



PNN PhD Survey

Asking the relevant questions

Survey information, demographics and COVID-19

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Contents

Summary.....	2
Recommendations	2
Samenvatting	3
Aanbevelingen	3
Introduction	4
Covid-19	4
Survey background information	5
Design	5
Informed consent	5
Response rate	5
Completion rate	6
Data availability.....	6
Demographic characteristics	7
Gender.....	7
Age	8
Type of Institution	9
University.....	10
UMC	11
Discipline	12
PhD Phase	13
Type of PhD arrangement.....	14
PhDs at universities.....	14
PhDs at University Medical Centers	14
PhDs at non-University Medical Centers	15
PhDs at Universities of Applied Sciences	16
PhDs at independent research institutes	17
PhDs at other types of institutions	17
Overall PhD typology.....	17
International PhDs	19
COVID-19.....	20
Appendix	22
Informed consent form	22

Summary

- The PNN PhD survey was circulated between March 2nd 2020 and May 10th 2020. 2,034 individuals participated in the survey, of which 1,601 PhDs completed the survey. This is the first survey that collected data on PhDs in the Netherlands on a national level.
- Two weeks into data collection, the Dutch government announced the ‘intelligent lockdown’ to reduce the spread of COVID-19. This will have impacted the results to some extent. This does not disqualify the results of our survey in any way, as they do provide valuable information about the current situation of PhDs that can help policy makers to address current urgent issues.
- The survey was circulated via the local PhD representatives at Dutch universities. Whether and how the survey was circulated, varied per representative, resulting in varying representation of universities. Wageningen University and Research is best represented (33.1%), while University of Amsterdam and TU Delft are poorly represented (1.7% and 0.5%).
- Two thirds of the survey respondents are female. The mean age of the respondents is 29.8. 69.1% of the respondents are doing their PhD at a university, 21.9% at a UMC. 28.6% of the respondents are doing a PhD in Medical and health sciences. 72.5% of the PhDs are employee PhDs, 14.2% are scholarship PhDs. 40.2% of the PhDs are international PhDs.
- After the lockdown, around 10% of the PhDs mentioned COVID-19 or Corona in at least one of the open question in the survey.
- The open question about COVID-19 experiences, that was added to the survey one week after the implementation of the lockdown, was answered by 329 respondents. 34% of these PhDs explicitly mentioned to experience delays due to the lockdown. 29.2% mentioned not being able to collect data and 20.7% were not able to access research labs, equipment or data from home. 17.6% of the PhDs explicitly mentioned that an extension of their contracts would help them deal with the experienced delays.

Recommendations

- This survey was the first to investigate PhDs in the Netherlands on a national level. PNN supports current efforts to establish harmonized PhD surveys, but recommends to accelerate this process.
- Crises should not prevent PhD surveys from being circulated. Especially in times of crises, reliable information about the current state of PhDs is necessary to help them get through the crisis.
- COVID-19 has impacted many PhDs. Institutions should help these PhDs by extending their contracts in cases of delays, regardless the nature of the delay (research related or related to personal circumstances) or the type of PhD arrangement, treating employee PhDs, scholarship PhDs, external PhDs and other types of PhDs equally.

Samenvatting

- De PNN PhD survey werd verspreid tussen 2 maart 2020 en 10 mei 2020. 2,034 personen namen deel aan het onderzoek, waarvan 1,601 promovendi de survey volledig hebben ingevuld. Dit is het eerste onderzoek dat op nationaal niveau gegevens over PhD's in Nederland heeft verzameld.
- Twee weken na de start van de dataverzameling kondigde de Nederlandse regering de 'intelligente lockdown' aan om de verspreiding van COVID-19 te verminderen. Dit zal enige invloed hebben gehad op de resultaten. Dit diskwalificeert de resultaten van ons onderzoek op geen enkele manier, omdat ze waardevolle informatie geven over de huidige situatie van promovendi die beleidsmakers kan helpen om de huidige urgente problemen aan te pakken.
- De survey werd verspreid via de lokale promovendi-overleggen van de Nederlandse universiteiten. Of en hoe de enquête werd verspreid, varieerde per promovendi-overleg, wat resulteerde in een wisselende vertegenwoordiging van de universiteiten. Wageningen Universiteit en Research is het best vertegenwoordigd (33,1%), terwijl de Universiteit van Amsterdam en de TU Delft slecht vertegenwoordigd zijn (1,7% en 0,5%).
- Twee derde van de respondenten is vrouwelijk. De gemiddelde leeftijd van de respondenten is 29,8 jaar. 69,1% van de respondenten promoveert aan een universiteit, 21,9% aan een UMC. 28,6% van de respondenten promoveert in de medische en gezondheidswetenschappen. 72,5% zijn werknemerpromovendi, 14,2% zijn beurspromovendi. 40,2% van de promovendi zijn internationale promovendi.
- Na de lockdown noemde ongeveer 10% van de promovendi COVID-19 of Corona in ten minste één van de open vragen in de survey.
- De open vraag over de ervaringen als gevolg van COVID-19, die een week na de invoering van de lockdown aan de survey werd toegevoegd, werd door 329 respondenten beantwoord. 34% van deze promovendi heeft expliciet melding gemaakt van vertragingen als gevolg van de lockdown. 29,2% gaf aan geen onderzoeksdata te kunnen verzamelen en 20,7% had geen toegang tot laboratoria, apparatuur of gegevens vanuit de thuiswerkplek. 17,6% van de promovendi gaf expliciet aan dat een verlenging van hun contracten hen zou helpen om de vertragingen op te vangen.

Aanbevelingen

- Deze survey was de eerste die promovendi in Nederland op nationaal niveau onderzocht. PNN steunt de huidige onderneming om PhD surveys te harmoniseren, maar beveelt aan om dit proces te versnellen.
- Crises zouden geen reden mogen zijn om PhD surveys niet te circuleren. Juist in tijden van crisis is betrouwbare informatie over de huidige omstandigheden van promovendi noodzakelijk om hen door de crisis te helpen.
- COVID-19 heeft op veel promovendi impact gehad. Instellingen zouden deze promovendi moeten helpen door hun contracten te verlengen in het geval van vertragingen, ongeacht de aard van de vertraging (onderzoeksgelateerd of vanwege persoonlijke omstandigheden) en type promotietraject, opdat werknemerpromovendi, beurspromovendi, buitenpromovendi en alle andere soorten promovendi gelijk worden behandeld.

Introduction

On March 2nd, 2020, PNN launched the first ever PNN PhD survey. The aim of this survey was to get insights in the circumstances in which PhDs are working in the Netherlands. With the results of this survey, PNN aims to identify the biggest obstacles for PhDs during their trajectories, and consequently address these issues with graduate schools, universities, UMCs, other organisations that host PhDs, and policy makers on the local and national level.

Practically every Dutch university conducts their own, local PhD survey yearly. Though these surveys give a good local view on the circumstances of PhDs, a national image of the situation of PhDs in the Netherlands is still lacking. In addition, though many interesting topics are covered by these local surveys, the range of topics is rather limited.

In this survey, PNN asked about topics that are usually neglected in these local surveys and try to get more in-depth insights about them: we did not only ask whether PhDs were satisfied with their supervisor, but also whether they have ever considered changing supervisors. We did not only ask about their wellbeing, but also about whether they have experienced discrimination, sexual harassment or breaches of integrity in the workplace. We did not only ask about their teaching load, but also whether people who teach while they formally don't have to, get additional financial compensation. We did not only ask whether scholarship PhDs would choose this position again, but also what kind of PhD position they would prefer to have. All in all, the PNN PhD survey asked the relevant questions. Many PhDs were willing to answer our questions, even though the survey was quite long (between 15 to 60 minutes). The survey was started by 2,034 individuals, of which 1,601 completed the survey.¹

Covid-19

As a lot of other research, the COVID-19 crisis interfered with our survey. On March 12th, the Dutch government announced the 'intelligent lockdown'. This public health emergency severely impacted the working conditions of PhDs in the Netherlands, who were now forced to work from home, could not access their research equipment or data, and were dealing with increased levels of anxiety and stress. As it was never the intention of this survey to measure the consequences of this emergency situation on PhDs, we adapted the survey on March 20th (also we needed time to adapt to the 'new normal'), asking PhDs specifically to not take the current COVID-19 crisis into account, but to focus on their PhD trajectories before the 'intelligent lockdown'. We also added an open question at the end of the survey, where PhDs could elaborate on their experiences during the lockdown and the consequences of this crisis on their research. The length of the original survey prevented us from adding more questions about these exceptional circumstances. Luckily, many local PhD representatives conducted their own local COVID-19 surveys, which have allowed us to get some insights in the consequences of this grave situation.

