To work at home or in the office? Well-being, information flow and relationships between office workers before and during the COVID-19 pandemic

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Abstract

Purpose – This paper aims to compare employee well-being, information flow and relationships with co-workers and supervisors for people working at home and working in different office types before and during the COVID-19 pandemic.

Design/methodology/approach – A nationwide study of 2,845 Estonian office workers in autumn 2019 and 2,972 in spring 2020 was carried out.

Findings – It was discovered that in normal circumstances, people at home had similar results to those in a cell office or activity-based office. Open-plan offices were found to be the worst in respect to the facets of work studied. However, in the context of the pandemic, the playing field became more level in some respects and worse in the case of activity-based offices.

Practical implications – When telework is well arranged both in terms of facilities and organising the necessary communication and information flow, then it is a viable alternative to working in an office. What is more, employers need to pay more attention to the physical and social work conditions in open-plan offices and also activity-based offices in the context of a pandemic.

Originality/value – Previous studies have only compared telework with working in an office in general. Comparing working at home with different kinds of offices gives valuable insights.

Keywords Work at home, Office type, Well-being, Information flow, Relationships between office workers, COVID-19, Information flow

Paper type Research paper

1. Introduction

Due to the COVID-19 pandemic, many organisations have had to rearrange where their employees work. Very suddenly and quickly, a great many people had to start working from home. Naturally, this raised concerns about how people cope with such a change. Previously, working from home has been analysed in various ways, and we can categorise

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scholarly knowledge into two main streams: on facilities and on employee productivity. Firstly, the scholarly stock of knowledge reports a heated debate on the need for office space due to COVID-19 from the perspective of costs (Naor *et al.*, 2021; Mwando *et al.*, 2021; Flynn, 2020) but also health risks (Buomprisco *et al.*, 2021; Belzunegui-Eraso and Erro-Garcés, 2020; Platts *et al.*, 2020). Secondly, overall advantages and disadvantages of telework[1] have been addressed in light of employee productivity or work-related outcomes (Naor *et al.*, 2021; Kazekami, 2020; Allen *et al.*, 2015; Harker Martin and MacDonnell, 2012; Gajendran and Harrison, 2007) but also differences between the output of teleworkers and non-teleworkers in relation to various facets of work (Sarbu, 2018; Dockery and Bawa, 2014; Nätti *et al.*, 2011; Wheatley, 2012). Consequently, we have quite an elaborate overview of what the benefits and drawbacks of working from home are compared to working in an office. But what we do not know is how working from home measures up to working in various types of offices. More precisely, in what ways is working from home comparable, better or worse compared to working in a cell office, activity-based office or open-plan office. Previous studies have only compared telework with non-telework or how people that previously were working in an office manage at home. Furthermore, there are many studies comparing working in different office types (Bodin Danielsson, 2016; Candido *et al.*, 2016; De Been and Beijer, 2014) or what happens when people are relocated from one office type to another (Bergström *et al.*, 2015; Babapour Chafi and Rolfö, 2019; Brennan *et al.*, 2002; Rolfö *et al.*, 2018; Wohlers and Hertel, 2018). But to our knowledge, there is no study based on a large population that brings these two sides together. In our opinion comparing just working at home with working in an office, in general, does not provide sufficient information. For example, various results in a cell office are often better and in an open-plan office often worse (Bergström *et al.*, 2015; Otterbring *et al.*, 2018).

Furthermore, our Estonian nationwide study offers a unique opportunity to compare situations before the pandemic (November 2019) and during the pandemic (May 2020). As stated by Barrero *et al.* (2021, p. 1), "Covid-19 drove a mass social experiment in working from home." During this period people had to cope with working at home in a situation where for some other family members also had to be at home trying to work or study when not all people at home had a separate room for working or at least their own desk and when co-workers and supervisors were suddenly no longer as close by as they used to be. As stated by Nakrošienė *et al.* (2019, p. 92), it is "the suitability of the working place at home" that facilitates a large part of the success of telework. Consequently, working at home in normal circumstances and working at home in the context of a pandemic may be very different. At the same time, not all could work from home. Some had to stay in the office despite the COVID-19 pandemic. Therefore, it is important to find out whether in these unusual circumstances working at home is different from working in various types of offices.

Based on the literature, we will focus on the three facets of work that may be relevant in the context of the pandemic. The first is people's well-being. Coping with the sudden shift to working at home, which in some cases was dictated and for which the employees were unprepared, can cause exhaustion and health problems that in turn may influence productivity (Haapakangas *et al.*, 2018; Meijer *et al.*, 2009) and performance (Soriano *et al.*, 2020). In normal circumstances, there can be favourable and unfavourable outcomes from working from home in regard to well-being, but we do not know whether the COVID-19 pandemic has intensified one or the other. The second very important problem that people deal with at home is (dis)connectedness from the work-related information flow, which of course also contributes to performance (Wohlers and Hertel, 2017). Although people can communicate via the internet and mobile devices, it does not fully replace face-to-face

communication (Bentley *et al.*, 2016; Sias *et al.*, 2012). We also cannot tell whether the COVID-19 pandemic brought more chaos to the communication function. And finally, relationships with co-workers and supervisors are important to analyse because social isolation is a real problem for people who are used to regular contact with co-workers and supervisors. Social isolation has also been proven to reduce performance (Golden *et al.*, 2008). Good relationships and satisfaction with communication, however, contribute to peoples' productivity levels (Haapakangas *et al.*, 2018; Neufeld and Fang, 2005). During the pandemic, most office workers suddenly found themselves working from home. Did this improve understanding between colleagues or did the pandemic bring additional tension to the relationships?

The aim of this article is to compare employee well-being, information flow and relationships with co-workers and supervisors for people working at home and working in different office types before and during the COVID-19 pandemic. The results provide employers better tools to make more deliberate decisions about peoples working arrangements.

The article is organised as follows. First, the different office types used in this article are defined; second, a review of literature exploring well-being, information flow and relationships with co-workers and supervisors is given in respect to people working at home and in different kinds of offices. Third, the data and data analysis methods are introduced. Fourth, the results of the study are presented, and finally, the results are discussed and conclusions and implications provided.

