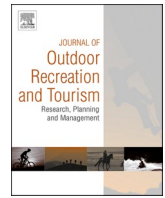


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Research Note

City tourism pre- and post-covid-19 pandemic – Messages to take home for climate change adaptation and mitigation?

Alexandra Jiricka-Pürner^{*}, Christiane Brandenburg, Ulrike Pröbstl-Haider

University of Natural Resources and Life Sciences, Peter-Jordanstraße 82, 1190, Vienna, Austria



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ABSTRACT

The paper presents the status quo on climate change impacts on city tourism in Austria describing the impacts by air travel and a short stay on the greenhouse gas emissions and the changing conditions in the city. For Austrian cities, depending on location and topography, heavy rainfall events, storms and heat waves in particular could become increasingly relevant in the tourism context. For medium-sized and large cities, heat is the most frequently discussed topic in connection with possible adaptation potentials. The analysis of challenges shows a strong overlap of adaptation targets in city tourism with adaptation challenges for city planning including connection to the sub-urban surrounding areas to confront climate change impacts. Covid-19 pandemic, additionally, offered the opportunity to discuss a new re-start of the city-tourism against the experience during the shutdown period in spring 2020. The paper argues that we can learn from the current health crisis for coping with climate change related extreme events and to increase achievements in climate change mitigation. Firstly, the pandemic provides a strong ability to discuss the impact of city tourism due to short-term air travel and options to enhance more climate-friendly options on the other hand. Secondly, Covid-19 emphasized the need to reconsider the role of free spaces in metropolitan areas as well as their accessibility. Herewith synergies with climate change adaptation are likely when questioning the availability and accessibility of green and blue infrastructure as well as their capacities. Challenges including crowding and impacts by over tourism on public free spaces will require joint strategies involving all public and private institutions (including local communities and businesses) responsible for the maintenance of green and blue free spaces. Thirdly, the strong interactions between urban and suburban areas became evident once more, which will also be very relevant for city tourism in the future (e.g. in times of heat waves). Reflection on the transferability of coping with such crowding effects, related to the adaptive behaviour of residents and tourists in times of severe heat waves, might be relevant for both city tourism and summer tourism destinations near metropolitan areas. Finally, the Covid-19 crisis encourages discussions on over-tourism in metropolitan destinations in favour of a more balanced approach, in particular in inner city areas and around major sightseeing attractions.

Management implications

Adaptation options for urban tourism arise primarily from the increased frequency of heat waves and their effects on the aggravation of urban heat islands. Therefore synergies for tourism result from the adaptation goals of urban development and open space planning. In order to avoid conflicts over open spaces in urban areas and the surrounding countryside cross-sectoral action plans and monitoring systems are required.

1. Introduction

A look at the composition of tourism offers for Austria shows that city tourism plays a very special and significant role. Particularly Vienna and Salzburg are very attractive cities for round trips of US and Asian tourists, not only because of their location in the centre of Europe but also due to their world-wide recognition (e.g. containment in listings such as “Travel USNews”). Many Austrian cities are also visited by European guests because of their special events and unique cultural heritage.

With regard to greenhouse gas emissions, short city trips can be

^{*} Corresponding author.

E-mail address: alexandra.jiricka@boku.ac.at (A. Jiricka-Pürner).

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considered as particularly climate-unfriendly, as frequently aviation is used as mode of transport to and from the city destination. For this reason, it seemed important to us to deal with this aspect in this special issue and to include data to illustrate the current situation as well as concepts for adaptation and mitigation.

However, when the paper had already put together the most important facts, the sudden lock-down due to the Covid-19 pandemic affected tourism activities worldwide. Since significant long-term impacts are expected due to the pandemic, especially in city tourism, the paper at hand aims at compiling not only the previous findings on climate change and city tourism, but also the expected consequences of the pandemic lock down. Finally, we want to discuss whether and if so, how far, the experiences from the Covid-19 pandemic could influence future city tourism developments and provide valuable new insights.

2. City tourism – the situation before the Covid-19 pandemic

2.1. City tourism: from steady growth to overtourism and impacts on climate change

Before the Covid-19 pandemic, city tourism had significantly increased Europe-wide, sometimes already leading to discussions over capacity limits and “overtourism” (Goodwin, 2017). In Austria – the focus country of this Special Issue – the demand for city tourism in summer has also risen steadily over the past ten years (Fleischhacker, 2019). The increased demand for city breaks reflects an overall trend towards more short-term and flexible holiday planning (Zellmann & Mayrhofer, 2015, 2017) and to more frequent short holidays (Wirtschaftskammer Tirol, 2018; WKO, 2018).

In the last decade, on a year-round basis, cultural, sightseeing and city tourism accounted for almost 10% of all travelling in Austria (Statistik Austria, 2016, 2017). For Vienna, Austria’s largest city destination, arrivals showed an increase over the past ten years (MA 23 Dezernat Statistik Wien, 2018a).

A comparison with other capital cities in Europe such as Berlin, Stockholm or Prag show that after the economic crisis (2007–8) most city destinations had a significant tourism growth. For Vienna, the development resulted in a more than 50% increase from 2006 onwards (MA 23 Dezernat Statistik Wien, 2018a).

Looking at the sources for city tourism in Austria, Germany was the most important country in terms of source markets. Regarding national guests – the second most important source market for tourism in Austria’s capital – the most recent statistics from 2018 showed a marked increase of 6% in overnight stays compared to 2017. With a greater margin – the United States represented the third most important source market for trips to Vienna (MA 23 Dezernat Statistik Wien, 2018b).