Despite our efforts to filter COVID-19 out of our survey, this has not been fully successful. Though many topics should be rather insensitive to these exceptional circumstances, open questions regarding delays and mental wellbeing revealed that COVID-19 also played a role in the answers PhDs have given. Though this distorts the image of the situation of PhDs in a default setting, it does show us the current situation PhDs are in and, therefore, the urgency of improving the situation of PhDs.

This report will discuss the survey design and circulation, the demographic characteristics of our survey respondents, and an analysis of the question on COVID-19.

Finally, we would like to thank all participants of this survey for taking the time to fill in our lengthy survey to help us gain better insights in their situation!

¹ More information about the completion rate can be found later in this document.

Survey background information

Design

The survey is a mix of traditional PhD survey questions regarding teaching, wellbeing and supervision, and questions addressing topics that usually lack from PhD surveys. A part of the questions used in the survey were taken from previous research and existing PhD surveys, while many questions were also developed from scratch. The PNN PhD survey was built using Qualtrics. We strived to cater the survey to the large variety of types of PhDs that exist in the Netherlands. This had as a consequence that not all PhDs have answered all questions. When the results concern such a subgroup, we will clearly state this. All questions, except for the informed consent confirmation question, were voluntary, giving the participants perfect freedom in providing the information they wanted and skipping whichever question they did not want to answer. Respondents could also go back in the survey to some extent to change previous answers. However, due to the customization of the survey, returning to previous question was not always technically possible. When respondents arrived at such a 'point of no return', there were notified about this before passing that point, giving them a last opportunity to reconsider their answers. The survey was tested extensively both by PNN board members as well as external PhDs from all sorts of PhD arrangements and external experts. This greatly helped to improve the survey and to find any hick-ups in the complex survey flow. We are very grateful for their help.

Informed consent

Before participation in the survey, all respondents were asked to confirm that they have read the informed consent form and to decide whether they would agree with the conditions of participating in the survey. This informed consent form (fully included at the end of this report) shortly described the purpose of the survey, and stressed the importance of filling in this survey next to the many local PhD surveys that already exist. Potential respondents were also told that they could voluntarily sign up for a lottery to win a personal career coaching session. We also stressed that PNN would collect and analyse the data, with help from Nadine Kanbier and Christine Teelken.

The informed consent text furthermore explicitly asked respondents to confirm that they had understood and approved of the following points:

- Participants could stop the survey at any point
- Participants could skip any question they preferred not to answer, except for the informed consent question
- The data will be recorded anonymously
- The data will not be shared with other parties
- Results will only be presented if they do not allow for individual participants to be identified based on the results

If a respondent did not agree with this consent form, the survey was terminated immediately.

Response rate

The fully online survey was first circulated on March 2nd 2020, and data collection closed on May 10th 2020. The news about the survey was sent to the members of PNN, the local PhD representatives, who were asked to circulate the survey amongst the PhDs of their institution. Some representatives sent around a separate email about the survey, others placed it in a newsletter.

These different ways of circulating have influenced the response quite a lot, with the first method appearing to be more effective at reaching PhDs than the latter. Two representatives (UvA and TU Delft) did not circulate the survey, resulting in low response from these two universities. Circulation at University Medical Centers was difficult as well, resulting in two UMCs being very well represented while other UMCs strongly lag behind. The most effective circulation of the survey occurred at Wageningen University and Research (WUR), where the

PNN PhD Survey practically replaced the local PhD survey which was cancelled due to COVID-19. This led to a very large response from WUR. Further details on the representation of all universities and UMCs can be found in the section on Demographics. Next to circulation via PNN members, the survey was at a later stage also circulated via social media. This resulted in limited additional response.

It is very difficult to calculate exactly how many PhDs of the total PhD population in the Netherlands have filled in the survey, as the total number of PhDs in the Netherlands is unknown. Though numbers on the number of PhDs are available for universities at VSNU², similar numbers are lacking for UMCs. In addition, these numbers only include employee PhDs, while even the VSNU distinguishes no less than five other types of PhDs. Based on the yearly number of PhD defences in the Netherlands, which is approximately 5,000³, we could estimate the total number of PhDs between 20,000 and 25,000. This would mean that between 8% and 10% of the PhDs in the Netherlands have responded to our survey.

Completion rate

2,034 people started the survey. 14 of them did not agree with the consent form and were automatically excluded from the survey. As the survey only targeted current or recently finished PhDs, PhDs who had not started their trajectory (n=4) and PhDs who have defended their thesis before 2019 (n=5) were excluded from participation in the survey. Furthermore, not all participants reached the end of the survey, and not all who reached the end of the survey were actually participating in the survey. To distinguish proper participants from drop-out participants, we took a list of 16 questions that all participants would get to see during the survey. A missing value analyses of these 16 questions revealed that individuals with 6 or more questions missing from this list had dropped out from the survey at some point. This analysis also revealed that 31 individuals had clicked through the entire survey without answering a single question.

To keep the number of respondents relatively stable for all topics, we decided to label anyone who had 6 or more questions missing from that list as not having finished the survey. They were therefore excluded from the main analyses in the survey reports. After this selection, 1,601 individuals remained in the survey, resulting in a 78.7% completion rate. Given the length of the survey, we consider this a relatively high completion rate. Most PhDs completed the survey within 15 to 45 minutes. For the demographic characteristics, results with and without the non-finishers can be found in the supplementary tables. For any other results, results including the non-finishers can be requested from the authors.

Data availability

Due to the sensitive nature of several topics in this survey, and the vulnerable, dependent position PhDs are in, we promised in our consent form that the data would not be shared with third parties and that we would not present results that would allow for individual participants to be identified. This means that we cannot share the data publicly.

However, we aim to be as open as possible about our results. As the survey contains a lot of information, reducing these data to readable results takes a lot of time. Therefore, we cannot present results for all possible groups. We have tried to select the most interesting results to present, but of course we may have missed something. If anyone would be interested in seeing results for a different combination of variables, they can contact us and we can discuss the possibilities. We will however never share raw data and will not present results when we feel the sample is not representative for that subgroup or the results would allow for identification of individuals. As all analyses are done in SPSS 26, we are happy to share our syntax-files with interested readers as well.

² VSNU (2020). Downloadbare gegevens personeel.

https://www.vsnu.nl/f_c_personeel_downloads.html

³ OCW in cijfers (2020). Aantallen gepromoveerden in Nederland.

<https://www.ocwincijfers.nl/wetenschap/universitair-onderzoek/promoties-nederland>

Demographic characteristics

Gender

At the beginning of the survey, we asked the participants to indicate their gender. The results can be found in figure 1. The survey was filled in most often by women: two thirds of the respondents is female, while less than one third is male. 0.4% of the participants did not identify as male or female, 1.2% choose the option prefer not to say, and 1 respondent did not answer this question. Given the low numbers for the category other and prefer not to say, we will not display any results for these categories in further analyses.

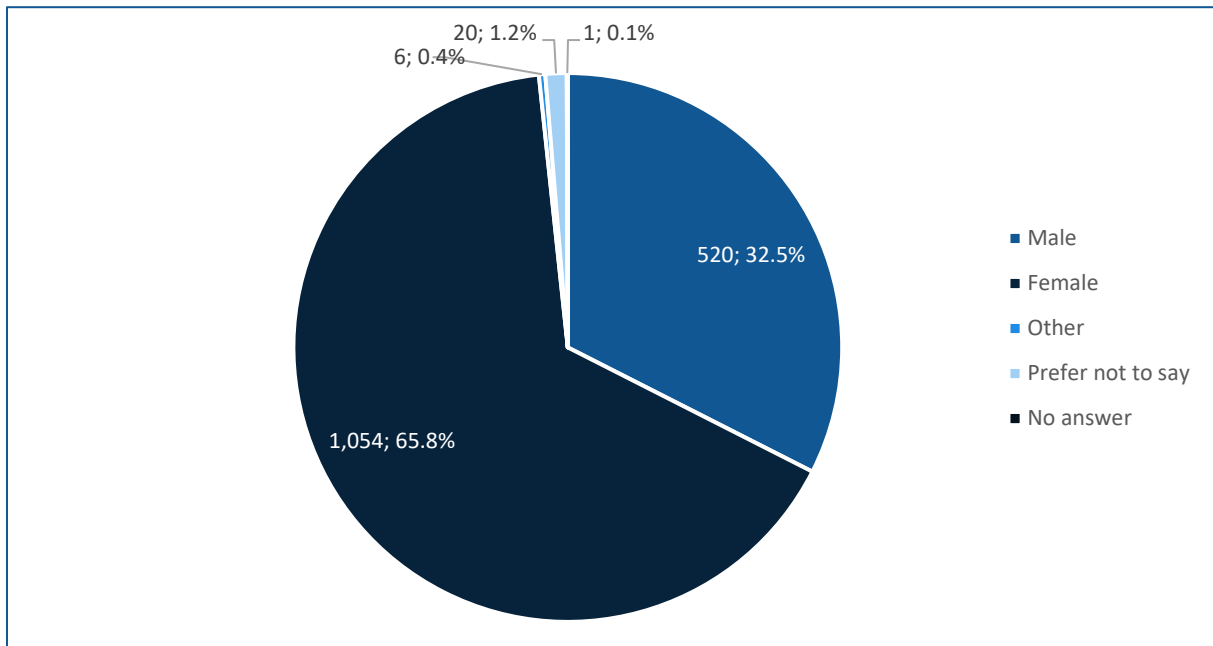


Figure 1: Response to the question: "What is your gender?" (n=1,601).

