

DOING PHD RESEARCH DURING THE COVID-19 PANDEMIC

FIRST RESULTS OF THE PHD SURVEY 2021

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Introduction

PhD Survey 2021

The Research, Training & Development Office (RTDO) at the Vrije Universiteit Brussel (VUB) aims to provide optimal support in the development and improvement of PhD candidates' research skills and the successful completion of their PhD trajectory. To evaluate this task and at the same time gauge the well-being and job satisfaction of PhD candidates, the RTDO commissioned the fifth wave of the PhD Survey in 2021. Like previous years, the PhD Survey of 2021 was conducted online by the Research Group TOR of the Sociology Department at the VUB using their in-house developed software platform for data collection MOTUS¹ ([Verbeylen, Minnen et al. 2017](#), [Glorieux, te Braak et al. 2018](#), [Glorieux, te Braak et al. 2019](#), [Glorieux, te Braak et al. 2020](#)).

In the period between April 20 and May 31, 2021, 1683 PhD candidates were invited to participate in the 2021 edition of the PhD Survey. Six invitations bounced, 845 PhD candidates started the survey and 722 PhD candidates completed it. The gross and net response rates of this year's PhD survey are 50.4 and 43.1 percent, respectively. This is in line with earlier editions of the PhD survey, which reported net response rates of 48.2, 44.9 and 44.3 percent in 2018, 2019 and 2020 respectively. More details on the survey design and methodology, the fieldwork and the (non-)response will be included in the technical report that will be finalised later this year (for technical reports of earlier editions, see [te Braak, Minnen et al. 2017](#), [Glorieux, Minnen et al. 2018](#), [Glorieux, te Braak et al. 2019](#), [Glorieux, te Braak et al. 2020](#)).

Impact of the COVID-19 pandemic

This first report focusses on the very particular conditions faced by PhD candidates during the academic year of 2020-2021: the lingering COVID-19 pandemic. At the end of the academic year 2019-2020, many PhD candidates faced strict measures which had to contain the first wave of COVID-19 infections. The summer of 2020 presented itself as a period in which daily (work) life would return to normal. However, nothing was less true. The academic year of 2020-2021 turned out to be dominated by the COVID-19 pandemic and subsequent containment measures. Almost throughout the whole academic year the VUB operated in code red, implying that working from home was mandatory and visits to the VUB campuses were limited to the very necessary bare minimum. Obviously, this had (and still has) a significant impact on the daily work life of students. Moreover, restrictions outside the VUB further impacted the social lives of PhD candidates.

Since the edition of 2020, the PhD Survey contains several questions that measured the impact of the COVID-19 pandemic on their research and general well-being ([Glorieux, te Braak et al. 2020](#)). This report is a follow-up study of this COVID-19 module and aims to provide RTDO and policy makers with figures that allow them to assess the impact of the COVID-19 pandemic on PhD candidates at the VUB.

Concerns of the COVID-19 pandemic

This first report focusses on two sets of figures. Firstly, it will provide general figures for the whole sample of PhD candidates and compare these figures with results from the 2020 edition of the PhD survey. In the 2020 edition (i.e., the end of academic

¹ MOTUS stands for Modular Online Time Use Survey and contains, amongst other things, a module to design, conduct and follow-up online survey questionnaires.

year 2019-2020), PhD candidates responded to a sudden, almost out of the blue impact of the COVID-19 pandemic. At that time, the expectation was that the pandemic would be short-lived, and this academic year would resume its normal course. In the 2021 edition, PhD candidates responded based on a lingering impact of the COVID-19 pandemic. The comparison between 2020 and 2021 provides insights in the continuing impact of the COVID-19 pandemic on PhD research, the improvement or deterioration in the conditions under which PhD research is being conducted, and the general well-being of PhD candidates, against which the restrictive and supportive measures of the VUB can be evaluated. Note that this first report presents cohort comparisons and not longitudinal analyses.

Secondly, it seems unlikely that the COVID-19 pandemic affects all PhD candidates equally. Therefore, this report stratifies the results by five subgroups:

Gender. Six years ago, the VUB launched its *Gender Action Plan*. Since then, gender and diversity has been high on the VUB's agenda. And while there is no immediate reason to believe that the COVID-19 pandemic will have direct, different effects on researchers' female and male identities — likely effects will be related rather to gender normative expectations and responsibilities — the first stratification of the results is made according to gender.

Living situation. The restrictive measures to contain the COVID-19 pandemic not only impacted work-life but also personal life. Home-schooling and day-care closures in combination with mandatory teleworking posed significant challenges for parents. From this point of view, PhD candidates who are also parents – and especially who are single parents – are a particular vulnerable group. The subgroup defined by living situation distinguished between PhD candidates that live without a partner or children, live with a partner, live with a partner and child(ren), or are single parents. This last category is very small (only 1.8% of PhD candidates are single parents; see Table 1) but very relevant in terms of the impact of the COVID-19 pandemic on their research. That is why it is included separately in the tables as a category.

Nationality. The social restrictions due to the COVID-19 pandemic, such as shutting down campus life, the very restrictive conditions under which it is possible to meet with friends or family and the ban on non-essential travel abroad, have an impact on the social supportive network of PhD candidates. In this case, foreign – and especially non-European – PhD candidates are very vulnerable to the consequences of the covid-19 pandemic on, for example, their well-being. More than half of the PhD candidates come from outside Belgium and one in three PhD candidates even from a non-European country (see Table 1).

Phase of PhD research. In the PhD Survey, PhD candidates are asked to indicate the phase they believe their PhD research is in. They distinguish between *starting phase*, *executing phase*, and *finalising phase* (see Table 1). Undoubtedly, PhD candidates in any phase of their research might be affected by the consequences of the COVID-19 pandemic. However, this impact may have various reasons. Early-stage PhD candidates may lack support in finding their way round the campus and administrative offices, settling in a new work environment, or simply getting started. Mid-stage PhD candidates may experience trouble with data collection, whereas final-stage PhD candidate may experience augmented stress in meeting submission deadlines and the practical and administrative tasks to organize their PhD defence. To gain an initial insight into this, we split the results for this subgroup.

Doctoral schools. The VUB distinguishes three doctoral schools: the Doctoral School of Human Sciences (DSh), the Doctoral School of Life Sciences and Medicine (LSM), and the Doctoral School of Natural Sciences and (Bioscience) Engineering (NSE). The type of research may vary between doctoral schools as may the way data are collected, which, in turn, may be impacted differently by the consequences of the COVID-19 pandemic. For example, data collection that relies on experiments in laboratories faces different challenges (i.e., managing the number of people in the laboratory and keeping social distance) compared to data collection that relies on face-to-face interaction (i.e., face-to-face interviews could be replaced by interviews over the phone, but medical examinations cannot). To assess whether PhD candidates from different doctoral schools are impacted differently, we split the results for this subgroup. Note that a few PhD candidates engage in interdisciplinary research (see Table 1). They are not considered for the division of results by the doctoral school subgroup because it is not known which doctoral school they joined.

TABLE 1. FREQUENCY DISTRIBUTION OF SUBGROUPS

	N	valid %
Gender		
Male	343	47.5
Female	379	52.5
Living situation		100.0
Without partner or children	320	44.8
With partner	299	41.8
Single parent	13	1.8
Two-parent family	83	11.6
<i>Missing</i>	7	
Nationality		100.0
Belgian	319	45.5
European	145	20.5
Non-European	239	34.0
<i>Missing/Don't know</i>	19	
PhD phase[†]		100.0
Starting	151	21.1
Executing	394	55.0
Finalising	171	23.9
<i>Missing</i>	6	
Doctoral school		100.0
Doctoral School of Human Sciences (DSh)	264	37.0
Doctoral School of Natural Sciences and (Bioscience) Engineering (NSE)	285	40.0
Doctoral School of Life Sciences and Medicine (LSM)	164	23.0
<i>Interdisciplinary (not included)</i>	9	
		100.0

[†]PhD candidates are asked to indicate the phase they believe their PhD research is in. The answering categories distinguish between starting phase (developing your research plan and design, reading...), executing phase (working on experiments, data, executing research plan/method), and finalizing phase (writing up phase).

Structure of the report

This first report presents four themes that are possibly impacted by the COVID-19 pandemic, namely the Research Plan, the Data Collection, the Communication with the supervisor, the PhD Submission, and one theme that is the direct result of the COVID-19 pandemic containment strategy, namely working from home. Note that working from home and teleworking are used interchangeably in this report and both imply working at home. Each theme is presented as a separate section. After a brief introduction, each section contains a table with the general results and comparison between 2020 and 2021, followed by a table stratifying the results by the different subgroups. A statistical test is conducted to assess whether the frequency distribution of the variable of interest varies across the characteristics that make up the subgroup. Each table is followed by a bullet point list with most notable and/or most notably absent results. Note that the reliability of the statistical test is dependent on the sample size. Small categories, such as single parent PhD candidates, will hardly generate significant effects. That does not mean that the results of small groups may not provide relevant insights. Similarly, the absence of statistically significant differences in frequency distributions may be equally important. Bullet point findings will, therefore, not be limited to significant results only. A final section summarizes and concludes the results.

