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RESEARCH ARTICLE

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Boomer tourism and climate change: an emerging conflict?

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ABSTRACT

A growing number of older adults have the financial means to travel extensively. This expanding travel market could have significant climate implications, as older travellers often prefer energy-intensive tourism, such as cruises. To explore the consequences of this trend, this paper examines the current and planned travel behaviours of a representative sample of the Boomer generation in Germany. The analysis is based on data from Reiseanalyse, an annual survey of 7,259 Germans, and a Norstat survey of 1,101 older German adults. Findings reveal a complex picture: A significant portion of retirees lacks the financial means to travel, while travel intensity declines with age, with a marked decrease after age 75. Averaged across the population, retirees have a smaller carbon footprint from travel than those still in the workforce. Although these factors suggest tourism emissions will decline as the population ages, this trend may reverse as Boomers retire, given their propensity for carbon-intensive travel. To keep Germany on track with its climate goals, proactive policies are needed to address these sociodemographic shifts and their implications for emissions. Findings extend beyond Germany, as affluent senior populations are growing in other high-income countries as well.

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Boomer; climate change; older adults; pensions; tourism; travel

1. Introduction

As the United Nations (UN, 2024: no page) highlight, 'The world's population is ageing. Virtually every country in the world is experiencing growth in the number and proportion of older persons in their population.' More specifically, the percentage of the world's population aged 65 and above will increase from 10% in 2022–16% in 2050, notably under scenarios of continued growth in the overall population to 9.7 billion by mid-century. Various factors have relevance in this development, specifically gains in life expectancy, which in 2021 was 71 years at birth (ibid.). The situation in high-income economies is often different, as population growth rates are lower, leading to a higher share of older adults in aging societies.

Tourism is responsible for an estimated 8.8% of global emissions of CO_2e, with air transport being responsible for more than half these (Sun et al., 2024). Older adults have relevance for tourism and emissions, as they are free to spend time travelling, also outside holiday periods. The senior tourism market has thus received considerable attention as a consumer group to whom holidaymaking can be sold as a lifestyle (Ylänne-McEwen, 2000). Often, seniors will choose emission-intense forms of

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This article has been corrected with minor changes. These changes do not impact the academic content of the article.

tourism such as cruises (Jiao et al., 2021) and are thus potentially relevant for growing emissions of greenhouse gases.

Older adults also often show less concern about climate change compared to younger generations (Pew Research Center, 2021). Studies indicate they are generally less willing to support income sacrifices or drastic lifestyle changes for environmental purposes, while affluent older individuals often have larger carbon footprints than the rest of the population (Ayalon et al., 2023; Haq, 2021). However, this is not uniform or generalizable, and the consumption patterns of some older individuals can also be motivated by values like intergenerational justice and legacy thinking (ibid.).

Germany is a country that is committed to reducing its emissions to net-zero by 2045, defined as 'net-zero greenhouse gas neutrality' (UBA, 2024). The German climate protection law mandates emission reductions by 65% until 2030, and 88% by 2040, compared to 1990 (ibid.). As Germany is the world's fourth largest emitter of greenhouse gas emissions from tourism (Sun et al., 2024), it is of relevance to understand the implications of the current and future tourism-related consumption of the rapidly growing group of pensioners in the country. This research seeks to address this question by providing an overview of the current travel patterns, as well as planned travel in the group of pensioners.

2. Theoretical background

2.1. Defining the senior travel market

Senior tourism refers to the travel behaviours and preferences of older adults, primarily retirees (Stončikaitė, 2022). This demographic is often characterised by increased leisure time and relatively higher disposable income, enabling more frequent and extended travel compared to other age groups. A variety of terms are used in the literature to describe this population, including the 'older market' (Allan, 1981), the '50-plus market' (Silvers, 1997), the 'mature market' (Wang et al., 2007), 'baby boomers' (Gillon, 2004), and the 'silver economy' or the 'silver market' (Branchik, 2010). The latter term broadly encompasses individuals aged 50 and older and reflects broader consumption trends within this segment (European Commission, 2015).

However, the absence of a standardised definition of 'senior' complicates both academic and market-based approaches to this group. This lack of consensus stems largely from the heterogeneity within the senior population (González et al., 2009). For example, Möller et al. (2007) categorised seniors into three life stages: empty nesters (55–64), young seniors (65–79), and seniors (80+). Zsarnoczky et al. (2016) expanded this classification into five aging subgroups, while other studies propose simpler binary divisions, such as pre-retirement (50–64) and post-retirement (65+) (Dann, 2007; Hong et al., 1999). These varied classifications underscore the challenge of generalising senior travel behaviour and raise questions about the consistency and comparability of research findings (Patterson & Balderas, 2020).

As the senior population continues to grow, driven by demographic shifts and increased longevity, there is a pressing need for scholars and policymakers to adopt more nuanced and anticipatory frameworks that address the complex needs and expectations of this evolving market.

2.2. Synthesising theoretical perspectives on senior travel

The multifaceted impact of the senior travel market has been extensively examined. Studies have focused on topics such as the motivations and constraints influencing senior travel behaviour (Alén et al., 2014; Filipe et al., 2021; Moal, 2021; Nicolau et al., 2020), the intersection of social tourism and wellbeing (Morgan et al., 2015; Panasiuk & Wszendybył-Skulska, 2021), effective destination management for elderly tourism (Zhao et al., 2023), and sustainable tourism trends (Sharma et al., 2023). To better understand the dynamics of senior travel, several theoretical frameworks have

been applied, each emphasising different aspects of aging and behaviour. Instead of viewing these theories in isolation, it is useful to explore how they intersect and what limitations they may carry in explaining contemporary patterns.

Lifecycle theory views senior travel behaviour through the lens of evolving roles and life transitions. As individuals age, changes such as retirement, widowhood, or becoming grandparents influence their time availability, financial situation, and motivation to travel (Combs et al., 2008; Silvers, 1997). These transitions are often accompanied by broader societal improvements – such as enhanced healthcare and education – that shape the resources and opportunities available to older travellers (Alén et al., 2017b). While lifecycle theory captures the structural and chronological aspects of aging, it can sometimes overlook the individual agency and variability in how people respond to life transitions.

Continuity theory, by contrast, posits that older adults tend to maintain established habits, preferences, and social ties into later life (Agahi et al., 2006; Huber, 2019). In this view, retirement does not radically alter travel behaviour; rather, past leisure patterns continue to inform future decisions (Nimrod & Rotem, 2012). This theory is particularly useful in explaining why many seniors maintain stable travel interests over time, but it may underplay the impact of health decline, caregiving responsibilities, or sudden life changes.

