

Digital age

Telework and ICT-based mobile work: Flexible working in the digital age



Telework and ICT-based mobile work: Flexible working in the digital age



When citing this report, please use the following wording:

Eurofound (2020), *Telework and ICT-based mobile work: Flexible working in the digital age*, New forms of employment series, Publications Office of the European Union, Luxembourg.

Authors: Oscar Vargas-Llave, Irene Mandl, Tina Weber and Mathijn Wilkens

Research managers: Oscar Vargas-Llave and Irene Mandl

Eurofound project: Conditions of work and employment of ICT-based mobile workers and teleworkers (170903)

Acknowledgements: The authors would like to express their gratitude to the following for their work on the literature review and case studies: Pablo Sanz (Notus), Juan Arasanz (Notus), Maria Caprile (Notus), Bernadette Allinger (Forba), Johanna Vallistu (BPI), Sandrine Gineste (BPI), Carsten Jørgensen (FAOS) and Karsten Krueger (XREAP), and to Pablo Sanz and Maria Caprile for coordinating this work. The Network of Eurofound Correspondents provided important input for Chapter 7 of the report on regulations. Finally, Eurofound colleagues Karel Fric, Julie Vanderleyden and Matteo Avogaro played a key role in analysing the data and providing new insights into the research of this project.

Luxembourg: Publications Office of the European Union

Print: ISBN 978-92-897-2042-7 doi:10.2806/70118 TJ-04-20-008-EN-C

PDF: ISBN 978-92-897-2043-4 doi:10.2806/337167 TJ-04-20-008-EN-N

This report and any associated materials are available online at <http://eurofound.link/ef19032>

It is part of Eurofound's New forms of employment series. See the full series at <http://eurofound.link/efs009>

© European Foundation for the Improvement of Living and Working Conditions, 2020

Reproduction is authorised provided the source is acknowledged.

For any use or reproduction of photos or other material that is not under the Eurofound copyright, permission must be sought directly from the copyright holders.

Cover image: © Firma V/Shutterstock.com

Maps pp. 8, 48–50: © GeoNames, HERE, MSFT

Any queries on copyright must be addressed in writing to: copyright@eurofound.europa.eu

The European Foundation for the Improvement of Living and Working Conditions (Eurofound) is a tripartite European Union Agency established in 1975. Its role is to provide knowledge in the area of social, employment and work-related policies according to Regulation (EU) 2019/127.

European Foundation for the Improvement of Living and Working Conditions

Telephone: (+353 1) 204 31 00

Email: information@eurofound.europa.eu

Web: www.eurofound.europa.eu

Contents

	Executive summary	1
	Introduction	3
	Background and objectives of the report	3
	Methodology	4
	Structure of the report	4
1.	What is TICTM?	5
	Concept and types of TICTM	5
	TICTM arrangements in practice	6
2.	Spread of TICTM in Europe	7
	Scale and distribution	7
	TICTM by sector	9
	TICTM by occupation	10
	TICTM in a second job	11
	TICTM among the self-employed	11
	Sociodemographic characteristics	11
	In short: Scale and scope of TICTM in Europe	12
3.	Work organisation, working time and work–life balance	13
	Impacts of ICT	14
	Benefits for work–life balance	16
	Downsides for work–life balance	17
	The autonomy paradox	25
	In short: Work organisation, working time and work–life balance	26
4.	Implications for health and well-being	27
	ICT at work and health outcomes	27
	TICTM and risk of MSDs	35
	In short: TICTM, health and well-being	35
5.	Worker performance and prospects	37
	Performance of workers	37
	Earnings	38
	Learning and training	39
	Career prospects and employment conditions	41
	In short: TICTM, worker performance and prospects	43
6.	Regulations on TICTM and work–life balance	45
	EU regulations	45
	National regulations	46
	In short: Divergent approaches to regulating TICTM	52
7.	Conclusions and policy pointers	53
	Conclusions	53
	Policy pointers	54
	Bibliography	55

Country codes EU28

AT	Austria	FI	Finland	NL	Netherlands
BE	Belgium	FR	France	PL	Poland
BG	Bulgaria	HR	Croatia	PT	Portugal
CY	Cyprus	HU	Hungary	RO	Romania
CZ	Czechia	IE	Ireland	SE	Sweden
DE	Germany	IT	Italy	SI	Slovenia
DK	Denmark	LT	Lithuania	SK	Slovakia
EE	Estonia	LU	Luxembourg	UK	United Kingdom
EL	Greece	LV	Latvia		
ES	Spain	MT	Malta		

Executive summary

Introduction

Telework and ICT-based mobile work (TICTM) is any type of work arrangement where workers work remotely, away from an employer's premises or fixed location, using digital technologies such as networks, laptops, mobile phones and the internet. It offers workers unprecedented flexibility in where they work and when they work. TICTM has emerged in the context of developments in the world of work and the economy, including digitalisation, flexibilisation of the labour market, increasing labour market participation of women and global competition.

This report analyses the employment and working conditions of workers with TICTM arrangements. It focuses on how the work environment and work organisation associated with TICTM affect the work-life balance, health, performance and prospects of workers. Because work-life balance is both a goal and a challenge of TICTM, and a core concern of EU social policy, the report includes a chapter mapping EU regulations directly related to work-life balance and TICTM.

Policy context

The European framework agreement on telework (2002) is the main European text covering this issue and addresses some working conditions of TICTM. The Working Time Directive (2003/88/EC) is also relevant insofar as it limits weekly working hours and regulates minimum daily rest periods. Two new EU regulatory initiatives will also have an impact:

- the Work-Life Balance Directive (COM/2017/0253 final), which extends the existing right to request flexible working arrangements (including remote work arrangements and flexible work schedules) to all working parents and carers
- the Transparent and Predictable Working Conditions Directive (COM/2017/0797 final), which contains provisions related to place of work and work patterns

Both directives are part of the implementation of the European Pillar of Social Rights.

Flexible working using ICT has become an important issue in the social policy debates of many countries in Europe. Some have adopted provisions on the right to disconnect in order to protect workers against the negative effects of such arrangements.

Key findings

- TICTM arrangements are in many ways advantageous for workers compared to the traditional setup of being based in a single workplace outside the home. Workers with a TICTM arrangement report greater autonomy, better work-life balance, higher productivity and reduced commuting times. There can be disadvantages, however: it can lead to longer working hours, the overlapping of work and home life, and increased intensity of work. Workers generally experience better working conditions and outcomes when TICTM is occasional.
- TICTM offers workers more autonomy, which is an asset. Autonomy, however, can also lead to an intensification of work when combined with heavy workloads and work cultures dominated by competition, self-management or mechanisms to enforce performance. This is the 'autonomy paradox' of such arrangements.
- Depending on how it is implemented, TICTM can aid or undermine work-life balance. Within the highly mobile TICTM group, the share of workers with poor work-life balance is considerably larger among those who have children compared to those who do not. By contrast, poor work-life balance is more prevalent among regular home-based teleworkers without children than those with children.
- TICTM poses some risks for the mental and physical well-being of workers. Not only are they more likely to report stress and other psychosocial and physical problems, they also are more likely to engage in a new phenomenon enabled by digitalisation: virtual presenteeism – that is, working from home when one is sick but not so sick as to preclude working.
- Working remotely does not seem to limit participation in training, although remote workers may miss out on some types of informal workplace learning. In addition, workers with TICTM arrangements generally have better career prospects, due in part to the longer hours they work, their level of engagement, the support they receive from managers and their occupational level. This career dividend is mostly experienced by medium-skilled and high-skilled workers.

- Not all workers benefit equally from TICTM. For example, while it can facilitate access to employment for vulnerable groups, there is a risk that regular home-based teleworkers are seen by colleagues and managers as having less commitment. This, combined with lack of visibility, could jeopardise their career development opportunities. From a broader perspective, roughly a quarter of workers with this type of arrangement are in precarious employment.
- The implementation of regulations to improve work–life balance in the context of flexible working using ICT varies across Europe. Only a few countries have adopted legislation that addresses the right to disconnect.
- TICTM should be promoted as a way to improve work–life balance (for example, through the transposition of the Work–Life Balance Directive). This should be done on the understanding that any of these initiatives may have implications for gender equality, and should respect employee-friendly schedules and maximum working hour limits.
- The Transparent and Predictable Working Conditions Directive should help to improve some of the conditions for workers with TICTM arrangements. However, there is also a need to assess whether the present Working Time Directive and the European framework agreement on telework are sufficient for the implementation of the provisions for these workers (and their protection), including measures to record, monitor and control their working time.

Policy pointers

- There are differences in how TICTM takes place in practice, which should be taken into consideration in policymaking. Intensive TICTM should be limited, for instance, because it has a negative impact on workers. In addition, general policies dealing with minimum standards in working conditions should encompass TICTM and include workers with precarious employment under such arrangements.
- Improvements in work organisation are necessary to tackle the risks associated with TICTM, and workplace-level initiatives could facilitate this. Systems of monitoring and control have to be designed to give TICTM workers real autonomy, to ensure that data on them are used appropriately and to prevent working time patterns from damaging their health and well-being. Collective bargaining and social dialogue should play a role in the design and implementation of such initiatives.
- The regulation of TICTM – like the right to disconnect – might be the only way to curb the trend towards a culture of work characterised by self-imposed work intensity, project-based and performance-paid work, and constant availability. These regulations would demand effective social dialogue at company and sectoral levels to ensure effective implementation and enforcement.
- The health impact of TICTM might be improved by clarifying the responsibilities of workers regarding the organisation of their work and workplace when they work remotely, and what is expected of them in terms of performance. Developing and implementing psychosocial risk assessments and management at company level is also an essential part of identifying and mitigating possible health risks for remote workers. Next to traditional concerns, like high stress levels, new phenomena like virtual presenteeism should be considered.

Introduction

The vices respectively fall short of or exceed what is right in both passions and actions, while virtue both finds and chooses that which is intermediate.

Aristotle (*Nicomachean Ethics*, Book II, Chapter 6)

Background and objectives of the report

Telework and ICT-based mobile work (TICTM) arrangements have emerged in response to societal developments, including technological changes driven by digitalisation, increasing flexibility within the labour market, the increasing participation of women, and greater global competition. TICTM started with the advent of the first mobile digital technologies in the 1970s and developed over the next four decades with the rapid spread of technologies such as the personal mobile computer, the internet and mobile phones (Eurofound and the ILO, 2017; Eurofound, 2019a).

Over the last decade, increasing numbers of workers have engaged in flexible work arrangements – for example, through flexible contracts, working part-time, having flexible working times or working from a place other than their employer’s premises. An important mediating factor for these developments has been the increased digitalisation of the economy and advances in information and communications technology (ICT). This technology has helped to transform the organisation of work by enabling greater flexibility in terms of time and location (European Commission, 2018). It has also facilitated interconnectivity, allowing workers to interact with colleagues, managers and other organisations virtually, and so be part of the workflow or production process from anywhere at any time. Although technology does not determine all aspects of work organisation, there is evidence that it has contributed to the rise of flexible working in many sectors, including public administration, professional activities, information and communication, financial services and sales.

The new forms of work organisation that have emerged depend less on workers being present at an employer’s premises for a set time period each day, and more on flexible task allocation and management by objectives. In short, labour markets are undergoing a transition from regular, bureaucratic and ‘factory-based’ work organisation to a more flexible model of work.

The literature has examined the impact of ICT on different aspects of work arrangements – working time adjustments, workplaces and mobility patterns – as well as its impact more generally on the tasks, activities, jobs and employment relationships associated with digitalisation (ETUI, 2016). A wide range of concepts have been used to describe working remotely with some degree of flexibility in terms of place and time. These include telecommuting, smart work, remote work, mobile e-work, telework and ICT-mobile work.

This report does not deal with the technological aspects of the digitalisation of work. Instead, it looks at how the use of ICT has changed work organisation and how this use is directly or indirectly associated with some working conditions. For example, ICT has facilitated flexible forms of work organisation. However, the working conditions associated with these are not a direct consequence of the technology used for work, but a result of the interaction between the technological change and the institutional context.

The current study analyses the employment and working conditions in TICTM based on a concept developed by Eurofound and the ILO (2017). This defines TICTM as working with ICT from more than one location (with different degrees of mobility) with the potential for flexibility as regards time and place of work. This definition emphasises the flexibility that ICT offers rather than the employment relationship or the nature of tasks. Building upon the research of Eurofound and the ILO, the current study focuses on exploring the effects of TICTM on work organisation, work–life balance, and the health, performance and prospects of workers. It also provides an overview of relevant legislation at EU level and maps regulations within Member States that are related to improving the work–life balance of TICTM workers.

This report includes evidence on how interactions between the world of work and digitalisation can shape the working conditions of employees in Europe. In this regard, it should be considered in the context of research and policies related to digitalisation. Other research shows that automation, artificial intelligence and platform work can also offer possibilities for further flexibility in terms of time and location as well as risks for the intensification of work. These are typical characteristics of working conditions in intensive and regular TICTM.

Methodology

This report builds upon previous Eurofound research on TICTM. The report *New forms of employment* (Eurofound, 2015a) identified ICT-based mobile work as one of the forms of work organisation on the rise in the EU. Subsequently, *Working anytime anywhere: The effects on the world of work* explored the topic in depth, based on information gathered from 10 Member States: Belgium, Finland, France, Germany, Hungary, Italy, the Netherlands, Spain, Sweden and the United Kingdom (Eurofound and the ILO, 2017). This was supplemented by analysis of the European Working Conditions Survey (EWCS).

The current study includes an additional literature review and further analyses of the EWCS 2015 data (Eurofound, 2019a), in-depth case studies on TICTM arrangements and national frameworks, and national contributions from the 28 EU Member States related to flexible work using ICT and work–life balance (Eurofound, forthcoming).

The EWCS covers a representative sample of 43,850 employees and self-employed people in 35 European countries. The survey involves face-to-face interviews carried out in people’s homes. The survey questionnaire covers a wide-ranging set of topics: worker characteristics (including household situation), job design, employment conditions, working time, exposure to physical risks, work organisation, skills use and autonomy, work–life balance, worker participation and representation, the social environment at work, and health and well-being.

For the purpose of this study, workers with a TICTM arrangement are defined as employees and self-employed workers who work with computers, laptops, smartphones and other ICTs ‘always’ or ‘almost all of the time’, and who work in at least one other location than their employer’s premises at least several times a month. They are further categorised based on frequency of ICT use, place of work and level of mobility. The working conditions of these workers are compared with those of workers whose workplace is fixed. These categories allow for comparative and EU-level statistical analyses of these workers for the first time.

Some EWCS items have been selected to examine issues that have been researched before in the literature in relation to this work arrangement. In some cases, the items are a proxy since they do not correspond exactly to the concepts used in the literature.

While analysis of differences between countries is limited due to the small sample size, the results of some job quality indexes are shown for illustrative purposes for five countries: Belgium, France, Slovenia, Spain and the United Kingdom.

The findings presented include the results of descriptive analyses and of multivariate analyses, the latter allowing for the effect of contextual variables such as occupation, sector and country to be controlled, as well as other factors where relevant.

The literature review was conducted in 2017–2018 and covered research publications, journals and articles published in English, Estonian, French, German and Spanish since 2012. These are languages of countries that have a comparatively high number of publications on the topic, with a relatively high level of TICTM and where digitalisation is the subject of national policies. The review focused on empirical research on the employment and working conditions of teleworkers and ICT-based mobile workers.

In addition, 15 in-depth case studies were conducted in five countries in 2018: Denmark, Estonia, France, Germany and Spain. The aim was to complement the quantitative analysis with illustrations of causal processes and mechanisms, and to gain further insight into the impact of TICTM on workers. The case studies are mainly based on half-standardised qualitative interviews with workers and their employers, and with self-employed people and their clients.

Structure of the report

The structure of the report is outlined below.

Chapter 1 defines and discusses the concept of TICTM and how it works in practice.

Chapter 2 gives a brief overview of the incidence of TICTM in Europe, providing information about its distribution in terms of countries, sectors, occupations, employment status, gender and age groups.

Chapters 3–5 explore the working conditions in TICTM related to work–life balance, health and career prospects, and analyses the findings.

Chapter 6 provides an overview of national regulations related to TICTM. It is based on 2017–2018 framework conditions – such as relevant policy discussions and regulations – from the same five countries as the case studies in order to provide context. It also presents some findings from an exercise conducted by Eurofound in 2019 to map regulations in the Member States related to the work–life balance of workers who work flexibly using ICT.

Chapter 7 presents conclusions and policy pointers from the consolidated analyses.

1 | What is TICTM?

Concept and types of TICTM

TICTM is a work arrangement characterised by working from more than one place, enabled by ICT (Eurofound and the ILO, 2017). ICT contributes to the organisation of work and the work environment of TICTM by providing flexibility in terms of location and time, a development that has virtualised the workplace and made constant connectivity possible.

TICTM spans, for example, office-based employees who also work in locations outside their employer’s premises (such as from home, in cafes or on public transport) and self-employed people who work flexibly, based at their own premises, at that of their clients, or in a shared office in a co-working centre. All of these workers have the opportunity to use ICT to work remotely and in more than one place.

So too do many workers in the nascent platform economy, where online platforms match the supply of and demand for paid labour. Since platform work is supported by digital infrastructure (via laptops, tablets and smartphones), platform workers can be required to work at any time or anywhere, especially when the work is performed online (Eurofound, 2018a).

Previous research has shown that the level of mobility and the intensity of ICT use varies across TICTM arrangements, which has a significant influence on working conditions (Eurofound and the ILO, 2017).

It is also essential to distinguish between employees and the self-employed, since the nature of their respective employment statuses leads to differences in working conditions in the context of TICTM. This report defines four categories of TICTM based on degree of mobility, use of ICT and employment status (Table 1):

- **regular home-based:** employees who frequently use ICT to work from home
- **highly mobile:** employees who frequently use ICT to work and have a high level of mobility
- **occasional:** employees who occasionally use ICT to work from locations other than their employer’s premises
- **self-employed:** self-employed workers who occasionally or frequently use ICT to work from locations other than their own premises

In this study, the working conditions in TICTM are compared to those of employees and self-employed people who always work from a fixed location. In this way, the effects of TICTM on working conditions can be identified. The three categories of workers without TICTM arrangements are:

- employees who frequently use ICT for work and who always work at their employer’s premises
- employees who use ICT occasionally or not at all and who always work at their employer’s premises
- self-employed with a fixed workplace

Table 1: Work arrangements compared in the report

Employment status	Category of work arrangement	Intensity of ICT use	Place of work/frequency
Employee	Regular home-based TICTM	High	Mainly from home, at least several times a month
	Highly mobile TICTM	High	In at least two locations, several times a week
	Occasional TICTM	High	One or more places outside the employer’s premises, with a lower degree of mobility than the highly mobile group, occasionally
	Always at employer’s premises, high ICT use	High	The employer’s premises
	Always at employer’s premises, low ICT use	Low/no	The employer’s premises
Self-employed	Self-employed TICTM	High	More than one location
	Self-employed with a fixed workplace	High/low/no	Only one place of work

Note: TICTM categories are shaded in blue.

Source: Author’s own compilation, based on Eurofound and the ILO, 2017

TICTM arrangements in practice

TICTM has been identified as a new form of employment in that it alters traditional work organisation and patterns of work, and is a growing trend in the world of work (Eurofound, 2015a). The case study evidence suggests that TICTM is generally conducted on the basis of standard work contracts. However, according to the EWCS, around a quarter of these workers experience precarious conditions characterised by temporary contracts, job insecurity, low pay, poor access to training and poor career prospects.

TICTM is increasingly covered in collective agreements at sectoral and company levels. However, less formal implementation of this work arrangement is still more prevalent. The availability of TICTM is often at the discretion of line managers, and the anecdotal evidence gathered from the case studies suggests that different rules are applied across organisations. While TICTM is not an appropriate arrangement for all jobs, due to their nature or issues such as security and data protection, the range of occupations involving at least some tasks that could be undertaken remotely is growing.

When interpreting the findings of this report, it should be noted that working conditions and their impact on workers are not defined just by the use of ICT or the workplace itself. The institutional aspects of the workplace interact with the characteristics of the employment relationship to shape working conditions. Digitalisation offers possibilities and advantages that did not exist in the past, including for the processing, storage and communication of information, as well as

temporal and spatial flexibility. However, it is the responsibility of employers, workers and institutions to shape TICTM, related working conditions and outcomes.

In general, TICTM is implemented at the request of the employee (usually with the aim of improving their autonomy, flexibility and work–life balance) or of the employer (if, for example, the work requires the employee to visit clients or as a way to reduce costs or to increase efficiency and productivity), or a combination of both. This results in differences across companies in terms of whether the whole staff is eligible for this work arrangement or just certain groups of employees.

An important precondition for effective and efficient TICTM is that remote workers have access to their company's communications systems and can exchange information with colleagues and their managers, irrespective of time and location (Eurofound, 2015a). This requires a cloud computing system that can be accessed from mobile devices, as well as agreed procedures for the exchange of information. Company practices differ in terms of whether the employer provides the required devices and, if so, whether employees are allowed to use them for private purposes as well. This is partly influenced by sector and occupation. For example, if the work requires access to sensitive client data, employers are strict about ensuring that remote workers have secure access to the relevant information through specific equipment and software, to ensure alignment with data protection rules.

Case study excerpt 1: Informal versus formal TICTM practices

In a German statutory health insurance company, TICTM has been available informally for a long time to specific groups of workers, notably management and highly qualified staff. It was implemented, for example, to allow staff members to work remotely while travelling for business reasons.

To explore a more formal approach to remote work, the company tested home-based telework through a limited pilot project in 2017. A second, more extended pilot is being prepared at the time of writing. The pilot project allows selected staff from across the organisation to spend up to half their time working from home. Employees must have a suitable work environment at home to qualify for the project, and this is subject to inspection by the company to ensure that legal, health and safety, and data protection requirements are met. Another criterion is that the employee must ensure that they can work from home without technical or personal interruptions. Working time must also be registered in the company system.

In parallel with the pilot projects, an agreement was reached between the management and the staff council on the formal implementation of 'mobile telework'. This covers situations combining office work, occasional mobility for business reasons and home-based telework. It is limited to directors, heads of department and division, highly qualified staff in certain departments, and external service staff such as sales agents. The individual arrangement must be agreed between the employee and their superior and is limited to no more than 20% of the total working time by the company agreement. Mobile staff are required to register their working time in the company system and are largely responsible for ensuring that their remote workplace meets occupational health and safety, and data protection standards (the company commits itself to training employees on how to avoid occupational risks).

2 | Spread of TICTM in Europe

Evidence on the scale and scope of TICTM in Europe remains limited, despite growing interest in it among policymakers and researchers (Eurofound and the ILO, 2017). In some countries, accurate and comprehensive data are either rare or do not reflect the true number of people using this type of arrangement because they relate only to people working from home. Another challenge in measuring TICTM is the lack of a harmonised understanding of the concept, which has resulted in different definitions being used by different researchers. These disparities ultimately lead to different results, which impede the development of a comparative analysis or, at least, makes such an analysis difficult. For these reasons, the most reliable comparable figures on the prevalence of TICTM in European countries come from the EWCS.

Scale and distribution

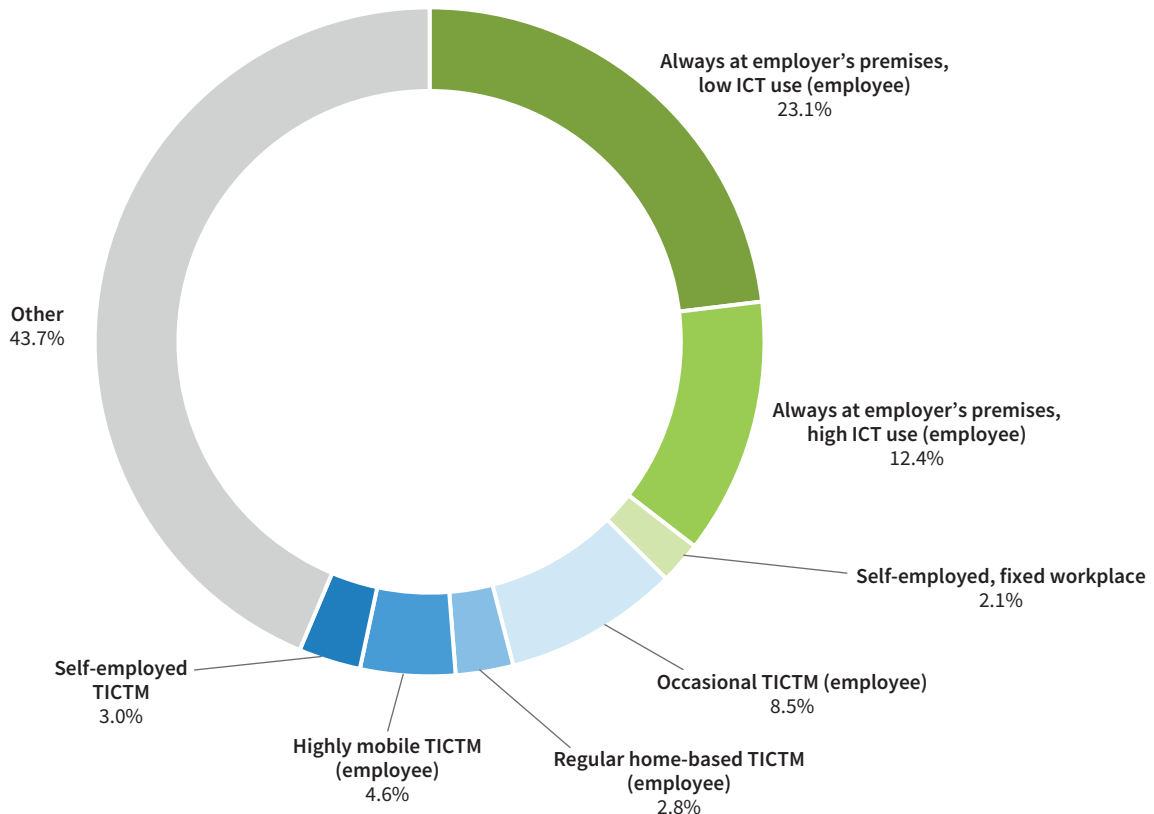
According to the EWCS 2015, around 19% of workers in the EU have TICTM arrangements at work (Figure 1). Of these, almost half are employees who are

occasionally mobile, while one-quarter are highly mobile employees. The shares of regular home-based TICTM employees and self-employed TICTM workers are comparatively lower; each accounts for 15% of all TICTM.

Across the EU, TICTM is most widespread in the Scandinavian countries: 38% and 33% of the workforce in Denmark and Sweden, respectively, work in this way (Figure 2). Other EU countries with relatively high shares of TICTM workers are the Netherlands (31%), Luxembourg (29%), the United Kingdom (27%), France (26%) and Estonia (25%). This suggests that TICTM arrangements are more common in the north and west of Europe, although there are some exceptions, such as Germany, which is below the EU average with 13%, and Estonia, which is above it with 24%.

