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Who was more likely to work from home during the COVID-19 pandemic? A gender perspective in Switzerland

Moreno Baruffini ^a and Federica Rossi ^b

ABSTRACT

The COVID-19 pandemic has brought about a significant impact on people's lives, both in terms of health and socioeconomic aspects. The pandemic has led to a shift in the work environment, with a massive increase in the number of people working from home due to movement restrictions. In this study, we analyse data from two waves (2019 and 2020) of the Swiss Labour Force Survey to investigate the prevalence of working from home in Switzerland before and during the pandemic. The study has two aims: to identify the characteristics of Swiss teleworkers during the pandemic and to determine if there is a gender gap in working from home. The findings reveal that highly educated workers with children in high-level occupations are more likely to telework. However, there is a gender gap in teleworking in some sectors, since part-time workers, who are mostly women (74 percent), are less likely to work from home than full-time workers.

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1. INTRODUCTION

The pandemic caused by the rapid spread worldwide of the new coronavirus SARS-CoV-2 in 2019–2020, well known as COVID-19, has profoundly affected the way people work, how and where they spend time, their lifestyle, being, as such, not only a health crisis but also a socio-economic one. Moreover, it changed our common language: words like contact tracing, social distancing, etc. became of everyday use. In particular, the frequency in the use of terms like remote working, teleworking, smart working and working from home has exponentially increased. Although they are all related to the spatial distribution of work, with some degree of overlapping, they are not precisely synonymous, but each presents specific characteristics.

As defined by the International Labour Organization (ILO, 2020), remote working is the broadest concept, indicating a situation where ‘the work is wholly or partly carried out at an

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alternative worksite than the default place of work (defined as the employer's/client's premises or public space where work is usually carried out). Teleworking could be seen as a subcategory of remote working, with specific features: the work carried out remotely implies the use of technological devices (e.g., computers, tablets, mobile phones), and it is often limited to employees only (Messenger et al., 2017). Finally, smart working refers to a situation where the work is partly carried out in the office and partly remotely to accommodate the need to balance work and family commitments (Weber et al., 2020). Working from home refers to the work entirely or partly done within the worker's own home (ILO, 2020). As underlined by Sostero et al. (2020), many employees working from home typically make intensive use of technological devices; therefore, the terms working from home and teleworking are used interchangeably throughout this paper.

The adoption of teleworking arrangements inside the European Union (EU) was highly heterogeneous up to the pandemic spread. As underlined in the study by Sostero et al. (2020), in 2019, more than 25 percent of workers worked from home either frequently or occasionally in Northern European countries, including Sweden, Finland and the Netherlands. However, fifteen of the twenty-seven EU countries exhibited a percentage below ten percent; specifically, Greece, Cyprus and Italy ranked lowest. There were countries like Belgium, France and Portugal that fell in between the two extremes, with teleworking percentages ranging from 13 to 19 percent. Among the reasons underlying this diversity, there are differences in the industrial structures, occupational mixes, employment distribution by firm size, rate of self-employment, digital technologies use among workers, organisational and management cultures, and regulatory frameworks across different countries (Vargas Llave & Weber, 2020).

This trend drastically changed during the COVID-19 pandemic, when all countries experienced a growth in working from home: according to the ILO (2020), around half of the workforce in high-income countries, such as North America and Western Europe, was able to work from home during the pandemic. Specifically, teleworkers share was over 30 percent in all but four EU countries (Romania, Hungary, Croatia and Bulgaria), varying within a wide range from 18 percent in Romania to 59 percent in Finland (Sostero et al., 2020, based on Eurofound survey data, collected in April 2020).

Although Switzerland is located in the middle of Europe, it is not part of the EU and only a few studies on the diffusion of teleworking in this country exist, motivating the current study.

Moreover, Switzerland represents a peculiar research setting concerning gender disparities in the labour market. Indeed, while 70% of men aged 15 years and above are employed, only 60% of women in the same age group are employed. A significant proportion of women in Switzerland, around 45%, work 30 h or less per week, compared to only 11.2% of men. Additionally, the gender pay gap is quite significant, with women earning an average of 19.0% or CHF 1512 less per month than men. Women are under-represented in demanding and senior positions, less well-qualified on average, and are more likely to work in low-paid sectors (Federal Office for Gender Equality, 2023).

Given the existing disparities described above, the paper aims to investigate the spread of working from home in Switzerland and to verify if gender gaps also exist in working from home. As previous studies (De Vos, 2020; Okubo et al., 2020; Tremblay, 2002; Wheatley, 2012) suggested, teleworking practices could affect workers' health, well-being, and work-life balance. Specifically, the following research questions are tackled:

- R1. Compare the diffusion of working from home before and during the COVID-19 pandemic.
- R2. Outline a profile of the Swiss teleworker during the pandemic.
- R3. Verify the existence of a gender gap in teleworking activities.

To reach these goals, the micro-data from two waves (2019 and 2020) of the Swiss Labour Force Survey are analysed through descriptive statistics and an econometric model. The paper therefore aims to fill the gap in the literature by disentangling the gender gap in teleworking arrangements in Switzerland through different sectors. As far as we know this is the first attempt to quantitatively study the teleworkability in the Swiss context during the COVID-19 pandemic.

