

The development of COVID-19 in the border area of the Netherlands, North Rhine-Westphalia and Belgium

Prof. Dr. Klasien Horstman, Dr. Volker Hackert, Dirk Philippsen, Dr. Alena Kamenshikova, Lisa Diemingen (MSc), Brigitte van der Zanden, Prof. Dr. Christian Hoebe

Maastricht University, Care and Public Health Research Institute (CAPHRI), GGD Zuid Limburg, Gesundheitsamt Düren and eUPREVENT.



Foreword

International cooperation and knowledge transfer form an important basis for examining the development of a pandemic such as COVID-19 in the border area between the Netherlands, North Rhine-Westphalia and Belgium. And of course the question of whether a possible border closure would have had any effect on the spread of the virus.

At the request of the Province of Limburg (also on behalf of Gelderland and Overijssel), the Staatskanzlei of the Land North Rhine-Westphalia (NRW) and the Dutch Ministry of the Interior and Kingdom Relations, we conducted a qualitative and quantitative study to gain insight into whether there are significant differences in the distribution of COVID-19 in the Netherlands and North Rhine-Westphalia. Attention was paid to how these differences relate to the different policy measures. We, euPrevent, GGD Zuid Limburg, Gesundheitsamt Düren and Maastricht University, also investigated the question of whether the virus distribution in the border region differs from the distribution within the Netherlands.

Within this research, many discussions took place with experts from the Netherlands, NRW and Belgium, for which we are very grateful. Without these experts, it would have been difficult – in a given situation where data is collected in different ways in the three countries – to give a good and thorough answer to the questions asked by our clients.

In addition, we were able to use existing databases to provide insight, for the Dutch, Belgian and German regions, into how many tests were carried out, how many infections were established and also into numbers of hospital admissions and deaths. This data is also available in a dashboard that can be viewed via the long-standing website, www.euregionalhealthatlas.eu. This atlas, which was compiled on the basis of this data, presents the data geographically for the first weeks of the COVID-19 pandemic until 1 May 2021.

I sincerely thank the aforementioned partners for their cooperation, which helped provide the basis for understanding and clarifying the course and transmission of COVID-19. This will help us to prepare for the future and allow us to work together towards the further elimination of COVID-19.

Brigitte van der Zanden
Director of euPrevent

Inhoud

| | |
|---------------------------------------------------------|----|
| <i>Foreword</i> | 1 |
| <i>Summary</i> | 3 |
| 1. Introduction | 5 |
| 1.1 Research questions | 5 |
| 1.2 Research methodology | 6 |
| 1.3 Reading guide | 7 |
| 2. Results | 8 |
| 2.1 Distribution of COVID-19 | 8 |
| 2.2 Border region versus interior | 14 |
| 2.3 Cross-border dimension | 15 |
| 2.4 COVID-19 and national measures | 18 |
| 2.5 Closing borders | 21 |
| 2.6 Learning from one another | 24 |
| 3. Recommendations | 28 |
| <i>Appendix 1 - Qualitative study</i> | 30 |
| <i>Appendix 2 - The Euregional COVID-19 Atlas</i> | 63 |

Summary

At the request of the Province of Limburg (also on behalf of Gelderland and Overijssel), the Staatskanzlei of the Land North Rhine-Westphalia (NRW) and the Dutch Ministry of the Interior and Kingdom Relations, we conducted both a qualitative and a quantitative study to gain insight into whether significant differences exist in the distribution of COVID-19 in the Netherlands, North Rhine-Westphalia and Belgium. Attention was paid to how these differences relate to the different policy measures. We, euPrevent, GGD Zuid Limburg, Gesundheitsamt Düren and Maastricht University, also investigated the question of whether the virus distribution in the border region differs from the distribution within these three countries.

Six research questions were put to us, which formed the basis for our report and to which extensive attention is devoted in the report. Below, we briefly summarise the conclusions for each research question:

1. *Are there significant differences in the distribution of COVID-19 in the Netherlands, North Rhine-Westphalia and Belgium?*

The general picture is that differences between the countries are mainly due to differences in national measures and the extent to which these were followed up within the countries.

2. *How did the virus spread in the border region and did it deviate from the domestic pattern of spread?*

In the different countries, the dynamics of COVID-19 was mainly determined by the level of measures active within a country and the variant of virus that was dominant at that time. There seems to be no difference between the border area and the rest of the country.

3. *Is there a significant cross-border dimension to the spread of the virus in the border region?*

Based on expert judgement, a relevant cross-border dimension seems to be limited with respect to the spread of COVID-19. Also, based on the maps (in the report), there appears to be little or no evidence of impact on cross-border spread of COVID-19.

4. *Are there differences in measures between the Netherlands, North Rhine-Westphalia and Belgium that have led to significant differences in the spread of the virus?*

Distinguish between behavioural measures for residents on the one hand, and public health measures on the other (in particular testing and source and contact investigations on both sides of the border).

It is not possible to make a distinction between behavioural measures on the one hand and public health measures on the other, and then determine which measures led to a significant difference in the three countries. However, the conclusion can be

drawn that by and large the measures taken by the countries were effective to some extent.

5. *Is closing the border an effective measure to limit the spread of COVID-19 in the border region (effective measure of infectious disease control)? What other unintended health-related effects can border closure bring?*

The maps show that there were times when the borders were open, but there is a clear difference between the countries. Closing borders seems to have had little or no effect on the spread of the COVID-19 virus. This is also shown by research among 10,001 citizens of Limburg. People who visited their family, friends or acquaintances in Germany or Belgium frequently turned out to have fewer antibodies against COVID-19 than those who did not make such visits but could have done so. This result also suggests that the role of border traffic in spreading is limited.

6. *What could the countries learn from one another? Are there possibilities to combat the virus more effectively in the border region?*

There is enough interest in cross-border cooperation, but at the moment there are still too many obstacles to structurally embed it. Structures such as euPrevent and EMRIC show that there are certainly possibilities, but that everything still stands or falls with personal commitment and project-funding.

Based on this study, we go on to list seven recommendations, which are explained in the report.

1. Closing the border does not seem to be an effective measure to limit the spread of COVID-19 in the border area. It seems much more useful to target measures more effectively at regions, regardless of borders.
2. In order to fight pandemics in the border region more effectively, it is important that the Netherlands, NRW and Belgium develop structural forms of cooperation.
3. It would be desirable to have legislation and regulations to make it possible to properly manage and monitor a pandemic in a border area.
4. It seems that the travel of citizens to foreign destinations beyond bordering regions has a greater impact on the spread and introduction of COVID-19 than border traffic. It is advisable that this is examined more explicitly, not only as a country, but also at EU level.
5. To date, there is little research available on the effects of individual measures and the effects of the measures in general on the course of a pandemic. Additional studies, focusing on comparable data and comparable measures, seem desirable.
6. It is strongly recommended that a set of comparable indicators, using the same methodologies as far as possible, is developed between countries or at EU level.
7. It would be desirable if the special character of border areas could be given more attention in national policy, so that professional regional cooperation across borders is also facilitated via national policy centres.

1. Introduction

This chapter describes the assignment, including the questions, the research methodology and the reading guide.

1.1 Research questions

At the request of the Province of Limburg (also on behalf of Gelderland and Overijssel), the Staatskanzlei of the Land North Rhine-Westphalia (NRW) and the Dutch Ministry of the Interior and Kingdom Relations, a study was conducted into whether there are significant differences in the distribution of COVID-19 in the Netherlands and North Rhine-Westphalia. Attention was paid to how these differences relate to the various policy measures. It was noted that it was also desirable to include the Belgian border region, adjacent to the above-mentioned provinces and NRW, in the description of the results.

Specifically, the following six research questions were put to us:

1. Are there significant differences in the spread of COVID-19¹ in the Netherlands and in North Rhine-Westphalia?
2. How did the virus spread in the border region and does it deviate from the domestic spread pattern?
3. Is there a significant cross-border dimension to the spread of the virus in the border region?
4. Are there differences in measures between North Rhine-Westphalia and the Netherlands that led to significant differences in the spread of the virus? Please distinguish between behavioural measures for residents on the one hand and public health actions (in particular testing and source and contact investigations on both sides of the border) on the other hand.
5. Is closing the border an effective measure to limit the spread of COVID-19 in the border region (effective measure of infectious disease control)? What other unintended health-related effects can border closure bring?
6. What could the countries learn from one another? Are there possibilities to fight the virus more effectively in the border region?

Chapter 2 addresses all these questions in detail. The next section describes the study's research methodology.

¹ Formally, the designation for the coronavirus is SARS-CoV-2 and for the disease caused by the coronavirus COVID-19. For the sake of readability in this report, however, we chose to use only the designation COVID-19.

1.2 Research methodology

To answer the question regarding the extent to which border traffic and restrictions on border traffic played a role in the spread of COVID-19, an obvious step is to look at epidemiological data from the three different countries. Based on information systematically collected in the three countries, epidemiologists involved in this research produced overview maps of infection rates² and other parameters (such as numbers of registered deaths, numbers of hospital admissions and the infection rate) for the border regions (see Appendix 2, The 'Euregional COVID-19 Atlas' and the digital COVID-19 dashboard). These maps are geographical visualisations of data. However, interpreting these maps is difficult due to differences between countries in comparability (definitions, testing policy, resolution and measurement period), and in their infrastructure and the measures taken. The data that can best be compared is the data on numbers of infections and therefore, from a quantitative perspective, these are included in the answers to the questions. The data are presented in Appendix 2 'The Euregional COVID-19 Atlas'. This is followed by a discussion of how the data can be interpreted and what possibilities and limitations exist.

Since epidemiological statistical data is too limited a basis to answer the research questions, a qualitative study was also conducted. A qualitative study means that experts were interviewed who are involved in practice or at policy level in combating COVID-19 in the four Euregions (the Euregion Meuse-Rhine, the Euregion Rhine-Meuse-North, the Euregion Rhine-Waal and the Euregion Enschede-Münster). This strategy was chosen because it can be assumed that these experts have a good picture of the development of the COVID-19 pandemic in the border region. In addition, they specifically also have a good view of the development of the COVID-19 pandemic in relation to border traffic, whether the regulation of border traffic had an impact on the development of the pandemic and on possible side effects. A total of 27 external experts were involved in the qualitative research: 10 from the Netherlands, 11 from NRW and 6 from Belgium (see table for overview in Appendix 1). The gender distribution was almost equal: 13 women and 14 men. Many of the experts hold a position with a regional public health organisation; in the Netherlands the GGD and in NRW the Gesundheitsamt. Others work in general practitioner care, care of the elderly, social care (involved in contact tracing) and safety care. Most of the experts hold senior positions.

Appendix 1 provides more background information on the qualitative part of this study, gives insight into the concept of 'border' and presents expert opinions.

² In the literature, politics, media, popular speech, etc., different terms are used for someone who has tested positive for COVID-19. In this report, the term 'number of infections' is used. In this report, this always refers to the number of COVID-19 infections. Other descriptions for the term "number of infections" are: number of (confirmed) cases, number of positive tests, number of infections, number of reports, number of cases, number of sick people, number of disease reports or incidence.

1.3 Reading guide

The following chapters present the analysis. Chapter 2, which has 6 paragraphs, addresses the individual questions. A research question is answered in each section. Chapter 3 explicitly deals with recommendations that can be made from a medical-epidemiological point of view as a result of the results presented in chapter two. No economic or political recommendations are made. All recommendations were discussed with experts.

The appendices in this report form an integral part of the present report.

Appendix 1 describes the entire qualitative part of the study. It includes statements by experts and the framework that should be taken into account when discussing borders and cross-border cooperation.

Appendix 2 shows all the map material, i.e. the COVID Euregional Atlas on paper. The data is also available online via the website www.euregionalhealthatlas.eu. This section can also be used as a separate report and has therefore been prepared as such.

2. Results

The questions as formulated by the principals are answered in this chapter. The questions are as follows:

1. Are there significant differences in the spread³ of COVID-19 in the Netherlands and in North Rhine-Westphalia?
2. How did the virus spread in the border region, and does it deviate from the domestic spread pattern?
3. Is there a significant cross-border dimension to the spread of the virus in the border region?
4. Are there differences in measures between North Rhine-Westphalia and the Netherlands that led to significant differences in the spread of the virus? Please distinguish between behavioural measures for residents on the one hand and public health actions (in particular testing and source and contact investigations on both sides of the border) on the other hand.
5. Is closing the border an effective measure to limit the spread of COVID-19 in the border region (effective measure of infectious disease control)? What other unintended health-related effects can border closure bring?
6. What could the countries learn from one another? Are there possibilities to fight the virus more effectively in the border region?

As already indicated in the introduction, the Belgian perspective is also included in the answers to these questions. Each of the following six paragraphs answers one of these questions.

2.1 Distribution of COVID-19

Are there significant differences in the distribution of COVID-19 in the Netherlands and in North Rhine-Westphalia?