Generational theory adds another layer by considering how socio-historical contexts shape the values and behaviours of different age cohorts (Chen & Shoemaker, 2014). For example, Alén et al. (2017a) found that some senior travellers, especially those influenced by post-war affluence, seek cultural enrichment, while others prioritise affordability and wellness. However, while generational theory helps explain motivational differences across cohorts, it risks stereotyping or over-generalising behaviours within age groups.

Together, these theories offer complementary insights into senior travel behaviour but also present conceptual overlaps and limitations. Lifecycle and continuity theories often focus on individual changes over time, while generational theory foregrounds shared historical influences. Yet none fully accounts for how past experiences, current constraints, and future aspirations intersect, especially in a fast-changing social and technological environment.

2.3. Senior travel in the European Union (EU)

The European Union (EU) is projected to be the second most affected region by population aging, following Japan (Zsarnoczky et al., 2016). Between 2015 and 2030, four of the top five aging countries globally are within the EU, led by Germany, with Italy, France, and Spain following (European Commission, 2015). In response, the EU has implemented key initiatives such as the Active and Assisted Living Programme (AAL), Horizon 2020, and the European Innovation Partnership on Active and Healthy Ageing (EIP AHA) to address demographic shifts (Zsarnoczky et al., 2016). These programmes align with the EU's 'active ageing' framework, aiming to promote longer, healthier lives (Eurostat, 2023).

Eurostat (2024) data reveals that age minimally impacts tourism behaviour until 65. Individuals aged 65–70 travel more frequently and for longer durations due to increased post-retirement time. While those aged 60–74 accounted for 23% of trips and 26% of tourism nights, older seniors (75+) travel less, often citing health issues, reduced motivation, and financial constraints. More specifically, research within the European Union indicates that senior tourists exhibit considerable flexibility in off-season travel, with a strong emphasis on safety and a preference for group travel (Zsarnoczky et al., 2016). Their motivations encompass medical and health tourism, visiting friends and relatives, as well as luxury and wellness experiences (Taloș et al., 2021; Zsarnoczky et al., 2016). Income levels play a significant role in determining travel propensity, with higher-income individuals engaging in travel more frequently, as demonstrated in various studies (Giesel & Köhler, 2015; Nicolau et al., 2020; Pak, 2020; Przybysz & Stanimir, 2022). Senior tourists are particularly attracted to destinations offering safety, familiarity, and a welcoming atmosphere (Hajra & Aggarwal,

2023; Sien Leong et al., 2023). These findings highlight the multifaceted factors influencing senior tourism, which also vary according to gender, socioeconomic status, and country-specific attributes (Eurostat, 2024).

2.4. The German context

There were 21.2 million pensioners in Germany in 2023, in a population of 84.7 million (Destatis, 2024a; Deutsche Rentenversicherung, 2024a). Considering the employment rate (54.2%, or 45.8 million, Destatis, 2024b), the retired dependent population is equivalent to 46.3% of the labour force, which is of relevance in Germany as the pension system relies on taxes and payments currently made by the working population. According to Institut der Deutschen Wirtschaft (IW, 2024a), 19.5 million people will leave the workforce until 2036. By 2040, it is expected that for every 100 people of working age, there will be 63 young and retired dependents. Additionally, the overall German population is projected to grow to 85 million by 2040.

While there are some discussions regarding the balance between the number of contributors and beneficiaries in the pension system (IW, 2024a), implications for travel have not been discussed. Yet, there is much evidence that German seniors travel frequently (RA 2024). The transport sector has also been identified as Germany's only economic sector in which no significant emission reductions have been achieved (UBA, 2024). Travel also has economic implications, as tourism is an export industry. This includes money spent for travel and tourism outside Germany, as well as pensions paid to accounts abroad. This will primarily include foreign workers returning to their home countries, though there is also an unknown share of older Germans living part-time or permanently abroad for health or climate reasons. According to Deutsche Rentenversicherung (2024b), 1.71 million pensions are paid to accounts outside Germany, corresponding to 8% of all pension payments.

The literature reveals that while senior travel is influenced by age-related transitions, stable lifestyle patterns, and generational context, these frameworks are often applied independently. There however is an interplay between life stage, prior travel experience, and evolving motivations. Moreover, few studies critically assess how well these theories hold across different national contexts or policy environments. This study addresses these gaps by focusing on German Boomers, a particularly relevant group within the European 'silver market.' By examining both actual and intended travel behaviours, this research aims to refine existing theoretical approaches and offer more insights for destination management and policy planning, here with a specific focus on the implications for climate change and Germany's net-zero commitments.

3. Methodology

This research is focused on the travel of older population segments, their current and future travel patterns. To address both, we use data from the German Reiseanalyse (RA, past travel) as well as a Norstat online panel (current and future travel). National data from German statistics (Destatis) is used to characterise current and future developments of the older population. All data sources are explained in further detail in the following section. In all climate impact calculations, focus is on transport emissions, which are responsible for the largest share of overall tourism emissions, and serve as a proxy for total impact (Sun et al., 2024).

Older population segments are defined as 'retired' and thus distinguished from the 'non-retired'. National data for age cohorts was derived from Destatis (2023) for 1992, 2023, and 2040. Destatis uses more than 20 scenarios to project population changes, a moderate scenario for birth rates, life expectancy, and work status was used (scenario G2L2W2). The development is shown in Figure 1, illustrating the Boomer peak in 1992 turn into 50–65-year-olds in 2023. There is also a large group of 85 + year olds. Figure 2 illustrates changes in life-expectancy.

Age groups have proven instrumental in identifying differences in travel styles, product preferences, and trip characteristics between younger and older senior cohorts (Alén et al., 2017b;