Research plan

Ideally, PhD candidates submit a research plan at the latest six months into their PhD trajectory. As of next year, the need for a research plan will be part of the doctoral regulations of the VUB. A research plan outlines the scope of their research, research goals, tasks, and time frame, and other responsibilities they have. The research plan serves as a guidance throughout their PhD trajectory. Earlier editions of the PhD survey have consistently shown the potential of the research plan in keeping PhD candidates on track. A research plan also associates with less time pressure and a better work-family balance ([Glorieux, te Braak et al. 2019](#), [Glorieux, te Braak et al. 2020](#)). In the PhD survey of 2021, PhD candidates were asked whether the COVID-19 pandemic caused them to make any adjustments to their research plan (Tables 2 and 3) and, if so, whether they received any help in doing this (Tables 4 and 5).

TABLE 2. ADJUSTMENT OF RESEARCH PLAN BY YEAR (%)

	2021 (n=721)
Yes	58.3
No	41.7
Total	100.0

Question: Did you adjust your research plan because of the COVID-19 measures?

- More than half of the PhD candidates adjusted their research plan because of the COVID-19 measures. This result not necessarily implies a negative impact of the COVID-19 pandemic on the PhD candidates' research plan. We might hypothesize that adjustments are made based on new opportunities that arose during the COVID-19 pandemic. If so, we expect this to apply to PhD candidates in the starting phase of their research.

TABLE 3. ADJUSTMENT OF RESEARCH PLAN BY SUBGROUPS (%)

	Yes	No	Total
Gender (n=721)			
Male	56.6	43.4	100.0
Female	59.8	40.2	100.0
Living situation (n=715)			
Without partner or children	56.6	43.4	100.0
With partner	56.5	43.5	100.0
Single parent	69.2	30.8	100.0
Two-parent family	69.9	30.1	100.0
Nationality (n=703) *			
Belgian	53.6	46.4	100.0
European	53.1	46.9	100.0
Non-European	66.5	33.5	100.0
PhD phase (n=716) **			
Starting	43.0	57.0	100.0
Executing	61.4	38.6	100.0
Finalising	63.7	36.3	100.0
Doctoral school (n=721)			
DSh	58.6	41.4	100.0
NSE	55.1	44.9	100.0
LSM	62.8	37.2	100.0

Question: Did you adjust your research plan because of the COVID-19 measures?

*Expected and observed frequencies of one or more categories vary significantly for *** $p \leq 0.001$, ** $p \leq 0.01$ or * $p \leq 0.05$ based on Pearson's chi-squared test.*

- Significantly more non-European PhD candidates adjusted their research plan. This category of PhD candidates might more likely be faced with time constraints to their PhD research that relate to the length of their stay at the VUB.
- Significantly less PhD candidates in their starting phase adjusted their research plan, which leads us to reject the earlier hypothesis that the COVID-19 pandemic creates new opportunities that lead to research plan adjustments. The finding that mainly PhD candidates in the executing and finalizing phase adjust their research plan, suggests that these alterations are likely done out of necessity.
- The observed gender differences and differences according to the doctoral school are not statistically significant.

TABLE 4. HELP WITH RESEARCH PLAN ADJUSTMENTS (%)

	2021 (n=420)
Yes, from (one of my) supervisor(s)	63.1
Yes, from other colleagues	17.9
No	35.5

Question: Did you receive help adjusting these plans? (Multiple answers possible)

- Only PhD candidates that did adjust their research plan were asked if, and if so, from whom they received help (n=420).
- A third of PhD candidates who indicated that they adjusted their research plan because of the COVID-19 measures received no help in doing so. This is quite remarkable given that a research plan helps to keep PhD candidates on track and benefits their well-being.
- Almost two thirds of the PhD candidates did receive help from their supervisors and another 18 percent received help from other colleagues.

TABLE 5. HELP WITH RESEARCH PLAN ADJUSTMENTS BY SUBGROUPS (%)

	Yes, from (one of my) supervisor(s)	Yes, from other colleagues	No
Gender (n=420)	**		**
Male	63.9	20.1	34.0
Female	62.4	15.9	36.7
Living situation (n=417)	**		**
Without partner or children	73.5	19.9	24.3
With partner	59.2	17.8	40.2
Single parent	44.4	0.0	55.6
Two-parent family	43.1	13.8	55.2
Nationality (n=407)	**		**
Belgian	50.9	14.0	46.8
European	63.6	18.2	35.1
Non-European	75.5	22.6	23.9
PhD phase (n=416)			
Starting	66.2	15.4	32.3
Executing	64.5	19.8	34.7
Finalising	57.8	15.6	39.4
Doctoral school (n=414)	*	*	*
DSh	54.5	10.4	44.8
NSE	69.4	21.7	29.9
LSM	65.0	23.3	31.1

Question: Did you receive help adjusting your research plan?

Note that respondents that received help could indicate multiple sources of help.

Expected and observed frequencies of one or more categories vary significantly for *** $p \leq 0.001$, ** $p \leq 0.01$ or * $p \leq 0.05$ based on Pearson's chi-squared test.

- Over half of the PhD candidates that are parents and that adjusted their research plan did not receive any help. PhD candidates that are single parents did not receive any help from colleagues either. On the contrary, three in four PhD candidates without partner and children found help from their supervisor. The impact of the COVID-19 pandemic on the research plan seems clearly stratified between PhD candidates depending on whether they have other significant social responsibilities.
- A substantial share of non-European PhD candidates adjusted their research plan (see Table 4), yet three in four did so with the help of their supervisor and one in five (also) did so with the help of colleagues. That is substantially more than PhD candidates with Belgian or other European nationalities. This contradicts the assumption that the COVID-19 restrictions cut off non-European PhD candidates from their social support network at the VUB.
- PhD candidates in the doctoral schools of NSE and LSM receive significantly more help from their supervisor and/or their colleagues compared to those in the DSh. Almost half of the PhD candidates in the DSh that adjusted their research plan, indicated having received no help at all.

Data collection

Data collection is a specific phase of the PhD trajectory and presents itself in multiple ways: observations, interviews, experiments in laboratory settings, assembling secondary data, online surveys, et cetera. Respondents were asked whether they had planned to collect data during this academic year. Importantly, the following questions were only asked to the PhD candidates who planned to collect data during the last year. 65 percent (n=469) of the sample planned to do so. Hereafter, they were asked how the COVID-19 pandemic impacted these plans (Tables 6 and 7).

TABLE 6. IMPACT ON DATA COLLECTION BY YEAR (%)

	2021 (n=468)	2020 (n=366)
The data collection can proceed as planned	19.0	20.5
The data collection was cancelled	5.3	7.9
The data collection was postponed	42.5	39.3
The methodology was adapted to cope with the corona crisis	25.6	19.9
It is not yet clear what the consequences are and how they will be addressed	7.5	12.3
Total	100.0	100.0

Question: How did the COVID-19 measures affect the data collection?

- The COVID-19 restrictions substantially impact data collection. Only one in five of the PhD candidates were able to continue their data collection as planned. Although there is no substantial difference between 2020 and 2021 in relative numbers, there is a considerable difference in absolute numbers. Of the 468 PhD candidates that planned to collect data in 2021, 379 were impacted by the COVID-19 restrictions, compared to 291 in 2020.
- Postponement of data collection has been reported as the most common impact (42.5%). One in four (25.6%) adapted their methodology to cope with the COVID-19 restrictions. In both cases this is an increase of about 3 and 6 percentage points respectively compared to 2020.
- The shares of PhD candidates that had to cancel their data collection or who are not yet clear about the consequences of the COVID-19 restrictions have decreased compared to 2020.

TABLE 7. IMPACT ON DATA COLLECTION BY SUBGROUPS (%)

	The data collection				impact is not yet clear	Total
	can proceed as planned	was cancelled	was postponed	methodology was adapted		
Gender (n= 468)						
Male	21.5	6.7	41.1	23.9	6.7	100.0
Female	17.0	4.2	43.6	27.0	8.1	100.0
Living situation (n=463)						
Without partner or children	23.2	3.8	42.2	24.6	6.2	100.0
With partner	14.2	6.8	43.7	26.8	8.4	100.0
Single parent	30.0	10.0	20.0	30.0	10.0	100.0
Two-parent family	19.2	5.8	40.4	25.0	9.6	100.0
Nationality (n=460)						
Belgian	13.9	6.7	43.8	27.4	8.2	100.0
European	18.4	5.1	42.9	26.5	7.1	100.0
Non-European	26.0	3.9	40.9	23.4	5.8	100.0
PhD phase (n=464) *						
Starting	27.6	2.6	31.6	27.6	10.5	100.0
Executing	17.7	4.1	46.3	24.1	7.8	100.0
Finalising	16.0	10.6	40.4	28.7	4.3	100.0
Doctoral school (n=468) *						
DSh	25.8	6.5	31.0	27.1	9.7	100.0
NSE	19.6	4.3	44.6	24.5	7.1	100.0
LSM	8.3	5.8	54.5	26.4	5.0	100.0

Question: How did the COVID-19 measure affect the data collection?

Expected and observed frequencies of one or more categories vary significantly for *** $p \leq 0.001$, ** $p \leq 0.01$ or * $p \leq 0.05$ based on Pearson's chi-squared test.