2. Literature review

2.1 Different office types

There are three main office types that can be considered: the cell office, activity-based office and open-plan office.

Cell offices are traditional closed offices, which can be single cells or shared cells. As the name states, a single cell office is meant for one employee. According to most studies, shared cell offices entail 2–3 employees sharing the same room (Bodin Danielsson and Theorell, 2019; De Been and Beijer, 2014; Gerdenitsch *et al.*, 2018) but sometimes also, for example, 3–5 (Brennan *et al.*, 2002) or 2–4 employees (Wohlers and Hertel, 2018).

Activity-based offices mean that there are both private and open areas, and people can choose a place depending on what they are doing. It is sort of a mix of traditional closed offices and open-plan offices. For example, usually, there are some more private rooms for team meetings, for quiet concentration, phone calls, etc. The mission behind the activity-based office concept is to enhance productivity through the stimulation of interaction between people (Appel-Meulenbroek *et al.*, 2011).

An open-plan office is characterised by the fact that it has an open-plan layout and quite many people work in the same room. In some studies, different sizes of open-plan offices are distinguished. Small open-plan offices usually have 4–9 people, medium-sized 10–24 people and large 25 people or more working in the same space (Bodin Danielsson and Theorell, 2019; Seddigh *et al.*, 2014).

Different kinds of office layouts are illustrated in Figure 1. Historically[2], cell offices mostly dominate in desk jobs. Open-plan offices were introduced on the one hand to improve collaboration and on the other hand to make the office space more cost-effective. It turned out that people still needed private spaces for concentration, so activity-based offices started to emerge. However, activity-based offices also have their drawbacks, which will be discussed in the following subsections.

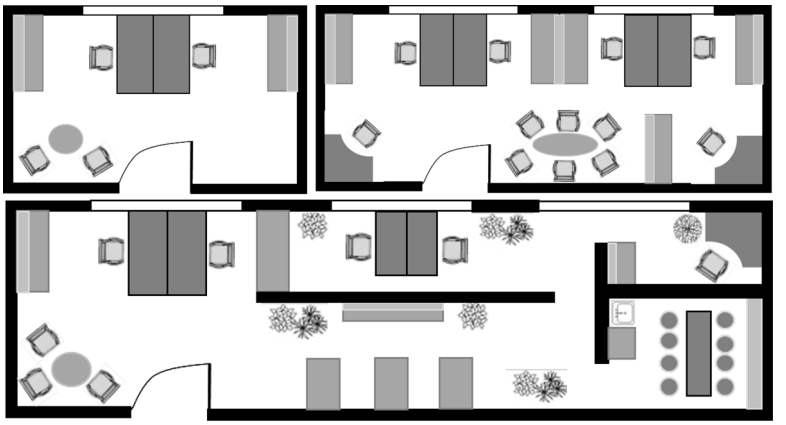


Figure 1.
Cell office (left), open office (right), activity-based office (below)

Source: Compiled by the authors

2.2 Well-being

Many elements can contribute to the well-being of workers, starting with the quality of their family life and ending with their level of wealth. In this article, we take quite a narrow view and concentrate on elements that have been highlighted concerning well-being in the literature about working at home and in different kinds of offices.

There is mixed evidence about whether working at home causes more or less well-being compared to working in an office (Palumbo *et al.*, 2021; Sarbu, 2018). On the one hand, some elements at home may influence well-being negatively. For example, home-related stress (Baruch, 2001), increased work-family conflict (Palumbo *et al.*, 2021; Wang *et al.*, 2021; Carnevale and Hatak, 2020), longer work hours because of the lack of a clear end to the working day (a person feels as if he or she is "never off duty") or working on the weekends (Towers *et al.*, 2006; Dockery and Bawa, 2014; Nätti *et al.*, 2011), greater tiredness at the end of the day (Tremblay and Thomsin, 2012). A vast proportion of the studies from the COVID-19 period resulted in signposting how all the mentioned negative aspects intensified, especially during the time when societies were in general lockdown (restrictions on entertainment, physical activity, shopping, schooling, childcare) and the switch from office to remote work was sudden, resulting in a sharp increase in the overall decline of mental and physical well-being among employees (Xiao *et al.*, 2021; Adisa *et al.*, 2021; Schifano *et al.*, 2021). Yet, most of these studies reflect evidence from the start of the COVID-19 period, when the switch was sudden and most countries faced general lockdown. Furthermore, studies from this period confirm how the decline in well-being is highest not only among those who have young children but also among people with more crowded housing (Schifano *et al.*, 2021). This again is logical, as working conditions should support the nature of the work done – office work in general demands great concentration and during lockdown, a great share of employees had to manage working with existing resources (e.g. the availability of enough desks and computers for all family members, the speed of the internet, etc.).

On the other hand, previous research shows that people at home report lower levels of work stress (Tremblay and Thomsin, 2012; Major *et al.*, 2008; Baruch, 2001), less role-stress (Gajendran and Harrison, 2007 meta-study) and less exhaustion (Gajendran and Harrison, 2007 meta-study; Sardeshmukh *et al.*, 2012). They may also have higher autonomy about

when to work (Gajendran and Harrison, 2007 meta-study; Sardeshmukh *et al.*, 2012), they can deal with family matters concurrently (Towers *et al.*, 2006), they can concentrate better and they suffer less stress from interruptions and distractions (Tremblay and Thomsin, 2012; Fonner and Roloff, 2010). After several years with the COVID-19 pandemic, not only both organisations and workers have been able to adjust to the new normality but also schooling and childcare have opened up. That said, we could also expect how the positive sides of homeworking have spread, including the overall spread of and demand for homeworking in companies (Barrero *et al.*, 2021).

