.500	3	19140114848.833		
	Total	1050978611012.250	11			
Sea	Between Groups	108115564.417	8	13514445.552	31.894	.008
	Within Groups	1271180.500	3	423726.833		
	Total	109386744.917	11			

According to gender and age groups, the differences were statistically significant (p-value = 0.016), indicating a significant difference between age groups (p-value < 0.05). A high degree of variability was observed in the means and confidence intervals across age groups. The age group 35–44 recorded the highest mean value, while the 0–14 age group had the lowest.

The analysis of variance (ANOVA) further supports these findings, with a significance level of 0.016. This p-value, being less than 0.05, suggests that the observed differences between age groups are not

due to random chance but represent meaningful variations. These results highlight significant differences in overseas travel values based on age, as illustrated in Figure 3.

Demographic Analysis of Tourism Volume Trends by Age and Gender During 2021-2022:

Tourism volumes showed significant development during the period following the relative recovery from the COVID-19 pandemic. The highest percentage of change was observed in the 35–44 age group, with a growth rate of 49.3%, representing an increase of 65,518 tourists. This was followed by the 15–24 age group, which recorded a growth rate of 46.8%, an increase of 13,988 tourists.

This growth can be attributed to pent-up demand for travel during the pandemic, which motivated these tourists to make up for missed opportunities. Additionally, the diversity of tourism activities catering to different age groups, as well as the rise in business travel among professionals in these age brackets, contributed to this increase.

First: Percentage Increase in Males Between 2021 and 2022

- **Largest Percentage Increase**: The highest growth was observed in the age group "0–14," with an increase rate of approximately 145.1%. This can be attributed to the rise in family travel with children, driven by the easing of travel restrictions after the pandemic and the strong resurgence of family tourism.
- **Lowest Percentage Increase**: The lowest growth was recorded in the age group "35–44," with no change in numbers (0%). This stability could be due to consistent travel rates for this group, which are often linked to professional or business travel.

Second: Percentage Increase in Females Between 2021 and 2022

- **Largest Percentage Increase**: Similarly, the age group "0–14" experienced the highest growth, with an increase rate of approximately 159%. This reflects a strong recovery in family tourism with children following the pandemic.
- **Lowest Percentage Increase**: The age group "35–44" showed the lowest growth compared to other groups, indicating stability in travel patterns for women in this demographic, typically associated with professional or leisure tourism.

Third: Number of Tourists Arriving From Outside Africa (Overseas) in 2022

- **Highest Numbers**: The age group "35–44" recorded the highest number of arrivals at 11,386. This indicates that individuals in this age group primarily travel for professional or tourism purposes, often due to their economic capacity (see Appendices 3 and 4).
- **Lowest Numbers**: The age group "0–14" recorded the lowest number of arrivals at 2,348, as travel for this group is generally dependent on family trips.

Source of the map: The map was prepared by the researcher based on data from www.statssa.gov.za

Figure (4) Global Percentage Change in Tourist Arrivals: 2021 vs. 2022

Fourth: Number of Tourists Arriving From SADC Countries in 2022

- **Highest**: The age group "35–44" recorded 70,344 arrivals, indicating that this demographic plays a significant role in regional travel within South Africa.
- **Lowest**: The age group "0–14" recorded 4,946 arrivals, reflecting the limited travel opportunities for children, which are primarily dependent on family tourism.

Table (3) Number of tourists from overseas, SADC and 'other' African regions by sex and age group

Male	Age Group	2021	2022	Overseas	SADC	'Other' African	Unspecified
	0-14	3018	7400	2348	4946	103	3
	15-24	6384	13087	3598	9157	321	11
	25-34	26929	53436	9304	42796	1271	65
	35-44	45353	45353	11386	70344	2015	146
	45-54	26554	52997	10902	40828	1129	138
	55-64	10037	23599	9214	13859	419	107
	65+	3100	11043	6757	4139	140	7
	Total	**121375**	**245453**	**53509**	**186069**	**5398**	**477**
Female							
	0-14	3009	7792	2266	5407	104	15
	15-24	5910	13195	3874	9123	193	5
	25-34	15989	41179	8030	32208	901	40
	35-44	18353	45333	6362	37965	881	125
	45-54	10887	28117	6095	21468	454	100
	55-64	5350	16140	6609	9299	175	57
	65+	2474	10053	5623	4361	64	5
	Total	**61972**	**161809**	**38859**	**119831**	**2772**	**347**