In Innsbruck and Salzburg, the two most important medium-sized urban destinations in Austria, the number of overnight stays in the summer season has also risen steadily over the past ten years. Innsbruck, for example, had recorded approx. 571,000 overnight stays in 2009 and already approx. 855,000 in 2018 (Stadt Innsbruck, 2019a). Salzburg, meanwhile, reported a little more than 8 million overnight stays in 2014 between May and August alone, which had increased to approx. 10.6 million by 2019 in the same period (Land Salzburg, 2019). Regarding their main source markets the larger cities in Austria differ, however, from Vienna. In Innsbruck for example, domestic guests were the most important source market, followed by visitors from Germany and Italy. Visitors from the United States represented the fourth most important source market in this case (Stadt Innsbruck, 2019b). Further significant source markets for Austrian city tourism were China, Russia and (in summer) the United Arab Emirates (Wien Tourismus, 2018). Especially guests from China (and other Asian countries) were expected to increase before Covid-19, even considering the very heterogeneous Chinese source market (Thuen Jørgensen et al., 2017).

According to their size, the impact of the increase in visitors was very diverse for the Austrian cities and their infrastructure and population.

For the city of Salzburg the correlation can be described with 19.6 overnight stays per inhabitant. In Vienna this correlation is only 8.2 overnight stays per inhabitant. The net lodging revenue per available room night was in 2017 in Salzburg at 78.36 euros, in Vienna at 73.80 euros. Therefore effects of perceived crowding are for the inhabitants in Salzburg significant but the revenue is (only) about the same compared to Vienna (Pröbstl-Haider, 2019, p. 20).

2.2. Climate change impacts on city tourism

For Austrian cities, depending on location and topography, heavy rainfall events, storms and heat waves in particular could become increasingly relevant in the tourism context. For medium-sized and large cities, heat is the most frequently discussed topic in connection with possible adaptation potentials (Fleischhacker & Formayer, 2007; Kromp-Kolb et al., 2007; Fleischhacker et al., 2009; Götz et al., 2012; Steininger, Bednar-Friedl, Formayer, & König, 2016; Stadt Wien, 2016). However, there is an apparent difference between the perceived heat stress of the urban population and visiting guests. Recent studies from small to medium size cities in Austria such as Graz and Leibnitz (Babicky & Seebauer, 2016) showed that the resident population has already experienced more difficult living and working conditions due to longer periods of heat days and tropical nights in the previous summers with longer heat waves (e.g. in 2015). Similarly, a survey of the Viennese population (Juschten, Brandenburg, et al., 2019 and b) showed that for a large metropolitan area, almost half of respondents perceived the warm temperatures of their city apartments as still “tolerable”, while little more than a third of respondents already considered the heat as a definite burden. For the extremely hot summer of 2015, around 45% indicated that they found the heat “stressful” and “difficult at night” (Juschten, Brandenburg, et al., 2019).

Over the past ten years, a number of international studies have examined the influence of weather or climatic conditions on booking decisions (Dubois et al., 2016; Fur, 2017; Gómez-Martín et al., 2017; Krajsits et al., 2008; Serquet & Rebetez, 2011; Zellmann & Mayrhofer, 2017). Dubois et al. (2016) showed for a French sample that predicted heat waves generally have less influence on changes in travel decisions than forecast bad weather and cold spells. Even in hindsight, memories of rainy periods – especially during longer vacations – are much more negatively perceived than those of heat waves at a holiday destination. Gössling et al. (2016) examined the complexities of classifying travel weather as “extreme”, and the strong variation in the longer-term effect of the associated memories. Serquet and Rebetez (2011) and Dubois et al. (2016) showed that there generally appears to be high “heat tolerance” among travellers.

Compared to other forms of travel, acceptable temperatures (before they are perceived as “too hot” by tourists) are higher for city breaks than for stays in mountainous areas, for example. This is also reflected in the past development of Vienna’s tourism industry, which has not yet shown any negative trends in hot summers. On the contrary, it confirms a steady trend towards highest booking levels in the summer months of July and August (Wien Tourismus, 2018). Considering the five hottest summers of the past ten years (2008–2018), not only does a strong increase in city tourism become apparent, but also the strongest increase in demand of any summer tourism category (Fleischhacker, 2019). Thus, actual, statistics-based demand has so far provided no indication of a negative impact of possible heat strain on Austrian city tourism.

However, in their survey of Vienna tourists almost ten years ago, Alex et al. (2011a) showed that 32.6% of respondents had already adapted their sightseeing programmes due to heat. They revealed a shift in activities, where visitors would deliberately plan longer breaks or seek out cooler places. Differences were most significant in the case of longer-duration stays, where programmes were adjusted much more frequently.