The paper is organised as follows. Section 2 gives a brief overview of the literature on teleworkers' profiles both before and during the COVID-19 pandemic. Section 3 describes the evolution of the COVID-19 pandemic in Switzerland and the related restricted measures undertaken. Data and methodology are presented in Section 4. Section 5 gives the results of the analysis. Finally, Section 6 is dedicated to discussion and conclusions.

2. LITERATURE REVIEW

The spread of remote working is one aspect of the complex mega trends that have characterised the last few decades, first and foremost the digitalisation processes. The rapid development of information and communication technologies (ICT) has allowed for an increasing flexibilisation of both the organisation and the spatial distribution of work. The COVID-19 pandemic has only accelerated these phenomena, bringing teleworking to the levels described above.

In this context, the features influencing teleworkability (i.e., the actual possibility of teleworking) can be grouped into workers' individual characteristics, firms' characteristics and territorial dimension.

Using information from the EU survey on ICT usage among workers, Sostero et al. (2020) described the socioeconomic profile of the average teleworker before the COVID-19 pandemic. It was shown that almost 40 percent of highly educated workers did so at least occasionally, compared to 10 percent of individuals with a medium level of education and only 3 percent of people with low or no education. As well known, there is a strong correlation between income and education. In the EU-27, workers in the top quartile of the income distribution had a 25 percent home-based workforce, compared to less than six percent in the lowest quartile. The pandemic made inequality worse, since higher-paid workers are more likely to be able to telework and, as a result, have a lesser likelihood of losing their jobs (Garrote Sanchez et al., 2021).

Gender represents a key dimension in working from home (Alfano et al., 2023). Before the pandemic, the gender differences in teleworking could be partially explained by the persistence of the traditional gendered division of unpaid work (Abendroth et al., 2022). Indeed, women would like to work from home to manage both family and working commitments (Arntz et al., 2020). This, however, contrasts with the cultural barriers of businesses, which forbid remote working based on the stereotype that women, particularly while working from home, experience a conflict between work and family duties (Abendroth et al., 2022). Instead, men had fewer cultural barriers with this working arrangement (Lott & Chung, 2016).

In the EU survey on ICT usage among workers, only small gender differences in the teleworking practices are identified (21 percent of men versus 18 percent of women); moreover, workers with children teleworked slightly more than people without them.

After the COVID-19 outbreak, women started working from home more than men (41 percent versus 37 percent), and the increase in the frequency of working from home was highest among younger employees (15–29 years old).

Depalo and Giorgi (2021) analysed the case of Italy, where teleworking increased from 1.5 percent in 2019 to 14 percent in the second quarter of 2020. They found that working from home grew significantly for women (+15.4 percent versus +12.8 percent for men), for larger companies' employees and within some sectors (i.e., ICT, financial and insurance activities,

real estate). Moreover, highly educated, managers and white-collar workers are more likely to work from home.

Abendroth et al. (2022) found that gender differences in the use and extent of teleworking decreased during the first wave of the pandemic in Germany.

Avdiu and Nayyar (2020) found that a large share of women are employed in occupations – such as personal care, food services, and sales-related jobs – that are intensive in face-to-face interactions and therefore cannot be performed at home.

Looking at the contract typology, Ono and Mori (2021) showed that part-time workers were significantly less likely to telework both before and after the COVID-19 outbreak. On the other hand, López-Igual and Rodríguez-Modroño (2020) suggested that teleworking is also becoming more common in jobs that are more temporary, low-paying and uncertain.

Several papers investigated the feasibility of working from home by occupation (Arntz et al., 2020; Barrero et al., 2023) and estimated the percentage of jobs that could be done from home in various countries: 37 percent of jobs in the United States can be performed entirely at home (Dingel & Neiman, 2020); 38 percent in Norway (Holgersen et al., 2021) and 41 percent in Canada (Gallacher & Hossain, 2020). López-Igual and Rodríguez-Modroño (2020) found that occasional European teleworkers are usually male managers or professionals.

Not only do workers' characteristics influence the likelihood of observing working from home, but also the firms' characteristics, specifically the sector and the size.

Barbieri et al. (2021) used data from the Italian INAPP survey to create a remote working index by sector. They demonstrated that, given the nature of the occupations, teleworking is more common in specific industries (e.g., ICT, real estate, finance and professional activities) and in knowledge- and ICT-intensive business services.

Using data from the EU-Labour Force Survey, Sostero et al. (2020) found that in 2018 it was more common to observe teleworking among employees working in ICT (35 percent), knowledge-intensive business services (26 percent), publishing, audiovisual and broadcasting activities (25 percent) and education¹ (32 percent). Furthermore, it has been shown that larger businesses are more likely than smaller ones to implement flexible work arrangements, such as teleworking.

Finally, looking at the territorial dimension, Sostero et al. (2020) showed that employees residing in cities or city suburbs were more likely to telework. This result was confirmed in the analysis by Vilhelmson and Thulin (2016) and by Ono and Mori (2021), who highlighted that teleworking was more common in the urban areas in China, the USA, Italy and Germany, while less common in South Korea.