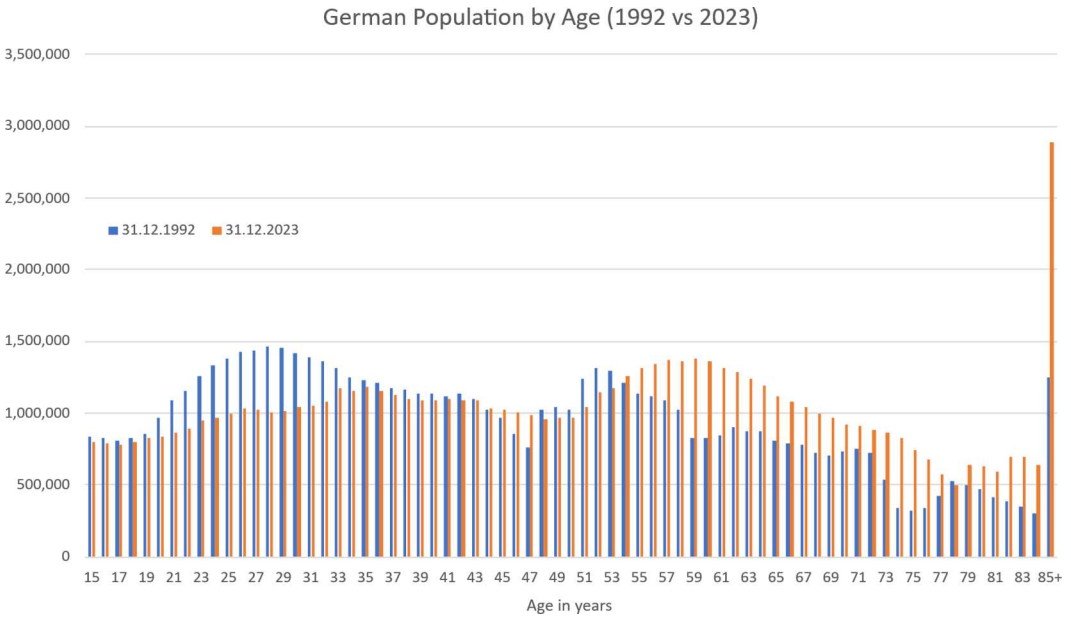

Figure 1. Shifts in German population cohorts between 1992–2023. Source: based on Destatis (2023).

Patterson & Balderas, 2020). While it is acknowledged that recorded age is an inadequate predictor of individual travel behaviour or physical health among seniors (Ruys & Wei, 2001), it is a suitable variable if applied to larger populations. Other variables, such as health, social networks, cultural factors, or personal interests also have relevance, but are not considered here due to the absence of available data.

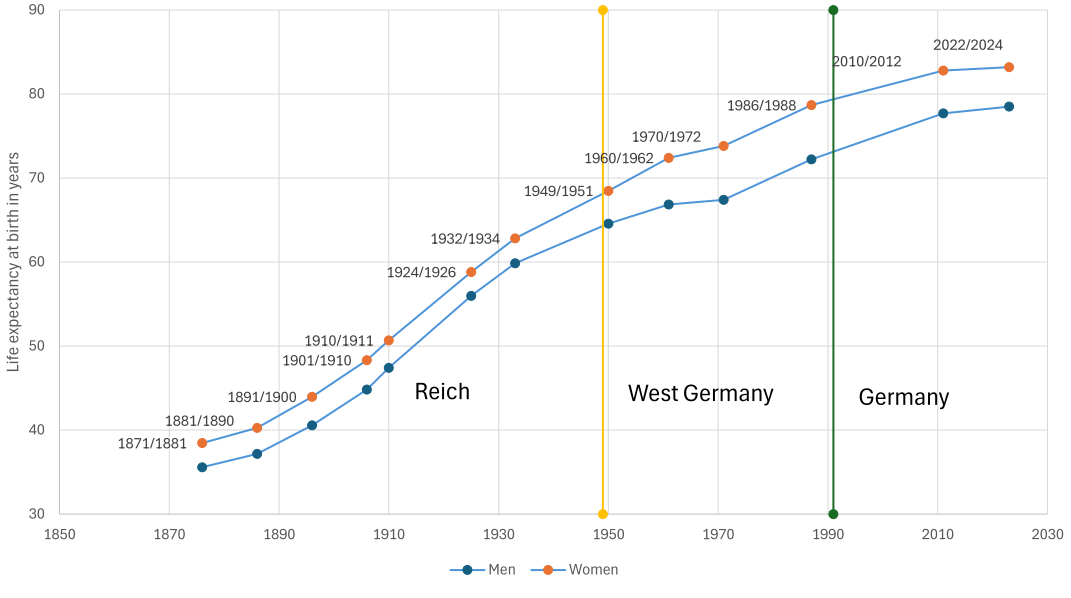

Figure 2. Changes in life expectancy at birth, Germany. Source: based on Destatis (2023).

To understand trends in travel patterns of older adults in Germany, the study relies on the 'Reiseanalyse' (RA), a national survey examining the holiday travel behaviour of the German-speaking population, conducted annually since 1970. The survey focuses on holiday trips lasting five days or longer, with data collected through random route sampling and face-to-face interviews. Data for shorter trips is available, but not at the level of detail to analyze emissions. Longer trips thus serve as a proxy for the climate impact, acknowledging that the tourism climate footprint is significantly larger than its transport component (Sun et al., 2024). In this context it is of relevance that the average distance travelled for the main holiday trip has, depending on age group, doubled or tripled since the 1970s (Figure 3).

Weigert et al. (2021) provide data on the travel distance of the main trip for the years 1972, 1992, and 2018 across different age groups. Figure 3 illustrates how this distance evolved over the three survey waves. With the exception of the youngest cohort (15–24 years) and the two oldest cohorts (65–74 and 75–84 years), the mean distance increased from 1972 to 1992 and again from 1992 to 2018. For the youngest and oldest groups, there is nevertheless a clear rise between 1972 and 2018, albeit without a monotonic increase across all three time points. The ANOVA test statistics (Table 1) confirm a statistically significant increase in the mean travel distance from 1972 to 1992 and 2018, with an eta square of 0.36 indicating a large effect. For the individual age groups, except for the oldest cohort (75–84), the statistically significant differences found in the ANOVA are confirmed, although the corresponding eta square values indicate only small to medium effects.

More detailed data is available from Reiseanalyse (RA). The data used in this article is drawn from RA 2004 (n = 7,858 respondents), 2014 (n = 7,795), and 2023 (n = 7,288). The sample is representative of the German-speaking population aged 14 and older living in private households, encompassing approximately 70 million individuals. Holiday trips, as defined in the survey, refer to journeys with two legs (outbound/return) and include both domestic and international travel lasting at least five days. RA data shows that the share of the population who participated in a holiday trip increased from 76.8% in 2004 (64.4 million people) to 77.9% in 2014 (70.3 million people) but declined slightly to 77.4% in 2024 (77.5 million people).

Data on *planned* (future) travel behaviour were collected through an online survey administered via the Norstat online panel. The sample comprises 1,101 German citizens aged 55 and older,

