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Post-/pandemic mobility adaptations and wellbeing in Oslo, Norway: A longitudinal mixed-methods approach

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ABSTRACT

This study investigates the understudied relationship between post-/pandemic mobility adaptations and wellbeing outcomes, drawing on a longitudinal mixed-method approach combining survey analyses and in-depth citizen interviews conducted between 2019 and 2022 in Oslo, Norway. Qualitative analyses explore the depth and diversity of pandemic mobility adaptations and the implications for hedonic and eudaimonic wellbeing. Factor and structural equation models confirm statistical evidence for three pandemic coping strategies – working from home, avoiding spaces of infection, and (enjoyment of) the local environment – with respectively neutral, negative and positive impacts on satisfaction with life. The post-pandemic ability to be more mobile and attend diverse activities again is by many perceived as positive, but people struggle to maintain cherished aspects of the slower-paced, localised lifestyles adopted during the pandemic. We discuss the significance of our findings for inclusive pandemic resilience, and reflect on the lessons relevant for addressing another crisis – climate change.

1. Introduction

To curb COVID-19 spreading, governments around the world imposed everyday mobility restrictions since March 2020. As a result, everyday routines and activities like travelling, going to work, socialising, and leisure were disrupted overnight (Greene et al., 2022, Wethal et al., 2022). This led to dramatic initial reductions and later rebounds in everyday mobility (Rudke et al., 2022; Liu and Yamamoto, 2022), albeit varying strongly across urban and national contexts (Möllers et al., 2022, Kim and Kwan, 2021; Kellermann et al., 2022), mobility cultures (Greene et al., 2022), and social groups (Qu et al., 2022). Positive societal impacts like greenhouse gas emission reductions, better air quality and improved traffic safety were identified both globally and in Norway (Silva et al., 2022; Le Quéré et al., 2020; Griffiths et al., 2021; Lee and Eom, 2023). Yet, biosecurity concerns and government mandates have also led to a dramatic reduction of and modal shift away from public transport (PT) (e.g. Parker et al., 2021; Rasca et al., 2021; Mussone and Changizi, 2023), which, if prolonged, may threaten the transition towards more inclusive and environmentally-friendly cities and mobility systems that are less dependent on private automobility.

Whilst the pandemic impacts on everyday mobility have been widely studied as indicated above, less is known about how this has impacted on wellbeing, and possibly unevenly so (e.g. Stevano et al., 2021; Klenert et al., 2020). Based on pre-pandemic theoretical

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frameworks on the relationship between wellbeing and mobility, mobility restrictions as observed during the pandemic may have negative impacts on wellbeing as they restrict people's ability to participate and experience meaningful everyday activities and travel (De Vos, 2020). Indeed, such link between pandemic travel reductions and reduced wellbeing has for example recently been demonstrated amongst students in Bangladesh (Jamal and Paez, 2023), yet studies on this mobility-wellbeing nexus during pandemic and post-pandemic conditions remain sparse.

The present study aims to explore and explain the developing relationship between mobility-related adaptations in everyday life and wellbeing outcomes, before, during and immediately after the main phases of the COVID-19 pandemic, and reflect on the longer-term implications of this developing relationship for sustainable mobility. Hereto, a longitudinal mixed-methods approach is used, combining the analysis of multi-wave surveys and in-depth interviews with citizens of the general population conducted between 2019 and 2022 in Oslo, Norway. After this introduction, Section 2 reviews literature on the pandemic impacts on everyday mobility and wellbeing outcomes, before Section 3 introduces the study area, data, mixed-methods approach, measurement instruments, and multivariate modelling techniques. Section 4 juxtaposes qualitative and descriptive quantitative findings, followed by an explanatory analysis on the relationships between post-/pandemic developments, mobility adaptations and satisfaction with life (SWL). Section 5 discusses our main findings on the post-/pandemic relationship between mobility and wellbeing, and draws lessons for addressing sustainable mobility, followed by a brief conclusion.

2. Literature review on Covid-19, mobility and wellbeing

Over the past four years, a vast number of studies have delved into the impact of Covid-19 on mobility. Especially its negative impacts on PT use have been widely reported, often connected to fear of infection and/or government mandates (Jenelius and Cebeacauer, 2020; Wielechowski et al., 2020; Vichiensan et al., 2021; Parker et al., 2021; Zhang et al., 2021; Esmailpour et al., 2022; Lee and Eom, 2023; Mussone and Changizi, 2023). On the contrary, some studies also find increases in active mobility during the pandemic. For instance, Nguyen and Pojani (2022) found an increase in pandemic recreational cycling in Hanoi, which is supported by findings from a range of other contexts (Abdullah et al., 2020; Kellermann et al., 2022; Costa et al., 2022). However, studies also found large inequalities in outcomes of active mobility, depending for instance on age and socio-economic status (Qu et al., 2022) and different urban contexts and infrastructures available (Möllers et al., 2022; Greene et al., 2022). Moreover, studies also report a strong increase in car-use as a direct consequence of infection measures and reduction in PT (e.g. Chen and Steiner, 2022; Lee and Eom, 2023; Mussone and Changizi, 2023). Regardless of transport mode, a large decrease in overall travel, especially commuting, can be observed as a result of increased working from home (WFH) (e.g. (Harrington and Hadjiconstantinou, 2022; Fatmi et al., 2022; Wethal et al., 2022)).

Several studies have also explored the effects of the pandemic on wellbeing. Studies across contexts have found an increase in negative emotions and a decrease in subjective wellbeing during the pandemic (e.g. Zolopa et al., 2022; Graupensperger et al., 2022), with the pandemic negatively affecting general mood (Suso-Ribera and Martín-Brufau, 2020), as well as rising levels of anxiety, depression and stress (Planchuelo-Gómez et al., 2020; Tang et al., 2021). Helliwell and others (2021, 2022) and Tao and others (2023) found increases in negative affect during the pandemic, even though longer-term measures of SWL remained relatively stable.

Some studies have also sought to link wellbeing-related outcomes to mobility changes. For instance, studies from Sicily, Italy, found that PT became associated with fear of being infected or infecting others with the virus which affected wellbeing (Gnerre et al., 2022). Such findings are supported by studies from other contexts (Parker et al., 2021; Zafrì et al., 2022; Wang and Gao, 2022). In South Africa, New Zealand, and Australia it was found that restrictions mandating people to stay at home correlated with decreases in wellbeing (Greyling, et al., 2021). In contrast, Costa-Font and others (2022) studied the reception of lock-down measures in areas with high mortality rate, finding that these were received positively in terms of mental health. Other studies find that wellbeing could be enhanced due to higher work flexibility enabled by WFH, more family time, and a calmer life during the first period of the pandemic with staying at home orders in place (Cornell et al., 2022). Similarly, a study amongst 17,000 UK school students, demonstrated that some student groups revealed improved self-reported wellbeing during the pandemic, for example related to improved social relations with family and friends, less loneliness and exclusion, and better management of school tasks (Soneson et al., 2023). An increase in active mobility, such as walking and cycling, during the pandemic has also indicated a positive influence on wellbeing in different contexts (Fuller et al., 2021; Gladwin and Duncan, 2022; Ranjbarnia et al., 2022), including in Norway (Fyhri et al., 2023). Contrastingly, other studies also report on reduced physical activity during the pandemic, for example due to increased WFH or the closure of activity centres (Ishibashi and Taniguchi, 2022). Burdett and others (2021) find that reduced park attendances negatively affect psychological wellbeing.

These findings illustrate how pandemic mobility changes can yield diverging wellbeing outcomes depending for instance on bodily capabilities, resources and capacities to adapt (Bohman et al., 2023). Several studies find stronger negative pandemic impacts on wellbeing for diverse groups of elderly (Buffel et al., 2023), people with physical limitations (Steptoe and Gessa, 2021; Holm et al., 2022), women (e.g. Devaraj and Patel, 2021; Mars et al., 2022), and young people (Mars et al., 2022). Regarding gender, others also find contrasting results: Schech and others (2022) and Berdejo-Espinola and others (2022) indicate how women are able to benefit more from social connections and environmental spaces than men, enabling them to better balance negative pandemic impacts on their psychological wellbeing. Other studies indicate a strong burden on parents with small children during lock-down, due to stress and exhaustion from juggling multiple roles and responsibilities (Dawes et al., 2021; Wethal et al., 2022). Studies by Preece and others (2023) and Mouratidis (2022) find that factors such as small dwellings, high density and reliance on PT impacted wellbeing challenges during the pandemic, whereas access to local facilities could impact positively. Other studies similarly indicate how immediate residential surroundings impact on pandemic wellbeing, depending on social cohesion, indoor space, and the immediate access to outdoor

natural environments (e.g. Moynat et al., 2022; Erfani & Bahrami, 2023).

To date, few studies have directly measured and explored how citizens of differing social and spatial background have deployed different mobility related coping strategies during and after the pandemic, and how such mobility related coping strategies have affected their wellbeing. Moreover, little research has been conducted on the linkages between pandemic mobility adaptations, wellbeing outcomes and sustainability implications. By exploring these linkages, the present study will provide a better understanding of which mobility changes and adaptations could, are likely to, and ideally should remain after the pandemic (König and Dreßler, 2021), providing valuable lessons for policy makers and planners on how to select and support behaviours and adaptations that synergise positive individual wellbeing, societal and environmental impacts, while discourage those that synergise the negatives of some or especially all of these aspects.

3. Research design

3.1. Longitudinal and mixed-methods approach

The current study utilises a mixed-method research design, combining qualitative and quantitative datasets to study the same phenomenon (Denzin, 1978) in the same study area. Although the transport field is dominated by single-method studies that are either quantitative (the majority) or qualitative, triangulation by mixed methods has been used in transport studies before (e.g. Czepkiewicz et al., 2020), including in Norway (e.g. Wolday et al., 2019; Tao and Næss, 2022). Triangulation and the use of mixed methods can help to achieve a more holistic understanding of phenomena under study (Alavi et al., 2018; Czepkiewicz et al., 2020). In the present study, we draw on this strength to provide a more comprehensive understanding of the interrelationships between pandemic conditions, mobility-related coping strategies and wellbeing outcomes. Moreover, we conduct our mixed methods study with a longitudinal setup, as for example previously done by Scheiner and others (2023) in a study on the relationships between travel behaviour and the built environment. In our case, the longitudinal design is chosen to unravel the dynamic relationships between pandemic conditions, mobility and wellbeing outcomes over time.

3.2. Study area

This study is situated in Greater Oslo, Norway. This urban area, located in the south-east of Norway, is the country's largest metropolitan area with over a million residents. The rationale for selecting Greater Oslo as the study area is threefold: First, Greater Oslo is the area in Norway that has had the strongest COVID-19 restrictions. Even though the area has been spared full curfews like in some other European cities, it has been subjected to strong lockdown and social distancing measures, including restrictions on the co-presence of people, closures of schools, nurseries and all but the most essential shops and services, and a heavy discouragement of PT use. Second, the area is relatively compactly built, with mixed land uses, building densities, and a substantial share of PT use: all elements that may pose social distancing and pandemic mobility challenges. PT constituted 30% of the transport modal split in 2019, but dropped about 40% in 2020 (Ruter, 2021). Third, the urban area is subjected to large geographic variations in socio-economic status, with most of the more well-off areas concentrated centrally and to the west of the city centre, while areas with lower socio-economic status and higher shares of non-western ethnicities, residential crowding, reliance on social welfare, and COVID-19 infection rates are located in densely populated valleys east and south east of the city centre (Böcker et al., 2021).