3. THE COVID-19 PANDEMIC IN SWITZERLAND

Switzerland is a unique research setting, consisting of a confederation of 26 states known as Cantons and having four official languages – German, French, Italian and Romansh. The country's federal structure has resulted in each Canton having its unique economic structure and measures to contain the pandemic. Therefore, the diffusion of the COVID-19 pandemic has varied greatly across the country. The French and Italian-speaking Cantons were more affected than the German-speaking ones, with the first positive case being recorded in Ticino, on 25 February 2020, and the second in Geneva.

In response to the pandemic, the Swiss Federal Council declared an 'extraordinary situation' on 16 March 2020, which led to the closure of all private and public events, restaurants, bars, leisure facilities and shops (excluding grocery stores and pharmacies). These measures were relaxed after 27 April 2020, with a gradual reopening of all economic activities and the easing of mobility restrictions.

The second wave of the pandemic hit in late October 2020. However, the Federal Council did not intervene and left each Canton to implement its measures. There were, therefore, significant discrepancies among the Canton responses, with some imposing strict restrictions on bars, restaurants and festivals, while others allowed leisure facilities to remain open.

Deopa and Fortunato (2021) investigated compliance with social distancing measures in Switzerland during 2020, using mobility data. They found that cultural differences across Swiss Cantons played a role, with German-speaking Cantons decreasing their mobility for non-essential activities significantly less than French-speaking Cantons. Meanwhile, Mazzonna and Gatti (2023) found that ‘older adults in Latin-speaking regions exhibit a larger social network and more intergenerational contacts than their German-speaking counterparts’, resulting in significant differences in the incidence of COVID-19 in both the first and second waves of the pandemic.

The described setting provides, therefore, a source of variation among Cantons, which may correlate with different behaviours during the COVID-19 pandemic, including the extent of work from home.

4. DATA AND METHODOLOGY

Two waves (2019 and 2020) of the Swiss Labour Force Survey are analysed. While for descriptive purposes we use both waves, the econometric model is based only on the cross-sectional 2020 dataset, since we are interested in outlining the teleworker profile during the pandemic.

This Swiss Labour Force Survey is conducted annually by the Federal Statistical Office, to collect information on the structure of the labour force and employment behavioural patterns. Specifically, the questions asked concern the labour market situation, education and training, household composition and demographic characteristics.

Data are collected through a telephone survey to a sample of individuals, aged 15 years and above, who are randomly selected from the municipal and cantonal official registers. The sample is stratified based on the cantonal population.

About 39,000 interviews are made every three months, so for each year there are four waves, in which part of the data gathered in the preceding waves are included and asked to be confirmed, and in addition, some new questions are asked.

We used data gathered in the third wave in October 2020, when there was a progressive easing of the restrictions and the economic activities reopened. After restricting the sample to employed individuals and dropping missing values, the dataset contains 32,271 observations.

To answer the second and third research questions (R2 and R3), we modelled the working from home choice in 2020 as a function of some independent variables through the following equation:

$$y_i = \alpha + \beta_1 Demo_i + \beta_2 Job_i + \beta_3 Sector_i + \beta_4 Area_i + \beta_5 MajReg_i + \varepsilon_i$$

where y represents the individual i answer to the question ‘In 2020, in the last 4 weeks, did you work at home? Yes/No’; $Demo$ is a matrix controlling for the demographic characteristics of individual i ; Job is a matrix of variables controlling for the jobs features of individual i ; $Sector$ is a matrix controlling for the company’s industry sector (based on NOGA classification) where individual i works; $Area$ is a matrix of dummy variables controlling for the urban/intermediate/rural context; $MajReg$ is a matrix of dummy variables discriminating for individuals residing in the seven Swiss major regions (i.e., Lake Geneva region; Espace Mittelland; North-west Switzerland; Zurich region; Eastern Switzerland; Central Switzerland; Ticino); ε_i is the error term.

Table 1. Descriptive statistics.