Age

Respondents were also asked to report their age (figure 2). As some respondents filled in implausible answers, we recoded all ages below 21 and over 75 as missing. The large majority of PhDs is aged between 26 and 30, followed by age 31-35 and 21-25. Only 6% of PhDs was aged over 40. The mean age of the respondents is 29.8 with a standard deviation of 5.2, the mode is 28, the lowest age encountered is 21 and the highest age (after our selection) is 72.

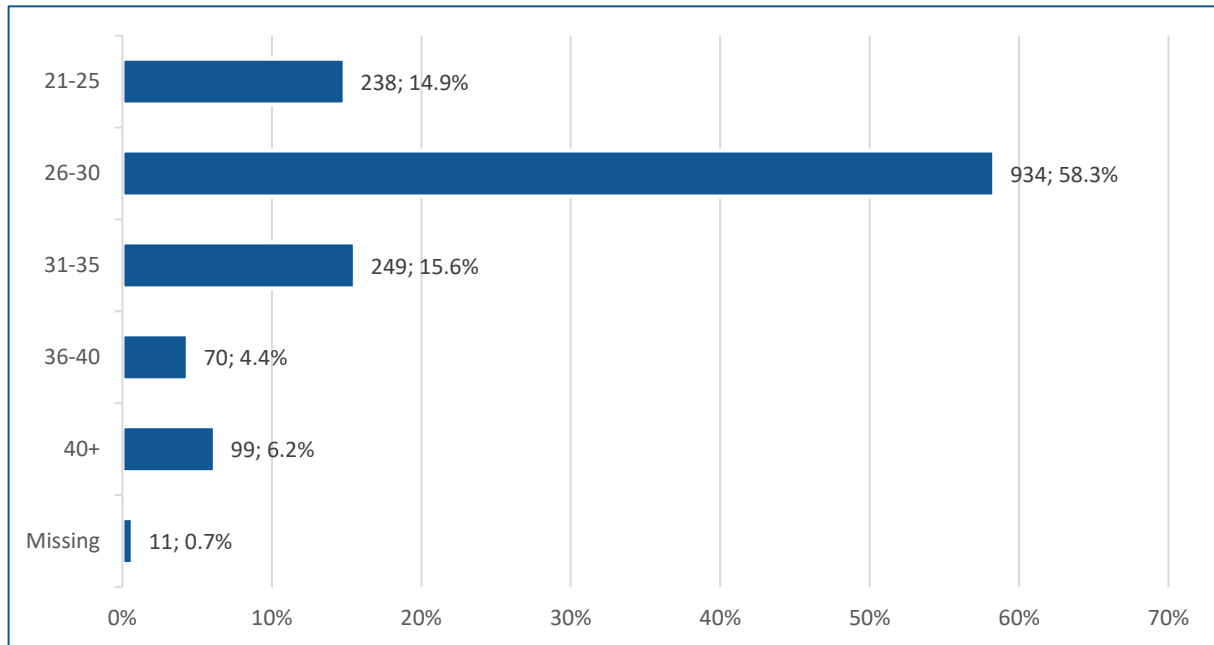


Figure 2: Response to the question: "What is your age?" (n=1,601, mean = 29.8, standard deviation = 5.2).

Type of Institution

The respondents were asked at what kind of institution they were doing their PhD. They were given the following options: “University”, “University Medical Center”, “non-University Medical Center”, “Research institutes connected to a University”, “Independent research institute”, “University of Applied Sciences” and “Other, namely...”. For those who answered “Other, namely...” and provided an open answer (n=22), we analysed the answers to see whether their institution could be categorized into one of the existing categories. This was the case for 9 respondents. Figure 3 shows that the large majority of the respondents is doing their PhDs at a University (69.1%). The second largest group is doing their PhD at a University Medical Center. 14 PhDs did not fit into these six categories. This was mostly due to their projects being linked to several types of institutions at the same time, making it difficult to categorize them. One of these 14 had not provided an open answer.

Due to the small numbers in the categories other than University and UMC, we will use a 3-group classification of type of institution when discussing other survey results. In this classification, we combine the categories university and research institution affiliated to a university into one category, keep a separate category for University Medical Centers, and combine the independent research institutes, non-University Medical Centers, Universities of Applied Sciences and other into one category, labelled ‘Other’.

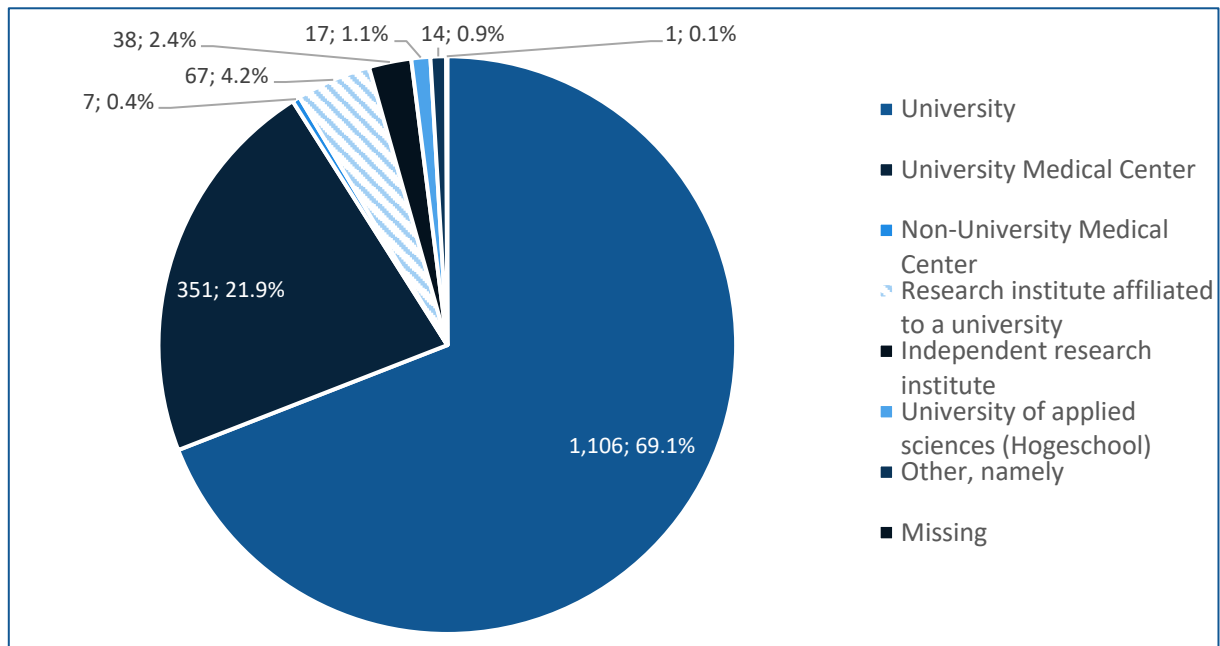


Figure 3: Response to the question: "At what type of institution are you doing your PhD?" (n=1,601).

University

The PhDs who stated they were doing a PhD at a university, were asked at which university they were doing their PhD. Individuals who were doing their PhD at an independent research institute, a research institute connected to a University, a University of Applied Sciences or another type of institution were asked to which university their PhD projects were connected. These questions have been combined in one variable indicating the university that will grant the PhD degree.