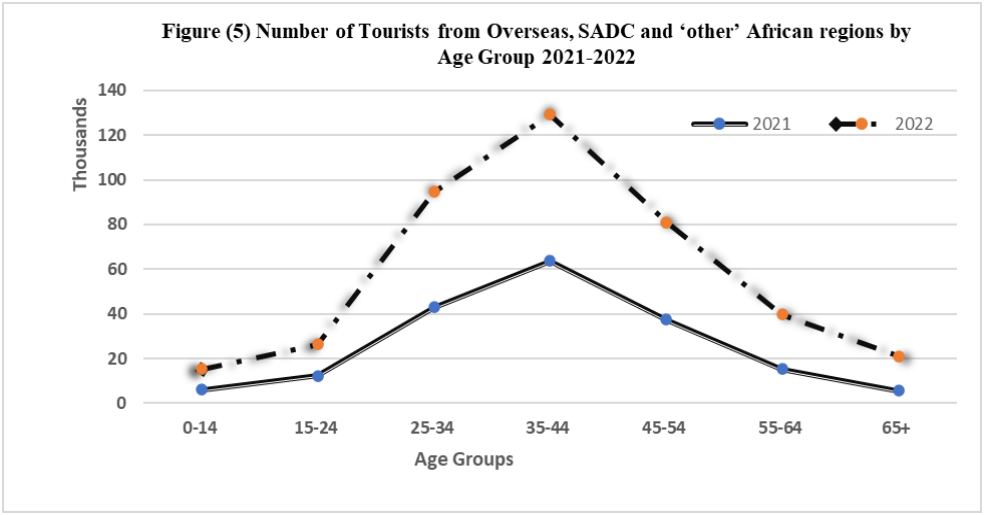
Data Source : www.statssa.gov.za

Fifth: Number of Tourists Arriving From Other African Countries ('Other' African) in 2022:

Highest: The age group "35–44" recorded 2,015 arrivals, highlighting the importance of this group in regional mobility for work and tourism activities.

Lowest: The age group "0–14" recorded 103 arrivals, the lowest percentage, due to the limited travel opportunities for children from these countries, which rely heavily on family tourism.

These results indicate that the age group "35–44" serves as the backbone of professional and regional tourism, while the age group "0–14" has significantly benefited from the resurgence of family tourism following the pandemic. Tourism from Overseas and SADC countries underscores South Africa's prominence as a key destination for both professional and leisure travel at regional and international
levels.



Source of the figure: The Figure was prepared by the researcher based on data from www.statssa.gov.za

The influence of age on destination choice:

Age plays a crucial role in shaping tourists' preferences. Younger individuals tend to seek adventure and recreational activities, whereas older individuals often prioritize cultural experiences and relaxation. A study conducted in South Africa revealed that various age groups assess the quality of accommodation and services differently, which significantly influences their choice of destinations (Van Vuuren et al., 2022).

The influence of gender on destination choice:

Gender significantly influences travel behavior. Women tend to show greater interest in the cultural and social aspects of a destination, while men are more inclined toward adventurous activities. A recent study revealed that women prioritize experiences emphasizing social connections more than men (Smith & Mograbi, 2021).

The interaction between age and gender in destination choice:

Age and gender interact to shape tourists' preferences in meaningful ways. For instance, older women often favor destinations with rich cultural experiences, whereas younger men are more drawn to sports-related activities. This complex interaction highlights the need for tour operators to design offerings that cater to the diverse needs of different demographic groups (Ajayi et al., 2022).

The impact of demographic factors on the tourist experience:

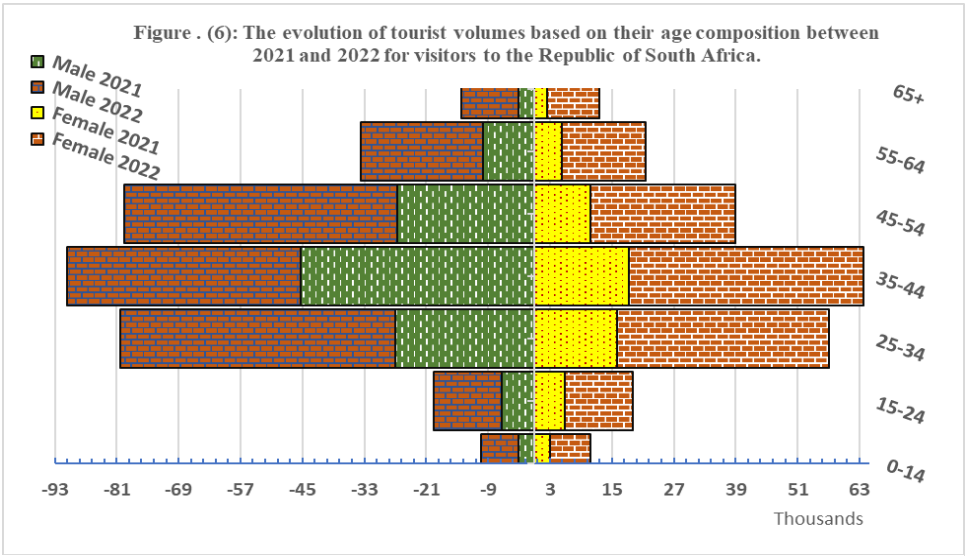
Demographic factors such as age and gender play a significant role in shaping tourists' assessments of service quality. A study conducted in South Africa revealed that evaluations and expectations varied based on these factors, directly influencing tourists' satisfaction and overall experience (Van Vuuren et al., 2022).

Recommendations for the tourism sector in South Africa:

To attract a greater number of tourists, it is essential to develop marketing strategies that consider age and gender differences. Offering tailored experiences that cater to the specific needs of various demographic groups will enhance South Africa's appeal as a unique and competitive tourist destination (Smith & Mograbi, 2021).

Table (4) ANOVA Analysis of Total Tourist Data for 2022

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6062335388.857	6	1010389231.476	5.994	.016
Within Groups	1180057015.500	7	168579573.643		
Total	7242392404.357	13			



Source of the figure: The Figure was prepared by the researcher based on data from www.statssa.gov.za

Using descriptive statistics to compare the number of tourists arriving through different airports in 2022, significant variations were observed. Cape Town Airport exhibited a high variance, indicating a notable disparity in the number of tourist arrivals. Stem-and-leaf plots revealed that most values were concentrated in a low range, with some extreme values representing periods of high tourist flow.

In contrast, King Shaka Airport showed lower variance, reflecting relative stability in tourist arrivals. Meanwhile, OR Tambo Airport displayed a high variance, suggesting significant fluctuations in tourist numbers. This indicates that OR Tambo Airport accommodates far greater numbers of tourists compared to the other airports, as illustrated in Appendix 1 and Map 3.

Conclusions and Implications:

This study provides critical insights into the gender gap in tourism in South Africa. By analyzing tourists' preferences, transportation choices, and demographic trends, it highlights significant disparities in travel behaviors, preferred destinations, and priorities between males and females. The findings underscore the role of safety concerns, cultural norms, and accessibility in shaping tourism trends, particularly among female tourists. Additionally, regional disparities were evident, with tourism services concentrated in urban areas, emphasizing the need for balanced development to support rural tourism and enhance its competitiveness.

Moreover, the study underscores the importance of addressing gender-specific needs through safety, accessibility, and inclusivity-focused tourism strategies. Policymakers and industry leaders should prioritize infrastructure development and implement targeted marketing campaigns to attract more tourists to rural areas and ensure equitable regional growth.

Future research is recommended to explore additional demographic factors such as income and education, which intersect with gender to shape tourism behaviors. Longitudinal studies could also track changes in tourism trends over time, especially in the post-pandemic era, providing valuable insights for sustainable tourism planning.

Finally, Geographic Information Systems (GIS) proved to be a vital tool for analyzing geodemographic trends and tourism planning. Utilizing GIS-based approaches can help identify tourism patterns, optimize infrastructure development, and promote inclusive, sustainable tourism practices

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Appendices

Appendix (1): Descriptive Statistics of Tourist Numbers by Airport Type

	Airport Type			Statistic	Std. Error
Value	Cape Town	Mean		3530.7308	1429.13004
		95% Confidence Interval for Mean	Lower Bound	587.3824	
			Upper Bound	6474.0792	
		5% Trimmed Mean		2376.9316	
		Median		503.0000	
		Variance		53102729.085	
		Std. Deviation		7287.16194	
		Minimum		32.00	
		Maximum		29119.00	
		Range		29087.00	
		Interquartile Range		2306.50	
		Skewness		2.766	.456
		Kurtosis		7.266	.887
	King Shak	Mean		164.5385	79.85655
		95% Confidence Interval for Mean	Lower Bound	.0708	
			Upper Bound	329.0061	
		5% Trimmed Mean		96.1923	
		Median		19.0000	
		Variance		165803.778	
		Std. Deviation		407.19010	
		Minimum		.00	
		Maximum		1611.00	
		Range		1611.00	
		Interquartile Range		62.75	
		Skewness		3.096	.456
		Kurtosis		8.877	.887
	ORTambo	Mean		9726.9231	4273.67852
		95% Confidence Interval for Mean	Lower Bound	925.1174	
			Upper Bound	18528.7287	
		5% Trimmed Mean		5951.0513	