- There is no significant variation in the impact of the COVID-19 restrictions on data collection by gender, living situation or nationality.
- For PhD candidates in the starting phase, there is a big variation in the way they cope with their data collection.
- Almost half of the PhD candidates in the starting phase of their research were able to proceed as planned or adapted their methodology. Only one in three had to cancel their data collection. Time seems at the essence here since one in ten of the PhD candidates in the finalizing phase had to cancel their data collection.
- To no surprise, PhD candidates in the executing phase were most likely to postpone their data collection.
- PhD candidates in the doctoral school of LSM were most likely to postpone their data collection and the least likely to proceed with data collection as planned. A possible explanation might be that access to their data collection infrastructure and subjects are severely hampered by the COVID-19 pandemic and/or PhD candidates might be employed elsewhere to cope with more urgent tasks related to the containment of the COVID-19 pandemic.

Telework

The VUB worked in code red for almost the entire academic year 2020-2021. This implied that all employees were (and still are) obliged to work from home. Only employees with valid reasons were allowed to work on-site. This measure was still in effect at the time of the PhD survey 2021. Respondents were asked about the extent of their teleworking during the COVID-19 pandemic (Tables 8 and 9) and to what extent they intent to keep working from home (Tables 10 and 11).

Extent and continuation of telework

TABLE 8. EXTENT OF TELEWORKING (%)

	2021 (n=717)
Daily	12.7
More than once a week	19.5
Once a week	9.5
Less than once a week	19.4
Never	38.9
Total	100.0

Question: In the last three months, how often did you go to your workplace (office, lab ...)?

- Almost 60 percent of the PhD candidates went to their workplace less than once a month over the last three months preceding the PhD survey.
- Almost one in three of the PhD candidates went to their workplace more than once a week or daily.

TABLE 9. EXTENT OF TELEWORKING BY SUBGROUPS (%)

	Never	Less than once a week	Once a week	More than once a week	Daily	Total
Gender (n=717)						
Male	36.7	18.8	11.4	22.3	10.9	100.0
Female	41.0	19.9	7.7	17.0	14.4	100.0
Living situation (n=711) **						
Without partner or children	33.3	17.0	11.6	20.8	17.3	100.0
With partner	38.0	23.6	9.1	18.9	10.4	100.0
Single parent	84.6	15.4	0.0	0.0	0.0	100.0
Two-parent family	57.8	14.5	4.8	18.1	4.8	100.0
Nationality (n=699)						
Belgian	34.6	21.9	13.0	18.7	11.7	100.0
European	44.1	18.6	4.8	17.2	15.2	100.0
Non-European	40.6	15.9	8.4	22.2	13.0	100.0
PhD phase (n=712) **						
Starting	40.4	23.8	10.6	17.9	7.3	100.0
Executing	32.9	18.9	10.2	21.9	16.1	100.0
Finalising	50.3	16.6	7.1	16.0	10.1	100.0
Doctoral school (n=708) **						
DSH	61.4	21.6	6.2	7.7	3.1	100.0
NSE	29.1	18.2	10.5	27.7	14.4	100.0
LSM	20.7	17.1	13.4	23.8	25.0	100.0

Question: In the last three months, how often did you go to your workplace (office, lab ...)?

Expected and observed frequencies of one or more categories vary significantly for *** $p \leq 0.001$, ** $p \leq 0.01$ or * $p \leq 0.05$ based on Pearson's chi-squared test.

- There are no significant differences in the extent of teleworking by gender.
- PhD candidates that are also parents only work from home to a much greater extent than other PhD candidates. Almost 60 percent of PhD candidates with partner and children never went to their workplace over the three months preceding the survey. For single parent PhD candidates this rises to 84.5 percent. It seems that other responsibilities that arise from parenthood and that are also subject to the restrictive measures enhance the impact of the COVID-19 pandemic on conducting PhD research.
- PhD candidates in the finalizing phase of their research went to their workplace significantly less often than the respondents in the other two phases. Close to 70 percent went less than once a week. It may be worrisome that also two in three PhD candidates in their starting phase never frequented their workplace more than once a week. PhD candidates in their executing phase went to their workplace most often. Over one in three went at least more than once a week.
- There is a strong significant difference in teleworking between doctoral schools. Almost two thirds of PhD candidates in the DSh never came to their workplace in the three months preceding the PhD survey. On the contrary, a quarter of the PhD candidates from the doctoral school of LSM frequented their workplace at a daily basis and another 23.8 percent at least once a week. This may be the result of PhD

candidates in medical sciences that combine PhD research with a specialty training trajectory, that are employed elsewhere to cope with more urgent tasks related to the containment of the COVID-19 pandemic, or whose PhD research is more dependent on workplace infrastructure such as laboratories and technical equipment.

TABLE 10. CONTINUATION OF TELEWORKING (%)

	2021 (n=628)
Never	2.4
Less than once a week	4.5
Once a week	7.5
Two days a week	12.9
Three days a week	23.7
Four days a week	19.7
Daily	29.3
Total	100.0

Question: Once all COVID-19 restrictions have been lifted, how often would you like to go to your VUB workplace on a weekly basis?

- After all restrictions have been lifted, almost 30 percent of the PhD candidates would like to go back to their workplace daily and a quarter of the PhD candidates would like to return to their workplace at most twice a week. Obviously, working from home completely or to a very large extent can be considered a suboptimal working condition for PhD candidates. Only 7 percent considers fulltime teleworking or frequenting their workplace less than once a week after the COVID-19 restrictions have been lifted.
- Note that this question was only asked to those with a physical workplace at the VUB. 12.5 percent of the PhD candidates indicated not having a workplace at the VUB.

TABLE 11. CONTINUATION OF TELEWORKING BY SUBGROUPS (%)

	Never	Less than once a week	Once a week	Two days a week	Three days a week	Four days a week	Daily	Total
Gender (n=628) **								
Male	1.4	3.7	6.4	10.5	23.0	17.9	37.2	100.0
Female	3.3	5.1	8.4	15.1	24.4	21.4	22.3	100.0
Living situation (n=623) ***								
Without partner or children	1,1	3,5	6,7	10,2	20,4	20,0	38,2	100.0
With partner	1,5	4,5	6,4	14,3	28,9	21,1	23,3	100.0
Single parent	10,0	10,0	30,0	10,0	10,0	20,0	10,0	100.0
Two-parent family	12,7	6,3	12,7	20,6	19,0	12,7	15,9	100.0
Nationality (n=612) ***								
Belgian	2,4	3,7	7,1	15,3	30,2	22,4	19,0	100.0
European	2,5	5,0	9,2	11,7	20,0	15,8	35,8	100.0
Non-European	2,5	4,5	7,6	9,6	17,2	17,2	41,4	100.0
PhD phase (n=625) **								
Starting	0,0	2,2	3,6	14,5	30,4	23,9	25,4	100.0
Executing	2,2	4,7	7,0	12,3	22,6	21,5	29,6	100.0
Finalising	5,4	6,2	11,5	13,1	20,0	10,8	33,1	100.0
Doctoral school (n=622) ***								
DSH	4,2	7,4	8,8	18,1	25,1	16,7	19,5	100.0
NSE	1,5	1,1	5,6	10,1	22,8	20,2	38,6	100.0
LSM	2,1	5,7	9,2	10,6	22,7	23,4	26,2	100.0

Question: Once all COVID-19 restrictions have been lifted, how often would you like to go to your VUB workplace on a weekly basis?

Expected and observed frequencies of one or more categories vary significantly for *** $p \leq 0.001$, ** $p \leq 0.01$ or * $p \leq 0.05$ based on Pearson's chi-squared test.

- Women seem to prefer a slightly greater degree of working from home than men. This is probably related to the fact that women are more likely than men to have other responsibilities tied to the home.
- This is supported by the finding that PhD candidates that are also parents prefer to work a substantial part of their workweek from home. Half of the single parents and almost a third of the two-parents prefer to frequent their workplace at most once a week. On the contrary, almost 40 percent of PhD candidates without partner and children prefer to come to work daily. It seems that among PhD candidates frequenting workplaces at the VUB is embedded in different social reasons.
- This, in turn, is also supported by the finding that non-European PhD candidates more than Belgian or other European nationalities prefer to come to their workplace daily.
- PhD candidates in the starting phase of their research prefer to work from home less than PhD candidates in their finalizing phase. Only 5.8 percent of the former prefer to frequent their workplace at most once a week compared to 11.6 percent

of the latter. PhD candidates in the executing phase (51.1%) would like to come back to their workplace four days a week or more.

- PhD candidates in the doctoral school of NSE (58.8%) followed by PhD candidates in the doctoral school of LSM (49.6%) prefer frequenting their workplace more often than PhD candidates of the DSh. In the doctoral school of NSE, almost 60 percent of the PhD candidates prefer to come back four days a week or more compared to almost 50 percent in the doctoral school of LSM and a 36.2 percent in the DSh.

Impact of teleworking

PhD candidates that worked from home, regardless the extent of telework, were asked to what extent this impacted their PhD trajectory in terms of the research they conduct, their productivity and their planning. They were also asked how teleworking affected their well-being, their work-life balance, and their physical health (Tables 12 and 13). The influence of working from home was rated according to the following scale: very negative influence (-2), negative influence (-1), no influence (0), positive influence (1) or very positive influence (2). Tables 12 and 13 contain the mean scores of this. A negative score means that there is on average a negative influence whereas a positive score indicates a positive influence.