The results (figure 4) clearly show that there are big differences in the representation of the universities. Wageningen University and Research stands out, accounting for one third of the respondents who are doing their PhD at a University, followed at a large distance by the Vrije Universiteit. In contrast, TU Delft is practically absent from this survey. These large differences are caused by variation in the circulation rates of the survey at these universities. At the University of Amsterdam, TU Delft, Open University and University of Humanistic Studies, the survey was not formally circulated due to another survey being circulated at the time, resulting in this low response. Though the distribution of respondents over universities is far from ideal, most universities are well represented in the survey, which makes this survey capable of making claims about the situation of PhDs in the Netherlands. This is a step forward compared to previous research, where conclusions could only be based on information on PhDs from one university.

The large differences in the representation of the universities refrains us from making any claims about differences between universities.

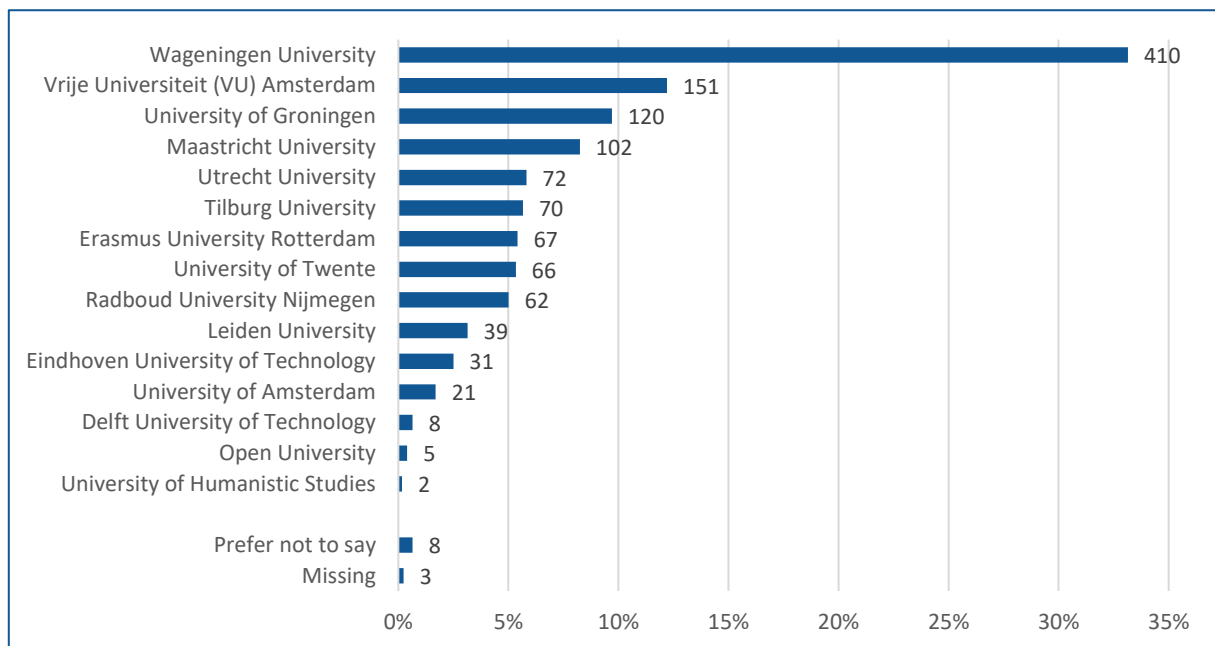


Figure 4: Combined response to the question: "At which university are you doing your PhD?" and "To which university is your PhD project connected?" (n=1,237).

UMC

The PhDs who stated they were doing a PhD at a University Medical center were asked at which UMC they were doing their PhD. Individuals who were doing their PhD at a non-University Medical Center were asked to which UMC their PhD project was connected. These questions were combined into one variable indicating the UMCs that are connected to these PhD projects.

The results show that the response is not equally distributed over the UMCs (figure 5). Leiden UMC and Erasmus MC Rotterdam are very well represented, accounting for 42.7% and 29.6% of the UMC responses, but the other UMCs follow at a very large distance, with mostly only between 10 and 15 respondents per UMC. The results for UMCs may therefore be less representative than we would have liked. However, it is still a step forward from results based on one UMC only.

The large differences in the representation of the UMCs refrains us from making any claims about differences between UMCs.

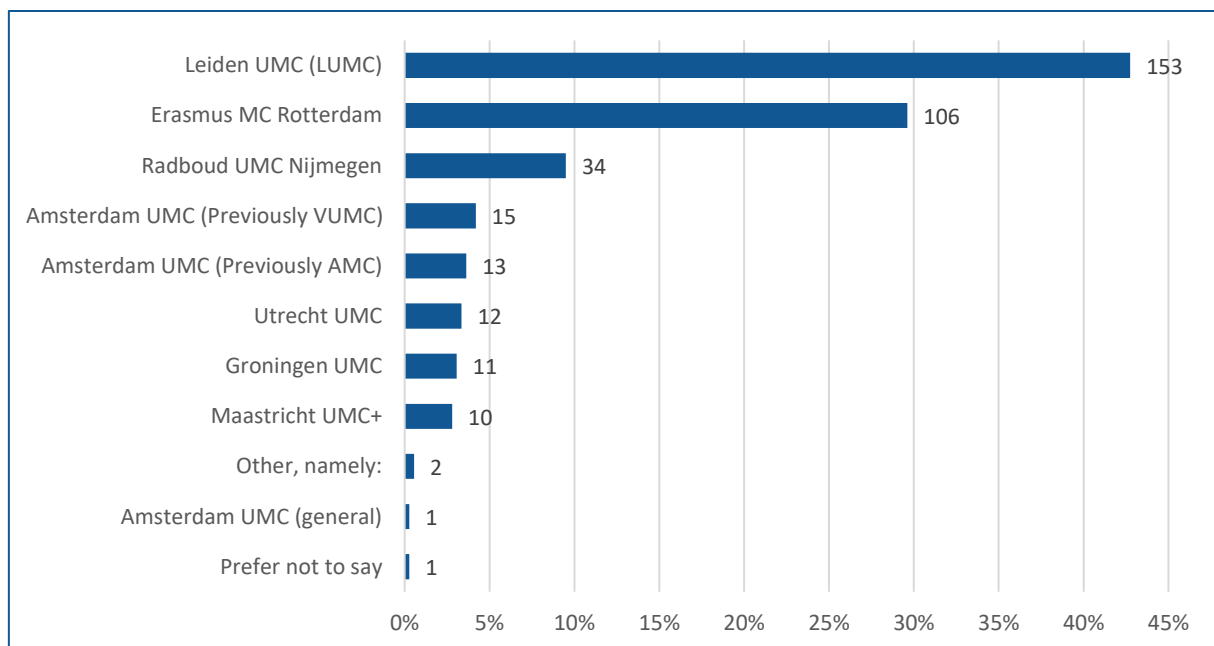


Figure 5: Combined response to the question: "At what UMC are you doing your PhD?" and "To which UMC is your PhD project connected?" (n=358).

Discipline

We asked all PhDs in which discipline they are doing their PhDs. We distinguished between the following disciplines, using the HOOP-classification:

- Agricultural sciences
- Behavioural and social sciences
- Economics and business
- Humanities
- Law
- Medical and Health sciences
- Natural sciences
- Technical sciences and Engineering
- Other, namely...
- Prefer not to say

A significant share of the PhDs chose the option 'Other, namely' (6.4%). One coder analysed the responses to this item, and though some disciplines were indeed hard to classify (35%), many could be easily classified in one of the eight categories. We therefore manually assigned these PhDs to the matching discipline.⁴

All disciplines are well represented in the survey, though some are more common than others (Figure 6). The largest discipline in our survey is Medical and Health Sciences (28.6%), followed by Behavioural and Social Sciences (21.5%) and Natural sciences (16.3%). The smallest discipline in the survey is Law (3.9%).

As each discipline has at least 62 respondents, we will make claims about differences between disciplines when discussing other survey results.