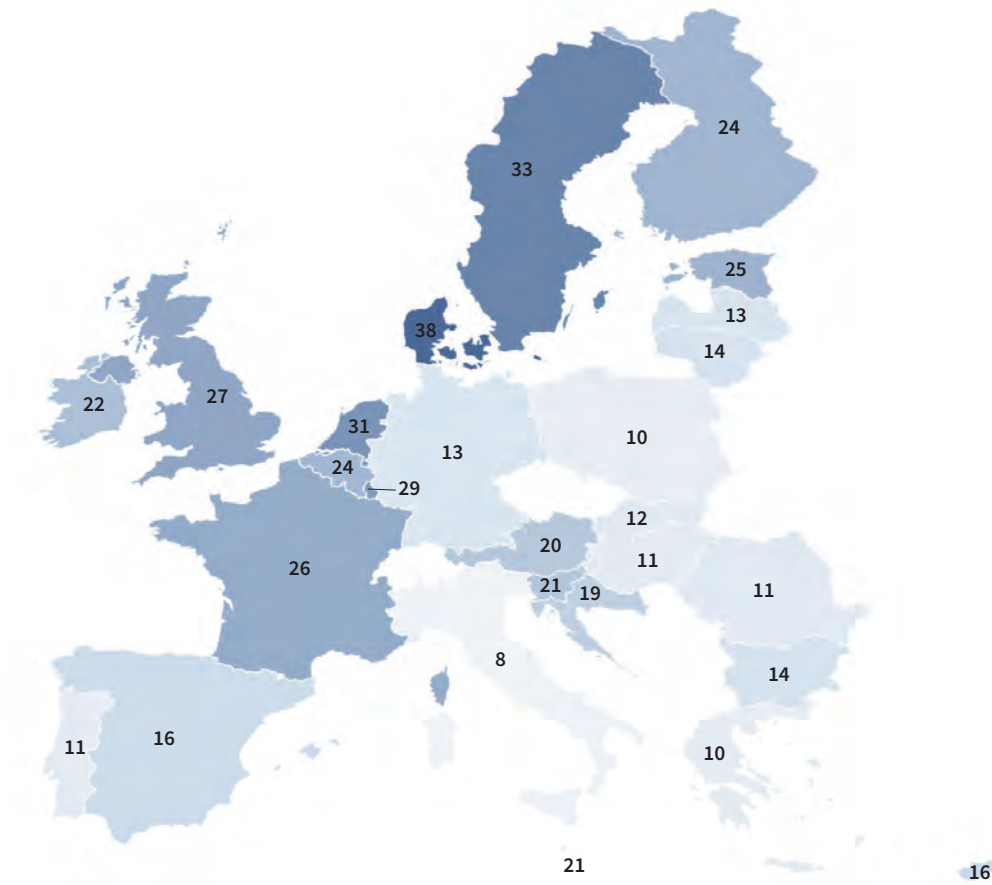
Spain is the southern European country with the highest share of TICTM workers (16%). Interestingly, the percentage of self-employed TICTM workers is higher in southern European countries. In Italy, for example, 36% of self-employed people can be categorised as TICTM, compared to only 7% of employees.

Figure 1: Shares of workers by type of work arrangement, EU28, 2015



Source: EWCS 2015

Figure 2: Shares of workers (employees and self-employed) with a TICTM arrangement (%), Member States, 2015



Source: EWCS 2015

A study by Eurofound and the ILO (2017) indicates that variations between countries can be explained by different factors: the spread of ICT, internet connectivity, ICT skills, economic structure, GDP, geography and work culture, including managerial models. Another important element is provisions in legislation and collective bargaining that regulate flexible and remote work. Accordingly, factors that drive the implementation of TICTM and barriers to it are multifaceted and interrelated, and the digitalisation of the economy is not the only determinant. This is reflected in data provided by the EU’s Digital Economy

and Society Index (DESI), which tracks Member States’ digital performance. Denmark and Estonia score highly, which could be linked to the fact that both countries have high levels of TICTM. However, France has an average DESI score despite its high level of TICTM, and Spain’s DESI score is on a par with that of France, yet the country has far fewer TICTM workers. This suggests that other factors are driving and hindering the use of TICTM across Europe, notably the management culture, a factor flagged in the case studies – see Case study excerpt 2.

Case study excerpt 2: Managerial culture fostering TICTM

Denmark is generally characterised by a management culture that is defined as ‘management based on trust’ and ‘freedom with responsibility’. A high level of social capital is seen as an important driver for good company performance. This is manifested by a high degree of worker autonomy and low levels of internal control in the work organisation. Such a managerial culture is an important basis for introducing TICTM, which is often implemented informally based on trust between managers and employees. While investing in TICTM solutions has become common in medium-sized and large enterprises, it is less common in small firms (particularly if they are family businesses), which tend to adhere to more traditional management styles.

While there are no comprehensive longitudinal data available, there is the general perception that a growing share of employees across Europe use ICT to work flexibly on at least an occasional basis, and this trend is even more marked for the self-employed (ETUI, 2013; Holtgrewe, 2014). Evidence from individual countries confirms this. In France, for example, the share of employees with a TICTM arrangement increased from 7% in 2007 to 12.4% in 2012 (Greenworking, 2012). Similarly, in Sweden, the share of enterprises with employees who telework increased from 36% in 2003 to 51% in 2014 (Statistics Sweden, 2015). This increase is expected to continue if digitalisation, the participation of women in the labour market, flexible employment and flexible work organisation continue to rise.

TICTM by sector

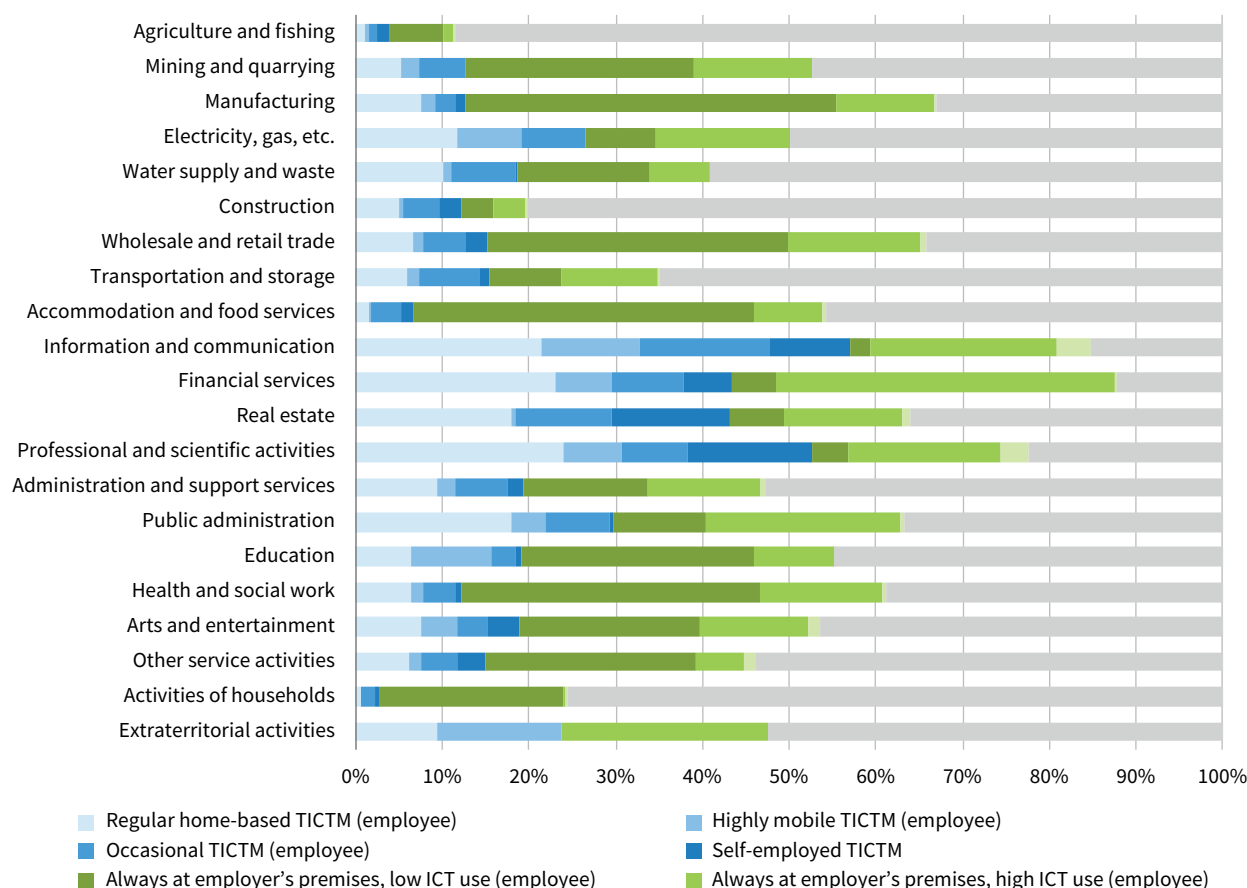
Considering the total EU workforce, relatively higher numbers of workers with TICTM arrangements are found in the professional and scientific activities sector as well as in the wholesale and retail trade.

Examining the data further shows that different types of TICTM are more prevalent according to sector. Regular home-based TICTM is found mainly in education and also commonly work in information and

communication (including the ICT industry) and in professional and scientific activities. Highly mobile TICTM is dispersed across sectors but are more concentrated in the wholesale and retail trade and to a lesser extent in manufacturing, transportation and storage, information and communication, public administration, and health. Occasional TICTM is the most common type across sectors; it is most prevalent in manufacturing, professional and scientific activities, and public administration. Self-employed TICTM workers are mainly found in professional and scientific activities, information and communication, and the wholesale and retail trade.

Figure 3 shows the proportions of workers in each category according to sector. The sectors with the highest proportions of workers with TICTM arrangements are information and communication (57% of workers in the sector), followed by professional and scientific activities (53%), financial services (43%), real estate (43%), and public administration (30%). Typically, these are sectors with a high level of ICT dependency and more flexibility regarding work location. Interestingly, information and communication and professional and scientific activities include a variety of TICTM types, whereas occasional TICTM is more dominant in other sectors.

Figure 3: Prevalence of types of work arrangement, by sector, EU28, 2015



Source: EWCS 2015

TICTM by occupation

As regards occupation, TICTM is most common among professionals; 6.5% of the EU workforce are professionals with a TICTM arrangement. This is followed by the technicians and associated professionals group (those doing TICTM make up 4.5% of the EU workforce), and clerical workers and managers (2.5% each of the EU workforce).

Again, different types of TICTM are more common in different occupations. Regular home-based TICTM is taken up mainly by professionals (including teachers, for example), whereas the highly mobile group includes a relatively large share of technicians, as well as services and sales workers, and craft workers. Employees doing occasional TICTM include a larger share of clerical support workers than in the other two arrangements.

The self-employed TICTM group includes a higher share of managers.

There are some differences between sectors in terms of the occupational distribution of TICTM (Figure 4).¹ In the financial services sector, technicians and associated professionals is the largest occupational group working on a TICTM basis. The sector comprising wholesale and retail, transport, and hospitality is more diverse, with TICTM workers including managers, technicians and associated professionals, and service and sales workers. In another three sectoral groups, professionals are the largest occupational category doing TICTM: information and communication; professional, scientific and administrative activities; and public administration, education and health. Some of these sectors include traditionally mobile occupations, such as sales people, which have recently adopted the use of ICT.

Figure 4: Shares of workers with a TICTM arrangement, by sector and occupation (%), EU28, 2015



Note: EU28=100%
Source: EWCS 2015

¹ In this case, the 21 sectors of the NACE Rev. 2 classification have been aggregated into 10 sectors (as in Eurofound, 2017a). It was not possible to use the 21-sector classification because of the very small number of cases per occupation.

TICTM in a second job

Some workers take on a second job to boost their income. The share of employees who report having a second job is higher among those with a TICTM arrangement than among other workers (after controlling by sector of activity). And considering just TICTM workers, regular home-based TICTM is the group with the highest share of workers who have a second job. For example, 14% of this group in the ‘other services’ sector have a second job (compared to 7% of employees who always work at their employer’s premises), of whom half work more than one job on a regular basis. It is plausible that home-based TICTM makes it easier for people to work more than one job, as does the greater flexibility in terms of working time and place.

TICTM among the self-employed

Around 20% of self-employed workers in the EU use a TICTM arrangement. Almost half of them are highly mobile, compared to 27% of employees. Therefore, the self-employed tend to use more intensive forms of TICTM than employees.

The composition of self-employed TICTM workers resembles that of the self-employed in general across Europe in that the majority are working for themselves or are sole directors. The proportion of freelance workers or those working as a partner in a business or professional activity represents less than one-fifth of the total number.

The data suggest that the level of dependency (that is, the percentage of the work done for a single client) in the self-employed TICTM group is somewhat higher for those who use this arrangement more often. However, the comparison between self-employed TICTM workers and other self-employed in general shows a slightly higher degree of dependency within the latter group. Therefore, although differences have been found within the TICTM categories, there is no evidence that self-employed TICTM workers are more dependent on a single client than the rest of the self-employed.

A higher share of self-employed TICTM workers report that they do not have the capacity to hire employees and do not have employees working for them compared

to those with a fixed workplace. Therefore, it is less common for a self-employed TICTM worker to be an employer than a self-employed worker who has a fixed place of work.

Sociodemographic characteristics

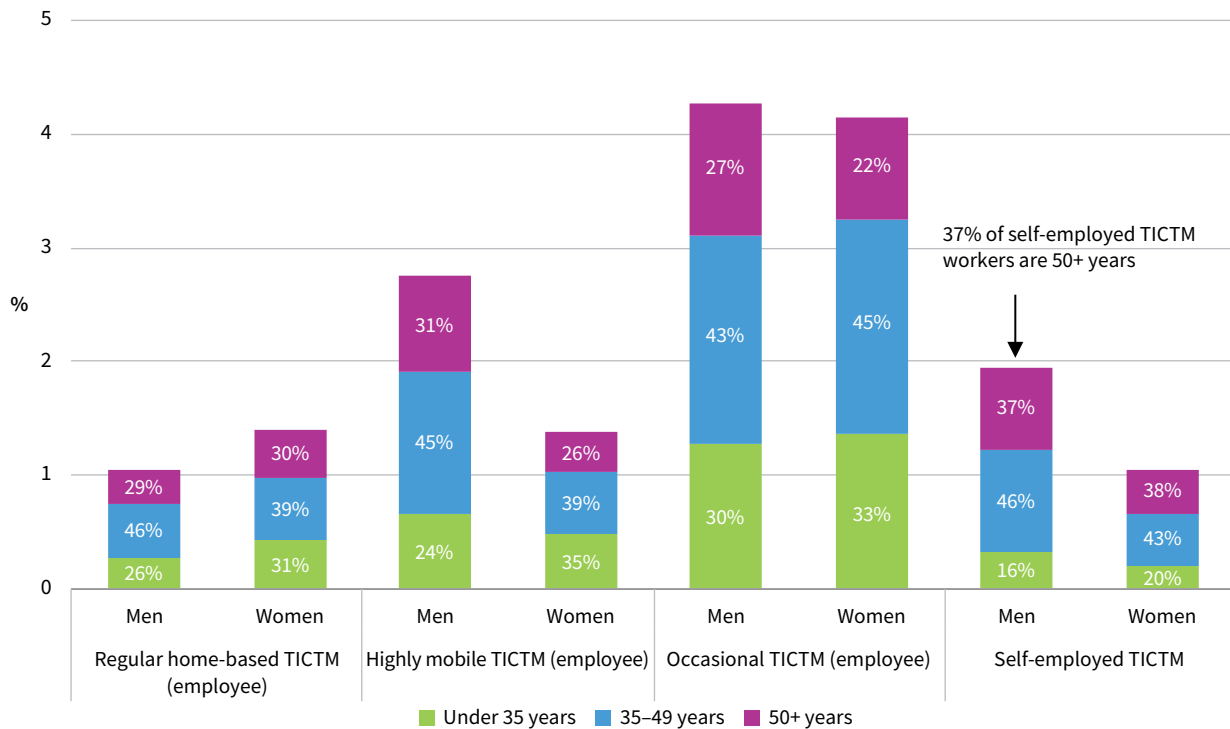
The EWCS findings show that a higher share of men (54%) have a TICTM arrangement than women (46%) (Eurofound and the ILO, 2017). Within the different types of TICTM, men make up a greater share of highly mobile TICTM employees and self-employed TICTM workers, whereas more women than men are in the regular home-based group. Occasional TICTM is equally common among both sexes. This gender breakdown might be related to traditional gender roles. Although more women are in paid work, they generally continue doing more household work than their male partners, so more women do regular home-based TICTM in order to combine work and domestic demands (Eurofound and the ILO, 2017).

The EWCS supports this conjecture, showing that a higher share of workers with TICTM arrangements have caring responsibilities than the rest of the workforce. It is also common for these workers to be the main earners in the household, implying that such employees place a greater value on work and are thus more motivated to work when they are away from their employer’s premises.

In relation to age, Figure 5 shows that the occasional TICTM group has a relatively high share of young workers, while the regular home-based, highly mobile and self-employed groups include relatively large shares of men aged 35–49. Workers in the self-employed group tend to be older (both men and women) than those in employment.

Generational differences in relation to ICT skills and types of job seem to favour higher adoption of TICTM among workers in the younger and prime age groups. However, as TICTM could be increasingly used to extend working life by offering a convenient work arrangement to older workers, this distribution might change in the future.

Figure 5: Shares of workers, by TICTM type, gender and age, EU28, 2015



Note: Percentage of workers by TICTM type, gender and age (EU28 = 100%), and percentages within each group of gender and TICTM (for example, self-employed male TICTM = 100%)

Source: EWCS 2015

In short: Scale and scope of TICTM in Europe

- About one-fifth of the EU workforce has a TICTM arrangement. Member States report an increasing trend in working remotely, away from an employer’s premises.
- There are considerable differences in prevalence across countries, with a general north-south and east-west divide. The variety is attributable to a combination of factors, including the stage of technological advancement and infrastructure of the country, the economic and labour market situation, the managerial culture and the regulatory frameworks.
- While TICTM is prevalent in most sectors, it is most widespread in information and communication, financial services, professional and scientific activities, and public administration.
- TICTM is most common among professionals and male workers aged under 49.
- About half of workers with this arrangement do it on an occasional basis. This, in combination with the finding that more TICTM workers have care responsibilities than the rest of the workforce, suggests that demand for flexibility is one of the factors driving this work arrangement.
- Self-employed workers tend to use TICTM more intensively.

3 Work organisation, working time and work–life balance

TICTM has advantages for both employers and workers. It allows time and place of work to be adapted to employer and worker needs alike, meaning it is also capable of improving productivity and work–life balance. However, some potential disadvantages, such as constant availability and long working hours, can blur the boundaries between private and working life. In addition, whether the work performed outside the employer’s premises is a substitute for or a supplement to in-house work appears to influence whether workers feel that TICTM improves or diminishes their work–life balance.

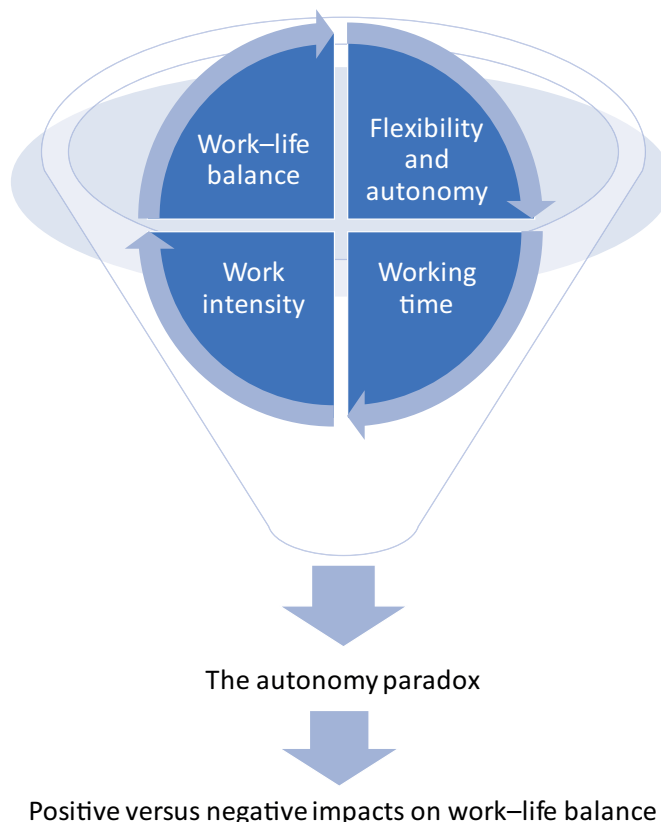
The research so far on the impact of TICTM is ambiguous and sometimes contradictory (Eurofound and the ILO, 2017). The analysis in this chapter aims to provide a more comprehensive assessment of the effects of this work arrangement on working conditions and work–life balance. Since many factors can influence work–life balance, this analysis focuses on some of

those raised in previous research by Eurofound and the ILO (2017), for which the EWCS provides specific data. They include:

- flexibility and autonomy
- working hours and working time quality
- work intensity and workload
- the boundary between work and home

It should be noted that TICTM is taken up mainly by workers working flexibly with ICT, the majority of whom are professionals and technicians. Therefore, although other occupations allow for this type of work arrangement (for example, sales people and clerical workers), the conclusions drawn mainly apply to highly skilled workers. However, the multivariate statistical analysis confirms that TICTM plays a role in shaping organisational aspects of work regardless of the specific job or occupation under consideration.

Figure 6: Factors influencing the impact of TICTM on work–life balance



Source: Author’s own compilation

Impacts of ICT

Working time flexibility

One concept strongly associated with the digitalisation of the workplace and specifically with the use of ICT is that of flexibility. ICT has facilitated new ways of organising work by giving workers more flexibility regarding when and where work can be performed. These forms of work organisation rely less on regular rhythms and instead allocate tasks more flexibly. This shift is accompanied by a more general trend towards work that is project-based and fragmented (Eurofound, 2015a), on-demand and performance-paid. These types of work are not necessarily tied to regular working time but require workers to be on-call, meet deadlines or reach targets set by employers or clients (Eurofound, 2019a).

Working time flexibility may be a requirement set by the employer, in which case it is involuntary for the worker, or instigated by the employee, in which case it is voluntary. Employer-friendly forms of working time flexibility are those that allow organisations to 'bring human capital in line with the temporal requirements following from business' (Eurofound, 2013, p. 17).

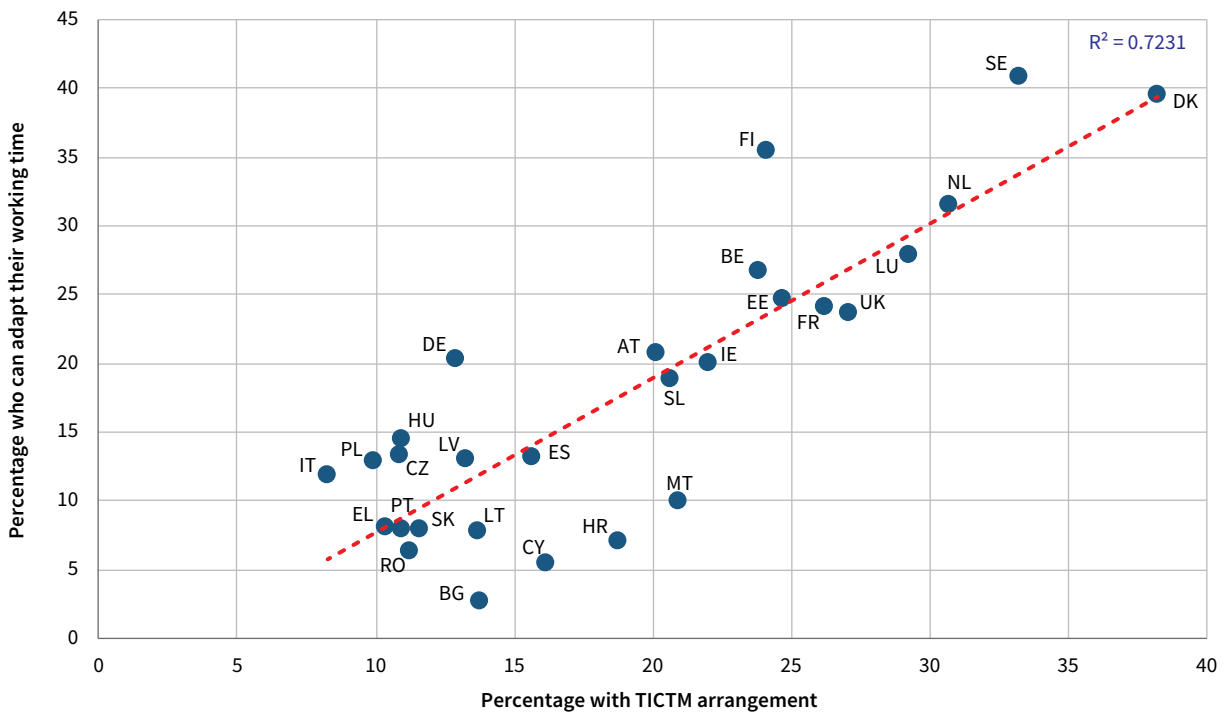
Employee-friendly forms are those 'that provide workers with the freedom to adapt their working hours and schedule to meet their own personal and family needs' (p. 17).

A substantially higher share of TICTM workers work flexibly compared to workers operating entirely from their employer's premises (Eurofound and the ILO, 2017). At country level, the evidence shows a strong positive correlation between TICTM and flexible forms of organising working time (Figure 7). Both flexible working time and TICTM are more prevalent in Belgium, Denmark, Estonia, Finland, France, Luxembourg, the Netherlands, Sweden and the United Kingdom.

Worker autonomy

Autonomy at work refers to a worker's ability to determine aspects of their work (such as the order of tasks, speed and working methods), have a say in their choice of colleagues and take a break when they so desire. In general, employees who work outside their employer's premises have more influence over their work organisation as they are less subject to the direct control mechanisms that usually come with having a physical presence in a specific workplace.

Figure 7: Correlation between flexible working time and TICTM, Member States, 2015



Source: EWCS 2015

Workers with a TICTM arrangement usually report higher levels of autonomy than other workers. The workers interviewed for the case studies reported that their work arrangements have allowed them to make certain decisions about their work schedules and pace of work, and have limited managerial control.

The degree of this autonomy often depends upon an informal understanding between the employee and their manager, which is shaped by managerial attitudes towards remote work. A study on telework by Ojala et al (2014) found that autonomous and ‘inspiring’ jobs are the strongest predictors of telework and informal overtime at home, which indicates that teleworkers in general have the discretion to determine their own work schedules and pace of work.