TABLE 12. IMPACT OF TELEWORKING BY YEAR (MEAN)

How does working from home affect your	2021 (n=624)	2020 (n=709)
Work		
research	-0.33	-0.20
productivity	-0.45	-
planning	-0.27	-
General health and well-being		
well-being	-0.53	-0.16
work-life balance	-0.50	-
physical health	-0.55	-

Note. Items are scored on a 5-point Likert scale ranging from 'very negative influence' (-2) to 'very positive influence' (+2). The table presents the mean score.

- In general, working from home has a negative influence PhD candidates' work and general health and well-being. Productivity of their work is negatively associated with teleworking the most (-0.45). However, for all items of general health and well-being the negative association is even higher (between -0.55 and -0.50).
- The associations between teleworking and research and well-being were measured in 2020 as well. A comparison reveals that the already negative associations found in 2020 have been substantially enlarged in 2021. Working from home due to the COVID-19 restrictions has left its marks.
- Note that this question was not asked to PhD candidates that indicated to go to their workplace daily (n=91).



TABLE 13. IMPACT OF TELEWORKING BY SUBGROUPS (MEAN)

How does working from home affect your	Work			General health and well-being		
	research	productivity	planning	well-being	work-life balance	physical health
Gender (n=624)						
Male	-0.37	-0.49	-0.38 ^a	-0.59	-0.64 ^a	-0.57
Female	-0.28	-0.41	-0.17 ^b	-0.47	-0.37 ^b	-0.53
Living situation (n=619)						
Without partner or children	-0.39	-0.47	-0.36	-0.58	-0.58	-0.52
With partner	-0.28	-0.44	-0.21	-0.55	-0.48	-0.63
Single parent	-0.38	-0.69	-0.23	-0.31	-0.15	-0.69
Two-parent family	-0.27	-0.35	-0.19	-0.27	-0.36	-0.31
Nationality (n=607)						
Belgian	-0.26	-0.43	-0.18	-0.51	-0.40	-0.45
European	-0.34	-0.46	-0.39	-0.61	-0.64	-0.70
Non-European	-0.38	-0.47	-0.31	-0.50	-0.54	-0.55
PhD phase (n=619)						
Starting	-0.49 ^a	-0.61	-0.45	-0.70	-0.65	-0.66
Executing	-0.34 ^{ab}	-0.43	-0.24	-0.48	-0.46	-0.52
Finalising	-0.17 ^b	-0.35	-0.19	-0.49	-0.46	-0.53
Doctoral school (n=616)						
DSh	-0.31 ^{ab}	-0.49	-0.30 ^{ab}	-0.58 ^a	-0.51 ^a	-0.58 ^a
NSE	-0.45 ^a	-0.49	-0.35 ^a	-0.61 ^a	-0.68 ^a	-0.64 ^a
LSM	-0.11 ^b	-0.27	-0.03 ^b	-0.27 ^b	-0.14 ^b	-0.29 ^b

Note. Items are scored on a 5-point Likert scale ranging from Very negative influence (-2) to Very positive influence (+2). Within groups, item means sharing a letter in their subscript are significantly different at $\alpha = 0.05$ according to a pairwise comparison with Bonferroni correction for multiple comparisons.

- All associations between teleworking and the items questioned are negative for all categories of subgroups. This, again, implies that working from home in the way it was done, that is, as part of the COVID-19 restrictions, has a substantial negative impact on PhD candidates' work and general health and well-being.
- Some results that stand out:
 - Male PhD candidates report larger negative associations between working from home and the planning of their research and between working from home and their overall work-life balance.
 - Single parents report a large negative association between working from home and the productivity of their PhD research and their physical health. The latter association stands out for partnered PhD candidates as well.
 - PhD candidates in the starting phase of their research report a larger negative association between telework and their research and their general health and well-being compared to PhD candidates in other phases.

- PhD candidates in the doctoral school of NSE, followed by PhD candidates from DSh, report the largest negative associations between working from home and all items questioned.

TABLE 14. CORRELATION BETWEEN IMPACT OF TELEWORKING ON DIFFERENT ELEMENTS

	Research	Productivity	Planning	Well-being	Work-life	Health
Research						
Productivity	0.68**					
Planning	0.66**	0.72**				
Well-being	0.49**	0.62**	0.54**			
Work-life balance	0.41**	0.43**	0.51**	0.52**		
Health	0.35**	0.41**	0.42**	0.54**	0.54**	

- Table 14 shows a significant positive correlation between all the items questioned. This indicates that the impact of the COVID-19 restrictions on work spill over to well-being and vice versa.

Communication

The inability to work on-campus has its consequences for communication with supervisors. PhD candidates were asked about the frequency of contact with their supervisor (Tables 14 and 15), and which means they used to keep in contact (Tables 16 and 17). Note that the percentages in Tables 16 and 17 do not add up to 100 percent, because PhD candidates could indicate multiple means of communication.

Next, PhD candidates were also asked to rate the accessibility of their supervisor using the following scale: much less accessible (-2), less accessible (-1), just as accessible (0), more accessible (1), much more accessible (2). Tables 18 and 19 provide both the proportional distribution of the answering categories of this scale as well as the mean score hereof. A negative score means that supervisors were on average less accessible according to PhD candidates whereas a positive score indicates that they were more accessible.

Finally, PhD candidates were asked to rate their satisfaction with the accessibility of their supervisor(s) using the following scale: totally unsatisfied (-2), unsatisfied (-1), neutral (0), satisfied (1), totally satisfied (2). Tables 20 and 21 provide both the proportional distribution of the answering categories of this scale as well as the mean score hereof. A negative score means that PhD candidates were on average unsatisfied whereas a positive score indicates that they were satisfied.

Supervisor

TABLE 15. FREQUENCY OF SUPERVISOR CONTACT BY YEAR (%)

	2021 (n=720)	2020 (n=709)
Daily	1.4	2.4
Several times a week	23.8	29.6
Once a week	24.7	25.4
Several times a month	27.1	23.7
Once a month	17.5	17.3
(Almost) never	5.6	1.6
Total	100.0	100.0

Question: How often do you communicate with your supervisor since the corona measures?

- A quarter of PhD candidates communicates with their supervisor at least several times a week. This is somewhat less than in 2020 (25.2% compared to 32.0%, respectively). The difference between 2020 and 2021 is shifted to an increase in PhD candidates that communicate almost never with their supervisor (5.6% in 2021 compared to 1.6% in 2020).

TABLE 16. FREQUENCY OF SUPERVISOR CONTACT BY SUBGROUPS (%)

	Daily	Several times a week	Once a week	Several times a month	Once a month	(Almost) never	Total
Gender (n=720)							
Male	1.5	27.2	25.7	25.7	15.8	4.1	100.0
Female	1.3	20.6	23.8	28.3	19.0	6.9	100.0
Living situation (n=714)*							
Without partner or children	1.9	26.6	26.3	25.0	15.6	4.7	100.0
With partner	1.0	22.1	26.8	27.2	17.8	5.0	100.0
Single parent	0.0	0.0	23.1	30.8	46.2	0.0	100.0
Two-parent family	1.2	22.9	13.3	32.5	18.1	12.0	100.0
Nationality (n=702)							
Belgian	0.9	25.5	26.7	25.2	15.7	6.0	100.0
European	2.8	22.1	26.2	28.3	13.1	7.6	100.0
Non-European	1.3	22.6	21.8	28.0	22.2	4.2	100.0
PhD phase (n=715)							
Starting	1.3	25.2	26.5	28.5	15.2	3.3	100.0
Executing	1.3	27.2	25.1	25.9	15.7	4.8	100.0
Finalising	1.8	15.3	22.9	28.2	22.4	9.4	100.0
Doctoral school (n=711)**							
DSh	0.4	16.4	17.6	29.8	27.5	8.4	100.0
NSE	1.8	28.4	30.2	26.7	9.8	3.2	100.0
LSM	1.8	27.4	26.8	24.4	14.6	4.9	100.0

Question: How often do you communicate with your supervisor since the corona measures?

Expected and observed frequencies of one or more categories vary significantly for *** $p \leq 0.001$,

** $p \leq 0.01$ or * $p \leq 0.05$ based on Pearson's chi-squared test.

- There are no significant differences in the frequency of communication with supervisors by gender.
- There is not much difference in the frequency of communication with supervisors between PhD candidates without a partner or children or PhD candidates with a partner. A quarter up to 30 percent communicates at least several times a week, around 20 percent communicates at most once a month, and the rest falls in between.
- PhD candidates with partner and children seem to fall into two groups. Like other PhD candidates, a quarter communicates with their supervisor at least several times a week. However, the share of PhD candidates with partner and children that communicates at most once a month is much higher (30.1%). Single parent PhD candidates communicate the least frequent with their supervisors.
- There are no significant differences in the frequency of communication with supervisors by nationality and PhD phase. Although PhD candidates in their finalizing phase seem to communicate slightly less frequent with their supervisors compared to PhD candidates in other phases of their PhD research.