2.3. Major adaptation needs in city tourism

Numerous publications have emphasized heat stress in cities as a major problem demanding a considerable adaptation effort and urgent action on the part of urban planning. For example, the “Austrian Strategy for Adaptation to Climate Change” (BMLFUW, 2017) devotes a separate chapter to green and open spaces in cities, including recommended measures. The City of Vienna, meanwhile, has specifically addressed the issue of “urban heat islands”. The result is a strategic plan identifying measures to counteract the increased warming of the city area (Brandenburg et al., 2015). The Federal Office for the Environment in Switzerland recommends similar measures (Bundesamt für Umwelt (BAFU), 2018). Further benefits for reducing heat islands can also be achieved through suitable open spaces – “Green and Blue Infrastructure” in terms of a strategically planned network of natural and semi-natural areas (EC, 2013) – which absorb precipitation and reduce water runoff, even maintaining their retention function during heavy rainfall events (EURAC, 2018). These measures primarily benefit the local population, but there may also be positive synergies for city tourism. Preserving or enhancing green spaces and their diverse uses, creating water-related structures in public spaces, as well as establishing an offer of water-based sports and recreational activities and – wherever possible – water-based mobility, can represent valuable elements for the design of summer tourism offers in city tourism.

In addition to green and blue infrastructure, there will also be a need for adaptation in the cooling of buildings (see Lund-Durlacher and Gössling - reference to other publications in the Special Issue). Due to the fact that some accommodation categories are still very poorly equipped with cooling systems in comparison to other countries, climate-compatible cooling is all the more important to prevent maladaptation (BMWFJ, 2010; Alex et al., 2011a; BMWFW & ÖHV, 2015). Adaptation regarding the choice of accommodation is also conceivable, e.g. by shifting preferences to the greener suburbs or the outskirts of the city. As yet, however, there are no concrete studies on this issue. Here, too, the aforementioned capacity limits during heat waves are a planning factor that will likely require increased attention. In this context, also co-benefits for climate change mitigation (see 2.4) respectively avoidance of maladaptation become relevant when planning transport option to the metropolitan area. In the future, resource conflicts will also play a greater role in the case of water. As the provision of drinking water is another important aspect besides the cooling of buildings, this might be challenging for Austrian cities on the long-term perspective too. So far, the City of Vienna has installed several drinking water fountains as well as water playgrounds, water distribution elements creating humid fog and several other activities related to water-induced cooling effects (Alex et al., 2011b, 2013). To manage also the aspects of sustainable (drinking) water management, tourism will have to engage with the other sectors, just as other sectors will have to coordinate their water saving measures with tourism, in order to promote synergies.

2.4. Climate change mitigation-challenges and options for city tourism

Intercontinental flights have a negative impact on global climate, especially without compensation (Pröbstl-Haider et al., 2019), and – contingent on the total length of stay in Europe and the choice of transport within the continent – they are the primary factor determining the CO₂ balance of city breaks. Considering the typically short length of stay compared to other forms of travel, and assuming repeated trips to urban destinations within a single year, the intra-European travel activities of city breakers also have a negative impact on climate change if they are conducted by air plane (in particular without compensation) or car. For the encouragement to foster climate change mitigation targets, there is moreover a significant difference whether the city itself is the main destination of a trip or just one of several attractions of a nearby holiday destination (e.g. bad weather programme for rural tourism or day trip destination on a cultural and culinary round-trip). Travellers

who are specifically planning a city break to an urban destination may be more drawn to arrangements combining climate-friendly travel and accommodation.

In contrast to other forms of travel, transport within the destination is already predominantly climate-friendly in the case of city tourism in medium to large Austrian cities such as Vienna or Graz, due to the public transport services available in the urban destinations. For some urban destinations parking a private car became very expensive and limitations are in place in several city districts/areas. Therefore, there is still further potential to promote travel by public transport also for the arrival, especially as no additional equipment (as is necessary for winter sports, for example) needs to be transported for city breaks, and because public transport is already predominantly used for the “last mile”. In some cases, incentives for climate-friendly travel to city hotels have already been introduced such as e.g. discounts on overnight rates upon presentation of a train ticket or another proof of another climate-friendly mode of travel (e.g. for the “Hotel Stadthalle” in Vienna).

Cooperation of transport companies with both the hotel industry and tourism advertising is important in this context. For business travellers in particular, who account for a significant proportion of city trips (reference), making climate-friendly travel to the destination more attractive is an important challenge, in addition to the already existing initiatives to promote and market climate-friendly mobility within the urban destination (e.g. conference tickets for public transport). Since business travellers related to conferences and large-scale events (e.g. fairs, large-scale training courses, company events) align their travel arrangements primarily according to aspects of expediency, it is upon conference organisers and companies organising “green events” (e.g. as according to the declaration of the Austrian Ministry of the Environment), including transport to and within the destination as a matter of concern and to raise awareness for these issues at the time the city trip is planned. The city of Vienna and the Vienna Convention Bureau are already strongly encouraging the use of public transport in the destination but could communicate more intensively alternative arrival options by climate-friendly transport modalities at large scale as well as to foster distribution of information adequately.

While the existing urban infrastructure is jointly used by city tourists, in line with the diversity of offers, accommodation plays a major role in terms of the overall climate balance. In this context, cooling and other adaptation measures to heat have become increasingly important factors for climate change mitigation. Guidance such as BMWFW, WKO & ÖHV (2015) outlines the relevant measures and are accompanied by funding to reduce energy consumption and enhance the thermal regulation of hotel buildings. For Austrian city tourism, there is still space for improvement left looking across all categories of accommodation facilities and their diverse building structures.