3.3. Data

The qualitative analyses are based on two rounds of data collection. First, 28 Oslo-based households were interviewed in April-June 2020 about their everyday life practices and experiences during the first lockdown. The households were self-recruited through online social media posts and snowballing from personal and professional networks. Recruited households were first asked to fill out a short survey on background variables, to allow us to sample a diversity of participants in terms of professions and work obligations, caring responsibilities, and household arrangements (see Table A in the appendix for informant information). Informants were asked about their everyday routines during the first COVID-19 lockdown, with particular focus on mobility, food, leisure and work activities, and their interconnections. Seven interviews were conducted physically and 21 digitally. The second round of data collection was conducted during summer 2022 (June-August), where fifteen households from the original sample were re-recruited for a follow-up interview. Four of these were conducted digitally and eleven physically. The first part of the interview involved filling out a timeline of events from lockdown in March 2020 to the time of interview, separating between societal events, life events and changing routines. The timeline was used as a tool for igniting recollection and reflection on the time period, and to discuss how different forms of events and changes to daily life had influenced one another and become interlinked. Informants were further asked specifically about changes in relation to mobility, food, work and leisure, but also probes from the interviewer based on the informants' responses during the first interview. One of the aims of the latter was to understand which COVID-19-induced changes had continued and which had returned to pre-pandemic circumstances. Data was analysed through both deductive and inductive approaches. The first round of interviews was analysed inductively, where thematic coding developed around the main topics emerging from the informants' account, used as a starting point to identify recurring themes. Insights from secondary literature and theory were then used to develop new themes. The second round of interviews were also analysed thematically, but through a more deductive approach insights were developed in relation to relevant theory and literature from the onset. Interviews lasted one to two hours and were recorded and transcribed verbatim. All informants are presented with a pseudonym.

The quantitative investigation focuses on the relationship between pandemic mobility coping strategies and SWL for different socio-spatial categories. Data are drawn from a self-administered multi-wave panel survey amongst greater Oslo residents, initially conducted in autumn 2019 ($n = 798^2$) and subsequently repeated at 1-year peri/post-pandemic intervals in spring 2020 ($n = 1,228$, response rate 63%), spring 2021 ($n = 916$, response rate 75%), and spring 2022 ($n = 661$, response rate 72%)³. Respondents have been recruited via the Internet panel of the questionnaire agency KANTAR (Norwegian Gallup Panel), from which a geographically-stratified sample but otherwise randomly selected sample was drawn. Geographic stratification by urban district and municipality secures that our sample represents inhabitants from various types of built environments and socio-economic-status areas. As a result, the socio-spatial composition of our sample aligns reasonably well with the general population in the study area, for example on key variables of interest, such as car ownership, gender, age and income. An exception is education level, which is substantially higher in our sample (74% medium to higher educated) than in the study area's general population (44% medium to higher educated). Although this over-representation of higher educated is quite common in web-based surveys (e.g. Arentze et al., 2005), including the Norwegian National Travel survey, it is something to be cognisant of when interpreting our results. The multi-wave panel survey has been used in one earlier scientific publication, which provides more details and statistics on sample recruitment, sample and study area population composition and data (Wolday and Böcker, 2023).

3.4. Conceptualising and measuring wellbeing and mobility-related coping strategies

In contemporary scientific psychology, there are two main approaches to wellbeing, both rooted in ancient Greek philosophy. First, a hedonic approach, attributed to Aristippus, focuses on the accumulation of short-term positive experiences and minimising of negative ones. Second, a eudaimonic approach, originating from Aristotle's idea that wellbeing equals a realising of one's full natural potential, encompassing longer-term goal satisfaction and self-realisation (e.g. Díaz Méndez et al., 2015; Huta, 2016). Whilst the two approaches have often been treated separately (e.g. Waterman, 1993; Delle Fave et al., 2011), some scholars suggest to treat the two in a more integrative manner (e.g. Samman, 2007; Gatt et al., 2014; Huta, 2016), or by investigating three components of wellbeing (eudaimonic, hedonic, SWL) simultaneously but as different phenomena (e.g. Mouratidis, 2018).

Drawing on these integrative approaches to wellbeing, our qualitative investigation combines informants' descriptions of positive and negative affect (hedonic wellbeing), with eudaimonic elements, drawing on fulfilment of the three fundamental psychological needs presented in the self-determination theory (SDT) as indications of eudaimonic wellbeing – *competence, autonomy, and relatedness* (Deci and Ryan, 2012). The *competence* need is satisfied when one successfully engages in the behaviours one values, or, more broadly, in mastering life and its many challenges and opportunities. *Relatedness* is satisfied when one feels accepted and close to other people, or to non-humans, such animals, nature, and the divine (Dambrun & Ricard, 2011; Leary, Tipsord, & Tate, 2008). The *autonomy* need is satisfied when people feel like they choose to take part in something rather than feeling compelled to do so, being intrinsically rather than extrinsically motivated (Deci and Ryan, 2012).

Our quantitative analyses will draw on SWL as the main outcome, which combines elements of both the hedonic and eudaimonic traditions (Díaz Méndez et al., 2015). SWL is measured by the single item question "Overall, how satisfied are you with your life? (7-point scale)". Although earlier studies have suggested that multi-item measures of SWL yield more reliable and valid results (Lucas and Donnellan, 2012), this has been challenged by several recent studies which find single and multi-item measures of SWL to correlate strongly and yield only marginal differences in multivariate analyses (e.g. Jovanović and Lazić, 2020).

Expanding on the recognition that wellbeing is inextricably linked to one's environment (e.g. Cloninger, Salloum and Mezzich, 2012; Bartels et al., 2022), various studies have examined how mobility relates to wellbeing, distinguishing three mechanisms in particular: "(1) through the experience of trips, (2) through participation in spatially separated activities, and (3) through spill-over effects of trip experience on the performance of and satisfaction with activities at trip destinations" (De Vos, 2020, p1). The first comprises largely of hedonic wellbeing, the second of eudaimonic wellbeing, and the third of the relationship between the hedonic and the eudaimonic (De Vos, 2020). Drawing on these insights, we investigate how mobility-related pandemic and post-pandemic coping strategies are associated with changes in hedonic and eudaimonic wellbeing qualitatively, and with changes in SWL quantitatively. Hereby, we differentiate between three different but interrelated mobility-related coping strategies. First, we look at *working from home (WFH)*, measured as the weekly frequency of doing so. Second, we derive a construct of *avoiding (mobile) spaces of infection*, consisting of the three items "avoiding crowded spaces", "avoiding crowded PT" and "avoiding the sharing of private vehicles". Exploratory and subsequent confirmatory factor analysis reveal the three items load well onto one factor, with good construct reliability ($CR = 0.843$) and convergent validity ($AVE = 0.644$). The third coping strategy is *enjoying the local*, which we capture by how much respondents agree that they: "like staying near the home"; "enjoy walks and bike rides in their local neighbourhood"; "are satisfied with the facilities (including public/green spaces) in their neighbourhood"; and "are (re)appreciating travelling locally as compared to longer-distance destinations". Exploratory and confirmatory factor analyses revealed no satisfactory ways to condense any or all of these items into one or multiple factors (with AVE and CR scores not exceeding 0.33 and 0.55 respectively in the best case). We therefore decided to treat all four items as correlated but separately estimated dimensions into our final multivariate statistical analyses.

² The initial 2019 survey had a larger n , but 798 is the number of respondents we successfully re-recruited in 2020 and it is these 798 respondents from this survey that we use information from.

³ In 2020 we supplemented the $n = 798$ sample with 430 new respondents not present in 2019. Because the $n = 798$ and $n = 1,228$ samples were relatively similar in sample composition and on key travel behaviour indicators, we make use of the full $n = 1,228$ sample for 2020. The 2021 and 2022 samples were recruited from respectively the 2020 and 2021 samples without supplementing with new respondents.

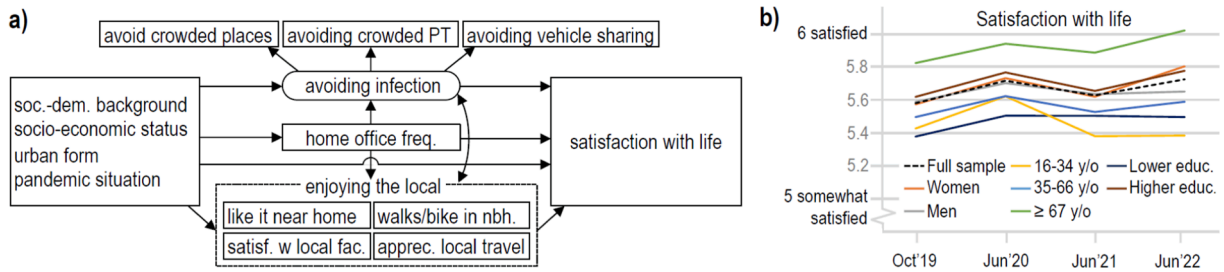


Fig. 1. Structural equation model structure (a) and pandemic dynamics of SWL (b).

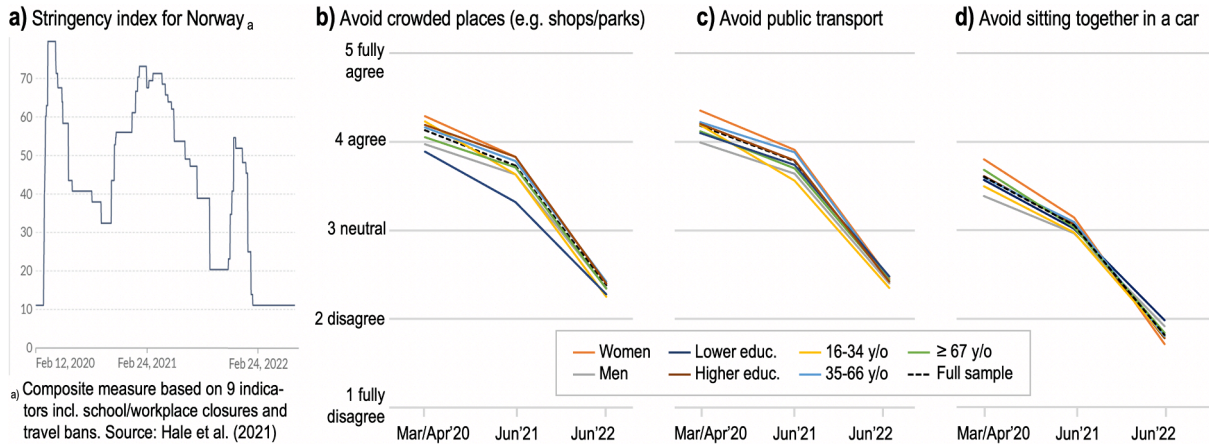


Fig. 2. Pandemic stringency (a) and the avoiding of crowded places (b), PT (c) and vehicle sharing (d).