- Respondents in the DSh have less frequent contact with their supervisors during the COVID-19 pandemic compared to the other doctoral schools. A third has contact with their supervisor at least once a week compared to 60.4 percent and 56 percent of the PhD candidates in the NSE and LSM, respectively.

TABLE 17. MEANS OF SUPERVISOR CONTACT BY YEAR (%)

	2021 (n=722)	2020 (n=710)
Video call (Microsoft Teams, Skype, Zoom...)	87.3	70.3
E-mail	82.5	83.0
Chat (Microsoft Teams, Skype...)	31.3	21.0
Telephone, audio call (WhatsApp, Skype...)	19.1	27.3
In person	16.2	-
Text message	13.0	16.5

Question: What are the main means of communication with your supervisor during the COVID-19 crisis? (Multiple answers possible)

- Compared to last year, there is a substantial increase of the use of video call and online chat to communicate with supervisors at the cost of telephone and audio calls.
- Only 16.3 percent of the PhD candidates reports to communicate with their supervisor in person, meaning that most of the communication between supervisor and PhD candidate still happens from a distance.
- Note that column percentages do not sum to 100 percent because PhD candidates could indicate multiple answers.

TABLE 18. MEANS OF SUPERVISOR CONTACT BY SUBGROUPS (%)

	Video call	E-mail	Chat	Telephone, audio call	In person	Text message
Gender (n=722)					**	
Male	84.8	19.8	82.8	13.1	36.4	18.1
Female	89.4	18.5	82.3	12.9	26.6	14.5
Living situation (n=715)				*	*	*
Without partner or children	88.8	82.8	33.8	19.7	21.6	11.6
With partner	88.3	80.9	29.4	15.4	11.7	12.4
Single parent	92.3	92.3	23.1	23.1	7.7	0.0
Two-parent family	73.3	86.7	30.1	31.3	12.0	22.9
Nationality (n=703)						
Belgian	89.3	79.9	29.2	17.2	15.4	13.5
European	88.3	84.8	32.4	20.7	21.4	12.4
Non-European	84.9	85.4	32.6	21.3	15.1	12.6
PhD phase (n=716)			*			
Starting	90.7	82.8	37.1	13.9	17.2	10.6
Executing	88.1	82.7	32.5	21.1	16.0	12.7
Finalising	83.6	81.9	24.0	19.3	16.4	15.8
Doctoral school (n=713)	*		**		**	*
DSh	87.1	83.0	26.1	18.2	8.0	11.0
NSE	91.2	82.8	41.8	16.8	20.4	11.2
LSM	81.1	80.5	21.3	25.6	22.6	20.1

Question: What are the main means of communication with your supervisor during the COVID-19 crisis? (Multiple answers possible)

Expected and observed frequencies of one or more categories vary significantly for *** $p \leq 0.001$, ** $p \leq 0.01$ or * $p \leq 0.05$ based on Pearson's chi-squared test.

- The different categories of the subgroups follow the same frequency distribution of means of communication as in Table 17. Some differences stand out:
 - Male PhD candidates manage to communicate with their supervisors in person more than female PhD candidates. This might correlate with male PhD candidates frequenting their workplace more often than female PhD candidates (see Table 9).
 - PhD candidates with partner and/or children communicate less in person and more via telephone or audio call and text message with their supervisors compared to PhD candidates without partner or children.
 - PhD candidates in their finalising phase use the chat function less than PhD candidates in the other phases of their PhD research.

- Video calls are most used in the doctoral school of NSE followed by DSh. The doctoral school of NSE also communicates substantially more via chat. PhD candidates of DSh communicate substantially less with their supervisors in person and PhD candidates in the doctoral school of LSM communicate substantially more with their supervisors using text messaging.

TABLE 19. SUPERVISOR ACCESSIBILITY BY YEAR (% AND MEAN)

My supervisor is	2021 (n=718)	2020 (n=710)
much less accessible than usual	4.6	2.4
less accessible than usual	13.5	10.3
just as accessible as usual	67.5	70.3
more accessible than usual	8.6	12.3
much more accessible than usual	5.7	4.8
Total	100.0	100.0
Mean (on score between -2 and 2)	-0.03	0.07

Question: How would you rate the accessibility of your supervisor during the COVID-19 crisis?

- Most of the PhD candidates (67.5%) reports that their supervisor is just as accessible during the COVID-19 pandemic as before. This is slightly less than last year.
- However, almost one in five PhD candidates reports that their supervisor is less or much less accessible during the COVID-19 pandemic. This is substantially more than in 2020 (18.1% compared to 12.7%, respectively).
- Whereas the mean score of supervisor accessibility was slightly positive last year (0.07) it reverted to slightly negative this year (-0.03). On average, PhD candidates thus experience that their supervisor is less accessible than usual.

TABLE 20. SUPERVISOR ACCESSIBILITY BY SUBGROUPS (% AND MEAN)

	My supervisor is					Total	Mean
	much less accessible	less accessible	just as accessible	more accessible	much more accessible		
Gender (n=718)							
Male	4.1	10.3	71.6	9.4	4.7	100.0	0.00
Female	5.0	16.4	63.9	8.0	6.6	100.0	-0.05
Living situation (n=712)							
Without partner or children	5.3	12.2	63.9	9.7	8.8	100.0	0.04
With partner	4.7	15.2	69.7	8.1	2.4	100.0	-0.12
Single parent	0.0	0.0	69.2	23.1	7.7	100.0	0.38
Two-parent family	2.4	15.7	71.1	4.8	6.0	100.0	-0.04
Nationality (n=700)							
Belgian	6.6	21.1	66.0	5.3	0.9	100.0	-0.27 ^b
European	4.2	7.0	73.4	8.4	7.0	100.0	0.07 ^a
Non-European	2.5	7.5	64.9	13.4	11.7	100.0	0.24 ^a
PhD phase (n=713)							
Starting	2.7	14.1	71.1	6.0	6.0	100.0	-0.01
Executing	4.6	12.7	66.8	9.9	6.1	100.0	0.00
Finalising	6.5	15.3	65.9	7.6	4.7	100.0	-0.11
Doctoral school (n=709)							
DSh	5.7	11.8	68.3	8.0	6.1	100.0	-0.03
NSE	4.2	13.1	65.0	11.0	6.7	100.0	0.03
LSM	3.7	15.9	70.7	6.1	3.7	100.0	-0.10

Question: How would you rate the accessibility of your supervisor during the COVID-19 crisis?
 Note: within groups, means sharing a letter in their subscript are not significantly different at $\alpha = 0.05$ according to multiple comparison (Bonferroni).

- It is somewhat striking that single parent PhD candidates report that their supervisor is more accessible (0.38, albeit not significantly different because of small numbers in this category). This is also true for non-Europeans (0.24). This contradicts the hypothesis that social and work contacts of these categories were impacted more by the COVID-19 pandemic.
- However, nothing is known about the basis against which the comparison is made. These categories may not have frequent communication with their supervisors in the first place. Similarly, Belgian PhD candidates report that their supervisors are much less accessible (-0.27), but Belgian PhD candidates may be used to more frequent communication with their supervisors.
- Supervisors in the doctoral school of LSM are reported to be less accessible. This may be related to supervisors being needed elsewhere to cope with more urgent tasks related to the containment of the COVID-19 pandemic.

TABLE 21. SATISFACTION WITH SUPERVISOR ACCESSIBILITY BY YEAR (% AND MEAN)

	2021 (n=720)	2020 (n=710)
Totally unsatisfied	1.7	1.8
Unsatisfied	6.7	5.2
Neutral	18.1	14.5
Satisfied	37.4	41.1
Totally satisfied	36.3	37.3
Total	100.0	100.0
Mean	1.00	1.07

Question: How satisfied are you with the accessibility of your supervisor during the COVID-19 crisis?

- Most PhD candidates (73.7%) are still (totally) satisfied with the accessibility of their supervisor during the pandemic. The difference of 5 percentage points with last year (78.4%) is mainly transferred to PhD candidates being neutral about supervisor accessibility or being unsatisfied (18.1% compared to 14.5% and 6.7% compared to 5.2% respectively).
- The mean score of satisfaction with the accessibility of the supervisor falls between the minimum of -2 (totally unsatisfied) and 2 (totally satisfied). Overall, PhD candidates are satisfied with the accessibility of their supervisor(s). The average score is slightly lower than last year.

