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The emergence of recreational cycling in Hanoi during the Covid-19 pandemic

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ABSTRACT

Objectives: This study examined recreational cycling in Hanoi, Vietnam, with a particular focus on changes brought about by the Covid-19 pandemic. The research questions were: (1) Has recreational cycling increased during the Covid-19 pandemic?; (2) If so, what factors have led to the increase?; and (3) What are some of the typical traits and behaviors of recreational cyclists?

Method: Face-to-face surveys of 356 recreational cyclists were carried out in March–April 2021 in four areas of inner Hanoi. The survey data were modelled through two binary and one ordinal logit regression.

Results: Recreational cycling has become much more popular in Hanoi during the Covid-19 pandemic, with early morning being the preferred time for this activity (to avoid heavy traffic). A quarter of the participants had started cycling recreationally since the first lockdown in April 2020, and about three quarters reported having noticed an increase in cycling activity around them. Nearly half of the participants cycled regularly (more than four times per week). The groups that were most likely to have taken up cycling for recreation during the pandemic included men, those living with children in the home, and those not working or studying. Age and income were not significant. People have been embracing cycling as a way to maintain or increase physical activity levels, and to safely socialize at the time when social gatherings are limited, walking is prohibited in some zones, and social distancing rules apply everywhere.

Conclusion: To sustain the growth in recreational cycling and widen the time-window for this activity while ensuring everyone’s safety, Hanoi’s planning and public health sectors should join forces to adopt a combination of ‘hard’ and ‘soft’ measures. The authors recommend creating multi-use paths for micromobility modes, launching a public bikesharing scheme, regulating motorised modes, and social marketing that promotes recreational cycling as trendy.

1. Introduction

Undeniably, the bicycle is one of the cleanest, cheapest, quietest, healthiest, most fun, and most flexible ways to get around (Handy et al., 2014; Klinger, 2017; Le Huyen T.K. et al., 2018; Martens, 2004; Midenet et al., 2018; Nikitas et al., 2021; Panik et al., 2019; Pojani et al., 2017; Volker and Handy, 2021; Wanner et al., 2012). In the megacities of the Global South or the sprawling cities of the Anglosphere, distances between destinations can be too large to cross by conventional push bicycles but the advent of e-bikes has
substantially increased the range of travel. And in hilly and/or hot settings, e-bikes have made utilitarian cycling more comfortable than ever before. Yet utilitarian cycling rates are abysmal in all but a few outlier cities in Northern Europe and East Asia (Table 1).

A key barrier to a large uptake of utilitarian cycling is traffic safety (Chataway et al., 2014; Dill and McNeil, 2013; Ehringott et al., 2012; Sener et al., 2009). The safety issue cannot be resolved through technological fixes, like e-bikes, provided by the private sector. A concerted effort on part of local governments is required to build state-of-the-art cycling infrastructure networks, which are fully interconnected, weather-protected, integrated with public transport nodes, and segregated from high-speed motorised vehicles such as cars, buses, and larger motorcycles. Infrastructure is absolutely necessary but not sufficient in itself. It needs to be completed by pro-cycling policies, education, and legislation (see Lee and Pojani, 2019; Pucher and Buehler, 2008). However, even as a climate breakdown looms, very few cities have been willing to make the required investments and legal reforms, fearing a backlash from pro-car communities, businesses, and industries – or simply being too invested in the status quo. Worse, some public institutional environments are openly hostile to utilitarian cycling (Butterworth and Pojani, 2018).

Under these circumstances, the authors turn their attention to recreational cycling instead. This activity is, in fact, much more popular than utilitarian cycling. Many people - children and adults - who cannot or will not cycle for utilitarian purposes - often cycle for fun or for exercise. Recent reports from Western Europe, North America, and the Indian Subcontinent suggest that the ongoing Covid-19 pandemic has created a new momentum for recreational cycling (Abdullah et al., 2021; Buehler and Pucher, 2021; Das et al., 2021; Nikitas et al., 2021; Schweizer et al., 2021; Shibayama et al., 2021; Venter et al., 2020; Vickerman, 2021). Fatigued and depressed from the pandemic and its knock-on effects (lockdowns, unemployment, videoconferencing, home-schooling, and so forth), but also encouraged by lower traffic levels in cities, many people have turned to cycling as a way to sustain their physical and mental health. Some cities have made an effort to prolong this trend by making some temporary street closures permanent.