3. Covid 19 – impacts on urban areas and their tourism activities

3.1. City tourism: expected recovery from the Covid-19 pandemic

At the beginning of the crisis in March 2020 some Federal states in Austria closed hotels. Finally, around Easter the federal government closed all hotels in Austria, for tourism purposes. Additionally, borders were closed to all neighboring countries from the beginning of the lockdown onwards. Internationally, air travel was also mainly shut down from the end of March until the end of June 2020. Airlines such as Austrian Airlines, Swiss and Lufthansa, received significant financial support by the respective states to be able to continue their business, other smaller low-budget airlines were particularly affected too.

From the 29th of May the hotels in Austria were allowed to reopen again if fulfilling certain hygienic conditions. The opportunities for most European countries to travel again started around the June 15, 2020 and Austrian borders were opened for some neighboring countries such as Germany and Switzerland (Sozialministerium, 2020). Other neighboring countries followed at the end of June respectively the beginning

of July. Conferences and fairs were cancelled over summer still at a certain size, but are scheduled for early autumn again. Nevertheless it remains questionable, how far this plan can be continued. Since the planning conditions are again unclear in midsummer, this business-related segment is not very likely to be able to recover soon from the pandemic impacts. The planning for large-scale events in sport and culture (e.g. festivals) is also possible for 2021 only. For instance, even outdoors, the large concert of the Viennese Philharmonics, which was postponed from June to September, was cancelled again. This is particularly relevant, as one of the main motives for city tourism is experiencing "culture". Regarding "summer holiday types", according to the Austrian Chamber of Commerce (WKO, 2018), cultural holidays accounted for 12% of total holidays in Austria during the summer season. The Research Association for Holidays and Travel (FUR, 2017) presented similar numbers for the German source market: cultural trips also had a 12% share in the category "short breaks 2016". The motive "sights and culture" is particularly highlighted in studies involving city travellers. Asked about their visit to Vienna, 74% of guests cited "sights & culture" as the basis for their decision (Wien Tourismus, 2019). Current studies such as Henry-Biabaud (2020) expect, however, individual cultural attractions and well-known sights can be better positioned during (or possibly shortly after) the pandemic than city destinations as a whole.

Overall, regarding Austria's most important source markets for city tourism, especially in the case of Vienna, it is clear that some important source markets have been particularly affected by Covid-19. It is uncertain to what extent the economic and socio-economic consequences of Covid-19 and related measures will affect the travel behaviour of Americans, Italians, Spaniards and the British. Therefore, amongst other reasons, the Austrian tourism branch expects a slow recover of the city tourism and experienced a decrease of about 85% in June, July and August 2020 compared to the season 2019 already (Kurier, 2020). Globally, recent studies (Trimble et al., 2020) don't expect a complete recovery of arrivals in European city tourism before 2023. Short city breaks are likely to be given lower priority over the main annual holiday. However, experts such as Henry-Biabaud (2020) currently assume that Europeans will continue to show an interest in city breaks in the mid-term perspective.

For how long and to what extent the Chinese source market will remain changed is not yet foreseeable. Recent studies (Xiang, 2020) show that two-thirds of Chinese are already interested in travelling again, but are focused on the domestic and regional markets for the time being. Due to Asian guests' comparatively short length of stay, their contribution to value creation in the individual city destinations is significantly lower compared to visitors from other source markets. In the short to medium term, Russia and the United Arab Emirates will also be affected by the low oil price, which will likely lead to disadvantages in the high and premium-priced city hotel sectors. Typical carriers such as Ryanair expect for the next years a reduction of 40% (Die Zeit, 2020).

3.2. Experiences during the Covid-19 pandemic in Austrian cities

During the Covid-19 pandemic, we were experiencing the implications of scarcity of certain resources, such as a lack of green space in metropolitan areas making it difficult to maintain the necessary distance to avoid spreading infection. Problems were aggravated as access to recreational areas and green spaces in cities was partly blocked and nearby surrounding green spaces were strictly limited to residents' use only.

The residents and few visitors also experienced a lack of coordination between the responsible institutions. In Vienna, for example, large parks in densely populated areas remained shut for several weeks in opposition to the will of the municipal government. The competencies for these specific parks belonged to the federal ministry at the national level.

Because of the need to socially distance from others during the Covid-19 pandemic, inhabitants of Vienna spread across protected areas

when carrying out their leisure time activities in Vienna's larger metropolitan areas which also includes protected areas such as a National park or a Biosphere Reserve. This high amount of visitation has – at this time of the year - very likely led to negative consequences particularly for breeding animals according to statements of the protected areas management.

During the pandemic, the strong interactions between urban and suburban areas were also shut down. The large recreation areas around Lake Neusiedl for instance, which includes the largest body of water in Eastern Austria and is situated only about 25 km from the eastern border of Vienna (municipality) respectively about 50 km from the inner city (e.g. Stephansplatz), was no longer accessible to non-residents due to a new restriction by the state governor aimed at preventing crowding along the lake shore and allowing locals to use these areas while maintaining the necessary distance. These limitations remained only for a very short time in place due to the strong protest of authorities, media and public from outside the Burgenland.

Covid-19 also changed the overall transportation behaviour in the city. Despite the excellent conditions - e.g. in Vienna - the transportation system was less used and perceived as a dangerous place. How long any inhibition to fully return to the use of public transport will last, is uncertain and depends on many factors. In the mid-term, however, this aspect will hopefully no longer play a role.

4. Discussion

4.1. What can we learn from the Covid-19 pandemic for climate change adaptation in city tourism?

Despite the completely diverse origin of difficulties, it seems we can learn from the current health crisis for coping with climate change related extreme events and attempts to minimize climate change.