Well-being levels in various office types have been shown to vary. For example, the study by Otterbring *et al.* (2018) reveals that subjective well-being is better in cell offices compared to open-plan offices and, consequently, that small open offices are better than larger open offices. A large part here seems to be again about concentration and privacy issues, as these are more of a problem in open-plan offices (Candido *et al.*, 2016; De Been and Beijer, 2014; Seddigh *et al.*, 2014). Pejtersen *et al.* (2011) demonstrate that people in open-plan offices have more sickness absences (Denmark, n = 2,043). Bodin Danielsson *et al.* (2014) have found that people take more short-term sick leave in open-plan offices compared to other office types and Bodin Danielsson (2016) presents evidence suggesting that there is a higher probability of longer sick leave in an open-plan office. With the COVID-19 pandemic, open-plan offices may be prone to the spread of health risks (Platts *et al.*, 2020). In the same vein, people in cell offices also report better sleep quality (Bodin Danielsson and Bodin, 2008) compared to medium and large-sized open offices. What is more, the study by Bergström *et al.* (2015) revealed that when people were relocated from mainly single cell offices to open-plan offices, they felt that their health deteriorated. Seddigh *et al.* (2014) found that cognitive stress is lower in cell offices and also in small open-plan offices compared to larger open offices and activity offices. Hodzic *et al.* (2021) also support the idea that fatigue levels rise after moving to activity-based offices. But there is also more encouraging evidence about activity-based offices. Meijer *et al.* (2009) indicate that after relocation from single cell offices to activity-based offices, the health of workers improved.

To sum up, working at home can bring contradictory effects in terms of well-being, and it is further undermined by the uncertainties brought by the COVID-19 pandemic. Working in a cell office seems to be better for well-being compared to open-plan offices and following on from that, small open-plan offices are better than large ones. There are contradictory results about activity-based offices.

2.3 Information flow and relationships with colleagues and supervisor

A vital part of many jobs is communication with colleagues and supervisors. It has been proven that people working from home compared to those who work in an office have less information (Allen *et al.*, 2015; Fonner and Roloff, 2010) and information quality, timeliness and frequency may also be affected (Fonner and Roloff, 2010) from being away from colleagues and supervisors. The provision of information and relationships with others are also interconnected (Golden and Raghuram, 2010), meaning that those who have better relationships share more information and more promptly and vice versa, when people get the necessary information, they are more satisfied with relationships.

Unfortunately, people working from home may feel more social isolation and loneliness due to having less daily social interaction (Larson *et al.*, 2020; Allen *et al.*, 2015; Golden *et al.*, 2008; Cooper and Kurland, 2002), the quality of relationships may also be worse (Allen *et al.*, 2015), they may often perceive a lack of support from colleagues (Sardeshmukh *et al.*, 2012) and overall get less feedback (Sardeshmukh *et al.*, 2012). They also feel more barriers to teamwork, a loss of team spirit and have more conflicts with their supervisor (van der Lippe and Lippényi, 2020; Tremblay and Thomsin, 2012).

In opposition to the previously presented study results, the meta-study conducted by Gajendran and Harrison (2007) revealed that relationships with a supervisor for those who predominately work at home were better and there was no statistically significant difference in the relationships with co-workers for those who work at home compared to those working in the office. Gajendran and Harrison (2007) themselves hypothesized otherwise and were surprised at these results. They discuss that maybe supervisors grant more attention to those working at home because they know how important relationships are. Additionally, they proposed that it may work also in reverse, meaning that people working at home invest extra effort with co-workers and supervisors. Interview results from the study by Mann *et al.* (2000) shed new light on this. Namely, at least some people working at home did not miss the office environment because not all communication between people is positive, which is vividly illustrated by the following quote: "You don't miss the back biting and all the bickering that goes on in an office" (Mann *et al.*, 2000, p. 677). To add more up-to-date evidence from the COVID-19 period, where most office workers were forced into homeworking, studies have found how social support seems to be the most powerful tool for enhancing not only well-being but also the quality of information and performance of employees (Wang *et al.*, 2021). Interestingly, COVID-period experience seems to confirm how in the case of toxic work environments, teleworking even has a positive effect, as similarly found by Mann *et al.* (2000) over 20 years ago. Namely, as van Zoonen *et al.* (2021, p. 14) report, telework allows the "out of sight out of mind" perspective:

> Suggesting that some employees may benefit from being separated from colleagues or supervisors they do not trust, or even distrust. Indeed, in the context of this pandemic, scholars have chronicled that the transition to remote work may have benefits for employees as they might be less exposed to toxic workplace relationships, or relieved from bullying colleagues.

In the office environment, the predominant argument for using activity-based and open-plan offices is usually the hope that it improves communication and cooperation because co-workers are nearer and within sight. Thereby, both planned interactions in the form of meetings and unplanned encounters are important (Haynes *et al.*, 2017).

Still, most previous research does not fully confirm that activity-based and open-plan offices support good communication. People in cell offices thought that their interaction with co-workers is easier compared to open-plan offices in the study by Otterbring *et al.* (2018). What is more, Bodin Danielsson and Bodin (2008) highlight that people in open-plan offices feel that they do not have good relationships with their supervisors compared to respondents in single cell offices.

Moving on to activity-based offices, Rolfö (2018) demonstrated that cooperation and spreading ideas improved after moving from cell and open-plan offices to an activity-based office. There were also more informal meetings and considerably more spontaneous meetings. People felt that they were more informed and communication was more transparent. Similarly, Gerdenitsch *et al.* (2018) revealed that relocating from shared cell offices to activity-based offices improved interactions with colleagues. For example, the respondents stated more often that they exchange views with co-workers and try to be together with them. Although, De Been and Beijer (2014) had contradictory results about activity-based offices. Similarly, Appel-Meulenbroek *et al.* (2011) indicate that about half of the respondents value highly that they can easily interact with others in activity-based offices, but indeed, 62% prefer to work at home when they have a busy day to gain better results. In a similar vein, Zamani and Gum (2019) found that people in activity-based offices would like the flexibility to sometimes work from home because in the office there are too many distractions.