The analysis of the EWCS data shows a higher level of autonomy among workers with a TICTM arrangement than among those who always work from their employer’s premises. This is due to some extent to the fact that TICTM is more common among white-collar workers higher up the occupational hierarchy, who

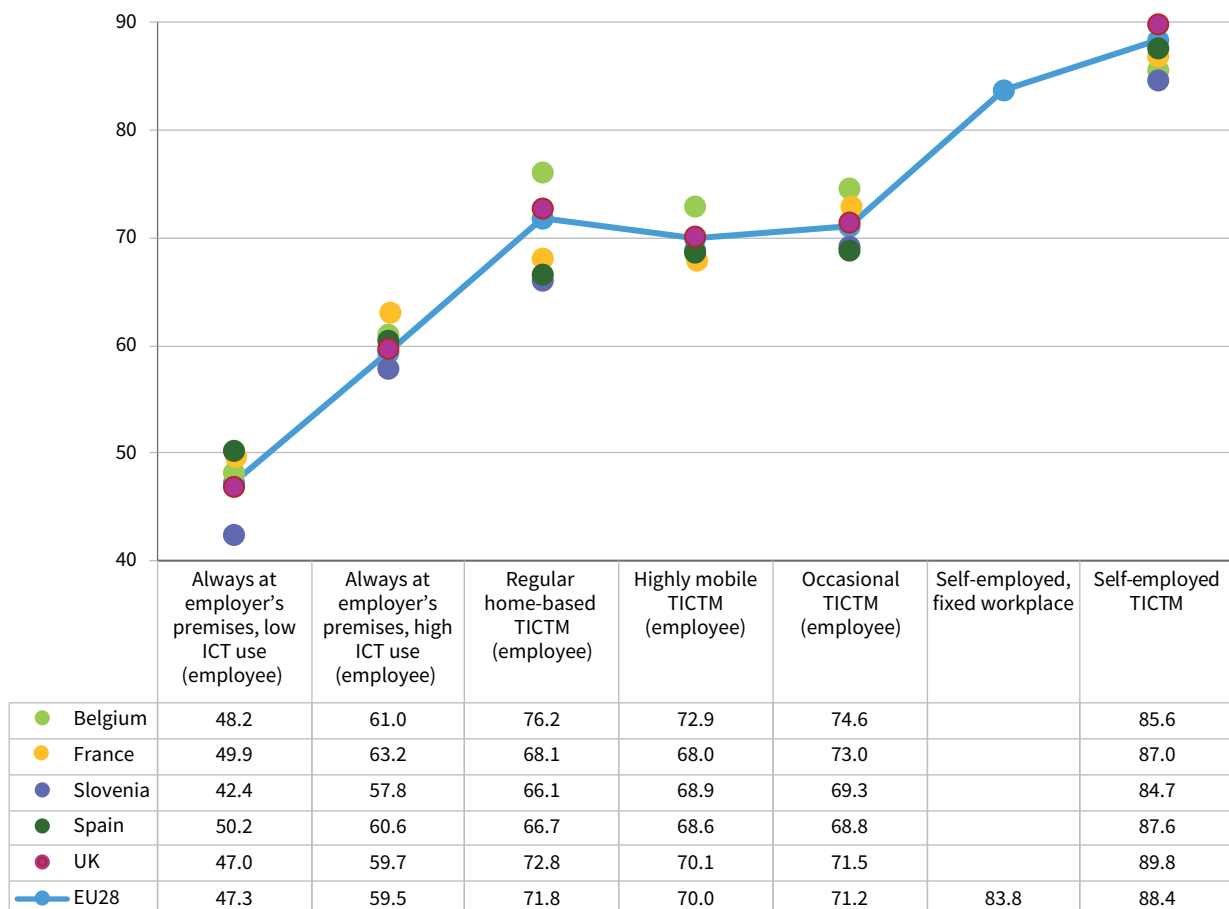
generally enjoy more discretion at work than workers lower down.

Comparing the TICTM categories, there are minimal differences in the levels of autonomy between the five Member States selected for specific analysis. The exception is regular home-based TICTM, a category where workers in Belgium score higher than average (Figure 8). One explanation for this could be that the country’s regulatory framework addresses the conditions of regular home-based work. In most TICTM categories, workers in Slovenia are below the EU average and have the lowest autonomy score among the five Member States.

Surveillance

While TICTM may increase autonomy, the use of digital technologies has also increased the potential for remote workers to be controlled or monitored. Limited information is available as of mid-2019 about the extent to which companies use ICT for worker surveillance.

Figure 8: Scores on autonomy index, by work arrangement, EU28 and five Member States, 2015



Notes: Mean scores 0–100. Highest–lowest country averages for total: 73 (Finland)–51 (Bulgaria); range = 23. Scores for self-employed with a fixed workplace are not shown for the individual countries due to an insufficient number of cases to draw reliable conclusions from.

Source: EWCS 2015

Anecdotal evidence suggests that there are two widespread practices:

- employers respecting the privacy of their staff in spite of the possibilities that technology provides
- employers conducting rigid surveillance through intensive use of technology

The presence of surveillance will influence the degree of autonomy for workers and raises the autonomy paradox – the fact that autonomy can make work more rewarding while at the same time causing workers to work long hours and disrupt their work–life balance, an issue discussed later in this chapter.

Benefits for work–life balance

Because TICTM enables workers to adapt the place and time of work to their individual needs, it offers much potential for improving work–life balance. It gives workers more freedom to better manage their care responsibilities, for example, or to take care of personal issues that are difficult to attend to outside core working hours due to specific opening times (such as visiting a public authority or attending a medical appointment) (Walrave and De Bie, 2005; Fundación Másfamilia, 2012).

Several national studies report a positive impact of TICTM on work–life balance. A survey by Lasfargue and Fauconnier (2015) in France, for instance, found that for 95% of respondents, telework had a positive impact on their quality of life, 89% reported that their family life was of a higher quality, and 88% believed they had a better work–life balance. This was explained in terms of having more time to spend with family (79%), on personal activities (66%) and on activities in the local community (47%).

The EWCS includes several questions on the topic of work–life balance. It asks respondents, for instance, about the fit between working hours and family commitments, whether work encroaches on home life, and whether respondents work in their free time to meet work demands.

The cross-national perspective provided by these data show that workers in the regular home-based TICTM category report a slightly better fit between their working hours and their family or social commitments than workers who always work at their employer’s premises. Multivariate analysis confirms this finding. In contrast, outcomes for the highly mobile group are less positive on all the survey indicators measuring work–life balance, including the fit between their working hours and their family or social commitments.

The results on work–life balance by work arrangement are quite similar for women and men. Highly mobile and occasional TICTM are exceptions; in these two groups, women are somewhat more likely to report that their working hours fit well or very well with their home life.

The case studies conducted for this study suggest that there are particularly good opportunities for improved work–life balance for workers with family responsibilities who occasionally do TICTM. Most of the occasional TICTM workers interviewed did not report conflicts between work and home life. The potential for such conflict increases, however, when regular home-based TICTM is more frequent.

The opportunity TICTM offers to save commuting time is also worth mentioning. The flexibility inherent in TICTM allows workers to avoid travelling to a specific workplace if the task is not place-bound or to arrange the travel at a convenient time (outside rush hours) if the task is not time-bound.

Case study excerpt 3: Digital surveillance in TICTM

Since an ICT upgrade, sales staff at a German ICT company have been required to record each step of their project through a smartphone or digital notebook, which enables management to track their performance more closely. The works council opposed the innovation, which resulted in an agreement from the company not to use the data to track the individual performance of workers.

Sales staff in the Spanish wholesale and distribution sector, which has historically had a highly mobile workforce, have used handheld devices since the 1990s. More recently, new features such as geolocation have been added to these devices. The innovation allows employers to check that goods are being delivered to clients at the agreed times by tracking whether workers have followed their pre-established daily routes. In the case study company, the trade union representative agreed that this feature improved performance but noted that it enhanced organisational control.

Case study excerpt 4: TICTM flexibility enhancing work–life balance

Two staff members from the Estonian branch of an international plant hire business emphasised that TICTM helps them to achieve a better work–life balance by enabling them to tend to their care responsibilities and health needs. Both also use the working time flexibility to make the daily commute easier and to better combine work with their personal lives. One, for example, tends to leave the office early to avoid traffic problems and continues to work from home later in the day. An example mentioned of how this flexibility can work was the possibility of taking a car in for repairs in the afternoon, working for a few hours, attending a sports club and working some more afterwards. In this way, personal activities undertaken during the day are compensated for with additional work in the evening.

A case study from the Spanish banking sector also emphasised the positive impact of TICTM on work–life balance. When employees work remotely, they commonly do so in the evening and, to a lesser extent, at night, instead of core working hours, especially if they are dealing with family needs. TICTM arrangements give employees greater autonomy to organise their schedule according to their own needs when they are working outside the bank's premises. To ensure this, corporate policy aims to prevent managers from acting in ways that could undermine the autonomy of employees – for example, by dictating when employees must be available or by establishing unnecessary meetings.

Downsides for work–life balance

In spite of the generally positive assessment of the relationship between TICTM and work–life balance outlined above, this work arrangement can also have more of a negative impact. Harmful consequences are mainly rooted in some of the working conditions of TICTM and the frequency with which workers work on this basis. Generally, those who do TICTM more often (notably the highly mobile workers) experience more negative effects on their work–life balance. For example, they miss out on or neglect family activities because work interferes with their personal life. This type of impact has been reported in Finland, Germany, the Netherlands, Sweden and the United Kingdom (Eurofound and the ILO, 2017). Apart from Germany, all these countries have relatively high numbers of workers with TICTM arrangements.

The blurring of boundaries between working time and private time is a particular problem for employees who work from home as it can be difficult to maintain a clear division between the two. This can be exacerbated when, due to workload or a personal work ethic related to career advancement, work done from home supplements the work done at the employer's premises rather than replacing it.

Apart from the factors already mentioned (flexibility, autonomy and surveillance), what aspects of work organisation in TICTM contribute to this erosion of the work–life boundary? To find the answers, intensity of work and working time quality need to be looked at more closely.

Intensity of work

The literature on the use of ICT within and outside the employer's premises tends to indicate that while ICT enables greater autonomy, it also leads to higher levels of work intensity (Eurofound, 2019a). Previous research identifies the following sources as contributing to increased intensity in TICTM (Green, 2006; Derks and Bakker, 2010; Kelliher and Anderson, 2010; Grant et al, 2013).

Work process monitoring: The use of technology to monitor work processes – which aims to avoid idle times in the production process – can result in an increased workload that needs to be addressed by greater work intensity or longer working hours.

Permanent connectivity: This can cause workers to believe that they must always be available for their job and able to respond to requests at short notice, resulting in greater work pressure.

Interruptions: Constant interruption, caused by permanent connectivity or unfavourable workplaces, eats into time and can put pressure on a person to work harder to make up for lost time or inefficiency.

'Social exchange' between employers and employees: Workers who are granted a flexible working arrangement may respond by putting in more effort ('reciprocity') to prove that it has not affected their work ethic or commitment.

Corporate or managerial culture, personal ethics or ambition: These aspects may drive an employee to put in effort above and beyond that needed to perform the job well.

Case study excerpt 5: Greater work intensity due to job enlargement

In a small French company that specialises in industrial manufacturing design, TICTM increased the efficiency of the sales process by reducing the time required for some tasks. This led the company to increase the sales targets for its sales agents and to increase the scope of their tasks.

Beyond making appointments with clients, sales staff must now do more reporting – for example, summarising customer visits and drafting weekly and monthly sales reports – a task that the interviewed employee considered time-consuming and unproductive. In addition, the complexity of the work has increased because the technical devices that sales agents bring on visits include readily available information about product characteristics and prices, and customers therefore expect more individualised advice.

Information overload: This occurs when the amount of information to be consumed and assimilated, particularly in relation to a task or decision, exceeds the capacity of the individual to process information.

Email overload: This occurs when the volume of email messages received and the time required to respond appropriately exceed the time available to do so. This may be due to the receipt of many unnecessary messages, a low-trust culture that prompts users to include many recipients in copy in emails, a worker being engaged in too many simultaneous projects, or a lack of group or organisational norms to promote the judicious use of email. Responding to email may also demand the recipient to switch between several distinct job roles and social contexts, exceeding their capacity for interaction.

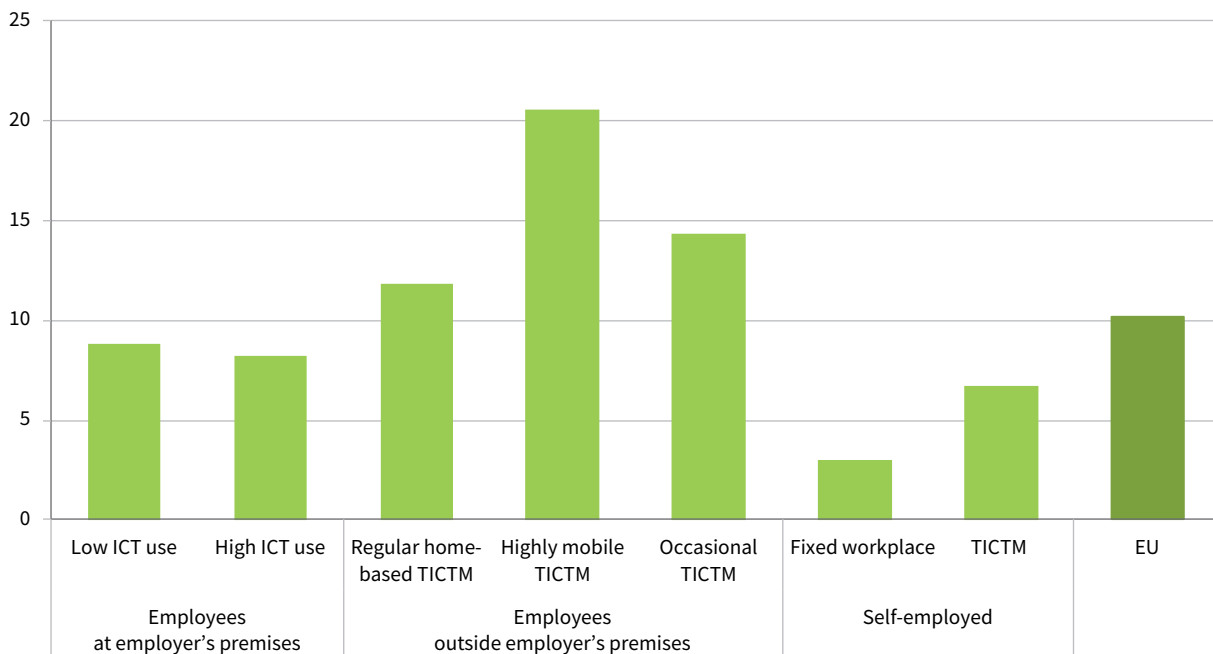
The case studies conducted for this study revealed another factor that has not yet been discussed in literature: job enlargement resulting from TICTM, which is described in the case study excerpt above.

Some of the factors that lead to increased intensification of work in TICTM have been analysed using the EWCS data and complemented with information from the case studies, and are outlined below.

Having enough time

Workload and pressure of work contribute significantly to work intensity in TICTM. The EWCS asks workers whether they have enough time to do their job, and the responses are shown in Figure 9. According to the multivariate analysis, employees with a TICTM arrangement are more likely to report that they find it

Figure 9: Shares of workers who rarely or never have enough time to do their job (%), by work arrangement, EU28, 2015



Source: EWCS 2015

difficult to do their job within the allotted time, especially the highly mobile group. The case studies suggest that the risk of overload is greater in jobs that combine high mobility with managerial responsibilities in the office.

When taking all groups of workers into account, the EWCS data show that self-employed people with low or no ICT use are more likely to have sufficient time to do their job. Therefore, it could be argued that the autonomy of the self-employed enables them to tackle pressure at work, which is not necessarily the case for employees in a TICTM arrangement.

Interruption

Another important factor that contributes to work intensity is permanent connectivity leading to interruptions throughout the working day. According to the EWCS, TICTM workers of all categories tend to have their scheduled tasks interrupted on a regular basis by unforeseen requests. In addition, both self-employed TICTM workers and those who regularly work with ICT at an employer's premises experience more interruptions than workers who do not use ICT. This suggests that the use of technology plays a greater role than mobility in determining the level of interruption.

The reported interruptions are disruptive for half of employees with a TICTM arrangement and one-third of self-employed TICTM. They are less so for those who do not regularly use ICT for work. This suggests that TICTM is not optimal for some activities and tasks and can add to work intensity and job demands.

Constant availability

ICT also enables employees and workers in general to be constantly available to their colleagues and clients, potentially extending their working time and increasing work pressure. This is reflected in several national

studies. According to the Finnish quality of work life survey, 65% of teleworkers were contacted about work-related matters outside of normal working hours in 2013, mostly via email. Over one-third (35%) reported that such contact had been made several times during the reference period (Statistics Finland, 2014). Similarly, 68% of Spanish workers confirmed that they had received emails or phone calls outside of normal working hours (Randstad, 2012). In Sweden, more than half of respondents (53%) to a survey of both mobile and non-mobile workers were available outside of normal working hours, even on a daily basis (Unionen, 2013). In addition, 31% of respondents agreed 'completely' or 'to a certain degree' that they often checked work emails outside of normal working hours.

The multivariate analysis of the EWCS data indicates that highly mobile TICTM workers (15% of this group) and self-employed TICTM workers (28%) are significantly more likely to be called to work on short notice in comparison with workers in the other TICTM categories or workers who are always at their employer's premises. These two groups consist mainly of professionals in the services sector and associated professionals in the services and commerce sectors. These findings suggest that being highly mobile often entails availability at short notice. Moreover, if a self-employed worker is TICTM, their chances of being called to work almost double.

The case studies also indicate that highly mobile TICTM employees as well as self-employed TICTM workers are more likely to be constantly available. Working regularly at various workplaces means that communication through ICT devices is an indispensable way of coordinating activities with colleagues, managers and clients. There was strong agreement among the interviewees that such a situation required clear boundaries to be set in terms of when to be available

Case study excerpt 6: Managing boundaries

A freelance German ICT consultant, who is a highly TICTM mobile worker, has established a technical solution to deal with the 'permanent connectivity challenge' typical for his profession and work arrangement. His clients understand that unless he is working at their premises, he is not directly reachable, and any business contact needs to be done through email or phone calls that are filtered by an online call service. This means that his business phone number is answered by a telephone service that is available from 8 a.m. to 6 p.m. Clients can explain their concerns and, depending on the instructions given by the consultant, the online call service either passes the call to his mobile phone or takes note of the call and informs him about it (so that he can follow up later).

A self-employed Spanish technical engineer, who uses TICTM to balance her work with caring for her young daughter, explained that she needed to be always available for new projects or to meet clients' demands, even after core working hours and during holidays. To manage this situation, she applies a 'communication code' where she will always pick up the phone to clients. But if she is with her child or engaged in other work tasks, she will only deal immediately with urgent requests. For non-urgent requests, she informs the client that she will call them back at the earliest convenience. Her experience with this approach has been positive, as it signals to clients that she is available while also allowing her to disconnect if needed.

for work and when to disconnect. In the case of self-employed people, these boundaries also need to be communicated to clients; a challenge since being disconnected could result in the loss of work.

Work intensity index

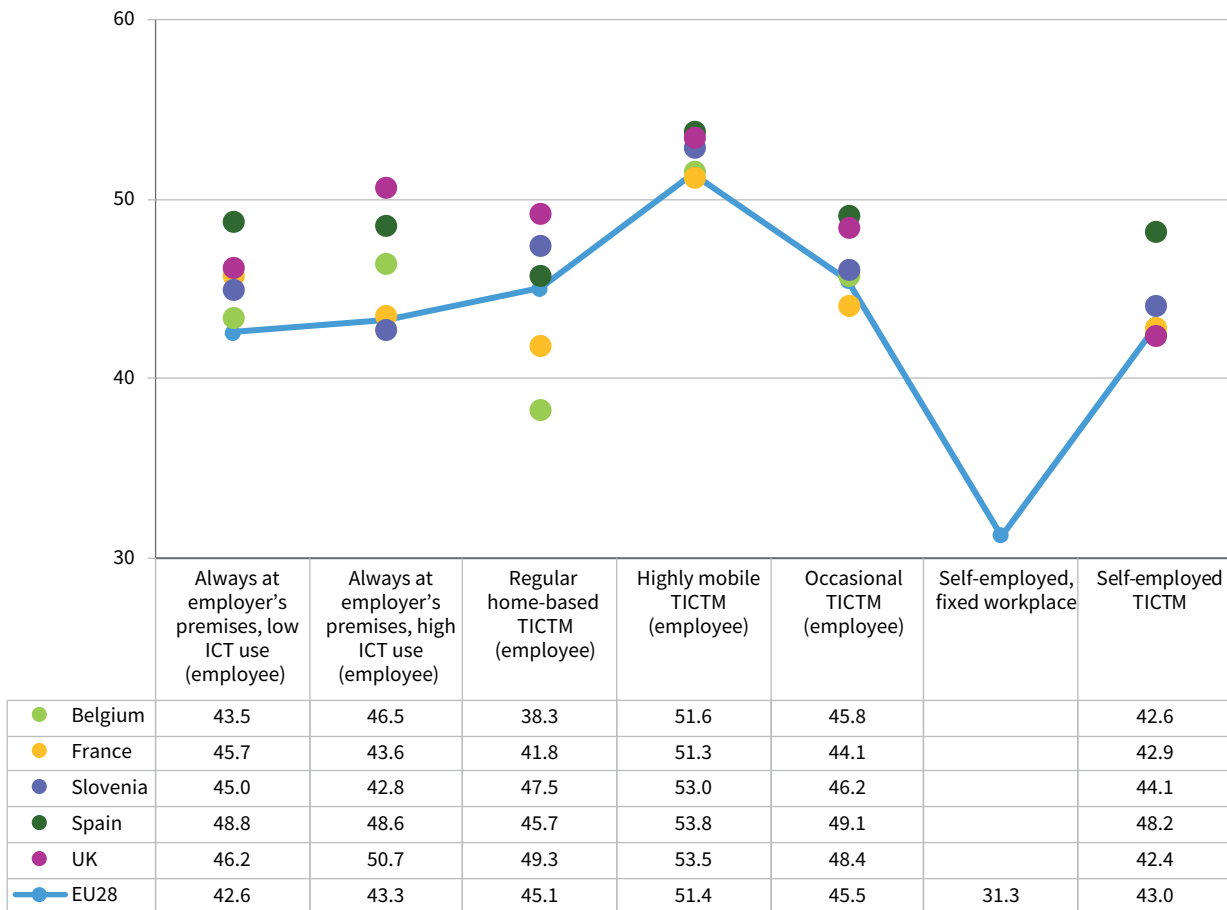
Some of the working conditions examined here (having time to do the job, experiencing interruptions, work pressures and working in one’s free time) form part of the Eurofound job quality index of work intensity.² Figure 10 shows the scores of workers on the index according to work arrangement, and it confirms that highly mobile TICTM entails higher levels of work intensity.

When scores are examined by occupation, there are variations among workers in the regular home-based

TICTM group, with managers reporting higher levels of intensity than other groups.³ Differences in work intensity between occupations in the occasional and highly mobile groups are not significant. However, TICTM leads to higher levels of work intensity in all occupations.

Figure 10 also isolates the work intensity index scores for five Member States (although the results should be treated cautiously because of the small number of cases). These suggest that the biggest differences between countries relate to regular home-based TICTM, which could arise from different national circumstances or policies. Most scores are above the EU average in Spain and the United Kingdom, which could be related to the overall higher level of work intensity in these countries.

Figure 10: Scores on work intensity index, by work arrangement, EU28 and five Member States, 2015



Notes: Mean index scores 0–100. Highest–lowest countries average for total: 57 (Cyprus)–32 (Latvia); range = 25. Scores for self-employed with a fixed workplace are not shown for the individual countries due to an insufficient number of cases to draw reliable conclusions from.
Source: EWCS 2015

² The work intensity index covers the following topics: working at high speed and to tight deadlines, the number of sources of work pressure, having enough time to get the job done, having frequent disruptive interruptions and working in one’s free time.

³ Due to the small number of TICTM workers in blue-collar jobs, it is not possible to draw reliable conclusions as regards the work intensity index for this group.

Differences in working time quality

Greater work intensity in TICTM arrangements can contribute to longer and more arbitrary working hours, supplemental work, and irregular schedules and insufficient rest times for TICTM workers, particularly for highly mobile workers and those with a high level of autonomy. All of these can have a negative impact on working time quality.

It is difficult to gauge the extent to which TICTM increases working time, as much of it is conducted outside of formal arrangements. For example, Glorieux et al (2008) showed that about half of workers in Belgium who teleworked did so in addition to their work at their employer’s premises. Similar results were found by a Spanish study, which showed that 64% of Spanish teleworkers carried out work tasks during their leisure time – eight percentage points more than the average (56%) (Randstad, 2012). Beauregard et al (2013) found that the difference between hours worked and contracted hours was higher for teleworkers than for office-based workers.

Working long hours

The EWCS data show that the share of employees working long hours – defined as more than 48 hours per week – is higher among those with a TICTM arrangement than other employees (Figure 11). This holds particularly true for highly mobile TICTM, where workers generally have a high level of autonomy.

Self-employed TICTM workers and the self-employed working in a fixed workplace are even more likely to work more than 48 hours a week, which could be expected, given their employment status. However, interestingly, fewer self-employed TICTM workers report working long hours when compared to those in a fixed workplace.

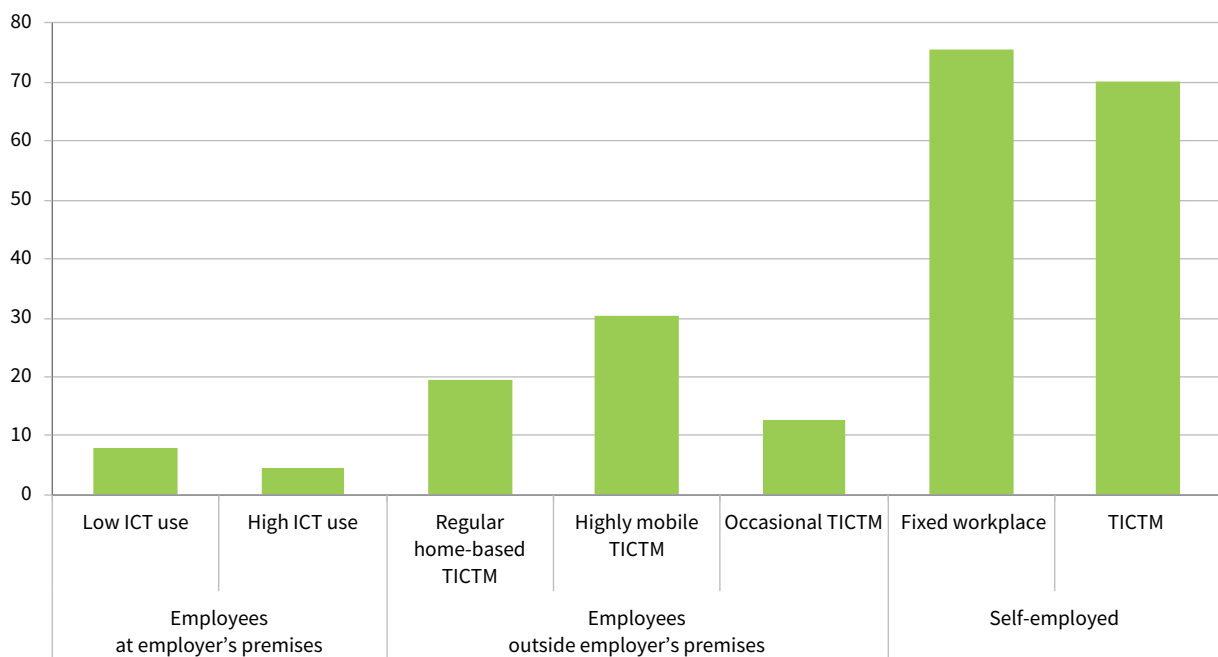
The multivariate analysis indicates that working time autonomy does not empower a large share of highly mobile TICTM workers to avoid working long hours; in fact, it appears that having autonomy in the organisation of work can contribute to longer working time. Moreover, the likelihood of TICTM workers working longer hours increases with the incidence of work pressure (measured in the EWCS according to whether one has enough time to get the job done) and interruptions.