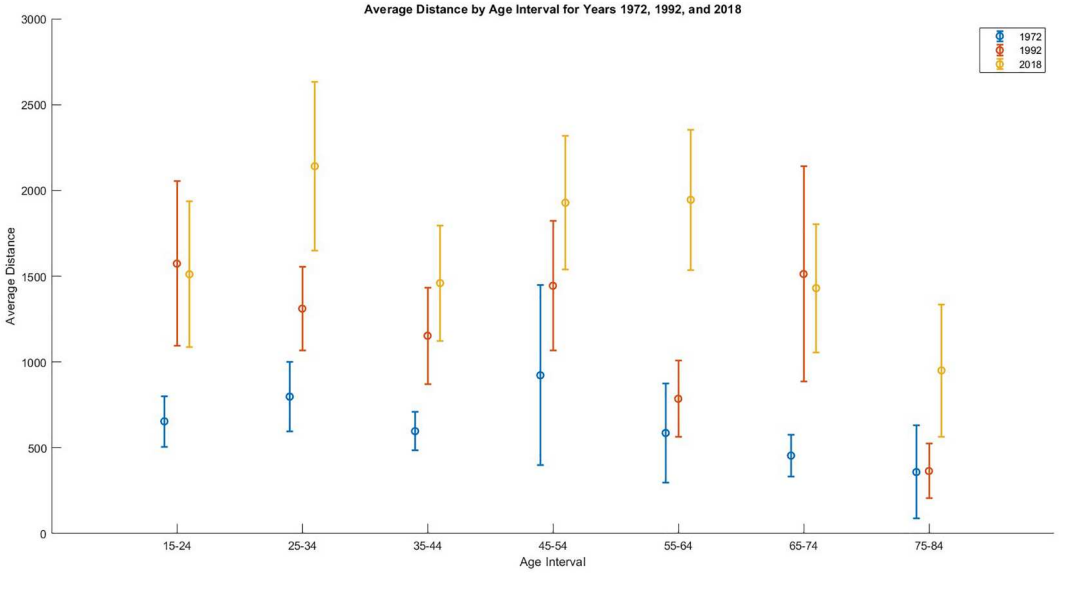

Figure 3. Changes in average trip distance, 1972, 1992, 2018. Source: Weigert et al. (2021).

Table 1. Average distance for main trip in 1972, 1992, and 2028 by age groups (ANOVA with post-hoc tests).

Age group	1972 (A) ($n = 279$)	1992 (B) ($n = 483$)	2018 (C) ($n = 585$)	Total ($n = 1347$)	F	η	η2
15–24 ($n = 129$)	654.09	1,573.38	1,511.29	1,323.20	3.46**	0.23	0.05
25–34 ($n = 261$)	798.13 [C]	1,311.08 [C]	2,140.91 [A, B]	1,448.27	9.12***	0.26	0.07
35–44 ($n = 248$)	597.07 [C]	1,152.94	1460.04 [A]	1,141.34	4.96***	0.20	0.04
45–54 ($n = 239$)	922.92 [C]	1,444.36	1928.2 [A]	1,559.83	3.54**	0.17	0.03
55–64 (n = 225)	586.26 [C]	785.85	1945.11 [A]	1,338.44	10.45***	0.29	0.09
65–74 ($n = 179$)	454.63 [B, C]	1512.97 [A]	1430.39 [A]	1,294.07	2.53*	0.17	0.03
75–85 ($n = 66$)	358.36	364.39	950.86	816.93	0.93	0.17	0.03
All ($n = 1347$)	678.63 [B, C]	1259.66 [A, C]	1679.44 [A, B]	1,322.08	25.18***	0.60	0.36

Notes: Indices indicate which segments differ significantly from another in post-hoc tests, e.g. indices B, C for 1972 mean that the average distance in 1972 differ significantly from 1992 and 2018 ($p < .05$). For ANOVA F-test * ($p < 0.10$), ** ($p < 0.05$), ***($p < 0.01$).

surveyed between August 16 and 31, 2023. Each participant completed a self-administered questionnaire in approximately 20 min and received an incentive of EUR 2.95. A quota sampling strategy was employed to ensure sample representativeness regarding age (between 55 and 99 years), gender, and geographical distribution in terms of urban versus rural areas and across federal regions of Germany, segmented into West, North, East, and South. The questionnaire included questions on social, economic, and demographic variables. Further, items about the respondents' travel behaviours, changes in travel patterns following retirement, and attitudes towards climate change and climate protection were included. Table 2 shows the sample characteristics. To examine differences in travel patterns between retired and non-retired participants, T-tests, Mann–Whitney U tests, and Chi-square tests were used to identify relevant variables.

4. Results

The data illustrates a number of developments characterising the period 1992–2023 (Figure 4). For both retired and working population between 55 and 75, trip numbers with a length of five days and more have grown significantly, from 0.76/0.74 in 1992–0.9/1.01 in 2023, representing a 18.4% to 36.5% increase in travel (retired/working). However, a more detailed analysis reveals complexities.

In the middle and high-income groups, retirees (55–75 years) are more mobile, making more trips per year than the rest of the population, while most of the growth in trip numbers falls on middle (€1300–2600/month net) and high (>€2600/month net) income groups. In the low-income group (< €1300/month net), trip numbers have remained constant for the general population (at 0.45) and declined for retirees (from 0.62 to 0.50). The most ardent travellers are now the non-retired high-income takers (1.16 trips in 2023), though the difference with retirees (1.14) is marginal (Table 3).

Table 2. Sample characteristics, percentages ($n = 1101$).

Sample characteristics, percentages (n = 1101)		
Gender	Male	49.5
	Female	50.4
	Diverse	0.1
Age	55–64	41.1
	65–74	39.5
	75–84	17.5
	+85	1.9
Retired	Yes	63.7
	No	36.3
Personal monthly net income	Below € 1300	26.9
	€ 1300 to € 1999	25.4
	€ 2000 to € 3599	28.0
	€ 3600 and more	10.0
	Don't know / not specified	9.7

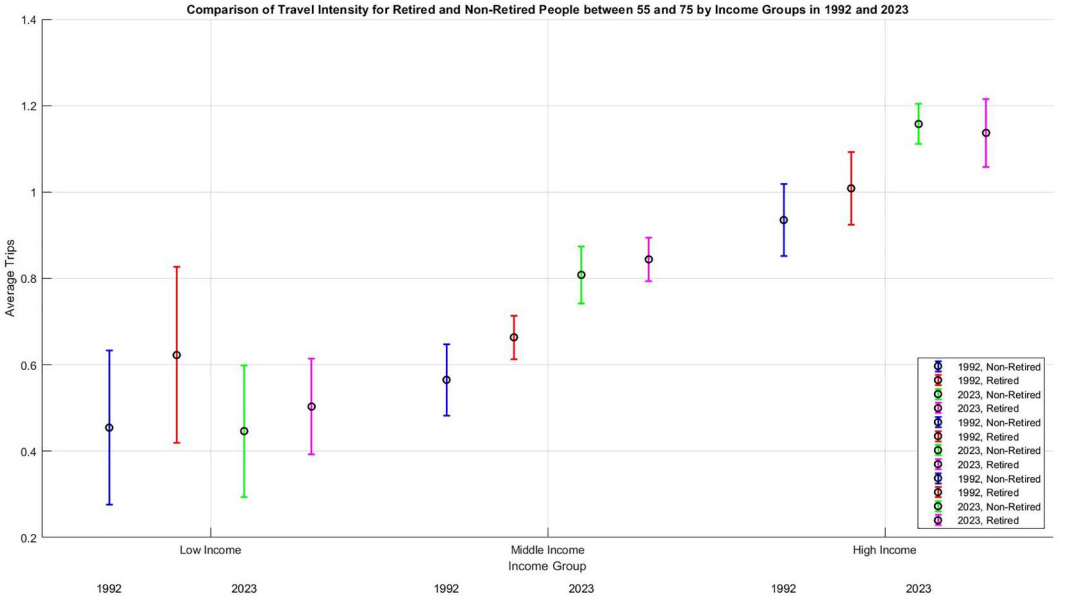

Figure 4. Travel intensity changes between 1992–2023, by income group. Source: Reiseanalyse 1992, 2023.

