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Desire to work from home: Results of an Irish study

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ABSTRACT

Large levels of working from home (WFH) were induced by social distancing and viral control measures undertaken to mitigate the Covid-19 pandemic. Representing an unpredicted change in the way large amounts of people undertake their day to day work, it is expected that the legacy of this event, in terms of significant alterations to work and commuting patterns will have wide-ranging and long-lasting results. However, how persistent the current trends will be, remains an open question. Therefore, there is a need for a well-represented study of employees’ preferences for the post-pandemic future and focus on white-collar workers and their well-established attitudes considering their flexibility in terms of workplace arrangements. This paper presents the results of a survey undertaken in Ireland in the summer of 2021 gauging the desire of office workers to WFH, the format that most appeals to them, the consideration of home relocation based on the ability to WFH, and the factors that may explain such preferences. Results indicate high levels of desire to WFH, either full time or partially, with increased desire to WFH positively correlated to pre-pandemic commute length, and to a perceived increase in work productivity and quality of non-work life as a result of time spent WFH. Additionally, a number of workers state that they may consider home relocation based upon the ability to WFH. These results should be interpreted as the desire to WFH or total addressable market that exists, rather than the likely levels of WFH that will be observed post-Covid.

1. Introduction

As a result of the Covid-19 pandemic, increased requirements to enforce social distancing measures to mitigate the spread of the virus resulted in the widespread adoption of working from home (WFH) practices in workplaces where such measures were possible. While WFH or teleworking had long been mooted as a means of addressing issues such as congestion, transport-related emissions, and increasing quality of life (Jain et al., 2022), the process of detaching work from conventional places of work was relatively slow (Felstead, 2012) and the pandemic represented the first time that WFH had been widely adopted. Emerging research indicates that it is highly likely that there will be a legacy impact from these measures, with both employees and employers indicating preferences to retain some of the aspects of pandemic working environment (Beck and Hensher, 2021).

From the perspective of transport modellers and planners, the adoption of such measures is likely to have significant impacts upon existing services and planned transport investments. While there are likely to be a number of benefits on both a societal and individual basis, there are also likely to be negative impacts such as threats to the viability of transport services following a reduction in the number of commuting trips. Conversely, this reduction might be offset by an increase in non-work trips or longer commutes of employees who relocated to the suburban areas (Department of Transport, 2021).

As this phenomenon is still evolving, transport planners are now required to update forecasts that may have previously been considered stable, and as the impact of the pandemic on mobility is likely to represent a behavioural step change (Gkiotsalitis and Cats, 2021; Schmidt et al., 2021), rather than the natural extension of existing trends, there is an urgent requirement to collect data regarding the potential trend of long term large scale adoption of WFH. This is the area in which our paper focuses and seeks to make an impact by adding to the emerging literature in this field.

2. Background

Since the beginning of the Covid-19 pandemic, a number of studies have been conducted to examine the short-term impact of enforced WFH
on transport demand and only a few explored the degree of likely long-term changes in working (and, hence, commuting) patterns (Currie et al., 2021; Ceccato et al., 2021). Some studies carried out immediately before the pandemic are also of relevance in the latter context and were reviewed in the literature (Jain et al., 2022; Hensher et al., 2021; Kalter et al., 2021; Nguyen and Armoogum, 2021). The substantial body of the research concentrates on changes in working patterns during the Covid-19 pandemic and its implications for undertaken trips. These studies are based on the collected data for traffic volumes and observed behaviours but do not account for the motivation of these behaviours (Currie et al., 2021).

2.1. Self-reported interest in working from home

Within Europe, Kalter et al. (2021) explored the intended behaviours when the Covid-19 restrictions no longer apply using a sample from the Netherlands. 68% of surveyed employees showed an interest in increasing teleworking activities by one day after the pandemic as compared to the number of teleworking days before Covid-19. A third of employees who started to WH during the lockdown intend to continue doing so after the pandemic either one day a week or more. The research on perceptions of WH in Belgium conducted on the national scale and reported by Moens et al. (2021) also indicates an increased desire to perform more work remotely in the future, a feeling common for 62.7% of Flemish employees, and compatible with satisfactory experiences with WH during Covid-19 pandemic. Similarly, surveys in the UK as a whole (ONS, 2021) and Scotland (McGinley et al., 2020) found high levels of support for hybrid working patterns.