Anecdotal evidence from the case studies suggests two reasons why TICTM leads workers to work longer hours:

- opportunity: workers consciously work longer when they are outside of a traditional workplace as they feel more productive
- necessity: the tasks or workload require them to put in extra time

There is also some risk that the supplemental hours worked are informal and unpaid, especially if overtime is not registered (as indicated in several of the case studies).

Figure 11: Shares of workers reporting working more than 48 hours per week (%), by work arrangement, EU28, 2015



Source: EWCS 2015

Case study excerpt 7: Company practices ensuring decent working hours

Several case study interviewees reported that they did not do additional work, but that the flexibility of TICTM allowed them to balance longer working hours at peak times with shorter working hours at other times. However, this requires a supportive corporate culture, self-discipline and the ability to self-manage.

The French branch of a multinational bank takes advantage of technology to encourage employees to stick to normal working hours. After nine hours of TICTM, the ICT system automatically sends a message to employees to remind them of their right to disconnect. Employees then know that if they receive requests from their manager outside the core working hours, they are not obliged to respond immediately.

Reduced rest periods

Working long hours can also reduce the amount of rest people take between working days (Figure 12). TICTM workers are more likely not to have a rest period of 11 consecutive hours within every 24 hours, which is the level stipulated by the Working Time Directive (2003/88/EC). Again, it is highly mobile and self-employed TICTM workers who are most affected.

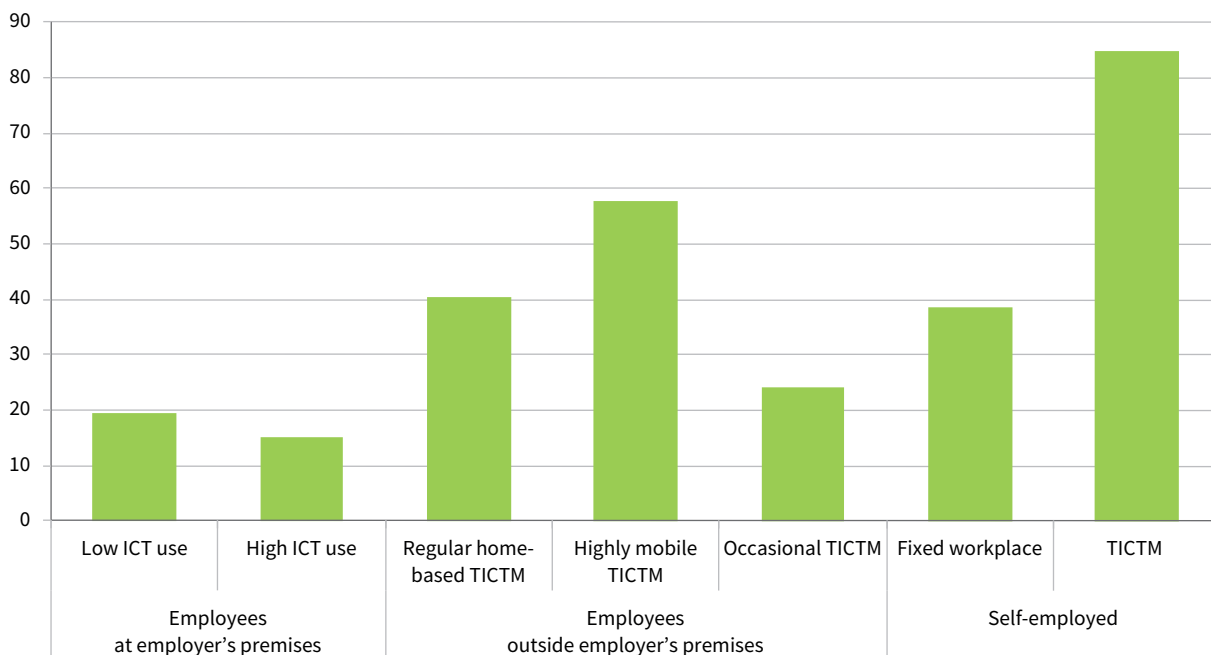
Working time quality index

Eurofound's working time quality index integrates EWCS indicators relating to duration, atypical working time, working time arrangements (autonomy and schedule changes) and worker flexibility. Figure 13 shows worker scores on this index according to workplace arrangement for the EU and five Member States. The results confirm that highly mobile TICTM workers and especially self-employed workers

(irrespective of workplace location) have poorer working time quality. The working time quality in regular home-based TICTM is similar to that of employees based always at their employer's premises whose use of ICT is low, but worse than that of those whose ICT use is high. Employees who do TICTM occasionally report relatively high working time quality. This could be an indication that ICT can improve working time quality, particularly if it is linked to selective workplace flexibility.

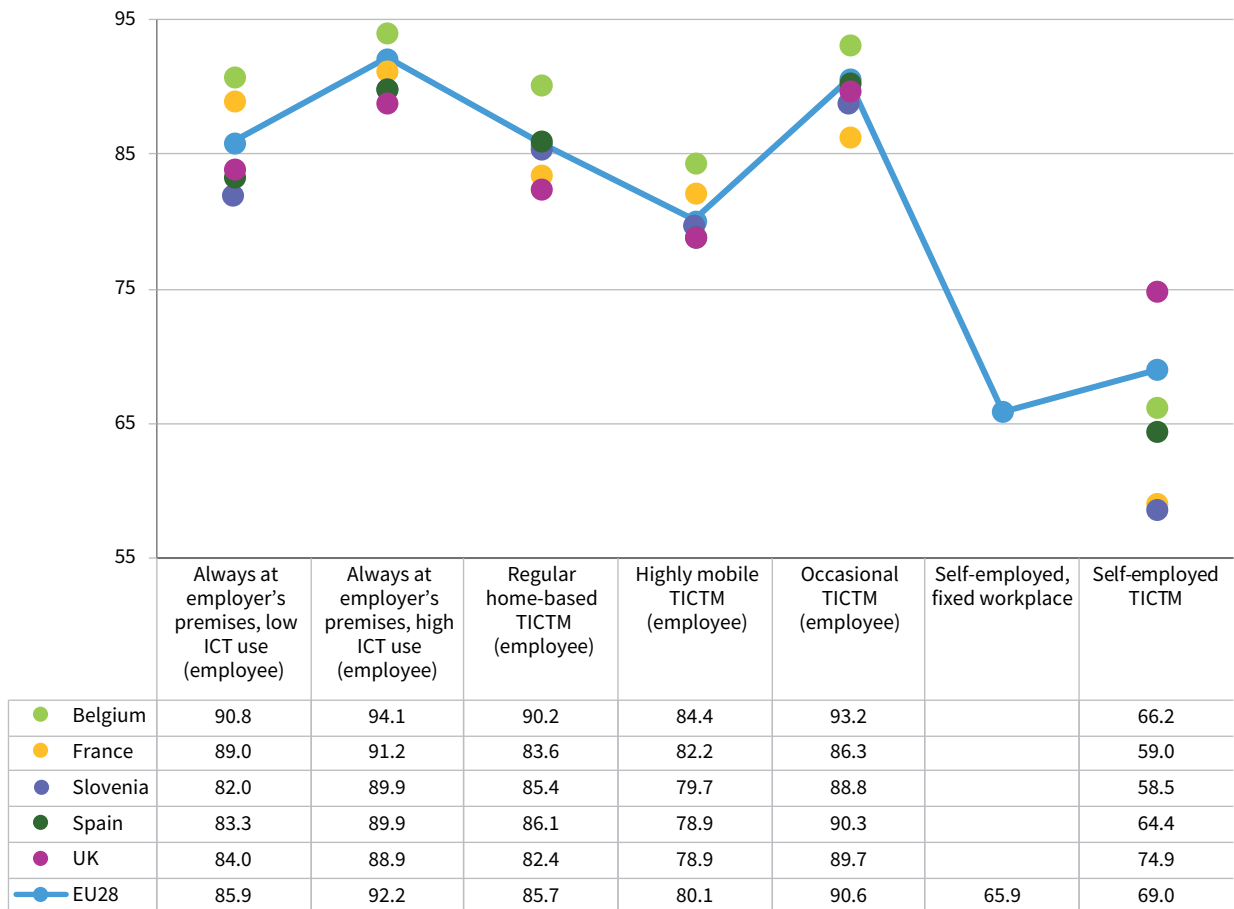
Looking in detail at the Member States, Belgium scores highest in all categories apart from self-employed TICTM, which could indicate that all employees in this country have better working time quality. Slovenia scores particularly poorly for the working time quality in self-employed TICTM, while the United Kingdom has a comparatively good score for the same group.

Figure 12: Shares of workers reporting a reduced rest period (%), by work arrangement, EU28, 2015



Note: The EWCS question asks whether, in the last month, the respondent had a rest period of less than 11 hours between two working days
 Source: EWCS 2015

Figure 13: Scores on working time quality index, by work arrangement, EU28 and five Member States, 2015



Notes: Mean index scores 0–100. Highest–lowest country averages for total: 89 (Denmark)–69 (Greece); range = 20. Scores for self-employed with a fixed workplace are not shown for the individual countries due to an insufficient number of cases to draw reliable conclusions from.

Source: EWCS 2015

Irregular hours

TICTM has an effect not only on the duration of working hours but also on the organisation of working time. Workers with a TICTM arrangement are more likely to work non-standard and irregular working hours, according to the EWCS. The flexibility that they have in terms of their location allows them to deviate from regular work schedules and perform work outside of regular business hours.

Other research supports this conclusion. Walrave and De Bie (2005) showed that the structure of a typical working day for Flemish teleworkers was very different from a traditional, eight-hour office day. Almost half of the teleworkers (45%) carried out small errands in between work activities, planned working hours around family needs and performed domestic chores when taking a break. Only 9% matched their timetables to that of their office, while 36% started and finished work earlier or later. So, while the working day of teleworkers is typically longer than that of other workers, it is also more porous (Genin, 2016).

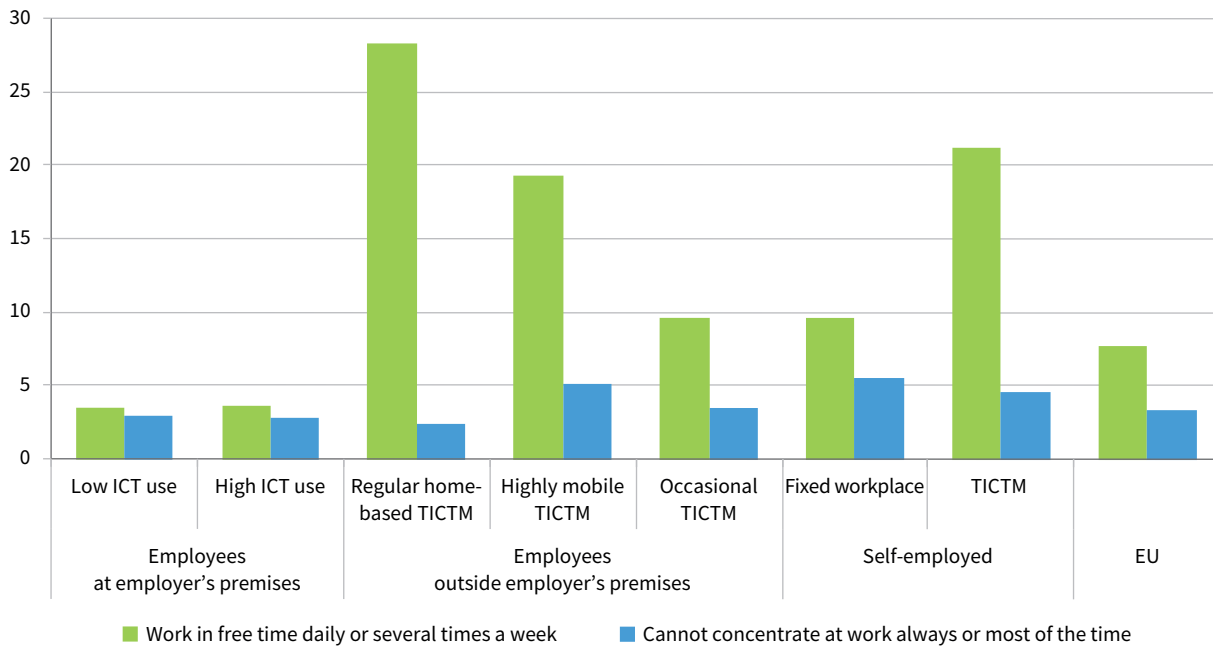
Non-standard and irregular working hours are a feature of on-demand work, which can take place in a TICTM context (ETUI, 2019). This is because more widespread access to digital infrastructure – via laptops, tablets and smartphones – provides an environment in which on-demand services can thrive (World Bank, 2019). For on-demand jobs, employer-friendly flexibility seems to prevail against the autonomy of employees' working time.

Work-home interference

Previous research shows that there is a risk with TICTM of work and personal life overlapping because of longer working hours and the mixing of work with domestic activities (Dén-Nagy, 2014; Allen et al, 2015; Eurofound and the ILO, 2017).

EWCS data, illustrated in Figure 14, confirm that the boundary between work and life is more blurred for workers with a TICTM arrangement, based on responses to questions about working in one's free time and difficulty concentrating on work because of family responsibilities. Furthermore, the multivariate

Figure 14: Shares of workers reporting work-home interference (%), by work arrangement, EU28, 2015



Note: The EWCS questions ask respondents how often they have worked in their free time to meet work demands and how often they have found it difficult to concentrate on their job because of family responsibilities.

Source: EWCS 2015

analysis highlights the significant difference between the self-employed with a fixed workplace and those with a TICTM arrangement. The latter are more likely to report problems, suggesting family responsibilities can disrupt their concentration at work because they work in their free time or work long hours, or because the line between work and home has become porous. Such issues are also prevalent for workers in the highly mobile and regular home-based TICTM categories.

The case studies also demonstrate the bidirectional nature of conflict between work and home life. The interviewees noted that domestic interruptions may interfere with their capacity to concentrate on work issues while interruptions from work can prevent them from attending to (and enjoying) their care responsibilities.

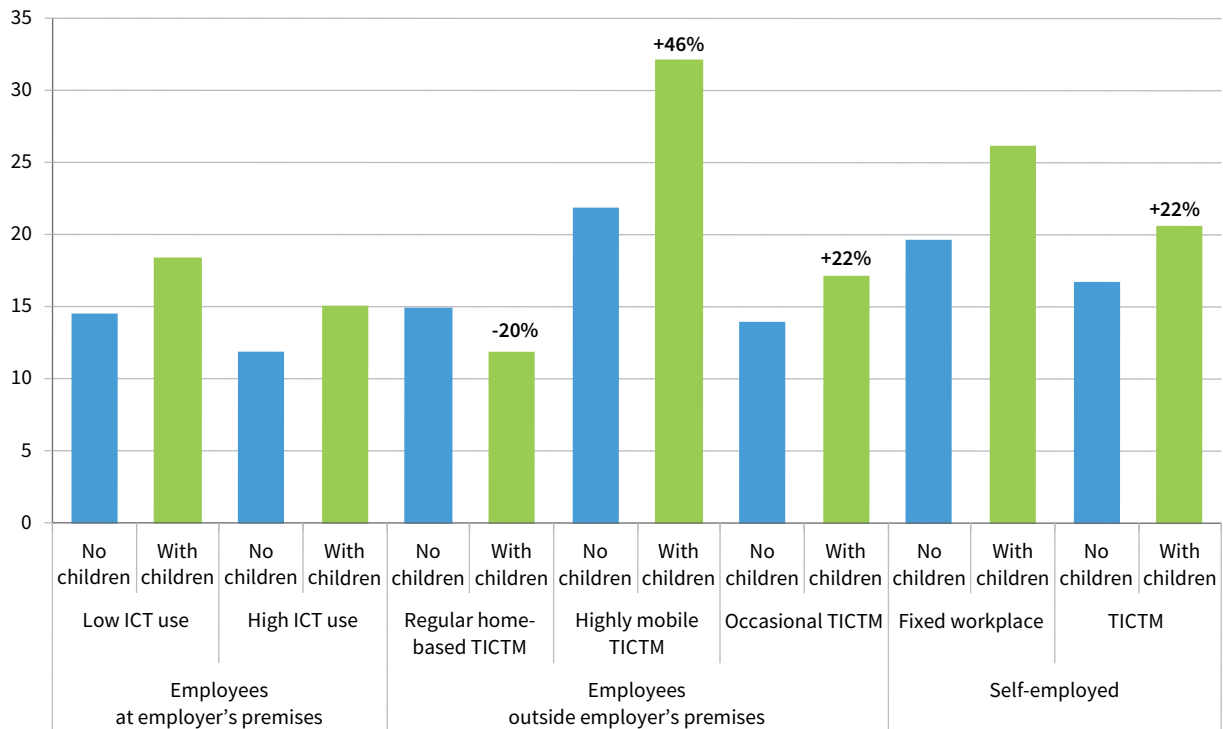
According to Ojala et al (2014), differences are apparent when family type is considered. Couples with children clearly telework and work in their free time more often than other household types. This informal overtime strongly correlates with increased conflict over the allocation of 'family time', and this connection remains after controlling for family and job characteristics. Unsurprisingly, work-life conflicts are particularly common among employees who work from home during their leisure time, while those who restrict their telework to office hours tend to assess their job quality and job satisfaction more positively (BITKOM, 2013; BMAS, 2015).

The EWCS confirms that informal overtime (working in one's free time) upsets a person's work-life balance. However, work-life balance improves for those with children who work from home. Regular home-based teleworkers is the only TICTM group who reports slightly better work-life balance than employees who always work at an employer's premises. One of the reasons is that mostly female workers use this arrangement and do so precisely to combine work and care (Eurofound and ILO, 2017).

The prevalence of work-life balance problems for the different TICTM groups with and without children is shown in Figure 15. Among employees without children, work-life balance problems are most common among highly mobile TICTM employees. But the prevalence increases by 46% for those with children. The case studies confirm that highly mobile working patterns are largely incompatible with family needs, especially caring for children. Occasional TICTM arrangements provide a level of flexibility that can accommodate certain care responsibilities, but children also increase the challenge of work-life balance for this group, where the share reporting problems increases by 22% for those with children.

Figure 15 also illustrates that the share of regular home-based TICTM workers with children who report work-life balance concerns is lower than the share of workers based at their employer's premises and teleworkers without children.

Figure 15: Shares of workers reporting work-life balance problems (%), by work arrangement and presence or absence of children, EU28, 2015



Note: The percentages shown represent the difference between the share of workers with no children and those with children.

Source: EWCS 2015

The autonomy paradox

It is clear that TICTM gives workers higher levels of autonomy and flexibility but experience longer and more irregular working hours, something that can challenge the work-life balance. This suggests that while autonomy at work is generally promoted, it can actually be detrimental, particularly for highly mobile TICTM workers. In such cases, autonomy turns from being an asset (a resource that gives workers the freedom to choose when, where and how to work) into a liability (the obligation to deal with an increased workload).

This autonomy paradox has been identified in the research (Mazmanian et al, 2013; Sewell and Taskin, 2015; Biron and van Veldhoven, 2016; Huws, 2017). It can be self-imposed by the worker (due to self-expectations and ambitions) or driven by the employer (through work organisation, performance goals and monitoring, and management styles, for instance).

The paradox underlines that working time and workplace flexibility as provided by TICTM must not be considered in isolation. The EWCS analysis and the case studies show that aspects of work organisation, as well

as management style and corporate culture, play an important role in the impact that TICTM has on employees – their work intensity, their working time and their work-life balance.

The case studies highlight possible ways to solve the autonomy paradox, such as:

- sponsorship of TICTM arrangements by management and active support of line management, as well as the acknowledgement of workers in contributing to business goals, even when they are not physically present
- establishing clear rules and mutual expectations, such as what constitutes working time, availability, reporting, performance goals and measurement
- adjusting work organisation to the particularities of TICTM, including task assignment, workload, communication and coordination among teams
- empowering employees by granting individuals responsibility under trust-based relationships (for example, enhancing self-organisation and self-management skills, and encouraging self-discipline in terms of disconnecting from work), and accepting the loss of direct control over employees' time

In short: Work organisation, working time and work–life balance in TICTM

- TICTM can influence work–life balance positively, as it gives workers greater autonomy to organise their working time based on their needs and preferences. It can also reduce commuting time.
- The findings suggest that a high level of flexibility in time and place of work combined with high levels of demand increases work intensity. This can mean, for instance, having insufficient time to finish one’s work, a situation that is exacerbated by interruptions and constant availability. High levels of work intensity can lead to long working hours and informal overtime.
- Working time differs across the TICTM categories. In general, those who are more mobile and work more frequently outside the traditional workplace are more likely to report longer working hours, as well as non-standard and irregular working times.
- A new pattern of working time has emerged thanks to the power and spread of ICT, where it is more difficult to distinguish working time from non-working time and workplace from non-workplace.
- Long, irregular and unsocial working hours in combination with working from home can create a situation where work interferes with family life, and family life interferes with work.
- Different types of TICTM have different impacts on work–life balance. While regular home-based TICTM and occasional TICTM tend to improve work–life balance, highly mobile TICTM produces more negative results.
- Both employers and workers need to be aware of the autonomy paradox – the positive and negative impact autonomy can have on the experience of work – and develop actions to prevent the inherent flexibility of TICTM from having a negative impact on work–life balance.
- Overall, neither the potentially positive nor potentially negative effects of TICTM on work–life balance dominate. It varies from case to case and depends on the individual characteristics of the worker, the company culture and the work arrangement.

4 Implications for health and well-being

Eurofound research (2013) has shown that people's working hours, their work schedules and the level of flexibility they have affects their health. Since TICTM has strong implications for those conditions of work, it follows that using ICT to work outside the employer's premises is likely to affect the health and well-being of workers. Moreover, the literature shows that TICTM can harm the health of workers, notably increasing stress and triggering sleeping disorders. Such health conditions are related to ergonomics, work-life balance, commuting, isolation and work intensity (Eurofound and the ILO, 2017). The analysis in this chapter focuses first on the effect of ICT use on health and then examines the specific impact of TICTM on the health of workers. The health outcomes examined are related to general health and well-being, as well as to psychosocial symptoms. Findings from the European Agency for Safety and Health at Work (EU-OSHA) on specific effects of ICT mobile devices on musculoskeletal disorders (MSDs) are discussed briefly at the end.

ICT at work and health outcomes

The introduction of new technologies in the workplace may alter the tasks that workers perform, change work processes and affect work organisation. ICT use may influence the pace of work (Green, 2006), working time, the level of interruptions and the cognitive demands that workers experience, leading in some cases to greater employee stress and burnout (Akinwale et al, 2011; Chesley, 2014; Berg-Beckhoff et al, 2017; ETUI, 2017). Salanova et al (2013) argue that the use of ICT is associated with 'technostain' (where people feel anxiety, fatigue, scepticism and lack of productivity related to technology) and 'technoaddiction' (an excessive and compulsive use of technologies). Other direct effects of ICT use include increased levels of computer vision syndrome, which is a set of vision-related problems resulting from prolonged ICT use, such as headaches or eyestrain (Rosenfield, 2011; Sheppard and Wolffsohn, 2018).

Charalampous et al (2019) support a more favourable view of the effects of ICT use. In a systematic review of the literature, they found that telework is related to more positive emotions, higher job satisfaction, more

autonomy, greater commitment and less emotional exhaustion. In effect, the research again yields ambiguous and contradictory findings.

The EWCS adds to the evidence, shedding more light on the health outcomes of using ICT for work. It shows that workers who use ICT, and particularly those who use it all the time, report high levels of work intensity, quantitative demands,⁴ interruptions, longer working hours and working in free time. The survey also confirms that among those using ICT, a high share report having autonomy in their work organisation (to decide methods of work, speed and tasks) and working time flexibility (such as being able to take time here and there to deal with personal matters). In addition, a higher share of workers who use ICT report that they receive social support.

Against this background, the following analysis explores whether ICT use is associated with certain job demands and job resources (psychosocial and organisational resources from an occupational health and safety perspective), and whether these job demands and resources are associated with health outcomes (Figure 16). If so, ICT use has an indirect effect on health. Alternatively, there might be a direct association between ICT use and health that is not explained by job demands and resources. This is represented by the line going directly from ICT use to the health indicators.

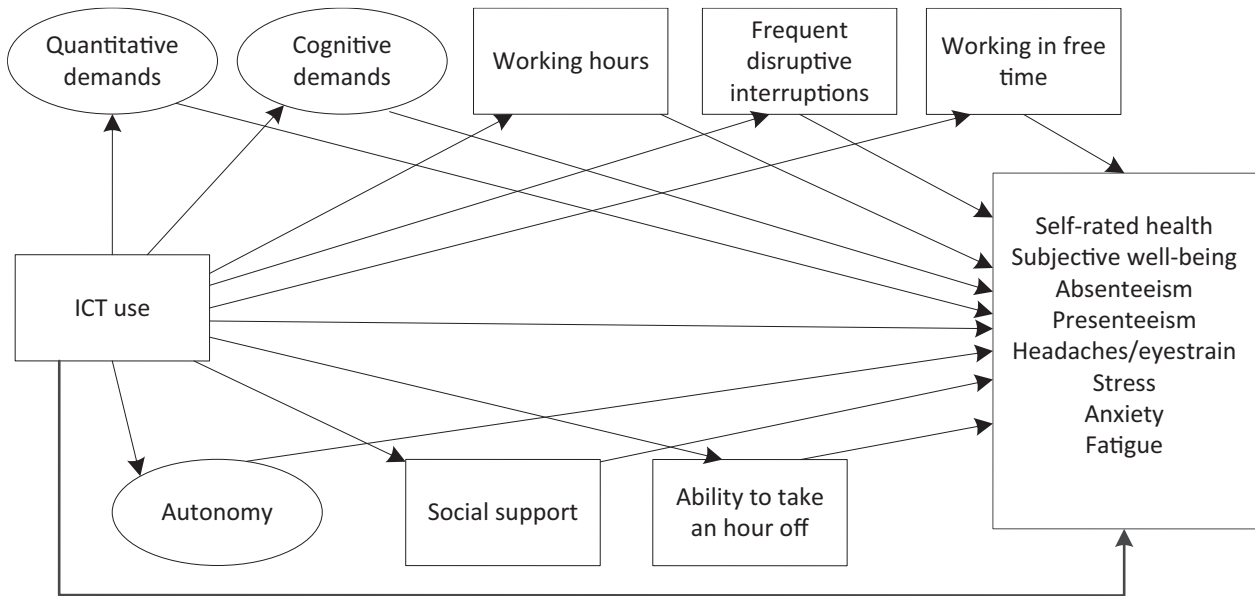
The job demands examined are quantitative demands, cognitive demands,⁵ working hours, frequent interruptions and working in free time; the resources are autonomy, social support and ability to take an hour off. Eight health outcomes are included in the analysis: self-rated health, subjective well-being, absenteeism, presenteeism, headaches and eyestrain, stress, anxiety and fatigue.