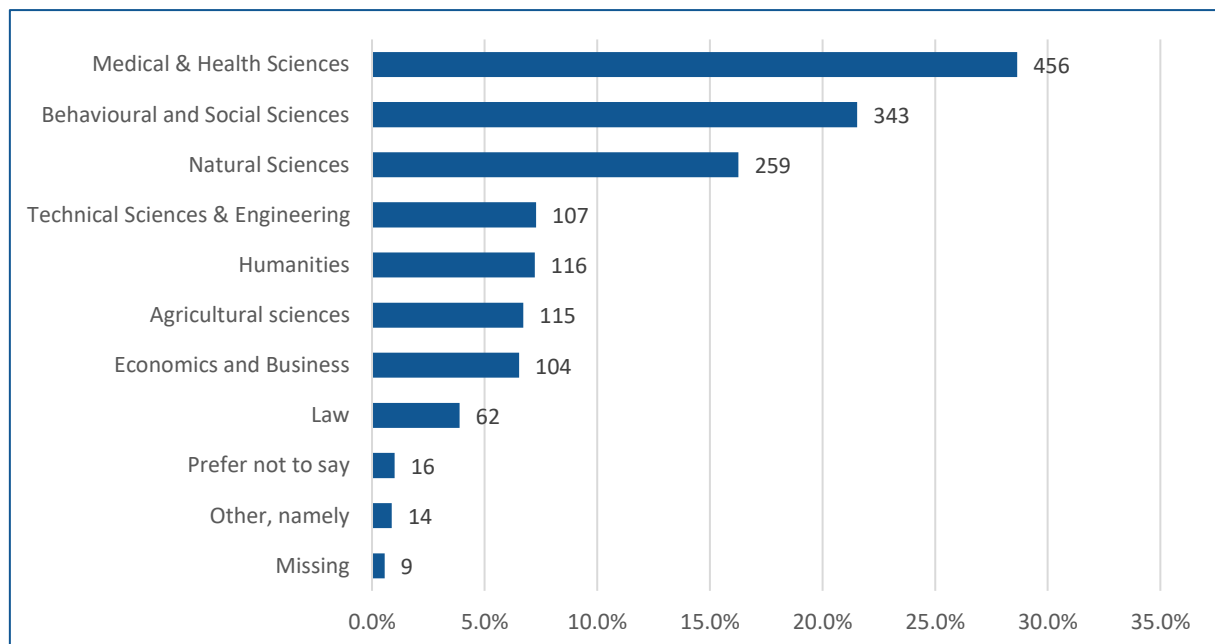


Figure 6: Response to the question: "What is your discipline?" (n=1,601).

⁴ An overview of which types of fields have been classified manually can be requested from the authors.

PhD Phase

We have asked the PhDs in which year and in which month they started with their PhD projects. For the sake of calculating the duration of the PhD trajectory so far, we assumed that the project started on the first day of that month. We calculated the duration of the project by subtracting the start date from the date on which the PhD filled in the survey. These results were subsequently categorised into year groups. Those who were in their sixth or more year were combined into one category.

The respondents of the survey are quite evenly distributed over the traditional four years of the PhD trajectory (figure 7). We also see that there are quite some PhDs in the fifth year of their project (8.8%) or even in their sixth or higher year (5.6%).

Not all PhDs who are in the fifth or later years of their PhD trajectory are still working on their PhD project (figure 8). Several PhDs have recently finished their PhDs (11.5% in the fifth year, 9.1% in the sixth or higher year). However, there is also a significant group who are still working on their PhD projects, but whose formal PhD agreement has ended. This is the case for 12.9% of the PhDs in their fifth year and 23.9% of the PhDs in the sixth or higher year. Even 1.7% of the PhDs in the fourth year indicate that they are still working on their PhD project while their formal PhD agreement is finished.

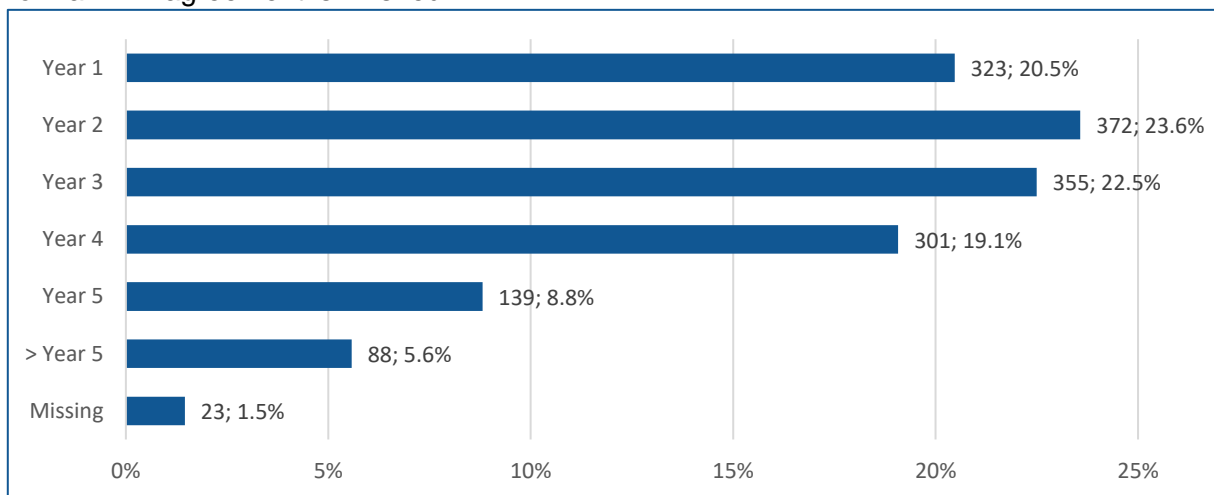


Figure 7: PhD phase of the respondents (own calculations, n=1,601).

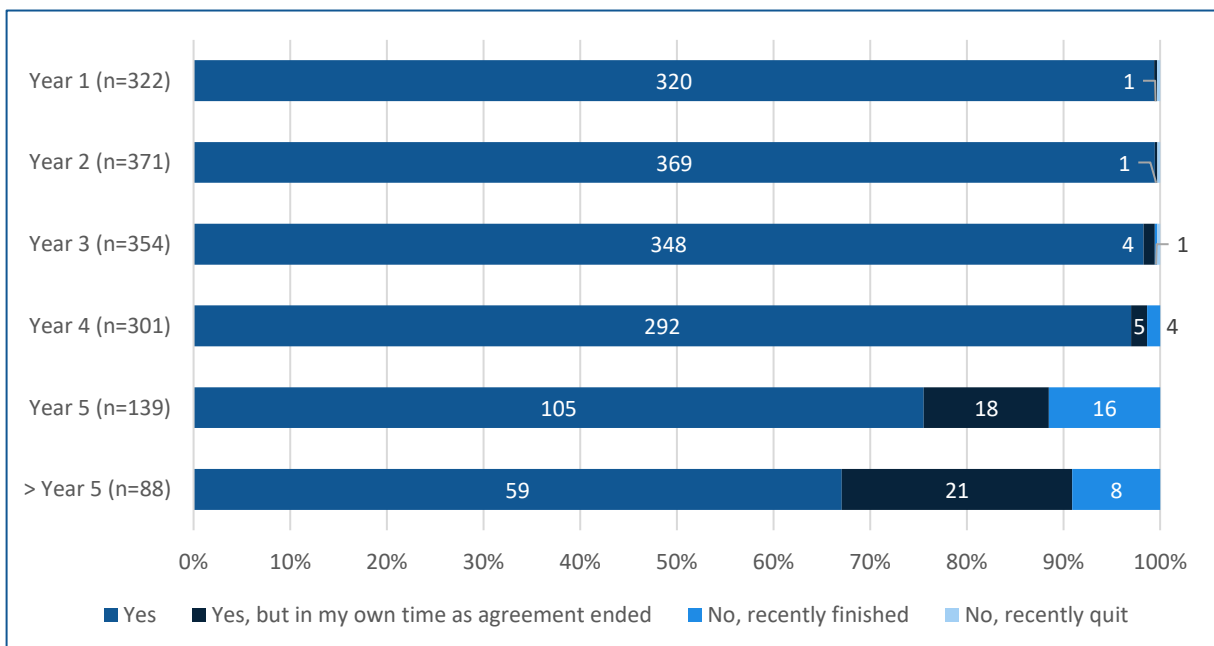


Figure 8: Response to the question: "Are you currently working on your PhD project?", per PhD phase (n=1,575). Only 3 PhDs recently quit their PhD projects, 1 in year 1, year 2, and year 3 each.

Type of PhD arrangement

To determine the type of PhD arrangement, we used several questions, depending on the type of institution the PhDs were doing their PhD at. Using these institution-specific typologies, we subsequently created an overall typology of PhDs. Here we will discuss the construction of the typology, as it will be used to present results on many subjects in subsequent reports. In the PNN Survey report on Contract characteristics, we will go into the results concerning these PhDs types in greater detail.