Beck and Hensher et al. (2021) report expectations for future WH among Australians who work in white-collar and blue-collar professions. The scholars concluded that widespread adoption of WH practices during the Covid-19 pandemic boosted the support for this work arrangement due to the positive experiences of both, employees and employers. The respondents expressed interest in WH more often, with more flexible hours, and being able to commute outside peak hours. According to the analysis presented by Beck et al. (2020), the number of employees who were not involved in any telework prior to Covid-19 dropped from 71% to 39% at its lowest after restrictions were imposed. As a result of positive experience with WH, 71% of respondents showed a desire to WH more often in the future and 62% expressed a wish to telework at least one day a week. On average, the employees would like to work 1.7 days a week post-Covid compared to 0.86 days before the pandemic (Beck et al., 2020; Beck and Hensher, 2021). Based on the preferences stated by the respondents in Melbourne (Currie et al., 2021), post-pandemic homeworking is expected to be 75% above pre-pandemic levels, when 4.6% of the working population WH on the day of the census. Beck et al. (2020) conclude that the extremes currently seen in that all work is done from home for around half of the respondents are not likely to be sustained, and rather there is a propensity for “a middle ground” in preferences. They also highlight the need for continuous monitoring of travel activities and evolving attitudes toward WH.

Worth mentioning is that the majority of studies referring to WH preferences in the post-pandemic world relied on convenience sampling when collecting data. On contrary, Kalter et al. (2021) used the data from the Dutch Travel Panel comprising of a representative sample of the Dutch population. Moreover, to overcome the “under-response bias” of convenience sampling, Currie et al. (2021) used a pre-stratification sampling to stratify the sample around age and income dimensions, and by regions within Melbourne. Alternatively, a post-stratification strategy was adopted by Moens et al. (2021) to ensure a more robust representation of gender, age, and education level in the Flemish sample.

2.2. Factors explaining preferences for working from home

Many factors have been said to increase preference for WH, such as reduced commutes and increased flexibility were the key factors among both those who already WH (pre-Covid) and those who aspired to do so. Kalter et al. (2021) found that office workers and employees who have longer commuting distances to the workplace show a greater desire to increase WH and reduce commuting by car. Also, pre-pandemic Helmink and Ristimäki (2007) noticed that in Finland, the probability of WH at least a day per week rises with the length of commuting trip and doubles for a 32 km commuting distance increase.

Demographic factors were found important in explaining the choice to WH, however, limited agreement exists between scholars regarding which demographic groups favour WH more and which less. Regarding age, the results of Nayak and Pandit (2021) show that the willingness to WH decreases with the age of respondents. Some other studies also suggest that employees aged 55 or more prefer to WH fewer days (Beck et al., 2020) or over-60s favour working remotely less than other age groups (McCarthy et al., 2021). However, on the contrary, older employees in Belgium were found to be more satisfied with WH than other age groups and appreciated its benefits to a greater extent (Moens et al., 2021). Older employees in South American countries tend to WH more frequently (Balbontín et al., 2021). There is also evidence that younger people display a greater desire to perform their work activities at the workplace rather than at home. For instance, this was noticed for respondents under-30s (McCarthy et al., 2021). Unlike all cited scholars, Currie et al. (2021) did not report any statistically reliable variation among age groups.

Concerning gender, most studies suggest that females have a more positive perception of WH than males. For example, Nguyen and Armoogum (2021) noted that women in Hanoi, Vietnam present substantially higher preferences for teleworking. This was also true in the Australian context, where females expressed an intention to WH on a significantly higher number of days (Beck and Hensher, 2021). Moreover, gender was revealed to be statistically significant in South America where women tend to WH more frequently (Balbontín et al., 2021). However, an Irish study by McCarthy et al. (2021) found that men favour daily telework while women would prefer to work remotely less frequent, only several days a week. Also, López Soler et al. (2021), in an EU-wide study using 2018 (i.e. pre-Covid) data, found that male gender was an significant factor in explaining the preference for WH.

The views regarding the role of income in explaining preferences for WH are rather consistent in the literature and indicate that the higher income groups were more likely to favour remote work arrangements. For instance, Australian employees with high and middle incomes expressed a desire to WH on a significantly higher number of days (Beck and Hensher, 2021). Similarly, a high-to-middle economic status of teleworkers was a predictor of WH across pre-pandemic Europe (López Soler et al., 2021). Income was also found to positively affect the weekly amount of WH in Australia and Chile (Balbontín et al., 2021). On a smaller scale, within the group of employees at the University of Padova in Italy, Ceccato et al. (2021) found that higher household income increases the probability to cancel the trip to work.

In addition, other factors such as improved work-life balance and higher productivity while WH may have a positive effect on strengthening the desire to WH. Scottish respondents to McGinley et al. (2020) stated that their staff had reported positive impacts on work-life balance, although certain groups of employees expressed negative mental health effects. Productivity emerges as a major factor influencing the decision to WH, both for employees and managers. Felstead and Reuschke (2020) suggest that homeworking boosts productivity; as do McCarthy et al. (2021) stating that 68% of respondents agreed or strongly agreed that working remotely increased their productivity. Beck and Hensher (2021) report a positive change in productivity for one-third of Australian employees and no change noticed by around half of the employees and employers. The evidence of a more substantial
decline in productivity emerges from the study of Shamshirpour et al. (2020) found that only roughly one-fifth of American telecommuters believe that their productivity increased, while the vast majority have seen a decrease or no change in productivity. These contradictory findings suggest that other underlying factors, such as work arrangements might be involved.