Many countries in Europe took broadly similar measures to contain the pandemic. The Netherlands, Germany and Belgium all developed policies on maintaining distance, washing hands and wearing facemasks, and introduced rules on quarantine, testing, curfews and lockdowns. However, in the three countries we also saw that the details, timing and concrete implementation of these measures differed. While Germany and Belgium were quick to make wearing facemasks in public places compulsory, this was long considered ineffective in the Netherlands, which is why facemasks were introduced there later. In the Netherlands, many measures remained voluntary for a long time, while in Germany and Belgium advice tended to be compulsory. Quarantine rules varied widely, with one country requiring 10 days' quarantine after a positive test, while another advised 14 or seven days. While the Netherlands introduced a

³ 'spread' is also called 'transmission'.

lockdown for sports facilities and museums, citizens in Belgium could continue to visit museums and swimming pools. Policies on schools also differed. This forest of different rules was quite complicated for daily life in the border area, especially since the rules were constantly changing.

Many interviews reflected on the different national measures. It is clear that, in this context, the legal enshrinement of rules varied considerably from country to country. In the Netherlands, for example, people with symptoms were advised to stay at home until a negative test result had been obtained, but it was up to people themselves how they interpreted and applied this advice. In Germany, quarantine is seen as a serious invasion of privacy: post-infection quarantine is a legal obligation rather than advice, but it can only come into effect if there is proof of infection in the form of a valid test result.

Although the different approaches to COVID-19 between the Netherlands, NRW and Belgium can be put into perspective from a helicopter perspective, the different national measures created many practical problems in the border area, for example for cross-border commuter traffic and school traffic.

In the border area, where people were used to living, working, studying, caring, etc. without borders, they had to deal not with one "forest of national rules" but with "three forests of different national rules". Sometimes these rules were fairly consistent with one another, sometimes less so. Nevertheless, these differences, which are an expression of different central, national policies in the three countries, created considerable complications in daily life in a border area. The pandemic was defined as a national problem and there was a national control strategy. The assumption was that the country was a whole and there was no consideration of the special nature of a border area or the negative effects of COVID-19 measures on the border area. Whereas for decades the border area of the Netherlands, NRW and Belgium had been regarded as situated at the centre of Europe, this pandemic suddenly made it a 'periphery' again and an object of central, national policy, while in many respects neighbours were closer than the (national) centre.

In the border region of the Netherlands, Belgium and Germany, the COVID-19 pandemic itself occurred in waves, as it did in the countries concerned (see figure). Although the wave pattern shows striking similarities over time, there are at least equally striking differences in the size of the 'wave peaks', i.e. the numbers of infections per country per day.

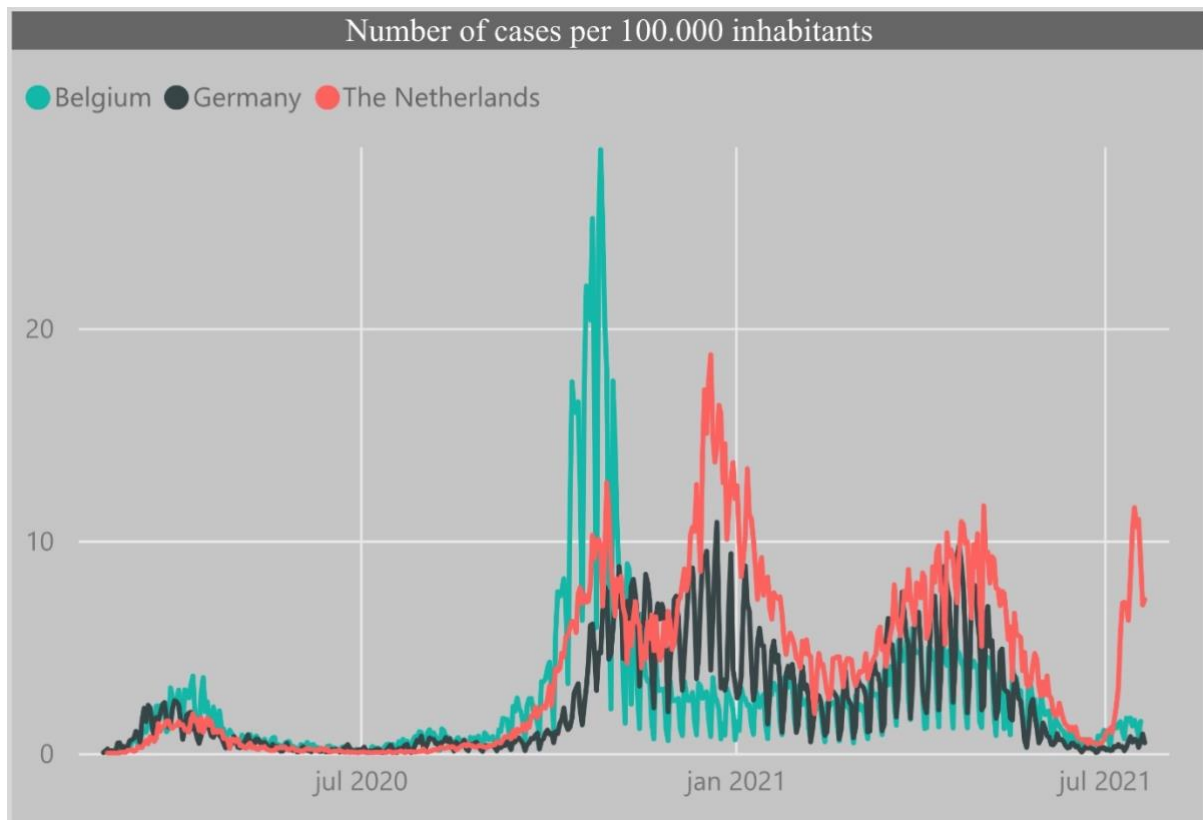


Figure 1 Daily rates of infection per 100,000 residents

The figure shows daily figures (as opposed to many figures which show a weekly or two-weekly period) based on positive test results. This is the number of infections as reported by the various test authorities to the authorities designated by the government in the Netherlands, NRW and Belgium. The figure clearly shows that the number of infections often seems to be lower around the weekend than during the week. This has to do with the fact that in the weekend, there is usually less testing for COVID-19. As a result, the figure shows a very strong upward and downward trend. It should also be noted that these are figures for actual positive tests performed. Therefore, it always reflects an underestimation of the actual number of infections because citizens themselves decided whether or not to be tested. Testing facilities were limited, especially in the first wave, making this underestimation even greater.

Appendix 2 'The Euregional COVID-19 Atlas' further explains how the figures should be interpreted.

First wave (February 2020-June 2020)

At the end of February 2020, the first reports of infection were made in the German border area, followed by reports on the Dutch and Belgian side with a few days delay. What followed is known as the 'first wave'. This wave lasted until June 2020. On the time axis of infections, the first wave in the border area has the shape of a parabola. It was accompanied by significantly lower infection rates than the later waves in all the areas involved and – despite higher infection rates in the Belgian area – did not have any obvious outliers at first sight. It should be noted that, during the first wave, there was relatively little testing for COVID-19 in all three countries. In the Netherlands, a nationwide scarcity of testing capacity was the reason for the restrictive testing policy. As a result, in this early phase, persons eligible for testing were only ones who were suspected (i.e. symptomatic) due to a link with a positively tested patient, who resided in a narrowly defined high-risk area and/or who were seriously ill. Although we do not have exact figures for the first months of the pandemic in terms of numbers of tests, the number of tests seems to be lower than in Belgium, taking into consideration the population in the Netherlands and also in Germany, where strict criteria for testing were also applied. The extent to which differences in national testing policy distort the numbers of infections in the border region is unknown. In all countries, the number of infections depends on the number of tests, which in turn depends on the supply of tests, the indication of the tests (e.g. only testing in cases of [serious] symptoms) and the willingness of citizens to be tested or not in cases of symptoms. However, it is plausible that in the first wave, due to limitations in testing policy in all three countries, there was a very substantial underestimation in the actual number of infections in the border region. Nationwide, the first wave was accompanied by a higher mortality in Belgium and a lower mortality in the Netherlands, but not in Germany, though differences in measurement methods may have played a role. In addition to demographic characteristics, differences in the gradual introduction of containment measures, hospital capacity (nursing and ICU beds), use and availability of protective materials, the average health status of the general population and behavioural factors (compliance with measures) may have played a role. Decisive for a short course and early containment of this first wave were the strict lockdowns (contact and mobility restrictions) that came into force in all three countries in mid-March and which differed little in the nature and scope of the measures. Until the resurgence of infection rates with the arrival of the second wave, the number of new infections in the border region, in the 'inter-wave period' from late June to late August 2020, remained at a low level in all three countries, despite an increased testing capacity and increased numbers of tests in this phase. The aim of testing was to keep track of the virus and to prompt starting a source and contact investigation that, if used optimally, could contain the spread of the virus by up to 10%. Source and contact investigations quickly isolate infected people, as well as potentially infected people, preventing them from participating in the spread and thus interrupting chains of infection.

Second wave (September 2020-February 2021)

After a slight increase in the number of infections in mid-August, the much more severe 'second wave' started in all three countries in the border region as August gave way to September 2020. The travel behaviour of holidaymakers in the summer of 2020 probably played an important role in this, as some of them brought the virus back home with them. This does not refer to travel behaviour in the home country or daily travel behaviour in the border region, but rather to holiday trips further afield. Not only did the second wave have a considerably more erratic course than the first wave, but it was also characterised by very clear differences between the individual countries. Most striking is the sharp peak in the Belgian border region, where the number of new infections reported initially rose very steeply (exponential increase), peaked as early as the end of October and then declined again, with a low plateau of new infections being reached in early December 2020 (which was, however, higher than during the inter-wave period). The peak of daily reported new cases in the Belgian border region, with almost 30 notifications per 100,000 inhabitants on 27 October, was more than 50% higher than in the Dutch border region, where the peak was reached on 20 December with 19 infections per 100,000, and almost three times higher than in the German part where the peak was reached on 23 December with 11 per 100,000 infections. In view of the exponential rise and increasing pressure on care, Belgium further tightened up measures that had already been taken on 30 October 2020, including the closure of non-essential shops (in addition to the catering industry which had already been closed down earlier), distance learning in higher education, 50% contact education in secondary schools and a contact restriction with a maximum of one 'cuddle contact' per household. The measures proved effective and led to a rapid decline in the number of new infections. Despite this, Belgium continued to apply the measures for months after the outbreak had ended and, unlike the Dutch and German border regions, prevented a new upsurge in the number of infections. In the Dutch and German border regions, the second wave – with a double peak in October and December – was very similar, although the daily reported number of new infections was generally higher in the Dutch border region than in the German one. The Netherlands adopted measures on 29 September that affected gatherings, parties, sports, eating and drinking establishments and contact professions. The ensuing decline in infections in the Dutch border region was quickly followed by a new increase with a second (higher) peak. Due to the degree of pressure on care facilities, this ultimately necessitated a partial lockdown on 13 October, including advice to work at home, closure of the catering industry and a ban on events. In mid-December, primary schools in the Netherlands were also closed. In Germany, a partial lockdown was imposed on 2 November (with the closure of the catering industry, but shops, schools and kindergartens remained open). The fallout from this lockdown was inconclusive and was quickly followed by a second peak. The stricter lockdown on 16 December (which included closing all schools) did bring about the desired decline in the German border region. Relaxations around Christmas led to a little peak in the downward trend of infections in the Dutch border region at the beginning of January. In January, because of the continuing high burden on the health care

system, the Dutch cabinet announced an extension of the lockdown until the beginning of February, and a curfew was introduced in the Netherlands at the end of January. Around the turn of the year, the first vaccinations against COVID-19 were carried out in the border region of all three countries. By the end of February, the second wave was brought to an end in the border area of all countries concerned, with the lowest rate of new daily infections (about 2 per 100,000) since the beginning of October. From December and January, the first vaccines were available internationally and, depending on availability per country, the vaccination campaign started. The actual start differed per country and per target group.