3.5. Statistical modelling techniques

To statistically investigate the complex interrelationships between pandemic phases, mobility-related coping strategies and SWL for different population categories, use is made of Structural Equation Modelling (SEM). SEM allows us to estimate the *simultaneous effects* of sociodemographic, socio-economic, geographic and pandemic background variables on, and the relationships between, the four main outcomes of interest in this paper: *i) WFH, ii) avoiding (mobile) spaces of infection, iii) four dimensions of enjoying the local, and iv) SWL*. We have configured our SEM analysis based on the following assumptions of causality between dependent variables prior to analysis. First, we assume correlations without a clear direction of causality between *ii) avoiding spaces of infection* and *iii) all four dimensions of enjoying the local*. Second, we assume *i) WFH* to be an enabling factor, affecting both *ii)* and *iii)*. Third, we expect all three coping strategies (*i, ii and iii*) to influence our final dependent variable *iv) SWL*.

The final dataset is restructured from a *wide-* into a *long-format*, where each respondent is represented by several rows of data (one for each time period), collapsing their multiple answers at different survey iterations into one variable for each survey question and creating an additional variable in the process that identifies each time period. We investigate how answers to identical key questions of mobility-related coping and SWL have developed over time during the pandemic using the following two temporal functions. The first is a dummy to distinguish between pre-pandemic (autumn 2019) and *peri*-pandemic (spring 2020) answers. This first temporal function is only analysed for SWL and not for mobility-related copings, as these questions were not asked in 2019. The second temporal function, estimated for both SWL and mobility-related copings, is a continuous variable that counts the years since pandemic onset, returning a value 0 for spring 2020, 1 for spring 2021 and 2 for spring 2022. To control for that answers given by the same respondent at different points in time are dependent on one another, we estimate robust standard errors that adjust for within-cluster correlations (Wooldridge, 2002) via Stata's *vce-cluster* command. Fig. 1a presents an overview of the relationships and causalities between all variables in our final SEM analysis. Fig. 1b presents a descriptive overview of the longitudinal development of our final dependent variable SWL. This will be discussed in more detail in the results section.

4. Results

This section is divided into four parts. The first three parts present results from the explorative juxtaposition of qualitative data and descriptive quantitative data, and the fourth part presents results from the quantitative analysis. The first part illuminates how fear of infection and abidance to COVID-19 related restrictions interconnect with mobility changes and adaptations that yielded wellbeing related experiences. The second part explores how the pandemic has changed the structure and experience of everyday (travel)

activities, with a particular focus on the expansion of WFH and how it affects work-life balance and wellbeing in everyday life. The third part expands on how these mobility changes have given space to localised and slower paced lifestyles. The fourth part develops on the essence of the preceding exploratory results, and investigates for different socio-economic groups the relationship between pandemic phases and how this relationship is mediated by their coping strategies and capabilities to adapt mobility in the ways described above (WFH, avoiding spaces of infection, and enjoying the local).

4.1. Fear of infection across spaces

From March 12, 2020, the Norwegian government imposed COVID-19 related restrictions. The pandemic stringency index for Norway, seen in Fig. 2a, reveals that these were implemented with immediate effect. As is reflected in Fig. 2b, there was at this point a widespread conception among the residents in Oslo that crowded public places were to be avoided. A fear associated with public places was also reflected upon by informants in the qualitative sample, and the uncertainties about the health threat posed by the virus were emphasised as particularly worrisome:

In the very beginning, when everything was completely closed and everyone was out walking in the Frogner park. [...] We had no idea how much it infected, how easily it infected. I thought about it when you walked past people, it was a bit like you'd hold your breath (Helena, F, 50s, family with teenage child, 2022).

Such fear and inclination of avoiding crowded places also applied to shared transport modes. Fig. 2c and d indicate that in the Oslo metropolitan area, shared rides by car and especially trips by PT were avoided, the latter in line with existing findings from around the world (see e.g. Abdullah et al., 2020; Parker et al., 2021). In the qualitative sample, changed experiences with PT were commonly emphasised. Several informants described how information about increased infection risk, combined with public recommendations to avoid PT, physical signs and seat barriers structuring behaviour, as well as a sense of social policing of others' behaviour during travelling, greatly influenced the trip experiences. As has been observed elsewhere (Helsingen et al., 2020), our informants described stress, frustration and feeling judged by others as parts of the experience of these trips during March/April 2020. As explained by Dagny, interviewed in June 2020, this feeling was still apparent, despite restrictions being softer at that time, as shown in Fig. 2a:

Well, I still think about it when I take the metro, I should keep distance, there are stickers in all metros, on the floors, and stickers everywhere, but one does have a different awareness about everything one does and everything everyone else does compared to what we had before, [...] like, oh, did I act correctly just now, did I forget to wash my hands there, now I think you're a little close to me on the metro, that kind of stuff (Dagny, F, 30s, lives with partner, 2020).

Towards the autumn of 2020, restrictions got increasingly strict again (see Fig. 2a), and the use of facemasks in public places to limit transmission was introduced, first as a strong recommendation and from September 2020 mandated by law in Oslo in instances where one meter social distancing was impossible (Lovdata, 2021). As explained by Aksel, this was detrimental to the experience of public travelling, and it decreased his sense of relatedness to co-passengers, which was something he had previously cherished:

Yes, I remember when it was at its worst, you know putting on the facemask and, when you have half the face covered, you miss many facial expressions. [...] One felt more isolated. Even though one was sitting on a metro wagon that was quite full there was no contact in a way (Aksel, M, living alone, 30s, 2022).

Fig. 2b, c and d clearly indicate that the avoidance of public spaces, PT, and shared car rides declined from March/April 2020 until June 2022, and reflections from the qualitative informants indicate how this strongly related to a changing experience of risks during trips. Many of the interviewees were particularly happy about the return to PT after restrictions ceased. However, Fig. 2b and c suggests that the avoidance of crowded places and PT had not entirely disappeared amongst panel respondents by June 2022. For some people, the ways of dealing with risk in relation to travel that was introduced during the first lockdown, seemed to have stayed on and continued to colour travelling experiences during the summer of 2022, as echoed by some of the qualitative interviews:

When I took the train my son got very interested in what was going on in the seat in front of us, where someone was sitting with their back against us and started coughing. [...] When she started coughing for the third time, I was just like, 'Let's switch seats. Let's move a bit further down' (Jorunn, F, lives with small child, 30s, 2022).

For others the PT experience was less explicitly connected to infection risk, but rather an embodied feeling of being uncomfortable when travelling in crowded buses or metros:

As of today, I use my bike a lot. Of course, I take the tram and subway every once in a while, but not that much. Not if it's packed, then I don't go in... Then I walk to the next stop. In case of, if I am going far, in the hope that there will be a new one [arriving] (Fanny, F, 60s, living alone, 2022).

For those with access, mobility by car became valued increasingly positively as it was a near infection risk-free, and thus safe, mode of transport. Amongst the car users, some also experienced that the driving experience itself became more comfortable by the pandemic context:

It was very comfortable to drive, because everyone else was WFH, there was almost no traffic (Sol, F, 40s, family with two children, 2022).

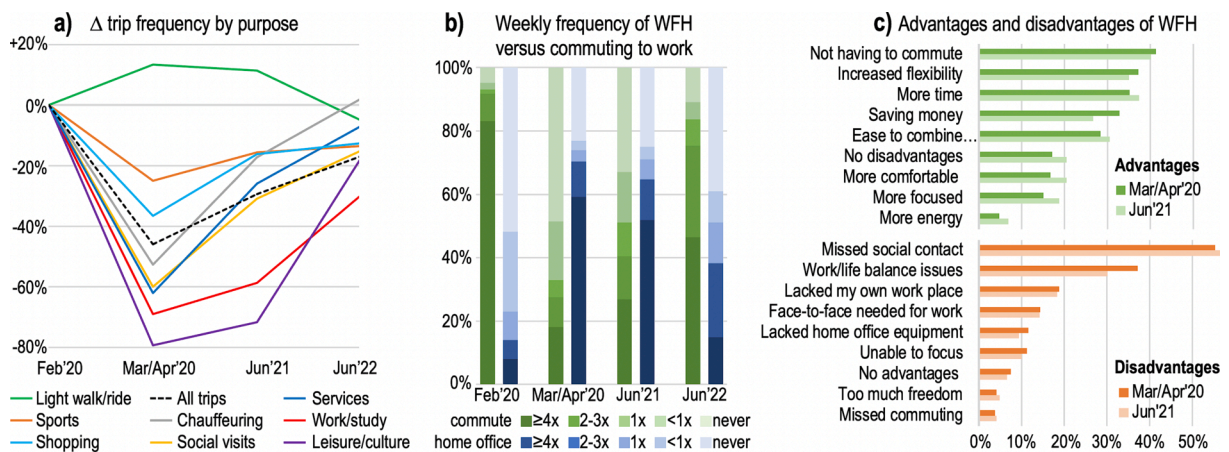


Fig. 3. Pandemic impacts on daily travel (a), commuting/WFH (b), and the (dis)advantages of doing so (c).

4.2. Changes in trip frequencies and the expansion of WFH

Echoing Sol's narrative of empty roads above, Fig. 3a shows that travel for all trip purposes, with the exception of leisure walk/bike trips (see section 4.3), reduced drastically: -45% across all trips, but down to almost -70% for trips to work/study. In June 2021 and June 2022, the mean frequency of trips steadily increased, but even in June 2022 the mean weekly trip frequency was still 17% below pre-pandemic levels (see also Chen and Steiner, 2022; Kellermann et al., 2022 for corresponding findings in other contexts).

The qualitative informants experienced the reduction in trip frequency in various ways, but many described it as predominantly negative. The abrupt end to many of the previously taken for granted out-of-home activities was seen as something that led to boredom, passivity, and restlessness having to spend the majority of their time at home, at least as an immediate reaction to the first lockdown in 2020. For some, insufficiency of information on scope and timeline made it hard to mobilise competence in creating alternative activities.

It is maybe that you have the need to do those things, like I just said, go to the gym, and need to do all those activities and like...what makes you feel good, I mean to go on those trips and that you get to... meet people, you know? So, all of that was sort of taken away from you or put a break on... so I do feel like it is important to have those things... I didn't think about it before it was lost (Åsmund, M, 30s, lives with partner, 2020).

In contrast, during the summer 2022, several of the informants described challenges and feelings of limited autonomy when the pandemic was over and there was the quick surge in trips seen in Fig. 3a. As explained by Aksel (M, 30s, living alone, 2022): "it feels like everything must be squeezed in, or to make up for what has been lost. So I feel like I can't quite keep up with what is going on somehow". Apparently, several had come to appreciate the slower living during the pandemic, and they felt it was hard to hold on to these aspects as society opened up and the potential to be mobile expanded.