2.3. Residential relocation

Increased frequency of WHH leads to a lower frequency of commute, making it possible to accept longer commute distances, and hence new areas become feasible residential locations (Ettema, 2010). Several authors studying changes in commuting behaviour due to advances in information technology before Covid-19 noticed that teleworkers have longer commuting distances to their workplaces than other commuters (Gubins et al., 2019; Ettema, 2010). This might result from the flexibility that WHH offers or, conversely, the adoption of telework could lead to choosing a home location distant from the workplace (Silva and Melo, 2018). Interestingly, Ory and Mokhtarian (2006) noticed that employees already WHH relocate closer to their workplace, while the commuters who choose to move further start WHH after the relocation. The direction of residential relocation determines the total household commute (Melo and Silva, 2017). If the teleworker decides to move closer to the household member who does not WHH, the total commute will likely decrease. Alternatively, if the preferred new location is suburban or rural, there might be an increase in total distance and time travelled. Moving to a new residential context can also disrupt past transport mode choices and people's attitudes to travel (De Vos et al., 2018). Relocating from urbanised areas to suburban environments was found to increase car use and decrease walking, while an opposite effect relates to changing location from less to more urbanised.

WHH was found to be positively associated with a preference for suburban relocation (Ettema, 2010) seen as more attractive because of the green environment, bigger and more affordable houses. Another reason for such preference might be a lack of adequate provision of dwellings in urban areas caused by a low jobs-housing balance in the cities, especially in well-developed countries (Zheng et al., 2021). Furthermore, compared to households without children, families favour more remote areas - outer city, town, and rural settings - driven by a desire for a safe and green surrounding (Ettema, 2010). Another relocation option might be partially moving the workplace to a ‘second home’ located in the same country or abroad and used previously only for recreational purposes (Naess et al., 2019). While the literature on home relocation associated with teleworking pre-pandemic shows the general trends and patterns, the impact of increased WHH on residential relocation during the Covid-19 pandemic and post-pandemic attitudes toward it, have not been explored in the literature.

2.4. Overview of the Irish context and Covid-19 situation

The Covid-19 health measures were first imposed in Ireland in March 2020, when the businesses and schools were shut and a further “stay-at-home” order restricting movement was imposed and enforced by police (GOI, 2020). The lockdown restrictions were gradually removed beginning from May 2020, imposed again in October 2020, eased for December, and subsequently imposed from January 2021. A re-opening plan for May and June was announced in April 2021 and a further easing of restrictions for June, July, and August a month later (GOI, 2021b). Since April 2021, there was a full return to classrooms for primary and secondary school students who then had summer holidays starting at the end of June. Although many of the Covid-19 restrictions were eased from May 2021, the employees were still advised to work from home if possible which advice remained in place till the beginning of 2022. Following easing public health measures from January 2022, safe return to the workplace started to be supported with safety measures in place (DETE, 2022b). The mandatory requirement to wear masks, except for public transport and healthcare facilities, was removed on the last day of February 2022 (GOI, 2022). Employers were also encouraged to develop or finalise their blended or remote working arrangements. Moreover, the bill giving employees a legal right to request remote working is about to be written into law as a part of the government’s plan to make WHH a permanent feature of Ireland’s workforce (DETE, 2022a).

During the initial lockdown in 2020, the traffic volumes decreased by 70% nationwide. Car traffic volumes continued to remain below 2019 levels in 2021 gradually increasing through the first half of the year and keeping relatively constant toward the end of 2021. In April 2022 further increase in car weekly traffic volume was observed reaching a level only 1% lower than pre-pandemic for the Dublin area (where 40% of the country's population live), and a few percent lower at the regional sites (CSO, 2022a). Worth noting that April 2019 included the Easter holidays when traffic volume tends to be lower. Public transport trips increased to their highest level since March 2020, but as of April 2022, there are still 33% fewer such journeys taken than before the pandemic in 2019 (CSO, 2022b). Some increase in traffic volumes may be attributed to the government's support for returning to the workplace (since January 2022), but other non-work trips following the removal of restrictions may also play their role.

Before the Covid-19 pandemic, only 23% of Irish employees worked remotely at some point. Pandemic gave an opportunity to 80% of workers to experience some sort of WHH arrangements. Results from the public survey (CSO, 2021) suggest further that in November 2021, 65% of employees were working remotely all or some of the time. WHH arrangements are facilitated by well-developed ICT infrastructure, allowing the vast majority (92%) of households to access the Internet mainly through a fixed broadband connection, supported also in regional locations (CSO, 2020). The Irish population is concentrated in the Greater Dublin Area which employment catchment area reaches beyond its boundaries. Due to high housing costs in Dublin city, many households decide to move to the growing suburbs and nearby towns. High demand for homes in this area combined with insufficient supply and vacant relic houses adds to the ongoing housing problem.