The model includes controls for age, gender, occupation, sector, education, year and country, meaning that the effect of these factors on health and well-being are taken into account and the results exclude their impact. The analysis uses EWCS data from 2010 and 2015. However, due to the nature of the data, no causal link between ICT use and job demands and resources – or their impact on health outcomes – can be established.

4 The quantitative demands measured are working at very high speed, working to tight deadlines and not having enough time to do the job.

5 The cognitive demands measured are solving unforeseen problems, performing complex tasks and learning new things.

Figure 16: Conceptual model for exploring the relationship between health and ICT use at work



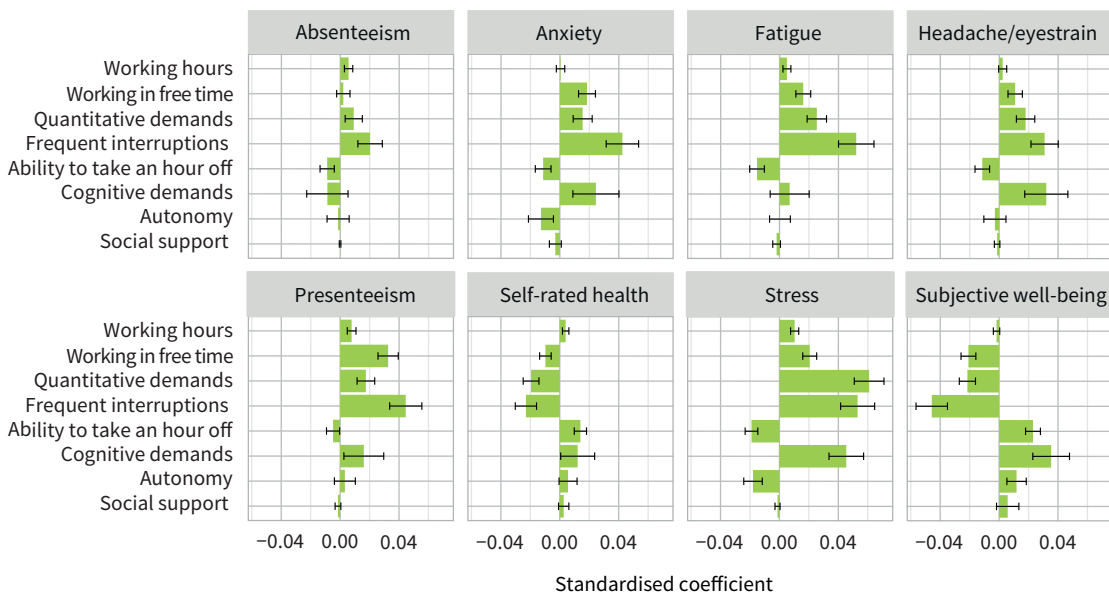
Source: Authors' own compilation

Results: Health impact of ICT use

In general, a higher level of job demands is associated with poorer health outcomes, and a higher level of job resources leads to better health outcomes (Eurofound, 2019b). Figure 17 shows the results of the current

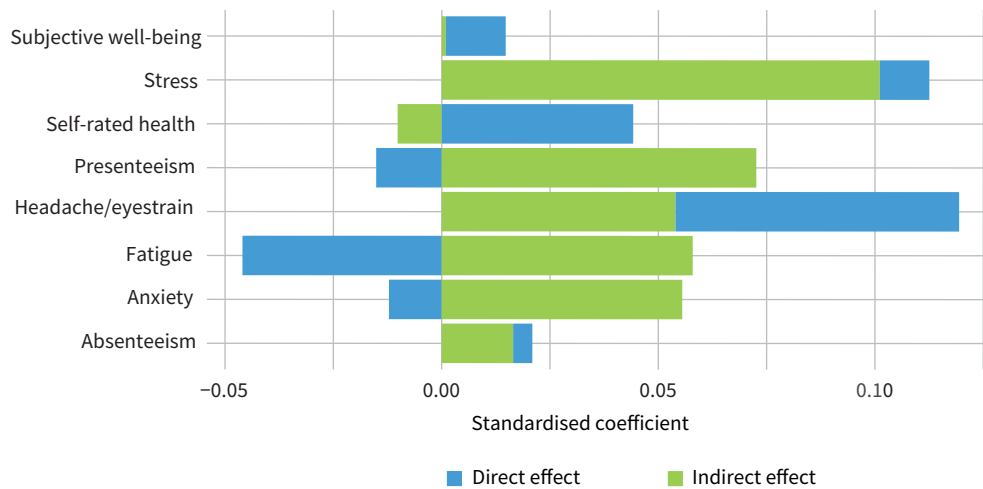
analysis of these relationships, and simply comparing the length of the green bars reveals that the association is stronger for job demands (longer bars) than for job resources (shorter bars). For example, autonomy and ability to take an hour off have a limited association with health outcomes.

Figure 17: Association of job demands and job resources with health outcomes



Note: Error bars show a 95% confidence interval.
Source: EWCS 2010 and 2015

Figure 18: Effect of ICT use at work on health outcomes



Note: Standardised coefficients have been used, direct and indirect (mediated through job demands and resources).
Source: EWCS 2010 and 2015

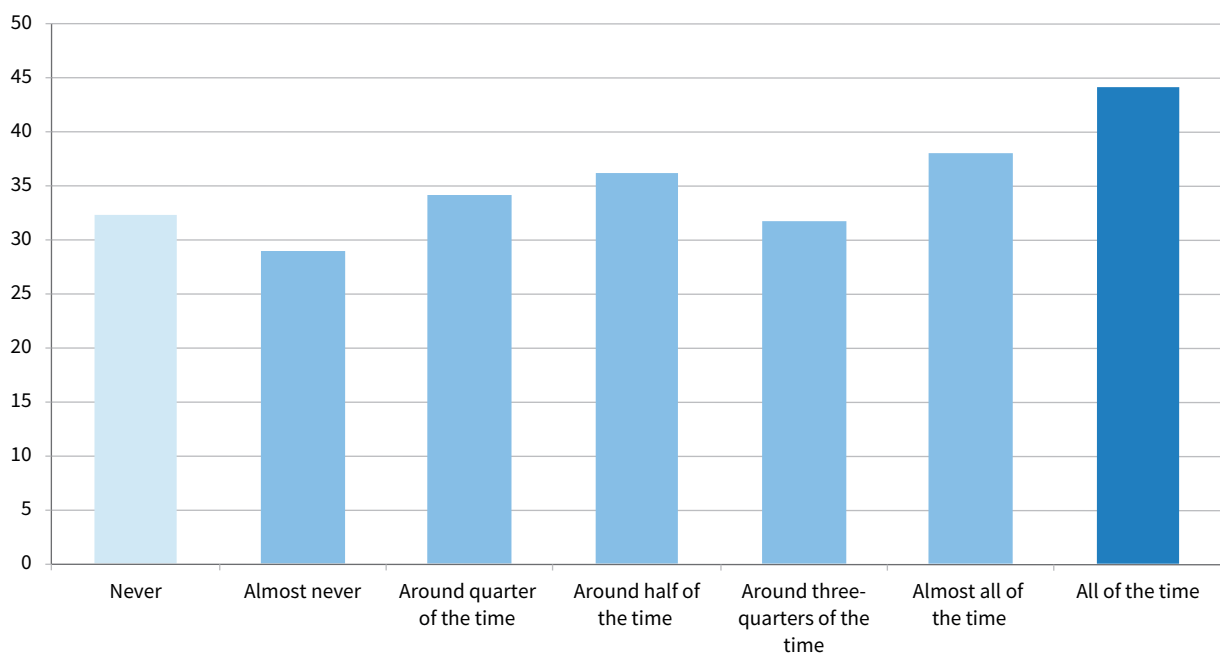
Working hours, working in free time, quantitative demands, frequent disruptive interruptions and cognitive demands increase negative health outcomes, whereas being able to take an hour off, autonomy and social support generally decrease those outcomes.

The factors that are most strongly linked to health are frequent disruptive interruptions, quantitative demands, working in free time and cognitive demands. If ICT use is also strongly associated with these job demands, a strong indirect effect on health would be expected. This is supported by the results of the model estimation, in Figure 18, which show that the frequency of ICT use at work is both directly and indirectly

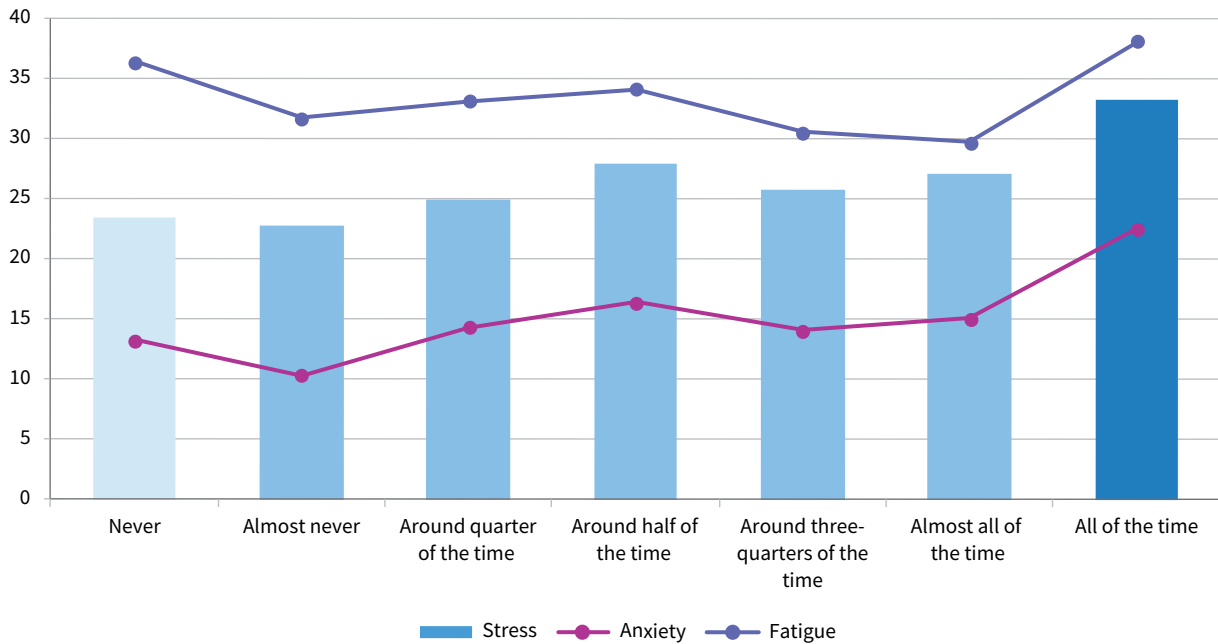
associated with the different health outcomes, but to varying degrees.

The strongest association is between ICT use and headaches and eyestrain. About half of this is indirect, through job demands. Those who use ICT all the time are more likely to have more cognitively demanding tasks and are interrupted more frequently, both of which are associated with higher reported levels of headache and eyestrain. ICT use in itself may also lead to headaches and eyestrain: 32% of those who never use ICT and 44% at the highest level of use report this problem (Figure 19).

Figure 19: Shares of workers reporting headaches and eyestrain (%), by frequency of ICT use, EU28, 2015



Source: EWCS 2015

Figure 20: Shares of workers reporting stress, anxiety and fatigue by frequency of ICT use (%), EU28, 2015

Source: EWCS 2015

The second largest link, as demonstrated in Figure 18, is between ICT use and stress. This link is almost entirely indirect: those who use ICT are more likely to have a mix of job demands that lead to stress. The negative effect comes from frequent interruptions, cognitive demands and quantitative demands.

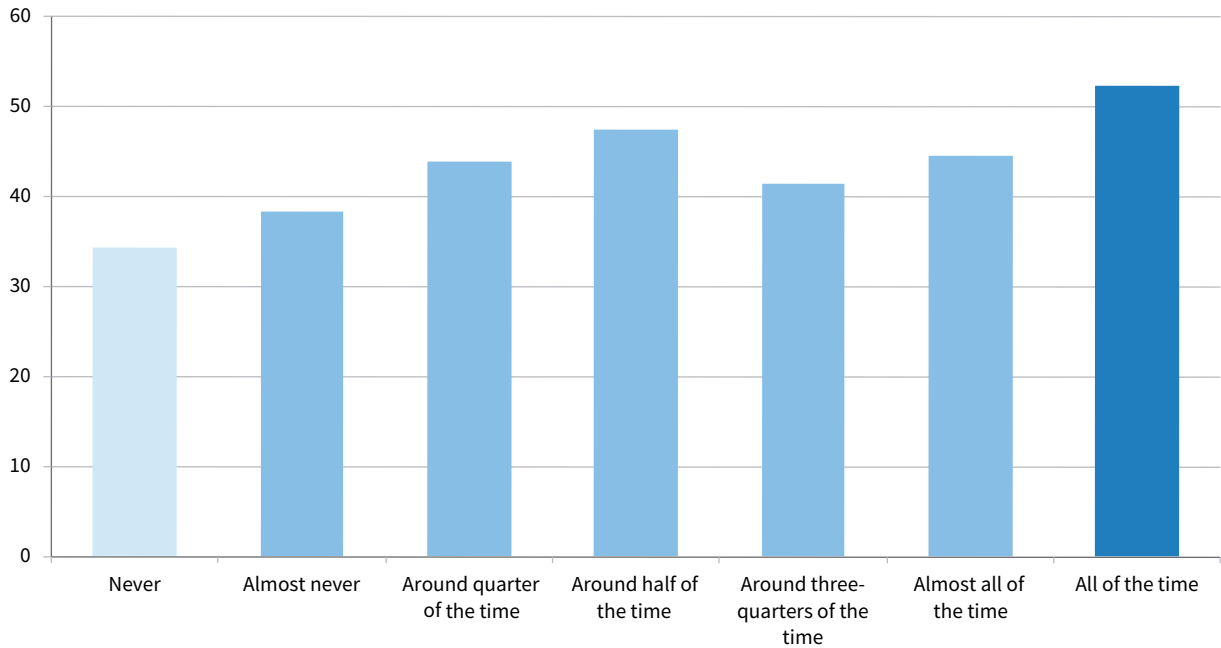
Anxiety is also more likely to be experienced in work environments with a high level of ICT use. In this case, some of the main indirect sources are interruptions and cognitive demands. On the other hand, use of ICT lessens fatigue directly, perhaps because it does not involve physical demands. However, other conditions in a digitalised work environment, such as a high level of job demands, might indirectly increase fatigue.

These associations seem to be reflected in the shares of workers reporting the different health outcomes (Figure 20). There is a clear correlation between the frequent use of ICT and stress, with 33% of workers who use ICT all the time reporting high levels of stress, compared with 23% of workers who never use ICT.

The correlation between ICT use and anxiety is more general for all levels of ICT use. Fatigue mainly affects those at the extremes of ICT use, but in different ways: non-users because this lack of use may mean they do physically demanding tasks instead; frequent users because of the work environment associated with ICT.

Presenteeism – working when one is sick – also seems to be indirectly affected by ICT use. Workers in environments with a high level of interruptions, who have a high level of cognitive demands or who work more often in their free time are more likely to use ICT and to work while sick. Therefore, workers in digitalised environments using ICT devices are more likely to report virtual presenteeism – working from home when one is sick although not to an extent that precludes working – which can impair performance, impede recovery and affect long-term health. This phenomenon is suggested by the fact that the largest difference in presenteeism is between those who never use ICT and those who use it all the time: 34% compared to 52% (Figure 21).

Figure 21: Shares of workers reporting presenteeism, by frequency of ICT use (%), EU28, 2015



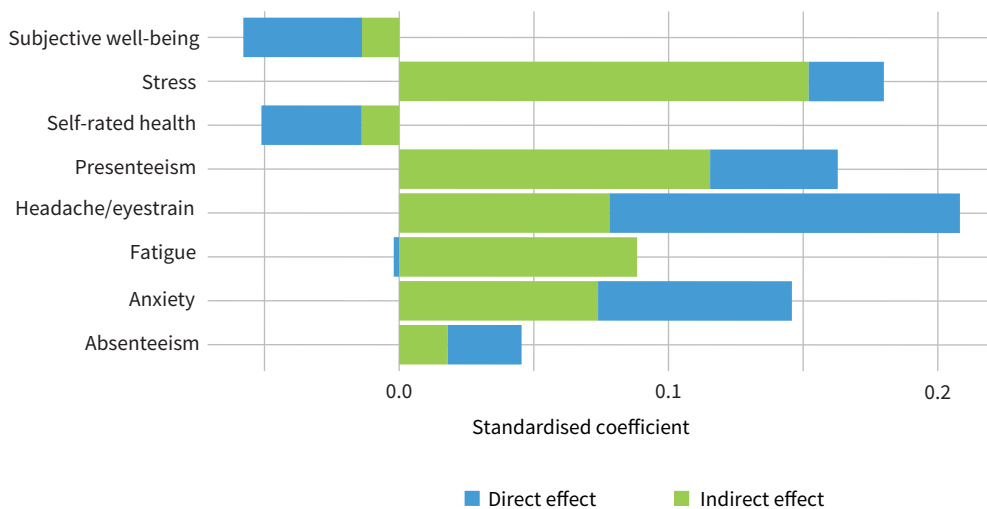
Note: The chart shows the proportion of workers who have worked while sick (presenteeism) for at least one day in the 12 months prior to the survey.
Source: EWCS 2015

Conversely, absenteeism does not seem to be associated with ICT use at work, while the association with subjective mental well-being is also small. Interestingly, the association between the variables considered in the model and overall self-rated health points to a positive association between ICT use at work and health indicators. This suggests that an ICT-based work environment might be perceived as less of a risk to health than a work environment with more physical demands.

Results: Health impact of TICTM

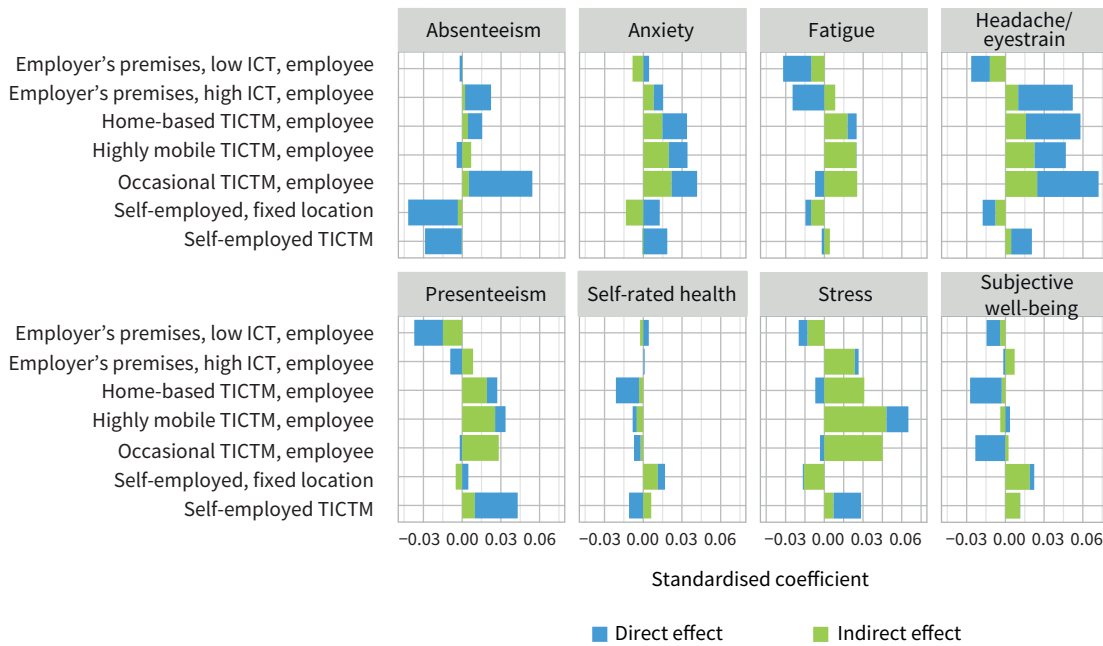
Analysing the relationship between health outcomes and TICTM shows that this work arrangement increases presenteeism and anxiety to a greater extent than ICT use (Figure 22). It also has a negative effect on subjective well-being and self-reported health. Overall, the effects of the work environment on health are largely the same as those for ICT use, which suggests that the same factors might play a similar role for health outcomes.

Figure 22: Effect of TICTM on health outcomes



Source: EWCS 2015

Figure 23: Association of types of work arrangements and health outcomes



Note: The figure shows the association of belonging to one of the groups relative to the category 'other', that is, the workers who do not belong to any of the groups presented in the figure.
Source: EWCS 2015

The findings for the TICTM groups generally differ from workers based at their employer's premises, both those with low ICT use and, to a lesser extent, those with high ICT use (Figure 23). Self-employed TICTM workers show a distinct pattern, but that may be due to their self-employed status. However, they are more likely to report stress, anxiety, headaches and presenteeism than other self-employed workers, and this is related to the TICTM arrangement.

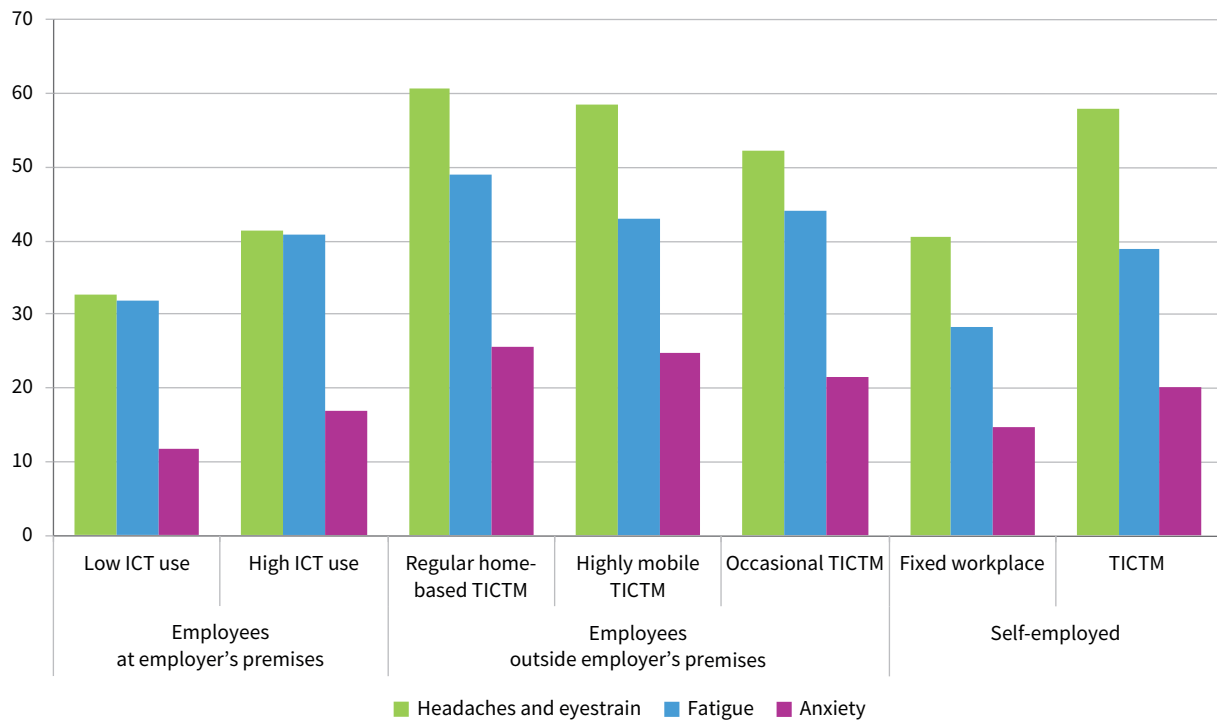
In some respects, the working conditions in TICTM are similar to those of workers who use ICT almost all of the time and all the time. As noted in Chapter 3, highly mobile TICTM workers have good levels of autonomy, but they also have schedules that are more irregular, tend to work longer and have relatively high levels of work intensity. The main difference is the mobility of these workers. However, the degree of mobility combined with the level of ICT use influences the work environment of workers. Figure 23 shows that for some of the health outcomes, there are no or very small differences between the TICTM types. Stress is somewhat higher for highly mobile TICTM workers,

which can be attributed mainly to work intensity (including workload and frequency of interruptions). Work-family conflict, which is more typical of TICTM, also contributes to a high level of stress among highly mobile workers (Eurofound and the ILO, 2017).

As Figure 24 demonstrates, all TICTM groups, especially those who are employees, are more likely to report headaches and eyestrain, as are workers who use ICT at their employer's premises. Therefore, headaches and eyestrain within TICTM is mainly a direct effect of ICT use. However, some elements of the work environment (such as interruptions, constant availability and high levels of cognitive demands) also contribute to this outcome.

Anxiety is also more likely to be reported by TICTM workers. It is associated with work environment factors that are similar to those that cause stress, but the use of ICT seems to play a more direct role. It also is interesting to note that TICTM workers are more likely to report fatigue than those who work only from their employer's premises.