Overall, we find no statistically significant differences in the average number of trips between retired and non-retired participants aged 55–75 across all income groups. However, for the same age groups, a statistically significant increase in the number of trips between 1992 and 2023 can be observed among middle – and high-income groups.

The data illustrates a 30-year development that has seen middle income groups (retirees and non-retirees) participate in more holiday trips. This highlights a longitudinal trend that is not evident in low-income groups, where fewer than half the number of trips are taken compared to high-income groups (both retirees and non-retirees). The data seems to confirm the relevance of pensions/savings for travel participation, and the general insight that income/wealth is the main single driver of tourism (Sun et al., 2024).

Further insights on changes over time can be gained from the comparison of Reiseanalyse data for age groups (1992 and 2023). Figure 5 confirms that travel intensities have increased throughout age groups, peaking in the group of 50–55-year-olds. With the exception of the 15–19 and 75–79 age groups, all increases in travel intensity between 1992 and 2023 are statistically significant (Table 4).

Table 3. Comparison of trip intensity retired vs. non-retired (between age 55 and 75).

	Year	Retirement	n	Mean trips	Retired vs. non-retired t-test	2023 vs. 1992 t-test
Low income	1992	Non-Retired	44	0.45	−1.220	
		Retired	53	0.62		
	2023	Non-Retired	56	0.45	−0.554	−0.7
		Retired	149	0.50		−1.067
Middle income	1992	Non-Retired	237	0.56	−1.550	
		Retired	663	0.64		
	2023	Non-Retired	438	0.81	−0.847	4.394***
		Retired	789	0.84		5.387***
High income	1992	Non-Retired	386	0.88	−1.253	
		Retired	483	0.95		
	2023	Non-Retired	858	1.16	0.467	6.264***
		Retired	453	1.14		3.481***

Notes: t-test * ($p < 0.10$), ** ($p < 0.05$), ***($p < 0.01$).

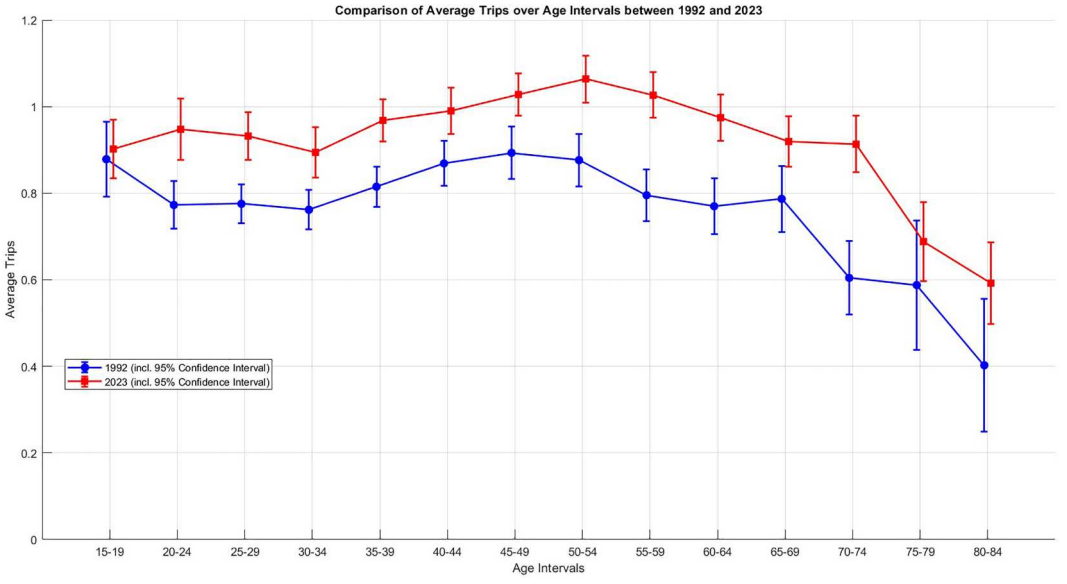

Figure 5. Travel intensity by age group, 1992 and 2023. Source: RA 1992 and 2023.

The most significant decline in travel intensity occurs around 75 years (2023 data, see also Eurostat, 2024), about five years later than in 1992, which might be explained with better health or higher pensions and sufficient savings. It is also notable that across age segments, travel intensities of the 70–74-year-olds have increased the most.

Table 4. Comparison of travel intensity, age group, and year.

Age group	Year	Travel intensity	t-test
15–19	2023	0.902	0.388
	1992	0.878	
20–24	2023	0.948	3.598***
	1992	0.773	
25–29	2023	0.932	4.114***
	1992	0.775	
30–34	2023	0.894	3.419***
	1992	0.762	
35–39	2023	0.968	4.312***
	1992	0.815	
40–44	2023	0.990	3.158***
	1992	0.869	
45–49	2023	1.028	3.388***
	1992	0.893	
50–54	2023	1.064	4.505***
	1992	0.876	
55–59	2023	1.027	5.723***
	1992	0.795	
60–64	2023	0.975	4.852***
	1992	0.770	
65–69	2023	0.919	2.753***
	1992	0.787	
70–74	2023	0.913	5.455***
	1992	0.604	
75–79	2023	0.688	1.096
	1992	0.588	
80–84	2023	0.592	2.034**
	1992	0.402	

Notes: t-test * ($p < 0.10$), ** ($p < 0.05$), ***($p < 0.01$).

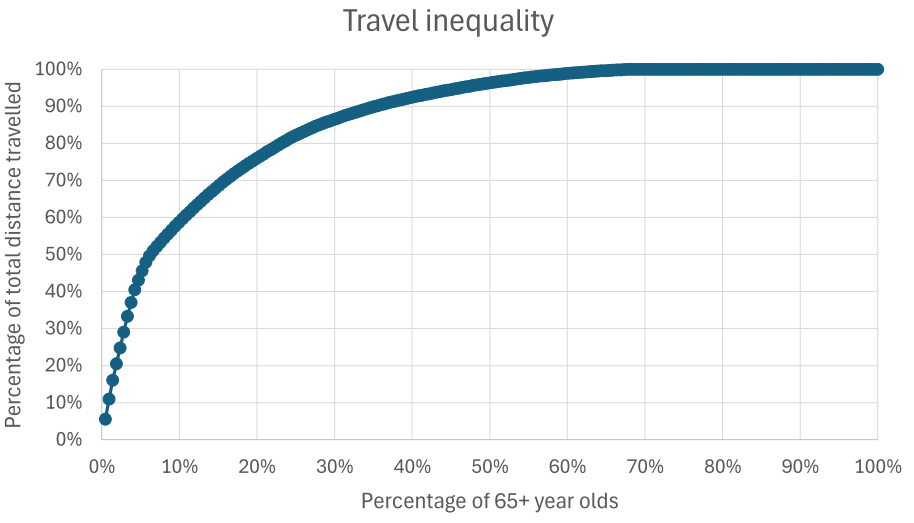

Figure 6. Lorenz curve illustrating retiree and travel distance distributions.