2.5. The rationale of this study

How persistent the recent trends in WHH will be, seems to be the major gap in studying the travel and attitudes toward telework. Currie et al. (2021) and Jain et al. (2022) noticed that a well-represented study of employees' preferences is required to fill this research gap if the trends are to be accurately anticipated. The current study provides a nationally representative analysis of the post-pandemic preference of Irish white-collar to WHH and relocate, and the factors correlated to such preferences. The survey took place when public experience with WHH arrangements was already advanced, allowing for well-established attitudes to be reported. We focus on white-collar workers who show the greatest potential for switching their workplace or increasing WHH activities. The research problem presented in this work is especially interesting to inform policy on the scale of possibly large shifts in the actual travel post-pandemic. Although the conclusions drawn from this research can assist the transport authorities in planning future interventions, the analysis of the travel behaviours is out of the scope of this article.

In our study, the data collected through an online survey consists of a nationally representative sample of working adults by gender, age and region in Ireland. Our research intends to determine the self-stated preferences toward working from home post-Covid, frequency of WHH, and regional differences among office workers. To examine the factors differentiating the preference toward WHH we applied the ordinal logistic regression and explored the influence of employees' socioeconomic characteristics and commuting patterns before the pandemic, as well as self-reported changes in work productivity and personal life quality. Furthermore, the traditional logit model was used to determine the relationship between a similar set of independent
variables and the consideration of home relocation.

This study specifically addresses the following research questions:

1. To what extent is there a desire to continue WfH in a post-Covid world?
2. How is such a desire related to the characteristics of individuals and their pre-Covid work and commuting experiences?
3. How does WfH impact possibility of home relocation?

Examining the possibility of home relocation due to an increased instance of WfH provides a contribution to the transport geography field. The home relocation model is a first step to try to understand the longer term trends in population distribution post pandemic. This approach, while it does have some limitations (discussed in section 3.3), provides insights as to the potential relocation of workers.

3. Methods

In order to address concerns regarding the impact of WfH on future year demand, the National Transport Authority (NTA) of Ireland commissioned a survey of desire to WfH in the summer of 2021. The response variable of interest, the stated desire to WfH, is ordinal in nature. Therefore, the ordered logistic regression model was deemed to be most appropriate for the purposes of analysis.

3.1. Data

The survey sample was collected from a nationally representative survey panel with a booster for the GDA commissioned by NTA and provided by Behaviour and Attitudes. The sample consisted of 1282 respondents, however as this analysis is only focused on white-collar workers, this reduces to 896 respondents. This group was the focus as previous research conducted in Ireland had shown they were the most likely to WfH (Crowley et al., 2021; Caulfield, 2015; Paul O’Keefe et al., 2016).

The survey was conducted online between 7th June to 16th July 2021 through the representative panel where the selected relevant panelists were invited to participate. During this period, about 110 Covid-19 cases per 100,000 people were reported (HPSC, 2022), some Covid-19 restrictions were eased such as dining outdoor (but not in Covid-19 cases per 100,000 people were reported (HPSC, 2022), some Covid-19 restrictions were eased such as dining outdoor (but not in Covid-19 cases per 100,000 people were reported (HPSC, 2022), some Covid-19 restrictions were eased such as dining outdoor (but not in

3.2. Desire to work from home model

The desire to WfH, and its relationship to the characteristics of the respondents is modelling using an ordinal logistic regression models. These models are an extension of the standard binary logit model, and are suitable for variables where there the data is in the form of discrete categories, but with clear ordering present, such as Likert data. In the case of desire to WfH, once the “Can’t” option is removed, the responses can be considered ordinal, indicating increasing levels of WfH or remaining in the office.

The ordinal logistic regression is a cumulative probability model, whereby the log odds or logit of belonging to a given group, is defined by the independent characteristics of the individual, and is extracted by calculating cumulative odds and subtracting. The logit or log-odds of falling into one or a combination of the respective ordered categories (P) is given by (Snedker et al., 2002; Stata, 2022):

\[ \logit(P_i) = \log \frac{P_i}{1 - P_i} = \alpha_i + \beta X \]

\[ \logit (P_1 + P_2) = \log \frac{P_1 + P_2}{1 - P_1 - P_2} = \alpha_1 + \beta X \]

\[ \logit (P_1 + P_2 + \ldots + P_k) = \log \frac{P_1 + P_2 + \ldots + P_k}{1 - P_1 - P_2 - \ldots - P_k} = \alpha_k + \beta X \]

Where \( a \) represent the cut points estimated by the model, \( k \) is the number of possible outcomes that the dependent variable can take, and \( \beta \) denotes the coefficients that were estimated for each variable.