PhDs at universities

PhDs who had stated that they were doing their PhD project at a university or at a research institute affiliated to a university were asked a list of five questions, based on the VSNU PhD-typology⁵, to determine the type of PhD:

1. Do you receive a salary, scholarship, financing, or time to do your PhD?
 - Yes → question 2 was asked,
 - No → the PhD was initially classified as **external PhD**.
2. Do you have an employment contract with your university? (For example, a scholarship contract is not an employment contract).
 - Yes → question 3 was asked
 - No → question 4 was asked.
3. Is "PhD Candidate" your official job title (in Dutch: UFO-profiel)?
 - Yes → the PhD was initially classified as **employee PhD**
 - No → the PhD was initially classified as **an employee pursuing a PhD**.
4. Do you receive a scholarship for your PhD project?
 - Yes → question 5 was asked
 - No → the PhD was initially classified as an **externally financed PhD**.
5. Do you receive the scholarship from your university or from an external funder?
 - "My university" → the PhD was initially classified as a **scholarship PhD, university funded**.
 - "External funder" → the PhD was initially classified as a **scholarship PhD, externally funded**.

After this initial classification, we showed all PhDs a description of the type of PhD they were classified as, and asked them whether they recognized themselves in this description. This allowed the PhDs to correct any misclassification. If the PhDs did not recognize themselves in their classified type, they were asked which type of PhD they were, given the choice between the six options mentioned above, and a seventh option "Other, namely". Their choice was then taken as their final PhD type. PhDs who did not answer some of the presented question, preventing the survey to classify them, were asked to choose their PhD type themselves as well. That choice was taken as their final PhD type too. The answers of the PhDs who answered "Other, namely" were recoded afterwards to fit in the existing categories.

PhDs at University Medical Centers

University Medical Centers (UMCs) do not have a clear typology as the one for Universities, and the typology for university PhDs does not cover the large variety in options within UMCs. Therefore, we tried to adapt the existing typology to the practice of UMCs. We asked UMC PhDs the following set of questions.

1. Do you receive a salary, scholarship, financing, or time to do your PhD?
 - Yes → Question 2 was asked
 - No → The PhD was initially classified as an **external PhD**
2. Do you have an employment contract with your University Medical Center? (For example, a scholarship contract is not an employment contract).

⁵ VSNU (2019). Een gezonde praktijk in het Nederlandse promotiestelsel, page 13.

https://www.vsnu.nl/files/documenten/Nieuwsberichten/Een_gezonde_praktijk_in_het_Nederlandse_promotiestelsel.pdf

- Yes → Question 3 was asked
 - No → Question 6 was asked
3. Are you a medical doctor? (M.D., in Dutch: basisarts)
 - Yes → Question 4 was asked
 - No → Question 5 was asked
 4. What is your job title? (Version for medical doctors)
 - **Physician-Researcher** (arts-onderzoeker) → The PhD was initially classified as such.
 - **Researcher in training** (onderzoeker-in-opleiding, oio) → The PhD was initially classified as such.
 - **Resident not in training** (ANIOS) → The PhD was initially classified as such.
 - **Resident in training** (AIOS) → The PhD was initially classified as such.
 - **Resident in training and clinical researcher** (AIOSKO) → The PhD was initially classified as such.
 - **Physician in training for researcher and GP** (AIOTO) → The PhD was initially classified as such.
 - Other, namely → The open answer was recoded afterwards.
 5. What is your job title? (Version for not medical doctors)
 - **Researcher in training** (onderzoeker-in-opleiding, oio) → The PhD was initially classified as such.
 - **Junior researcher** → The PhD was initially classified as such.
 - **Junior lecturer** → The PhD was initially classified as such.
 - **Student-assistant** → The PhD was initially classified as such.
 - Other, namely → The open answer was recoded afterwards.
 6. Do you receive a scholarship for your PhD project?
 - Yes → Question 7 was asked.
 - No → The PhD was initially classified as an **externally financed PhD**.
 7. Do you receive the scholarship from your University Medical Center or from an external funder?
 - “My University Medical Center” → The PhD was classified as a **scholarship PhD, university funded**.
 - “External funder” → the PhD was initially classified as a **scholarship PhD, externally funded**.

Combined, the typology for UMC PhDs consisted of no less than 14 categories. These PhDs were subsequently also shown a description of the type of PhD they were classified as, and were asked whether they recognized themselves in this description. If they did not recognize themselves in that description, they were asked to choose their PhD type themselves, from that list of 14 categories, and a 15th category “Other, namely...”. Their choice was then taken as their final PhD type. PhDs who had not answered some of the presented questions, preventing the survey from classifying them, were asked to choose their PhD type themselves as well. That choice was then also taken as their final PhD type. An analysis of the open answers to the option “Other, namely” revealed that many PhDs filled in “PhD” or “researcher”. Therefore, these were included as separate categories in the final creation of the UMC PhD typology.

PhDs at non-University Medical Centers

At non-University Medical Centers (nUMCs), PhDs are hired in a different way compared to UMCs. Scholarship PhDs for instance cannot be hired at nUMCs. Therefore, we again used a different set of question to determine the type of PhDs.

1. Do you get salary, financing or time to do your PhD?
 - a. Yes → Question 2 was asked
 - b. No → The PhD was classified as an **external PhD**, and question 2 was asked.
2. Are you employed by your non-university medical center?

- a. Yes → The PhD was initially classified as **nUMC employed** and question 3 was asked.
 - b. Yes, but I am also employed a university medical center → The PhD was initially classified as **employed by both UMC and nUMC**, question 3 was asked, and question 5 would be asked after question 3
 - c. No, I am employed by a university medical center → The PhD was classified as **employed by UMC**, question 3 was asked, and question 5 would be asked after question 3.)
 - d. No, I have a different employer → The PhD was initially classified as **external PhD** and question 3 was asked.
3. Are you a medical doctor? (M.D., in Dutch: basisarts)
 - a. Yes → Question 4 was asked, unless question 2 was c., then question 5 was asked
 - b. No → Question 4 was asked, unless question 2 was c., then question 5 was asked, or unless question 2 was d., then this flow ended.
 4. In which "functiegroep" are you registered for your job at the non-university medical center? (For example: a research nurse is usually in functiegroep 55, and an ANIOS is usually in functiegroep 65.) If you do not know, please fill in 0.
 - a. 0 → PhD was classified as **function group unknown**, combined with the previous acquired classification of nUMC employed or employed by both UMC and nUMC. If Question 3 was answered b. question 5 was asked.
 - b. >0 → PhD was classified as **function group known**, with the previous acquired classification of nUMC employed or employed by both UMC and nUMC. If Question 3 was answered b. question 5 was asked.
 5. What is your role in the University Medical Center?
 [The same fifteen options as asked UMC PhDs when they did not recognized themselves in their classification] → the PhD was assigned as such.

In practice, only 8 respondents stated they were doing their PhD at a nUMC, making this scheme largely obsolete. For instance, as we had expected, there were no PhDs indicating that they were only employed by a UMC. In the end, we only distinguished between the following types of PhDs:

- Only nUMC employed, function group known
- Only nUMC employed, function group unknown
- nUMC and UMC employed, function group known
- nUMC and UMC employed, function group unknown
- External PhD.

PhDs at Universities of Applied Sciences

For PhDs at Universities of Applied Sciences (HBO), there are only two possible options for pursuing a PhD: as an externally financed PhD or as an external PhD. Therefore, one question sufficed to classify PhDs at HBOs:

- Do you get salary, financing or time to do your PhD?
 - Yes → The PhD was classified as an **externally financed PhD**.
 - No → The PhD was classified as an **external PhD**.

After this question, we showed the PhDs a description of the type of PhD they were classified as, and asked them whether they recognized themselves in that description. If they did not recognize themselves in the description, they asked to choose their PhD type themselves. This choice would then be their final classification. If someone had not answered the classification question, they were given the option to choose their own PhD type themselves as well.

In practice, all 21 PhDs at HBOs were classified as externally financed PhDs.

PhDs at independent research institutes

For PhDs at independent research institutes, the classification and options is very similar to the classification of PhDs at universities. The most important difference is that the job title of PhD candidates is not “PhD”, but researcher in training (in Dutch: *onderzoeker in opleiding, oio*). Therefore, we used the same classification here as we used for PhDs at universities, only replacing the word ‘university’ with ‘research institution’ and the job title ‘PhD’ with ‘Researcher in training (*Onderzoeker in opleiding, oio*). Just like for the PhD at the previously described institutions, these PhDs were also asked whether they recognized themselves in the descriptive text about their classification, and if they did not, they were given the option to choose their type of PhD themselves. PhDs who had not answered some of the presented questions, preventing the survey to classify them, were asked to choose their PhD type themselves as well. That choice was then also taken as their final PhD type.