Recreational cycling does not necessarily connect destinations: it often takes place in a loop, starting and ending in one’s home. Where public shared bicycles are used, recreational trips may connect two or more docking stations scattered around parks, pedestrianised zones, or shorelines (Pojani et al., 2020). In some cases, particularly where children are involved, people may drive a car or ride a bus to these recreational areas and start cycling there (rather riding a bicycle for the entire trip). However, these observations are mostly anecdotal. Very little research has been conducted on recreational cycling, and virtually all existing studies are set in the Global North (Adams et al., 2013; Heesch et al., 2014; Titze et al., 2010; Van Holle et al., 2012).

This study examines recreational cycling in the Global South, with a particular focus on changes brought about by the Covid-19 pandemic. The setting is Hanoi, the capital of Vietnam. The authors surveyed 356 recreational cyclists to answer the following research questions: (1) Has recreational cycling increased during the Covid-19 pandemic?; (2) If so, what factors have led to the increase?; and (3) What are some of the typical traits and behaviours of recreational cyclists? The rest of this article sets forth the study methods, discusses the findings, and concludes with policy recommendations in support of recreational cycling in Hanoi and farther afield.

2. Methodology

The following sections discuss the case study of Hanoi, the questionnaire design and the subsequent data collection and analysis, as well as some methodological limitations.

2.1. Case study setting

Hanoi is a typical Global South megacity, in that it urgently needs urban transport reform and more sustainable development practices (Bakker et al., 2017; Stead and Pojani, 2017). Mobility and accessibility are inadequate here, and create much hardship for Hanoi’s eight million inhabitants. An unfettered proliferation of motorcycles, a shortage of bus and bicycle transport infrastructure, a limited public transport capacity, and a fragmented transportation planning sector have produced major congestion, air and noise pollution, and general chaos (Nguyen et al., 2019, 2020; Nguyen and Pojani, 2018, 2021). Simply crossing the street can be a treacherous experience (T. C. Nguyen et al., 2021; Truong et al., 2019).

While overwhelming, these conditions are relatively new. Up until the market reforms of the early 1990s (doi moi, similar to China’s gaige kaifang), bicycles were the dominant mode in the Vietnamese capital. Cycling was used for both transport and leisure but precise data is lacking. Dedicated cycling facilities were not provided as they were unnecessary at a time when few motorised vehicles roamed the streets. Unfortunately, the share of cycling fell considerably in less than a decade after doi moi was introduced: from 61% in 1995 to less than 3% in 2013 (Huynh and Gomez-Ibanez, 2017). Currently, cycling for transport is the near exclusive province of schoolchildren (M. H. Nguyen et al., 2021b). Among adults, it is typically regarded as a recreational rather than an utilitarian pursuit (Hansen, 2017). Daily travel is now based on motorcycles, of which there are 8 per 10 inhabitants, while car ownership is still fairly low (Nguyen and Pojani, 2022).

To provide some context on the Covid-19 timeline in Hanoi: in April 2020 the city went into its first lockdown (M. H. Nguyen et al.,

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1 By way of definition, utilitarian cycling refers to cycling as a transport mode, i.e., to travel to work, school, shops, etc.; recreational cycling is defined as cycling for exercise or leisure (Heesch et al., 2014).
2 Conversely, most utilitarian cyclists also cycle recreationally (Heesch et al., 2014; Pierotti et al., 2017).
Thereafter, infection rates fell substantially. Urban activities returned to a cautious ‘new normal’, and, for the most part proceeded as such until May 2021, when Covid-19 cases resurged. At that point, the city went into lockdown once again. As of this writing (September 2021), a strict lockdown continues in ten urban districts. The data for this study were collected in March–April 2021, before the lockdown.

2.2. Survey design

The primary data for this study were collected through a structured population survey. As noted, the purpose was to provide answers to three research questions: (1) Has recreational cycling increased during the Covid-19 pandemic?; (2) If so, what factors have led to the increase?; and (3) What are some of the typical traits and behaviours of recreational cyclists?