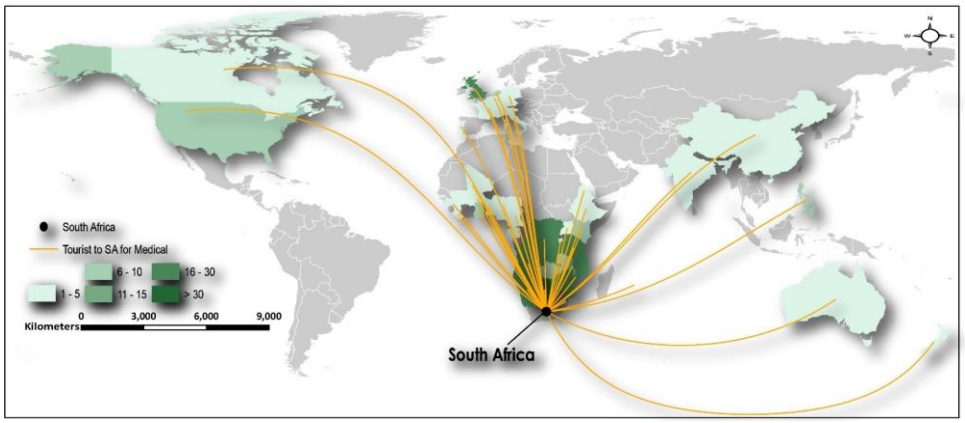
		Median		974.0000	
		Variance		474872529.354	
		Std. Deviation		21791.57014	
		Minimum		141.00	
		Maximum		95298.00	
		Range		95157.00	
		Interquartile Range		4877.75	
		Skewness		3.150	.456
		Kurtosis		10.255	.887
	Other	Mean		66.9615	27.84647
		95% Confidence Interval for Mean	Lower Bound	9.6107	
			Upper Bound	124.3124	
		5% Trimmed Mean		45.1752	
		Median		7.0000	
		Variance		20161.078	
		Std. Deviation		141.98971	
		Minimum		.00	
		Maximum		554.00	
		Range		554.00	
		Interquartile Range		21.75	
		Skewness		2.565	.456
		Kurtosis		6.124	.887

Appendix (2): ANOVA Analysis of Tourist Transportation Modes: Air, Road, and Sea (Detailed Breakdown)

		Sum of Squares	df	Mean Square	F	Sig.
Air1	Between Groups	27336018007.534	104	262846326.996	223.320	.000
	Within Groups	4707981.200	4	1176995.300		
	Total	27340725988.734	108			
Road1	Between Groups	231507639014.191	103	2247646980.720	197844.057	.000
	Within Groups	45442.800	4	11360.700		
	Total	231507684456.991	107			
Sea1	Between Groups	119731.717	103	1162.444	9.663	.019
	Within Groups	481.200	4	120.300		
	Total	120212.917	107			

Source of the map: The map was prepared by the researcher based on data from www.statssa.gov.za

Appendix (3): Global Distribution of Tourists Traveling to South Africa for Holiday Purposes 2022



Source of the map: The map was prepared by the researcher based on data from www.statssa.gov.za

Appendix (4) Global Distribution of Tourists Traveling to South Africa for Medical Purposes 2022

Abbreviations List

1. **SADC**
   SADC stands for the Southern African Development Community, a regional organization established in 1992 to promote economic integration, sustainable development, and political stability across Southern Africa. The SADC comprises 16 member states: Angola, Botswana, Comoros, Democratic Republic of Congo, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Tanzania, Zambia, and Zimbabwe. The organization facilitates regional cooperation in various sectors, including trade, tourism, and infrastructure development, making it a key driver of intra-regional travel and economic collaboration.

Statement: The Use of AI in This Research Paper[1]

[1] Artificial intelligence tools, such as text analysis techniques, were utilized to enhance content formulation and ensure the accuracy and consistency of the presented findings.