The calmness remained until sports and leisure activities started up again. And of course, [...] our events too, right. Like shared cabin trips or parties or 40 years anniversaries and so forth. It is double-edged. It was a bit like, 'ah, it was sad it didn't work out', but at the same time a bit nice. A bit like [...], what I think was the best thing with the pandemic was to gear down[...] that we were forced to gear down, to go down to zero and just be here and now, present (Sol, F, 40s, family with two children, 2022).

While the overall trip making was only 15% below pre-pandemic levels in June 2022, the decrease in frequency of commute trips, as seen in Fig. 3a, was still 30% lower in June 2022 as compared to pre-pandemic levels. This prolonged reduction in commuting was closely associated with emergence and persistence of WFH. As seen in Fig. 3b, only 15% of the sample worked from home two or more times per week prior to the pandemic, whereas by March/April 2020 about 70% did so, and in June 2022 this was 39% . Reflecting on this, many of the interviewed informants described how they had reconsidered the role and value of the commute itself, both with regard to the isolated experience of it (e.g. moods and feelings while driving to work) and with regard to its broader function in the composition of everyday life. In line with what is seen at the bottom half in Fig. 3c, many informants missed the social interactions with colleagues, and described how digital communication tools were insufficient substitutions for such relational needs. Instead, communication became more stringent and the barriers higher for contacting colleagues compared to when working together physically:

Of course, there are negative aspects of sitting at home alone, and not having the social chat with work, or colleagues at the coffee machine, and ... talking about things, right. In terms of work, there was also a lot of stuff you didn't get clarified, that ... the threshold for connecting and calling on Teams and talking to a colleague was completely different than if you were on the same floor and the same landscape, right, it's something completely different (Helena, F, 50s, family with teenage child, 2022).

In the bottom half of Fig. 3c, we see that only around 4% of respondents listed that they miss commuting as a top three disadvantage

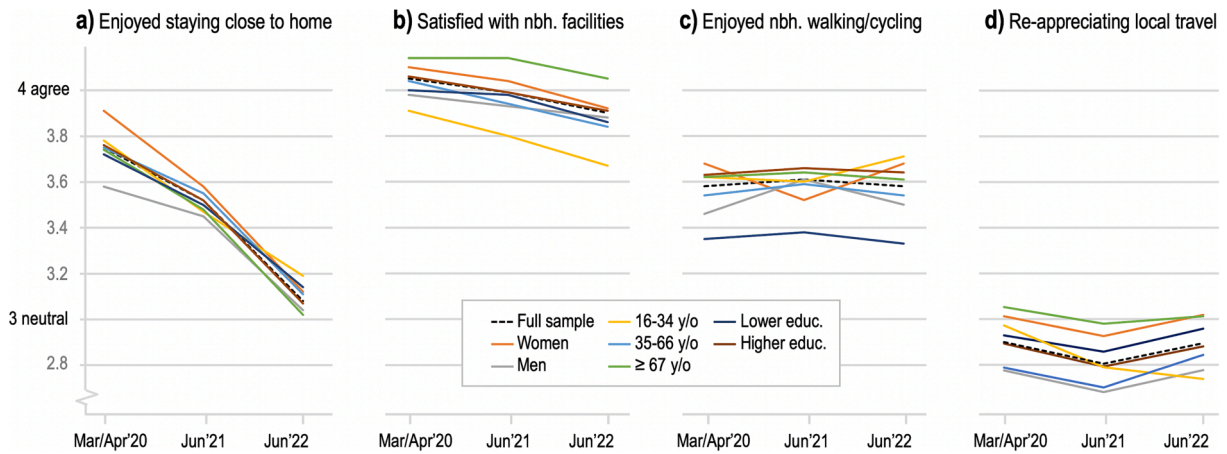


Fig. 4. Rediscovering and -appreciating the home (a), local neighbourhood (b-c) and local travel (d) during the pandemic.

with WFH in 2020 and 2021. However, about 55% in both time periods agreed that issues with work/life balance were a top three issue with WFH. In the interviews, some informants explicitly linked these two issues and described how such balancing became harder with the absence of a physical commute that had served as a boundary marker between work and home (see also Wethal et al., 2022). Without the commute in place, the distinction between work and life became blurrier with WFH:

...it's just a forceful reduction in personal time for me, those hours I had to and from work, those were- yes, they take time, but then [...] I listen to a podcast to get into another mode than work mode, and kind of put behind you those [work] thoughts. Whereas here [at home] ...it's probably one of the reasons that it got a little, like, stressful, because you weren't able to put aside- not physically nor mentally- there was no divide, like, between them (Ingrid, F, 30s, family with three children, 2020).

Hence, some of the qualitative informants reflected positively about being able to re-establishing their commuting routines, improving their work-life balance. As explained by Marianne:

'Well, it's easier to go home and not continue with the computer. So I experience a different calmness. [...] it is easier to «compartmentalise». You know, a flow in different zones' (F, 40s, family with two children, 2022).

Others, both amongst the qualitative informants and generally in Oslo, as seen at the top half in Fig. 3c, did, however, appreciate many aspects of WFH. As seen in Fig. 3c, about 40% of the latter group both in March/April 2020 and June 2021 agreed that not having to commute was positive. About 35% in both periods agreed that WFH gave them both more time and more flexibility (see also Moynat et al., 2022, Wethal et al., 2022). Indeed, many of the interviewed informants highlighted how WFH had diminished everyday stress and freed up time for more highly appreciated activities, as exemplified by Olivia:

Well, I have a lot more energy; I've had time to work out for the first time in like five years. Because I avoid that trip every time, to work and well... In that sense, I feel that this has been great for both the family and me. [...] I wish there were a fewer work hours and a bit more time for other things (Olivia, F, 30s, family with three children, 2020).

When interviewed in 2020, many of the informants talked about how they intended to maintain their newly attained WFH practices after the pandemic, and they were grateful for the flexibility granted by employers in relation to WFH. By the summer of 2022, several operated with hybrid situations where they combined WFH and office days. Amongst those practicing this, it was described as something that yielded a sense of autonomy as they were free to combine the best of both worlds in favourable ways. This corresponds with what we see in Fig. 3b, where over 50% still used WFH one or more times per week in 2022.

4.3. Emergence of localised and slower-paced practices

Much like the expansion of WFH, several other lifestyle changes associated with the pandemic became appreciated components of everyday life. In the early period of the pandemic, people in Oslo generally enjoyed staying close to home (Fig. 4a), were satisfied with the facilities in their neighbourhood (Fig. 4b), and enjoyed walking and biking in their neighbourhood (Fig. 4c). As can be observed from Fig. 3a, leisurely trips by foot or bike increased by about 13% from February 2020 to March/April 2020.

In the qualitative sample, several talked with enthusiasm about positive experiences of spending more time at home when the pandemic began. This was echoed even by those who missed the out-of-home activities. Characteristic for the most enthusiastic about their time at home, was how they felt less time scarcity and thus more time to take up old or new hobbies, learn new things, or develop different projects (see also Moynat et al., 2022). This was described in terms of following their intrinsic motivations, or of acquiring competences needed for thriving in light of living in the COVID-19 context. For instance, Harald went from 'not really being into food' to start cooking his way through all the countries in the world alphabetically, a hobby and project that he upheld when speaking to him two years after its initiation:

When I go somewhere, I always eat as much 'strange' food as possible, meaning food you do not get in Norway. And that was something that I had thought of, that it would be fun to make different types of food. But when I was furloughed, I got really time to do things I actually wanted to do. So, I got the time, energy and incentive to do the cooking research and make a hobby out of the project (Harald, M, 20s, living alone, 2022).

Several also appreciated the daily experiences of spending more time in and close to their home. Ingrid, who lived quite remote in a forested area in Oslo with three (now four) children and her husband, experienced the increase in time used at home as deeply rewarding as it made her and her family engage much more with their property. In 2020, she explained how they had made their own plot suitable for new home-based activities by putting up a traditional Sami tent and a trampoline, creating a skating ramp and an outdoor training and climbing park. In 2022, she reflected on how the pandemic had opened their eyes:

All these possibilities that have always been here the ten years that we have lived here. But we have just never seen them, you know. So now it was kind of [...] really, so much fun to be creative within a smaller frame (Ingrid, F, 30s, family with four children, 2022).

With these lifestyle changes, Ingrid also experienced close relations to become increasingly meaningful and deep, particularly to her family and their neighbours. Other interview informants had similar reflections, and it was a shared experience that such relations could partly make up for lost activities elsewhere. As narrated by Sol, during the pandemic, neighbours who would normally only exchange a few words in passing ended up spending national holidays together, creating local social arenas, both for children and adults:

What has happened... we have, quite literally, the best neighbourhood in the world. It is so very, very nice here. Meaning that there are such good people here. So that these will continue as our friends in the future. But clearly the pandemic made it so that this is where we were, in a way. It was those people that we met, sort of (Sol, F, 40s, family with two children, 2022).

Enjoyable localised activities also stretched beyond people's property and immediate neighbours. For instance, the increase in leisurely trips by foot or by bike found in the panel data was also reflected in the qualitative sample. Such trips were mainly described in positive terms, but also a necessary adaptation to the COVID-19 context and related lack of mobility and out of home activities. Several described active travelling as a means to break up the day, escape the monotony of home, or get time alone. Moreover, some also described how walking became a new means to experience relatedness, using walks to socialise with people outside the immediate household, given how walks enabled safe socialising while in accordance with to rules and regulations:

We were out walking every day [...]. Particularly after a day WFH, you got desperate and it was just to get outside [...]. After a while, we went on more walks with other people [...]. Suddenly ended up going for weekly walks together. Some regulars for example that I didn't have a lot of contact with over the years, but then suddenly we found back old friends again, so we walked and chatted, we went for hikes ... yeah, well that was a really positive thing (Helena, F, 50s, family with teenage child, 2022).

Others used active travelling time to talk on the phone and catch up with friends and family. This seemed to give the travelling a stronger purpose than 'just' walking or biking, and fuel otherwise restricted relatedness. Some found synergy between practising leisurely walks and WFH:

But now, I think it is much freer, that I know about myself that I really enjoy developing ideas or think about how to make this presentation or that process flow. It works much better for me if I can go for a walk while thinking about that [...] The creative part, and that about movement, that is the biggest change for me (Ingrid, 30s, family with four children, 2022).

However, while Fig. 3a indicates an increase in leisurely trips from February 2020 to June 2022, there was simultaneously also a 12% increase of those never doing such trips. Geir, who prior to the pandemic commuted 8 km by bike in each direction, lost what he considered a very meaningful part of his everyday life when WFH. He reflected on feeling trapped indoors and being unable to find motivation to leave the house without a set destination:

I have been thinking that the days got more monotonous. That I didn't get any movement. And that I didn't bother go for a walk during lunchtime or anything, because I didn't have a purpose with the trip. [...] I had nothing to do. No destination. I mean, no place to go [...] To be confined sort of, and then imposing on oneself to be even more confined than needed... I don't know if there was something underneath there...that I was thinking 'Get out!', and then I didn't get out [laughs] (Geir, 50s, living alone, 2022).