Third wave (March 2021-July 2021)

The dip at the end of the second wave was very short-lived. In all three countries in the border area, infections rose again at a rapid pace from the beginning of March 2021, with numbers higher in the Dutch border region than in Belgium and Germany. An important driver of this third wave was the emergence of the more contagious alpha variant of COVID-19 (formerly 'British variant'), which was first detected in the United Kingdom and since January had rapidly displaced all other variants in the border region and elsewhere in the Netherlands, Belgium and Germany. By March, almost all infections in the border area were due to this new variant. Relaxation of the measures also contributed to the new upsurge in the number of new infections. In the Netherlands, for example, primary schools and childcare facilities were fully reopened from 8 February, followed by a partial reopening of secondary schools on 1 March. However, further relaxations were abandoned and the continued measures, supported by increasing vaccination coverage, ensured a gradual decline in new infections in all three countries in the border region after a peak was reached in early May 2021. At the end of June, the relaxation in measures led to a sharp upturn in the number of reported infections in the first days of July in the Dutch border region, driven by clusters and super-spreading events in the catering industry and the rapidly spreading and highly contagious delta variant of COVID-19. However, numbers of infections as a measure are increasingly comparable because testing policies varied widely due to differences in combinations of test lines, rapid tests, commercial test lines and self-testing. For example, in the Netherlands, during the period when European football matches were taking place, the – mostly negative – tests of people who wanted to gain access to the stadium ('testing for access') were also counted. As a result, the number of infections per 100,000 inhabitants decreased. This is because many people were included who under normal circumstances would not have been tested because they had no symptoms. In the Netherlands, the number of hospital admissions, for example, was only half that for Belgium, while Belgium recorded far fewer infections.

Looking at the 10-year cohorts⁴, for example, it can be noted that the number of infections among young people and young adults was structurally slightly higher than among the elderly.

⁴ A cohort refers to an age group: 20-30 years or 40-50 years, etc.

This is mainly due to the fact that these young people often have the most contacts. But comparisons between the age cohorts show only a small difference in percentage terms. It is not the case that young people caused half of the infections, for example. This picture is the same for the Netherlands, NRW and Belgium.

It can be concluded that the general picture suggests that differences between the countries are mainly due to differences in national measures and the extent to which these were followed up within the countries.

2.2 Border region versus interior

How did COVID-19 spread in the border region and does it deviate from the domestic pattern?

In the three countries, the dynamics of COVID-19 were mainly determined by the level of measures that were imposed within a country and the variant of the virus that was dominant at that time (the original strain was much less infectious and pathogenic than the later alpha and delta variants, so that measures had a different effect on the spread). Despite the major role of national policy, differences were seen within the various countries on the basis of local context (domestic pattern). For example, in the Netherlands, the rural North was the most spared in the COVID-19 dynamics, while right from the start of the pandemic, the South, including Brabant and Limburg, often topped the list as having the highest number of infections. There were also times when the major cities came out on top. These internal dynamics, which can be seen in all three countries, depend on many different things. Although some suggestions can be made as to which aspects played a role (e.g. carnival, use of nightclubs, events), these differences cannot be fully interpreted. Therefore, for question 3 we focus on what was seen in the Euregion in terms of distribution patterns.

The interviews with experts reveal a similar picture. They indicate that the spread of COVID-19 in the border region follows national trends and that there were few indications that the trends in the border region deviate greatly from the domestic pattern.

There are certainly regions in the border area where there were more infections than in other parts of the country, but the picture was sometimes also reversed: i.e. domestic regions that were worse off than regions in the border area of the three countries. The level of infections depends on many factors, making comparison within a country difficult, let alone between border regions.

'Mobility (within the context of contacts with people) is the big problem (in getting infected). In Germany, in the Netherlands, everywhere. People should stay at home. ... Mobility is always a source of infection.'

Another complication is that it is never possible to say with certainty where someone contracted the infection. This is because registration is based on place of residence and not on place of

infection. It is therefore possible that someone contracted the infection in Amsterdam, Brussels or Berlin, but because this person lives in the border area, it is assigned to that area.

It can be concluded that there seems to be no difference between the border area and the rest of the country.

2.3 Cross-border dimension

Is there a significant cross-border dimension to the distribution of COVID-19 in the border area?

Based on this study, a relevant cross-border dimension seems to be limited with regard to the spreading of COVID-19; at least a cross-border dimension that can be traced back to the direct border area between the Netherlands, NRW and Belgium and the daily mobility that takes place across the border. This is confirmed by almost all the experts consulted.

We also checked whether the experts' opinions corresponded with the data. We looked at whether there were any indications of COVID-19 spreading across the border as revealed by maps of the atlas. The maps were analysed per period. The conclusion is that there are no indications that border traffic played an important role in the spread.

Period March/April 2020

At the start of the pandemic, the map may suggest a slight cross-border effect from the epidemic in Heinsberg, Germany. This could include a carnival event in Gangelt as a super-spreading event that spread to the neighbouring region in the Netherlands. It is likely that the carnival activities in the whole region, as well as the increasing numbers of travellers returning from their skiing holidays in Italy and Austria, contributed to or even explain the overall picture. Previous research on the virus by the GGD Zuid Limburg found the same virus in persons from Heinsberg and the Netherlands (demonstrated by sequencing – a form of identical bar code). Also, a few cases introduced from Germany (or Dutch people present in Germany) would have been enough to further the spread of COVID-19 in the Netherlands. This was possible at that time because the entire population was still fully susceptible to COVID-19 and there were hardly any restrictions on behaviour or none at all. The 'Corona Onderzoek Limburg' among 10,001 Dutch citizens of Limburg also revealed that carnival was one of the spreading factors.

Period July/August/September 2020

In this period, there is a clear impact of flows of returning travellers, first in Belgian-Limburg and Liège, where the school holidays started on 1 July and ended on 31 August, with a growing and rather homogenous distribution **within** these regions. The much higher initial spread in the Walloon region, as well as in the Flemish region, clearly increasing, is very striking. There is no indication of cross-border spreading based on the map image. However, Dutch Limburg, where the school holidays didn't start until 11 July and ended on 23 August, followed suit. The pattern

could be explained by the later start of the holidays in the Netherlands. Strikingly, there was no effect on the German region (holidays 29 June to 11 August), possibly related to stricter measures and better adhesion to the measures by the population.

Period October/November 2020

The upward distribution continued in the Belgian and Dutch regions. However, Germany had joined in. Incidence in the individual German border regions is heterogeneously distributed and does not seem to appear to correlate with locations near the high-incidence areas in the Belgian and Dutch regions.

Period December 2020/January 2021

Effects of the measures are visible in the German and Belgian regions, while the Netherlands lagged behind for a while. There are no indications for cross-border spreading based on the picture provided by the map.

Period March/April 2021

Third wave, the Belgian and Dutch regions remained on the same level. Germany did better, with less spreading. No evidence of oil slick phenomenon, i.e., gradual cross-border spread from one geographical area to another. The prevalence of COVID-19 infection was homogeneously lower in the German 'Kreise' than in the Belgian or Dutch regions; again, there was no association with dark (high-incidence) areas in the Netherlands and Belgium.

It can be concluded that, on the basis of the maps, there appears to be little or no evidence of impact on the cross-border spread of COVID-19. Although there certainly will have been occasional infections among people who actively crossed borders, this was a very limited group in the total number of infections per region and per country. The picture seems to be more consistent with spread within individual regions, presumably driven by measures, behaviour (compliance with measures) and returning holidaymakers. There is a notable difference in

Walloon and Flemish Belgium, possibly influenced by French visitors, or other factors such as the economy, geography and behaviour.

COVID-19: Stringency Index

This is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest). If policies vary at the subnational level, the index is shown as the response level of the strictest sub-region.

Our World
in Data

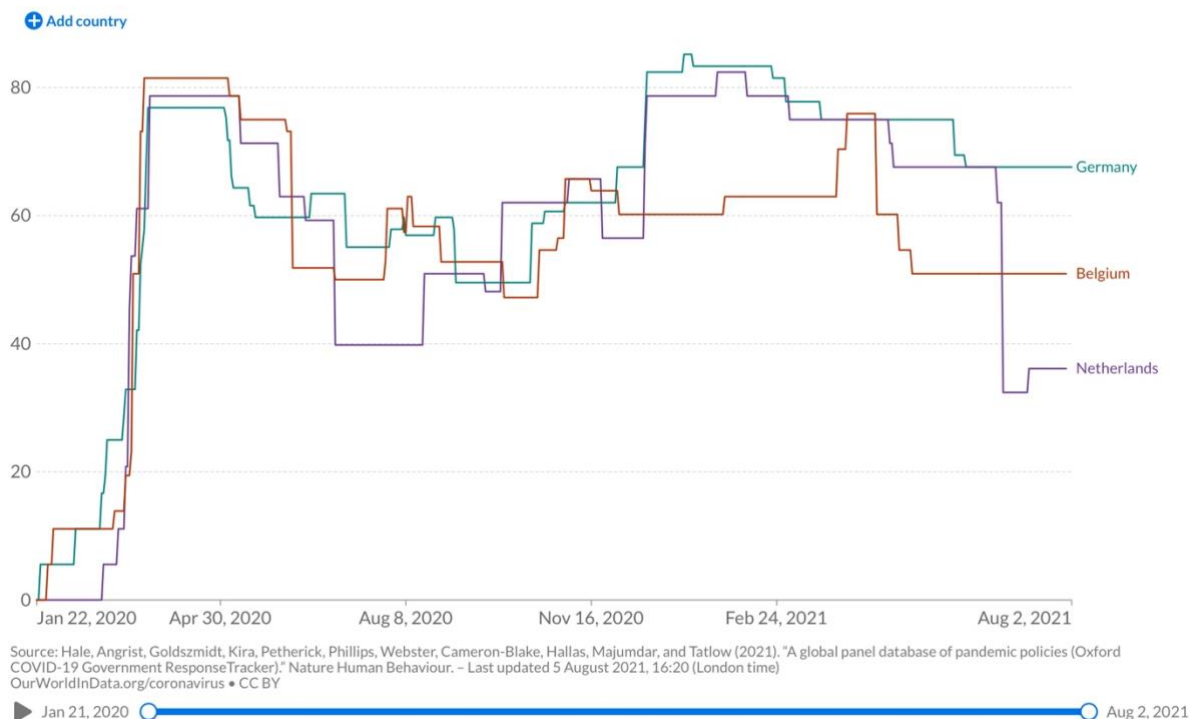


Figure 2 COVID-19 Stringency Index from Oxford University

This figure rates the stringency of measures, using a tool developed by Oxford University for comparing countries. It is an artificial composite measure running from 0 to 100 (most stringent) and is based on nine types of measures (indicators). These nine indicators⁵ include school closures, work restrictions and travel restrictions. In case of differences by region, the most severe measure for a country was used.

The early, firm lifting of measures in June 2021 in the Netherlands is notable, causing a sharp increase in infection rates specifically due to releasing from the measure regarding night catering and events without 1.5 metres (4th wave). What is not visible in this graph is the course of the different COVID-19 subtypes that occurred. After the classical variant (until February 2021) with a reproduction number of about 2.5, the alpha variant, which was approximately 45% more infectious, became dominant in the three countries almost simultaneously (March to June 2021). Then, from June 2021, the delta variant became dominant which was approximately 100% more contagious than the classical variant. This meant that measures had to be increasingly strict in

⁵ School closures, workplace closures, cancelling public events, restrictions on gatherings, closure of public transport, public information campaigns, working from home, restrictions on internal movement, international travel controls, testing policy, contact tracing, face coverings, vaccination policy.

order to limit further spread. In addition, since January 2021, vaccination was available. The number of susceptible people was reduced in all three countries, both through having experienced COVID-19 infection and through vaccination. The graph below shows the status of vaccination coverage in the Netherlands, Germany and Belgium compared to Europe and the world. This, together with the measures, determines the level of infection. Belgium and the Netherlands are among the countries with the highest vaccination coverage, with Germany following close behind.

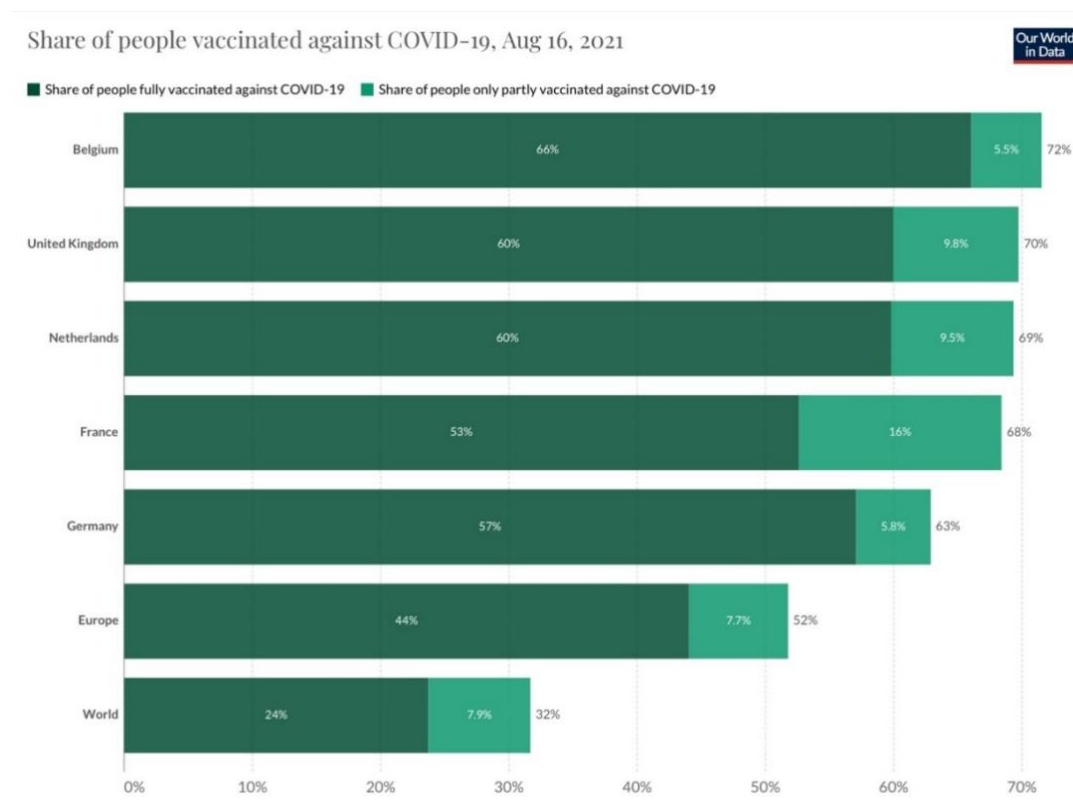


Figure 3 Vaccination coverage of some European countries, Europe and globally

2.4 COVID-19 and national measures

Are there differences in measures between North Rhine-Westphalia and the Netherlands that led to significant differences in the spread of the virus? Please distinguish between behavioural measures for inhabitants on the one hand and actions from public health services on the other (in particular testing and source and contact investigations on both sides of the border).'