The first part of the survey gathered information on the participants’ recreational cycling patterns before and after the outbreak of the Covid-19 pandemic. The ‘cut-off’ month was March 2020, which is when the first Covid-19 case was detected in Hanoi. Participants were asked if, when, and how much they cycled for leisure before and after March 2020, and more specifically in the three months preceding the survey (January–April 2021). A few questions on bicycle ownership were also asked. The survey distinguished between sports bicycles and city bicycles, with definitions provided in the form.

The second part of the survey included a series of attitudinal statements, which were measured on a five-point Likert scale. The purpose was to identify the factors that support or suppress recreational cycling. Research has already shown that the perceived risk of contracting a dangerous disease affects modal choice (Abdullah et al., 2021; Dolnicar, 2005). Therefore, the authors included two items on the perceived risk of Covid-19 contagion in public space and while cycling. Study participants were also asked whether they engaged in recreational cycling to improve their health or to compensate for other physical exercise opportunities that were lost during Covid-19.

Some statements focused on the timing of recreational cycling (morning or afternoon). In the questionnaires the authors defined ‘morning’ and ‘afternoon’ as 5:00–8:00 a.m. and 3:30–6:30 p.m., respectively. Preliminary observations in Hanoi suggested that more people cycle recreationally in the morning (between 5 a.m. and 7 a.m., before the commute rush begins). This is likely due to Hanoi’s hot weather, which precludes midday recreational cycling (see Nosal and Miranda-Moreno, 2014). In theory, people could cycle in the afternoon (after 4.30 p.m.), once the weather cools down but, due to Hanoi’s proximity to the equator, the sun sets quite early, and the twilight is brief. By 6 p.m. it is usually dark, which presumably makes cycling less enjoyable and safe.

To quantify the phenomenon, participants were asked whether there were any time constraints that might prevent them from engaging in recreational cycling in the afternoon. Because recreational cycling is often a group activity (Beecham and Wood, 2014), the participants were also asked about the availability of friends and/or relatives to cycle in the afternoon. Finally, the authors inquired about the participants’ perceived risk of collisions in the morning vs the afternoon – on the basis that cycling tends to be perceived as a risky endeavour (Blaizot et al., 2013; de Hartog et al., 2010). The last part of the survey collected demographic data (on gender, age, employment status, monthly household income, and presence of children in household).

Table 1

| City       | Cycling modal split (commute only) |
|------------|----------------------------------|
| Amsterdam  | 27–29%                           |
| Copenhagen | ~27%                             |
| Tokyo      | 17–19%                           |
| Shanghai   | ~16%                             |
| Berlin     | 13–14%                           |
| Zurich     | 6–8%                             |
| Vancouver  | ~7%                              |
| Portland   | 5–7%                             |
| Helsinki   | 5–7%                             |
| Delhi      | 5–9%                             |
| Bogotá     | ~4%                              |
| Stockholm  | ~3%                              |
| Montreal   | 3–4%                             |
| London     | 3–5%                             |
| Brisbane   | ~1%                              |
| New York   | ~1%                              |
| São Paulo  | ~1%                              |
| Cape Town  | <1%                              |

Source: Goel et al. (2021); Koglin (2015), Deloitte (2021).

Self-protection measures, particularly mask wearing, were highly recommended, and the local population generally complied (Huu Manh et al., 2021).

During the survey period, there was a Covid-19 wave in Vietnam. However, this was concentrated in the Hai Duong province whereas Hanoi was relatively safe and no mobility restrictions were in place.
2.3. Data collection

The total populations of commuter and recreational cyclists in Hanoi are unknown - both during normal times and during the Covid-19 pandemic. Hence, it is impossible to reach a representative sample of cyclists in order to estimate the prevalence of recreational cycling. To circumvent this issue, the sample was obtained by approaching recreational cyclists directly outdoors. Hanoi has many tree-lined blue surfaces (lakes and rivers), which attract numerous recreational cyclists because the surrounding traffic is calmer, and the air is fresher. Also, there are resting spaces on the shores which are useful for conducting surveys. The data was collected around four selected lakes within urban districts (Fig. 1).