TABLE 22. SATISFACTION WITH SUPERVISOR ACCESSIBILITY BY SUBGROUPS (% AND MEAN)

	Totally unsatisfied	Unsatisfied	Neutral	Satisfied	Totally satisfied	Total	Mean
Gender (n=720)							
Male	0.9	5.8	18.1	37.6	37.6	100.0	1.05
Female	2.4	7.4	18.0	37.1	35.0	100.0	0.95
Living situation (n=714)							
Without partner or children	1.9	6.6	17.6	33.9	40.1	100.0	1.04
With partner	1.3	7.4	18.1	41.8	31.4	100.0	0.95
Single parent	0.0	0.0	15.4	53.8	30.8	100.0	1.15
Two-parent family	2.4	6.0	19.3	32.5	39.8	100.0	1.01
Nationality (n=702)							
Belgian	3.1	8.5	22.9	38.6	27.0	100.0	0.78 ^b
European	0.0	7.6	17.4	33.3	41.7	100.0	1.09 ^a
Non-European	0.8	3.8	12.6	37.2	45.6	100.0	1.23 ^{ab}
PhD phase (n=715)							
Starting	0.7	5.3	17.9	33.8	42.4	100.0	1.12 ^a
Executing	1.5	5.6	18.8	37.1	37.1	100.0	1.03 ^{ab}
Finalising	2.9	10.6	16.5	40.6	29.4	100.0	0.83 ^b
Doctoral school (n=711)							
DSh	2.3	8.4	14.4	35.0	39.9	100.0	1.02
NSE	2.1	6.0	16.9	35.9	39.1	100.0	1.04
LSM	0.0	5.5	25.0	43.9	25.6	100.0	0.90

Question: How satisfied are you with the accessibility of your supervisor during the COVID-19 crisis?
 Note: Within groups, means sharing a letter in their subscript are significantly different at $\alpha = 0.05$ according to pairwise comparison with Bonferroni correction for multiple comparisons.

- The different categories of the subgroups report the same mean satisfaction score as in Table 21. Some differences stand out:
 - Belgian PhD candidates are slight less satisfied with the accessibility of their supervisor during the COVID-19 crisis compared to the (non-)European PhD candidates. This is in line with the finding that Belgian PhD candidates consider their supervisors less accessible than usual (see Table 20).
 - PhD candidates in the starting phase of their research are significantly more satisfied with the accessibility of their supervisor than those in the finalizing phase.

Colleagues

The inability to work on-campus also has its consequences for social contact with colleagues. Social contact with colleagues is considered an important source of informal social support for PhD candidates. PhD candidates were asked about the frequency of contact with their colleagues (Tables 22 and 23), and which means they used to keep in contact (Tables 24 and 25). PhD candidates were also asked to indicate who initiate social contact with colleagues (Table 26). Note that the percentages in Tables 24, 25 and 26 do not add up to 100 percent, because PhD candidates could indicate multiple means of communication and multiple initiators of social contact.

TABLE 23. FREQUENCY OF INFORMAL CONTACT WITH COLLEAGUES (%)

	2021 (n=717)
Daily	8.2
Several times a week	19.9
Once a week	11.7
Several times a month	18.1
Once a month	16.2
(Almost) never	25.8
Total	100.0

Question: How often do you have informal contact with colleagues during the COVID-19 crisis?

- There is quite some variation in the frequency of informal contact with colleagues. Most striking is that one in four PhD candidates has (almost) never been in touch with colleagues during the COVID-19 pandemic. Almost 40 percent manages to get in touch at least once a week.

TABLE 24. FREQUENCY OF INFORMAL CONTACT WITH COLLEAGUES BY SUBGROUPS (%)

	Daily	Several times a week	Once a week	Several times a month	Once a month	(Almost) never	Total
Gender (n=717) *							
Male	7.6	20.8	13.8	13.5	17.3	27.0	100.0
Female	8.8	19.1	9.8	22.3	15.2	24.7	100.0
Living situation (n=711) *							
Without partner or children	10.0	22.2	12.8	18.8	13.8	22.5	100.0
With partner	7.8	20.6	11.1	16.6	19.9	24.0	100.0
Single parent	0.0	0.0	7.7	23.1	30.8	38.5	100.0
Two-parent family	4.9	11.0	11.0	19.5	9.8	43.9	100.0
Nationality (n=700) *							
Belgian	10.1	24.3	10.4	17.0	16.1	22.1	100.0
European	9.0	22.2	13.2	15.3	15.3	25.0	100.0
Non-European	5.9	13.4	12.6	19.7	16.7	31.8	100.0
PhD phase (n=712)							
Starting	7.9	15.9	14.6	21.2	13.9	26.5	100.0
Executing	8.7	22.5	11.0	17.1	16.1	24.6	100.0
Finalising	7.6	18.2	11.2	18.2	17.1	27.6	100.0
Doctoral school (n=708) *							
DSh	5.3	19.5	8.0	21.8	17.2	28.2	100.0
NSE	10.6	17.3	14.8	16.2	17.6	23.6	100.0
LSM	9.3	24.7	12.3	15.4	13.0	25.3	100.0

Question: How often do you have informal contact with colleagues during the COVID-19 crisis?
 Expected and observed frequencies of one or more categories vary significantly for *** $p \leq 0.001$,
 ** $p \leq 0.01$ or * $p \leq 0.05$ based on Pearson's chi-squared test.

- More male PhD candidates (42.2%) compared to female PhD candidates (37.7%) stay in touch with colleagues on a at least once a week basis.
- PhD candidates who live without a partner and without children maintain the most frequent informal contact with their colleagues compared to other living situations. PhD candidates with responsibilities that arise from parenthood (and that are also subject to the restrictive measures) seem less able to stay in touch with colleagues.
- One in three Belgian PhD candidates (34.3%) report informal contact with their colleagues at least several times a week. This is substantially more than non-European PhD candidates (19.3%), indicating a potential risk of loss of social support network for foreign PhD candidates because of the COVID-19 restrictions.
- PhD candidates in the doctoral school of LSM have the most frequent informal contact with their colleagues. Over a third reports informal contact at least several times a week, compared to 24.8 percent in the DSh and 27.9 percent in the doctoral school of NSE. This might be partially explained by the type and need of infrastructure to conduct their research, which also led them to frequent their workplace more often than PhD candidates in the DSh.

TABLE 25. MEANS OF INFORMAL CONTACT WITH COLLEAGUES (%)

	2021
Online videocall (Teams, Skype, Zoom...)	49.2
Online text communication (Messenger, WhatsApp, Discord...)	48.6
Real life activities (walk, museum, sport...)	23.3
Activity organized by PhD network (online beer tasting, quiz...)	6.5
Online games (Scribbl, Among Us...)	5.7
Other	2.9

Question: What kind of informal contact do you have with your colleagues? (Multiple answers possible)

- Half of the PhD candidates report communicating informally with colleagues using video calls and online text communication.
- Almost a quarter of PhD candidates met their colleagues on real life activities.
- Note that column percentages do not sum to 100 percent because PhD candidates could indicate multiple answers.

TABLE 26. MEANS OF INFORMAL CONTACT WITH COLLEAGUES BY SUBGROUPS (%)

	Online videocall	Online text communication	Real life activities	Activity organized by PhD network	Online games	Other
Gender (n=722)		**				
Male	47.8	42.6	23.3	6.1	7.3	2.3
Female	50.4	54.1	23.2	6.9	4.2	3.4
Living situation (n=715)		*	**			
Without partner or children	51.6	51.6	27.8	8.4	6.6	3.1
With partner	47.8	49.5	22.1	4.7	6.0	3.3
Single parent	53.8	23.1	7.7	0.0	0.0	0.0
Two-parent family	43.4	38.6	12.0	7.2	2.4	1.2
Nationality (n=703)			**	*		*
Belgian	51.4	51.7	22.9	5.0	7.2	4.7
European	49.0	51.0	33.8	4.8	6.2	2.8
Non-European	45.6	42.7	18.4	10.0	3.8	0.8
PhD phase (n=716)						
Starting	49.7	49.0	23.2	7.3	4.6	3.3
Executing	49.5	49.0	24.9	7.6	6.6	3.3
Finalising	48.0	48.0	20.5	3.5	4.7	1.8
Doctoral school (n=713)	*		**		*	
DSh	56.8	45.5	19.3	5.3	4.5	2.7
NSE	47.4	46.7	30.5	6.7	8.8	2.8
LSM	40.9	56.7	17.7	8.5	2.4	3.7

Question: What kind of informal contact do you have with your colleagues? (Multiple answers possible)

Expected and observed frequencies of one or more categories vary significantly for *** $p \leq 0.001$, ** $p \leq 0.01$ or * $p \leq 0.05$ based on Pearson's chi-squared test.

- The different categories of the subgroups follow the same frequency distribution of means of communication as in Table 25. Some differences stand out:
 - More female PhD candidates communicate via online text communications than male PhD candidates.
 - PhD candidates that are parents use less online text communication and are substantially deprived from meeting colleagues during real life activities. Again, this presumably relates to other responsibilities that arise from parenthood and that are also subject to the restrictive measures.
 - This also seems true of non-European PhD candidates. In turn, substantially more non-European PhD candidates meet colleagues informally during activities organized by PhD networks compared to Belgian and other European PhD candidates.
 - PhD candidates in the DSh are more likely to meet colleagues via video calls, whereas PhD candidates in the doctoral school of NSE are more likely to meet in real life activities and via online gaming.

TABLE 27. INITIATION OF INFORMAL CONTACT WITH COLLEAGUES (%)

	2021
PhD candidates/postdocs	56.1
(One of the) own supervisor(s)	13.0
Head of the research group	12.5
Other	7.3
PhD networks	6.6
Faculty (dean, secretariat...)	1.8

Question: Who organises this informal contact? (Multiple answers possible)

- PhD candidates themselves and postdocs are by far the most common initiator of informal contact.