In addition, the downside of close proximity may be more conflict, as Bodin Danielsson *et al.* (2015) found that people experienced both a greater prevalence of conflict and greater ongoing conflict levels in activity-based offices compared with cell offices. What is more, the study by Bodin Danielsson and Bodin (2008) revealed that respondents from activity-based offices stated more often that they do not have good relationships with their supervisors compared to people working in cell offices. The study by Wohlers and Hertel (2018) showed support for the previously mentioned contradictory results concerning activity-based offices, when people were relocated from a cell office to an activity-based office and that, on the one hand, people felt that they have more contact, communication and collaboration possibilities but they also stated that teamwork was actually jeopardised by less communication and cooperation. This suggests that the possibilities to communicate were there, but people did not use them enough. What is more, face-to-face communication decreased in the opinion of some participants. The study by Zamani and Gum (2019) supports that finding and indicates that after relocating to activity-based offices, people felt less satisfied with the communication and collaboration with colleagues and supervisors.

To summarise all the previous results (see Figure 2), one can say that working from home has primarily brought contradictory results about well-being and relationships and that information flow is rather hindered at home. Cell offices are favourable and open-plan offices unfavourable in all the mentioned facets of work. The results for activity-based offices are contradictory.

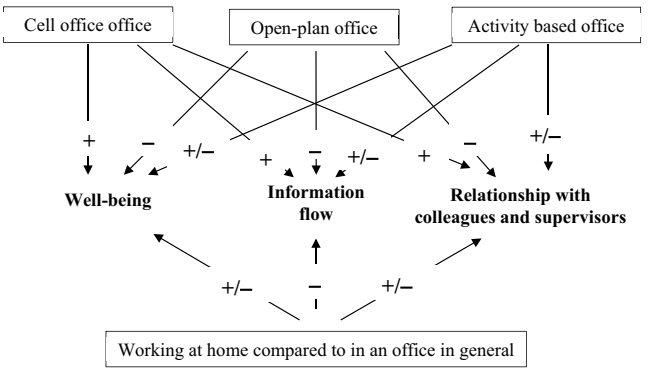
Based on the problem setting illustrated by Figure 2, the following research questions are posed:

R1. How does working from home compared to working in different kinds of offices in regard to well-being, information flow and relationships?

R2. How are well-being, information flow and relationships at home and in different kinds of offices influenced by the COVID-19 pandemic?

3. Data and method

Data were collected from the Estonian Salary Information Agency data set. This organisation collects information biannually about the Estonian market and salary trends,



Source: Compiled by the authors based on previous studies presented in the literature review

Figure 2.
Well-being, information flow and relationships at home and in different kinds of offices

and among others they ask some additional questions which vary each year, for example, about motivation, commitment, job satisfaction, remote working and so on. This data set is the largest possible one on employees in Estonia. It covers a wide selection of different sectors and occupations in all regions of Estonia. European skills, competences, qualifications and occupations is used to classify occupations, covering approximately 500 different occupations.

In November 2019, 10,085 respondents participated in their study and in May 2020, 11,112 respondents participated. From these respondents, we selected people who were working at the time of the study; we also chose people who worked in Estonia and predominately had a desk job at a specialist or management level. All blue-collar jobs were left out and also those who worked in outdoor jobs, in moving vehicles, on construction sites or with their client. General education teachers, kindergarten teachers, babysitters, medical personnel and caretakers were also left out. Therefore, the final sample for this article is 2,845 (in 2019) and 2,972 (in 2020). The five most prevalent sectors in both years were:

(1) finance and accounting;
(2) office and administrative jobs;
(3) information technology and telecommunications;
(4) commerce; and
(5) state and local government.

More than a half of the respondents worked in these five fields. There were participants from all 15 Estonian counties.

Female participants and respondents in managerial positions are slightly over-represented in this sample. In Estonia, usually, about 60% of women work in managerial, specialist or civil servant positions (Statistics Estonia, 2021); in our sample, this number is 70%. Usually, about 20% of people in the previously mentioned occupations are managers in Estonia (Statistics Estonia, 2021), but in our sample, this number is about 40%.

Based on education, most were highly educated, which can be expected because we are looking at white-collar positions, and this is in accordance with the situation in Estonia (Statistics Estonia, 2021). According to age and work experience, the respondents are quite equally distributed.

Looking at the size of the organisations, smaller organisations are strongly under-represented, as organisations are mostly small in Estonia. Most of the participants work full-time. An overview of the sample is shown in Appendix 1.

Our data set includes questions about work conditions: whether they work at home or in the office. Office types are specified as cell, activity-based and open-plan offices. Overall, the sample characteristics were similar for 2019 and 2020 and thus, the situations before and during the pandemic can be compared. The only exception being that in the pre-pandemic period, only a small proportion of the respondents were working at home (9.1% of specialists and 4.7% of managers) but during the pandemic, that changed considerably as almost three-quarters were working at home. In 2019, only respondents from five sectors were working at home. Most of them were from the field of finance and accounting, followed by information technology and telecommunications, arts and humanities, nature and technical science and state and local government, but during the pandemic, people from all sectors needed to work from home. Pre-pandemic people from small organisations were mostly able to work at home. In organisations that had less than 10 members, 22% worked at home compared to about 5% that could work from home in organisations that had 10 or more individuals (see Table 1). During the pandemic, this kind of separation disappeared.

In normal circumstances, about half of the respondents work in cell offices (alone or with 1–2 co-workers) and about 40% in open-plan offices. Thereby, slightly more of the managers work in cell offices and more specialists in open-plan offices. Still, about one-third of the managers also work in open-plan offices. The greatest proportion of people working in open-plan offices is in the banking and insurance sector (69%) and in information technology and telecommunications (58%). As expected, open-plan offices are seen more in larger organisations (see Table 1). If an organisation has less than 10 members, only about 20% work in an open-plan office. In organisations with more than 250 individuals, about half work in an open-plan office. The smaller the organisation the more cell offices are used.

Activity-based offices are still not widespread in Estonia, and it is logical that only about 6% work in the mentioned type of office in our study. Activity-based offices can be found most in information technology and telecommunications and especially in the largest organisations.