Data also suggests that there is a considerable concentration in travel intensity. Among individuals aged 65 and older, 6% of the population account for 50% of the total distance travelled. Given the strong correlation between travel distance and emissions, a similar distribution likely holds for emissions. The correlation between retiree share in distances travelled is illustrated in Figure 6, suggesting that retiree travel is characterised by considerable inequality.

Figure 7 further analyzes the role of wealth in observed travel inequalities, distinguishing three age groups, 55–59, 60–69 and 70+. The data confirms that trip frequency is closely tied to income levels: individuals aged 70 and older make the fewest trips in the below €1300 income group (see also Giesel & Köhler, 2015), while those in the €2600 income group travel the most – making three times as many trips as their lower-income counterparts. This suggests that the

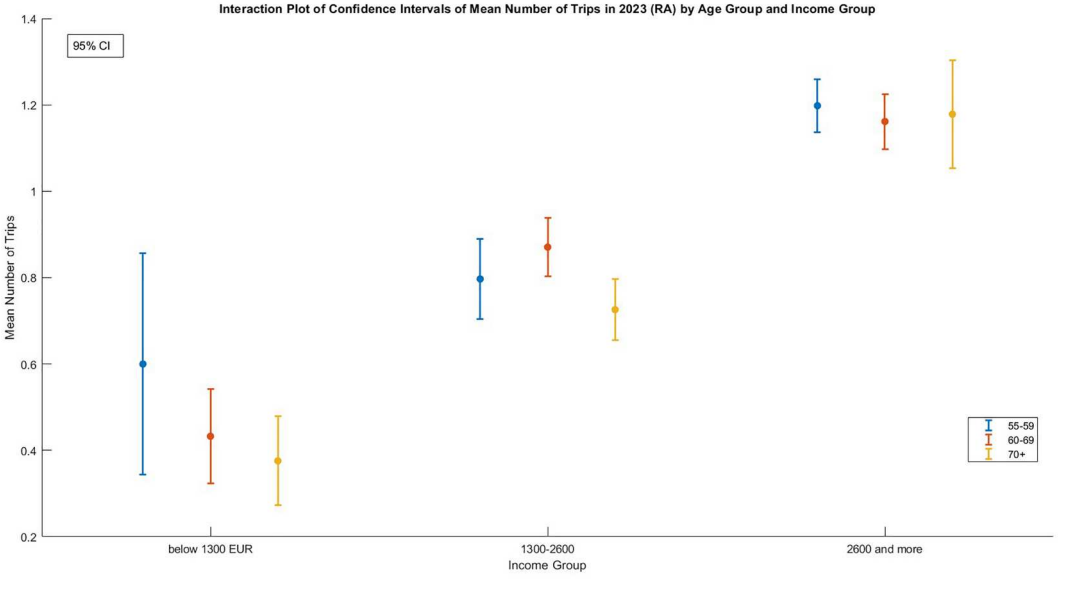

Figure 7. Travel intensity by age and income group, 2023. Source: RA 1992, RA 2023.

availability of income, potentially supplemented by savings or assets, significantly influences travel patterns.

Other factors, such as physical fitness or education – which are often correlated with income – may also play a role.

Last, it is also important to determine the transport modes used, as well as the travel distances (RA 2024). In 2023, 51% of all trips (5 days or longer) by Germans were made with surface-bound transport modes, and 47% by air. While air travel is more common in the non-retired population (52.6% of all trips) than in the retired population (26.8% of all trips), the average distance flown is slightly longer for the retirees (3,433 km) than the non-retired (3,127 km). The group of retirees is also smaller, taking 3.88 million flights (compared to 26.32 million in the non-retired population), as well as 10.17 million surface bound trips (compared to 22.95 million in the non-retired population). For surface-bound trips, distances travelled by non-retired are longer (718 km) than retired (538 km). Data allows for an estimate of the amount and share of emissions stemming from the retired. As shown in Table 5, about 3.75 Mt CO_2 from the main holiday trips of the retired population (5 days or longer) can be compared to 19.73 Mt CO_2 from the non-retired population. This means that the non-retired – 77.6% of the population taking a holiday – are responsible for 84.0% of the emissions from transport on longer trips. Per trip, averaged transport emissions are 267 kg CO_2 for retired, and 400 kg CO_2 for the non-retired population.

This data can be compared with the Norstat survey ($n = 1{,}101$), which asked respondents to report longer and short holiday trips, defined as lasting between two and four days, and more than four days (Table 6). Data confirms that the working population travelled more than the retired population (short and long trips). The number of short trips is almost twice as high as the number of longer trips. Variation in trip numbers between 2021 and 2023 can be explained with COVID-19 effects, including a peak in 2022, the first 'normal' post-pandemic travel year in Germany. The peak is likely to point to a rebound and catch-up effect.

Retired respondents use air transport considerably less often than the working population (0.37 vs. 0.64 trips), but they participate in cruises slightly more often (0.07 vs. 0.05 trips). While the difference is not statistically significant for cruises, it needs to be noted that the cruise segment is small. Camper ownership is also slightly higher for retirees (0.03 vs. 0.02). Overall, data confirms the patterns found in the RA, adding that as many as 5% (non-retired) to 7% (retired) of holidays may be cruise-based.

With regard to retirement travel plans, almost half of working respondents (49.5%) report that their habits will not change. About one in six (17%) expects to travel less, and one third (33.5%) to travel more. This would indicate a change from current travel intensity distributions, where the working population travels more than the retired population.

The analysis of income reveals that the high-income group (€3600 + per month) is the most likely to increase their travel frequency, with 47% expecting to travel more (Table 7). Notably, this group already takes the most trips and engages in the most carbon-intensive travel, reporting flights twice

Table 5. Distribution of longer trips (5 days+) and emissions, retired vs. non-retired.