The question posed regarding whether there is a difference in measures between the Netherlands and NRW that led to a significant difference in the spread is too complex to be further specified with the possibilities of this study. This would imply that for each measure – adherence to measures, testing and source and contact research – it should be possible to

determine whether it works or not. But in a pandemic like the COVID-19 pandemic, these aspects cannot be separated. All measures reinforce one another and were effective to some extent. How effective each measure was is not known.

The national measures to combat the COVID-19 pandemic meant that, after decades of "borderless" life, residents in the border areas of the Netherlands, NRW and Belgium became once again aware that they were citizens of different countries. Many countries in Europe took broadly the same measures to curb the pandemic. The Netherlands, Germany and Belgium all developed policies on maintaining distance, washing hands and wearing facemasks, and introduced rules on quarantine, testing, curfews and lockdowns. However, in the three countries we also saw differences in the details, timing, and the actual implementation of these measures. No detailed analysis is available of the differences in how source and contact investigations were conducted in the three countries. While Germany and Belgium were quick to introduce the obligation to wear facemasks in public places, this was long considered ineffective in the Netherlands, so facemasks were introduced there later. In the Netherlands, many measures were voluntary for a long time, while advice became mandatory in Germany and Belgium. Quarantine rules varied widely, with one country asking for 10 days' quarantine after a positive test, another advising 14 or seven days. While the Netherlands introduced the lockdown for sports facilities and museums, people in Belgium could continue to visit museums and swimming pools. Policies on schools also differed: whether or not to go to school; which age-group to allow and which not; full days or just a few days; when to go and when not to go; with a test or without a test; what if someone in the family has an infection, etc. This forest of different rules was quite complicated for everyday life in a border region, especially as the rules were constantly changing. This was confirmed by the experts in all areas.

Part of the national measures is the monitoring of the virus via sequencing (a form of bar code of the virus). This allows countries to determine which virus is circulating, such as the alpha or the delta variant, through so-called germline surveillance. Sometimes this was also used to analyse clusters of cases and determine specific spread. It is not known to what extent the three different countries used it in the border region.

The effectiveness also depends on the region. Not only can this differ per country, but also per region within a country. There was always a difference between the north, west, east and south of the Netherlands, but also between Flanders and Wallonia, and between NRW and Bavaria. At one moment the number of people infected was high in Limburg, then it was in the region of The Hague and suddenly it was in Zeeland. This was influenced by too many factors. Testing only uncovered some of the infections because it depends on whether a person gets tested or not. Source and contact investigation were impossible for infections that were not visible. In addition, the guidelines and measures sometimes differed from week to week, making it very difficult to establish which measure worked and which did not.

What also seems to be of influence are the cultural differences between the countries. This refers to compliance with the measures being higher or lower in the different countries. Science agrees that 'compliance' has a major influence on the effect of a measure. The same applies to behavioural measures. There is a clear feeling among the experts that compliance differs between the Netherlands, Germany and Belgium. Some experts say that there is a certain looseness (in terms of facemasks, keeping a distance) in the Netherlands, but that Belgium also has citizens who do not comply. Other experts point out that although at the beginning of the pandemic the Netherlands had fewer restrictions (no facemasks), later on the Netherlands was actually stricter than Germany (working from home, only allowing to receive one person at home). This is despite the fact that it is based on voluntariness. Citizens in Germany (and Belgium) seem more likely to observe the rules than citizens in the Netherlands.

Belgium is quite a different story. Not only is it a federal system, you also have the German-speaking community, the Flemish, the Walloon ...; working with Belgium implies working with three different governments.'

You actually have four different ministers of health. ... '

What also clearly influences differences in measures is the difference in laws and regulations in the three countries. The ability to implement and enforce laws in a pandemic is very different in the Netherlands, Germany and Belgium. In the Netherlands, for example, people with symptoms were advised to stay at home until they had a negative test result, but it is up to people themselves how they interpret and apply this advice. If an infection is established, the GGD phones the infected person and his or her contacts and asks them to stay at home in quarantine. But there is no legal basis, so quarantine is voluntary in the Netherlands. In Germany, there is a legal basis and quarantine is a legal obligation and does not take the form of advice, but it can only come into effect if there is proof of infection in the form of a proper test result. The infected person and his or her contacts are then given a written quarantine order. In Belgium, quarantine was introduced as an obligation, but it later turned out that there was no legal basis for this at all. Enforcing something depends on whether it is regulated by law or not.

When asking the question as to who should be in quarantine, who is considered a contact person and how long you should be in quarantine, differences can even be seen between German districts. But the differences become even greater once you cross a national border. '

It can be concluded that it is not possible to distinguish between behavioural measures on the one hand and public measures on the other and then determine which measures led to a significant difference in the three countries. However, it can be concluded that – by and large – the measures taken by the countries were to some extent effective.

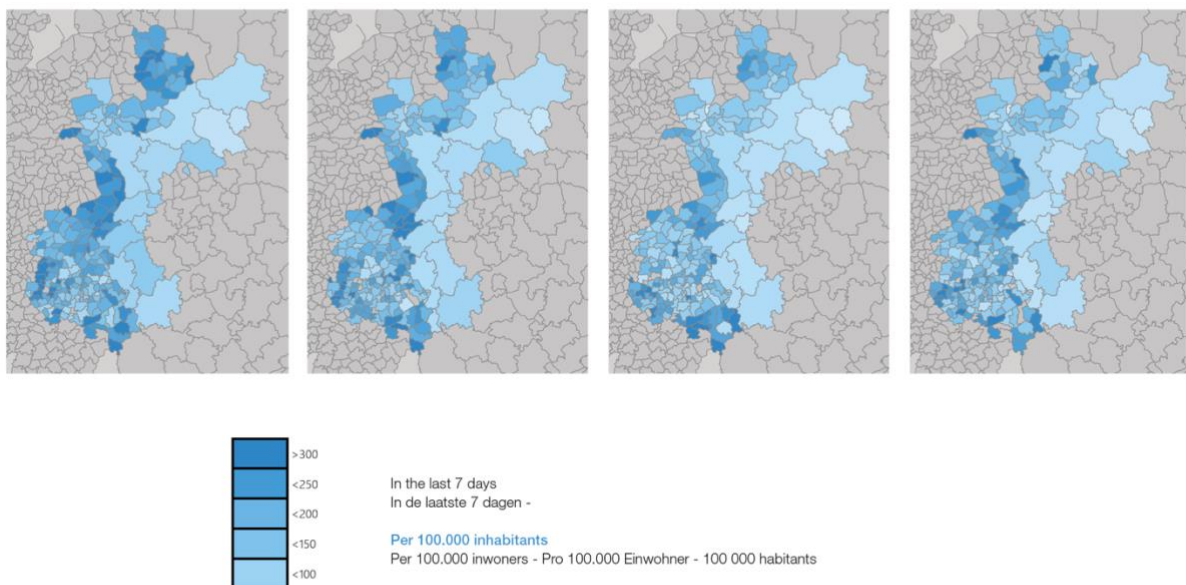
2.5 Closing borders

Is closing the border an effective measure to limit the spread of COVID-19 in the border region (effective measure of infectious disease control)? What other unintended health-related effects can border closure bring?’

To answer this question, our starting point is a study conducted by the Limburg GGDs, Maastricht UMC+ and the Province of Limburg in November 2020, 9 months after the start of the pandemic. This empirical-epidemiological study among 10,001 Limburg citizens showed that people who frequently visited their family, friends or acquaintances in Germany or Belgium had fewer antibodies against COVID-19 than those who did not make such visits but could have done so: 16% versus 18% (Fact sheet Corona Study Limburg www.ggdzl.nl). This result suggests that the role of border traffic in spreading is limited.

Infections

Besmettingcijfers - Infektionsraten - Taux d'infection



25-1-2021 31-1-2021 1-2-2021 7-2-2021 8-2-2021 14-2-2021 15-2-2021 21-2-2021

Figure 4 Number of COVID-19 infections in the period 5 October to 1 November

The data also shows that there were whole periods when the borders were open, but a clear difference can still be found between the countries. Take for instance the time period 5 October to 1 November 2020 (see Figure 4). At that time the borders were open, but a clear difference can still be seen between the Netherlands and Belgium on the one hand and NRW on the other.

Now, for example, take the period from 1 January to 1 March 2021 (Figure 5) when the border between the Netherlands and Belgium was closed: hardly any difference is visible between the two countries.

Infections

Besmettingcijfers - Infektionsraten - Taux d'infection

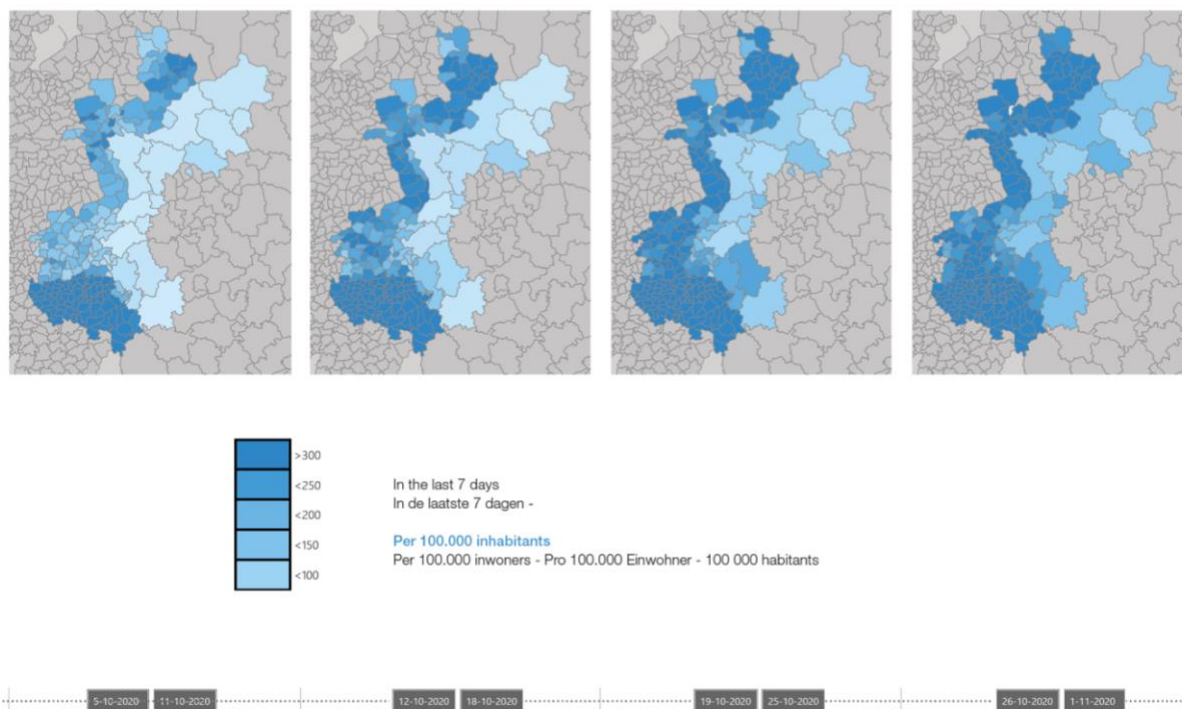


Figure 5 Number of infections in the period 1 January to 1 March 2021

These maps show – see the replies to questions 2 and 3 – that there is no indication that closing a border had any significant effect. For further map material, please refer to Appendix 2 'The Euregional COVID-19 Atlas'.