Moreover, as seen in Fig. 4a and b, people's enjoyment of staying close to their home and satisfaction with neighbourhood facilities weakened in the later stages of the pandemic. This resonated with the qualitative material, which supplemented on how informants described how the joy of walking near their home became exhausted over time, particularly because it felt repetitive:

We went on so many trips [...] So I will definitely say that I think we have never walked so many trips along Akerselva [river in Oslo] like we did from at least spring 2020. It is almost like I got so sick of it that I cannot stand walking there anymore, you know (Anna, F, 20s, lives with partner, 2022).

Others had more unconsciously stopped doing such walks. Harald (M, 20s, living alone, 2022), who talked warmly about him and his partner discovering their local area during spring 2020 and walking there regularly, was somewhat surprised when he realised that he had not been back for over half a year when we talked to him in 2022.

The localised practices catalysed by the pandemic context spanned also into the domain of vacations. Several in the qualitative sample described, both with frustration and gratitude, how vacation plans abroad had been replaced with vacation in Norway due to

Table 1
Multivariate structural equation model outputs.

	mobility-related pandemic coping mediators														SWL											
	WFH		avoiding				enjoying the local				direct		total													
	frequency		sp. of inf.		like it near home		walk/bike in nbh		satisf. nbh fac.		appr. local travel		effect		effect											
	coeff.	z	coeff.	z	coeff.	z	coeff.	z	coeff.	z	coeff.	z	coeff.	z	coeff.	z										
pandemic coping																										
WFH freq.			0.090	6.96	***	0.043	3.18	**	0.042	2.82	**	0.022	2.13	*	0.006	0.39	0.023	1.40	0.024	1.44						
avoid spaces of inf.																	-0.093	-2.59	*	-0.093	-2.59	**				
enjoying the local liking it near home																	-0.058	-1.86		-0.058	-1.86					
enjoy walk/bike nbh																	0.172	6.14	***	0.172	6.14	***				
satisf. with nbh fac.																	0.181	5.40	***	0.181	5.40	***				
appr. local travel																	0.082	2.96	**	0.082	2.96	**				
respondent backgr.																										
female	-0.040	-0.31	0.270	5.96	***	0.174	3.67	***	0.254	4.61	***	0.182	4.34	***	0.275	5.08	***	0.168	2.80	**	0.231	3.70	***			
age	0.034	0.99	0.008	0.88		-0.009	-0.92		-0.020	-1.78		0.000	0.05		-0.049	-4.54	***	-0.033	-2.57	*	-0.039	-2.98	**			
age squared	0.000	-1.01	0.000	-0.60		0.000	0.93		0.000	2.08	*	0.000	1.11		0.001	5.08	***	0.000	3.56	***	0.001	4.11	***			
higher education	0.672	3.62	***	0.009	0.17		-0.010	-0.16		0.174	2.26	*	-0.045	-0.85		-0.026	-0.37		0.024	0.29		0.059	0.68			
household income	0.280	6.49	***	-0.010	-0.61		-0.015	-0.87		0.026	1.36		0.018	1.21		-0.043	-2.11	*	0.144	6.76	***	0.157	7.33	***		
living alone	0.362	2.03	*	-0.157	-2.50	*	-0.059	-0.90		-0.023	-0.29		-0.005	-0.09		-0.079	-1.06		-0.094	-1.10		-0.079	-0.88			
population density	0.000	1.39		0.000	-2.93	**	0.000	-3.28	**	0.000	2.93	**	0.000	5.53	***	0.000	-1.17		0.000	0.09		0.000	1.54			
(e-)bike access	0.162	1.21		-0.002	-0.05		-0.002	-0.05		0.325	5.74	***	0.190	4.40	***	0.166	2.95	**	0.027	0.47		0.136	2.23	*		
car access	-0.172	-0.98		-0.014	-0.23		-0.030	-0.44		0.019	0.23		0.105	1.62		0.058	0.72		0.112	1.30		0.138	1.48			
pandemic time period																										
spring '20 vs. fall '19																			0.143	3.46	**	0.143	3.46	***		
years since onset	-0.889	-18.46	***	-0.771	-3.76	***	-0.287	-11.95	***	0.043	1.63		-0.071	-3.50	***	-0.003	-0.15		-0.088	-2.36	*	-0.027	-1.20			
constant	2.301	3.12	**				4.551	19.00	***	3.039	11.15	***	3.341	14.79	***	3.883	14.45	***	3.655	1.14	***					
model fit																										
LR Chi2 (df)	358.025 (41)																									
RMSEA / CFI / TLI / NFI	0.046 / 0.959 / 0.873 / 0.972																									
full model R ²	0.314																									
sub-equation R ² s	0.091		0.080				0.023				0.054				0.060				0.048				0.173			

***significant with 99.9% confidence; ** with 99.0% confidence; * with 95.0% confidence.

international travel bans, fear of infection and other uncertainties. This appears to correspond well with what is seen in Fig. 4d, where people in the panel in sum neither agreed nor disagreed that they had started appreciating local vacations equally high or even higher than distant and international vacations. This neutral stand is well exemplified by Sol, who emphasised in her summer 2022 interview how a vacation to London that summer had been fantastic and that the trip felt like a necessity. At the same time, she described with excitement how they had been innovative and discovered a novel way of having vacation in Norway in the COVID-19 pandemic context:

Yes, it is clear that, since we have not been allowed to travel abroad, or, well, we have not desired it. So that has influenced us. Like, where do we choose to spend our time, right? We have travelled a lot to our cabin [...]. Last year we changed houses with people across the country. That was very clever. We should do much more of that because it was great (Sol, F, 40s, family with two children, 2022).

4.4. Multivariate SEM analysis

The explorative results above suggest that there were multiple ways of adapting to and coping with the overall pandemic context and related mobility changes. We have described different ways that this was coped with and experienced through avoiding (mobile) spaces of infection risk, WFH, and enjoying localised ways of living. Throughout, we have also presented how people experienced the opening up of society in the early post-pandemic period, June 2022. All these diverse experiences have been introduced in relation to wellbeing.

To further examine these relationships, we deploy a SEM analysis as conceptually described in Fig. 1a, with SWL as the final dependent variable and with WFH, *avoiding spaces of infection (latent construct)*, and four dimensions of *enjoying the local* serving as mediators. As exogenous variables, we include variables capturing socio demographic background, socio economic status, geographic background and pandemic situation, and we assume that these both have a direct effect on SWL, as well as indirect effects via the mediators. Table 1 presents the SEM model outcomes. Columns in the middle of the table list the direct effects on each of the pandemic coping mediators. Columns to the right of the table list both the direct and total effects on our final dependent variable SWL. Total effects sum up the direct effects on SWL, as well as all possible indirect effects via the mediators. The model is well-fitted with an RMSEA value below 0.5, CFI and TLI values well above 0.95, and a TLI value near 0.9. Moreover, explained variance of the overall model is 31.4%, whilst explained variance of the final dependent variable SWL is 17.3%.

Beginning with pandemic coping strategies, the model suggests that the frequency of WFH was higher for people with higher education, higher household income, and for those who were living alone relative to living with others. This is sensible, given how higher paid and higher education office jobs often offer more flexibility when it comes to WFH, whilst those living alone possibly have better conditions to WFH undisturbed by other household members. In line with Fig. 3b, there was a strong, negative pandemic effect, where frequency of WFH declined for each year since the onset of the pandemic. The effects of other exogenous variables were non-significant.

When it comes to *avoiding spaces of infection*, the model shows that this was positively affected by WFH. When looking at the effects of respondent background, women and those living together with others were more likely to avoid (mobile) spaces of infection than men and those living alone. People living in more densely populated areas were less avoidant of potential spaces of infection than those living in less densely populated areas. A possible explanation can be that it is harder for those in densely built areas to avoid those types of spaces and PT modes. In line with Fig. 2b and c, we also observe that avoiding of (mobile) spaces of infection clearly tapered off over time since the onset of the pandemic in March 2020.

When looking at *enjoying the local* it appears that three of its four dimensions were positively affected by the frequency of WFH, the exception being appreciating localised travel, which was non-significant. It can also be observed that women enjoyed all four dimensions of localised (mobility) lifestyles more than men did. Age appears to have a non-linear relationship with the enjoyment of walk and bike rides in the local neighbourhood and especially with the appreciation of localised travel, with higher values observed for both the youngest (negative age effect) and oldest segments (positive age squared effect). People in densely built areas and those with (e-)bike access were more satisfied with what their neighbourhood had to offer in terms of facilities, green and public spaces, and they enjoyed more local neighbourhood walk and bike rides. The latter is also true for highly educated. A higher appreciation of localised travel can also be observed amongst those with (e-)bike access. High income households on the contrary longed more for further-away destinations. Whilst many people liked to keep themselves at or close to home at the onset of the pandemic, this effect was strongly tapering off with each subsequent year. A similar significant tapering off, albeit substantially less strong, can be found for people's satisfaction with the facilities green and public spaces in their neighbourhood.

When looking at the pandemic impact on SWL, our model, perhaps somewhat surprisingly, reveals that SWL was higher during the first stage of the pandemic (June 2020), than it was before the pandemic (Autumn 2019). This can potentially be linked with the previous discussions of the qualitative exploration of people's everyday lives, where the pandemic did not only bring misery, but to some also positive elements, such as a pleasant deceleration and reappraisal of life, or more time with loved ones. Whether any such potential boost of SWL will last remains to be seen. So far, it appears that much of it began fading away in subsequent years.

The pandemic impacts on SWL discussed above hide strong variations between different (groups of) people. First of all, SWL was clearly related to the ways people coped during the pandemic by adjusting their mobilities and orientation towards localised travel and lifestyles, however with contrasting impacts for different strategies. Those who were more occupied with avoiding (mobile) spaces of infection scored lower on SWL, whilst those who actively reoriented themselves to embrace a more localised lifestyle (i.e. enjoying walks and bike rides, appreciating local neighbourhood facilities, and appreciating localised travel) scored higher on SWL. Besides the impact of coping strategies, we also observe differences between different groups of people, both directly and mediated by their

copings. Women had higher SWL than men, both directly and aided by their enjoyment of the local, which more than offset any potential negative indirect effect of women's higher avoidance of spaces of infection on SWL. The effect is somewhat surprising as it contrasts with findings in the existing literature that women suffer from a double burden during the pandemic (Sevilla and Smith 2020, Coban 2022), and that they had lower general wellbeing than men (Croda and Grossbard, 2021). This might be attributed to Norway being amongst the top five countries in the world in terms of gender equality (Husu 2015). Age turned out to have a non-linear effect, where groups at both the lower and higher end of the age spectrum enjoyed higher SWL, both directly and via their higher appreciation of localised travel. SWL was also higher for high-income households, in part because of their possibilities to WFH. We observe no significant geographic differences in SWL, but SWL was somewhat higher amongst those with (e-)bike access, aided by a higher enjoyment of facilities and walk/bike rides in their neighbourhoods.

The interrelations between people's backgrounds, mobility-related pandemic coping strategies and SWL investigated in the SEM analyses, correspond well with the experiences expressed by several of the qualitative informants, where reduced biosecurity concerns and the ability to be mobile again, were perceived as positive. However, several informants simultaneously missed the localised, slower-paced lifestyles that they had discovered during the pandemic, and found it difficult to maintain these practices as society was reopened and they were pushed and pulled from and towards errands, activities, and appointments. Put differently, they in many ways expressed a feeling of being back in the hamster wheel.