Figure 24: Shares of workers reporting fatigue, headaches and eyestrain, and anxiety (%), by work arrangement, EU28, 2015



Source: EWCS 2015

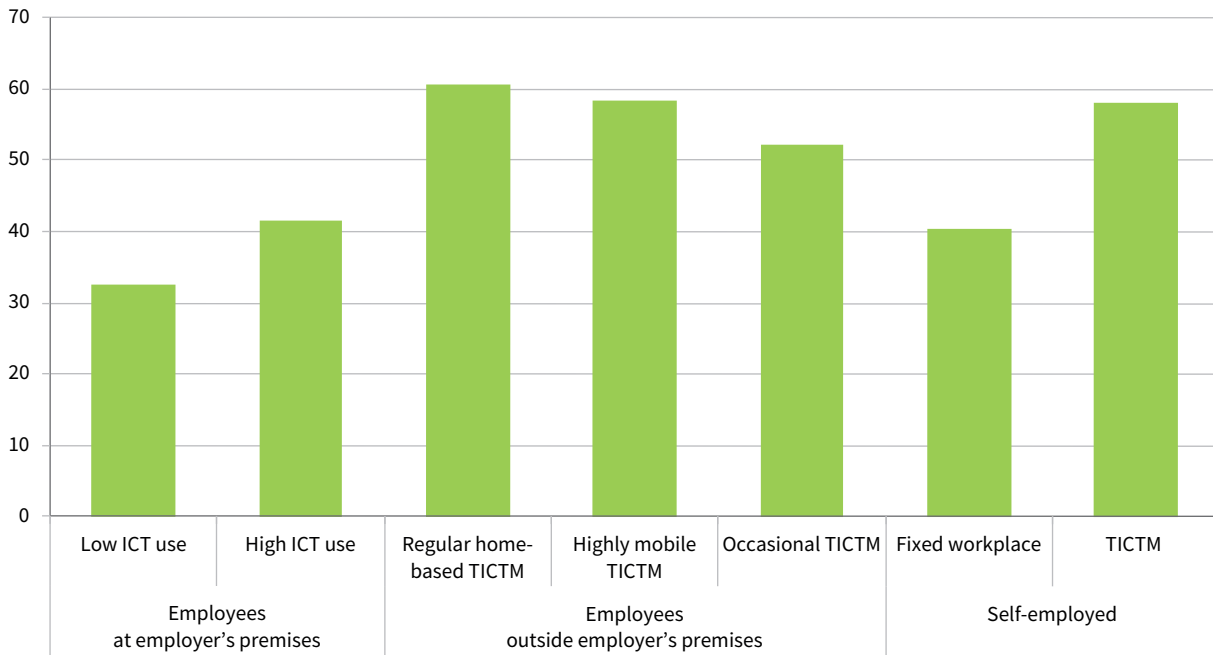
Anecdotal evidence from the case studies indicates that problems related to stress, anxiety and ICT addiction among highly mobile workers are largely the result of long hours, unsocial and irregular working time patterns, and high levels of work intensity. This is particularly the case if the high levels of work intensity are task-driven rather than the result of intrinsic motivation. Other contributing factors include working in isolation when carrying out high-level tasks (involving cognitive demands), limited autonomy in terms of work intensity and lack of support (such as the absence of management policies for stress assessment and prevention). The interviewees also reported fatigue resulting from long commutes.

The EWCS analysis shows that more regular home-based and highly mobile TICTM workers (42% for both) report sleeping problems than workers based at their employer's premises (29%).

The multivariate analysis confirms that regular home-based TICTM workers are more likely to report this problem, which seems to be related to the high levels of supplemental work that these workers undertake. High work intensity also plays a role in sleeping disorders among TICTM workers.

Virtual presenteeism is considerably higher among workers in TICTM arrangements than among workers always at their employer's premises (around 60% for regular home-based and highly mobile TICTM, 58% for self-employed TICTM, and 52% for occasional TICTM) (Figure 25). This indicator is associated mainly with disruptive interruptions and supplemental work. Furthermore, those who report working in their free time are also more likely to report higher levels of presenteeism.

Figure 25: Shares of workers reporting presenteeism (%), by work arrangement, EU28, 2015



Note: The figure shows the proportion of workers who have worked while sick (presenteeism) for at least one day in the 12 months prior to the survey.
Source: EWCS 2015

The case studies support the view that TICTM environments are conducive to presenteeism, reducing ‘justified and legally recognised’ sick leaves. For example, where they have occasional TICTM arrangements – which give workers the option to work outside the employer’s premises on sporadic days – sick employees tend to work from home instead of applying for sick leave. It seems that this is a choice made by the worker on the basis of their workload.

The effect of presenteeism on working life varies. The experience is negative for some workers, while others are satisfied that they can work from home rather than go into their employer’s premises when they are feeling unwell. Whether one receives sick leave pay also plays a role in determining workers’ decisions on working or not.

Case study excerpt 8: Unpaid sick leave drives virtual presenteeism

Several case studies revealed that workers were happy to have the option to work from home when they are feeling unwell. In Estonia, it was mentioned that presenteeism could also be driven by a sick leave regulation that specifies how the first three days of absence are unpaid. Accordingly, it is assumed that many employees prefer to work when they are feeling only slightly unwell. TICTM allows them to stay at home and get some rest or work fewer hours. If TICTM were not an option, they would have to take sick leave and forego some earnings or go in to work and tolerate the discomfort of feeling unwell.

TICTM and risk of MSDs

According to a study from EU-OSHA (2018), mobile ICT equipment (particularly small devices such as mobile phones, tablets and laptops) often does not meet ergonomic standards and has limited suitability for office work and for lengthy stretches of work. Problems with such equipment include small or reflective displays; small or virtual keyboards; and fixed screens and keyboards whose positions cannot be adjusted. These features can lead to constrained or poor postures and the risk of developing MSDs, especially MSDs of the

upper limbs, neck and back. In addition, homes, public places or transport may not be ergonomically suitable for work purposes. Half of laptop users complain of impaired working conditions (IFA, 2016).

Multivariate analysis of the EWCS shows that regular home-based and highly mobile TICTM workers are more likely to report MSDs in their upper limbs. This association is not found for occasional TICTM workers. No association was found between other MSDs (for example, lower limb problems) and TICTM.

In short: TICTM, health and well-being

- There is a clear link between ICT use at work, TICTM and health outcomes. Some aspects of the TICTM environment have positive outcomes, but others may harm workers' health.
- Workers who use computers at work, including those with TICTM arrangements, are more likely to report higher levels of certain job demands (such as quantitative demands) and higher levels of certain job resources (such as working time flexibility).
- Health and well-being outcomes such as fatigue, anxiety and presenteeism are likely to be greater for workers who work remotely or are mobile, which might be related to extensive travelling, high levels of work intensity and permanent connectivity.
- The TICTM work environment is strongly associated with stress, and autonomy is not an effective cushion against this.
- Highly mobile and regular home-based TICTM work are associated with the highest number of negative health outcomes, mainly due to work intensity. However, some outcomes, such as headache and eyestrain, fatigue and virtual presenteeism, seem to be likely in all TICTM arrangements.
- Reducing the use of ICT can reduce the risk of headaches and eyestrain. However, reducing stress related to TICTM means tackling a number of problems including extensive job demands, heavy workloads, permanent connectivity and availability, and difficulties coping with a high level of cognitive demands.
- Sleeping disorders are more likely to be reported by regular home-based and highly mobile TICTM workers.
- Virtual presenteeism – working from home when one is unwell but still able to perform tasks – is a new phenomenon related to TICTM. Workers interviewed for the case studies were positive about this option as it means they can get some degree of work done when they are unwell while not having to take any sick leave.
- Intense TICTM also has effects on physical health by increasing the risk of MSDs in the upper limbs, neck and back.

5 Worker performance and prospects

Globalisation is one of the megatrends influencing the economy and the labour market. To compete in the global market, companies are looking for solutions to maintain and improve their efficiency and to reduce costs, while taking labour productivity into account, as well as ways to attract and retain talent. TICTM arrangements can be part of the solution as they have the potential to result in win-win situations for employers and employees due to their inherent flexibility, which can suit both parties (Eurofound, 2015a).

Against this background, it is important to explore what TICTM means for the performance of workers⁶ and their prospects. This includes task-specific and non-task-specific behaviours, communication, effort, support among the team and monitoring (Campbell et al, 1990). The available research does not discuss these issues in depth, although there is some indication that TICTM is favourable for career advancement (Eurofound, 2019a). This chapter aims to provide more evidence on this topic and, as much as possible, to identify whether there are different outcomes depending on the types of TICTM.

Performance of workers

The causal link between TICTM and job performance is not as clear as is often presumed. It does not depend solely on the individual worker's characteristics (such as abilities and attitudes) but is also influenced by aspects of work organisation (communication and coordination, for example), and how technology is strategically used to support the workflow. The available studies indicate that TICTM has a generally positive effect on individual performance. According to Lasfargue and Fauconnier (2015), for example, 84% of French teleworkers stated that their productivity increased due to telework, and 81% said that their remote work was of a higher quality than their office work.

Features that drive performance

As discussed in previous chapters, the longer working hours that are a common feature of TICTM can negatively affect work-life balance. However, studies from France, Sweden and the UK suggest that TICTM results in improved performance due to the additional, unpaid hours worked (Beauregard et al, 2013; Eurofound and the ILO, 2017).

Furthermore, the flexibility of TICTM in terms of location and work organisation provides workers with more autonomy. They can choose which tasks to complete at which workplace, and this allows them to organise their work to suit their characteristics and preferences (Beauregard et al, 2013; Lasfargue and Fauconnier, 2015). Avoiding a commute also means that this time can be used for more productive work (Lasfargue and Fauconnier, 2015).

Beauregard et al (2013) and Lasfargue and Fauconnier (2015) suggest that partial TICTM has a higher impact on performance and productivity than more intense forms. This might be related to this report's earlier findings that interruptions tend to be more disruptive for employees and the self-employed in highly mobile arrangements. In any case, constant interruption can jeopardise the performance of workers doing all types of TICTM, although regular home-based TICTM workers sometimes benefit from the ability to concentrate on certain tasks due to a lack of the interruptions that would normally occur in the workplace.

Evidence from Belgium and the Netherlands also suggests that certain features of TICTM can help to improve performance by fostering innovative behaviours (Eurofound and the ILO, 2017). The national studies further suggest that close monitoring or supervision can obstruct such innovative behaviour.

⁶ TICTM, as any other work arrangement, has the potential to affect both organisational and individual performance. Organisational performance refers to the economic situation of the establishment, including labour productivity, profitability, market shares and customer satisfaction as well as work and staffing issues like absenteeism, recruitment and retention, staff motivation and commitment. Analysing this would go beyond the scope of this report, which focuses on individual performance.

Case study excerpt 9: TICTM and performance in self-employment

A high level of job performance is particularly important for self-employed people, as it directly affects their financial circumstances, and influences the economic situation and sustainability of their business.

The self-employed TICTM workers interviewed for the case studies – all of them professionals in the services sector – strongly argued the business case for TICTM. All chose to be self-employed because they wanted to be more independent and have more autonomy in their work. They opted for a TICTM work arrangement for personal reasons (for example, to accommodate care responsibilities), but also saw it as an important precondition for economic success. The mobility and connectivity enabled by TICTM allow them to provide their services more effectively, such as responding to client emails or phone calls from various premises, providing virtual services to multiple clients from their home office, or using travel or waiting time for work purposes.

The interviewees also noted that clients still favour some level of physical interaction or that they sometimes need to work on location due to the complexity of a task. TICTM allows them to accommodate this while also remaining available to other current and prospective clients.

Beyond that, and similar to what was found for TICTM employees, the self-employed interviewees emphasised the benefits of TICTM in terms of fewer interruptions and higher work motivation, which they felt contributed to better performance.

Features that impede performance

The existing literature and the case studies did not identify any ways in which TICTM has a significantly negative impact on the performance of workers. However, Eurofound and the ILO (2017) suggest there are certain factors that can reduce performance.

Management supervision: Close monitoring and supervision can render a TICTM arrangement inefficient and reduce the performance of workers (for example, due to the need to spend more time on unproductive tasks like reporting).

High-level ICT requirements: If TICTM is based on complex ICT systems, and workers lack the skills and experience to use these systems effectively, this can have a negative impact on their productivity.

Disruptive working environment: Unfavourable environments (such as noisy surroundings or uncomfortable workplaces) can reduce productivity.

Coordination: For TICTM employees working in bigger teams, the effort to coordinate a physically absent workforce can not only result in organisational inefficiencies, but also undermine the individual worker's performance. In this context, several of the case study interviewees flagged the importance of regular face-to-face meetings among the team, and between the line manager and the staff, for effective and efficient exchange and coordination. While it is

becoming increasingly common practice to use digital communication channels (such as email, WhatsApp and Skype), this is not always optimal as the worker's attention span can be shorter when using such tools.

Earnings

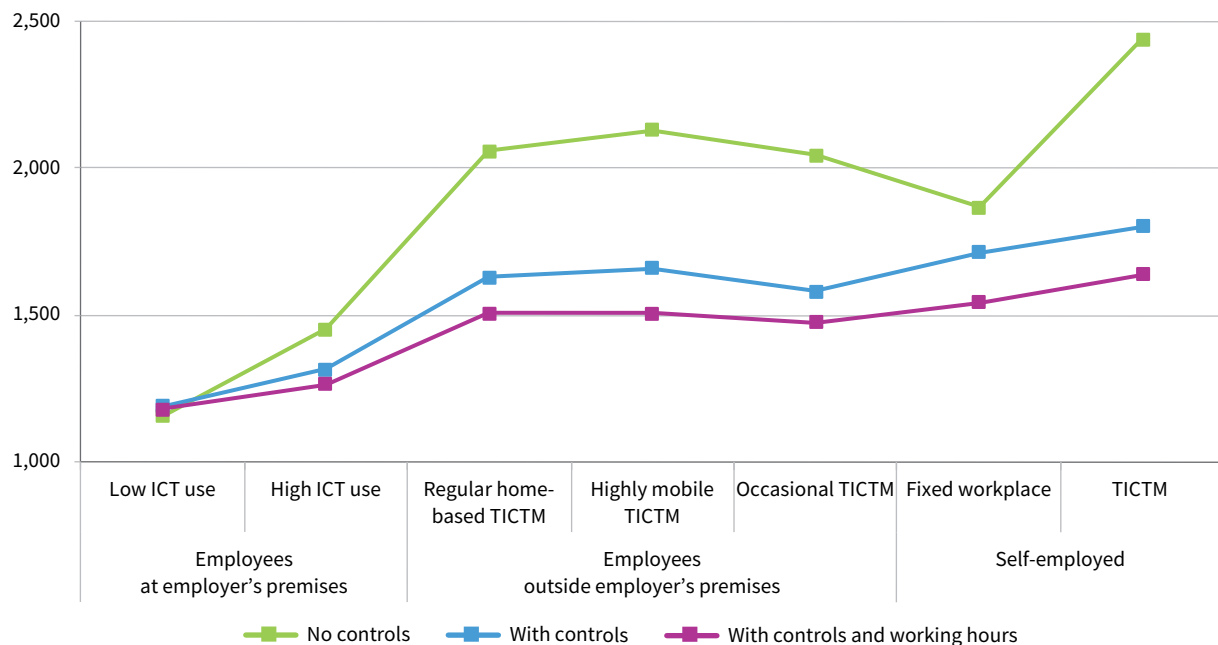
Research on the pay of workers with TICTM arrangements is scarce in Europe. From the literature review, three aspects need to be considered when examining this topic (Eurofound, 2019a):

- the potentially negative impact of lack of visibility and the detachment of these workers from the workplace⁷
- the fact that they tend to work unpaid overtime more often than other workers
- the potential impact of longer hours on wages and careers in comparison to other workers

An index of monthly earnings shows that the monthly average earnings of workers with TICTM arrangements in the EU are higher than the earnings of those who always work at their employer's premises (Figure 26). Within the TICTM categories, earnings are highest among self-employed workers, but differences are not significant among the types of TICTM. The differences are reduced when controls are applied (meaning differences in the age, country, gender, occupation, sector and working hours of the respondents are taken into account) but do not disappear.

⁷ In their study on telework, Allen et al (2015) found this effect to be strongest for women in professional and managerial roles.

Figure 26: Monthly average earnings in euro, by work arrangement, EU28, 2015



Notes: 'No controls' shows the actual average values; 'With controls' shows the average values after controlling for differences in age, country, gender, occupation and sector; 'With controls and working hours' shows the average values after differences in working hours are also controlled.
Source: EWCS 2015

Learning and training

Formal learning

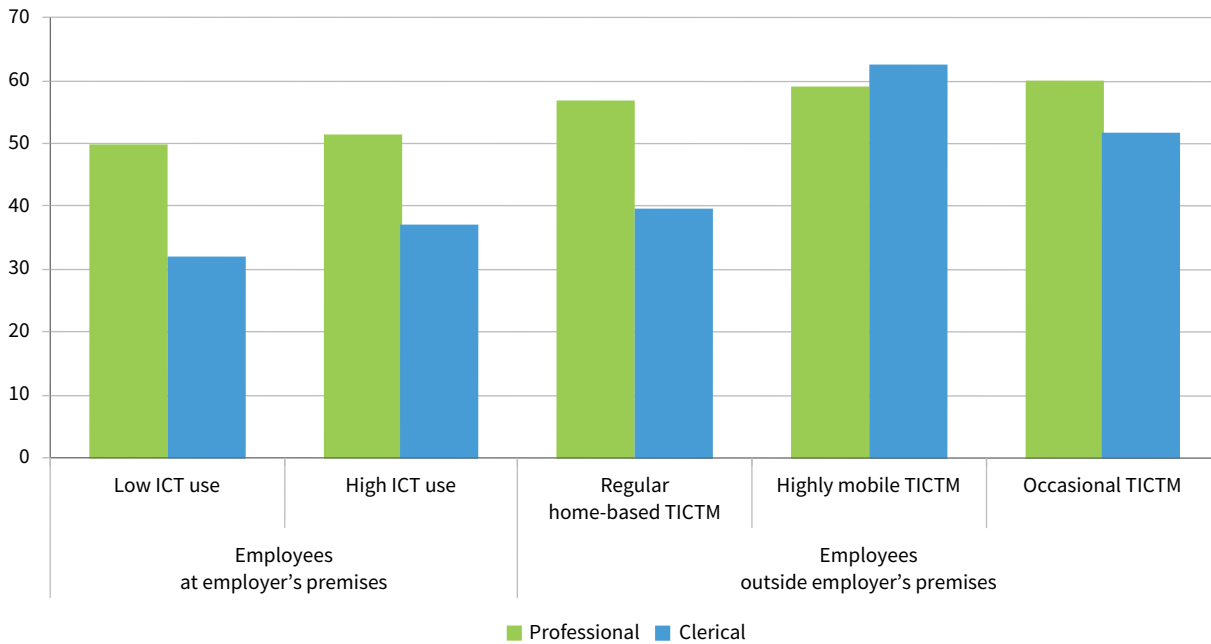
Continuous learning is widely recognised as an important precondition for sustained employability and career advancement. In terms of formal training offered by employers, the question arises whether TICTM workers participate in such training to the same extent as fixed-location workers. Martínez and Gómez (2013) found that employees who had more flexibility to work outside the workplace on a regular basis participated in less training. This may be due to their lack of visibility

leading to less managerial support for their professional development.

However, developments in e-learning and self-learning through the internet should be taken into account before any conclusions are drawn as to whether TICTM prevents workers from learning and developing skills. Companies that offer modern types of training through ICT also tend to be more open to offering modern work arrangements like TICTM and providing workers with new learning pathways. The anecdotal evidence from the case studies also points towards the use of online learning among the TICTM workers interviewed.

Case study excerpt 10: E-learning for TICTM workers

A Danish retail company has installed e-learning software on the smartphones of its TICTM workers. The software is an easy-to-use communication and engagement platform that is designed to reach, train and manage remote employees. Project leaders send exercises (such as theoretical or real work-related problems to solve) to the workers for training purposes. The employees send back their answers through the application, and a follow-up dialogue can emerge. These exercises are considered part of working time, and the app is used frequently, not only for training but also for communication among the team or to post requests for support. The tool is considered a good way of providing support and sharing knowledge.

Figure 27: Shares of workers who received employer-paid training (%), by work arrangement, EU28, 2015

Source: EWCS 2015

According to the EWCS, occasional TICTM workers are more likely to be offered training by their employer, whereas those in the home-based category have fewer opportunities. In general, however, TICTM workers report greater involvement in formal training than those groups always at their employer's premises.

As might be expected, differences exist in terms of occupation, and highly skilled professionals have more chances to participate in training than clerical workers (Figure 27). Among TICTM workers, the difference between the two occupational groups is greatest among regular home-based teleworkers.

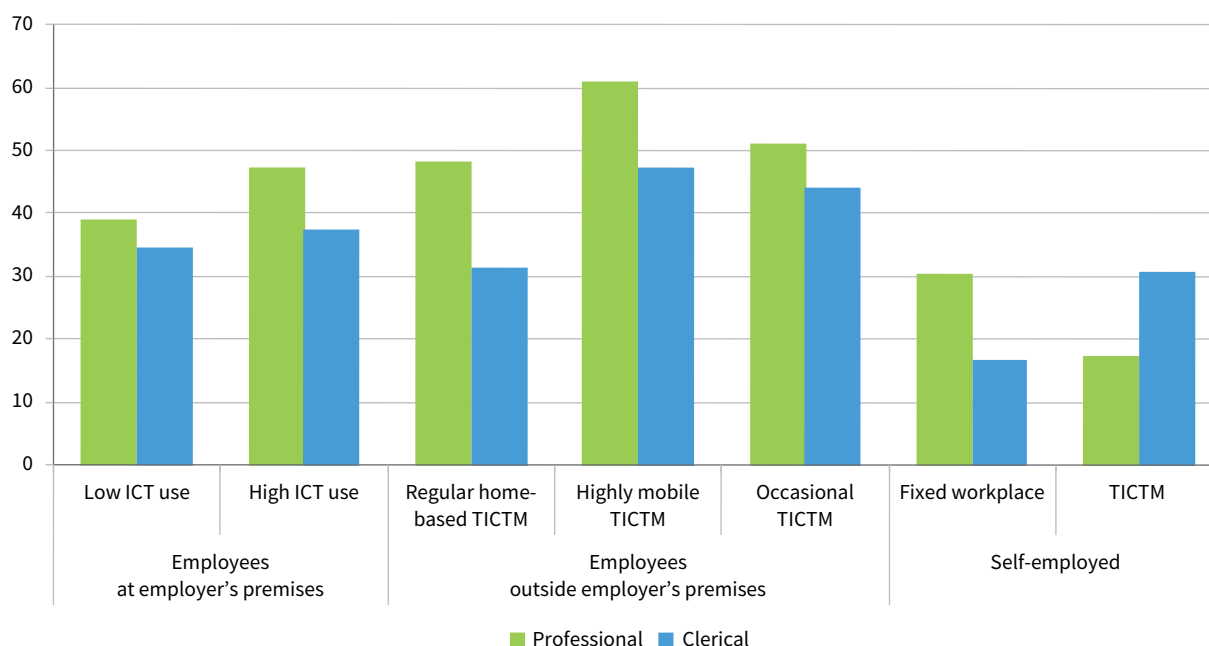
It is also important to consider informal and non-formal learning. Workplace socialisation is widely recognised as a critical component of workplace learning and the transfer of organisational knowledge. Due to their physical absence from their employer's premises, TICTM workers may feel excluded from knowledge sharing through interpersonal relationships and informal learning that enhances work-related skills. This can lead to their disconnection from important sources of professional development and career advancement

(Sewell and Taskin, 2015). Taskin and Bridoux (2010) flagged that the frequency of a worker's telework is likely to affect the extent to which they identify with their employer's goals and values. Socialisation is driven by relational aspects affecting the creation and transmission of tacit knowledge in the workplace, which can affect the transmission of explicit knowledge.

Other research points to the role of technology in knowledge sharing, deeming it as important as face-to-face interaction. Golden and Raghuram (2010) suggest that face-to-face interactions and the extensive use of technology are likely to facilitate knowledge sharing for teleworkers with relationships that are marked by a low level of trust, though less so for those with relationships where there is a high level of trust. The authors conclude that the nature of interpersonal relationships is not fundamentally affected by a teleworker's spatial and technological interactions.

On-the-job training relates closely to the transfer of tacit knowledge or informal training in that some connection with a workplace, colleagues and supervisors is implied (Figure 28).

Figure 28: Shares of workers who participated in on-the-job training, by work arrangement (%), EU28, 2015



Source: EWCS 2015

The EWCS shows that employees with a TICTM arrangement are more likely to participate in on-the-job training than the self-employed or those who work at their employer's premises. Workers doing regular home-based TICTM have fewer opportunities for such training than the other TICTM employees. Therefore, at least for regular home-based TICTM and self-employed workers, the concerns expressed by some of the authors mentioned above seem to be confirmed by the EWCS (especially for clerical workers). Although online training exists, and can be accessed by workers in TICTM arrangements, being in contact with colleagues and supervisors at the workplace might enhance their chances of learning and receiving training.

The multivariate analysis shows that, after applying contextual controls (including occupation), highly mobile and occasional TICTM workers are more likely to report learning new things in their current job. Regular home-based TICTM workers are less likely to do so, which could support the perspective that detachment and social isolation can result in less tacit learning or learning in general. However, this cannot be definitively confirmed with the analysis.

Another aspect to consider is the fact that TICTM arrangements make it necessary for the worker to have ICT skills. These competences are not only crucial for accessing work, but also for self-promotion and building an online reputation to guarantee employment opportunities and expand career prospects.

Career prospects and employment conditions

Analysis of the EWCS data shows that 24% of TICTM workers are in precarious employment: they are more likely to have a fixed-term contract, earn a low income, experience job insecurity, and lack training opportunities. This group includes workers in service-related sectors (information and communication; professional activities; administrative and support activities; arts, entertainment and recreation; and other service activities). By occupation, they are more likely to be professionals (in the legal, cultural and social fields, for example), service and sales workers, and information and communication technicians. In relation to type of TICTM, there is a higher probability of self-employed TICTM workers being in this precarious group.

This shows the heterogeneity of employment conditions within TICTM. It means that a quarter of TICTM workers do not benefit from some of the positive aspects of this arrangement. While TICTM has traditionally been viewed as a form of work that is more typical of professionals and highly qualified workers, the EWCS finding confirms that it is also prevalent among clerical and service workers in service-related sectors.

In these sectors, research has identified the potentially precarious and non-standard conditions for some groups who work intensively with new technologies and have flexibility in terms of time and location. Online platform work is a case in point, which is often viewed as a new form of non-standard employment (Huws et al, 2017). Some platform workers may experience precarious conditions, including low or unpredictable earnings, an unclear employment status and unclear employment rights, and less control over their work (Eurofound, 2019a, 2019c).

TICTM can offer some groups for whom a job with standard hours in an employer’s workplace does not suit – people with family responsibilities or disabilities, for instance – an opportunity to access the labour market. However, it has also been reported that being away from an employer’s premises for a sustained period can negatively affect career prospects.