The statements selected for the analysis are about well-being (statements of "I felt tired" and "My health is good"), information flow ("Satisfaction with information flow in the organisation" and "I am well aware what happens in the organisation") and relationships ("I get along well with co-workers" and "I get along well with my immediate supervisor"). Unfortunately, not all statements used exactly the same wording in 2019 and 2020. Still, three were the same and three were very similar. In one statement, a seven-point Likert scale was used; otherwise, a five-point scale was used. The specific statements with response options are provided in Appendix 2.

To answer *RQ1* and find out whether estimations of well-being, information flow and relationships differ for people working at home or various office types, we use an analysis of variance. Furthermore, we conducted the analysis separately for 2019 and 2020 to answer the second research question in our study regarding the possible changes caused by the COVID-19 pandemic. The chosen significance level was 0.05. To estimate which group means differ from the rest, a post hoc least significant difference (LSD) test is applied.

4. Results

4.1 Well-being

The study carried out before COVID-19 in autumn 2019 showed (see Table 2) that tiredness levels are similar for respondents working at home and in a cell or activity-based office. Therewith, all three options are better than working in an open-plan office. The good news is also that in the 2019 study, there were no differences in estimations about health. Meaning that feeling more tired in an open-plan office is probably not as a result of health issues but from aspects related to the work environment (distractions from noise, interruptions from colleagues, etc.).

Number of people in the organisation	At home (%)		Cell office (%)		Activity-based office (%)		Open-plan office (%)	
	2019	2020	2019	2020	2019	2020	2019	2020
Less than 10	22.33	71.74	53.14	13.32	4.40	2.17	20.13	12.77
10–49	7.13	68.94	52.98	18.58	5.09	1.31	34.79	11.18
50–249	5.54	74.97	49.46	14.72	4.69	1.25	40.31	9.06
250 and more	5.02	77.57	40.45	11.73	7.47	1.85	47.07	8.85

Source: Compiled by the authors

Table 1. Working at home and in different offices according to the size of organisations in 2019 and 2020

In spring 2020, similarly to autumn 2019, the health of the respondents was not different in different types of offices or working at home (see Table 3). But there are changes in terms of how tired the respondents felt. The fact that the standard deviations have doubled means that there is much greater variation in the answers in 2020 compared to 2019. The working conditions people need to work at home has become critical. If a person has a separate room for working, the situation is the same as in 2019 (if a person works at home, he or she is as tired as in a cell or activity-based office and less tired than in an open-plan office).

The worst option is when a person does not have a separate room for working and does not even have their own dedicated workstation. In that case, it is better to work in a cell or activity-based office. Another difference is that activity-based offices have become less favourable as the respondents there reported being as tired as in open-plan offices in 2020.

4.2 Information flow

In 2019, the respondents working at home felt similarly informed about what is happening in the organisation compared to participants from cell offices and activity-based offices and better informed than people in open-plan offices (see Table 4). Concerning satisfaction with information flow, the respondents at home were even more satisfied compared to people in all office types.

Table 2.
Analysis of variances about well-being at home and in different types of offices in 2019

Statements about well-being	Average estimation (standard deviation) Home (1)	Cell (2)	Activity-based (3)	Open-plan (4)	Sign Sign	Post hoc LSD test
I felt tired	2.97 (0.87) n = 208	3.04 (0.89) n = 1325	3.03 (0.91) n = 158	3.21 (0.88) n = 1,093	0.00*	(1) < (4) (2) < (4) (3) < (4)
My health is good	3.63 (0.98) n = 211	3.71 (0.89) n = 1,319	3.82 (0.94) n = 159	3.70 (0.95) n = 1,092	0.27	

Source: calculated by authors based on Estonian Salary Agency database, scale 1–5.
Note: * Statistically significantly different at 0.05

Table 3.
Analysis of variances about well-being at home and in different types of offices in 2020

Statements about well being	Average estimations (standard deviation) (1)	(2)	(3)	(4)	(5)	(6)	(7)	Sign	Post hoc LSD test
During last month I felt tired[1]	3.86 (1.94) n = 564	4.00 (1.86) n = 668	4.14 (1.76) n = 461	4.41 (1.91) n = 225	3.78 (1.88) n = 391	3.79 (1.72) n = 43	4.24 (1.91) n = 274	0.00*	(1)<(3) (1)<(4) (1)<(7) (2)<(4) (5)<(3) (5)<(4) (5)<(7) (6)<(4)
My health is good[2]	4.00 (0.92) n = 581	3.94 (0.93) n = 692	4.01 (0.91) n = 458	3.91 (0.99) n = 229	4.05 (0.89) n = 416	4.09 (0.74) n = 44	3.94 (0.93) n = 285	0.38	

Source: Calculated by authors based on Estonian Salary Agency database. (1) Home, separate workroom; (2) Home, no separate workroom, own workstation; (3) Home, no separate workroom, sometimes own workstation; (4) Home, no separate workroom, no private workstation; (5) Cell; (6) Activity-based; (7) Open-plan. *Statistically significantly different at 0.05. 1 on a seven-point scale. 2 on a five-point scale

In spring 2020, the situation had changed considerably compared to 2019 (see Table 5). Both people at home and in all types of offices were similarly aware about what is happening in the organization, and they were also similarly satisfied with the information flow.