While this research is more focused on the role that predictor variables play in terms of impact on desire to WfH, and less concerned on calculating the exact probabilities associated with the given categories, the ordinal logistic regression model represents an appropriate means of examining such relationships, given the nature of the response variable.

3.3. Home relocation model

To examine the impact of WfH practices on individuals’ desire to relocate their home, respondents were asked the following: “Would you consider changing home location based upon the ability to WfH”, with a yes/no response being required. It could be argued that this application is simplistic and ignores the potential changes in distances travelled due to relocation. However, the model does provide some insights as to what the potential longer term changes might be after the pandemic.

As this response was binary in nature, a traditional logit model was used to analyse the relationship between the response and the characteristics of the individual, rather than the extended ordinal version utilised for the previous question. This takes a similar form as the previous model, though it simplifies to:

\[ \logit(P) = \log \frac{P}{1 - P} = \alpha_1 + \beta X \]
4. Results

4.1. Descriptive statistics

The main point of interest in the survey was revealing the propensity to WfH after pandemic. The survey asked respondents if they wished to WfH post-Covid, noting that this relates to the desire to WfH, not how possible it is. Given options of various degrees working from the office or home (Fig. 1), 77.9% of respondents in the sample showed a preference for some form of WfH. Fig. 1 outlines the desire to WfH and the percentage of respondents in the respective categories for both the GDA and the rest of Ireland. These results demonstrate that the majority of respondents in both areas wish to engage in some form of WfH, either full time or a blended approach, with a mostly at home setup being the most attractive, particularly within the GDA. It is worth noting that only 10.6% of respondents within the GDA and 12.9% of those outside it, who have the ability to WfH, wish to work full time from the office. In this analysis Ireland is split between the GDA and the rest of the country.

Fig. 2 outlines the preference to WfH by day. These are based on the answers to the question asking on which of the days would the respondents like to WfH, and how often would they like to work on this day (always, sometimes, never, do not usually work this day), if they were given a free choice. The results of this analysis clearly highlight a biphasic desire to WfH, with higher levels of preference being expressed to WfH on Mondays and Fridays, with respect to the middle of the standard working week. While this only represents desire, and does not take into account how organisations may structure their staff, it does highlight potential issues for public transport services, with demand potentially being concentrated in the middle of the week.

In addition, respondents were asked about how their experiences with WfH during the Covid-19 pandemic impacted upon both their perceived productivity at work, as well as the quality of their non-work lives. Precisely, “how do you feel working from home has impacted on your work productivity?” and “how do you feel the quality of your non-work life has changed due to working from home?”. The respondents marked their answers on a 5-point scale from “greatly increased/improved” to “greatly decreased/disimproved a lot”. Fig. 3 presents the results for these questions, highlighting that the majority of respondents perceived an increase in their productivity at work and an increase in the quality of their non-work life.

4.2. Desire to work from home logistic regression results

Table 2 outlines the results of the ordered logistic regression undertaken to provide insight into the factors correlated to desire to WfH. Coefficients should be interpreted such that positive and increasing values represent a greater desire to WfH with respect to the reference level, while negative and decreasing values represent a lesser desire. For instance, the reference group for “gender” is set to be “male” and the negative coefficient value for the “female” group indicates a lesser desire for WfH expressed by females than males. However, as the model is based upon a logistic distribution, coefficient values cannot be interpreted as may be the case with a linear model where a one-point change in the independent variable results in a change to the dependent variable proportional to the value of the coefficient. In this case, the odds ratio provides a more intuitive basis for understanding as it provides the change in odds resulting from a change in the predictor variable. In the case of continuous variables, this is a one-unit change, and in the case of categorical variables, it is a change between respective levels.

Explanatory variables can be broadly classified into two categories, namely the characteristics of the commuter, and the characteristics of their regular pre-Covid commute. First examining the characteristics of the commuter, we find that desire to WfH is negatively related to the age, modelled as a continuous variable, of respondents, with younger workers displaying a greater desire to WfH. The gender of the respondent is not a significant predictor of WfH desire, nor is the number of children under eighteen present in their household with respect to the reference category of no children present.

Examining the role of the individual within their organisation of employment, while individual categories display parameters that are statistically different from the reference category at \( p = 0.05 \), no clear pattern emerges with regard to either their position within the organisation (junior role, middle role, senior role) or the number of years they have spent within the role. A lower desire to WfH exists for middle role workers than more junior ones, but the difference between employees in junior and senior roles does not emerge as being statistically significant.

For the role of commute characteristics, a clear positive relationship emerges with respect to pre-Covid one way commute travel time where, with the exception of respondents in the 75 to 90 min category, desire to WfH increases with respect to travel time and is highly statistically significant. This effect is most pronounced for those workers in the 90–120 min and 120+ minute categories, as may be expected given that these are quite long one way commutes.