Four groups of trained surveyors circulated around the lakes and approached all cyclists who were resting or warming up, with an invitation to participate in the study. (Some attempts were made to hail cyclists in movement but that method yielded few results.) The average response rate was high at around 75%. Those who accepted were screened based on two inclusion criteria: (1) adult age (18+), and (2) recreational cycling trip purpose. Participants were reminded that the survey could only be taken once. They could fill out the questionnaire form on their own or have the questions read to them by the surveyor.

Surveyors worked in two shifts of 1.5 h each in order to capture as many recreational trips as possible. The morning shift started at 6.00 a.m. and the afternoon shift started at 4.30 p.m. The surveys were conducted both on weekdays and weekends. To minimise the effect of weather, no surveys were conducted on rainy or cold days. (Hanoi being a wet tropical city, precipitation is common and a day is considered ‘cold’ when the temperature drops below 20 °C). Based on this method, 388 questionnaires were collected. Of these, 32 were eliminated due to missing and/or unreliable answers. The final sample size was 356.

2.4. Modelling procedure

Three logit models were estimated in Stata 15.0 to explore the factors that influence recreational cycling – in particular its growing uptake during the Covid-19 pandemic. The first two models involved binary logit regression whereas the third was an ordered logit regression. In the first model, the dependent variable was participant started cycling recreationally during the Covid-19 pandemic (with the response being binary: yes/no). In the second model, the dependent variable was participant engages in recreational cycling only in the morning (with the response being binary: yes/no). In the third model, the dependent variable was the frequency of recreational cycling, with the response being ordinal: (a) occasional; (b) frequent; (c) regular. The dependent variables in second and third model refer to the three months preceding the survey.

The same list of independent variables (demographic, behavioural, and attitudinal) was used to fit all three models. To detect any presence of multicollinearity, the Variance Inflation Factors (VIFs) were calculated for each independent variable. VIFs must be smaller than 4 to eliminate the risk of multicollinearity (O’brien, 2007), and in this case, all were less than 1.5. For the ordered logit model, the Brant test was also carried out to check whether the parallel regression assumption was violated. This test produced non-significant statistics ($\text{chi}^2 = 20.08; p = 0.169; \text{df} = 15$) indicating that the use of ordered logit regression was acceptable.

2.5. Study limitations

This study is cross-sectional. Ideally, a longitudinal study employing representative panel data would be conducted to monitor changes in cycling and other green modes in the ‘new normal’. Further, the study targeted people who took up recreational cycling during the Covid-19 pandemic, neglecting those who gave up this activity during the same period. This means that the growth in recreational cycling in Hanoi may have been underestimated. Additionally, a number of natural environment characteristics that are known to affect cycling, such as weather (Bean et al., 2021) and topography (An et al., 2019; Mateo-Babiano et al., 2016) were ignored. So was the effect of built environment factors such as dedicated cycling infrastructure or land-use mix. While it is plausible that most recreational cycling takes place along water features and in parks where car traffic is low or nil, some recreational cycling may also take place along urban roads, provided that safe infrastructure is available, the levels of pollution are low, and the urban aesthetics along the route are attractive (Kamphuis et al., 2008; Lu et al., 2019; Márquez and Soto, 2021). In the future, these factors should be examined in order to design evidence-based policies in support of recreational cycling.

3. Results and discussion

The results are presented in two parts: first the descriptive statistics and then the regression analysis.

3.1. Descriptive statistics

Table 2 presents an overview of the sample characteristics. As seen, slightly more women than men participated in the survey: 54% vs 46%. (Meanwhile a myriad studies on commuter cycling have found large gender gaps, with women much less likely to travel to work by bicycle than men (Goel et al., 2021).) Most cyclists fell in the 18 to 55 age bracket. It was discouraging to observe that only 14% of the sample comprised older adults, who, in theory, have more time for recreational activities, and would derive many health

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5 This could be a simple methodological aberration: field surveyors reported that women were more approachable and more willing to complete the survey.
Fig. 1. Survey areas. Photos by authors.