4.3 Relationships with co-workers and supervisors

Getting along with co-workers and supervisors gave quite different results before and after the COVID-19 pandemic (see Table 6). Concerning getting along with co-workers in 2019, the respondents at home gave similar answers compared to people in the different offices. Participants from activity-based offices had higher estimations about this facet compared to cell offices and open-plan offices. In 2020, there were no statistically significant differences

Statements about information flow	Average estimations (standard deviation) Home (1)	Cell (2)	Activity-based (3)	Open-plan (4)	Sign	Post hoc LSD test
I am well aware of what happens in the organisation	3.58 (1.02) n = 202	3.54 (0.98) n = 1,320	3.65 (1.01) n = 159	3.34 (1.00) n = 1,090	0.00*	(1)>(4) (2)>(4) (3)>(4)
Satisfaction with information flow in the organisation	3.77 (1,07) n = 193	3.26 (1.11) n = 1,310	3.48 (1.18) n = 161	3.14 (1.16) n = 1,080	0.00*	(1)>(2) (1)>(3) (1)>(4) (2)<(3) (2)>(4) (3)>(4)

Source: Calculated by authors based on Estonian Salary Agency database, scale 1–5
Note: Statistically significantly different at 0.05

Table 4. Analysis of variances about information flow at home and in different types of offices in 2019

Statements about information flow	Average estimations (standard deviation) Home (1)	Cell (2)	Activity-based (3)	Open-plan (4)	Sign
I am well aware what happens in the organisation	3.60 (0.99) n = 2,140	3.63 (1.01) n = 417	3.59 (1.17) n = 44	3.49 (1.02) n = 286	0.30
Satisfaction with information flow in the organisation	3.84 (1.00) n = 2,176	3.83 (0.95) n = 421	3.81 (1.14) n = 47	3.70 (1.06) n = 290	0.19

Source: Calculated by authors based on Estonian Salary Agency database, scale 1–5

Table 5. Analysis of variances about information flow at home and in different types of offices in 2020

Statements about relationships	Average estimations (standard deviation) Home (1)	Cell (2)	Activity-based (3)	Open-plan (4)	Sign	Post hoc LSD test
I get along well with co-workers	4.29 (0.72) n = 194	4.23 (0.68) n = 1,319	4.42 (0.66) n = 159	4.19 (0.71) n = 1,091	0.00*	(2)<(3) (3)>(4)
I get along well with my immediate supervisor	4.28 (0.83) n = 197	4.14 (0.85) n = 1,311	4.26 (0.88) n = 155	4.09 (0.89) n = 1,086	0.01*	(1)>(4) (3)>(4)

Notes: Calculated by authors based on Estonian Salary Agency database, scale 1–5
Note: * Statistically significantly different at 0.05

Table 6. Analysis of variances about relationships between co-workers at home and in different types of offices in 2019

in estimations about getting along with co-workers (see Table 7). So whether at home or in the office, everyone felt they got along with others similarly.

Concerning getting along with supervisors in 2019, it turned out that respondents working from home had similar estimations as participants from cell offices and activity-based offices but better estimations than people from open-plan offices. People working in open-plan offices had lower estimations about their relationships with their supervisors compared to activity-based offices.

In the context of the pandemic situation in 2020, the respondents working at home are still similarly satisfied with their relationships with their supervisor as those working in cell offices. In 2020, estimations about relations with supervisors in activity-based offices have decreased, and they are similar to estimations in open-plan offices and lower than at home or in cell offices, which is different from 2019.

5. Discussion

Previous results have highlighted both advantages and disadvantages about working at home. Still, in this study, participants generally coped well with working at home pre-pandemic and during the pandemic.

Concerning the well-being of workers, previous results have been contrary – some facets can affect peoples' well-being negatively while working at home, but some facets are better than in an office. Our study took a closer look and we discovered that tiredness levels for people working at home are similar to working in a cell office or an activity-based office and less than in an open-plan office when people have a proper place to work at home (preferably a separate room or at least their own desk). Similar results of home and cell offices and activity-based offices can be explained by the fact that at home people get more tired from home-related stress, interruptions and distractions and in the cell office and activity-based office from work-related aspects. However, in the open-plan office, concentration and privacy present greater challenges and therefore, open-plan offices have previously proven to be the worst for the well-being of workers (Otterbring *et al.*, 2018; Pejtersen *et al.*, 2011; Bodin Danielsson *et al.*, 2014; Bodin Danielsson, 2016) and our results are in accordance with these findings.

The situation changed slightly during the pandemic in spring 2020, as activity-based offices became less favourable in regard to avoiding tiredness. The reason may be that activity-based offices have open areas like open-plan offices, and in the context of the pandemic, people had to make an extra effort to keep a distance, they were also probably worried about being around people and this can also contribute to tiredness. In addition to

Table 7.
Analysis of variances about relationships between co-workers at home and in different types of offices in 2020

Statements about relationships	Average estimations (standard deviation) Home (1)	Cell (2)	Activity-based (3)	Open-plan (4)	Sign	Post hoc LSD test
Satisfaction with getting along with co-workers	4.49 (0.73) n = 2,156	4.52 (0.71) n = 419	4.40 (0.77) n = 47	4.46 (0.77) n = 289	0.60	
Satisfaction with getting along with immediate supervisor	4.35 (0.92) n = 2,150	4.33 (0.92) n = 418	4.07 (1.10) n = 46	4.20 (0.94) n = 288	0.02*	(1)>(3) (1)>(4) (2)>(3) (2)>(4)

Source: Calculated by authors based on Estonian Salary Agency database, scale 1–5
Note: * Statistically significantly different at 0.05

this effect in activity-based offices and open-plan offices, working at home without a proper workstation or separate room also made people more tired during the pandemic. Approximately 40% of the people who were suddenly forced to work from home did not have suitable conditions all the time or some portion of the time.

Fortunately, estimations of health did not differ at home and in different kinds of offices nor in the pre-pandemic and pandemic periods, which indicates a difference compared to previous studies, where health was reported to be worse in open-plan offices (Bodin Danielsson, 2016) or health became worse after relocating to an open-plan office (Bergström *et al.*, 2015). This can be explained by the fact that in Estonia, open-plan offices are rather small. Most respondents (60.6%) in 2019 worked in an open-plan office with 4–9 people and only 14.2% in an open-plan office with more than 25 individuals. For example, in a previously mentioned study in Sweden, approximately 40% of respondents were working in a large open-plan office (Bodin Danielsson, 2016) which seems to be typical for Sweden (Bodin Danielsson and Theorell, 2019; Seddigh *et al.*, 2014). What is more, the people who work in the largest offices in Estonia are people whose work is rather suitable for such conditions. For example, in information technology and telecommunications, software developers, software testers, system administrators, system analysts, data entry operators and others work most of the time quietly at their computer and thus not disturb others. Similarly, in finance and accounting, most work is done individually at a computer.