Variables		Total		Men		Women	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Age groups	18–24 years old	0.049	0.216	0.042	0.200	0.056	0.231
	25–29 years old	0.059	0.236	0.057	0.232	0.061	0.240
	30–34 years old	0.084	0.278	0.085	0.278	0.084	0.277
	35–39 years old	0.109	0.312	0.105	0.306	0.114	0.318
	40–44 years old	0.126	0.332	0.121	0.326	0.131	0.338
	Over 45 years old	0.570	0.495	0.589	0.492	0.549	0.498
Children	Children aged 0–6 years old	0.157	0.364	0.164	0.370	0.149	0.357
	Children aged 7–14 years old	0.157	0.364	0.159	0.366	0.155	0.362
Contract type	Permanent contract	0.948	0.223	0.956	0.206	0.939	0.238
	Temporary contract	0.052	0.223	0.044	0.206	0.061	0.238
	Full-time contract	0.637	0.481	0.852	0.355	0.410	0.492
	Part-time contract	0.363	0.481	0.148	0.355	0.590	0.492
Education	Primary school	0.063	0.244	0.060	0.238	0.067	0.250
	Middle and high school	0.574	0.495	0.570	0.495	0.578	0.494
	University degree	0.363	0.481	0.370	0.483	0.355	0.478
Sectors (NOGA 2008)	Agriculture, forestry and fishing	0.022	0.146	0.029	0.169	0.014	0.116
Classification	Mining and quarrying	0.001	0.028	0.001	0.033	0.001	0.022
	Manufacturing	0.129	0.335	0.178	0.382	0.077	0.266
	Electricity, gas, steam and air conditioning supply	0.008	0.091	0.013	0.113	0.003	0.058
	Water supply; sewerage, waste management and remediation activities	0.003	0.055	0.005	0.068	0.001	0.037
	Construction	0.051	0.219	0.084	0.278	0.015	0.122
	Wholesale and retail trade; repair of motor vehicles and motorcycles	0.112	0.315	0.107	0.309	0.118	0.322
	Transportation and storage	0.044	0.206	0.064	0.244	0.024	0.153
	Accommodation and food service activities	0.032	0.175	0.028	0.164	0.036	0.186
	Information and communication	0.040	0.195	0.055	0.229	0.023	0.149
	Financial and insurance activities	0.060	0.237	0.069	0.254	0.050	0.217
	Real estate activities	0.012	0.110	0.010	0.099	0.015	0.121
	Professional, scientific and technical activities	0.089	0.285	0.101	0.301	0.077	0.266
	Administrative and support service activities	0.032	0.175	0.035	0.184	0.028	0.164
	Public administration and defence; compulsory social security	0.060	0.238	0.062	0.241	0.059	0.235
	Education	0.089	0.285	0.056	0.230	0.125	0.331
	Human health and social work activities	0.160	0.367	0.071	0.257	0.255	0.436

(Continued)

Table 1. Continued.

Variables		Total		Men		Women	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
	Arts, entertainment and recreation	0.017	0.129	0.013	0.112	0.022	0.145
	Other service activities	0.030	0.170	0.017	0.129	0.043	0.203
	Activities of households as employers; undifferentiated goods ...	0.008	0.090	0.002	0.043	0.015	0.121
	Activities of extraterritorial organisations and bodies	0.001	0.038	0.001	0.029	0.002	0.046
Occupations (ISCO classification)	Armed forces	0.000	0.021	0.001	0.029	0.000	0.000
By (ILO)	Legislators, senior officials and managers	0.091	0.288	0.118	0.322	0.063	0.243
	Professionals	0.300	0.458	0.288	0.453	0.312	0.463
	Technicians and associate professionals	0.171	0.377	0.171	0.377	0.171	0.377
	Clerks	0.130	0.337	0.088	0.283	0.175	0.380
	Service workers and shop and market sales workers	0.122	0.327	0.073	0.261	0.173	0.378
	Skilled agricultural and fishery workers	0.022	0.147	0.034	0.180	0.010	0.098
	Craft and related trades workers	0.086	0.280	0.143	0.350	0.025	0.156
	Plant and machine operators and assemblers	0.034	0.181	0.055	0.229	0.011	0.103
	Basic occupations	0.044	0.205	0.029	0.167	0.060	0.237
Area type	Rural	0.167	0.373	0.170	0.375	0.164	0.370
	Intermediate	0.224	0.417	0.226	0.418	0.222	0.416
	Urban	0.609	0.488	0.604	0.489	0.614	0.487
Swiss major regions	Lake Geneva region	0.183	0.386	0.178	0.382	0.188	0.391
	Espace Mittelland	0.221	0.415	0.222	0.416	0.220	0.415
	North-west Switzerland	0.129	0.335	0.126	0.332	0.133	0.339
	Zurich region	0.173	0.378	0.172	0.378	0.173	0.378
	Eastern Switzerland	0.134	0.341	0.137	0.344	0.132	0.338
	Central Switzerland	0.101	0.301	0.102	0.302	0.100	0.300
	Ticino	0.059	0.235	0.063	0.244	0.054	0.226

Specifically, the matrix Demo concerns the variables related to gender, age, education and family composition, while the matrix Job is made of variables belonging to the domain of job features, such as temporary contract, part-time contract and occupation.²

Table 1 shows descriptive statistics of the explanatory variables used in the econometric model, disentangling also by gender. It emerges that women are overrepresented in part-time jobs, shop and market sales services, and in the sectors of education, human health and social work activities. Also, they are underrepresented in manufacturing and high-level occupations such as legislators, senior officials and managers.

Given the dichotomous nature of the dependent variable, several specifications of the Probit model are estimated. Results are presented in the next section.

5. RESULTS

5.1. Descriptive statistics evidence

In the Swiss Labour Force Survey, two questions were asked of the interviewees' workplace:

- Which is your usual place of work? Home / Traditional workplace (i.e., employer's premises).
- In the last 4 weeks, did you work at home? Yes / No.

By comparing the answers between 2019 and 2020, we can identify any possible changes in the workplace linked to the COVID-19 pandemic. As a robustness check, we also run the same analysis on a subsample, restricted to the panel of the same individuals who have answered both in 2019 and 2020.