Firstly, we see a strong ability to reduce air-born travelling. Depending on the future source markets (US, UK, China, Russia and, in the summer, the United Arab Emirates) travel to Austria's cities is also in the future likely to happen by air via the airports of Vienna, Munich or Innsbruck and Salzburg in combination with intercity rail transport to other urban destinations. However, a reduced offer on one hand and new air taxes discussed across Europe may make this kind of travelling less attractive. During the Covid-19 pandemic all these short distance flights and the many city breaks for shopping in London or cultural events in Salzburg or Vienna were impossible. Even business flights are likely to remain after Covid-19 less attractive. Climate policy including taxes and airport fees may simulate this post Covid-19 situation. Newspapers and companies discuss whether this reduced post-Covid-19 standard is likely to be kept even after the pandemic. We might be able to refer to scenarios post Covid-19 were source markets changed to more regional, national and continental arrivals. However, we also see a threat in context of climate change mitigation when individual car travel is increasing.

Secondly, Covid-19 emphasized the need to reconsider free spaces in metropolitan areas. Herewith synergies with climate change adaptation are likely when questioning the availability and accessibility of green and blue infrastructure as well as their capacities. Looking at the measures taken in response to the additional space requirements in times of the Covid-19 pandemic, we can see that challenges arose primarily in terms of the competencies of, and the need for coordination between, the responsible institutions. Challenges including crowding and impacts by over tourism on public free spaces will require joint strategies involving all public and private institutions responsible for the maintenance of green and blue free spaces.

Thirdly, the strong interactions between urban and suburban areas became evident. Similar as in times of Covid-19 in spring 2020 also in times of heat waves, recreational areas close to large cities may become even more crowded due to urban citizens escaping urban heat islands (Juschten et al., 2019). Restrictions may follow (and partly be

necessary) to avoid damages, and trade-offs between tourists and local residents may become a bigger issue over the coming decades, in particular in suburban areas which do not effectively but also sustainably profit from day tourism activities. At the same time, metropolitan residents' adaptation needs (such as escaping to refreshing green areas) need to be considered carefully to prevent potential negative impacts on their health and well-being, e.g. if these areas should become crowded with tourists. Limited access to resources such as recreational areas, e.g. due to a need to close some of these structures, can lead to stronger impacts on other the green and blue resources of cities.

Heat waves may also increase the attractiveness of urban forests, parks and nearby protected areas, similar to the time of the Covid-19 pandemic. To prevent the experienced negative impacts also in times of heat waves, when both residents and tourists might seek refreshment in nearby areas (Juschten et al., 2019) interdisciplinary strategies including tourism management, nature protection and city planning are needed, so that there is no overcrowding in these areas.

The crucial aspect to consider for the future is, whether some installations could be limited to residents also in times of severe crowding and overuse e.g. when citizens and tourists merge in time of heat waves and/or the lake is impacted by drought (as it is the case at the moment). We have already seen how actions and procedures which had not already been laid down before the crisis (which, of course, was not expected by the governing institutions) can lead to controversy. Reflection on the transferability of coping with such crowding effects, related to the adaptive behaviour of residents and tourists in times of severe heat waves, might be relevant for both city tourism and summer tourism destinations near metropolitan areas. A combination with drought might even increase the conflicts of interest, e.g. in near-metropolitan and metropolitan forest areas, which might be limited in accessibility to avoid the risks of forest fires.

Finally, the Covid-19 crisis encourages discussions on both the limits of tourism growth and over-tourism. Based on scenarios before and post Covid-19 we are able to discuss a more balanced approach, in particular in inner city areas and around major sightseeing attractions. In this context the duration of a city break is an essential factor, which allows having less people at the destination, who spend more money over a longer time-frame visiting also more and diverse attractions.

4.2. What future do we want?

The pandemic crisis gives us the opportunity to discuss our travel behaviour of the past, to check the feasibility of adaptation measures and to define the new "normal". The ability to travel is a crucial element of democratic countries. Despite reduced travelling activities we still saw the desire of people to continue to go elsewhere than home in the vacation time even in the "pandemic-summer" of 2020 (Kurier, 2020). However, city trips such as Rome-Vienna –Rome for 29 Euro have been a development which was far beyond sustainable. The value of travelling may gain importance (as the first trip to nature after the Covid-19 lock down), if it is thoughtfully planned and not too cheap. To what extent the prices will increase, will not only depend on climate change mitigation measures but also depend on how hard the European and non-European countries important for Austrian city tourism, such as the United States of America, are hit by the economic crisis that is likely to follow.

In the interest of climate change mitigation, promotion of the two main source markets Germany and Austria followed by the other nearby European source markets would have been preferable even before Covid-19, especially if public transport options were expanded and more intensively marketed at the same time. Looking at the summer season 2020 we also see, however, that at the moment guests from Austria and Germany prefer other forms of tourism such as lake and mountain tourism (Kurier, 2020).

Some tourism operators and the hospitality industry in Austria used the Covid-19 crisis to enhance quality-oriented tourism and focus on

renovation activities some others planned to make their services more sustainable by approaching new, diverse target group(s). However, the paper at hand also shows that moving away from the city-tourism we know requires more engagement including climate friendly travelling, city planning, a cooperative and integrated concept with the hinterland and city tourism products which truly support the regional economy due to a longer stay. If we are able to learn the significant lesson from the Covid-19 crisis remains to be seen.