	Million trips		Total travel distance (billion pkm)		Emissions Air* (Mt CO_2)	Emissions surface* (Mt CO_2)	Total emissions (Mt CO_2)
	air	*surface*	*air*	*surface*			
Retired	3.88	10.17	26.64	10.94	2.66	1.09	3.75

Non-retired	Million trips		Total travel distance (billion pkm)		Emissions Air* (Mt CO_2)	Emissions surface* (Mt CO_2)	Total emissions (Mt CO_2)
	air	*surface*	*air*	*surface*			
	26.32	22.95	164.61	32.96	16.46	3.27	19.73

RA 2024; *at 0.1 kg CO_2 per pkm (Gössling & Humpe, 2024a; INFRAS, 2023).

Table 6. Travel patterns, retired and non-retired respondents.

	Not retired	Retired	t-value	Standardised Mann-Whitney U
Short trips (2–4 days) 2021	1.29	1.09	−1.2545	1.5550
Short trips (2–4 days) 2022	1.52	1.37	−0.7442	3.2020***
Short trips (2–4 days) 2023	1.32	0.96	−3.2341***	4.6000***
Long trips (> 4 days) 2021	0.69	0.62	−0.9772	2.1060**
Long trips (> 4 days) 2022	0.95	0.85	−1.1653	3.2290***
Long trips (> 4 days) 2023	0.81	0.69	−1.6211*	3.2780***
Leisure flight(s), past 12 months	0.64	0.37	−4.448***	4.7180***
Cruise trips, past 12 months	0.05	0.07	1.3690	−4.3300
Do you own a camper van? (Yes)	0.02	0.03	−1.1380	1.1380

as often and cruises more than four times as frequently compared to the <€1300 income group (Table 8).

A last question focused on the most popular countries to visit during the first five years of retirement. Data suggests that the five most popular countries/regions are all long-haul destinations (Australia, USA, Canada, Caribbean, New Zealand). These countries are also cruise destinations, potentially suggesting combinations of flight/cruise holidays. Response frequencies regarding this question are low, however, and stated preferences do not necessarily translate into actual travel.

5. Discussion

The starting point for this research was the question of whether a growing number of retirees in the German population will lead to an increase in the country's tourism emissions. The findings suggest that the outcome will ultimately depend on affluence and wealth distribution. This highlights the importance, in tourism contexts, of distinguishing between the working and retired populations (Dann, 2007; Hong et al., 1999), as well as life stages (Möller et al., 2007; Zarnóczky, 2016). However, it is affluence – measured in financial savings or income – that primarily determines travel behaviour, beyond other motivations for travel (Alén et al., 2014; Filipe et al., 2021; Moal, 2021; Nicolau et al., 2020).

As this research suggests, the larger the group with high monthly pensions and/or substantial financial assets, the more likely it is that trip numbers and energy-intensive forms of tourism will increase, confirming Eurostat (2024). This, in turn, will pose challenges for decarbonisation, especially if there is growth in hard-to-abate sectors such as aviation. In terms of tourism emissions, findings point to two potentially contradictory outcomes for German climate policies, which may be described as 'status quo continuation' and 'affluent Boomers'.

Table 7. Planned travel pattern during retirement and income groups.

Travel pattern once retired vs. income groups						
	Income group					
	under € 1300	€ 1300 to € 1999	€ 2000 to € 3599	€ 3600 and more	Don't know / not specified	Total
No change	44	33	68	32	21	198
	53.01%	41.25%	50.00%	48.48%	60.00%	49.50%
I will travel less	16	22	21	3	6	68
	19.28%	27.50%	15.44%	4.55%	17.14%	17.00%
I will travel more	23	25	47	31	8	134
	27.71%	31.25%	34.56%	46.97%	22.86%	33.50%
Total	83	80	136	66	35	400
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Chi-square	19.520**					

Table 8. Trip intensity by income group, 2023.

Full sample				
Income	Short trips (2–4 days)	Long trips (> 4 days)	Flights (past 12 month)	Cruises (past 12 months)
Under € 1300	0.78	0.53	0.30	0.03
€ 1300 to € 1999	0.82	0.64	0.40	0.05
€ 2000 to € 3599	1.34	0.85	0.57	0.08
€ 3600 and more	1.85	1.13	0.78	0.09
Don't know / not specified	1.17	0.82	0.53	0.10
Chi-square test	151.500***	83.743***	71.330***	10.704
Retired only				
Income	Short trips (2–4 days)	Long trips (> 4 days)	Flights (past 12 month)	Cruises (past 12 month)
Under € 1300	0.73	0.48	0.24	0.03
€ 1300 to € 1999	0.76	0.64	0.36	0.07
€ 2000 to € 3599	1.31	0.88	0.48	0.10
€ 3600 and more	1.45	1.00	0.48	0.14
Don't know/not specified	1.08	0.85	0.50	0.13
Chi-square test	68.469***	61.063***	44.072***	14.177

In the *status quo continuation scenario,* shifts from the working population to retirees lead to a decline in German tourism emissions. This is because, at present, a German entering retirement generates lower tourism emissions than a person still in the workforce. Over time, this shift is expected to reduce tourism emissions, assuming there are no changes in average emissions per trip. Specifically, it is projected that 19.5 million Germans will leave the workforce by 2036, while only 12.5 million will enter it (IW, 2024a). The number of retirees will increase by 36.7%, reaching 21.5 million, while the working population is anticipated to decline by 6% to 52.2 million by 2040 (IW, 2024b; see also Destatis, 2022). This shift implies an increase in the share of tourism emissions attributable to retirees but a decline in overall tourism emissions due to the reduction in individuals with higher per capita emissions. Notably, even the expected growth of the German population to 85 million by 2040 (IW, 2024b) – an increase of 1.5 million compared to the end of 2023 (Destatis, 2024a) – is unlikely to alter this distributional trend significantly.

The *affluent Boomers scenario* provides a different perspective. As this research shows, relative income and wealth levels determine travel activity, a finding also confirmed in retirement and tourism studies (Giesel & Köhler, 2015; Nicolau et al., 2020; Pak, 2020; Przybysz & Stanimir, 2022; Sun et al., 2024). This has great relevance for the Boomer generation, which have been described as 'the richest generation that has ever lived' (Allianz Research, 2024, p. 3). As a generation, the Boomers are thus relatively affluent (savings), but they can also expect significant discretionary income in the form of pensions, as the economic system is geared to their advantage (IW, 2024b). They also enjoy a better fitness and health, and a high life expectancy (Figure 2). This may mean that the Boomers are not comparable to the current retiree generation in the sense that their retirement travel patterns will be fundamentally different. This would also have to be seen in light of the popular destinations mentioned by respondents in this research: Dream destinations primarily involve long-haul travel, making it a likely scenario that per trip emissions will increase as the Boomer generation enters retirement.

The working population, on the other hand, may lose travel opportunities, as they will have to finance the German pension system, with suggestions that their discretionary income may be negatively affected (IW, 2024a). This raises the possibility that per trip emission interrelationships may be reversed between the two groups, i.e. that retirees may emit more than the working population in the future. While this is a suggestion primarily pertaining to the main holiday trip, it may also be true for short trips, but more research is needed to understand the relevance of these.