Figure 1a shows that traditional workplaces (such as the office, the factory, etc.) are dominant, both in 2019 and 2020. There was a small growth (plus one percent) between 2019 and 2020 in the number of workers who stay at home as their usual place of work. Looking at the absolute numbers, in 2019 there were 2131 people usually working at home, while that rose to 2555 in 2020. This is also true in the restricted sample (Figure 1b).

Focusing on the second question, Figure 2a shows that, in 2020 compared to 2019, there was a 7.5 percentage increase in people who worked from home in the previous 4 weeks (the percentage in 2020 was 38.5). Looking at the absolute numbers, in 2019 there were 11,955 teleworkers, while that rose to 21,963 in 2020. The increase (+7 percent) in the sub-sample (Figure 2b) is almost equal to the overall sample.

Comparing these data with the Eurofound one (Sostero et al., 2020), before the pandemic Switzerland was at the top of the ranking, together with Sweden, the Netherlands and Luxembourg, in terms of the percentage of teleworkers. This trend has undergone a moderate but significant increase with the spread of the COVID-19 pandemic.

Moreover, when the answers are disentangled by gender (see Figure 3), some peculiarities emerge. Unlike the Italian case (Depalo & Giorgi, 2021) – where working from home grew

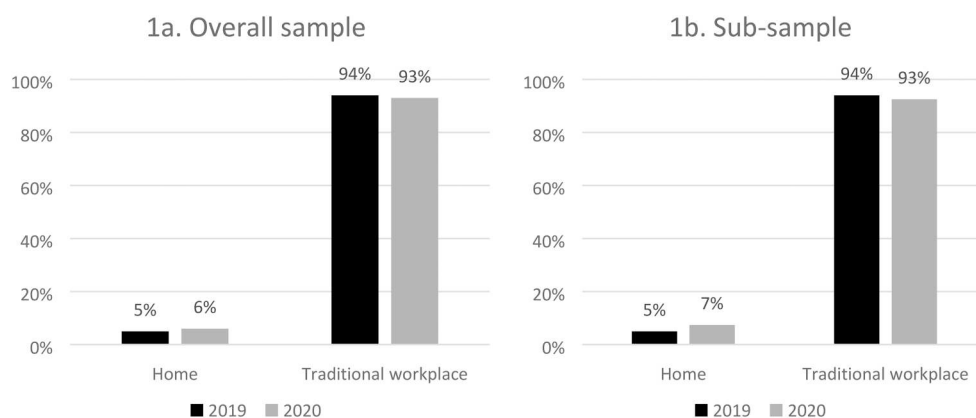


Figure 1. Usual places of work.

Source: Authors' elaboration on the Swiss Labour Force Survey.

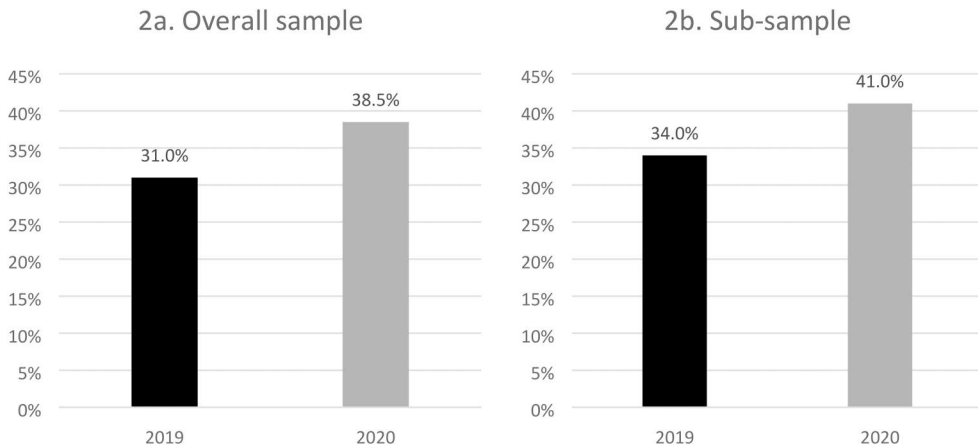


Figure 2. Percentage of people who worked from home in the previous 4 weeks.
Source: Authors' elaboration on the Swiss Labour Force Survey.