PhDs at other types of institutions

For PhDs at other types of institutions, we decided to not classify them using a set of questions, like we had for the previous types of institutions, but to offer respondents a choice between the six types of PhDs from the university PhD-typology, and a seventh option “Other, namely”, immediately.

Overall PhD typology

Though these institution-specific typologies give great insights in the variation that exists within institutions, they are less convenient for acquiring a complete image of the type of PhDs of all PhDs in total. Therefore, constructed one variable that combined all classifications into one overall classification. For the main categories of this classification are

- Employee PhD
- Employee pursuing a PhD
- Scholarship PhD
- Externally financed PhD
- External PhD
- Other employee

The final category was constructed for PhDs who had chosen the option “Other, namely” and only stated that their type of PhD was called “PhD” or “researcher” (or Dutch equivalents to those terms). These terms were not specified enough to be able to classify them in one of the other categories, but occurred frequently enough to give them a separate category. After this procedure, only 4 respondents who completed the survey could not be classified in one of these categories as they did not provide sufficient information. 72.5% of the PhDs are classified as employee PhDs, 14.2% is classified as scholarship PhDs and 4.9% are classified as external PhDs. Another 4.1% of the PhDs are externally financed PhDs, 2.3% are Employees pursuing a PhD and 1.9% is an ‘other’ type of PhD.

How the institution-specific PhD classification were recoded into the overall PhD classification is shown in table 1. This classification can be used to identify all types of PhDs for each type of institution. However, as some categories are very small, for most subgroup analyses we will use a more condensed categorisation of PhD types, in which the categories “Employee pursuing a PhD”, “Externally financed PhD” and “Other” are combined into one group named “Other”. The categories “Employee PhD”, “Scholarship PhD” and “External PhD” are maintained.

Table 1: Overview of types recoding of institution-specific PhD typologies to overall PhD typology

	Employee PhD	Employee pursuing a PhD	Scholarship PhD	Externally financed PhD	External PhD	Other employee	
University	Employee PhD	x					
	Employee pursuing a PhD		x				
	Scholarship PhD, university funded					x	
	Scholarship PhD, externally funded					x	
	Externally financed PhD				x		
	External PhD					x	
	Other						x
UMC	Physician researcher	x					
	Researcher in training	x					
	Resident not in training*	x					
	Resident in training	x					
	Resident in training and clinical researcher	x					
	Physician in training for researcher and GP	x					
	Junior researcher						x
	Junior lecturer*						x
	Student-assistant*						x
	Employee pursuing a PhD		x				
	Scholarship PhD, university funded						x
	Scholarship PhD, externally funded						x
	Externally financed PhD					x	
	External PhD						x
nUMC	PhD Researcher	x					
	Only nUMC employed, function group known	x					
	Only nUMC employed, function group known						x
	nUMC and UMC employed, function group known*	x					
	nUMC and UMC employed, function group unknown*						x
External PhD						x	
HBO	Externally financed PhD					x	
	External PhD*					x	
Research instituta	Employee PhD	x					
	Employee pursuing a PhD		x				
	Scholarship PhD, university funded					x	
	Scholarship PhD, externally funded					x	
	Externally financed PhD					x	
	External PhD*						x
Other	Employee PhD	x					
	Employee pursuing a PhD*		x				
	Scholarship PhD, university funded					x	
	Scholarship PhD, externally funded					x	
	Externally financed PhD					x	
	External PhD						x
N** (total n = 1,597)	1,159	36	227	66	79	30	

* This type of PhD was not encountered in the data. ** Only respondents who completed the survey.

International PhDs

To determine whether PhDs were international PhDs, without determining this based on their country of origin, we asked the PhDs the following question: “Working in the Netherlands, do you consider yourself to be an international PhD?” Those who replied “Yes” to this question, were asked to indicate their country of origin (though it was stressed that they could skip this question if they did not want to answer this question). The responses to this question showed that 87 PhDs indicated that they were from the Netherlands. These PhDs were re-classified as non-international PhDs.

In total, 40.2% of the PhDs were classified as international PhDs. An overview of which countries they are from is presented in table 2. Countries with less than 5 respondents were grouped into their respective continents.

Table 1: Responses to the question “What is your country of origin?”

		Number (n = 644)	%
Countries	Germany	84	13.0%
	China	49	7.6%
	Italy	36	5.6%
	India	27	4.2%
	Spain	25	3.9%
	Indonesia	24	3.7%
	Greece	20	3.1%
	France	16	2.5%
	Belgium	14	2.2%
	Mexico	14	2.2%
	Brazil	13	2.0%
	Turkey	13	2.0%
	United Kingdom of Great Britain and Northern Ireland	13	2.0%
	Colombia	8	1.2%
	Ethiopia	8	1.2%
	Portugal	8	1.2%
	Russian Federation	8	1.2%
	United States of America	8	1.2%
	Nigeria	8	1.2%
	Kenya	7	1.1%
	Poland	7	1.1%
	Bangladesh	6	0.9%
	Canada	6	0.9%
	Chile	6	0.9%
	Iran	6	0.9%
	Uganda	6	0.9%
	Austria	5	0.8%
	Vietnam	5	0.8%
	Other European countries	42	6.5%
	Other African countries	26	4.0%
	Other Asian countries	16	2.5%
	Other South American countries	7	1.1%
	Other North American countries	6	0.9%
Oceanian countries	6	0.9%	
Background	Non-western background	245	38.0%
	Western background	308	47.8%
Missing	<i>No answer/missing</i>	91	14.1%

COVID-19

Only 10 days into data collection, on March 12th, the Dutch government commissioned an 'intelligent lockdown' to prevent the further spreading of COVID-19. This lockdown required inhabitants of the Netherlands to work from home when possible and to predominantly stay at home as well.

These measures had a large impact on PhD candidates. Universities and laboratories were closed for non-essential research activities, regular care in University Medical Centers and other hospitals was shut down and, in some cases, encountered an influx of COVID-19 patients. Travelling abroad also became practically impossible. This situation has impacted the research of many PhDs, as well as their mental wellbeing.

On March 20th, one week after the lockdown started, we added a message at the start of the survey, asking the respondents to filter out of their answers as much as they could and to answer the questions about their PhD trajectory before COVID-19 struck. Next to this, we included an open question at the very end of the survey, asking PhDs to elaborate on their experiences as a consequence of COVID-19 and the lockdown. However, we have observed that some respondents have mentioned COVID-19 or Corona in one of the other open questions, also after we asked them to try to filter COVID-19 out of their answers. We created a variable that indicated how often PhDs had mentioned either 'Covid' or 'Corona' in one of 12 potentially relevant open answers, excluding the assigned COVID-19 question. The results can be found in figure 9.

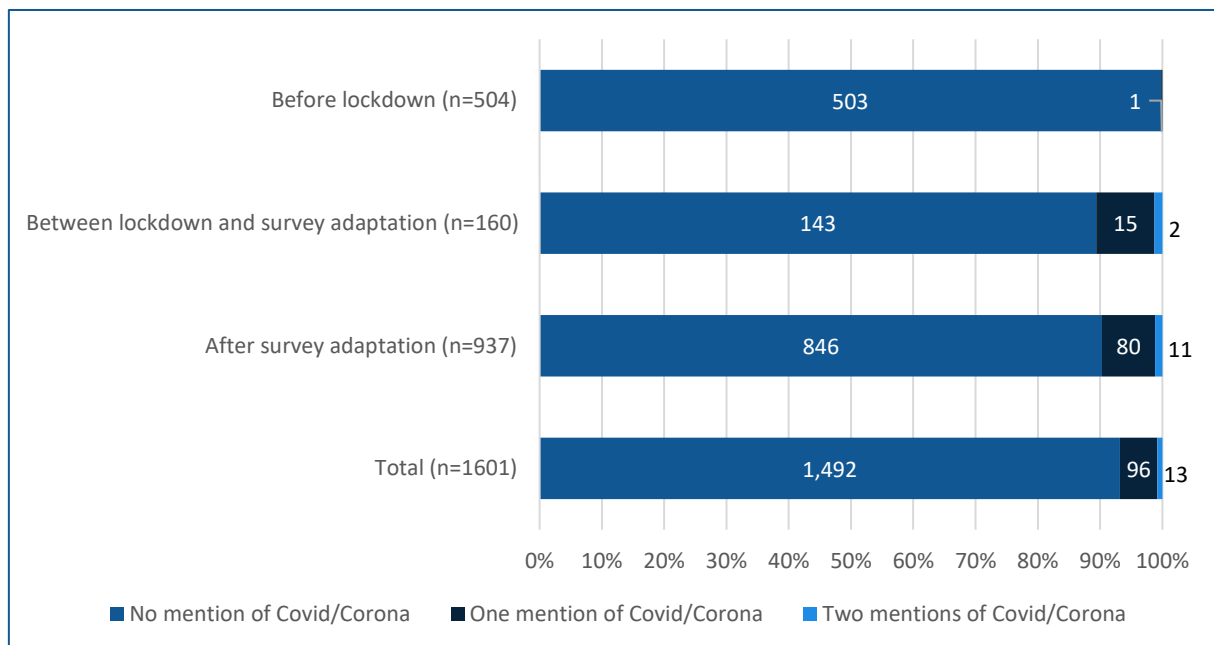


Figure 9: Number of respondents mentioning 'Covid' or 'Corona' in any of twelve open questions (n=1,601).