Table 2
Descriptive statistics (N = 356).

| Variables                                         | Freq. | %   |
|---------------------------------------------------|-------|-----|
| Gender                                            |       |     |
| Female                                            | 192   | 54  |
| Male                                              | 164   | 46  |
| Age                                               |       |     |
| Adult (18–55)                                     | 305   | 86  |
| Older adult (>55)                                 | 51    | 14  |
| Monthly household income                          |       |     |
| Low (<500 USD)                                    | 52    | 15  |
| Low-middle (500–under 1000 USD)                   | 148   | 41  |
| High-middle (1000–under 1500 USD)                 | 113   | 32  |
| High (≥1500 USD)                                  | 43    | 12  |
| Employed and/or studying                          |       |     |
| Yes                                               | 265   | 74  |
| No                                                | 91    | 26  |
| Living with children <16                          |       |     |
| No                                                | 81    | 23  |
| Yes                                               | 275   | 77  |
| Purchased new bicycle during Covid-19             |       |     |
| Yes                                               | 78    | 22  |
| No                                                | 278   | 78  |
| Bicycle type                                      |       |     |
| Sports bicycle                                    | 244   | 69  |
| City bicycle                                      | 112   | 31  |
| I believe the risk of Covid-19 infection in public spaces is still high | 3.7 ± 0.06 |
| I believe recreational cycling is safer than walking in terms of infection risk | 3.9 ± 0.05 |
| I cycle to compensate for physical exercise lost during Covid-19/improve my health | 3.6 ± 0.05 |
| Cycling in the afternoon is much riskier than in the morning (due to high traffic) | 3.9 ± 0.06 |
| My friends/relatives are too busy to cycle with me in the afternoon | 3.4 ± 0.05 |
| I am too busy for recreational cycling in the afternoon | 3.3 ± 0.05 |
| Number of recreational cyclists during the Covid-19 pandemic compared to before |       |     |
| More                                              | 269   | 76  |
| Nearly unchanged                                   | 64    | 18  |
| Fewer                                             | 23    | 6   |
| Participant started cycling recreationally during the Covid-19 pandemic |       |     |
| No (already cycled for recreation pre-Covid-19)   | 266   | 75  |
| Yes                                               | 90    | 25  |
| Shifted from walking (pre-Covid-19) to recreational cycling | 56 | 15 |
| Started recreational cycling during Covid-19      | 34    | 10  |
| Participant engages in recreational cycling only in the morning |       |     |
| Yes                                               | 228   | 64  |
| No                                                | 128   | 36  |
| Frequency of recreational cycling |       |     |
| Occasional (up to 3 times per month)              | 57    | 16  |
| Frequent (1–3 days a week)                        | 136   | 38  |
| Regular (>4 days a week)                          | 163   | 46  |

a Mean.
b Standard error.
c Used as a dependent variable in modelling.
benefits from physical activity (see Titze et al., 2010). Among older cyclists, the gender split was balanced: 49% men vs 51% women.

Most study participants belonged in the middle-income range; few low- and high-income individuals appeared to engage in recreational cycling. Nearly three fourths of participants were employed and/or studying. It is positive that they managed to carve some time to cycle out of a presumably busy day.

A high majority of participants lived with children under 16. This was as expected given that extended families where three generations (children, parents, and grandparents) live under the same roof are common in Vietnam. (The situation in Global North settings may be quite different.) In terms of cycling uptake, it was positive to see that many parents and grandparents were setting an example for children.

More than a fifth of the participants had purchased a new bicycle after the outbreak of Covid-19, and about a quarter had started to cycle recreationally during the pandemic, as a way to feel better and incorporate more physical exercise into their daily routine. Therefore, the answer to the first research question set forth in the Introduction is: yes, recreational cycling has increased in Hanoi during the Covid-19 pandemic.

Some participants had even shifted from recreational walking to recreational cycling, believing that the latter was safer in terms of infection risk. While until recently Hanoi has been relatively safe from Covid-19, concern about contracting the disease was high among study participants. Cross-tabulations and Anova tests showed that men, older adults, and people living with children were slightly more concerned than others.

The overwhelming majority (84%) cycled regularly or frequently, and many had noticed an increase in recreational cycling during the pandemic. Reinforcing the observation that most participants were serious about cycling was the fact that 69% rode sport bicycles. Those who used regular city bikes tended to reach a lakeside with the intention of playing sports with friends (tai chi, dance, aerobics, badminton) whereas sports bicycles were mainly used by those intending to solely engage in cycling.

