Influence of the COVID-19 pandemic on the distribution of teleworking in Bulgaria – social, occupational, and sectoral dimensions

Dragomir Draganov
University of National and World Economy, Bulgaria
ddraganov@unwe.bg

Abstract: *The outbreak of COVID-19 pandemic and the related containment measures had a significant influence on the Bulgarian labour market. Economic activities where it was difficult to apply flexible regimes of work allowing the physical absence of the employee from the location of production or service provision were hit particularly high. Therefore, it is interesting from the research point of view to analyse the influence of the COVID-19 pandemics on the changes in the distribution of the remote work not only with a view of its coverage and frequency of application, but mainly in terms of its social, occupational, and sectoral characteristics. Such an analysis would contribute to better understating of the readiness of the Bulgarian labour market to implement the flexible regimes of work mediated by information and communication technologies. The analysis is based on the 10th round of the European Social Survey for Bulgaria.*
Keywords*: REMOTE WORK, TELEWORK, DIGITALISATION OF WORK, COVID-19, EUROPEAN SOCIAL SURVEY*

1. Introduction

For many years, technologies and their impact on work, employment, and labour markets have attracted the attention of sociology. Currently, the research focus is on the transformative role of the digital, microchip or computer-assisted technologies which widespread use in all economic sectors is as an attempt to push production beyond the limits shaped by the industrial era mass-production technologies. This trend is often called "digitalisation".

According to Eurofound, the impacts of digitalisation on work will be channelled by three phenomena with enormous economic, social and policy implications: 1) automation of work; 2) digitisation of production processes, and 3) establishment of platforms – digital networks facilitating labour market interactions [1]. In his famous book *The Fourth Industrial Revolution*, Klaus Schwab, the founder of the World Economic Forum, uses the term *human cloud* to describe metaphorically the platform work. This witty analogy to cloud computing technologies emphasises that the digitalisation has made it possible to bring together workers from all geographical locations to carry out common assignments or projects. In 2016, when *The Fourth Industrial Revolution* was published, Schwab was certain that this was a part of an ongoing "flexible work revolution" [2].

In this context, sociologist agree that digitalisation of work, among its other hypothesised effects such as job cuts and modified skill requirements, is most likely to transform existing jobs rather than create new ones [3]. Therefore, it is essential to track the changes in working conditions imposed by digital technologies.

COVID-19 pandemic has given rise to new causes of uncertainty. Employment in many economic sectors was severely affected and containment measures enforced by public authorities created a different context of the social reproduction of 'worker-employer' and 'worker-worker' relations. As a result, digitalisation has gained pace and the use of some flexible forms of employment such as teleworking and working from home become more common. At EU-level, in 2021 more than 20% of all employees worked from home for some time while in many countries (Denmark, Belgium, Ireland, Finland, Luxembourg, Sweden, and Netherlands) the share of employees having some spells of teleworking reached or even exceeded 40% [4]. However, the manifestation of this trend was uneven across sectors and occupations. It has once again magnified the importance of the concept of *teleworkability* [5] meaning that the effects of digitalisation on spatial division of labour could be modified by the technical aspects of job-related tasks in each economic sector.

Existing studies of the Bulgarian labour market show similar picture. Even before COVID-19 pandemic, the incidence of teleworking was low [4] which can be explained not only by the job characteristics but also by many other variables such as digital competences, access to Internet at home, computer- or mobile device availability, family situation, income level, etc. [6]. Studies present different scenarios about the future of work in technological era; however, it is still unclear how Bulgarian firms will adapt to the upcoming structural shits [7].

Therefore, it can be concluded that available evidence about the influence of the COVID-19 pandemic on work and working conditions in Bulgaria is still in a fragmentary state. This paper does not have an ambition to solve this problem but rather to contribute to enriching the existing body of knowledge by exploring the social, occupational, and sectoral dimensions of teleworking, which is only one of the many aspects of the digitalisation of work. In that regard, the choice of topic just highlights the need for further research.

2. Methods and data

This paper employs the definition of *teleworking* presented in Sostero et al. [5]. It is a sub-category of the broader concept of *remote work* where work is carried out at a place which is different from the usual place of work. It can be either the home of the worker or another place. A distinctive characteristic of teleworking is the mediating role of electronic devices. In contrast, working from home does not imply the presence of another (usual) place of work and although electronic devices may be used in some cases, it is a different concept from teleworking. Finally, teleworking is often used to describe a specific form of work organization applicable to dependent workers, i.e., employees, while working from home (regardless of the means and tools) can be performed by both dependent and independent workers (self-employed).

In this regard, the paper seeks to answer the question of how *(i)* the prevalence of teleworking and *(ii)* the profile of workers performing teleworking have changed due to COVID-19 pandemic.