The borders between the three countries were open. This implies that the distribution of COVID-19 is mainly determined nationally and not Euregionally. In other words, on the basis of this data, closing borders would seem to make little or no sense.

That didn't work. It didn't work for the British variant, nor for any other. It simply does not work. There are also far too many exceptions. ... Border closures are not an effective instrument. We are too mobile for that.'

That which is apparent from the Limburg COVID study and the data is also supported by the experts interviewed in this study. They indicate that border closure is not an effective measure to limit the spread of COVID-19. They doubt the effectiveness of border closures and point out:

- the many exceptions that are unavoidable in a border area (for work, school, family, co-parenting etc.)
- the domestic mobility that is permitted (Heerlen-Groningen is, while Heerlen-Aachen isn't)
- the timing of border closures (too late, may only be effective in the early stages of the pandemic)
- The greater importance of differences in national advice regarding contact possibilities (e.g., working from home, receiving visitors).

Stopping an infection, stopping a pandemic by closing the border is totally absurd. That cannot work. In our team we always said, that is the same as stopping a flood by issuing a decree instead of placing sandbags. You can't stop viruses with laws. Here, the border closures were experienced more as a punch in the stomach, as an attack on the idea of Europe, than as an effective measure to prevent the spread of infections)'.

The experts do point out the many unintended health-related complications that border closures entail. People who needed to cross the border for health, care or welfare purposes had to pass through additional barriers (bureaucracy, sometimes traffic jams): people working in care (doctors, nurses, carers for the elderly and disabled), but also informal carers and patients who needed to cross the border for medical treatment. Some practical examples are described in the box; informal carers who encountered problems because of the border closures. This caused problems not only for informal carers, but also for the people they cared for. Where these forms of care were suddenly under pressure due to border closures, in a number of cases the professional health care systems – already overburdened at the time – had to step in, which led to undesirable situations.

Effect of border closures on family carers⁶:

Mrs Janssen and her brother both live in Maastricht and look after their parents who live in Belgium. Normally, they drive to their parents' home every fortnight to provide informal care. Their mother has dementia and their father takes care of her. They are on their own because family and friends all live in the Netherlands. When Ms Janssen and her brother go to their parents' house, they do the laundry, shopping and housework, help with the finances and take

⁶ These are actual problems that were reported to Burgerkracht Limburg. For reasons of privacy, fictitious names are used here.

care of their mother's physical care so that their father has the weekend off to recuperate. Because of the border closure, they stayed away from their parents, but this was no longer an option for their parents. The financial problems increased and emotional problems also arose.

Another question came from Mrs Smit. Her mother is 92 years old, still lives independently and is cared for by her sister who also lives in Belgium. But her sister was hospitalised and was no longer able to care for their mother. Mrs Smit could not cross the border to take care of her mother during the period that her sister was in hospital.

Mr Green also came with a question. A dear friend of his who lived in Belgium was dying. After a few weeks in hospital, his friend was allowed to go home but needed care. His parents were very old and not able to take care of him. Mr Groen was one of the few people who could have taken care of him so that his friend could have gone home. But this was not possible because the border was closed.

Ambulances returning COVID-19 patients to a neighbouring country were also unable to pass through. Apart from this, experts mentioned the great impact of border closures on people's daily lives.

The experts pointed out that the different national structures for combating the pandemic in the three countries, the speed with which policies and measures changed and the lack of good cooperation, for example, also in relation to source and contact tracing, made it difficult to obtain a good picture of the national rules, a professional way of working and the effectiveness of measures.

It can be concluded that closing borders seems to have had little or no effect on the spread of the COVID-19 virus.

2.6 Learning from one another

What could the countries learn from one another? Are there possibilities to fight the virus more effectively in the border region?

In discussions with the experts, attention was also given to the challenges that COVID-19 posed in relation to professional work in infectious disease control in the border region. An important theme was cooperation across the borders: viruses do not stop at borders. In the context of this study, some experts referred to the work of euPrevent and EMRIC. Both promote cross-border cooperation and keep it going as far as possible within their specific fields of interest. In practice, good incidental cooperation has developed historically between some professionals. However, this often depends on a number of individuals and leads only to limited structural cooperation beyond projects.

Not only is infectious disease control organised quite differently in the three countries as a result of the national context, but – prior to the outbreak of the pandemic – professionals in the Netherlands, NRW and Belgium focused primarily on their national task. They therefore knew relatively little about how their colleagues on the other side of the border worked and had limited contact with one another.

Yes, there was money for meetings and we had an exchange. And there was something Euregional about multi-resistant pathogens ... and I participated in an Interreg programme for a long time. But that all stopped.

The fact that the control of infectious diseases is organised nationally on the basis of historical logics meant that cooperation with colleagues in a neighbouring country was not given a structural place in the organisation. Cooperation was therefore always a matter of a personal initiative, temporary project-funding or an incidental cause: cooperation was often not prioritised by the organisation and as long as no major cross-border outbreaks occurred there were no reasons to change this. Although experts who had experience with cross-border cooperation projects could fully understand this, the termination of a temporary project also often meant the end of cross-border professional contacts. The pressure of work, the fact that cross-border cooperation is not a regular task and the lack of resources did not permit the investment of time in continuation and actual structural cross-border cooperation. Sometimes a mobile phone number remained in this or that contact list so that a professional could still call a colleague on the other side of the border if there was an incidental problem, but these lists become outdated and sometimes professionals had no idea at all how and with whom to make contact if necessary. Also, cooperation often depends on the initiative of certain individuals who are particularly interested in cross-border work and if those individuals – for whatever reason – no longer take the lead, then cooperation stops. Though this system works well as long as there is project-funding and personal commitment, it is nevertheless vulnerable and requires maintenance. EuPrevent and EMRIC provide a form of continuity, but often remain dependent on limited structural resources and project-funding. There is more than enough commitment to these networks in terms of content.

During the pandemic, in relation to their work in the border region, professionals experienced to a greater extent the limitations of the strong national focus of infectious disease control.

Cooperation during the pandemic was sorely missed, precisely because legislation differs in the three countries, protocols are established at national level, ICT systems differ greatly and different national legal-cultural conventions apply. Moreover, professionals noticed that national protocols sometimes formed an obstacle to local infectious disease control in a border region with intensive border traffic. The central, national direction and approach to the pandemic has disadvantages in a border area. Professionals were also hampered by the national approach and rules on contact tracing after an infection.

How do professionals from the Netherlands, NRW and Belgium see their work in the border region in the near future? It should come as no surprise that, given the experts' comments on their professional work in the border region before and during the pandemic, almost everyone thought it was important to invest more in cross-border contacts and cooperation.

We have three GGDs in Gelderland. All three share a border with Germany. ... I think we had a meeting every two years. It is important to stay in contact because there is a lot of border traffic, with large numbers of people who live in Germany and work in the Netherlands and vice versa; also people who live in Germany and are in a Dutch hospital. This requires that we inform colleagues on the other side of the border. ... But we haven't had any meetings in recent years. Three years ago, due to circumstances, one was postponed and then it never happened again.

Experts pointed out that it is important to better understand how colleagues work across borders. After all, as one expert so eloquently put it, in peacetime you have to prepare for the next conflict. All kinds of ideas were discussed regarding these forms of cooperation: they ranged from cross-border internships during training to looking at one another's work from behind the scenes, to regular symposiums on substantive topics.

At the level of infectious disease control, the pandemic strongly highlighted how much these services are nationally based, also in terms of data infrastructure: for example, there is no structural cross-border data infrastructure and no structural data exchange. Data has to come from national or regional institutions and this depends mainly on the goodwill of these organisations. There is no way of 'enforcing' this. However, for some time now euPrevent and GGD Zuid Limburg have been cooperating on a voluntary basis with organisations such as Sciensano from Belgium and data experts on the German side of the Gesundheitsamt in Düren and are therefore able to access some data. Cooperation between these parties is based on a

voluntary partnership agreeing to present data annually⁷ for the Euregional Health Atlas on an online platform that presents comparable data between the three countries. This is currently limited to the regions within the Meuse-Rhine Euroregion.

Some experts argued that it is important, within a political context, to focus more on cooperation. During the pandemic, countries came up with their own national policies and in trying to justify them, they often looked at the performance of neighbouring countries. Which countries did well, which did less well and which did badly? In the public and political arena, this created an atmosphere of competition and rivalry that, according to the experts, is unproductive and even counterproductive in the border region.

Summarising, it can be concluded that there is enough interest in cross-border cooperation, but there are currently still too many obstacles to structurally embed it. Structures such as euPrevent and EMRIC show that there are certainly possibilities, but that everything still stands or falls with personal commitment and project-funding.

⁷ www.euregionalhealthatlas.eu

3. Recommendations

In this chapter, we once again briefly summarise the recommendations based on the questions answered in chapter two. The recommendations are of a medical and epidemiological nature, and are independent of economic and political desirability.

1. Based on this study, it can be concluded that closing the border does not seem to be an effective measure in limiting the spread of COVID-19 in the border area, as border traffic did not play a decisive role in the spread of the virus. It seems much more useful to coordinate measures within regions with no regard to borders. In other words, to also coordinate with neighbouring regions in the neighbouring country. The respective health authorities or the GGDs can play a role in this.
2. There have been valuable collaborations in the COVID pandemic, often on an individual level and because people knew one another from existing networks such as euPrevent or EMRIC. This is also how the experts see it. For a more effective fight against the pandemic in the border region, it is important that the Netherlands, NRW and Belgium develop structural forms of cooperation that make it possible to coordinate and communicate better and to find solutions to local problems due to the pandemic and local problems in the fight against the pandemic that result from the national infrastructural organisation. This involves structural cooperation (not one-off, temporary projects) that is embedded in the financial structure of the organisations and in their regular tasks. In this way, obstacles that arise in border areas during a pandemic, particularly in relation to various national policies (quarantine, source and contact tracing, testing, data exchange) can be resolved earlier and more effectively.
3. In times of a pandemic and certainly for carrying out source and contact investigations in a border area, it is necessary to be able to exchange data across borders. Due to data and privacy regulations, this is currently not possible, or only to a limited extent. This is despite the fact that citizens will continue to cross the borders anyway. For proper management and monitoring of a pandemic in a border area, including the ability to conduct source and contact investigations in the event of a pandemic, it would be desirable to have legislation and regulations to make this possible so that data is (temporarily) available across borders with due regard to the maximum protection of citizens' privacy.
4. As described, it seems that the impact of citizens travelling to and from foreign destinations beyond neighbouring regions is greater than that of border traffic on the spread and introduction of COVID-19. If measures are needed regarding a pandemic with this health impact, it is rather advisable to look into this more explicitly, not only as a country but also at EU level.
5. Little research is available to date on the effects of individual measures and the impact of the measures on the course of the pandemic. All countries were in

unknown territory. This is why there is a need for additional research. Several studies have already started. However, these focus mostly on a measure itself or on a country, rarely on the effects of a pandemic like this on a border area. This makes additional studies desirable. The focus should then be on comparable data and comparable measures.

6. In addition, it is strongly recommended to argue for a number of comparable indicators between countries, or at EU level, using the same methodologies as far as possible, and which are available at least at NUTS 3 level, but preferably at municipal level. This would make it possible to estimate the spread in the border area much more quickly in times of pandemics such as this.
7. According to the experts, it would be desirable for national policy to pay more attention to the special nature of border regions, so that professional regional cooperation across the border is also facilitated by national policy centres. Based on regional arguments, deviations from national policy could sometimes be permitted in order to combat the pandemic more effectively in the border region.

Appendix 1 - Qualitative study

1. COVID-19 in a border region: design of the study

1.1 Introduction

After the first cases of COVID-19 were identified in December 2019 in the Wuhan province in China, the pandemic reached Europe in January 2020. According to the World Health Organisation (WHO), by March 2020 Europe had more cases than the rest of the world combined (WHO, 2021; ECDC, 2021). The rapid development of this pandemic is largely due to globalisation: worldwide economic dependency relationships and intensive traveller traffic (Barlow et al., 2021; Christidis & Christodoulou, 2020; Walsh et al., 2020).

In order to limit the spread of COVID-19 in Europe, European countries focused primarily on Europe's external borders with non-European countries and restricted travel with China (Linka et al., 2020). In the spring of 2020, the European Commission decided to establish external border controls "to protect citizens' health, ensure the right treatment of people who do have to travel, and make sure essential goods and services remain available" (European Commission, 2021a). This meant that control of Europe's external borders was combined with ensuring the mobility of goods and services within Europe. However, the rapid spread of the virus in European countries was a reason for many European countries to implement specific national pandemic policies, such as rules on distance, hygiene, lockdowns, contact tracing, testing, quarantine, masks, etc. National policies to regulate or restrict travel within Europe were also implemented.