Fig. 1. White-collar employees’ working from home preference by area, GDA (N = 586) vs non-GDA (N = 310).
Dummy variables are included to capture the respondents’ usual commuter modes. If the trip is multimodal, a respondent is assigned to more than one mode. It should be noted that each of the modes is represented by an individual dummy variable, rather than by a single mode categorical variable, hence the lack of a reference mode. While no mode is observed to be statistically significant at $p = 0.05$, with an odds ratio of 1.54 and $p = 0.06$ it appears that rail users are more likely to WfH than other modes, even when controlling for commute length.

Finally, the model also examines the relationship between stated changes in productivity (self-reported) and quality of work-life, with the desire to WfH. These results clearly demonstrate that greater levels of WfH is desirable to those who have seen increased productivity and increased quality of non-work life while WfH. While these results may not be very surprising, they indicate the model is operating as would be expected.

4.3. Home relocation logistic regression results

This study also revealed the attitudes of respondents toward home relocation. The survey asked respondents if they would consider changing home location based upon the ability to work from home (yes/no question). Up to 42.5% of the white-collar respondents who have the ability to work from home state that they would consider moving. It must be noted that this does not represent 42.5% of the sample, rather those respondents within the white-collar category who had already indicated that it was possible for them to WfH.

Table 3 outlines the results of the logistic regression to identify the independent characteristics of the respondents that are correlated with their consideration of change in home location. With regard to demographic characteristics, a statistically significant difference is not observed between genders, while an increase in the age of respondents is observed to be linked with a decreased, and significant, reduction in consideration of relocating.

With an odds ratio value of 1.68, respondents living in Dublin are more likely to consider relocating based upon working from home ability, in comparison to the non-Dublin reference group. In terms of pre-Covid commute, a significant difference from the reference group is only present for those commuters who already travel over 120 min. No
significant differences are present with regard to mode of commuting. Regarding stated change in productivity, respondents who stated their productivity had somewhat increased are not statistically different from the reference group who stated their productivity had greatly increased, however for the other categories, consideration of home relocation appears to decline within respect to declining stated changes in productivity experienced. The same pattern is observed for respondents who stated that their non-work life had improved, where there is a divide between those categories that saw improvement, who have a greater tendency to consider relocation, and those who did not see an improvement, and have a lower tendency to consider moving.

Due to issues of multicolinearity, the presence of children in the respondent’s household has been reduced to a binary variable, compared to a categorical variable in the ordinal regression model. The multicollinearity was caused by high correlations between this and other variables leading to problems with identifying which variables explain the dependent variable. Regardless of that, the presence of children was not found to be statistically significant. In terms of role within the organisation, neither position nor the number of years within a given structure, etc.)

5. Discussion and conclusions

This research was undertaken to examine the desire to WfH and the

| Table 2 |
| --- |
| Ordered logistic regression model estimates for desire to work from home post-pandemic. |
| Number of obs. | 588 |
| LR chi2(36) | 195.22 |
| Prob. > chi2 | 0 |
| Pseudo R2 | 0.1163 |
| Log likelihood | 741.786 |

| Gender | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Male | Ref | Ref | Ref |
| Female | 0.14 | 0.87 | 0.38 |
| Home Location | 0.03 | 0.98 | 0.01 |
| Not Dublin | - | - | - |
| Dublin | 0.13 | 1.14 | 0.47 |

| Commute | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Less than 15 min | 0.64 | 1.90 | 0.02 |
| 15 to 30 min | 0.73 | 2.08 | 0.01 |
| 30 to 45 min | 0.90 | 2.47 | 0.00 |
| 45 to 60 min | 1.17 | 3.20 | 0.00 |
| 60 to 75 min | 2.59 | 13.31 | 0.00 |
| 75 to 90 min | 2.67 | 14.42 | 0.00 |
| 90 to 120 min | 2.67 | 14.42 | 0.00 |

| Mode (dummy variables) | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Car Driver | 0.03 | 1.03 | 0.90 |
| Bike | 0.09 | 0.91 | 0.74 |
| Bus | 0.18 | 1.19 | 0.41 |
| Rail | 0.43 | 1.54 | 0.06 |
| Walk | 0.03 | 1.03 | 0.91 |

| Perceived Change in Work Productivity | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Greatly Increased | 0.08 | 1.09 | 0.72 |
| Somewhat Increased | -0.81 | 0.44 | 0.00 |
| No Change | -1.52 | 0.22 | 0.00 |
| Greatly Decreased | -2.91 | 0.05 | 0.00 |

| Change in Quality of Non-Work Life | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Greatly Improved | 0.03 | 1.03 | 0.94 |
| Somewhat Improved | -0.58 | 0.68 | 0.08 |
| No Change | -1.10 | 0.33 | 0.00 |
| Disimproved a little | -1.13 | 0.32 | 0.00 |
| Disimproved a lot | -1.31 | 0.27 | 0.00 |