From the perspective of the individual worker, the lack of visibility and detachment from their employer’s workplace can jeopardise career development. Maruyama and Tietze (2012) found that female teleworkers, especially those with children and those who spend more than 50% of their working hours at home, were more likely to report that they experienced reduced visibility and had fewer career development opportunities. Managers may also see the physical

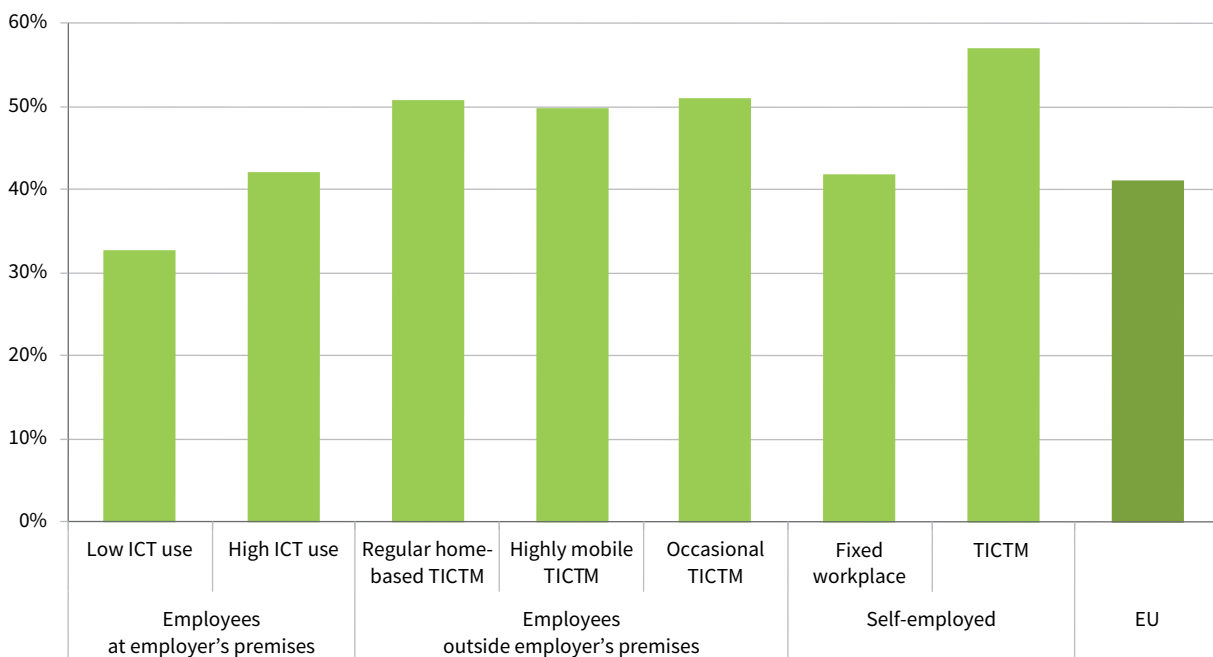
absence of workers as a lack of commitment, which can result in career penalties for the workers concerned (Leslie et al, 2012).

Several other authors suggest that high levels of engagement, high levels of trust and supportive relations between the employee and the employer have a positive impact on career development within TICTM (Gajendran et al, 2015; Boell et al, 2016; Glass and Nooman, 2016; Koslowski, 2016; Masuda et al, 2017). In terms of the performance of workers, Konrad and Yang (2012) also found that the long-term benefits of using flexible working arrangements tended to offset the initially negative views of managers and co-workers. It also enhanced promotion chances.

EWCS data show that self-employed TICTM workers are the most likely to state that they have good prospects for career advancement (Figure 29). TICTM employees are also more likely to report positive career prospects than their counterparts based at an employer’s premises.

The case studies provide little evidence in relation to prospects. However, some interviewees reported that TICTM required them to develop specific capabilities that could improve their prospects, such as the ability to handle high levels of responsibility and self-management.

Figure 29: Shares of workers who report that their job offers good prospects for career advancement (%), by work arrangement, EU28, 2015



Source: EWCS 2015

In short: TICTM, worker performance and prospects

- The flexibility in working time and location provided by ICT generally has a positive impact on performance in jobs that lend themselves to TICTM. However, features of some TICTM environments impede performance and need to be avoided; these include close monitoring, interruptions, complex ICT systems and complications arising from physical absence from the employer's premises.
- TICTM can be an important precondition for sustainability and business growth for some groups of self-employed workers, particularly those whose clients expect flexibility in terms of time and location.
- TICTM workers earn higher average wages, although further research is needed to establish the true influence of TICTM on earning levels.
- TICTM does not prevent workers from participating in employer-paid training or on-the-job training. In fact, occasional and highly mobile TICTM employees are actually more likely to learn new things at work.
- Exchanging knowledge through informal learning is more difficult when there is a lack of face-to-face interaction. This affects some self-employed TICTM workers and, to some extent, regular home-based TICTM workers.
- While TICTM can facilitate access to employment, and this can be important for people disadvantaged in the labour market, there is a risk that regular home-based TICTM workers are seen as having a low level of commitment. The lack of visibility could also jeopardise their career development.
- In general, workers with TICTM arrangements have better career prospects. This is partially related to their longer working hours, their level of engagement, the support they receive from managers and their occupational level (the majority are medium-skilled and high-skilled workers). Therefore, TICTM can help to advance careers, especially for well-qualified workers.
- Not all workers benefit equally from TICTM. About a quarter of workers in this arrangement experience precarious employment conditions (such as job insecurity, low earnings and a lack of prospects), and this includes medium-skilled and high-skilled workers.

6 Regulations on TICTM and work–life balance

The freedom to more effectively balance work demands with family commitments is one of the main reasons that workers opt for TICTM arrangements. However, the available evidence shows that the outcomes in relation to work–life balance are not always positive, because it can lead to more intense work, irregular work schedules and long working hours. This, in turn, can be harmful to workers' health and well-being. Workers who are very mobile, who work regularly from home, who use ICT intensively or who work evenings or weekends are at particular risk.

Some of these effects on workers are not new, as they are already a feature of more traditional work arrangements. And regulators at EU and national levels, in response to such risks, have established regulatory frameworks to protect employees. More recently, governments and the social partners have designed interventions that aim to address specifically the quality of working conditions for mobile workers, intensive ICT use at work, or a combination of both.

This chapter provides a brief overview of such regulations at EU and national levels, with a focus on measures related to TICTM and work–life balance, including the 'right to disconnect'.

EU regulations

Working Time Directive

The available evidence on the working conditions of TICTM workers suggests that there are potential challenges regarding working time – its length and scheduling. The European Working Time Directive (2003/88/EC) provides a regulatory framework in this context. While the main aim of the directive is to protect the health and safety of workers, the duration and organisation of working time can have an impact on work–life balance.

The directive provides a legal framework that sets a maximum working week of 48 hours, including overtime. The reference period should not exceed four months but may be extended to a maximum of six months, and, under certain conditions (for example, in

the case of a collective agreement), it may be extended to a maximum of one year. This is an important provision for TICTM, particularly in light of the EWCS finding that TICTM workers are much more likely to report long weekly working hours than other workers.

The Working Time Directive also provides for minimum periods of consecutive hours of daily rest (11 hours) and weekly rest (35 hours, which can be averaged over a two-week period). This regulation is also highly relevant for TICTM workers as they tend to have insufficient rest periods. According to the EWCS, 58% of highly mobile, 41% of regular home-based and 24% of occasional TICTM employees had less than 11 hours' rest at least once in the month before the survey. The EU average for employees is 21%.

The findings in Chapter 3 also show that, when compared to other groups, highly mobile TICTM employees are more likely to be called into work at short notice and to work in their free time. This raises the question of what is considered working time in work arrangements that differ from the traditional arrangements at an employer's premises. For the legislation, working time is binary: the worker is either in working time or in a rest period.⁸ In principle, both can and should be recorded, so that remuneration can be established based on working time and the minimum rest period can be respected. However, there is some evidence from the literature and the EWCS that the unpredictability of life can make it more difficult to distinguish what is and what is not working time.

Remote workers with unconventional schedules find it more challenging to record, monitor and control their working time than workers who are based at their employer's premises and have a set schedule. The Working Time Directive only requires employers to record the working hours of those workers who have opted out of the 48-hour maximum working time provisions. While national legislation in most Member States goes beyond this and requires working hours to be recorded for all workers, only a minority have specific provisions on recording working time while working remotely.

⁸ 'Working time' means any period during which the worker is working, at the employer's disposal and carrying out his activity or duties, in accordance with national laws and/or practice. 'Rest period' means any period that is not working time. The jurisprudence of the European Court of Justice linked to the Working Time Directive also distinguishes between on-call time and stand-by time. On-call time is performed at the employer's premises and is counted as working time even if it is 'inactive'; stand-by time is where a worker is at home or a place of their choosing but required to be contactable and ready to work if called upon, which is counted as working time only for the hours actually worked.

Tracking the working hours of TICTM workers is difficult not only because they work outside the employer's premises, but also because they might work informally, blurring the lines between work and private life. Concerns have also been raised regarding the data protection implications of such monitoring arrangements. In some countries, initiatives have been put in place at company or other levels to record the working time of remote workers; this is explored in more depth in a forthcoming Eurofound publication looking at regulations on flexible work using ICT.

Framework agreement on telework

The European framework agreement on telework (2002) negotiated by the European cross-industry social partners is still the main European text on this issue. An autonomous agreement, it has been implemented by national affiliates of the social partners according to the procedures and practices specific to each Member State. The level of this implementation has varied across countries as the agreement is not legally binding, although most have used it to frame the provisions that define telework either through legislation, collective agreement, joint guidelines or other texts.

However, there are some aspects of TICTM arrangements that are not clearly covered by the agreement (Eurofound and the ILO, 2017). These include the fact that telework is sometimes informal and based on trust, and that most workers work in this way only occasionally; the agreement instead refers to a voluntary, but formal, arrangement that includes regular telework. It appears that recent technological advances that have enabled greater levels of flexible working were not foreseen when the agreement was signed in 2002.

Rights relating to voluntariness and the reversibility principle are also not fully covered by the framework agreement. It stipulates that the TICTM arrangement is reversible when it has been agreed voluntarily between the employer and the employee, and this has typically been translated into national regulations. However, when TICTM is required as part of the job description, workers are not entitled to change their work arrangement to a fixed location at their employer's premises. Highly mobile sales people who are required to travel extensively and regularly use ICT for their work are particularly affected by this. These workers may find themselves with a double burden: they not only experience conditions that may have a negative impact on their work-life balance and well-being, but they also lack the legal means to change their situation unless they change their job.

Recent legislative initiatives

Some more recent legislative developments aim specifically to address concerns about the work-life balance of TICTM workers. These include the Work-Life Balance Directive (COM/2017/0253 final) and the Transparent and Predictable Working Conditions Directive (COM/2017/0797 final), adopted by the European Council in June 2019.

The Work-Life Balance Directive will extend the existing right to request flexible working arrangements to all working parents of children up to eight years old⁹ and all carers. This should be facilitated, where possible, through remote working arrangements, flexible working schedules or a reduction in working hours. Workers who exercise this right will be protected against discrimination or any unfavourable treatment resulting from the request. If the directive is implemented, parents and carers will have the right to request TICTM arrangements that could help to improve their work-life balance (particularly regular home-based telework).

The Transparent and Predictable Working Conditions Directive could also help to address some of the problems related to TICTM arrangements. The directive proposes that provisions on place of work and work patterns are included in employee contracts, which would make the working conditions of TICTM more transparent and predictable from the outset of the employment relationship. Moreover, the directive seeks to protect workers from on-demand requests by specifying that they have a reasonable period of advanced notice about when work will take place. This could help to reduce the unpredictability of irregular working time patterns and have a positive impact on the work-life balance of workers.

National regulations

The information in this section is largely based on a forthcoming Eurofound report detailing regulations on flexible work using ICT for the improvement of work-life balance in the Member States.

Several Member States have developed regulations on TICTM, with some promoting it as a way to improve work-life balance and others aiming to protect workers from the negative aspects of this work arrangement. Some Member States, including Denmark, Estonia, France, Germany and Spain, have incorporated completely, or to some extent, the provisions of the framework agreement on telework. Most countries have also updated or extended these regulations in recent years.

⁹ A higher age limit can be set at Member State level.

However, while the ‘voluntary principle’ has been regulated in TICTM, there are a number of aspects of this work arrangement that have not (or have only been regulated to a small extent). These include issues related to the work–life balance, the right to disconnect, health and safety, data protection, employee surveillance and high levels of job demand.

Legislative and collectively agreed responses

Collective bargaining and legislation have been crucial for developing initiatives on flexible working time that address the work–life balance in several European countries (Eurofound, 2015b). However, the approach to the issue and the content of such initiatives differ between countries.

Central and eastern Europe is characterised by more rigid regulation and fewer clauses in collective agreements, reflecting the respective roles played by legislation versus collective bargaining (particularly at the national sectoral level) in these countries. Nevertheless, some countries in this part of Europe have introduced part-time and more flexible working time options.

In Nordic countries with regulations allowing for more flexible patterns, support has increased for the role of collective bargaining. Flexible working time clauses are relatively widespread as a result.

Western European countries are diverse in relation to the prevalence of clauses on working time flexibility, and different approaches have been introduced in legislation and collective agreements. These range from the right to flexible working in the United Kingdom (in legislation) to the right to disconnect in France (in legislation and collective bargaining) (Eurofound, 2015b, 2017b, 2018b; Eurofound and the ILO, 2017).

Only seven Member States have legislation directly linking provisions on telework or remote work using ICT with efforts to support a better work–life balance.¹⁰ Of these, only four countries seek to address both the potentially positive and negative implications of these forms of work for the reconciliation of work and private life. An additional 13 Member States have legislation regulating TICTM, but these do not make a direct connection between flexible working arrangements and work–life balance (they mainly regulate the performance of telework).

In most countries, collective agreements are the principal way of shaping the use of TICTM and its link with work–life balance arrangements in practice (Figure 30). Where there is legislation, it is usually supplemented with collective bargaining at various levels. Where there is sectoral bargaining in a country, the provisions tend to be further developed through company-level bargaining.

As Figure 30 illustrates, national, sectoral and company-level collective agreements play a significant role in a number of countries where specific legislation provides the highest level of regulation for TICTM and work–life balance. This is particularly true in Belgium, France, Italy and Spain, and to some extent in Portugal. In Belgium, universally applicable national collective agreements help to promote telework and limit the working hours of teleworkers. Sectoral agreements tend to reiterate the requirements set out in legislation and national collective agreements, whereas company-level agreements are the main level for determining the details of TICTM and the right to disconnect for individual employees.

The finance and public administration sectors are particularly well represented among those sectors that have negotiated relevant collective agreements. Other sectors where agreements promoting telework are relatively widespread include manufacturing, information and communication, and professional, scientific and technical activities. However, in the absence of publicly available databases on collective agreements in many countries, it is difficult to estimate the extent to which TICTM and work–life balance are covered in such agreements.

The presence of regulations does not mean that in all these countries the provisions are widespread at different levels. For example, sectoral agreements and company-level agreements on the subject are more widespread in France than in Spain, where there is a relatively small number of these agreements. The significant differences in the prevalence of collective bargaining, and the different levels and scope of the application of such agreements in different countries, means that the information in Figure 30 should not be considered in isolation.

¹⁰ Not all legislation specifically mentions ICT-based mobile work, with reference generally being made to telework (which is interpreted as including ICT-based remote work and telework). Legislation regarding work–life balance measures and telework are also not necessarily part of the same legislative package, but reference is often made to the positive impact that remote work and telework can have on work–life balance.

Figure 30: Highest level of regulation linking TICTM and work–life balance, by Member State



Note: Green countries have sectoral or national collective agreements, blue countries have legislation and pink countries only have company-level agreements.

Source: Authors' own compilation, based on contributions from the Network of Eurofound Correspondents

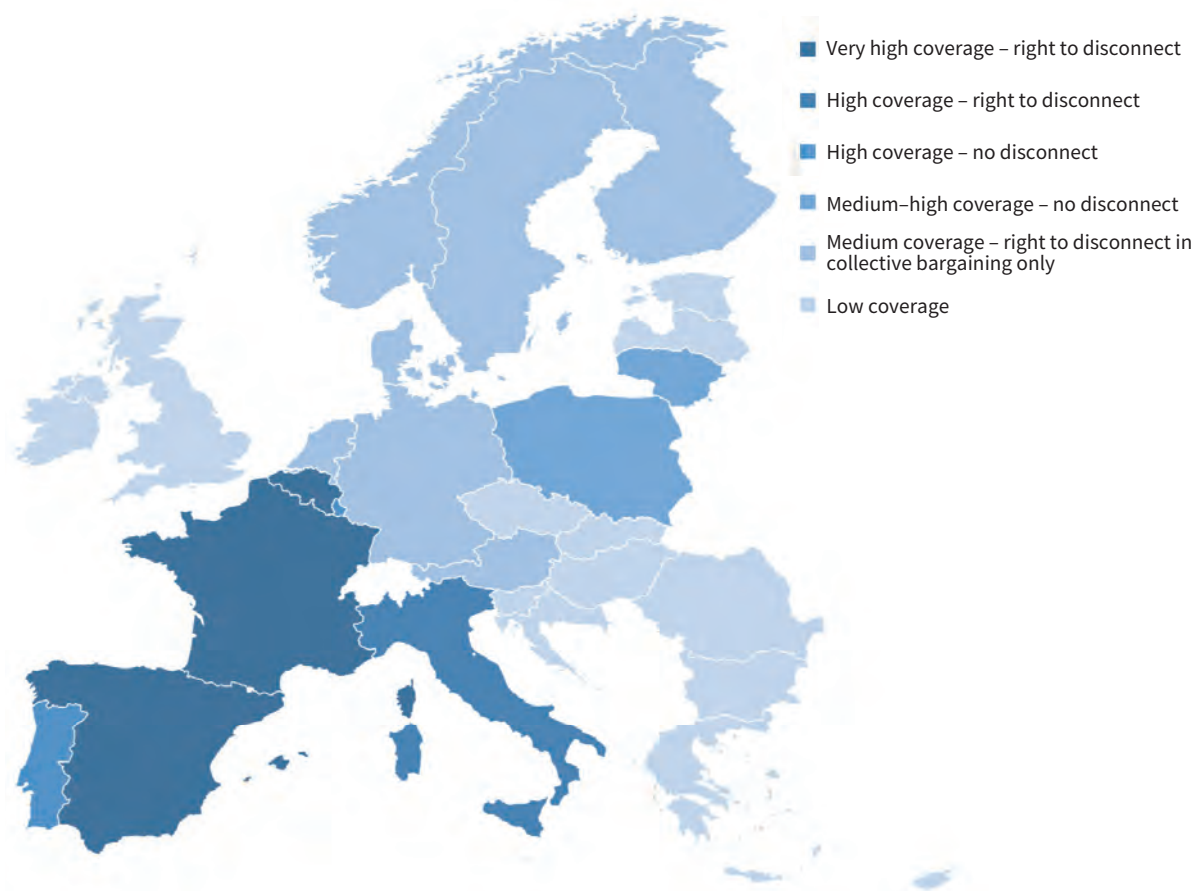
The coverage of legislation directly or indirectly linking provisions on telework and work–life balance is also influenced by company size thresholds and the mechanism through which such provisions are implemented (for example, through collective bargaining, health and safety committees or direct contractual arrangements between employer and employee). Figure 31 provides a tentative assessment of the breadth of coverage of such legislation and collective agreements.

- A very high level of coverage denotes legislation or collective agreements that are universally (or almost universally) applicable and – in the case of collective agreements – cover all or almost all sectors of the economy.
- A high level of coverage is present in countries where collective agreements cover at least half of all sectors and where extensions of such agreements are widespread, or legislation covers a significant share of the workforce.

- Medium levels of coverage denote countries where collective agreements cover less than half of the sectors or legislation regulates TICTM and work–life balance for a more limited share of the workforce.
- Finally, a low level of coverage is found in countries without legislation linking provisions on work–life balance and TICTM, and collective agreements are limited to a few companies.

With regard to legislation, a distinction is made between the countries that include a right to disconnect in their legislation (Belgium, France, Italy and Spain) and the countries that make a specific link between TICTM and work–life balance, but do not include a right to disconnect in their legislation (Lithuania, Poland and Portugal). However, due to the lack of precise information from each country on the number of companies or sectors included in these provisions, the classification should be interpreted with caution and be considered an approximation.

Figure 31: Approximate coverage of regulations that include TICTM linked to work-life balance, Member States



Note: Despite the existence of a national agreement on telework in Greece, which follows the European social partner agreement, it has been ranked as low. This is because the overall use of telework and the practical application of the agreement at company level are considered low.

Source: Authors' own compilation, based on contributions from the Network of Eurofound Correspondents

The existence of legislation explicitly linking TICTM and work-life balance in Lithuania and Poland is ranked as 'medium-high coverage – no right to disconnect' as this legislation applies to all workers but does not include the right to disconnect. Portugal is ranked as 'high coverage – no right to disconnect' due to the presence of several sectoral collective agreements on these issues, which are extended to the whole workforce. This is not the case in Lithuania and Poland, where negotiations on such issues are limited to the company level and are not widespread.

Belgium and France are ranked as 'very high coverage – right to disconnect'. Although the legislation in these countries applies only to companies with more than 50 employees, these legislative provisions are supplemented with collective agreements in almost all sectors, which are extended to the majority of the workforce (and, in many cases, include the right to disconnect).

Spain is also ranked as 'very high coverage – right to disconnect' because although the share of sectors with relevant collective agreements (which are usually extended) is lower, the legislation requires all employers to draw up protocols on the right to disconnect.

In Italy, the law – known as the Lavoro Agile law – requires an individual agreement on the right to disconnect to be established between employer and employee. However, this applies only in the case of so-called 'smart workers' who hold a specific contractual status. In addition, sectoral and company-level collective agreements are in place, which tend to be extended. The sectoral coverage of such agreements is 'high coverage – right to disconnect'.

In Luxembourg, the high level of coverage arises from the fact that national agreements are universally binding.

Legislative approaches

In recent years, the right to disconnect has started to emerge in legislation, collective agreements and company practices in an attempt to limit any negative consequences of telework and TICTM by protecting the non-working time of employees. While the right to disconnect has been included in the legislation and/or sectoral and company collective agreements of a number of Member States, the use of such provisions is not yet widespread.

Several approaches to legislation governing the use of TICTM can be distinguished (Figure 32).

Balanced promoting–protecting: Specific legislation exists promoting the use of ICT to support flexible working, whereby the right to disconnect is provided to protect workers from the potentially negative consequences of being constantly available. These countries include Belgium, France, Italy and Spain.

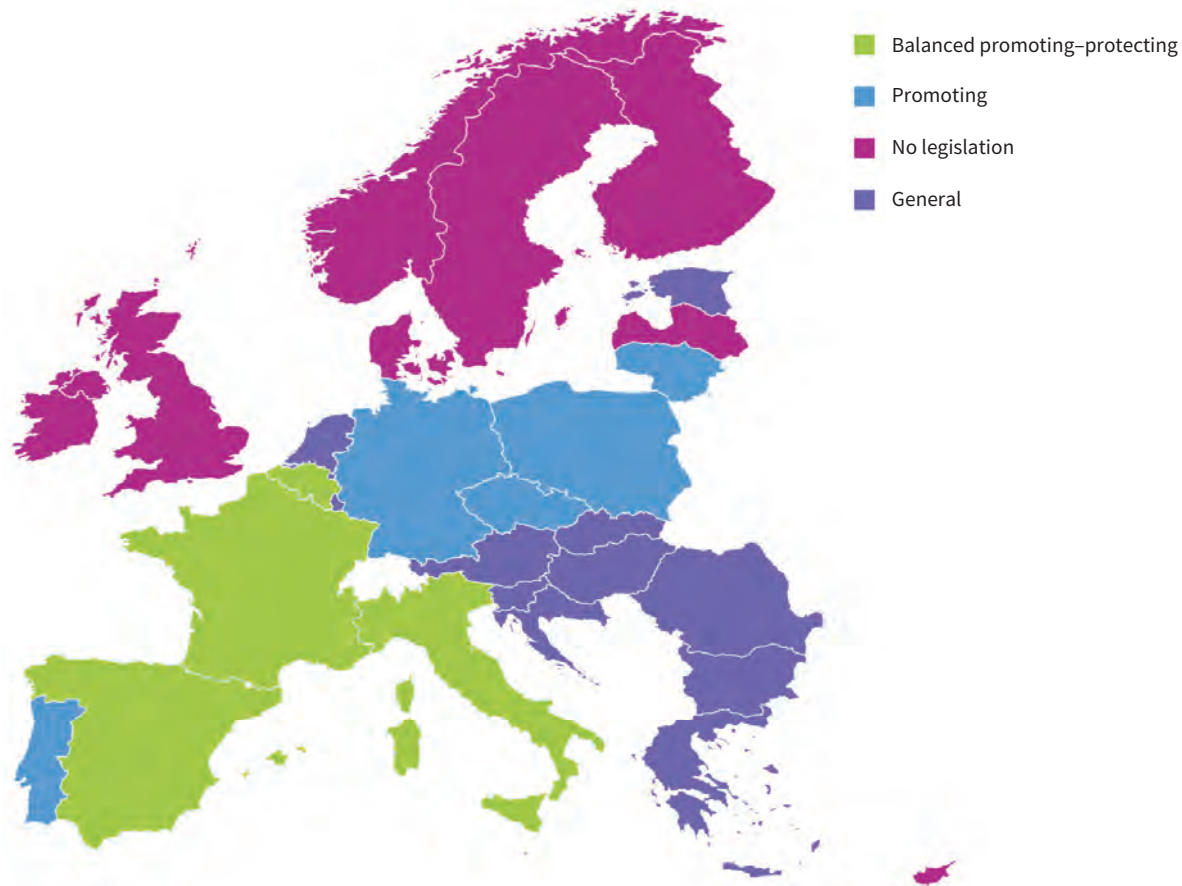
Promoting: Legislation exists on telework or remote work with a direct link between the potential benefits of these flexible forms of work and work–life balance, but

it does not specifically deal with any negative consequences. These countries include Czechia, Lithuania, Poland and Portugal.¹¹

General: These countries have general legislation regulating telework or remote work, without drawing a direct link between such work and work–life balance (although this may be assumed to be an indirect benefit). These countries include Bulgaria, Croatia, Estonia, Germany, Greece, Hungary, Luxembourg, Malta, the Netherlands, Romania, Slovakia and Slovenia.

No legislation: These countries do not have any specific legislation governing telework or remote work and include Cyprus, Denmark, Finland, Ireland, Latvia, Norway, Sweden and the United Kingdom. The lack of specific legislation in the Nordic countries is more a reflection of the precedence taken by collective bargaining. In the United Kingdom, the legislation on the right to request flexible working is not included in these considerations as no direct link is made to telework or remote work.

Figure 32: Presence and nature of legislation linking TICTM and work–life balance, Member States



Source: Authors' own compilation, based on contributions from the Network of Eurofound Correspondents

11 Although all four countries are considered to have this approach for the purposes of classification, only the Lavoro Agile law in Italy directly refers to both the potentially negative and positive effects of TICTM.