5. Conclusion and discussion

This study investigated the understudied relationship between pandemic mobility adaptations and wellbeing outcomes, deploying a longitudinal mixed-methods approach combining analyses of 2020–2022 qualitative citizen interviews and 2019–2022 panel surveys from Greater Oslo Norway.

Echoing existing findings from around the world (e.g. Kellermann et al., 2022; Smite et al., 2023; Esmailpour et al., 2022; Cornell et al., 2022), our study confirms major everyday mobility reductions during the first phase of the pandemic, accompanied by a surge in working from home (WFH), an avoidance of public transport (PT) and other spaces of infection, and an enjoyment of localised lifestyles. Even though travel frequencies, the enjoyment of localised lifestyles, and especially the avoidance of spaces of infection, had largely subdued to normal levels by summer 2022, we observe a continuation of WFH practices significantly above pre-pandemic levels, albeit at lower levels than in earlier in the pandemic. We find these different pandemic mobility adaptation strategies to have opposing effects on satisfaction with life (SWL): The avoidance of spaces of infection appears negatively associated with SWL; the enjoyment of localised lifestyles positive; and the frequency of WFH appears to be not significantly associated. All in all, we find higher SWL during the early pandemic as compared to 2019, albeit fading away somewhat in the later post-/pandemic years. Our qualitative material sheds light on this somewhat surprising finding. While we do find that the wellbeing outcomes throughout the pandemic were negative for some, most informants described positive gains in wellbeing. Drawing on self-determination theory (Deci and Ryan, 2012), the *autonomy* and *competence* to find, and make work, new ways to enjoy slower-paced localised lifestyles, and receiving stronger *relatedness* to loved ones and local places in the process, appeared as key to this (in line with e.g. Australian findings by Cornell et al., 2022).

Beyond delivering these pandemic insights, the results presented in this paper provide constructive lessons for addressing another global crisis, that of climate change. Societal response to the pandemic has demonstrated that the ought-to-be-stable mobility routines and lifestyles carved out over decades, could be changed into routines less detrimental to the environment, and in fact do so overnight – a timeframe of adaptation that could well match the urgency of climate change. Moreover, this study reveals that many Oslo residents have adopted what Christopher Key Chapple (2008: 235) describes as “new models of sacrifice” required to “foster a sustainable economic and political and psychological and spiritual state of affairs”: Rather than experiencing the mobility and lifestyle changes solely as a cost, a burden or a punishment, people actually appreciated many of the adaptations as positive, helping them to “return to a sense of immediacy and aliveness” and reorient their personal identity to the “connectivity with others” rather than “being tied to the acquisition and manipulation of things” (Chapple, 2008: 235). This gives hope for climate change mitigation, as such reorientation towards more eudaimonic rather than hedonic aspects of wellbeing may deliver a decoupling of wellbeing from high mobility and material consumption and smoothen the adoption of more environmentally friendly lifestyles.

Why then, have required behavioural changes to tackle the pandemic come so swiftly, whilst behavioural changes to truly mitigate the climate crises have been so much slower and more difficult to achieve? Whilst sharing obvious similarities and clear interlinkages, both crises are also fundamentally different, as discussed in a recent study in which Khojasteh and others (2022), unite interdisciplinary perspectives on both crises. The pandemic was characterised by geographic proximity of impacts, an immediacy of urgency, a sense of personal responsibility, a somewhat comprehensible problem and solution, relative immediate feedback (e.g. social distancing to observe a flattening of the curve 1–2 weeks later), and a transience of measures. Contrastingly, the climate crisis is often conceived as further away, less immediate, incomprehensible, long-lasting, and with slower feedback, despite extreme weather flashing its urgency and bringing it closer to home. Our findings accurately illustrate some of the contrasts between both crises. With immediate pandemic urgency now having faded, it remains to be seen how much the slower-paced localised mobility lifestyles are here to stay. With the warmly welcomed entry of the post pandemic era, many informants also experienced limited autonomy in maintaining their newly gained slower-paced mobility lifestyles, following from how they felt participation in work, leisure activities, and socialisation demanded again high mobility across larger distances, and concerns of infection were less of a socially accepted excuse for being less mobile and staying close to home.

Two avenues of policies are suggested, both of which relate to the call for policy makers to focus on how people can access what they desire and need locally, by balancing accessibility from spatial proximity, the use of active transport modes, and digital

Table A
Background information on qualitative sample.

Pseudon.	ID	Age	Gend.	Household structure	Living situation (first lockdown)	WFH (first lockdown)	Occupation	2020	2022
Harald	NO1	20s	m	2020: Couple 2022: Living alone	Suburban, semi-detached house with garden	No, furloughed	Actor and receptionist	x	x
Mette	NO2	20s	f	2020: Living alone 2022: Moved out of Oslo, living with partner	Detached house, city centre	Yes	2020: Student 2022: Researcher	x	x
Oliver	NO3	30s	m	Couple	Suburban apartment	Partially	Teacher	x	
Torunn	NO4	30s	f	Family with two children (0, 3)	Suburban apartment	Yes	Office manager	x	
Ingrid	NO5	30s	f	2020: Family with three children (4, 6, 8) 2022: had one more baby	Suburban, detached house, private garden	Yes	Project manager	x	x
Aksel	NO6	30s	m	2020: Couple 2022: Living alone	Semi-urban apartment	Yes	Social worker	x	x
Gitte	NO7	60s	f	Living alone	Semi-urban apartment, private garden	Partially	2020: Senior advisor 2022: Retired Senior advisor	x	x
Hilde	NO8	40s	f	Family with two children (4, 7)	Semi-urban apartment	Partially	Senior advisor	x	
Merethe	NO9	30s	f	Family with two children (1, 10)	Apartment in city centre	No	2020: Nurse 2022: On sick-leave	x	x
Fanny	NO10	60s	f	Living alone	Apartment in city centre	Partially	2020: Social worker 2022: Retired	x	x
Berit	NO13	60s	f	Shared living	Apartment in city centre	No	2020: Therapist 2022: Retired	x	x
Louise	NO14	60s	f	Living alone	Semi-urban apartment, private garden	Partially	2020: Family therapist 2022: Retired	x	x
Henriette	NO15	20s	f	Shared living	Apartment in city centre	Yes	Student	x	
Anna	NO16	20s	f	Shared living	Semi-urban apartment	Yes	2020: Student, substitute teacher 2022: Research assistant	x	x
Linnea	NO17	30s	f	Couple	Apartment in city centre	Partially	Film festival producer	x	
Yvonne	NO18	30s	f	Living alone	Suburban apartment	Yes	Research project coordinator	x	
Helena	NO19	50s	f	Family with teenage child (16)	Apartment in city centre	Yes	Middle manager	x	x
Olivia	NO21	30s	f	Family with three children (1, 4, 5)	Semi-urban apartment	Yes	Senior advisor	x	
Geir	NO22	50s	m	Living alone	Sub-urban apartment	Yes	Senior engineer	x	x
Sol	NO23	40s	f	Family with two children (7, 9)	Sub-urban townhouse, private garden	No	Child welfare consultant	x	x
Dagny	NO25	30s	f	Couple	Sub-urban apartment	Yes	PhD candidate	x	
Marianne and Petter	NO26	40s	f/m	Family with two children (7, 10)	Suburban, detached house, private garden	Yes	Senior researcher/project manager	x	x
Lotte	NO27	20s	f	Shared living	Apartment in city centre	No	Journalist	x	
Jorunn	NO28	30s	f	2020: Living alone 2022: Had a baby	Apartment in city centre	Partially	2020: Actor, theatre teacher 2022: Headmaster, creative school	x	x
Sigurd	NO30	30s	m	Family with one child (5)	Apartment in city centre	No	Electrician	x	
Øystein	NO35	20s	m	Couple	Apartment in city centre	Yes	Digital marketer	x	
Åsmund	NO36	30s	m	Couple	Apartment in city centre	No	Elevator fitter	x	
Karl	NO38	30s	m	Family with two children (6, one older in school)	Semi-urban apartment	Yes	Middle manager	x	

connectivity (Lyons, 2021; Lyons and Davidson 2016). This study reveals the potential for people previously accustomed to highly energy intensive mobility routines, to thrive with more localised and active mobility lifestyles, even though with time some also got tired again of exploring their local environment. To aid people to continue enjoying localised lifestyles, there is first a need for policies aimed at ensuring local, safe and inclusive access by active and public transport modes to high quality facilities such as shops, services, parks, and recreational areas, possibly combined with car sharing services to occasionally get away. The 15-minute city, a concept developed in 2016 but which gained particular traction during and after the pandemic, is a notable example of an urban policy vision that combines such elements (Moreno et al., 2021). Second, we find the use of WFH to have a supporting role for people to adopt localised lifestyles and enjoy them, even though too much of it can also have negative effects on wellbeing. To support the continuation

of a balanced use of WFH in a manner that supports wellbeing and the adoption of localised lifestyles, it is pertinent to develop policies aimed at institutionalising WFH as a hybrid option and thus maintaining digital connectivity to work in the post pandemic context.

Further research could expand on the insights provided in this study and address its limitations in a couple of ways. First, as the empirical knowledge base on the relationship between mobility and wellbeing during the pandemic is gradually expanding, review and meta-review studies could be deployed to assess cultural differences in pandemic adaptation strategies and the experiences of these. Such studies may also control for the role of seasonality on SWL, which may explain some of the variation in SWL outcomes (cf. Blanchflower and Bryson, 2023) that we were unable to unravel from pandemic impacts in this study. Second, future studies may investigate the net climate footprint of potentially counteracting mobility changes during and after the pandemic, such as the adoption of more localised lifestyles but also a potential shift from public to private motorised transportation. Third, future research may expand on the findings of this study by further exploring what may aid or hinder people from enjoying slower-paced localised lifestyles in post-pandemic contexts. As some of the informants in this study described WFH as something negative that passivated them, fourth, future studies may investigate how various forms of WFH and ways of relating to it, hamper or contribute to more localised lifestyles that can also be positive for wellbeing. Finally, studies are recommended that focus on more marginalised groups.