Although there has been much talk of 'border closures', according to Lee, an expert in the field of global public health, there is probably no country that completely closed its borders (Lee et al., 2021, 6) and in practice there is a patchwork of many variants of border traffic regulation. National policies to regulate border traffic were also seen in different phases of the pandemic in the Netherlands, Belgium and Germany (Boffey, 2021). While the border between these countries had in many ways disappeared since the Schengen Agreement came into force in 1995, the border became tangible again in various ways during the COVID-19 pandemic. This had a massive impact, especially in the border regions of these countries. As the daily newspaper De Limburger recently headlined: "The border with Germany is back" (De Limburger, 15 April 2021).

The regulation of border traffic is a subject of much debate. Critics point to the tense relationship between border measures and international and European law, and to the negative impact on social and economic life. They also point out that national policies to control the global COVID-19 crisis have major shortcomings compared to a strategy of international cooperation (Chetail, 2020; Opiłowska, 2021; Wille & Kanesu, 2020). According to the WHO, measures to restrict border traffic are legitimate only if there are no alternative measures that provide the same level of health protection (Lee et al., 2021). However, there are few studies that show the

effectiveness of border regulation in a border region. In a review of mobility-restricting COVID-19 measures in China and Wuhan, Grepin et al. (2021) conclude that most studies are modelling studies that indicate that restrictive measures were effective in the early phase of the pandemic. Burns et al. (2021) stated that most studies showing some effectiveness of various international travel restrictions are modelling studies, so the results have a large margin of uncertainty. They state that there is a scarcity of empirical research that provides realistic insights into the impact of border regulation on health and on social and economic life in a specific context. However, an empirical-epidemiological study among 10,001 Limburgers, conducted by the Limburg GGDs, Maastricht UMC+ and the Province of Limburg in November 2020, showed that Dutch people who visited their family, friends or acquaintances in Germany or Belgium more often had fewer antibodies against COVID-19 than those who did not visit them: 16% versus 18% (Fact sheet Corona Research Limburg www.ggdzl.nl).

1.2 The scientific landscape around the concept of 'border'?

Borders have long been regarded as the dividing line between countries as territorial and administrative units, which are governed from the centre. From this conception of "borders", a border region was not interesting for research: it was nothing more than the periphery of a country. These administrative borders are sometimes partly formed by natural conditions (a mountain range or a river) and also often indicate language borders, but certainly not always. National borders are seldom created without a struggle. On the contrary, the construction of national borders was often a long and sometimes painful process, and even where borders are relatively stable, their status is sometimes disputed. In recent decades, in the context of globalisation and migration processes, the concept of borders as given administrative, territorial divisions between countries has been critically examined.

Recent decades have seen a great increase in intercontinental and international mobility of workers, tourists and students: a globalising economy in which global companies set the tone and the growth of imports and exports on a worldwide scale generated a large flow of labour mobility. Labour migration became a normal part of the economy. Alongside this economic traffic, the global mobility of tourists and students developed. Travel became cheaper and growing prosperity made travel more accessible for larger groups of people. In recent decades, barriers to global travel have been lowered, partly through digitalisation: the provision of information for travellers, visa requirements, money transfers, availability of transport, etc. have been greatly simplified in the last twenty years. Besides these flows of travellers, we also saw international flows of people fleeing from political violence and natural disasters.

New forms of mobility were also made possible within Europe. Since 1993, an internal free market for people, goods, services and money has been created in Europe. This means that residents of EU member states can move freely within Europe: at airports, for example, European travellers are distinguished from non-European travellers. This policy led, among other

things, to an increase in labour migration within Europe and to an intensification of European exchange programmes for students. In 1995, the Schengen Treaty came into force for the Netherlands, Germany, Belgium, France and Luxembourg, which regulated the free movement of people. Other European countries subsequently joined this Schengen area. As a result of the Schengen Agreement, physical border posts were removed from the border between the Netherlands and Germany and the border between the Netherlands and Belgium. Inhabitants of this border region have thus lived "without a border" for over 25 years.

Against the backdrop of these developments in mobility, researchers introduced new notions of "border" – as a reaction to the concept of "border" as a relatively stable, administrative-territorial separation between states. First, they pointed out that borders which are sometimes presented as impenetrable – like a wall – in order to indicate different administrative and cultural identities, are in practice 'fluid' and permeable (Dijstelbloem & Van der Veer, 2019). Even in regions where physically hard administrative–territorial borders are drawn, such as between Israel and the Palestinian territories (Ross & Razon, 2015) and between Mexico and the United States (Becker, 2018), there are forms of border traffic that try to evade the dichotomization and the we/they thinking around the border. Secondly, in the slipstream of attention to the fluidity of borders, researchers have also put the concept of 'border country' on the agenda: after all, when borders become fluid, the relationship between centre (power) and periphery (following) is no longer self-evident either. These researchers advocate breaking away from the centre–periphery model and recognising and exploring the unique characters of border regions (Thailand and Myanmar, the United States and Mexico, the Netherlands, Germany and Belgium) (Hinchcliffe et al. 2012). Thirdly, researchers have theorised on the stable nature of borders: in the context of globalisation and migration processes, borders become dynamic and negotiable: instead of presenting the border as a thing, attention is drawn to processes of 'de-greening' and 're-greening'. Many researchers also relate this to new forms of equality and inequality: while the borders become more open for some groups (tourists), they become more closed for others (refugees) (Van Houtem, 2021).

In the context of this report, it would be going too far to describe these conceptual and empirical developments in border research in detail. However, the conceptualisation of border regions as regions that are not merely the periphery of a country but have a character of their own, and concepts such as de- and re-ordering, are also important for this study.

1.3 Qualitative research: experts have their say

We interviewed experts who are involved in the control of COVID-19 in the four Euroregions on a practical and/or policy level. We chose this strategy because we assume that these experts have a good understanding of the impact of border traffic and border traffic regulation on the development of the pandemic and possible side effects.

We spoke to a total of 27 experts: 10 from the Netherlands, 11 from NRW and 6 from Belgium (see table for overview). The gender distribution was almost equal: 13 women and 14 men. Many of the experts hold a position in a regional public health organisation, the GGD in the Netherlands and the Gesundheitsamt in North Rhine-Westphalia. Others work in general practitioner care, geriatric care, social care involved in contact tracing and safety care. Most experts hold senior positions.

| Country | Region | Interviews |
|---------------|---------------------|------------|
| Netherlands | Limburg-North | 2 |
| Netherlands | Limburg-South | 5 |
| Netherlands | Gelderland | 1 |
| Netherlands | Twente | 2 |
| Belgium | Flanders | 3 |
| Belgium | Liege | 2 |
| Belgium | Eupen | 1 |
| NRW (Germany) | Kreis Heinsberg | 2 |
| NRW (Germany) | Kreis Düren | 1 |
| NRW (Germany) | Borken district | 2 |
| NRW (Germany) | Kleve district | 1 |
| NRW (Germany) | Euskirchen district | 1 |
| NRW (Germany) | Kreis Viersen | 2 |
| NRW (Germany) | City of Aachen | 2 |

The interviews were semi-structured and thus relatively open. Themes that were central to the interviews are: the role of the expert in combating COVID-19, the role of border traffic in the spread of COVID-19, policy and practice to control COVID-19 in the border region, cross-border cooperation in combating COVID-19, cross-border use of data, the role of digital tools (apps) in the border region, recommendations for future pandemic control in the border region. Due to the open nature of the interviews, the participants had ample opportunity to present their knowledge, experiences and perspective in their specific national context. The interviews lasted 30 to 60 minutes and were conducted in Dutch, German, French or English. A recording was made of the conversation and it was edited for analysis. Afterwards, the recording was destroyed. The analysis was guided by the research questions and by the theoretical discussions on the concept of 'border'. In the presentation of the analysis, the participants were anonymised: B refers to Belgium, D to NRW in Germany and N to the Netherlands.

To validate the analysis, we organised feedback sessions: 2 in German and 2 in Dutch. At these we presented and discussed the analysis with some of the experts available at the time: 4 from the Netherlands, 3 from NRW, 2 from Belgium. Others provided written feedback on the draft report. Based on the feedback, some points of the analysis were adjusted, sharpened or qualified. Everyone also received a draft version of the report and, if desired, provided feedback. Participants were thus able to check whether the method of anonymisation was adequate, whether the scope of their contribution was adequately represented and whether they agreed with the analysis and interpretation.

1.4 Research ethics

For ethical justification of the research, we took our guidance from the guidelines of the American Anthropological Association (AAA Statement on Ethics 2012). First, the value of informed

consent is important. In the context of the Netherlands, Belgium and NRW, this notion means that all participants – after being explained the purpose of research, about anonymisation, and about the possibility of withdrawal – agreed to participate and signed a consent form. Second, good care of participants is important. In this context, we provided opportunities for feedback, verbal and written, to check whether the method of anonymisation was adequate and to do justice to the participants' input.

1.5 Contents of this Appendix

The following chapters present the analysis. First, we outline the special nature of borderless daily life in a border region and how in this context the border suddenly manifested itself forcefully during the COVID-19 pandemic (Chapter 2). We then turn to the effects of border traffic restrictions on social life and on the spread of the pandemic (Chapter 3). We then discuss the relationship between the national organisation of infectious disease control and the local control of a pandemic in a border region (Chapter 4).

2. The pandemic in a European border region

2.1 Introduction

In order to gain insight into how national borders and border traffic regulation played a role in the development of COVID-19 in the border regions of the Netherlands, NRW and Belgium, this chapter first focuses on the question of what life was like in a border region before the outbreak of this pandemic. Border regions are often special areas with many natural, material and symbolic traces of the way in which the borders developed over the centuries. There are often shared histories on both sides of the border and special cultural blends arise in the way of life. However, one border region is not like another. Where there are no strong border controls, a border region is often associated with freedom: residents can flexibly make use of the advantages of life on both sides of the border. For example, they can buy some groceries in their own country and others in the neighbouring country. What is prohibited in one country can be done in another. In countries with strong border control, the border region is associated not only with freedom, but also with illegality, smuggling and adventure.

(www.smokkelmuseumcranendonck.nl). In countries with strong border protection, living in a border region encourages people to seek illegal routes for social traffic and trade. Many formal and informal border crossings developed to enable legal and illegal border traffic. On the Grensfiets website one can read about the border region between Dutch and Belgian Limburg: "There are at least 25 border crossings and shortcuts south of Stramproy between fields, meadows, marshes, streams, woods and hedgerows".

However, since the creation of the Schengen Area of the Netherlands, Germany, Belgium, Luxembourg and France, these Euregions have become less dependent on shortcuts because border traffic has become much easier. Intensive border traffic is inextricably linked to social and economic life in the Euroregions that are the focus of this study. In 2017, for example, 40 thousand people work in the Netherlands who live in Germany and 39 thousand who live in

Belgium (CBS, 2020). The CBS website shows that South Limburg is the Dutch region with the highest percentage of employees living in Germany or Belgium, namely 5%. In 2018, for example, 7980 Dutch nationals and 5330 Belgians work in German North Rhine-Westphalia (Interreg, 2021). Crossing the border daily is the most normal thing in the world for the many cross-border workers.

In this chapter, we first address the question of how the experts see and experience everyday life in a border region. Then we let them speak about how life in a border region and the COVID-19 measures influenced the spread of COVID-19.

2.2 Living without borders in a border region

The border region of the Netherlands, NRW and Belgium is a special region, because the administrative–territorial border has rarely manifested itself as a border in the last 25 years. The interviews show that the experts characterise the social and economic life in this border region as almost borderless until the outbreak. In daily life, several experts said, there is a lot of border traffic, but many residents do not see it as cross-border because they simply do not feel there is a border. In some villages the border runs through the village, people of different nationalities partly speak the same language and people from different countries attend the same schools and clubs. Family life, love-life, leisure activities, health care, work, consumption – all these things – are so naturally cross-border that the administrative-territorial national border, as it were, no longer exists.

In everyday life, the border plays no role. We go to school and we work across the border. We go to the doctor or the garage across the border and our horses graze in the meadow on the other side of the border. The border is part of our lives. It is a "basin du vie". (B3)

The border region has developed in such a way ... that we do not experience a border. (D2)

I think the COVID crisis makes that clear, that a border is really just a line on a plan. (B1)

One expert notes that people feel connected to the region, as a European melting pot, and not necessarily to a country of which they are citizens.

This region is very dynamic. We are at the centre of Europe and 'border' – in this context – is an artificial concept. People are simultaneously connected to several countries. They work in one country, they have family in another, they shop in the third. (N3)

Another expert says that it is nice for people to be able to enjoy the benefits of several countries.