Legislation on the right to disconnect

As mentioned already, only a few countries have included the right to disconnect in their legislation, and in most of these cases, effective implementation of this right is via sectoral and/or company-level collective bargaining. In some other countries, only collective bargaining, mainly at company level, plays a role (for example, Volkswagen in Germany). These initiatives have been developed in the context of increasingly digitalised and flexible work, which has made the implementation of working time legislation more difficult.

Legislation covering the right to disconnect has been passed in Belgium, France, Italy and Spain, while a proposal was also tabled in Portugal but rejected in July 2019. In each case, the legislation does not provide for a direct right. Instead, it requires the social partners at sectoral or company level, or indeed the individual employee, to reach an agreement on how to make this right operational.

It is important to note that the rights enshrined within this new legislation are not always strictly new but are based on pre-existing national social partner agreements (for example, in France) or on company practices (for example, in Italy). Italy is unique in the sense that the legislature has opted to assign the responsibility for reaching such agreements to individual employers and employees (rather than representatives), which arguably implies a different power balance between the parties.

The coverage and approach to implementation also differs between the countries. In Italy, the *Lavoro Agile* law covers only 'smart workers', who combine working from their office base with working remotely in order to balance work and family commitments. As of mid-2019, there were estimated to be around 480,000 smart workers in Italy. Workers classified as 'teleworkers' are covered by separate legislation that does not include the right to disconnect.

In France, the right to disconnect is implemented through agreements between employers and trade unions in all companies with more than 50 employees. According to Eurostat estimates, this means that the legislation applies to less than 1% of employers and between 45–50% of the workforce. However, these legal provisions are further supplemented by universally applicable sectoral collective agreements, as well as company-level agreements.

The law in Belgium covers all companies where health and safety committees are established (this is a legal requirement in companies with more than 50 employees) and precise provisions have to be negotiated within these committees. A high number of universally applicable sectoral collective agreements and company agreements are also in place, extending coverage beyond the approximately 47% of workers working in companies with more than 50 employees.

The Spanish Organic Law also leaves the implementation of the right to disconnect to the collective bargaining parties at sector or company level. As of mid-2019, the right to disconnect is enshrined in a sectoral collective agreement only in the manufacturing sector and in a number of company-level collective agreements.

Despite this legislation, it is not universally accepted that a specific legal right to disconnect is necessary, because the Working Time Directive already provides for maximum working hours (in principle). A number of national court cases have ruled on such issues (such as the *Kepak* case in Ireland), while the European Court of Justice recently ruled that employers must establish systems to record working hours (case C-55/18 CCOO).

Some countries prefer to rely on collective bargaining and company practice to regulate TICTM linked to work-life balance and the right to disconnect. However, such approaches can lead to inequalities between countries and sectors as well as between types of workers who may not have strong representation in collective bargaining at different levels.

Right to disconnect not specifically regulated

In Germany, the national-level regulation does not include the right to disconnect, and TICTM-related legislation is normally supplemented by sectoral and company-level collective bargaining. A white paper from the federal government found that there is no need for additional legislation to regulate the right to disconnect, as workers are not obliged to be available to their employers during their leisure time (BMASK, 2017). The paper concluded that collective bargaining is seen as the most appropriate means to regulate overworking and to protect the private life of workers from demands for flexibility.

TICTM is exclusively regulated through collective bargaining at sectoral and company levels in Denmark, which has the highest share of TICTM workers in Europe and a strong tradition of regulating the labour market through social dialogue (Eurofound, 2018b). The right to disconnect is not part of the political discourse, nor is it part of the discussions between the social partners. Instead, the issue raised by trade unions in the context of TICTM is 'self-inflicted overtime'.

It could be argued that another benefit of including a specific right to disconnect in legislation or an agreement is that it reduces the need for employees to try and enforce this right themselves. The implementation of the right to disconnect can also lead to the creation of technical tools that allow this right to be exercised. Such tools can take different forms, including hard and softer means of disconnection (such as a wireless router shutdown after a certain amount of time or pop-up messages reminding workers that they do not need to respond to emails out of hours).

The broader issue of workload is another important aspect to consider in connection with the right to disconnect. It is likely that disconnecting without causing added pressure to the employee is only possible when workload and working hours are sensibly aligned. There are also potential problems in relation to the organisation of working time and the constant availability of remote workers.

In short: Diverse approaches to regulating TICTM

- EU-level provisions linked to TICTM include the Working Time Directive and the framework agreement on telework. More recently, the Work–Life Balance Directive and the Transparent and Predictable Working Conditions Directive have addressed the potential challenges for decent working conditions in TICTM.
- There is legislation or collective agreements on TICTM in most Member States. However, only some of these regulations explicitly include the aim to promote work–life balance, and few of them include provisions on the right to disconnect. Collective bargaining at sectoral and company levels is commonly the way in which practical provisions are developed for the implementation of TICTM regulations.
- Regulations on TICTM and work–life balance are developed solely through sectoral collective bargaining in Austria, Czechia, Denmark, Finland, Germany, the Netherlands, Norway and Sweden.
- National-level collective agreements including provisions linking TICTM and work–life balance are found in Estonia, Greece and Luxembourg.
- Legislative approaches (complemented with collective bargaining), including both the promotion and protection of TICTM, have been developed in Belgium, France, Italy and Spain.
- TICTM legislation is most commonly negotiated at company level in most of central and eastern Europe, as well as in Ireland and the United Kingdom.
- There is a lack of consensus in Europe about the need for legislation addressing the right to disconnect, and how such legislation should be regulated. This issue and the different levels of coverage can lead to inequalities between countries, sectors or types of worker in terms of protection against the impact of TICTM on work–life balance and worker health.

7 | Conclusions and policy pointers

Conclusions

Telework and ICT-based mobile work (TICTM) arrangements are in many ways advantageous for workers when compared to traditional work arrangements based in a single workplace. TICTM workers generally have greater autonomy to organise their working time, a better work–life balance and higher productivity. They also spend less time commuting. There are disadvantages to TICTM too, however, including the tendency for working hours to lengthen, for paid work to overlap with personal life, and for work to intensify for workers using this arrangement. The analysis suggests that the workers who benefit most from TICTM are those who do it occasionally – for them, it generally results in better working conditions and better outcomes in relation to working time, work–life balance, and some aspects of health and well-being.

It appears that the paradoxical effects of TICTM to some extent are the result of interactions between ICT use, the place of work, the work environment and the characteristics of different occupations. The autonomy paradox exemplifies the issue. TICTM offers workers more autonomy, which is an asset. However, it can also make work more intense when combined with heavy workloads and work cultures dominated by competition, self-management or mechanisms to enforce performance outside the employer’s premises.

Self-employed TICTM workers illustrate some of the unwished-for side-effects of autonomy. These workers have similar working conditions to highly mobile TICTM employees, but their working time quality is poorer, which is probably related to the high level of autonomy the self-employed have over their working time. For example, they are more likely not to take the necessary rest periods between working days. They are also more likely to experience isolation, although this can be overcome to some extent by using ICT to stay in touch with colleagues and clients.

Similar ambiguity exists around work–life balance. One of the main reasons that workers choose a TICTM arrangement is to better combine work with home life. But depending on how it is implemented, TICTM can have either positive or negative effects on work–life balance. Many variables play a role in shaping work–life balance, including the degree of autonomy, the intensity of work and working time patterns. The interaction of these factors might not result in improved work–life balance. For example, workers with children tend to find that their work–life balance worsens with TICTM. This is particularly true of the highly mobile group, where the share reporting poor work–life

balance doubles for those who have children. However, regular home-based TICTM workers with children report a better work–life balance than those without children.

The findings also show that the work environment of TICTM poses some risks for the mental and physical well-being of workers. Not only are they more likely to report stress and other health problems, but they are also more likely to engage in a new phenomenon enabled by the digital world: virtual presenteeism, or working from home when sick but not so sick as to preclude working.

The report also presents new findings in areas of working conditions that have not been researched in depth at EU or national levels before. These included the finding that working remotely does not seem to have a particularly negative effect on participation in training, although remote workers may miss out on some types of informal learning in the workplace. In addition, TICTM might even contribute to career development, as workers with these arrangements are more likely to work longer hours, to a high level of engagement and to receive support from their managers – this is especially applicable to workers with medium to high levels of qualification.

Not all workers benefit equally from TICTM. For example, while ICT can facilitate access to employment for vulnerable groups, there is a risk that regular home-based TICTM workers are seen as having low levels of commitment. This, combined with a lack of visibility, could jeopardise their career development opportunities. More broadly, roughly one-quarter of workers in these arrangements are in precarious employment because they report a combination of low wages, job insecurity, a lack of access to training and limited career prospects. Interestingly, this precarious group includes medium-level and highly qualified workers.

The same patterns of differences in working conditions between the TICTM groups (classified by frequency of ICT use and mobility) can be found in all Member States. The findings suggest that some differences are influenced by the institutional setting of the country – regular home-based teleworkers in Belgium, for instance, enjoy better conditions, which might be because the country has extensive labour market regulations.

However, the scope and implementation of regulations to improve work–life balance in the context of flexible work using ICT varies across Europe. And only a few countries have adopted legislation that addresses the right to disconnect. Available information also suggests that Member States differ in terms of regulations to protect workers against the negative effects of TICTM.

The growing trend of flexible work arrangements supported by digital technology is changing the world of work, affecting working time patterns, health risks, and the organisation of work and private life. Existing regulations need to be adjusted – and new regulations developed – in order to foster the positive elements of new work arrangements and offset any negative consequences.

Finally, this report has demonstrated how the interaction between the world of work and digitalisation can shape working conditions for workers in Europe. In this regard, it should be considered in the context of research and policies related to digitalisation. Other research shows some evidence that automation, artificial intelligence and platform work can also offer further possibilities for flexibility in the time and place of work, as well as increasing the risk of greater work intensity. These are typical characteristics of working conditions in intensive and regular TICTM.

Policy pointers

Different forms of TICTM: TICTM takes different forms and this should be taken into consideration in assessing how it can contribute to working life. Intensive, highly mobile forms of TICTM should be limited, and occasional TICTM should be encouraged because it has a more positive impact on working conditions, work–life balance and the well-being of workers.

Around a quarter of TICTM workers do not enjoy all the benefits of this work arrangement; they have non-standard employment, low pay, limited access to training and relatively high levels of job insecurity. General policies dealing with minimum standards in working conditions, such as the Directive on Transparent and Predictable Working Conditions, should encompass this group of workers.

Work organisation: Improvements in work organisation are necessary in order to tackle the risks associated with TICTM. These risks include constant availability and the possibility that employees use it to supplement rather than substitute work done at the employer’s premises, which often occur when the workload is high and the corporate culture encourages immediate responses. Workplace-level initiatives can help to mitigate these risks by addressing workload, team dynamics (for example, physical meetings to reduce the isolation of remote workers), availability for work and working time. Systems of monitoring and control have to be designed in a way that gives these workers autonomy and ensures data protection. And TICTM workers, including the self-employed, need to be familiar with such initiatives so that they can manage the boundaries between work and private life more effectively. Collective bargaining and social dialogue should play a role in the design and implementation of such initiatives.

Corporate culture and management: For such workplace initiatives to be successful, a supportive corporate culture and managerial approach is essential. Unconventional work arrangements like TICTM need to be supported by the top management, while line managers must apply management styles that empower remote workers and help them to self-manage. This requires awareness-raising and educational measures that aim to help managers familiarise themselves with the practicalities of coordinating teams of virtual workers.

Work–life balance: From a policy perspective, TICTM should be promoted as a way to improve work–life balance (through the transposition of the Work–Life Balance Directive, for example). However, this should be done on the understanding that these initiatives may have implications in terms of gender equality and should respect employee-friendly schedules and maximum working hour limits. Therefore, for parents working flexibly with ICT, social support and interactions with colleagues must be ensured in order to avoid a lack of visibility and assumptions of low commitment associated with remote work.

Working time: TICTM workers are more likely to report working long hours and not having enough rest between working days. Even though new EU directives should improve the working conditions of TICTM, there is a need to assess whether the Working Time Directive and the European framework agreement on telework are sufficient for the implementation of the provisions protecting this group of workers.

Regulations: The regulation of TICTM – such as providing the right to disconnect – might be the only way to curb the trend towards a culture of work characterised by self-imposed work intensity, project-based work, performance-based pay and constant availability. Regulations could contribute to a cultural change and establish a higher level of protection for workers against possible health and well-being risks. These regulations need effective social dialogue at company and sectoral levels to ensure implementation and enforcement.

Worker health: The health of workers with a TICTM arrangement might be improved by clarifying their responsibilities in a context where the EU legislation determines that the employer is responsible for the health and safety of employees. The implementation of this provision in multiple locations beyond employers’ premises is challenging. In this context, information and training are hugely necessary. Developing and implementing psychosocial risk assessments at company level is also an essential part of identifying and mitigating possible health risks for remote workers. Next to traditional issues of concern, such as high levels of stress, new phenomena like virtual presenteeism should be considered.

Bibliography

Eurofound publications are available at www.eurofound.europa.eu

Akinwale, B., Lynch, K., Wiggins, R., Harding, S., Bartley, M. and Blaine, D. (2011), 'Work, permanent sickness and mortality risk: A prospective cohort study of England and Wales, 1971–2006', *Journal of Epidemiology & Community Health*, Vol. 65, No. 9, pp. 786–792.

Allen, T. D., Golden, T. D. and Shockley, K. M. (2015), 'How effective is telecommuting? Assessing the status of our scientific findings', *Psychological Science in the Public Interest*, Vol. 16, No. 2, pp. 40–68.

Beauregard, T. A. and Basile, K. (2016), 'Strategies for successful telework: How effective employees manage work/home boundaries', *Strategic HR Review*, Vol. 15, No. 3, pp. 106–111.

Beauregard, T. A., Basile, K. and Canonico, E. (2013), *Home is where the work is: A new study of homeworking in Acas – and beyond*, Acas, London.

Berg-Beckhoff, G., Nielsen, G. and Ladekjær Larsen, E. (2017), 'Use of information communication technology and stress, burnout, and mental health in older, middle-aged, and younger workers – results from a systematic review', *International Journal of Occupational and Environmental Health*, Vol. 23, No. 2, pp. 160–171.

Biron, M. and Van Veldhoven, M. (2016), 'When control becomes a liability rather than an asset: Comparing home and office days among part-time teleworkers', *Journal of Organizational Behavior*, Vol. 37, No. 8, pp. 1317–1337.

BITKOM (2013), *Arbeit 3.0. Arbeiten in der digitalen Welt*, Berlin.

BMAS (2015), *Forschungsbericht 460: Mobiles und entgrenztes Arbeiten*, Berlin.

BMASK (2017), *Sozialbericht: Sozialpolitische Entwicklungen und Maßnahmen 2015–2016*, Sozialpolitische Analysen, Vienna.

Boell, S. K., Cecez-Kecmanovic, D. and Campbell, J. (2016), 'Telework paradoxes and practices: The importance of the nature of work', *New Technology, Work and Employment*, Vol. 31, No. 2, pp. 114–131.

Campbell, J., McHenry, J. and Wise, L. (1990), 'Modeling job performance in a population of jobs', *Personnel Psychology*, Vol. 43, No. 2, pp. 313–575.

Charalampous, M., Grant, C., Tramontano, C. and Michailidis, E. (2019), 'Systematically reviewing remote e-workers' well-being at work: A multidimensional approach', *European Journal of Work and Organizational Psychology*, Vol. 28, No. 1, pp. 51–73.

Chesley, N. (2014), 'Information communication technology use, work intensification and employee strain and distress', *Work, Employment and Society*, Vol. 28, No. 4, pp. 589–610.

Dén-Nagy, I. (2014), 'A double-edged sword?: A critical evaluation of the mobile phone in creating work–life balance', *New Technology, Work and Employment*, Vol. 29, No. 2, pp. 193–211.

Derks, D. and Bakker, A. B. (2010), 'The impact of e-mail communication on organizational life', *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, Vol. 4, No. 1.

ETUI (2013), *The Janus face of 'new ways of work': Rise, risks and regulation of nomadic work*, ETUI Working Paper 2013.07, Brussels.

ETUI (2016), *Digitalisation of the economy and its impact on labour markets*, ETUI Working Paper 2016.02, Brussels.

ETUI (2017), 'Toeing the line. Working conditions in the digital era', *HesaMag #16: The future of work in the digital era*, pp. 12–16.

ETUI (2019), *Regulating uncertainty: Variable work schedules and zero-hour work in EU employment policy*, ETUI Policy Brief, No. 5/2019, Brussels.

EU-OSHA (European Agency for Safety and Health at Work) (2018), *Foresight on new and emerging occupational safety and health risks associated with digitalisation 2025*, Publications Office of the European Union, Luxembourg.

Eurofound (2013), *Organisation of working time: Implications for productivity and working conditions – Overview report*, Dublin.

Eurofound (2015a), *New forms of employment*, Publications Office of the European Union, Luxembourg.

Eurofound (2015b), *Policies to improve work–life balance*, Dublin.

Eurofound (2017a), *Sixth European Working Conditions Survey – Overview report (2017 update)*, Publications Office of the European Union, Luxembourg.

- Eurofound (2017b), *Working time patterns for sustainable work*, Publications Office of the European Union, Luxembourg.
- Eurofound (2018a), *Employment and working conditions of selected types of platform work*, Publications Office of the European Union, Luxembourg.
- Eurofound (2018b), *Measuring varieties of industrial relations in Europe: A quantitative approach*, Publications Office of the European Union, Luxembourg.
- Eurofound (2019a), *Further exploring the working conditions of ICT-based mobile workers and home-based teleworkers*, Dublin.
- Eurofound (2019b), *Working conditions and workers' health*, Publications Office of the European Union, Luxembourg.
- Eurofound (2019c), *Platform work: Maximising the potential while safeguarding standards?*, Publications Office of the European Union, Luxembourg.
- Eurofound (forthcoming), *Regulations on flexible work using ICT for the improvement of work–life balance in the EU28 Member States*, Publications Office of the European Union, Luxembourg.
- Eurofound and the ILO (2017), *Working anytime, anywhere: The effects on the world of work*, Publications Office of the European Union, Luxembourg, and the International Labour Office, Geneva.
- European Commission (2018), *Employment and social developments in Europe: Annual review 2018*, Publications Office of the European Union, Luxembourg.
- Fundación Másfamilia (2012), *El Libro Blanco del teletrabajo en España: Del trabajo a domicilio a los e-workers. Un recorrido por la flexibilidad espacial, la movilidad y el trabajo en remoto*, Madrid.
- Gajendran, R., Harrison, D. and Delaney-Klinger, K. (2015), 'Are telecommuters remotely good citizens? Unpacking telecommuting's effects on performance via i-deals and job resources', *Personnel Psychology*, Vol. 68, No. 2, pp. 353–393.
- Genin, E. (2016), 'Proposal for a theoretical framework for the analysis of time porosity', *International Journal of Comparative Labour Law and Industrial Relations*, Vol. 32, No. 3, pp. 280–300.
- Glass, J. L. and Noonan, M. C. (2016), 'Telecommuting and earnings trajectories among American women 1989–2008', *Social Forces*, Vol. 95, No. 1, pp. 217–250.
- Glorieux, I., Mestdag, I. and Minnen, J. (2008), 'The coming of the 24-hour economy?: Changing work schedules in Belgium between 1966 and 1999', *Time & Society*, Vol. 17, No. 1, pp. 63–83.
- Golden, T. and Raghuram, S. (2010), 'Teleworker knowledge sharing and the role of altered relational and technological interactions', *Journal of Organizational Behavior*, Vol. 31, No. 8, pp. 1061–1085.
- Grant, C., Wallace, L. and Spurgeon, P. (2013), 'An exploration of the psychological factors affecting remote e-worker's job effectiveness, well-being and work–life balance', *Employee Relations*, Vol. 35, No. 5, pp. 527–546.
- Green, F. (2006), *Demanding work: The paradox of job quality in an affluent economy*, Princeton University Press, Princeton, New Jersey, USA.
- Greenworking (2012), *Le télétravail dans les grandes entreprises françaises: Comment la distance transforme nos modes de travail*, Ministre de l'Industrie, de l'Energie et de l'Economie Numérique, Paris.
- Holtgrewe, U. (2014), 'New new technologies: The future and the present of work in information and communication technology', *New Technology Work and Employment*, Vol. 29, No. 1, pp. 9–24.
- Huus, U. (2017), 'Where did online platforms come from? The virtualization of work organization and the new policy challenges it raises', in Meil, P. and Kirov, V. (eds.), *Policy implications of virtual work*, Palgrave Macmillan, London, pp. 29–48.
- Huus, U., Spencer, N. H., Syrdal, D. S. and Holts, K. (2017), *Work in the European gig economy: Research results from the UK, Sweden, Germany, Austria, the Netherlands, Switzerland and Italy*, Foundation of European Progressive Studies and UNI Europa, Brussels.
- IFA (Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung) (2016), *It's all about people: Priorities for tomorrow's occupational safety and health*, Deutsche Gesetzliche Unfallversicherung, Berlin.
- Kelliher, C. and Anderson, D. (2010), 'Doing more with less? Flexible working practices and the intensification of work', *Human Relations*, Vol. 63, No. 1, pp. 83–106.
- Konrad, A. M. and Yang, Y. (2012), 'Is using work–life interface benefits a career-limiting move? An examination of women, men, lone parents, and parents with partners', *Journal of Organizational Behaviour*, Vol. 33, No. 8, pp. 1095–1119.
- Koslowski, N. C. (2016), 'My company is invisible – Generating trust in the context of placelessness, precarity and invisibility in virtual work', in Flecker, J. (ed.), *Space, place and global digital work*, Palgrave Macmillan, London, pp. 171–199.
- Lasfargue, Y. and Fauconnier, S. (2015), *Télétravail salarié: Comment concilier liens de subordination et marges de liberté?*, Obergo, Paris.

- Leslie, L. M., Flaherty Manchester, C., Park, T.-Y. and Mehng, S. A. (2012), 'Flexible work practices: A source of career premiums or penalties?', *Academy of Management Journal*, Vol. 55, No. 5, pp. 1407–1428.
- Martínez, P. and Gómez, C. B. (2013), 'Trading telecommuting flexibility for fewer training opportunities?', *Management Research*, Vol. 11, No. 3, pp. 235–259.
- Maruyama, T. and Tietze, S. (2012), 'From anxiety to assurance: Concerns and outcomes of telework', *Personnel Review*, Vol. 41, No. 4, pp. 450–469.
- Masuda, A., Holtschlag, C. and Nicklin, J. (2017), 'Why the availability of telecommuting matters: The effects of telecommuting on engagement via goal pursuit', *Career Development International*, Vol. 22, No. 2, pp. 200–219.
- Mazmanian, M., Orlikowski, W. J. and Yates, J. (2013), 'The autonomy paradox: The implications of mobile email devices for knowledge professionals', *Organization Science*, Vol. 24, No. 5, pp. 1291–1600.
- Ojala, S., Nätti, J. and Anttila, T. (2014), 'Informal overtime at home instead of telework: Increase in negative work–family interface', *International Journal of Sociology and Social Policy*, Vol. 34, No. 1–2, pp. 69–87.
- Randstad (2012), *Las tecnologías destruyen las fronteras entre vida privada y laboral*, press release, 12 April.
- Rosenfield, M. (2011), 'Computer vision syndrome: A review of ocular causes and potential treatments', *Ophthalmic and Physiological Optics*, Vol. 31, No. 5, pp. 502–515.
- Salanova, M., Acosta Antognoni, H., Torrente Barberá, P. and Llorens Gumbau, S. (2013), 'Prácticas organizacionales saludables: Un análisis exploratorio de su impacto relativo sobre el engagement con el trabajo', *Revista de Peruana de Psicología y Trabajo Social*, Vol. 2, No. 1, pp. 107–120.
- Sewell, G. and Taskin, L. (2015), 'Out of sight, out of mind in a new world of work? Autonomy, control and spatiotemporal scaling in telework', *Organization Studies*, Vol. 36, No. 11, pp. 1507–1529.
- Sheppard, A. and Wolffsohn, J. (2018), 'Digital eye strain: Prevalence, measurement and amelioration', *BMJ Open Ophthalmology*, Vol. 3, No. 1.
- Statistics Finland (2014), *Työolojen muutokset 1977–2013*, Helsinki.
- Statistics Sweden (2015), *Labour Force Surveys 2015*, Stockholm.
- Taskin, L. and Bridoux, F. (2010), 'Telework: A challenge to knowledge transfer in organizations', *The International Journal of Human Resource Management*, Vol. 21, No. 13, pp. 2503–2520.
- Unionen (2013), *Jobbet alltid närvarande – en studie om tjänstemännens gränslösa arbetsliv*, Malmö, Sweden.
- Walrave, M. and De Bie, M. (2005), *Teleworking @ home or closer to home: Attitudes towards and experiences with teleworking*, University of Antwerp, Antwerp, Belgium.
- World Bank (2019), *World Development Report 2019: The changing nature of work*, Washington, D.C., USA.

Getting in touch with the EU

In person

All over the European Union there are hundreds of Europe Direct information centres. You can find the address of the centre nearest you at: <http://europa.eu/contact>

On the phone or by email

Europe Direct is a service that answers your questions about the European Union. You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls)
- at the following standard number: +32 22999696
- by email via: <http://europa.eu/contact>

Finding information about the EU

Online

Information about the European Union in all the official languages of the EU is available on the Europa website at: <http://europa.eu>

EU publications

You can download or order free and priced EU publications from the EU Bookshop at: <http://publications.europa.eu/eubookshop>. Multiple copies of free publications may be obtained by contacting Europe Direct or your local information centre (see <http://europa.eu/contact>).

EU law and related documents

For access to legal information from the EU, including all EU law since 1951 in all the official language versions, go to EUR-Lex at: <http://eur-lex.europa.eu>

Open data from the EU

The EU Open Data Portal (<http://data.europa.eu/euodp>) provides access to datasets from the EU. Data can be downloaded and reused for free, both for commercial and non-commercial purposes.

Advances in ICT have opened the door to new ways of organising work. We are shifting from a regular, bureaucratic and ‘factory-based’ working time pattern towards a more flexible model of work. Telework and ICT-based mobile work (TICTM) has emerged in this transition, giving workers and employers the ability to adapt the time and location of work to their needs.

Despite the flexibility and higher level of worker autonomy inherent in TICTM, there are risks that this work arrangement leads to the deterioration of work–life balance, higher stress levels and failing worker health. This report analyses the employment and working conditions of workers with TICTM arrangements, focusing on how it affects their work–life balance, health, performance and job prospects. While policymakers in many EU countries are debating TICTM and its implications, the study finds that only a few have implemented new regulations to prevent TICTM from having a negative impact on the well-being of workers.

The European Foundation for the Improvement of Living and Working Conditions (Eurofound) is a tripartite European Union Agency established in 1975. Its role is to provide knowledge in the area of social, employment and work-related policies according to Regulation (EU) 2019/127.