Of the 504 respondents who fully completed survey before the lockdown, only one mentioned COVID-19 in one of those 12 open questions. In the period after the lockdown started and before we had adapted the survey, there is a large increase in the number of mentions of COVID-19 in these open questions, with a total of 10.7% of 160 respondents mentioning COVID-19 once or twice. After our adaptation of the survey and our request to filter COVID-19 out of the survey, still 8.5% of 846 mentioned COVID-19 once, and another 1.2% mentioned it twice. COVID-19 was most often mentioned in open questions concerning delays (50 times), mental wellbeing (48 times) and work pressure (10 times).

With regards to the open question that allowed PhDs to elaborate on their experiences after the lockdown, 329 respondents (20.5%) provided an answer to this question. Given that the question was asked at the end of the very long survey and this was an open question, which

require relatively a lot of effort to answer, we cannot assume that those who did not provide an answer to this question (1272) did not experience any difficulties as a consequence of COVID-19. The reported results are likely not representative, and give only an image of the experiences of PhDs in this exceptional situation.

The given answers were manually coded by one coder to identify common experiences. Topics were only coded as present if they were explicitly mentioned in the text. For instance, the topic “extension” was only coded as present when a respondent explicitly mentioned that an extension would help them deal with the delays. The frequency of these experiences can be found in figure 10.

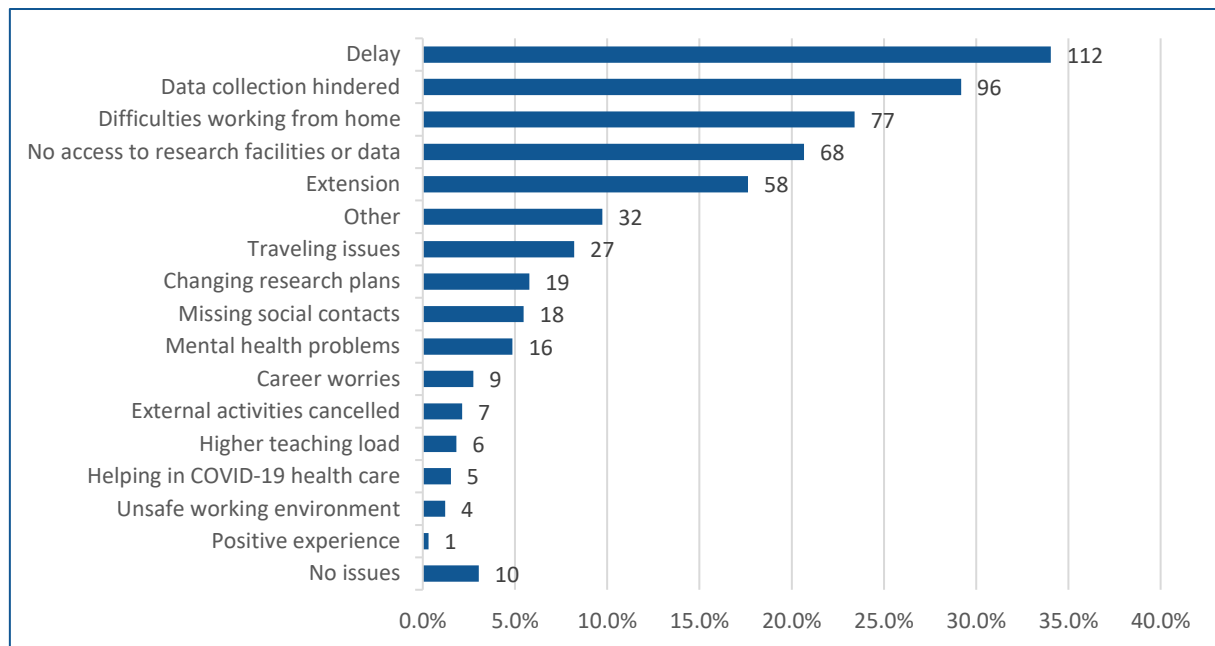


Figure 10: Experiences mentioned in response to the question: "If you experience any problems in your PhD trajectory as a consequence of the corona virus or the measures taken to prevent further spread of the virus, you can elaborate here. Please also let us know what could be solutions to the specific problems you are encountering." (n=329).

The most frequently mentioned experience is that the PhD project suffered from a delay due to COVID-19 and the related measures (34%). Often, this experience was accompanied by difficulties in collecting data (29.2%) and not being able to access research labs, equipment or data (20.7%). A significant share of PhDs explicitly mentioned to experience problems working from home (23.4%): many reported difficulties to focus on their work, and some struggled to keep a work-life balance with young children at home. 17.6% of the PhDs who answered this question explicitly mentioned that an extension would help them deal with the experienced delays.

Other experiences that were mentioned in this question were issues concerning travelling, with some PhDs being stuck abroad or unable to go abroad (8.2%). 5.8% of the PhDs stated to miss social contacts, and 4.9% mentioned to experience mental health problems as a consequence of the lockdown. Smaller groups explicitly mentioned worries about their career prospects (2.7%), the cancellation of external activities such as conferences (2.1%), higher teaching loads due to the switch to remote teaching (1.8%), helping in COVID-19 health care (1.5%) or having to work in an unsafe environment (1.2%). 3% stated not to experience any issues due to COVID-19, and one PhD considered the lockdown a positive experience.

Appendix

Informed consent form

Dear prospective participant,

Thank you for considering participation in this **PNN PhD survey**. This survey has been set up by the **PhD Network Netherlands (PNN)** to get more detailed insights into the employment conditions and well-being of all the PhD candidates in the Netherlands. PNN intends to use the results from this survey **to improve the situation of all PhDs in the Netherlands**, regardless of contract type, type of institution or background.

We know that you generally participate in your local PhD surveys, and might think: "Please, not another survey!" However, the results from those local surveys are **not always shared publicly**, making it difficult to assess on a national level which problems PhDs encounter. Also, this survey will address **relevant topics that usually are not addressed by local PhD surveys**. We therefore hope you want to participate in this survey as well: **the more questions you answer, the better we can identify points of improvement!**

Also, if you participate in our survey, you can sign up to a lottery to **win a personal career coaching session** with Van Sijl Counseling and Training.

The data will be collected and analyzed by PNN. This process will be assisted by **Nadine Kanbier**, master student Organization Sciences at the Vrije Universiteit Amsterdam. She will write her master's thesis using these data. She will be supervised by dr. **Christine Teelken**, associate professor at the department of Organisation Sciences.

Furthermore, PNN will write a report on the results of the survey. This report will be publicly available. **Results will be presented in such a manner that individual participants will not be identifiable based on the results.**

Of course, participation in this survey is **completely voluntary and non-binding**. You can **stop the survey at any point**. Also, except from the consent question, you can **skip any questions you prefer not to answer**. Your answers will be **recorded anonymously** and the resulting **data will be treated in a confidential manner and will not be shared with other parties**. If you have any questions about this survey, please contact info@hetpnn.nl.

I have read the above text and confirm that I have understood that:

- my participation in this survey is voluntary and non-binding
- I can stop the survey at any point
- I can skip any questions I prefer not to answer, except for this consent question
- my data will be recorded anonymously
- the data will not be shared with other parties
- results will only be presented if they do not allow for individual participants to be identified based on the results.