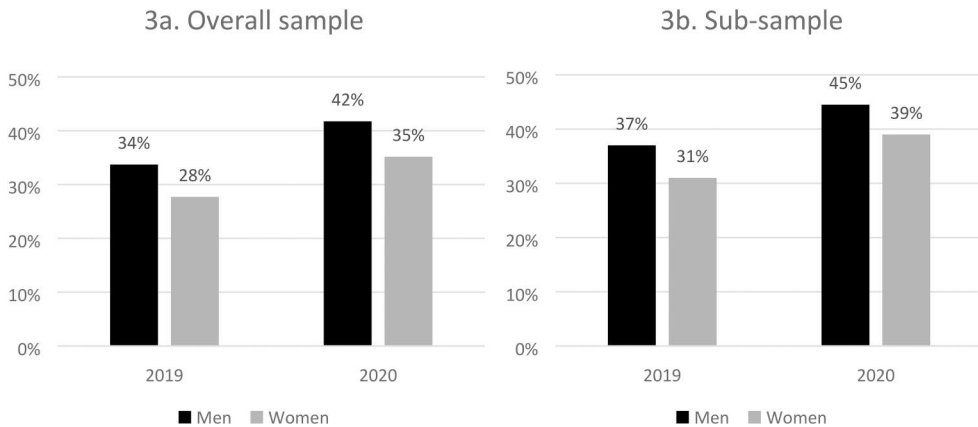


Figure 3. Percentage of people who worked from home in the previous 4 weeks by gender.
Source: Authors' elaboration on the Swiss Labour Force Survey.

especially for women – in Switzerland both in 2019 and 2020 teleworking was more common among men, and the increase induced by the pandemic was similar for both genders.

5.2. Estimation results

Table 2 shows the results of four specifications of the Probit model, providing indications about the profile of the Swiss teleworker during the COVID-19 pandemic, after controlling for several covariates. Columns 3 and 4 refer to the estimations on the overall sample, while columns 5 and 6 restrict the observations only to women, as a robustness check. Moreover, specification (i) includes only socio-demographic variables, while in the specification (ii) we also control for occupations, economic sectors, area type and Swiss Major regions.

The empirical results show that workers aged more than 24 years old are more likely to telework, as well as those having children aged 0–14 years old are more likely to work from home than those without them or with children aged over 14 years.

Looking at the contract type, we found that part-time workers are less likely to work from home than full-time workers.

Table 2. Probit model estimation results.

Variables	Overall (i)	Overall (ii)	Only women (i)	Only women (ii)
Age groups			Reference category	
18–24 years old	0.224*** [0.042]	0.164*** [0.046]	0.228*** [0.057]	0.163*** [0.062]
25–29 years old	0.334*** [0.041]	0.265*** [0.045]	0.323*** [0.056]	0.258*** [0.062]
30–34 years old	0.381*** [0.041]	0.321*** [0.045]	0.356*** [0.055]	0.317*** [0.062]
35–39 years old	0.448*** [0.040]	0.361*** [0.044]	0.459*** [0.053]	0.408*** [0.059]
40–44 years old	0.408*** [0.034]	0.318*** [0.038]	0.391*** [0.045]	0.315*** [0.050]
Over 45 years old	Reference category	Reference category	Reference category	Reference category
Gender				/
Men	-0.095*** [0.017]	-0.105*** [0.020]		/
Women				
Children			Reference category	
No children or children aged more than 15 years old	0.133*** [0.024]	0.100*** [0.026]	0.190*** [0.036]	0.091** [0.040]
Children aged 0–6 years old	0.148*** [0.022]	0.134*** [0.025]	0.166*** [0.032]	0.121*** [0.036]
Contract type			Reference category	
Permanent contract	0.076** [0.030]	-0.080** [0.034]	0.118*** [0.040]	-0.062 [0.045]
Temporary contract			Reference category	
Full-time contract	-0.107*** [0.018]	-0.053*** [0.020]	-0.178*** [0.023]	-0.078*** [0.027]
Part-time contract			Reference category	
Education			Reference category	
Primary school	1.101*** [0.044]	0.567*** [0.051]	1.032*** [0.061]	0.457*** [0.070]
Middle and high school				

(Continued)

Table 2. Continued.

Variables	Overall (i)	Overall (ii)	Only women (i)	Only women (ii)
University degree	1.935*** [0.045]	0.942*** [0.053]	1.730*** [0.062]	0.792*** [0.073]
Swiss major regions		Reference category		
Zurich region	/	-0.17*** [0.027]	/	-0.14 [0.118]
Lake Geneva region	/	-0.063** [0.027]	/	0.081 [0.115]
Espace Mittelland	/	-0.026 [0.030]	/	0.122 [0.128]
North-west Switzerland	/	-0.155*** [0.030]	/	-0.026 [0.134]
Eastern Switzerland	/	-0.104*** [0.033]	/	-0.055 [0.139]
Central Switzerland	/	-0.237*** [0.040]	/	-0.312 [0.192]
Ticino	/		/	
Occupations (ISCO)	No	Yes	No	Yes
Sectors	No	Yes	No	Yes
Area type	No	Yes	No	Yes
Constant	-1.970*** [0.053]	-2.567*** [0.093]	-1.904*** [0.072]	-2.512*** [0.123]
Log-likelihood	-18973.4	-15380.67	-9590.448	-7740.88
Pseudo-R2	0.1238	0.2878	0.1003	0.2720
Prob > chi2	0.0000	0.0000	0.0000	0.0000
Observations	32271	32271	1851	1851

Notes: Standard errors in brackets. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Moreover, workers with all types of training above and beyond compulsory education (compared to the last ones mentioned) are more likely to work from home.