Similar results about health in different offices and at home can be explained by the tendency of people to pull themselves together in unusual circumstances. During the period of the study, many hoped that the situation is temporary and that soon people would be able to return to their normal habits, which helped them to manage the difficult aspects of the time. One reason may be that, with all the social distancing, people were able to save themselves not only from COVID-19 but also other seasonal viruses that usually spread at this time of year. And very few people were left in the office. Therefore, we need to take into account that the initial pandemic lasted a short while (general lockdown started on 12 March), and the first wave of the pandemic was mild in Estonia. Consequently, it is impossible to predict how the situation will be, for example, after a year or two because, for example, stress-related health issues take time to develop. Overall, we cannot forget that even in ideal circumstances working at home is not suitable for all people (Pyöriä, 2011).

Furthermore, contrary to previous research, respondents at home in this study in the pre-pandemic period felt that they were well-informed about events in their organisation, on a similar level with those in cell offices and activity-based offices and even better than open-plan offices. Satisfaction with information flow pre-pandemic was even better at home than in various offices. This can be explained by the very good level of digitalisation in Estonia. The internet is widespread and relatively inexpensive, and people are well acquainted with the abundance of e-solutions. What is more, more than half of the respondents in this study were from sectors where the presence of good IT technology is self-evident (e.g. information technology and telecommunications, finance and accounting). Also, supervisors and co-workers may exert extra effort considering that people at home are away and more isolated (Gajendran and Harrison, 2007). In the context of the pandemic, all information flow must have been very well-managed because at home and in all offices, the results were similar. It is likely that everything related to information was especially well thought out, and meetings and materials were organised.

Finally, relationships with colleagues for people working at home were similar to those working in an office and relationships with supervisors were similar or sometimes even better than in some office types. Prior results here have been contradictory, as many studies have proven that relationships suffer when people work away from others

(Tremblay and Thomsin, 2012; Sardeshmukh *et al.*, 2012, etc.), but the meta-study by Gajendran and Harrison (2007) did not support this. We agree with Gajendran and Harrison (2007) that people at home may make more effort to maintain good relationships with colleagues and supervisors and vice versa. Especially, since the study by Gajendran and Harrison (2007), various IT solutions have improved considerably, and it is now much easier to communicate from a distance. What is more, we suggest that in the pre-pandemic situation, only people who preferred to work at home chose that form of work and that they were already used to it, which made communication much easier. In the context of the pandemic, everyone was in the same boat and probably tended to stick together. In addition, not only people struggle of course with some aspects of being away from others but it also has its advantages as the study by Mann *et al.* (2000) proved. So the positives and negatives even themselves out. On the one hand, people may experience social isolation (Golden *et al.*, 2008; Mann *et al.*, 2000) and miss casual encounters (Cooper and Kurland, 2002), but on the other hand, they avoid unnecessary distractions (Fonner and Roloff, 2010; Mann *et al.*, 2000), office "dramas" (van Zoonen *et al.*, 2021; Mann *et al.*, 2000) and so on.

Still, relationships with supervisors did get worse for those working in activity-based offices during the pandemic. In normal circumstances, they were better than in open-plan offices but during the pandemic became similar to estimations in open-plan offices. As mentioned, activity-based offices have open areas which people probably feel uncomfortable about during the pandemic, and this may well have been because they had to stay in the office in the context of strained relationships with their supervisor.

In normal circumstances, activity-based offices had very good results in Estonia in terms of all the facets surveyed, which is not in accordance with previous studies, which showed contrary results for well-being, information flow and relationships with colleagues. The reason for this may be that the success of activity-based offices greatly depends on how they are built and how they are used (Babapour Chafi and Rolfö, 2019). There should be enough areas for private concentration (Rolfö *et al.*, 2018; De Been and Beijer, 2014), and people should choose a suitable area for working within an activity-based office depending on what they are doing. What is more, Skogland (2017) stresses that even the smallest detail, such as the position of different areas relative to each other, plays an important role in the functioning of activity-based offices. People nevertheless tend to stay in one place (Appel-Meulenbroek *et al.*, 2011; Hoendervanger *et al.*, 2016). Unfortunately, we do not have data about how activity-based offices are built and used in this study, but as they have worked out well, we can assume that they have been applied rather adequately. Based on this study, activity-based offices are mostly used in information technology and telecommunications, commerce, finance and accounting and state and local government sectors. Those who have implemented activity-based offices in Estonia can be considered pioneers (that kind of office started to emerge around 2017 in Estonia), and they probably have enough resources and care for their employees.

However, it is probably too soon to make generalisations about activity-based offices in Estonia because there were rather few respondents in this group. What is more, there are always personal preferences, strengths and weaknesses. What is suitable for one is not suitable for another. For example, Rolfö (2018) indicates that after moving to an activity-based office from primarily open-plan offices, 46% felt that their performance increased, 18% felt it decreased and 36% were neutral.

To sum up the discussion, we can say that in normal circumstances open-plan offices are rather unfavourable for well-being, information flow and relationships, but cell offices and working at home are the best option along with activity-based offices. Surprisingly, information flow and relationships with co-workers during the pandemic became similar in

all working places, but more enclosed spaces (at home and cell offices) are preferable for avoiding tiredness and ensuring good relationships with supervisors. Although statistically significant, the differences in estimations were all quite small, so every organisation can choose the option that is most appropriate and preferable for their employees. Certainly, not all jobs are suitable for working at home and not all firms can build cell offices for everybody or have resources for well-set-up activity-based offices. Still, when necessary and possible, working at home is a viable option, at least in the short-term, according to this study's results.

5.1 Implications

5.1.1 For research. Our contribution to research comes firstly from the novel approach where we did not compare working from home to working in an office in general but to different types of offices. As our study, proved this kind of distinction is necessary to achieve a more adequate overview of the situation. Secondly, we proved that by researching working from home, separate subcategories of participants should be considered. Even having one's own desk can make a difference. Consequently, in future research, more detailed information about work facilities at home should be collected and analysed.