Findings suggest that more attention should be paid to the Boomer generation and their consumption patterns. In particular the wealthiest groups with considerable assets and high pensions are likely to transact their affluence in more tourism that is also more energy intense. As research on the issue suggests, it is likely a small group contributing disproportionally to emissions (Brand & Boardman, 2008; Mattioli et al., 2023; Theine et al., 2022). As most tourism will be outside Germany, there is an associated issue of economic leakage. Excessive travel in this group will also be perceived as a climate and social injustice, as younger generations are confronted with the increasingly palatable outcomes of the climate change, while they also finance the pensions of the Boomer generation.

As a general observation, irrespective of the specific scenario (e.g. *status quo continuation* vis-a-vis *affluent Boomers*), it is essential to focus on developments in the transport sector. Achieving emission reductions in line with the Paris Agreement and Germany's climate laws will become increasingly challenging. Germany already faces significant difficulties in mitigating emissions from its transport sector, and continued growth in international air transport is not even accounted for under national law.

Given these challenges, and the potential for increased travel intensity from the wealthy Boomer generation entering retirement, the government should adopt anticipatory measures to curb emissions. A priority action should be the internalisation of the social cost of carbon – that is, including the damage caused by climate change under a polluter-pays principle. Currently, this cost would likely be several hundred € per ton CO_2 in air transport, considering that emissions from air transport

are approximately three times as impactful on global warming (Lee et al., 2021; Tol, 2023). From a climate change perspective, it seems crucial to also internalise the social cost of carbon throughout the tourism value chain to achieve meaningful progress on decarbonisation, though such a measure may by itself not be sufficient to bring down emissions from the group of affluent retirees. Additional measures, such as the taxation of cruises and flights as tourism's most carbon-intense forms of transport may have to be considered as well (Gössling & Humpe, 2024b).

While this study focuses on Germany, its findings have broader implications for emission reductions. For instance, in the USA – the global leader in tourism-related emissions (Sun et al., 2024) – the 65–74 age group holds the highest median and average net household wealth (Federal Reserve, 2023). This growing demographic (Jang & Ham, 2009) is likely to vote Republican (Pew Research Center, 2024), a party associated with climate change skepticism (Pew Research Center, 2021). Hence, there appears to be a link between climate change denial, age, affluence, travel intensity, and individual emissions. This is particularly relevant in the USA, where the 55 + year olds own 79% of stocks and equity funds (Market Watch, 2024), but may also have importance in other countries where individual wealth has primarily grown because of private investments for retirement.

This connection warrants further study across other countries. The evidence suggests that, in global tourism, the older population in high-income countries is becoming an increasingly significant factor in climate change. As they appear to simultaneously be less concerned with the outcomes of climate change, while voting for parties that deny climate change or stall mitigation efforts, they deserve, as a demographic, greater scrutiny in tourism and consumption studies, as well as studies concerned with environmental justice.

6. Conclusions

This is one of the first papers addressing interrelationships of age, income, and travel intensity in a high-income country. The findings highlight the growing relevance of the silver ager market for tourism, suggesting that, over the coming decade, seniors in Germany will become increasingly relevant as tourists and as a source of greenhouse gas emissions. This is a result of the growing number of retirees, coupled with the Boomer generation's affluence and strong interest in travel. Importantly, however, it is a comparably small share of retirees, the 6% accounting for 50% of travel distances, that have the greatest relevance. Here, the paper establishes a strong link to wealth distribution.

As the Boomers will be the most affluent retiree generation that has ever lived in Germany, results also have relevance for future emission developments. Findings indicate that current distributions in per-trip emissions could change, with future retirees emitting more per trip than the working population. If this occurs, the share of emissions from tourism attributable to retirees will increase, while tourism's overall emissions will also grow. Tourism could thus become an emissions growth sector, directly contradicting efforts to reduce emissions under Germany's climate law – a challenging goal already. Therefore, attention should be paid to the retired population in terms of the number of retirees, wealth distribution among retirees, as well the share of retirees in the total population.

This latter aspect – total and relative retiree numbers in the population – has relevance, because a share of retirees appear to show less interest in climate change mitigation. They also rely on pension payments supported by a shrinking working population. This dynamic could spark controversies related to social and climate justice, especially since retirees form a large and growing segment of the population and wield substantial political influence. Additionally, economic leakage arises when a significant portion of tourism expenditure is spent outside Germany, raising concerns about welfare implications. For these reasons, a deeper understanding of the current and future role of affluent retirees in emissions is critical.

This research has limitations. Main holiday trip transport mode choices were used as a proxy for tourism's carbon footprint. Non-transport emissions would have to be added, acknowledging that consumption patterns, such as differences in accommodation and food preferences between

retirees and non-retirees, may also vary significantly. Future emissions may also grow if average travel distances continue to increase, an issue that may be particularly relevant for young adults. A more comprehensive analysis of the Boomer market is needed to understand whether there is a high-emitting group deserving political attention, also in terms of travel motives (e.g. visiting friends and relatives, to find social connectedness), and attitudes to climate change/mitigation. Monitoring developments over time is equally important, given the relatively short transition period during which Boomers will retire. This is potentially also relevant for Gen Y (the Millennials), who appear to be frequent travellers. Above all, understanding wealth distributions and their implications is crucial for crafting policies that address these challenges and ensure Germany stays on track to meet its climate goals.

Novelty statement

This paper offers an original contribution to tourism research by integrating demographic change, travel behaviour, and climate implications through a robust, mixed-method design using two large-scale datasets. While the environmental impacts of tourism are well-studied, previous research has rarely examined how generational and life-stage transitions, particularly among the rapidly expanding Boomer population, reshape tourism demand and associated carbon emissions. By analysing both current and anticipated travel preferences, this study provides a novel framework that links aging processes, travel choices, and environmental externalities.

Methodologically, the paper leverages representative annual survey data (Reiseanalyse) alongside a targeted survey of older adults (Norstat), capturing detailed insights into financial capacity, travel frequency, and willingness to engage in energy-intensive tourism. This comprehensive approach forms the basis for more sophisticated modelling of how socio-demographic transformations drive destination choices and carbon footprints.

In doing so, the paper significantly advances tourism's agenda by highlighting a critical intersection between demographic trends and climate policy imperatives, urging the field to address emerging emissions trajectories shaped by increasingly affluent senior populations.

Author contributions

CRediT: **Andreas Humpe:** Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Visualization, Writing – original draft, Writing – review & editing; **Stefan Gössling:** Conceptualization, Investigation, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing; **Shaniel Bernard:** Conceptualization, Investigation, Writing – original draft; **Ulf Sonntag:** Data curation, Formal analysis, Investigation, Methodology, Validation, Writing – review & editing.

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