Looking at the regional dimension, workers residing in most of the Swiss major regions (except North-west Switzerland) are less likely to work from home than workers residing in the Zurich region. This result can be explained by the economic structure of the areas: the Zurich region exhibits a concentration of high value-added tertiary activities and several headquarters, which are characterised by a high teleworkability index according to the literature (Barbieri et al., 2021). Finally, Table 2 shows that women are less likely to work from home than men.

When controlling for occupations, economic sectors, area type and Swiss Major regions (specification (ii) in Table 2), all the coefficients remain significant.

Repeating the analysis only on the women subsample (columns 5 and 6), similar patterns emerge. Specifically, workers with small children, those with all types of training above and beyond compulsory education, and full-time workers are more likely to telework. Interestingly, the coefficients associated with the Swiss major regions are no longer significant. This result could be due to the limited sample size.

The result on gender could be biased by horizontal segregation: in our sample, there is a large share of women employed in occupations such as health, personal and social care, that are intensive in face-to-face interactions and cannot be performed at home (Avdiu & Nayyar, 2020). Therefore, we decided to estimate the Probit model (see Table 3), considering only four sectors – information and communication activities; financial and insurance activities; real estate activities; professional, scientific and technical activities – which have the highest remote working index according to the literature (Barbieri et al., 2021).

As shown in Table 3, the coefficients associated with the woman variable are not statistically significant. Thus, results show that being a woman *per se* does not influence the likelihood of working from home in these sectors.

Moreover, the coefficients linked to the family composition are positive and significant, while the part-time coefficient is negative and significant only for information and communication activities, and for professional, scientific and technical activities.

6. DISCUSSION AND CONCLUSIONS

The paper investigates the spread of working from home in Switzerland before and during the COVID-19 pandemic, to outline a profile of the Swiss teleworker, and to verify the existence of a gender gap in working from home. It contributes to filling the gap in the literature about the diffusion of teleworking during the COVID-19 pandemic in Switzerland, given its labour market peculiarities.

The results of the descriptive statistics analysis show that, in Switzerland, teleworking was quite diffused before the pandemic (31% of interviewed people worked from home in 2019), and significantly increased with the spread of COVID-19 (+7.5%), as in other European countries. Education, children's age, economic sectors and occupations are among the main predictors of working from home, as highlighted in previous studies. Specifically, the Swiss results are in line with the European ones that concern education and family composition: highly educated workers and those with small children are more likely to telework (Sostero et al., 2020). In the first case, this is probably related to the type of occupation, for example, highly educated workers will be more likely to hold managerial occupations, which are more teleworkable. Regarding the presence of small children, the literature emphasises how teleworking allows more flexibility in terms of time and space, and in balancing personal and professional routines (e.g., reconciliation of family commitments with work and removal of commuting time), thereby improving work-life balance (Okubo et al., 2020).

Table 3. Probit model estimation results disentangled by economic sector.

Variables	Information and communication activities – overall			Financial and insurance activities – overall			Professional, scientific and technical activities – overall			Information and communication activities – only women			Financial and insurance activities – only women			Real estate activities – only women			Professional, scientific, and technical activities – only women			
Age groups	Reference category																					
18–24 years old	-0.065	0.035	0.097	0.012	-0.668	0.043	0.131	0.054														
25–29 years old	[0.222]	[0.162]	[0.512]	[0.141]	[0.412]	[0.224]	[0.757]	[0.202]														
30–34 years old	0.101	0.067	-0.449	0.268*	0.148	0.048	-0.593	0.310														
35–39 years old	[0.219]	[0.160]	[0.529]	[0.140]	[0.434]	[0.218]	[0.710]	[0.205]														
35–39 years old	0.290	0.090	-0.416	0.377***	-0.226	0.012	-0.802	0.438**														
40–44 years old	[0.229]	[0.155]	[0.541]	[0.141]	[0.425]	[0.213]	[0.752]	[0.207]														
40–44 years old	0.116	0.075	-0.073	0.507***	-0.195	0.158	-0.192	0.793***														
Over 45 years old	[0.219]	[0.152]	[0.523]	[0.143]	[0.410]	[0.216]	[0.713]	[0.210]														
Over 45 years old	0.097	0.107	-0.110	0.375***	-0.355	-0.027	-0.259	0.556***														
Gender	[0.185]	[0.128]	[0.459]	[0.122]	[0.351]	[0.176]	[0.643]	[0.179]														
Men	Reference category				/	/	/	/														
Women	-0.047	-0.067	0.094	0.003	/	/	/	/														
Women	[0.104]	[0.068]	[0.185]	[0.061]																		
Children	Reference category																					
No children or children aged more than 15 years old																						