5.1.2 For practice. This study has also signposted some implications for practice. Namely, office types or practices at work that may have functioned well in normal circumstances may not be suited to the context of a pandemic. In particular, the example of activity-based offices in our study proved that point. Hence, constant reviewing of the situation and employee circumstances is necessary. For instance, to diminish the negative aspects of open-plan offices and in the context of a pandemic also activity-based offices, one or several telework days a week or a month may be offered to employees who have the right conditions at home and are willing to use that option. In a way, this also makes it possible to be prepared and get used to working from home in case there is a necessity to work from home due to minor illness or for self-isolation purposes. Using that approach, relocation between office and home causes less disruption for the person him/herself but also for colleagues. The study by van Zoonen *et al.* (2021) indicates that more experienced teleworkers have gathered valuable know how and, therefore, adapt better to changes. One way to get more experienced is training, but we believe implementing regular telework makes it possible to practice the necessary skills. For example, staying in touch with others from a distance (e.g. using MS Teams, Zoom or similar). What is more, it should be assured that a person has all he or she needs for working from home to avoid situations where a person has to work at a kitchen table or on an ironing board. When frequent changes in location involve duplicating the necessary equipment (e.g. printer, headset, etc.), then the employer must consider this and make the necessary provisions. Finally, in spite of where employees work, the issues of information flow and relationships cannot be taken for granted. In particular, the fact that people are located closely together, as in the case of open-plan offices, does not guarantee that they will communicate well and smoothly.

5.1.3 For society. COVID-19 has acted as an accelerator, not only pushing people out of their comfort zones but also triggering a value-change across society with respect to the perception of telework. As well-noted by the ever-growing volume of studies (Harker Martin and MacDonnell, 2012), as a result of global COVID-19 lockdowns, offers of and demands for telework and a better work-life balance are here to stay (Marsh, 2021; Naor *et al.*, 2021). This article managed to signpost how the new normality will also trigger a need to consider the overall use of work-related facilities and their functionality. That said, patterns and perceptions of telework at the societal level will ultimately translate to the institutional level and to working life.

5.2 Limitations

The main limitation of the study, as usual with questionnaires, is that it involved self-reported data, and thus, we only know the respondents' opinions about the facets of the enquiry, but we do not know how things actually are. For example, we have to rely on the respondents' evaluations of whether their office is an open-plan office or an activity-based office. Sometimes this distinction is rather difficult to see. Another limitation is the very specific timeframe of the second part of the survey. Namely, in the context of the COVID-19 pandemic, the workload in some organisations was noticeably lower. Consequently, well-being may have been less influenced than usual and also there may have been less need to exchange information, and the very specific nature of the pandemic may have also influenced relationships. Or the other way around, some organisations might have had a much higher workload, but these may be under-represented in the second part of this study because they were probably less prone to participate in the survey because they were short on time. In addition, during the pandemic, some offices may have been less occupied than usual, which could have influenced the facets analysed in this study.

A further limitation of the study is the sample collected. Namely, micro and small organisations were under-represented and some sectors were over-represented. The sample also consisted of quite a lot of people from managerial positions who may have had a more positive view of things. More women also participated in the survey.

A final limitation of this study is the country where the survey was made. The results for Estonia may not apply in countries that are culturally different or heterogenous, with a much larger population or different in other respects.

Notes

1. A comprehensive review of definitions of telework and related concepts is provided in Allen *et al.* (2015). Usually, teleworking means that a person is not working on the premises of the organisation but at home or other suitable place with the help of information technology tools.
2. For a more elaborate overview, see Parker (2016).

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Appendix 1

Group	Category	2019	2020
Gender	Male	29.5	29.7
	Female	70.3	69.5
	Not answered	0.2	0.8
Education	Secondary school education	12.0	11.6
	Bachelor degree	24.3	25.2
	Master's degree	32.0	33.7
	Other	31.6	28.6
	Not answered	0.1	0.9
Age	Less than 25	3.5	3.6
	25–34	30.2	30.7
	35–44	28.2	26.5
	45–54	20.7	21.2
	55 and more	17.1	17.1
	Not answered	0.3	0.9
Work experience	Less than a year	17.9	16.8
	1–2 years	22.5	23.7
	3–4 years	17.1	18.8
	5–9 years	17.9	17.5
	10 and more	24.6	23.2
Position	Managerial	30.6	35.0
	Specialist	69.4	65.0
Size of the organisation	less than 10	11.2	12.4
	10–49	24.1	23.2
	50–249	29.2	29.7
	250 and more	32.9	32.7
	Not answered	2.6	2.3
Workload	Full-time	85.6	88.8
	Part-time	4.7	7.1
	Other or no answer	9.7	4.1
Office type	At home	7.8	74.2
	Cell	47.4	14.3
	Activity-based	5.7	1.6
	Open-plan	39.1	9.9

Source: Compiled by the authors

Table A1. Sample characteristics

Appendix 2

Table A2. Statements used in the analysis

Category	2019 Statement	2019 Scale	2020 Statement	2020 Scale
Well-being	I felt tired	1 – never, 5 – always	During last month I felt tired	1 – never; 7 – very often or always
	My health is good	1 – totally disagree, 5 – totally agree	The same as 2019	
Information flow	Satisfaction with information flow in the organisation	1 – not satisfied at all, 5 – very satisfied	The same as 2019	
	I am well aware what happens in the organisation	1 – totally disagree, 5 – totally agree	The same as 2019	
Relationships	I get along well with co-workers	1 – totally disagree, 5 – totally agree	Satisfaction with getting along with co-workers	1 – not satisfied at all, 5 – very satisfied
	I get along well with my immediate supervisor	1 – totally disagree, 5 – totally agree	Satisfaction with getting along with immediate supervisor	1 – not satisfied at all, 5 – very satisfied

Source: Compiled by the authors

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