"When it comes to leisure activities, the border region is highly valued. People drive from Enschede to Germany for the weekend, and from Germany to Winterswijk to enjoy the culture. (D1)

Partying across the border is also normal in a border region: many residents, for example, attend gatherings in the run-up to carnival, the carnival celebrations themselves and post-carnival gatherings in neighbouring municipalities on the other side of the border. For example, one of the first cases of COVID-19 in Dutch Limburg could be traced back to Heinsberg in NRW through genetic characteristics of the virus: carnival activities in the border region turned out to be a hotspot for COVID-19 infections.

Nevertheless, people in the "borderless" border region are sometimes confronted with borders. For example, several experts noted that working in one country and living in another involves a lot of red tape. Institutional practices such as social security systems, pensions and taxes are embedded in and an expression of complicated national laws and regulations that create a lot of extra work for cross-border workers.

What you do notice about the border, is the difficulty for a Dutchman to work in Belgium. Just as we have a DigiD in the Netherlands, you need an eID in Belgium... I've been working here for a few years now and there are still a lot of programmes I can't open, because I don't have that card. And you can only get it if you live in Belgium, so I struggle with that every time." (B2)

Those who have to deal with social insurance or taxes do feel the boundary. (D1)

Despite special regulations for cross-border workers, as well as additional information and education, the administrative hurdles are often very high. However, this does not detract from the fact that social life in a border region has many advantages.

Many experts therefore relativised the significance of administrative–territorial borders in the border regions in relation to the outbreak of COVID-19. In this context, various experts pointed out that internal borders between districts and regions are sometimes experienced as stronger than administrative national borders. Thus, experts from Belgium:

Belgian-Limburg feels closer to Dutch-Limburg than to Wallonia. (B5)

I think that the Limburger feels much more connected to Dutch Limburg than to Liège, which also borders on us. We feel that Wallonia is more of a different country than Dutch Limburg. (B1)

These experiences of "borderlessness" before the outbreak of COVID-19 raise the question of what changed with the outbreak of the pandemic.

2.3 A forest of national rules

The national measures to combat the COVID-19 pandemic meant that, after decades of "borderless" life, residents in the border regions of the Netherlands, NRW and Belgium again felt that they were citizens of different countries. Many countries in Europe took broadly the same measures to curb the pandemic. The Netherlands, Germany and Belgium all developed policies on keeping a distance, washing hands and wearing facemasks, and introduced rules on quarantine, testing, curfews and lockdowns. However, in the three countries we also saw that the details, timing and concrete implementation of these measures differed. While Germany and Belgium were quick to make it compulsory to wear facemasks in public places, this was long considered ineffective in the Netherlands, so facemasks were introduced there later. In the Netherlands, many measures were voluntary for a long time, while in Germany and Belgium advice became mandatory. Quarantine rules varied widely, with one country requiring ten days' quarantine after a positive test, another advising fourteen or seven days. While the Netherlands introduced lockdown for sports facilities and museums, people in Belgium could continue to visit museums and swimming pools. Policies on schools also differed. This forest of different rules was quite complicated for daily life in a border region, especially since the rules were constantly changing.

Many interviews reflected on the various national measures. On the one hand, it was pointed out that rules in the Netherlands are sometimes less strict in terms of content and that the Dutch also handle them loosely. For example, one expert said that Belgian schools with many Dutch pupils often had to re-explain the rules and have discussions with Dutch parents because the rules were less strict in the Netherlands.

It is also often difficult because different countries have different measures. And that makes it difficult for people, because they then move from one situation to another. Then you see that schools clash with pupils and parents from the Netherlands who find the measures in Belgium too far-reaching. That is a big difference with the world they live in at home, where things are a bit more flexible. (B1)

Another expert also points out the 'looseness' of the Netherlands in comparison to Germany.

The Dutch were a bit loose about corona. Last summer I was in Renesse myself and I was surprised at the large groups of people, the use of facemasks, et cetera. They didn't test that much in the beginning either. There were high death rates, and people said, yes, it is your own responsibility. The Netherlands does these things differently to Germany. (D2)

In this context, some experts noted that the legal enshrinement of rules varied considerably from country to country. In the Netherlands, for example, people with complaints were advised to stay at home until a negative test result had been obtained, but it was up to people themselves how to

interpret and apply this advice. In Germany, quarantine is seen as a serious invasion of privacy: post-infection quarantine was a legal obligation and not an advisory measure, but it could only come into effect if there is proof of infection in the form of a valid test result.

For us, quarantine is a restriction on fundamental rights and we need very good arguments for that. That is why we always want the results of the index case, laboratory results that conclusively confirm "this person is corona-positive". That legitimises us to impose quarantine, to restrict people's basic rights. ... In Germany, these rules have a constitutional character, and people also receive an official letter from us. In the Netherlands things are different. There is no legal basis for quarantine and sometimes there are not even laboratory results. If we sometimes ask for them, they say, no we don't have them. (D9)

Others put the differences between countries into perspective, both with regard to the rules themselves and how they are dealt with.

.... Wear a facemask and keep your distance. ...difference between Belgium and the Netherlands? I would not dare to say so myself, because I also see plenty of Belgian people who do not keep to this. (B2)

In the beginning, there were fewer restrictions in the Netherlands, for example, no rule on facemasks ... Later, we had more freedom and the Netherlands was very strict: only working at home, only allowed to receive one person at home. (D8)

The interviews show that there are many types of differences between the approach to the pandemic in the Netherlands, Belgium and Germany, but these differences cannot be easily reduced to the dichotomy of legal/non-binding, strict/relaxed.

Some experts also pointed out domestic differences in this respect. Although the COVID-19 approach was centrally managed in all three countries, some powers were delegated to lower authorities, which also created domestic differences.

When it comes to the question of who should be in quarantine, who is considered a contact person and how long you should be in quarantine, we even see differences between German districts. But the differences become even greater when you cross the national border. (D7)

Belgium is a really different story. It is not only a federal system, you also have the German-speaking community, the Flemish, the Walloon... working with Belgium implies working with three different authorities. ... and they have totally different structures for ID control. (N5)

You actually have four different ministers of health. ... (B2)

Although the different approaches to COVID-19 between the Netherlands, Germany and Belgium can be put into perspective from a helicopter perspective, the various national measures created many practical problems in the border regions, for example for cross-border commuters and school traffic.

We have many commuters, for example. They work for a German employer and live in the Netherlands and therefore often have to cross the border. We ask the GGD for a written statement for the employer that an employee tested negative, but then we hear 'no, we cannot arrange written statements'. (D8)

Suppose people work in Belgium and live in the Netherlands. Then we advise to follow the Dutch rules for the home situation and the Belgian rules for Belgian work situations and work relations. But that is sometimes complicated, because the rules sometimes contradict each other. The Dutch rules require you to go into quarantine for ten days after infection, in Belgium it's fourteen days. We then discuss the best solution with people and employers. (N1)

The Dutch have a shorter quarantine.... But we and also the German employers don't want them to come back to work too soon. ... that is difficult. (D10)

Commuting school students also faced practical problems due to the different rules they had to deal with.

Dutch families who live in Germany and take their children to a Belgian school ... what should they do if a child in their class tests positive? What happens in the Netherlands? What happens in Belgium? What happens in Germany? Each country has its own protocol. (D7)

In the border regions where people live, work, study, care etc. without borders, they had to deal with not "one forest of national rules" but "three forests of different national rules". Sometimes these rules were more consistent with one another, sometimes less so. In public discussions about the approach to COVID-19 in Europe, these national differences were often blamed and stereotyped as an expression of "national mentalities and cultures". The interviews revealed that it is not adequate to reduce national differences in COVID-19 interventions to a stereotypical schema of "loose" and strict" or "liberal and paternalistic": there are too many types of differences for that. Nevertheless, these differences, which are an expression of different central, national policies in the three countries, created considerable complications for everyday life in a border region. These unforeseen effects of national policies in the border region long went unnoticed by the institutions that took these measures. The pandemic was defined as a national

problem and there was a national control strategy. The assumption was that the country was one, and no attention was paid to the special character of a border region nor to the negative effects of the COVID-19 measures for the border region. While for decades the border region of the Netherlands, NRW and Belgium could be situated at the middle of Europe, this pandemic suddenly made it a 'periphery' again and an object of central, national policy, while in many respects the neighbours were closer than the centre.

2.4 Is border traffic a risk?

The idea that epidemics have something to do with social movement is centuries old. Even when concepts such as viruses and bacteria did not yet exist, people took measures to restrict social traffic and mobility. In the 14th century, for example, many cities barred ships from areas where a plague epidemic had raged. Even the word 'quarantine' (*quaranta giorni*, forty days) comes from Italian and dates from the time of the plague epidemic. At that time, all ships docking at a port were required to remain stationary for 40 days and the crew were not allowed to leave the ship. Nowadays, this measure mainly means sealing off sources of risk to reduce the spread of infection. Cities were sometimes closed off or sick inhabitants were placed outside the city. From 1770 onwards, the Habsburg Empire even established a so-called cordon sanitaire – they closed the 1600 km long border with the Ottomans in order to keep the plague out of the Empire (Janssen, 2020). Apparently, it was thought at the time that such cross-border traffic posed a danger and was best avoided. The literary scholar and anthropologist Wald, in her book *Contagious. Cultures, Carriers, and the Outbreak Narrative* (2008), Wald investigated which dominant narratives are associated with an epidemic. She shows that the idea that diseases and infections come 'from outside' and are brought by 'foreigners' or 'others' has a long history and is still relevant today.

Today, much more is known about the spread of viruses and bacteria than in the 14th century, but a new virus also generates new questions about mobility and spread. Those who live on an island and have a high degree of control over incoming and outgoing traffic can limit the introduction and spread of such a virus by preventing anyone from coming ashore. But even countries like Australia and New Zealand are dependent on imports of necessary goods because these countries are not entirely self-sufficient, and it is difficult to control a long coastline. It is virtually impossible, in practice, to reduce the risk of spreading a virus to zero. However, a Euroregion between the Netherlands, NRW and Belgium is the opposite of an island: life is borderless and there is intensive everyday border traffic. To what extent can this cross-border mobility be considered a risk for the spread of COVID-19?

Some experts said that contacts across the border sometimes played a role in the contamination.

At the moment, there is still a higher incidence in the Netherlands, which was later addressed by more contact restrictions. Yes I am sure we got some infections from the Netherlands. (D6)

However, most experts do not see border traffic as a major risk.

I would not say that cross-border mobility plays a major role. But it does play a role. ... In some areas we had a higher incidence because of the close contacts with the Netherlands. But we got through the crisis together very well. (D1)

We had a handful of cross-border cases with Belgium, but they were not statistically relevant at all. ... it was about decimal points. We are more likely to see infections coming via the Cologne-Bonn agglomeration than via Belgium-Luxembourg. (D5)

The trend you see nationwide in Belgium also fits one hundred percent in our own working area. ... some measures came later in the Netherlands than in Belgium. And Maasmechelen is so close to the Dutch border that I would expect it to show a similar infection pattern as the Netherlands. But that actually didn't happen. (B2)

We do not feel that many infections have spread from one country to another. Of course, the outbreak started in Heinsberg, but the infections somehow also reached the western Netherlands. (D9)

Others argued that there is a lack of knowledge and information to answer the question of whether border traffic influenced the development of the pandemic in different countries.

Has cross-border traffic had an impact on the pandemic figures? I have no hard data to measure that. I cannot answer that question in the affirmative because I have no data. My feeling is that no. But that's just a feeling. (B3)

Some experts pointed out that very different issues from border traffic play a role in spreading. For example, some said that it is important to look at the mechanism of transmission of the virus, which is not related to border traffic as such.

I do not think that crossing the border is the main cause of transmission. After all, the situation for residents living on the Dutch and German side of the border respectively is the same as residents living in two Dutch neighbouring villages. I do not think that the border has much to do with it. (N1)

No, the patterns of transmission are the same everywhere. (N2)

Others made it clear that it is not border traffic that plays a major role in the spread, but the extent to which people are inclined to follow the preventive measures.

The real cause of the pandemic is simply the extent to which people are complying with the measures and advice, both on the Belgian side and the Dutch and German sides. (D5)

It is not the border that does it, it is the family life on both sides of the border. And the friends who live on both sides of the border and the work. ... I don't believe that the border plays the decisive role, but the contacts between people. And that is the same on both sides of the border. (D7)

In this context, some experts wondered what the difference is between travelling from Maastricht to Aachen or Liège, and travelling from Maastricht to Utrecht or Groningen?

I am convinced that travelling between Maastricht and a nearby Belgian town is the same as travelling from Maastricht to a similar town in the Netherlands. ... A friend of mine lives in the Netherlands but has family in Belgium and he could not see them for a long time. Whereas I live in Maastricht and can visit my family in the north. (N1)

A special phenomenon discussed by some was the labour migration from Eastern Europe to the Netherlands, Germany and Belgium. There are many temporary workers from Eastern European countries who regularly travel back and forth between the country where they work and their home country. A number of clusters of COVID-19 have also been identified at companies that frequently work with labour migrants, such as butcher's shops and companies in the agricultural sector. It often proved difficult to monitor the effects of this mobility, while they did represent a COVID-19 risk because they often lived in relatively poor conditions, with many in a small space, where COVID-19 measures are not enforceable. Transportation to work or housing was also often done without measures in place.