5. Conclusion and outlook

While city tourism showed very strong growth within overall tourism demand before the Covid-19 pandemic, it is currently one of the most strongly impacted segments in Austria's tourism. The extent to which economic and social consequences of the Covid-19virus pandemic will continue to affect the most important source markets in the short and medium term is still unclear. On the positive side, however, European guests account for a large share of both European and Austrian city tourism. Despite the border openings within the EU –which happened starting from mid-June – swifter recovery was not possible for city tourism so far and seems still not reachable in the short to medium-term.

Especially with regard to climate change adaptation, the Covid-19virus crisis may also give rise to possible lessons learned for urban tourism. Adaptation options for urban tourism arise primarily from the increased frequency of heat waves and their effects on the aggravation of urban heat islands (high agreement, strong evidence). Even if past statistics have shown that heat stress in particular had little influence on booking behaviour, nevertheless there has been little research on the future influence of extreme events on city tourism in Austria. Links between heat tolerance and the motives of different target groups, but also the influence of urban planning parameters (e.g. the proportion of green space), have also scarcely been considered in the context of Austrian urban tourism to date.

Synergies for tourism can result from the adaptation goals of urban development and open space planning, in particular the greening of densely built-up areas as well as the cooling of large public spaces (again, high agreement and strong evidence). Important aspects are the availability and accessibility of green and blue infrastructure as well as the (maximum) accepted distance to reach it (or alternative, indoor attractions in cool buildings), depending on the target group. An analysis of varying acceptance depending on the source market would also be important in this regard. Furthermore, as Allex et al. (2011a) first demonstrated, sightseeing routes could shift as attractions are getting too hot. Furthermore, the acceptable walking distance between sights might decrease in hot weather. Larger green areas and bodies of water could be increasingly integrated into the design of tourism offers, as could cooler indoor activities (e.g. visits to cultural institutions, churches, etc.).

Correspondingly, their connection by public transport and other transportation means (bike, e-bike, e-scooter) must be considered, but the interests of the urban population must also be protected (high agreement, medium evidence). Alternatively, the capacity of air-conditioned public transport connections between tourist attractions should be examined, as demand for the use of individual lines could increase. It may also be necessary to consider shorter intervals in mobility planning. Current, concrete studies for the Austrian urban destinations (especially Vienna and Graz with their strongly increasing heat levels) on the acceptance of measures or changes in daily tourist programmes can provide valuable information for marketing and product design.

Finally, conflicts over open spaces in urban areas and the surrounding countryside have increased during the Covid-19 pandemic or have escalated dramatically for the first time in some cases. It could prove highly important to discuss responsibilities, particularly across all types of legislative and operational "borders" (e.g. between urban and suburban areas or between different federal states), early enough to

adapt concrete cross-sectoral action plans involving all responsible institutions, to adjust data sources and the performance of monitoring systems for recreational areas (especially protected areas in and near large metropolitan areas), and to identify the consequences of decisions, including the pros and cons for tourism, residents and existing nature conservation targets, based on an interdisciplinary perspective.

CRedit authorship contribution statement

Alexandra Jiricka-Pürner: Conceptualization, Formal analysis, Investigation, Methodology, Writing - original draft, Writing - review & editing. **Christiane Brandenburg:** Formal analysis, Investigation, Writing - original draft. **Ulrike Pröbstl-Haider:** Formal analysis, Funding acquisition, Methodology, Project administration, Resources, Writing - original draft.