As expected based on preliminary observations, more people cycled in the morning (64%) compared to the afternoon (36%). Participants offered that recreational cycling in the afternoon was more difficult due to a higher risk of traffic crashes, general busyness, and the unavailability of relatives and/or friends whom to cycle during that time.

3.2. Regression analysis

Table 3 presents the results of the three models examining the factors that have influenced recreational cycling behaviour in Hanoi during the Covid-19 pandemic. Model 1 provides the answer to the second research question while Models 2 and 3 provide the answers to the third research question set forth in the Introduction.

While earlier research in other settings has found that cycling for recreation is not linked to gender (Heesch et al., 2014; Titze et al., 2010), this study found that women were less likely to take up recreational cycling during the Covid-19 pandemic - but note that the statistical significance was weak. Women were more likely to cycle exclusively in the morning. This is probably because in Vietnam, women are expected to shoulder most childcare and house chores and these responsibilities have increased noticeably during the pandemic (Nguyen and Armoogum, 2021). While women can allocate some time for recreational cycling by waking up early, after work they are too busy collecting children from school, shopping, and preparing dinner. A higher concern with traffic safety is another likely reason (Hidayati et al., 2020).

Older adults constituted a small part of the sample, as noted, and they tended to cycle in the morning. As with women, fear of traffic crashes during the afternoon rush hour is the most likely reason here (see Boufous et al., 2021). Another reason is the fresher air around lakes in the early hours. Also, older adults tend to sleep less and awake earlier (Bloom et al., 2009). However, older participants cycled more frequently than younger ones – as they have more time (if retired) and are more concerned with their health (Boufous et al., 2021). This finding is very positive in terms of public health because research has shown a significant inverse relationship between cycling and mortality related to serious conditions such as cardiovascular diseases, diabetes, and obesity among older persons (Andersen et al., 2015; Oja et al., 2011).

Unemployment or retirement was positively associated with the likelihood of taking up recreational cycling during the Covid-19 pandemic (albeit the statistical significance was weak). It is likely that some participants lost their jobs in the economic downturn that accompanied the pandemic, and took up cycling as a way to overcome the upset and spend their newfound free time. However, this result contradicts other studies which have found that exiting the labour force leads people to abandon recreational cycling as well (Heesch et al., 2014). A possible explanation is that losing one’s job can lead to depression. While physical exercise tends to alleviate depression, it may be the case that unemployed persons lack the motivation to engage in it (Roshanaei-Moghaddam et al., 2009).

Low-income participants cycled for recreation more frequently than high-income participants. The most likely reason is that wealthier people can afford alternatives for physical exercise, such as memberships in fitness centres or gym equipment at home, whereas for the poor cycling is a relatively cheap way to keep fit. Another explanation could be a prevailing time poverty among higher earning people. But it is not necessarily the case that higher paying jobs or more lucrative businesses require people to work longer hours. In fact, the poor, in Vietnam as elsewhere, are often forced to work multiple jobs to make ends meet (Sakellariou and Patrinos, 2000). Also, note that recreational cycling can be a costly activity if sports bicycles are used instead of conventional bicycles.

Parents and grandparents were more likely to have taken up recreational cycling during the pandemic but with a reduced frequency compared to other people. This is probably because caretakers are concerned about falling rates of physical activity among children in the Covid-19 era (Xiang et al., 2020) and are trying to compensate by taking the children out to cycle. However, it may be difficult to prepare the children for cycling in the morning before school, and the afternoons tend to be busy with tutoring and courses. As a result, most recreational cycling with children occurs on weekends. Despite parents’ best intentions, this may be insufficient for health and fitness. The World Health Organisation recommends that school-aged children (5-17 years old) attain at least 60 min of physical
activity, such as cycling, per day (The World Health Organization, 2010).

Those who were more concerned about contracting Covid-19 while outdoors, and those who were convinced that cycling is safer than walking (due to more distance and minimal interaction between riders than between pedestrians), were more likely to have taken up recreational cycling during the pandemic. In this sense, recreational cycling may be viewed as a self-protection measure and a strategy to assuage infection fears (Homburg and Stolberg, 2006; Régner et al., 2018) while compensating for a more sedentary lifestyle under pandemic conditions (Fig. 2a). Existing research has shown that walking and cycling have similar health benefits (Kelly et al., 2014).