| Children Under 18 | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Zero | 0.15 | 1.16 | 0.51 |
| One | 0.03 | 1.03 | 0.94 |
| Two | -1.20 | 0.30 | 0.07 |
| Three | 0.27 | 1.00 | 0.59 |

| Role in Organisation | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Junior role | -0.54 | 0.58 | 0.01 |
| Middle role | -0.40 | 0.67 | 0.13 |
| Senior role | 0.64 | 1.89 | 0.33 |

| Children Present | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Less than a year | 0.14 | 0.87 | 0.49 |
| 1–2 years | -0.41 | 0.66 | 0.19 |
| 2–5 years | -0.02 | 1.02 | 0.95 |
| 5–10 years | -0.23 | 0.79 | 0.49 |
| 10–20 years | 0.18 | 1.20 | 0.66 |
| More than 20 years | -0.71 | 0.49 | 0.30 |

Table 3

| Logistic regression model estimates for desire to changing home location. |
| Number of obs. | 588 |
| LR chi2(32) | 117.79 |
| Prob. > chi2 | 0 |
| Pseudo R2 | 0.1469 |
| Log likelihood | -342.065 |

| Gender | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Male | Ref | Ref | Ref |
| Female | 0.31 | 1.36 | 0.12 |
| Age | -0.05 | 0.95 | 0.00 |

| Home Location | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Not Dublin | Ref | Ref | Ref |
| Dublin | 0.52 | 1.68 | 0.01 |

| Commute | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Less than 15 min | 0.13 | 1.14 | 0.70 |
| 15 to 30 min | 0.58 | 1.78 | 0.11 |
| 30 to 45 min | 0.08 | 1.09 | 0.83 |
| 45 to 60 min | 0.24 | 1.27 | 0.59 |
| 60 to 75 min | 0.01 | 1.01 | 0.99 |
| 75 to 90 min | 0.99 | 2.69 | 0.19 |
| Over 120 min | 2.07 | 7.91 | 0.04 |

| Mode (dummy variables) | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Car Driver | -0.27 | 0.77 | 0.29 |
| Bike | -0.35 | 0.70 | 0.27 |
| Bus | 0.33 | 1.40 | 0.19 |
| Rail | 0.20 | 1.22 | 0.45 |
| Walk | 0.46 | 1.58 | 0.10 |

| Perceived Change in Work Productivity | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Greatly Increased | Ref | Ref | Ref |
| Somewhat Increased | -0.14 | 0.87 | 0.61 |
| No Change | -0.87 | 0.42 | 0.00 |
| Somewhat Decreased | -0.47 | 0.62 | 0.21 |
| Greatly Decreased | -2.04 | 0.13 | 0.03 |

| Change in Quality of Non-Work Life | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Greatly Improved | 0.10 | 1.10 | 0.70 |
| Somewhat Improved | -0.15 | 0.86 | 0.64 |
| No Change | -0.79 | 0.45 | 0.02 |
| Disimproved a little | -1.27 | 0.28 | 0.03 |

| Children Under 18 | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| No Children | Ref | Ref | Ref |
| Children Present | -0.14 | 0.87 | 0.49 |

| Role in Organisation | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Junior role | Ref | Ref | Ref |
| Middle role | -0.33 | 0.72 | 0.20 |
| Senior role | -0.04 | 0.96 | 0.89 |

| Role in Organisation | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Not applicable (sole trader, flat work | 1.28 | 3.59 | 0.08 |
| structure, etc.) | Number of Years in Role | Coefficient | Odds Ratio | P > z |
| --- | --- | --- | --- |
| Less than a year | 0.41 | 0.66 | 0.19 |
| 1–2 years | -0.02 | 1.02 | 0.95 |
| 2–5 years | -0.23 | 0.79 | 0.49 |
| 5–10 years | 0.18 | 1.20 | 0.66 |
| More than 20 years | -0.71 | 0.49 | 0.30 |
consideration of relocation based upon this ability in a post-Covid environment using a sample of office workers in Ireland. In terms of general trends, the results of this study highlight the presence of a large desire to continue WfH, especially in some form of hybrid model, within the sample of Irish office workers, with rough 3 out of every 4 workers desiring some form of continued WfH arrangements. Results also demonstrated that, while mostly WfH appears to be the most popular option, there is not a majority consensus regarding the most attractive balance of from-home and on-site working, suggesting that organisations and employers may need to provide multiple options to their staff.