Analysis is based on data for Bulgaria from the 10th round of the European Social Survey, edition 1.3 data set [9]. Data has been collected by the Institute of Philosophy and Sociology at the Bulgarian Academy of Sciences between 28.06.2021 and 30.9.2021. The number of valid respondents is 2720.

For the purposes of this analysis, a sub-sample of 1199 respondents is created. Following the definition of *teleworking*, the sub-sample consists of respondents with a status of dependent workers (employees) in the last 7 days prior the moment of data collection.

It is also assumed that employees who report some periods of remote working but at the same time declare that they do not have online or mobile communication with the people who they work with, do not telework. Therefore, remote working and teleworking are not considered synonyms.

3. Results

Data from the European Social Survey shows that 73.4% of all employees report that they do not work remotely compared to only 26.6% who do. The share of employees who report some periods of

remote working but do not have online or mobile communication with people who they work with, is very low – only 0.5% of total number of employees.

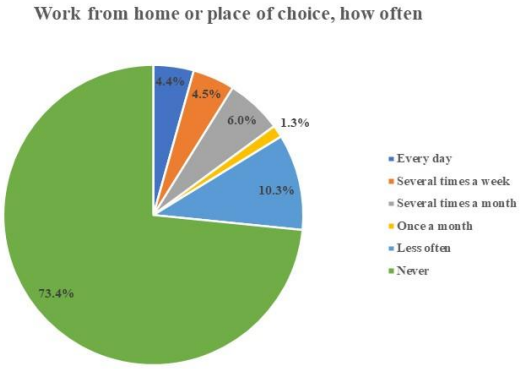

Fig. 1 *Prevalence of teleworking in Bulgaria*

In that regard it could be concluded that 26.1% of all workers have some experience of teleworking. Among them, 4.4% do telework every day.

How has the COVID-19 pandemic changed the prevalence of remote working? Approximately 7 out of 10 workers report that they cannot work from home or from another place of choice.

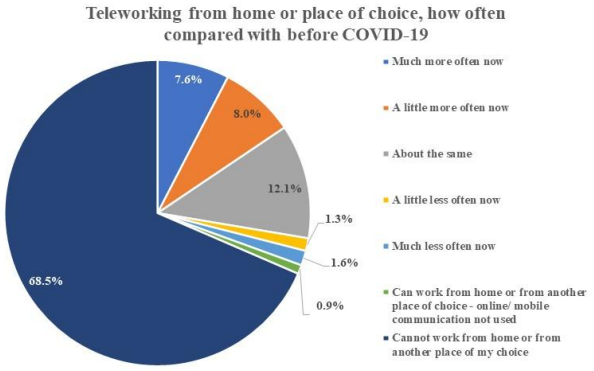

Fig. 2 *Prevalence of teleworking compared with before COVID-19*

Among the others, 30.5% report experience of teleworking, with 15.6% reporting more frequent digital contacts with colleagues since the coronavirus outbreak, less than 2.9% report a decline, and 12.1% do not report any changes.

It is interesting, however, to investigate to what extent the observed variability of working arrangements could be attributed to COVID-19.

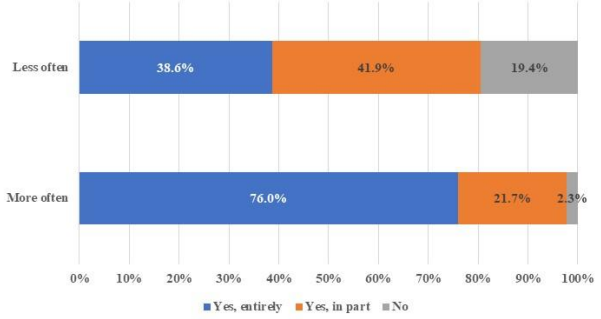

Fig. 3 *Changes in incidence of teleworking due to COVID-19*

In that regard, it should be noted that almost 98% of respondents reporting that teleworking has become a more frequent feature of their working conditions since the start of COVID-19 pandemic (15.6% of the workers) tend to explain this shift in whole or in part with the coronavirus outbreak. This explanation is valid for approximately 80% of respondents reporting a lower frequency of teleworking (2.9% of the workers). So, it could be concluded that COVID-19 has brought observable changes in the frequency of teleworking among those who already had some experience of teleworking. Nevertheless, the share of workers having observed any changes remains rather low – 18.5%.

The most important question, however, remains unanswered. It is related to the profile of workers who work remotely.

Sectoral distribution of teleworking

The sectoral distribution of teleworking shows that more than 90% of all workers reporting some periods of teleworking are concentrated in 20 economic activities. It seems that more than one third of these employees work in sectors where the state is the biggest employer (education; public administration and defence; compulsory social security). On the other hand, almost all workers in ICT-intensive activities (computer programming, consultancy and related activities; information service activities; programming and broadcasting activities) and activities where work is performed predominantly in an office (for example real estate; other professional, scientific and technical activities; architectural and engineering activities; technical testing and analysis) report that they had some period of teleworking.