During some Covid-19 stages, walking for recreation around the lakes was prohibited to prevent community transmission, thereby limiting opportunities for physical activity. No similar constraints applied to recreational cycling, which is why some people shifted from walking to bicycles to keep fit. The more were participants concerned about health and fitness, the more they cycled recreationally. This makes sense from a public health perspective: while anyone can contract Covid-19, a healthy and fit body may help overcome the disease more successfully (Bloch et al., 2020).

### Table 3
Modelling results ($N = 356$ for all models).

| Variable | Model 1 | Model 2 | Model 3 |
|----------|---------|---------|---------|
|          | Participant started cycling recreationally during the Covid-19 pandemic | Participant engages in recreational cycling only in the morning | Frequency of recreational cycling |
|          | Coef. | p | Coef. | p | Coef. | p |
| Gender (Ref = Male) | | | | | | |
| Female | −0.610 | 0.075 | 0.992 | 0.001 | 0.207 | 0.000 | 1.628 | 0.000 |
| Age (Ref = ≤55) | | | | | | |
| >55 | | | | | | |
| Employed/studying (Ref = Yes) | | | | | | |
| No | 0.731 | 0.062 | | | | | |
| Monthly household income (Ref = Low) | | | | | | |
| Low-middle | | | | | | |
| High-middle | | | | | | |
| High | | | | | | |
| Living with children <16 (Ref = Yes) | | | | | | |
| No | −0.759 | 0.033 | | | | | |
| Purchasing new bikes during Covid-19 (Ref = Yes) | | | | | | |
| No | −2.272 | 0.000 | −1.479 | 0.001 | | | |
| Bicycle type (Ref = City bicycle) | | | | | | |
| Sports bicycle | | | | | | |
| I believe the risk of Covid-19 infection in public spaces is still high | 0.299 | 0.046 | | | | | |
| I believe recreational cycling is safer than walking in terms of infection risk | 0.551 | 0.005 | | | | | |
| I cycle to compensate for physical exercise lost during Covid-19/improve my health | 0.346 | 0.035 | | | | | |
| Cycling in the afternoon is much riskier than in the morning (due to high traffic) | | | | | | |
| My friends/relatives are too busy to cycle with me in the afternoon | 0.263 | 0.055 | | | | | |
| I am too busy for recreational cycling in the afternoon | 0.250 | 0.041 | | | | | |
| Constant | −4.245 | 0.014 | −3.342 | 0.023 | −0.637 | 1.262 | |
| /cut1 (cut point 1) | | | | | | | |
| /cut2 (cut point 2) | | | | | | | |
| Log likelihood | −142.46153 | | −187.03833 | | −310.56037 | | |
| Likelihood Ratio chi-square test (df=15) | 117.64 | 90.97 | 104.12 | | | | |
| Pseudo R² | 0.2922 | 0.1956 | 0.1436 | | | | |

Notes.
- Only significant variables (p < 0.1) are shown.
- Binary logit regression (Yes = 1).
- Ordered logit regression with three ordinal levels (occasional; frequent; regular).

Fig. 2. (a) To limit the spread of Covid-19, boardwalks are blocked to prevent walking and gatherings; (b) Motorised vehicles run along recreational cyclists on narrow roads; (c) Recreational cycling is a collective activity. Photos by authors.
Physical inactivity has increased in Vietnamese megacities since *doi moi* and the accompanying socio-economic transformation. Research in Ho Chi Minh City, for example, shows that less than half of the adult population engages in at least 30 min of moderate physical activity per day (Trinh et al., 2008). Notably, recreational activities contribute little (less than 10%) to the overall physical activity level. This contrasts to Global North contexts where recreational sports, bicycles rides, walks, and hikes are the major source of physical activity among adults (Bertrais et al., 2004; Parks et al., 2003).