CRedit authorship contribution statement

Sindre Cottis Hoff: Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Lars Böcker:** Writing – review & editing, Writing – original draft, Visualization, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization. **Ulrikke Bryn Wethal:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Funding acquisition, Formal analysis.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix

Table A

References

- Abdullah, M., Dias, C., Muley, D., Shahin, M., 2020. Exploring the impacts of COVID-19 on travel behavior and mode preferences. *Transp. Res. Interdiscip. Perspect.* 8, 100255.
- Alavi, M., Archibald, M., McMaster, R., Lopez, V., Cleary, M., 2018. Aligning theory and methodology in mixed methods research: before design theoretical placement. *Int. J. Soc. Res. Methodol.* 21 (5), 527–540.
- Arentze, T., Bos, I., Molin, E., Timmermans, H., 2005. Internet-based travel surveys: selected evidence on response rates, sampling bias and reliability. *Transportmetrica* 1 (3), 193–207.
- Bartels, M., Nes, R.B., Armitage, J.M., van de Wijer, M.P., de Vries, L.P., Haworth, C., 2022. Exploring the biological basis for wellbeing.
- Berdejo-Espinola, V., Zahnow, R., Suárez-Castro, A.F., Rhodes, J.R., Fuller, R.A., 2022. Changes in green space use during a COVID-19 lockdown are associated with both individual and green space characteristics. *Front. Ecol. Evol.* 10, 804443.
- Blanchflower, D.G., Bryson, A., 2023. Seasonality and the female happiness paradox. *Qual. Quant.* 1–33.
- Böcker, L., Røe, P.G., Oftedal, E. 2021. Urban Regional Planning under the Pandemic: the Case of Oslo. In: Volume 4: Policy and Planning. Bristol University Press, pp. 189–200.
- Bohman, H., Ryan, J., Stjernborg, V., Nilsson, D., 2023. A study of changes in everyday mobility during the Covid-19 pandemic: as perceived by people living in Malmö, Sweden. *Transp. Policy* 106, 109–119.
- Buffel, T., Yarker, S., Phillipson, C., Lang, L., Lewis, C., Doran, P., Goff, M., 2023. Locked down by inequality: older people and the COVID-19 pandemic. *Urban Stud.* 60 (8), 1465–1482.
- Burdett, A., Davillas, A., Etheridge, B., 2021. Weather, mental health, and mobility during the first wave of the COVID-19 pandemic. *Health Econ.* 30 (9), 2296–2306.
- Chapple, C.K., 2008. Sacrifice and Sustainability. *Worldviews: Glob. Relig. Cult. Ecol.* 12 (2–3), 221–236.
- Chen, K., Steiner, R., 2022. Longitudinal and spatial analysis of Americans' travel distances following COVID-19. *Transp. Res. Part D: Transp. Environ.* 110, 103414.
- Cloninger, C.R., Salloum, I.M., Mezzich, J.E., 2012. The dynamic origins of positive health and wellbeing. *Int. J. Pers. Cent. Med.* 2 (2), 179.
- Coban, S., 2022. Gender and telework: work and family experiences of teleworking professional, middle-class, married women with children during the covid-19 pandemic in Turkey. *Gend. Work. Organ.* 29 (1), 241–255. <https://doi.org/10.1111/gwao.12684>.
- Cornell, S., Nickel, B., Cvejic, E., Bonner, C., McCaffery, K.J., Ayre, J., Dodd, R., 2022. Positive outcomes associated with the COVID-19 pandemic in Australia. *Health Promot. J. Austr.* 33 (2), 311–319.
- Costa, M., Félix, R., Marques, M., Moura, F., 2022. Impact of COVID-19 lockdown on the behavior change of cyclists in Lisbon, using multinomial logit regression analysis. *Transp. Res. Interdiscip. Perspect.* 100609.
- Costa-Font, J., Knapp, M., Vilaplana-Prieto, C., 2022. The 'welcomed lockdown' hypothesis? Mental wellbeing and mobility restrictions. *Eur. J. Health Econ.* 1–21.

- Croda, E., Grossbard, S., 2021. Women pay the price of COVID-19 more than men. *Rev. Econ. Househ.* 19, 1–9.
- Czepkiewicz, M., Heinonen, J., Næss, P., Stefansdottir, H., 2020. Who travels more, and why? A mixed-method study of urban dwellers' leisure travel. *Travel Behav. Soc.* 19, 67–81.
- Dambrun, M., Ricard, M., 2011. Self-centeredness and selflessness: a theory of self-based psychological functioning and its consequences for happiness. *Rev. Gen. Psychol.* 15 (2), 138–157.
- Dawes, J., May, T., McKinlay, A., Fancourt, D., Burton, A., 2021. Impact of the COVID-19 pandemic on the mental health and wellbeing of parents with young children: a qualitative interview study. *BMC Psychol.* 9 (1), 1–13.
- De Vos, J., 2020. The effect of COVID-19 and subsequent social distancing on travel behavior. *Transp. Res. Interdiscip. Perspect.* 5, 100121.
- Deci, E.L., Ryan, R.M., 2012. Self-determination theory. In: Van Lange, P.A.M., Kruglanski, A.W., Higgins, E.T. (Eds.), *Handbook of Theories of Social Psychology*. Sage Publications Ltd., pp. 416–436. <https://doi.org/10.4135/9781446249215.n21>
- Delle Fave, A., Brdar, I., Freire, T., Vella-Brodrick, D., Wissing, M.P., 2011. The eudaimonic and hedonic components of happiness: qualitative and quantitative findings. *Soc. Indic. Res.* 100 (2), 185–207.
- Denzin, N.K., 1978. *The Research Act: A theoretical introduction to sociological methods*, 2nd ed. McGraw Hill, New York, NY.
- Devaraj, S., Patel, P.C., 2021. Change in psychological distress in response to changes in reduced mobility during the early 2020 COVID-19 pandemic: evidence of modest effects from the US. *Soc Sci Med* 270, 113615.
- Díaz Méndez, D.N., Stavraki, M., Blanco Abarca, A., Gandarillas Gutiérrez, B., 2015. The eudaimonic component of satisfaction with life and psychological well-being in Spanish cultures. *Psicothema*.
- Erfani, G., Bahrami, B., 2023. COVID and the home: the emergence of new urban home life practised under pandemic-imposed restrictions. *Cities Health* 7 (4), 548–555.
- Esmailpour, J., Aghabayk, K., Aghajanzadeh, M., De Gruyter, C., 2022. Has COVID-19 changed our loyalty towards public transport? Understanding the moderating role of the pandemic in the relationship between service quality, customer satisfaction and loyalty. *Transp. Res. A Policy Pract.*
- Fatmi, M.R., Orvin, M.M., Thirkell, C.E., 2022. The future of telecommuting post COVID-19 pandemic. *Transp. Res. Interdiscip. Perspect.* 16, 100685.
- Fuller, G., McGuinness, K., Waitt, G., Buchanan, I., Lea, T., 2021. The reactivated bike: self-reported cycling activity during the 2020 COVID-19 pandemic in Australia. *Transp. Res. Interdiscip. Perspect.* 10, 100377.
- Fyhri, A., Ciccone, A., Papaix, C., Karlsen, K., 2023. Does active transport lead to improved mood and performance? A panel study of travel changes during the Covid-19 lockdown in Norway. *Transport. Res. F: Traffic Psychol. Behav.* 94, 114–132.
- Gatt, J.M., Burton, K.L., Schofield, P.R., Bryant, R.A., Williams, L.M., 2014. The heritability of mental health and wellbeing defined using COMPAS-W, a new composite measure of wellbeing. *Psychiatry Res.* 219 (1), 204–213.
- Gladwin, K., Duncan, M., 2022. COVID-19's impact on older adults' cycling behaviors in a small, auto-centric urban area. *Transp. Res. Interdiscip. Perspect.* 16, 100675.
- Gnerre, M., Abati, D., Bina, M., Confalonieri, F., De Battisti, S., Biassoni, F., 2022. Risk perception and travel satisfaction associated with the use of public transport in the time of COVID-19. The case of Turin, Italy. *Plos One* 17 (3), e0265245.
- Graupensperger, S., Calhoun, B.H., Patrick, M.E., Lee, C.M., 2022. Longitudinal effects of COVID-19-related stressors on young adults' mental health and wellbeing. *Appl. Psychol. Health Well Being* 14 (3), 734–756.
- Greene, M., Ellsworth-Krebs, K., Volden, J., Fox, E., Anantharaman, M., 2022. Practicing culture: exploring the implications of pre-existing mobility cultures on (post-) pandemic practices in Norway, Ireland, and the United States. *Sustain.: Sci. Pract. Policy* 18 (1), 483–499.
- Greyling, T., Rossouw, S., Adhikari, T., 2021. A tale of three countries: what is the relationship between COVID-19, lockdown and happiness? *S. Afr. J. Econ.* 89 (1), 25–43.
- Griffiths, S., Del Rio, D.F., Sovacool, B., 2021. Policy mixes to achieve sustainable mobility after the COVID-19 crisis. *Renew. Sustain. Energy Rev.* 143 <https://doi.org/10.1016/j.rser.2021.110919>.
- Helliwell, J.F., Layard, R., Sachs, J.D., Neve, J.E.D., 2021. *World happiness report 2021*.
- Harrington, D.M., Hadjiconstantinou, M., 2022. Changes in commuting behaviours in response to the COVID-19 pandemic in the UK. *J. Transp. Health* 24, 101313.
- Helliwell, J., Layard, R., Sachs, J.D., De Neve, J.E., Aknin, L.B., Wang, S., 2022. Overview on our tenth anniversary. *World Happiness Rep.* 5–13.
- Helsingén, L.M., Refsum, E., Gjostein, D.K., Løberg, M., Bretthauer, M., Kalager, M., Emilsson, L., 2020. The COVID-19 pandemic in Norway and Sweden—threats, trust, and impact on daily life: a comparative survey. *BMC Public Health* 20 (1), 1–10.
- Holm, M.E., Saino, P., Parikka, S., Koskinen, S., 2022. The effects of the COVID-19 pandemic on the psychological well-being of people with disabilities. *Disabil. Health J.* 15 (2), 101224.
- Husu, L., 2015. A comprehensive national approach to promote gender equality in science: the case of Norway. *Adv. Women Sci.: Int. Perspect.* 3, 329–331.
- Huta, V., 2016. An overview of hedonic and eudaimonic well-being concepts. In: *The Routledge Handbook of Media Use and Well-Being*, pp. 14–33.
- Ishibashi, S., Taniguchi, M., 2022. Workstyle change effects on physical activity and health consciousness in Japan: results from COVID-19 lifestyle activity survey. *Transp. Res. Interdiscip. Perspect.* 15, 100657.
- Jamal, S., Paez, A., 2023. Well-being implications of immobility during COVID-19: evidence from a student sample in Bangladesh using the satisfaction with life scale. *Transportation* 1–31.
- Jenelius, E., Cebecauer, M., 2020. Impacts of COVID-19 on public transport ridership in Sweden: analysis of ticket validations, sales and passenger counts. *Transp. Res. Interdiscip. Perspect.* 8, 100242.
- Jovanović, V., Lazić, M., 2020. Is longer always better? A comparison of the validity of single-item versus multiple-item measures of life satisfaction. *Appl. Res. Qual. Life* 15, 675–692.
- Kellermann, R., Conde, D.S., Rößler, D., Kliewer, N., Dienel, H.L., 2022. Mobility in pandemic times: exploring changes and long-term effects of COVID-19 on urban mobility behavior. *Transp. Res. Interdiscip. Perspect.* 15, 100668.
- Khojasteh, D., Davani, E., Shamsipour, A., Haghani, M., Glamore, W., 2022. Climate change and COVID-19: interdisciplinary perspectives from two global crises. *Sci. Total Environ.* 844, 157142.
- Kim, J., Kwan, M.P., 2021. The impact of the COVID-19 pandemic on people's mobility: a longitudinal study of the US from March to September of 2020. *J. Transp. Geogr.* 93, 103039.
- Klenert, D., Funke, F., Mattauch, L., O'Callaghan, B., 2020. Five lessons from COVID-19 for advancing climate change mitigation. *Environ. Resour. Econ.* 76, 751–778.
- König, A., Dreßler, A., 2021. A mixed-methods analysis of mobility behavior changes in the COVID-19 era in a rural case study. *Eur. Transp. Res. Rev.* 13 (1), 1–13.
- Le Quéré, C., Jackson, R.B., Jones, M.W., Smith, A.J., Abernethy, S., Andrew, R.M., Peters, G.P., 2020. Temporary reduction in daily global CO₂ emissions during the COVID-19 forced confinement. *Nat. Clim. Chang.* 10 (7), 647–653.
- Leary, M.R., Tipsord, J.M., Tate, E.B., 2008. Allo-inclusive identity: incorporating the social and natural worlds into one's sense of self. In: Wayment, H.A., Bauer, J.J. (Eds.), *Transcending Self-Interest: Psychological Explorations of the Quiet Ego*. American Psychological Association, pp. 137–147. <https://doi.org/10.1037/11771-013>.
- Lee, K.S., Eom, J.K., 2023. Systematic literature review on impacts of COVID-19 pandemic and corresponding measures on mobility. *Transportation* 1–55.
- Liu, S., Yamamoto, T., 2022. Role of stay-at-home requests and travel restrictions in preventing the spread of COVID-19 in Japan. *Transp. Res. A Policy Pract.* 159, 1–16.
- Lovdata, 2021. *Notiseforskrift om endring i covid-19-forskriften*. The Norwegian Ministry of Health and Care Services. <https://lovdata.no/dokument/LTI/forskrift/2021-12-02-3337>.
- Lucas, R.E., Brent Donnellan, M., 2012. Estimating the reliability of single-item life satisfaction measures: results from four national panel studies. *Soc. Indic. Res.* 105, 323–331.
- Lyons, G., Davidson, C., 2016. Guidance for transport planning and policymaking in the face of an uncertain future. *Transp. Res. A Policy Pract.* 88, 104–116.
- Lyons, G., 2021. Discovering 'the sweet spot'. *Local Transport Today*, 823, 17 May, 16–17.