Table 1: *Sectoral distribution of employees who report at least some period of teleworking*

Economic activity	% of total
Education	23.2%
Public administration and defence; compulsory social security	13.5%
Retail trade, except of motor vehicles and motorcycles	12.3%
Computer programming, consultancy and related activities	6.4%
Legal and accounting activities	6.0%
Land transport and transport via pipelines	4.2%
Human health activities	4.0%
Information service activities	2.7%
Financial service activities, except insurance and pension funding	2.4%
Construction of buildings	2.2%
Insurance, reinsurance and pension funding, except compulsory social security	2.2%
Manufacture of fabricated metal products, except machinery and equipment	1.8%
Advertising and market research	1.5%
Scientific research and development	1.5%
Real estate activities	1.5%
Manufacture of wearing apparel	1.2%
Electricity, gas, steam and air conditioning supply	1.1%
Social work activities without accommodation	1.1%
Programming and broadcasting activities	1.1%
Manufacture of food products	0.7%
Repair and installation of machinery and equipment	0.7%
Postal and courier activities	0.7%
Publishing activities	0.7%
Other (19 activities)	7.0%
No workers reported teleworking (32 activities)	0.0%

Occupational distribution

Approximately 4 out of 10 workers who report at least some periods of teleworking represent the occupational group of *Professionals*. The other three groups having the biggest share of the total number of employees who telework are *Clerical support workers* (18.5%), *Technicians and associate professionals* (15.8%)

and *Managers* (12.5%). It is evident that these are occupations having higher qualification and skill requirements.

Table 2: *Occupational distribution of employees who report at least some period of teleworking*

Occupational status	% within group	% of total
Armed forces	0.0%	0.0%
Managers	54.8%	12.5%
Professionals	66.5%	43.2%
Technicians and associate professionals	37.4%	15.8%
Clerical support workers	44.6%	18.5%
Service and sales workers	9.7%	5.2%
Skilled agricultural, forestry and fishery workers	32.6%	0.4%
Craft and related trades workers	4.7%	1.9%
Plant and machine operators, and assemblers	5.2%	1.8%
Elementary occupations	2.2%	0.7%
Armed forces	0.0%	0.0%

Socio-demographic distribution

To understand better which other factors except sectoral and occupational status influence the prevalence of teleworking, a binary logistic regression in SPSS is used. The sample includes 973 employees who reported that they were able to use online or mobile communication tools to interact with people who they worked with. Among them, 29.6% had some experience of teleworking and 70.4% - did not. The following variables are included in the model:

Table 2: *Sectoral distribution of employees who report at least some period of teleworking*

Predictor variable	Categories
1. Education	Basic of lower, including without education; Secondary education; Post-secondary and higher education (reference category)
2. Region	Sofia – capital (reference category); The six NUTS level 3 regions with the largest population (Sofia – district; Plovdiv; Varna; Burgas; Stara Zagora; Blagoevgrad); Other NUTS level 3 regions.
3. Type of organisation	Public organisation; Private organisation (reference category).

The model was statistically better than the baseline at explaining the probability someone to have some experience of teleworking [$x^2(1) = 207.148; p = 0.000;\ p < 0.001$; R^2 = 0.192 (Cox-Snell), 0.273 (Nagelkerke)]. The model correctly predicted the experience of teleworking of 72.9% of respondents including 78.2% of respondents without experience of teleworking and 60.1% of those who have. The results also suggest that people with post-secondary or higher education are much more likely to telework. The probability for people with secondary (exp(β) = 0.147, Sig. = 0.000) or less than secondary education (exp(β) = 0.053, Sig. = 0.000) is very low. Compared to employees living in Sofia (capital), for workers living in one of the top six, in terms of their population size, NUTS 3 regions it is less likely to telework (exp(β) = 0.519, Sig. = 0.001). The same could be concluded for workers living in smaller NUTS 3 regions (exp(β) = 0.524, Sig. = 0.001). Furthermore, the probability that people working in public organisations (central administration, public financed educational or health organisation, etc.) have some experience of teleworking is significantly, almost 60%, higher (exp(β) = 1.586, Sig. = 0.005) compared to private firm workers.

4. Conclusion

The results from the 10th wave of the European Social Survey show a worrying picture. On the one hand, the prevalence of teleworking in Bulgaria remains low despite the impact of COVID-19. This suggests that many Bulgarian employers are unwilling or unable to provide opportunities for flexible working arrangements, both with a view to protecting workers' health and maximising efficiency. On the other hand, there are some signs that differences in the prevalence of teleworking could reinforce existing divisions between public and private sectors, between high and low ICT-intensive industries, and between higher and lower skilled employees. Therefore, further research into the implications of this *flexible work revolution*, as Klaus Schwab named it, on the workers' wellbeing and quality of life, is more than necessary as many of the driving causes of these changes remain insufficiently explained.

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