Children aged 0–6 years old	0.177 [0.135]	0.094 [0.092]	0.109 [0.294]	0.143* [0.081]	-0.252 [0.265]	0.087 [0.148]	0.358 [0.411]	0.387*** [0.131]
Children aged 7–14 years old	0.400*** [0.154]	0.239*** [0.087]	0.742*** [0.280]	0.235*** [0.086]	0.350 [0.315]	0.210 [0.141]	1.297*** [0.397]	0.212* [0.129]
Contract type				<i>Reference category</i>				
Permanent contract								
Temporary contract	-0.361* [0.193]	-0.468*** [0.153]	0.193 [0.690]	-0.040 [0.124]	-0.555* [0.296]	-0.384 [0.243]		0.248 [0.188]
Full-time contract				<i>Reference category</i>				
Part-time contract	-0.331*** [0.103]	-0.123 [0.078]	-0.147 [0.185]	-0.335*** [0.064]	-0.463*** [0.171]	-0.110 [0.100]	-0.323 [0.269]	-0.451*** [0.093]
Education				<i>Reference category</i>				
Primary school								
Middle and high school	0.901*** [0.313]	0.406 [0.263]	0.719** [0.333]	0.509* [0.279]	0.978* [0.591]	0.746** [0.341]	1.264** [0.513]	0.145 [0.390]
University degree	1.143*** [0.320]	0.620** [0.268]	1.082*** [0.377]	0.975*** [0.283]	1.084* [0.604]	0.878** [0.352]	1.502*** [0.564]	0.611 [0.398]
Other controls (ISCO)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area type	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Swiss major regions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-1.927*** [0.577]	-1.223** [0.513]	-1.306* [0.772]	-2.265*** [0.411]	-6.099 [254.157]	-1.558*** [0.586]	-1.600 [1.064]	-1.954*** [0.515]

(Continued)

Table 3. Continued.

Variables	Information and communication activities – overall		Financial and insurance activities – overall		Professional, scientific and technical activities – overall		Information and communication activities – only women		Financial and insurance activities – only women		Real estate activities – only women		Professional, scientific, and technical activities – only women	
Log-likelihood	-545.00777	-1235.2733	-183.98737	-1449.1048	-175.64989	-553.89248	-104.31322	-652.10019						
Pseudo-R2	0.1616	0.0799	0.2134	0.1722	0.2277	0.0784	0.2680	0.1952						
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						
Observations	1236	2088	365	2550	365	894	225	1169						

Notes: Standard errors in brackets. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Looking at the contract type, we found that part-time workers are less likely to work from home than full-time workers, as in the Ono and Mori (2021) analysis. This result can be explained by the fact that part-time workers work a few days a week, therefore their presence at the office is probably required. Moreover, full-time contracts are often observed in many managerial occupations, in which remote working is easier, therefore penalising part-time workers.

Interestingly, we found that women are less likely to work from home than men, depicting a very different picture for Switzerland compared to the other European countries, where, after the COVID-19 outbreak, women started working from home more than men (Depalo & Giorgi, 2021; Sostero et al., 2020). When eliminating occupations such as health, personal and social care, that are intensive in face-to-face interactions and cannot be performed at home, we found that being a woman *per se* does not influence the likelihood of working from home. The fact that results are mixed, showed that teleworking strongly depends on the economic sector and on the real possibility of working from home. We found no evidence of cultural barriers to teleworking arrangements discriminating women (Abendroth et al., 2022).

However, since most part-time workers are women (74%), we can highlight the existence of a gender gap in teleworking activities at least in some sectors.

To sum up, the 'typical' Swiss teleworker is highly educated, with children and a full-time contract, and involved in high-level occupations and service activities.

The limitations caused by the COVID-19 pandemic have exacerbated the teleworking negative effects and widened the gender gap in unpaid work (Arntz et al., 2020; Blaskó et al., 2020; Dunatchik et al., 2021; Eurofound, 2020; Farrè et al., 2022; Kabeer et al., 2021). Indeed, there is increasing empirical evidence that childcare (due to the school closures), housework and support to sick and elderly family members fall mainly on women's shoulders. These high workload levels by employed women generated great dissatisfaction with their work-life balance (Alfano et al., 2023; Çoban, 2022; Craig & Churchill, 2021; İlkkaracan & Memiş, 2021).

Thus, the necessity for teleworking regulations and policy interventions targeted at redistributing and decreasing care work has been brought to light by the COVID-19 pandemic (İlkkaracan & Memiş, 2021). Furthermore, considering the growing recognition of the importance of care labour and caregivers (UNDP, 2020), gender-equal care policies should be advocated (Alfano et al., 2023; Corsi & İlkkaracan, 2022).

Although the present paper sheds some light on the diffusion of teleworking in Switzerland, it presents some limitations. First, the regional differences among the Swiss Major regions are analysed through control variables in the empirical model applied to a cross-sectional dataset. Counterfactual models, like regression discontinuity ones, could be adopted to deeply investigate this issue, but require panel data. Moreover, a longitudinal research design would be useful to investigate if the pandemic has had a short- or long-term impact on the labour force, implying a return toward a steady state or a 'new normal' in teleworking diffusion (Spurk & Straub, 2020). These issues are left for future research.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors. The authors have no relevant financial or non-financial interests to disclose.

NOTES

¹ Activities like preparing classes or grading papers are considered as working from home by the teachers.

² The International Standard Classification of Occupations (ISCO) classification by ILO is used, which distinguishes among armed forces; legislators, senior officials and managers; professionals; technicians and associate professionals; clerks; service workers and shop and market sales workers; skilled agricultural and fishery workers; craft and related trades workers; plant and machine operators and assemblers; basic occupations.

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