TABLE 28. INITIATION OF INFORMAL CONTACT WITH COLLEAGUES BY SUBGROUPS (%)

	PhD candidates / postdocs	(One of the) own supervisor(s)	Head of the research group	Other	PhD networks	Faculty (dean, secretariat...)
Gender (n=703)			*			
Male	54.2	14.3	15.2	5.8	7.6	1.7
Female	57.8	11.9	10.0	8.7	5.8	1.8
Living situation (n=715)	**				*	
Without partner or children	58.1	14.1	10.9	7.8	9.4	2.5
With partner	60.2	11.0	14.4	6.7	5.4	1.0
Single parent	38.5	23.1	7.7	1.9	0.0	7.7
Two-parent family	36.1	14.5	12.0	13.2	2.4	1.2
Nationality (n=703)	*	**		*	**	**
Belgian	60.5	9.1	11.3	9.7	4.4	0.3
European	61.4	8.3	9.7	9.7	4.8	0.7
Non-European	47.3	20.1	15.5	3.3	10.9	4.2
PhD phase (n=716)						
Starting	57.0	10.6	11.3	7.9	6.6	2.0
Executing	58.6	13.2	12.9	6.6	7.9	2.0
Finalising	50.3	14.6	12.9	8.2	4.1	1.2
Doctoral school (n=713)			*			
DSh	55.3	14.8	11.0	6.8	6.1	2.7
NSE	58.2	13.7	16.5	8.1	5.6	1.8
LSM	53.7	9.8	7.9	7.3	9.8	0.6

Question: Who organises this informal contact? (Multiple answers possible)

Expected and observed frequencies of one or more categories vary significantly for *** $p \leq 0.001$, ** $p \leq 0.01$ or * $p \leq 0.05$ based on Pearson's chi-squared test.

- For the different categories of the subgroups PhD candidates themselves or postdocs are the most important initiators of informal contact with colleagues. Some differences stand out:
 - More male PhD candidates (15.2%) report their supervisor as an initiator of informal contact compared to female PhD candidates (10.0%).
 - PhD candidates with children report fellow PhD candidates or postdocs less as the initiator of informal contact with colleagues than PhD candidates without children. Note that PhD candidates with children already engaged less in informal contact in the first place (see Table 24).
 - Non-European PhD candidates are more likely to report more formal initiators of their informal contact with colleagues, such as their own supervisors and PhD networks.
 - In the doctoral school of NSE, the heads of the research groups are reported as initiators of informal contact significantly more than in the doctoral school of LSM and in the DSh (16.5% compared to 7.9% and 11.0%, respectively).

Successful submission

Impact on timing

PhD candidates were asked to what extent the COVID-19 pandemic affected the timing of their PhD trajectory (Tables 28 and 29). Those who indicated that the COVID-19 pandemic caused a delay, were then asked whether they had or planned to discuss an extension of their contract with their supervisor (Tables 30 and 31).

TABLE 29. IMPACT ON TIMING BY YEAR (%)

The corona measures	2021 (n=718)	2020 (n=711)
will give me more time to finish my PhD research	3.2	7.3
will not really have an impact on the timing of my PhD research	25.2	30.8
will delay my PhD research, but I expect to be able to catch up	33.0	27.4
will delay my PhD research and severely impact the successful completion of my PhD	6.8	3.1
make me concerned about the timing of my PhD, but it is not yet clear what the impact will be	31.8	31.4
Total	100.0	100.0

Question: Please indicate the answer that applies to the timing of your PhD research: the corona measures...

- In 2021, 39.8 percent of PhD candidates report that COVID-19 will cause a delay in their research, which is substantially more than 30.5 percent of PhD candidates in 2020. Most of them (33%) expect to be able to catch up, but almost 7 percent expect a severe impact on the successful completion of their PhD research. This has more than doubled compared to last year.
- One in four PhD candidates (25.2%) reports that COVID-19 does not really have an impact on their research. This is 5 percentage points less than in 2020.
- For 31.8 percent of PhD candidates, the impact of COVID-19 on their research is not yet clear. This about the same percentage as last year.
- The share of PhD candidates that is optimistic and expects the COVID-19 pandemic to give them more time to finish their PhD has halved compared to last year (3.2% compared to 7.3%, respectively).

TABLE 30. IMPACT ON TIMING BY SUBGROUPS (%)

	The corona measures					Total
	give more time	have no impact	delay but will catch up	delay and severely impact	impact not yet clear	
Gender (n=718)						
Male	2.1	23.8	36.2	7.4	30.6	100.0
Female	4.2	26.5	30.2	6.3	32.8	100.0
Living situation (n=712)						
Without partner or children	2.5	26.1	31.8	5.0	34.6	100.0
With partner	3.4	27.5	31.9	7.4	29.9	100.0
Single parent	7.7	15.4	30.8	7.7	38.5	100.0
Two-parent family	3.6	15.7	41.0	10.8	28.9	100.0
Nationality (n=700) *						
Belgian	0.9	25.9	29.7	7.6	36.0	100.0
European	2.8	27.6	31.0	4.8	33.8	100.0
Non-European	6.3	23.5	39.1	6.7	24.4	100.0
PhD phase (n=713) **						
Starting	2.0	32.2	28.2	2.7	34.9	100.0
Executing	2.5	21.4	32.8	7.6	35.6	100.0
Finalising	5.8	27.4	36.8	8.8	21.1	100.0
Doctoral school (n=709)						
DSh	4.2	26.0	28.2	8.0	33.6	100.0
NSE	2.1	25.4	35.2	5.3	32.0	100.0
LSM	3.7	23.3	37.4	7.4	28.2	100.0

Question: Please indicate the answer that applies to the timing of your PhD research: the corona measures...

Expected and observed frequencies of one or more categories vary significantly for *** $p \leq 0.001$, ** $p \leq 0.01$ or * $p \leq 0.05$ based on Pearson's chi-squared test.

- The different categories of the subgroups follow the same frequency distribution of means of the impact of the COVID-19 pandemic on their timing as in Table 29. Some differences stand out:
 - Non-European PhD candidates seem to be the most optimistic since 6.3 percent expects that the COVID-19 restrictions will give them more time to finish their research or 39.1 percent indicates that they will be able to catch up with the delay. Belgian PhD candidates are the least optimistic, since 7.6 percent expects severe delays and 36 percent does not yet know what the impact will be.
 - PhD candidates who are already further in their research trajectory more likely expect severe delays (8.8% of PhD candidates in their finalising phase and 7.6% of PhD candidates in their executing phase). PhD candidates in the starting phase are most likely to report no impact of the COVID-19 pandemic on their research (32.3%).

TABLE 31. DISCUSS CONTRACT EXTENSION (%)

	2021 (n=441)
Yes	28.6
No, but I am considering it	24.7
No	46.7
Total	100.0

Question: Did you discuss the possibility to extend your contract with your supervisor?

- The PhD candidates who indicated that the COVID-19 measures will cause a delay in their research were asked whether they already discussed the possibility of extending their contract with their supervisor. Almost 30 percent did do so. Another quarter is considering it, but almost half of PhD candidates expecting a delay did not discuss an extension of their contract.

TABLE 32. DISCUSS CONTRACT EXTENSION BY SUBGROUPS (%)

	Yes	No, but I am considering it	No	Total
Gender (n=441)				
Male	26.6	26.6	46.8	100.0
Female	30.5	22.9	46.6	100.0
Living situation (n=437)				
Without partner or children	26.7	21.1	52.5	100.0
With partner	30.6	27.8	41.7	100.0
Single parent	16.7	50.0	33.3	100.0
Two-parent family	31.9	27.7	40.4	100.0
Nationality (n=430)				
Belgian	27.1	22.7	50.2	100.0
European	30.7	23.9	45.5	100.0
Non-European	29.6	27.4	43.0	100.0
PhD phase (n=441)**				
Starting	15.7	22.5	61.8	100.0
Executing	24.5	27.7	47.8	100.0
Finalising	57.7	16.7	25.6	100.0
Doctoral school (n=436)				
DSh	32.4	23.0	44.6	100.0
NSE	23.5	28.1	48.5	100.0
LSM	32.7	20.8	46.5	100.0

Question: Did you discuss the possibility to extend your contract with your supervisor?

Expected and observed frequencies of one or more categories vary significantly for *** $p \leq 0.001$, ** $p \leq 0.01$ or * $p \leq 0.05$ based on Pearson's chi-squared test.

- The different categories of the subgroups follow the same frequency distribution of discussing contract extension in case of an expected delay in research caused by the COVID-19 pandemic as in Table 31. One difference stands out:

- Substantially more PhD candidates in the finalising phase (57.7%) report to have discussed the extension of their contract compared to PhD candidates in other phases of their research (24.5% in the executing phase and 15.7% in the starting phase). On the contrary, substantially less PhD candidates in the starting phase of their research (61.8%) reported not having discussed an extension of their contract.

Chance of successful submission

In each edition of the PhD survey, PhD candidates were asked to give a score between 0 and 10 to express the extent to which they estimate their chance of successfully submitting their PhD research. For this scoring 0 means that submission is totally unlikely and 10 means that submission is an absolute certainty. The recurrence of this questions allows to picture the evolution of the trend since last year. This comparison exceptionally uses longitudinal analysis. A comparison is made between the estimated chance of successful submission in 2021 compared to 2020, in 2021 compared to 2019, and in 2020 compared to 2019 (Table 32 and 33).