- Mars, L., Arroyo, R., Ruiz, T., 2022. Mobility and wellbeing during the covid-19 lockdown. Evidence from Spain. *Transp. Res. A Policy Pract.* 161, 107–129.
- Möllers, A., Specht, S., Wessel, J., 2022. The impact of the Covid-19 pandemic and government intervention on active mobility. *Transp. Res. A Policy Pract.* 165, 356–375.
- Moreno, C., Allam, Z., Chabaud, D., Gall, C., Pralong, F., 2021. Introducing the “15-Minute City”: sustainability, resilience and place identity in future post-pandemic cities. *Smart Cities* 4 (1), 93–111.
- Mouratidis, K., 2018. Rethinking how built environments influence subjective well-being: a new conceptual framework. *J. Urban.: Int. Res. Placemaking Urban Sustain.* 11 (1), 24–40.
- Mouratidis, K., 2022. COVID-19 and the compact city: implications for well-being and sustainable urban planning. *Sci. Total Environ.* 811, 152332.
- Moynat, O., Volden, J., Sahakian, M., 2022. How do COVID-19 lockdown practices relate to sustainable well-being? Lessons from Oslo and Geneva. *Sustain. Sci. Pract. Policy* 18 (1), 309–324.
- Mussone, L., Changizi, F., 2023. The relationship between subjective well-being and individual characteristics, personality traits, and choice of transport mode during the first lock-down in Milan, Italy. *J. Transp. Health* 30, 101600.
- Nguyen, M.H., Pojani, D., 2022. The emergence of recreational cycling in Hanoi during the Covid-19 pandemic. *J. Transp. Health* 24, 101332.
- Parker, M.E., Li, M., Bouzaghane, M.A., Obeid, H., Hayes, D., Frick, K.T., Chatman, D.G., 2021. Public transit use in the United States in the era of COVID-19: transit riders’ travel behavior in the COVID-19 impact and recovery period. *Transp. Policy* 111, 53–62.
- Planchuelo-Gómez, Á., Odriozola-González, P., Irurtia, M.J., de Luis-García, R., 2020. Longitudinal evaluation of the psychological impact of the COVID-19 crisis in Spain. *J. Affect. Disord.* 277, 842–849.
- Preece, J., McKee, K., Robinson, D., Flint, J., 2023. Urban rhythms in a small home: COVID-19 as a mechanism of exception. *Urban Stud.* 60 (9), 1650–1667.
- Qu, T.T., Gates, T.J., Xu, C., Seguin, D., Kay, J., 2022. The disparate impact of COVID-19 on walking and biking behaviors. *Transp. Res. Part D: Transp. Environ.* 103494.
- Ranjbaria, B., Kamelifar, M.J., Masoumi, H., 2022. The association between active mobility and subjective wellbeing during COVID-19 in MENA countries. *Healthcare* 2022 (10), 1603.
- Rasca, S., Markvica, K., Ivanschitz, B.P., 2021. Impacts of COVID-19 and pandemic control measures on public transport ridership in European urban areas—The cases of Vienna, Innsbruck, Oslo, and Agder. *Transp. Res. Interdiscip. Perspect.* 10, 100376.
- Rudke, A.P., de Almeida, D.S., Alves, R.A., Beal, A., Martins, L.D., Martins, J.A., Albuquerque, T.T., 2022. Impacts of strategic mobility restrictions policies during 2020 COVID-19 outbreak on Brazil’s regional air quality. *Aerosol Air Qual. Res.* 22, 210351.
- Ruter, 2021. *Annual report 2020*.
- Samman, E., 2007. Psychological and subjective well-being: a proposal for internationally comparable indicators. *Oxf. Dev. Stud.* 35 (4), 459–486.
- Schech, S., Dodd, M., Saikia, U., 2022. Maintaining Women’s Wellbeing: the role of environment and community during the COVID-19 pandemic. *Aust. Geogr.* 53 (3), 313–330.
- Scheiner, J., Frank, S., Gerwinat, V., Huber, O., Naess, P., Schimohr, K., Wismer, A., 2023. In search of causality in the relationship between the built environment and travel behaviour. On the challenges of planning and realising an ambitious mixed-methods panel travel survey among relocating households in Germany. *Prog. Plan.* 100820.
- Sevilla, A., Smith, S., 2020. Baby steps: the gender division of childcare during the COVID-19 pandemic. *Oxford Rev. Econ. Policy* 36 (S1), S169–S186. <https://doi.org/10.1093/oxrep/gra027>.
- Silva, A.C.T., Branco, P.T., Sousa, S.I., 2022. Impact of COVID-19 pandemic on air quality: a systematic review. *Int. J. Environ. Res. Public Health* 19 (4), 1950.
- Smite, D., Moe, N.B., Hildrum, J., Gonzalez-Huerta, J., Mendez, D., 2023. Work-from-home is here to stay: call for flexibility in post-pandemic work policies. *J. Syst. Softw.* 195, 111552.
- Soneson, E., Puntis, S., Chapman, N., Mansfield, K.L., Jones, P.B., Fazel, M., 2023. Happier during lockdown: a descriptive analysis of self-reported wellbeing in 17,000 UK school students during Covid-19 lockdown. *Eur. Child Adolesc. Psychiatry* 32 (6), 1131–1146.
- Steptoe, A., Di Gessa, G., 2021. Mental health and social interactions of older people with physical disabilities in England during the COVID-19 pandemic: a longitudinal cohort study. *Lancet Public Health* 6 (6), e365–e373.
- Stevano, S., Franz, T., Dafermos, Y., Van Waeyenberge, E., 2021. COVID-19 and crises of capitalism: intensifying inequalities and global responses. *Rev. Can. Etudes Dev.* 42 (1–2), 1–17.
- Suso-Ribera, C., Martín-Brufau, R., 2020. How much support is there for the recommendations made to the general population during confinement? A study during the first three days of the covid-19 quarantine in Spain. *Int. J. Environ. Res. Public Health* 17 (12), 4382.
- Tang, F., Liang, J., Zhang, H., Kelifa, M.M., He, Q., Wang, P., 2021. COVID-19 related depression and anxiety among quarantined respondents. *Psychol. Health* 36 (2), 164–178.
- Tao, T., Naess, P., 2022. Exploring nonlinear built environment effects on driving with a mixed-methods approach. *Transp. Res. Part D: Transp. Environ.* 111, 103443.
- Tao, Y., Petrović, A., van Ham, M., 2023. Working from home and subjective wellbeing during the COVID-19 pandemic: the role of pre-COVID-19 commuting distance and mode choices. *J. Transp. Geogr.* 112, 103690.
- Vichiensan, V., Hayashi, Y., Kamnerdsap, S., 2021. COVID-19 countermeasures and passengers’ confidence of urban rail travel in Bangkok. *Sustainability* 13 (16), 9377.
- Wang, Y., Gao, Y., 2022. Travel satisfaction and travel well-being: which is more related to travel choice behaviour in the post COVID-19 pandemic? Evidence from public transport travellers in Xi’an, China. *Transp. Res. A: Policy Pract.*
- Waterman, A.S., 1993. Two conceptions of happiness: contrasts of personal expressiveness (eudaimonia) and hedonic enjoyment. *J. Pers. Soc. Psychol.* 64 (4), 678.
- Wethal, U., Ellsworth-Krebs, K., Hansen, A., Changede, S., Spaargaren, G., 2022. Reworking boundaries in the home-as-office: boundary traffic during COVID-19 lockdown and the future of working from home. *Sustain.: Sci. Pract. Policy* 18 (1), 325–343.
- Wielechowski, M., Czech, K., Grzęda, Ł., 2020. Decline in mobility: public transport in Poland in the time of the COVID-19 pandemic. *Economies* 8 (4), 78.
- Wolday, F., Böcker, L., 2023. Exploring changes in residential preference during COVID-19: implications to contemporary urban planning. *Environ. Plan. B: Urban Anal. City Sci.* 50 (5), 1280–1297.
- Wolday, F., Naess, P., Cao, X.J., 2019. Travel-based residential self-selection: a qualitatively improved understanding from Norway. *Cities* 87, 87–102.
- Wooldridge, J.M., 2002. *Econometric Analysis of Cross Section and Panel Data*. MIT press, Cambridge, Ma.
- Zafri, N.M., Khan, A., Jamal, S., Alam, B.M., 2022. Risk perceptions of COVID-19 transmission in different travel modes. *Transp. Res. Interdiscip. Perspect.* 13, 100548.
- Zhang, N., Jia, W., Wang, P., Dung, C.H., Zhao, P., Leung, K., Li, Y., 2021. Changes in local travel behaviour before and during the COVID-19 pandemic in Hong Kong. *Cities* 112, 103139.
- Zolopa, C., Burack, J.A., O’Connor, R.M., Corran, C., Lai, J., Bomfim, E., Wendt, D.C., 2022. Changes in youth mental health, psychological wellbeing, and substance use during the COVID-19 pandemic: a rapid review. *Adolesc. Res. Rev.* 7 (2), 161–177.