The results presented, indicate that, given workers’ free choice, there is likely to be a substantial decrease in commuter trips, and that such a decrease will not be evenly distributed across the traditional Monday to Friday work week. The reduction in peak-hour commuting will likely occur due to employees choosing to WfH. The continued practice is expected to “lead to reduced demand for the commercial services that typically support office-based activities in centralised locations such food outlets and cleaning companies” and hence “it is possible that the incidence of travel to urban centres among workers who do not engage in teleworking will also be suppressed to some extent.” (Department of Transport, 2021, pp. 6–7). Yet, a decrease in commuter trips might not necessarily lead to a decline in the total number of journeys as home-based telework might induce travel. In particular, more travel was observed for single-worker households (Silva and Melo, 2018). Telecommuters make fewer commute trips but more non-work journeys and frequency of trips for other purposes can be reduced if accessibility to daily destinations is facilitated through local planning (Budnitz et al., 2020). For example, WfH reduced travel demand in Sweden and contributed to greater use of active transport modes, presumably for non-commute trips (Elder, 2020). Therefore, an increase in non-commuter journeys is a possible outcome of intensified WfH practices to be considered by transport planners and hence there is a need for mixed land-use planning and compact development where non-commuting trips can be taken by walk or bicycle.

Examining the desire to WfH with regard to the socio-economic and travel characteristics of the respondents, pre-pandemic commute length emerges as a significant predictor of desire to WfH, with longer commute times being associated with an increased desire to spend more time WfH. This makes intuitive sense as travel time has long been identified as a negative aspect of travelling and one that many interventions seek to reduce. This link was also spotted in several studies referring to pre-Covid arrangements (Helminen and Ristimäki, 2007) and post-Covid attitudes (Kalter et al., 2021; Nguyen and Armoogum, 2021) where longer commuting distance to the workplace was associated with a greater desire to increase WfH or agree to remote work arrangements after the pandemic.

Looking at the impact of the recent experience of WfH, stated increases in work productivity as well as increases in the quality of non-work life are found within the sample. Positive changes in these metrics are found to be strongly and positively associated with an increased desire to WfH. This finding can be considered to be intuitively correct, with the majority of respondents stating that both their productivity and quality of life has increased due to WfH, and it would naturally be expected that they wish to retain these benefits. While this finding aligns with evidence in Beck et al. (2020) and Kalter et al. (2021) who noticed a higher propensity for telework associated with greater productivity, there might be some gender differences in certain geographical contexts (Nguyen and Armoogum, 2021). As noticed by Beck et al. (2020), some employees will still prefer to undertake working activities at home regardless of self-reported productivity level.

Further, this study addressed the potential for relocation based upon the ability to work from home, and specifically how this relates to the characteristics of the respondents. For the purposes of consistency, the same independent variables were used in this model as were used for the desire to WfH analysis. We found that almost half of the employees who can WfH stated they would consider changing their home location based on the ability to WfH. Results also indicate a higher preference for Dublin based dwellers to relocate, when compared to non-Dublin based workers. While gender has not been found to be a significant predictor of consideration of relocation, a significant relationship was observed with respect to age, where younger respondents are more likely to consider relocation. Given the considerable interest in residential relocation and that, according to estimates, around 8% of employees had already relocated within Ireland since the beginning of the pandemic, there are likely to be certain changes in spatial settlement patterns influencing demand for transport and use of transport network. Implications from residential relocation following the surge in WfH, in contrast to limited pre-pandemic experience, can be profound. Initially, it is expected that commute length for households that would relocate will increase, however with a lower frequency of the trips made (Melo and Silva, 2017). Relocation to low-density areas following the ability for remote working has also the potential to revive rural communities vulnerable to depopulation (GOL, 2021a). Exploring the implications of home relocation further with reference to preferences and evolving trends is a highly advisable direction for future research.

Overall, the results of this analysis show that there is a considerable desire for large parts of the working population to continue some form of WfH in a post-Covid world, and that only some of the factors that determine this can be considered to be foreseeable at the level that transport modellers traditionally operate. Moreover, the positive attitudes and intention to WfH only translate into action when work activities are feasible to be done remotely and when social and employer support is given (Jain et al., 2022). Hence, to achieve higher precision in forecasting the impacts on public transport, walking, cycling, and traffic volumes, further research could focus on employers’ attitudes toward WfH practices and their support for long-term remote work arrangements. However, the results presented in this paper do outline that there is a very considerable addressable market for both WfH, and home relocation as a result of this. This also demonstrates that working from home as a transport demand management tool provides policymakers with an important instrument to use when formulating transport and spatial strategies.

**CRediT authorship contribution statement**

Agnieszka Stefaniec: Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Resources, Data curation, Writing – original draft, Writing – review & editing, Visualization. William Brazil: Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Resources, Data curation, Writing – original draft, Writing – review & editing, Visualization, Supervision, Project administration. Warren Whitney: Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Resources, Data curation, Writing – original draft, Writing – review & editing, Visualization. Brian Caulfield: Conceptualization, Methodology, Software, Formal analysis, Resources, Data curation, Writing – original draft, Writing – review & editing, Visualization, Supervision, Project administration, Funding acquisition.

**Data availability**

The data that has been used is confidential.

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