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References

- Allex, B., Brandenburg, C., Liebl, U., Gerersdorfer, T., & Czachs, C. (2013). Hot town, summer in the city – entwicklung von hitzerelevanten Anpassungsstrategien im Städtetourismus“. *Regional Development and Information Society*, 393–398.
- Allex, B., Liebl, U., Brandenburg, C., Gerersdorfer, T., & Czachs, C. (2011a). Hot town, summer in the city – Die Auswirkungen von Hitzetagen auf das Freizeit- und Erholungsverhalten sowie das Beschäftigungsprogramm von StädtetouristInnen – dargestellt am Beispiel Wiens. Endbericht von Start-Clim2010. In *F in StartClim2010: Anpassung an den Klimawandel: Weitere Beiträge zur Erstellung einer Anpassungsstrategie für Österreich*, Auftragsgeber: BMLFUW, BMWF, BMWFJ. ÖBF.
- Allex, B., Liebl, U., Brandenburg, C., Gerersdorfer, T., & Czachs, C. (2011b). Familie und Jugend. In *Hot Town, Summer in the City. Die Herausforderungen vermehrter Hitzetage im Städtetourismus*. Management Letter. Tourismus-Servicestelle im Bundesministerium für Wirtschaft (Vol. 17).
- Babicky, P., & Seebauer, S. (2016). *PATCH:ES private adaptation to climate change*. Graz: Fallstudienbericht Klimawandelanpassung von Privathaushalten.
- BMLFUW (Hrsg.). (2017). *Die österreichische Strategie zur Anpassung an den Klimawandel*. Wien: Aktualisierte Fassung.
- BMWFJ. (2010). *Die neue Österreichische Tourismusstrategie*. Wien: Bundesministerium für Wirtschaft, Familie und Jugend.
- BMWF, W. K. O., & ÖHV. (2015). *Energiemanagement in der Hotellerie und Gastronomie: Ein Leitfaden, 3. Auflage*. Wien: BMWF, WKO and ÖHV.
- Brandenburg, C., Damyanovic, D., Reinwald, F., Allex, B., Gantner, B., & Czachs, C. (2015). Urban heat islands - Strategieplan wien. *Finanziert von: Wiener Umweltschutzabteilung – Magistratsabteilung*, 22, 112.
- Bundesamt für Umwelt (BAFU). (2018). *Hitze in Städten*. Bern: Grundlagen für eine klimagerechte Stadtentwicklung.
- Die Zeit. (2020). *Die Regierung soll den Mund halten und zahlen* (Vol. 4, p. 17). Juni 2020, Nr.24.
- Dubois, G., Ceron, J. P., Gössling, S., & Hall, C. M. (2016). Weather preferences of French tourists: Lessons for climate change impact assessment. In *Climatic Change*, 136 pp. 339–351. <https://doi.org/10.1007/s10584-016-1620-6>, 2.
- EC – European Commission. (2013). *Supporting the implementation of green infrastructure* (Final report. Brussels).
- EURAC Research. (2018). *Klimareport Südtirol* (Bozen).
- Fleischhacker, V. (2019). *ITR-tourismusreport. Der Sommer in Österreich 2018, Tendenzen der Nachfragesegmente* (Tulln an der Donau).
- Fleischhacker, V., & Formayer, H. (2007). *Die Sensitivität des Sommertourismus in Österreich auf den Klimawandel*. Wien. Aufrufbar unter http://www.austroclim.at/s_tartclim/. letzter Zugriff: 22.01.2019.
- Fleischhacker, V., Formayer, H., Seisser, O., Wolf-Eberl, S., & Kromp-Kolb, H. (2009). *Klimawandel und Reiseverhalten: Auswirkungen des Klimawandels auf das künftige Reiseverhalten im österreichischen Tourismus. Forschungsbericht im Auftrag des Bundesministeriums für Wirtschaft, Familie und Jugend*. Bd. 4179. Wien.
- FUR (Forschungsgemeinschaft Urlaub und Reisen). (2017). *Reiseanalyse 2017. Erste ausgewählte Ergebnisse der 47. Kiel: Reiseanalyse zur ITB 2017*.
- Gómez-Martín, M. B., Armero-López, X. A., & Martínez-Ibarra, E. (2017). Tourists, weather and climate. official tourism promotion websites as a source of information. *Atmosphere*, 8(12). <https://doi.org/10.3390/atmos8120255>. Nr. 255.
- Goodwin, H. (2017). The challenge of Overtourism. *Responsible Tourism Partnership Working*, 19. Paper 4.10.2017.
- Gössling, S., Abegg, B., & Steiger, R. (2016). 'It was raining all the time!': Ex post tourist weather perceptions. *Atmosphere*, 7(1), 1–12. <https://doi.org/10.3390/atmos7010010>.
- Götz, A., Burkhardt, A., Manser, R., Marendaz, E., Willi, H. P., Hohmann, R., Köllner-Heck, P., & Probst, T. (2012). *Anpassung an den Klimawandel in der Schweiz. Ziele, Herausforderungen und Handlungsfelder. Erster Teil der Strategie des Bundesrates*. vom 2. März 2012.
- Juschten, M., Brandenburg, C., Hössinger, R., Liebl, U., Offenzeller, M., Prutsch, A., Unbehauen, W., Weber, F., & Jiricka-Pürner, A. (2019). Out of the city heat – Way to less or more sustainable futures? *Sustainability*, 11(1), 214. <https://doi.org/10.3390/su11010214>, 2019.
- Juschten, M., Jiricka-Pürner, A., Unbehauen, W., & Hössinger, R. (2019b). The mountains are calling, an extended TPB model for understanding metropolitan residents' intentions to visit nearby alpine destinations in summer. In *Tourism Management*, 75 pp. 293–306.
- Krajsits, C., Andel, A., Neugebauer, W., Stanzer, G., Wach, I., Kroisleitner, C., & Schöner, W. (2008). *ALSO WIKI Alpiner Sommertourismus in Österreich und mögliche Wirkungen des Klimawandels*. StartClim2007F. Wien. Aufrufbar unter <http://www.austroclim.at/startclim/>. letzter Zugriff: 22.01.2019.