As expected, there was a positive relationship between purchasing a new bicycle and taking up recreational cycling. Participants with new bicycles were more likely to cycle for recreation only in the morning – possibly because they are relatively new to this activity and wish to avoid heavy traffic (Fig. 2b). This interpretation is reinforced by the finding that those riding a sports bicycle (presumably the more experienced cyclists) spread this activity more evenly between the morning and the afternoon.

Three attitudinal variables explained why mornings were preferred to the afternoons for recreational cycling. All associations were statistically significant and positive, meaning that, by choosing the mornings, people wished to avoid the risks associated with afternoon traffic, they were too busy with other things toward the end of the day, and their ‘cycling buddies’ were more available early in the day. The authors’ observations suggested that those cycling in groups tended to keep a close distance or even ride in horizontal formation while chatting with one another (Fig. 2c). Of course, distracted cyclists, who ignore motorised traffic and other obstacles, can place themselves and others at risk. At the same time, a critical mass of cyclists on the road can act to slow down motorised traffic and force car drivers and motorcycle riders to pay more attention.

Study participants were quite aware of motorised traffic. While the perceived risk of crashes was not a determinant of the overall likelihood to cycle recreationally, it did determine the timing of this activity. Unlike commuter cycling, recreational cycling is a flexible activity, and in this case, cyclists chose the time window that was less likely to lead to crashes. This finding is inconsistent with previous studies, which, counterintuitively, have found that recreational cycling rates are not affected by either the perceived traffic safety nor the perceived traffic volume (Adams et al., 2013; Titze et al., 2010).

4. Conclusion

This study has revealed that, in Hanoi recreational cycling has increased in popularity during the Covid-19 pandemic, with early morning being the preferred time for this activity. A quarter of the participants in this study started cycling recreationally since the first lockdown in April 2020, and about three quarters reported having noticed an increase in cycling activity around them. Nearly half of the participants cycled regularly (more than four times per week). These figures are impressive considering that no recent public policies and investments have been made in Hanoi to support this mode.

People have been embracing cycling as a way to maintain or increase physical activity levels, and to safely socialize at the time when social gatherings are limited, walking is prohibited in some zones, and social distancing rules apply everywhere. The groups that were most likely to have taken up cycling for recreation during the pandemic included men, those living with children in the home, and those not working or studying. Age and income were not significant.

A growth in recreational cycling is very positive, in that it promotes public health, raises the image of cycling in society, supports parenting and active aging, and strengthens the community spirit. Cycling also makes the city appear more friendly and cheerful (whereas streets clogged with motorised traffic are stressful and unpleasant). Perhaps recreational cycling can serve as a stepping stone to utilitarian cycling: once people become more confident by riding in low-traffic areas, they may be more willing to venture out on urban roads.

However, recreational cycling also poses challenges. A good portion of trips take place on mixed-traffic roads raising safety concerns. There is now a higher risk of collisions between bicycles and cars, motorcycles, pedestrians, and other bicycles (Jo et al., 2020). Study participants – women and older persons in particular - were in fact quite concerned about safety, and that is partly why they chose to cycle in the morning only. Also, more recreational cyclists on the road means more traffic congestion (as these trips do not substitute for motorised commute trips).

To sustain the growth in recreational cycling and widen the time-window for this activity while ensuring everyone’s safety, Hanoi’s planning and public health sectors should join forces to adopt a combination of ‘hard’ and ‘soft’ measures. The measures are similar to those required for utilitarian cycling, but should target areas where cycling for recreation is more likely to take place. These include urban and ex-urban parks, riversides, lake shores, and possibly historic districts such as the French Quarter and the Old Quarter (which are major tourist attractions). Here multi-use paths for micromobility modes should be created. Launching a public bikesharing scheme is also desirable at this stage.

Limited public budgets will preclude large infrastructure investments - especially during a major public health crisis such as Covid-19, which has required the diversion of transport funds to healthcare and has undermined public transport revenues. However, regulating motorised modes (e.g., by applying area-based or time-based restrictions that coincide with recreational cycling locations and timeframes) does not require much public spending. Social marketing is another low-cost strategy that the public sector could adopt. This is likely to yield good results, Vietnam having a collectivist culture (Lin et al., 2020). Recreational cycling should be promoted as a trendy activity that all social groups have come to enjoy.

Author statement

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