TABLE 33. CHANCE OF PHD SUBMISSION BY YEAR (%)

	2020 compared to 2019 (n=329)	2021 compared to 2019 (n=206)	2021 compared to 2020 (n=354)
Estimated lower	32.8	29.1	31.9
Estimated equally	38.3	37.9	33.3
Estimated higher	28.9	33.0	34.7
	100.0	100.0	100.0

*Question: On a scale of 0 to 10: do you think you will successfully submit your PhD?
(0= totally unlikely and 10= certainly)*

- In 2020, 32.8 percent of the PhD candidates estimated their chance to complete the PhD successfully lower compared to before the COVID-19 crisis (2019). In 2021, this is 4 percentage points less (29.1%). The group that estimates their chances higher than before the crisis has increased with 4 percentage points. Note that these are longitudinal results implying that these PhD candidates already progressed in their research for two years.
- 34.7 percent estimates their chances to submit successfully higher compared to last year, when the COVID-19 crisis had just started. One in three estimates their chances equally.

Summary and conclusion

At the beginning of calendar year 2020, PhD candidates faced the first wave of infection from the corona virus. Society went into lockdown. The consequences for PhD candidates were significant ([Glorieux, te Braak et al. 2020](#)). Working from home became mandatory, social contacts were greatly reduced, many data collections were halted, and other facilities such as schools and day-care centres also closed their doors which made the organization of working from home difficult. By the summer of 2020, there seemed to be light at the end of the tunnel. The COVID-19 pandemic seemed to be only a short pain. No less proved to be the case. Shortly after the start of the 2020-2021 academic year, the COVID-19 pandemic flared up again. It would be the precursor to an almost full year of working under COVID-19 restrictions.

The impact of the first lockdown of the COVID-19 pandemic on the work and well-being of PhD candidates at the Vrije Universiteit Brussel (VUB) was measured using a series of specific questions added to the annual PhD survey ([Glorieux, te Braak et al. 2020](#)). This year, during the fifth edition of the PhD survey, the same questions and some additional questions were asked. This report presents the results of these questions that measure the (extent of the) consequences of the COVID-19 pandemic for PhD candidates. Where possible, comparisons have been made with 2020. In addition, the results are broken down by characteristics that may experience different consequences of the COVID-19 restrictions for a variety of reasons. These include gender, living situation, nationality, phase of PhD research, and doctoral school. This section presents the main findings and conclusions.

General findings

In 2021, one in three PhD candidates does not know what the impact of the COVID-19 pandemic will be on their PhD research. This has not changed compared to 2020. Moreover, the share of PhD candidates whose research is severely impacted has rising from 3 percent in 2020 to 7 percent in 2021. Overall, one year of PhD research in almost complete lockdown has not improved the situation of PhD candidates VUB.

PhD candidates' substantive struggles with their research is visible in the large share of PhD candidates (60%) that had to adapt their research plan and one in three of them not receiving any help at all in doing so. More PhD candidates had to postpone their data collection or adjust their methodology compared to last year (42.5% vs. 39.3% and 25.6% vs. 19.9% in 2021 vs. 2020, respectively). Communication with supervisors is less frequent and less in person, leading PhD respondents to report less satisfaction with supervisor accessibility compared to last year.

The mandatory teleworking already associated negatively with PhD candidates' work and well-being in 2020. This association has worsened over the last year, with a substantial increase in the negative association between working from home and well-being (from -0.16 in 2020 to -0.53 in 2021 on a scale from -2 to 2; -2 being a very negative influence). On the contrary, most PhD candidates do not expect to return to their workplace daily after the COVID-19 restrictions have been lifted.

Frequenting the workplace more often is likely to improve informal contact with colleagues. Less than a quarter of PhD candidates managed to stay in touch with colleagues informally through real life activities. Informal contacts at work are an important source of a social support network. The lack of real-life activities or face-to-face contact is partly met by contact through video meetings. Still, it is notable that despite the importance of social contacts at work, PhD candidates indicate that it is mainly they or their postdoctoral colleagues who are the initiators of informal contacts.

Findings by subgroups

Underlying these general findings are some variations by different subgroups of PhD candidates.

Living situation

A stratification was made by PhD candidates' living situation. PhD candidates with social responsibilities and expectations towards partner and/or child(ren) faced consequences of the multiple COVID-19 restrictions, such as school and day-care closure, sharing home office with partner, inability to use their social network to care for their children, et cetera. This makes PhD candidates who are also parents – and especially single parents – a vulnerable group.

They received disproportionately less help in adjusting their research plan, even though a disproportionate share of them had to adjust it (70% of single parent PhD candidates needed to revise their research plan). They are most likely to have never frequented their workplace over the three months preceding the survey. Single parent PhD candidates report the highest negative associations between teleworking on the one hand and productivity and physical well-being on the other. Despite these associations and even though they also report a disproportionately low frequency of contact with their supervisors and with colleagues, PhD candidates who are also parents are hoping to continue working from home with some regularity. They did, however, report higher satisfaction with supervisor accessibility.

Nationality

Results were also stratified by PhD candidates' nationality. PhD candidates with non-European background faced substantial COVID-19 restrictions in establishing and maintaining a social network at the VUB or in Belgium let alone in travelling abroad. This makes non-European PhD candidates vulnerable for social isolation and all the consequences hereof.

Not all results confirm this assumption. Although non-European PhD candidates disproportionately needed to adjust their research plan, three in four received help from their supervisors on doing so. They represent the largest share of PhD candidates that could proceed with data collection, and they managed to keep in touch with their supervisors on a relatively regular basis. They are least likely not to know the impact of the COVID-19 pandemic on their PhD research. On the other hand, they also represent the largest share of PhD candidates that hopes to return to their workplace daily and that has the least informal contact with colleagues.

PhD Phase

Findings also varied in relation to the phase of the research trajectory PhD candidates consider themselves in. Undoubtedly, PhD candidates in all phases are affected by the COVID-19 pandemic, but the way varies. PhD candidates in their finalising phase were disproportionately more likely to adjust their research and they represent the highest share of PhD candidates with a very low frequency of supervisor contact. At the same time, they were more likely to discuss an extension of their contract because of a delay in their PhD research. PhD candidates in their starting phase were more likely to report that the impact of the COVID-19 pandemic is not yet clear to them and most eager to return to their workplace. PhD candidates in the executing phase frequented their workplace more often, which is not surprising since they are in the data-collection phase of their research and more often need specific infrastructure.

Doctoral school

The doctoral schools represent different types of research that may need different types of research infrastructure and thus may be impacted differently by the COVID-19 pandemic. PhD candidates in the DSh represented the lowest share of PhD candidates that received help with adjusting their research plan from either their supervisor or from colleagues. Yet they also represented the highest share of PhD candidates that could proceed with the data collection as planned (1 in 4). Even though PhD candidates in the DSh had the highest frequency of teleworking, the PhD candidates in the doctoral school of NSE experienced the largest negative impact of working from home. PhD candidates in the doctoral school of LSM most often postponed their data collection. Possibly these PhD candidates have been employed elsewhere to cope with more urgent tasks related to the containment of the COVID-19 pandemic. This might explain their disproportionately high frequency of informal contact with colleagues.

Gender

Findings were also stratified by gender since gender and diversity has been high on the VUB's agenda. Male and female PhD candidates seem to be impacted to a large extent in the same way by the effects of the COVID-19 pandemic. Any differences are most likely effects that rather relate to gender normative expectations and responsibilities.

Conclusion

The well-being of PhD candidates at the VUB has been impacted substantially by the COVID-19 restrictions over the past year. Two important conclusions can be drawn from these first results of the PhD survey 2021. Firstly, there is a high degree of uncertainty among PhD candidates. Many PhD candidates had to adjust their research plan, yet many did so without help from their supervisors. Many PhD candidates do not know what the eventual impact will be whereas others face challenges with their data collections. Many PhD candidates are faced with delays, yet only few have discussed a possible extension of their contract.

Secondly, the start of the academic year 2021-2022 will be an enormous challenge. The COVID-19 pandemic taught us that many prefer a combination of teleworking and working at the workplace. Yet this often dubbed "return to the new normal" comes with serious potential tensions among PhD candidates and possibly between PhD candidates and their supervisors. Especially when it comes to working from home, the results

stratified by subgroups not only reveal substantial variations in the extent to which PhD candidates plan or hope to work from home and at their workplace, but also in the reasons for doing so. Some will telework to better combine work and family life, yet some will shun telework to have more social interaction with colleagues or increased frequency of supervisor contacts. Others simply need to visit their workplace because they need certain research infrastructure. Supervisors and head of research groups are faced with the challenge of managing it all. How to organise teleworking of senior researchers (which often happen to be the ones with children) in a way that they are still around enough time to be available for junior researchers or exchange students? How to coordinate group projects? How to make sure no one misses out on important information? How to create social cohesion? How to inventory what the infrastructure should look like? How to manage access to research infrastructure? The results suggest that this will be very challenging. A clear set of handles and guidelines centrally managed from the VUB and tailored to the different doctoral schools and faculties would help meet the challenges and opportunities of the "new normal".

The covid-19 pandemic presented many challenges. Now, with the end in sight, it is time to turn these challenges into opportunities.

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