- Kromp-Kolb, H., Formayer, H., & Clementschitsch, L. (2007). *Auswirkungen des Klimawandels auf Wien unter besonderer Berücksichtigung von Klimaszenarien*. Kurier. (2020 August 2020). *Der Sommertourismus nimmt etwas Fahrt auf*, 14. <https://www.msn.com/de-at/finanzen/top-stories/sommertourismus-nimmt-etwas-an-fahrt-auf/ar-BB17Wx01?ocid=msedgntp>.
- Land Salzburg. (2019). *Tourismusstatistik, Zahlen, Fakten, Daten. Die bisherige Sommersaison 2019 im Überblick*. Mai-August 2019. Online unter <https://www.salzburg.gv.at/statistik/Seiten/statistik-tourismus.aspx>.
- MA 23 Dezernat Statistik Wien. (2018a). *Gästeankünfte in Wien nach Herkunftsländern 2007 bis 2017*. Online unter <https://www.wien.gv.at/statistik/wirtschaft/tabellen/ankuenfte-laender-zr.html>. letzter Zugriff: 21.11.2019.
- MA 23 Dezernat Statistik Wien. (2018b). *Nächtigungen in Wien (top 10) 1-12/2018*. Online unter: [b2b.wien.info/de/presse/bilanz2018#grafiken](https://www.b2b.wien.info/de/presse/bilanz2018#grafiken) (letzter Zugriff: 11.02.2019).
- Pröbstl-Haider, U. (2019). *Destinationsentwicklung in den Alpen: Ein Spagat zwischen Under- und Over-tourism? neue Entwicklungen unter Berücksichtigung des Klimawandels*. Wien: Vortrag im Zusammenhang mit dem Stakeholderworkshop in Innsbruck.
- Pröbstl-Haider, U., Lund-Durlacher, D., Olefs, M., & Pretenthaler, F. (2019). *APCC Special Report on tourism, large culture and sport events and climate change (Interim Report – activity Report)*. Finanziert von: Klima- und Energiefonds. Austrian Climate Research Programme - ACRP 10th Call.
- Serquet, G., & Rebetez, M. (2011). Relationship between tourism demand in the Swiss Alps and hot summer air temperatures associated with climate change. *Climatic Change*, 108, 291–300. <https://doi.org/10.1007/s10584-010-0012-6>.
- Sozialministerium. (2020). www.sozialministerium.at/Informationen-zum-Coronavirus/.
- Stadt Innsbruck. (2019a). *Statistiken Zahlen, Tourismus, Ankünfte und Übernachtungen nach Beherbergungsarten in den Sommerhalbjahren 1986-2018*. Aufrufbar unter <https://www.innsbruck.gv.at/page.cfm?vpath=verwaltung/statistiken-zahlen/tourismus>. letzter Zugriff: 15.11.2019.
- Stadt Innsbruck. (2019b). *Statistiken Zahlen, Tourismus, Übernachtungen in den gewerblichen Beherbergungsbetrieben nach ausgewählten Herkunftsländern*. Aufrufbar unter <https://www.innsbruck.gv.at/page.cfm?vpath=verwaltung/statistiken-zahlen/tourismus>. letzter Zugriff: 15.11.2019.
- Stadt Wien. (2016). *Klimatologische kenntnisse in Wien 1954 bis 2016*. Aufrufbar unter <https://www.wien.gv.at/statistik/lebensraum/tabellen/eis-hitze-tage-zr.html>. letzter Zugriff: 22.01.2010.
- Statistik Austria. (2016). *Tourismus; Ankünfte, Übernachtungen, Urlaubsreisen*. In *Statistisches Jahrbuch 2016* (pp. 420–429). herausgegeben von Bundesanstalt Statistik Österreich.
- Statistik Austria. (2017). *Pressemitteilung*, 11, 565–125/17.
- Steininger, K. W., Bednar-Friedl, B., Formayer, H., & König, M. (2016). Consistent economic cross-sectoral climate change impact scenario analysis: Method and application to Austria. *Clim. Serv.*, 1, 39–52. <https://doi.org/10.1016/j.ciser.2016.02.003>.
- Thuen Jørgensen, M., Law, R., & King, B. E. (2017). Understanding the past, anticipating the future – a critical assessment of China outbound tourism research. In *Journal of Travel & Tourism Marketing*, 34 pp. 880–891, 7.
- Travel USNews (s.t.) <https://travel.usnews.com/rankings/best-europe-vacations/>.
- Trimble, S. J., Ferran, K., McDermott, H., & MC Dermott, H. (2020). *COVID-19: Pandemic impacts on European city tourism*. Tourism Economics Oxford. https://s3.amazonaws.com/tourism-economics/craft/Latest-Research-Docs/GCT_Covid-19_regional_RB_EUR_Summary.pdf.
- Wien Tourismus. (2018). *Ankünfte Wien 2003–17*. Aufrufbar unter: [b2b.wien.info](https://www.b2b.wien.info) (letzter Zugriff: 11.02.2019).
- Wien Tourismus. (2019). *Der Wiener Urlaubsgast (Private Urlaube in entgeltlichen Unterkünften 2017/2018)*. *Wiener Gästebefragung 2017/2018 im Rahmen des Tourismus Monitors Austria (T-MONA)*. Aufrufbar unter <https://b2b.wien.info/de/statistik/marktforschung/gaestebefragung>. letzter Zugriff: 20.11.2019.
- Wirtschaftskammer Tirol. (2018). *Tourismus: Die Sommerfrische ist wieder da*. wirtschaft.tirol. 2018. Aufrufbar unter <https://www.wirtschaft.tirol/2017/11/29/sommertourismus-die-frische-ist-wieder-da/>. letzter Zugriff: 22.01.2020.
- WKO. (2018). *Tourismus und Freizeitwirtschaft in Zahlen: Österreichische und internationale Tourismus- und Wirtschaftsdaten*. 54. Ausgabe, Februar 2018. Herausgegeben von *Wirtschaftskammer Österreich Bundespartei Tourismus und Freizeitwirtschaft*. Wien: Eigenverlag.
- Zellmann, P., & Mayrhofer, S. (2015). *Die Urlaubsrepublik: Die Zukunft des Tourismus in Österreich*. Wien: MANZ'sche Verlags- und Universitätsbuchhandlung GmbH.
- Zellmann, P., & Mayrhofer, S. (2017). *Forschungstelegramm Mai 2017 (Nr. 41/7)*. Wann Urlaubsreisen gebucht werden. *Der Countdown für den Sommerurlaub läuft*. 41/7. Wien.