Because also across our border region, the free movement of people causes problems in the follow-up of COVID. And then I am talking mainly about people who come from Eastern Europe. We know that there is a whole group, a fairly large group, of migrant workers in our municipality and we don't know whether they are following the rules in terms of quarantine. And that is almost impossible to map out. ... If someone from Europe comes here and they are actually obliged to register with the local government. But if that doesn't happen, you don't know that they are there. And even if we establish that they are here and they still don't register, there are no consequences. People do not benefit from doing it. And what we see is that often people travel up and down. The first time they come, they do register, because they need a number to be able to work here. But once they have that number, they don't let on anymore, "oh, we're leaving", or "we're

coming back”. And do you know if there have been outbreaks among that group? Yes.
(B1)

Interviews have shown that COVID-19 infections are sometimes related to cross-border contacts with family members, colleagues or friends, during work, celebrations or family care. And sometimes there is an outbreak - a cluster of infections - where it becomes clear through contact tracing that the outbreak is related to border traffic. However, the experts put the extent of the number of infections caused by border traffic into perspective. Not only do they point out that they have no data to support the claim that border traffic had a major impact on the development of the pandemic in any of the three countries, any form of mobility – whether domestic or cross-border – is, in their view, a risk if preventive measures are neglected.

2.5 Closing statement

It has become clear in this section that the experts do not see borderless life in the border region as an important factor in the spread of the pandemic, but they did see the administrative-territorial borders between these countries slowly but surely returning through national control measures in the Netherlands, Germany and Belgium. While the border region had acquired its own borderless social, economic and cultural character since 1995, during the pandemic it became a focal point for many different, often contradictory national measures to control the pandemic. The national character of infectious disease control caused few complications in the border region as long as there was no pandemic, but COVID-19 revealed tensions between borderless life in a border region and nationally organised and centrally controlled infectious disease control. The fact that the jumble of rules in the Netherlands, Germany and Belgium – from facemasks to quarantine – created many complications for life in the border region is not clearly visible to national administrators in charge of pandemic control. They see the nation state as a whole. The notion of a European border region is therefore subordinated to the centre–periphery model by and in the national COVID-19 strategies. By necessity, relations with national governments are given priority over relations with neighbours.

3. "Closed" borders, daily life and the pandemic

3.1 Introduction

Most of the experts we interviewed put the role of border traffic in those countries over the course of the pandemic into perspective. Nevertheless, several countries took measures to limit border traffic during the pandemic, assuming that this would help reduce the number of domestic infections. Border closures were widely reported in the public debate, but the palette of measures shows many different degrees and different forms of restrictions on border traffic: specific conditions for crossing the border, such as a limited duration of the visit and test certificates, specific rules for quarantine after border traffic, and prohibitions on non-emergency border traffic. According to Lee et al. (2021), many different names were used for different types of restrictions, which makes ordering difficult. Restrictions on non-emergency passenger traffic in the Netherlands, Germany and Belgium were presented and experienced as "border closures". Because these measures were reinforced by the use of impressive warning signs, material roadblocks (concrete blocks, fences, sand heaps) and police checks, they had a great impact on life in the border region.



The symbolic dimension of these material and physical barriers in a border region in the Schengen area should not be underestimated.

In this chapter we first discuss the experts' views on what effects the border traffic restrictions had on people's social and economic life in the border region. Then we present their views on whether border traffic restrictions contributed to fighting the pandemic and reducing the number of infections.

3.2 Restrictions on border traffic and social life in the border region

All the people we interviewed emphasised the profound effect of border traffic restrictions on life in a border region. This was something they had to deal with themselves as private individuals: some live in one country and work in another, others have relatives across the border or children attending schools in another country. But also as experts they saw the consequences of border traffic restrictions. For example, one expert referred to the consequences for care of the elderly.

The people who find it more difficult to pay for help always come to us. ... Those people also have to go shopping. ... It is much cheaper to go to a big department store in the Netherlands. For many of those seniors we do an outing. We go to Stein ... they can have a cup of coffee. That's very important for those people. But that's all gone. ... And then there are family members who live in the Netherlands, or who want to visit their parents, or their daughter. The contact is much less, isn't it? (B5)

Others pointed out that health care in the border region, for example, relies heavily on border traffic. Many patients cross the border to visit their doctor and many medical and health care experts cross the border daily because they work in hospitals and health care facilities in another country.

Suppose you restrict this necessary border traffic – you prevent doctors' visits or cross-border professional work – this will cause great damage. There are many Germans working in a Belgian hospital, for example. Suppose you were to stop that, what would happen then? (D3)

They stressed that travel restrictions in the context of tourism are of a different calibre compared to restrictions on everyday border traffic in a border region.

Not going on holiday is something completely different ... It has not been considered that there are so many people who work across the border or have to cross the border frequently for other reasons. That cannot just stop because of COVID-19. (N10)

The restrictions on border traffic were very drastic for many residents of the border region, but the exact meaning of "border closure" depends on the practical context and whether there was room for negotiation and practical adjustments. In Belgium, for instance, many formal exceptions were created for border region residents who had to travel to the Netherlands or Germany.

It is natural that after the decision to close the borders one is immediately confronted with the fact that for many citizens it became impossible to lead a normal life, even if they respected the measures. So a whole series of legal exceptions were quickly created. To visit a partner, to carry out co-parenting, doctor's visits – were all included in the law as exceptions. (B3)

In Germany, too, exceptions were made in order not to excessively burden the social life of people living in villages located on the border, such as Selfkant, Dinxperlo and Suderwick. Not only legally, but also in practice, openings and adaptations were sought. For example, a German expert explained how the physical location of the border is negotiable in practice:

We have a Belgian supermarket nearby, it is located 20 metres from the border on Belgian territory. Many local German residents do their shopping there. When two customs officers came to close the border, the owner, with that typical Belgian mentality, went up to them and said: 'Hey, you can't close the border here!'. Then they put the signs 50 metres away so that the German inhabitants could still go to the shop there. (D5)

But not everyone was willing to compromise and negotiate, and other solutions had to be found. This happened, for example, with the transport of patients across the border. Normally, this was done by Belgian and German ambulances, but the closing of the border made this difficult.

It was no problem to transport patients by ambulance from Belgium to Germany. It was more difficult in the opposite direction. When the German ambulance was not allowed to cross the border, they obeyed the rules and stopped at the border. So then we had to come up with something else. In Belgium, we do get around the law a bit, but it's different for people from Germany. They say, if I can't go any further, I won't go any further. So we sent ambulances to Germany to pick up the patients. (B6)

Restrictions on border traffic caused many problems in a border region where people are used to living without borders. Invoking formal rules of exception meant a lot of administrative and bureaucratic work. But residents of the border region also took fate into their own hands: they moved signs and border posts around, informed one another about shortcuts and warned about controls. During the pandemic, administrative borders between the Netherlands, Germany and Belgium were re-established, but this also stimulated the creative application of the rules by residents: here and there, the atmosphere of smuggling returned.

3.3 Restrictions on border traffic and national COVID-19 trends

The idea behind restricting border traffic is to limit mobility and make it easier to control and reduce the number of infections in a country. Whether this actually occurred in practice is difficult to establish. What do the experts we interviewed think about the role of border traffic in spreading the virus?

Some did see a correlation between border traffic and the incidence of infections in their national border region and put this down to different measures on both sides of the border.

Of course, the development of the pandemic, especially in Belgium, had a great impact on the border region... because the incidence figures then started to follow those of the neighbouring country. We have a lot of border traffic here. (D10)

For nine months we were in the top three in Germany with the weekly incidence per 100,000 inhabitants. Since the restrictions on border traffic with the Netherlands, those figures are much lower. Surely that is an indication. (D6)

However, most experts were rather sceptical about the regulation of border traffic as a tool in controlling COVID-19. According to some, restrictions on border traffic might have had some effect in the first phase of the pandemic, especially a delaying effect.

Closing the border in April or May last year would have been totally pointless. Restricting mobility would have made sense in the earliest phase of the pandemic, in February. I think that would have had an effect on the development of the crisis. (N2)

I think that the border in itself does not stop the spread of the virus. At best, it can slow it down. Ultimately, pathogens do not stop at borders. Nor do they have a passport. Closing borders is only useful in the earliest phase of a pandemic, as research shows. ...We would not have been able to prevent the pandemic, but we might have been able to slow it down a bit. (N3)

According to most, border closures are not an effective tool for pandemic control in a region that is highly dependent on border traffic.

It didn't work. It did not work for the British version or for any other. It simply does not work. There are also far too many exceptions. ... Border closures are not an effective instrument. We are too mobile for that. (D10)

But we certainly did not have the impression in the test centre that re-opening the borders had a great effect on the distribution. If I then ..., well, I can only speak about Maasmechelen and about my feelings. (B1)

Some experts stressed that mobility and social contact is the big problem, but not necessarily border traffic.

Personally, I do not think that closing the border had much effect. People had to travel for work, school etc. anyway. People would have to travel less in general. (N5)

Mobility is the big problem. In Germany, in the Netherlands, everywhere. People should stay at home. Mobility is always a source of infection. So, will closing the borders really help? I can't really judge, but I have my doubts. (N6)

Maintaining preventive measures on both sides of the border is important, not closing the border.

We saw that the figures went down considerably when we [Germany] were in lockdown and the Netherlands also introduced restrictions. ... It is also clear that if just across the border there is a weekly incidence of 300 and we have 100, then those figures would be affected by border traffic, shopping and so on. That is normal. I don't think closing the border would change that much, it's the measures in place that do it. It is important to reduce the number of infections in a place of residence so that you don't get clusters. ... So it is important that contact restrictions are in place in the Netherlands. That would have more effect than closing the border. (D6)

Some experts considered the border closures in the context of Schengen to be complete nonsense.

Stopping an infection, stopping a pandemic by closing the border is totally absurd. That cannot work. In our team we always said that is the same as stopping a flood by issuing a decree instead of placing sandbags. You can't stop viruses with laws. The border closures were seen here more as a punch in the stomach, as an attack on the idea of Europe, than as an effective measure to prevent the spread of infections. (D5)

The Schengen Agreement had given the border region an identity itself as a European border region, but with the many national measures to restrict border traffic, the border region was effectively back to square one.

3.4 Closing statement

The previous chapter has shown that the experts do not consider intensive border traffic in a border region in itself as a risk for the spread of COVID-19 in the countries involved. After all, travelling across a border does not differ from travelling within a country. It is therefore not surprising that this chapter reveals that the experts do not see the added value of strict restrictions on border traffic in combating COVID-19. There is currently little evidence of the effectiveness of border traffic restrictions and from their professional perspective, many other measures such as maintaining a distance (certainly in the private sphere) and less mobility in general are much more important for combating COVID-19. While the added value of border traffic restrictions is lacking according to the experts, they emphatically pointed out the negative consequences of these measures on life in the border region of the Netherlands, NRW and Belgium. Social and economic life, including professional and informal care relationships, were disrupted considerably and some consider the measures to be completely at odds with the spirit of European cooperation as expressed in the Schengen Agreement.

4. Pandemic control in a border region

4.1 Introduction

Historically, the organisation of infectious disease control is strongly linked to processes of state formation. The introduction of the civil registry at the beginning of the 19th century with the registration of births, deaths and marriages formed the basis for the development of birth, death and cause of death statistics in European countries. In 1866, for instance, the first national cause of death statistics appeared in the Netherlands with six causes of death. The development of statistical techniques made it possible to visualise the health situation of a country or region at a glance, in a table or in a graph. Statistics became an important tool for doctors who advocated preventive approaches to tackling health problems in the 19th century (Houwaart, 1991) and for life insurance doctors who played a major role in the responsible management of insurance portfolios by large-scale, national life insurance companies (Hacking, 1990; Horstman, 1996). The control of infectious diseases cannot be seen separately from the arrangements that made the production of statistics possible: the counting and collating of reports on infectious diseases is embedded in national legislation, national organisational structures and funding arrangements, national data infrastructures and national ethical codes. The Netherlands, Germany and Belgium have their own variants of centralisation and decentralisation of tasks and competences. From a global perspective, these differences (in infectious disease control) between the countries may be small, but for experts who work in the border region and sometimes have to deal with all three countries, they are considerable.

In this chapter, we discuss how the experts experienced COVID-19 control in the border region before and during the pandemic, and how they view the future of infectious disease control in the border region.

4.2 We do not know our colleagues across the border very well

The challenges posed by COVID-19 for professional work on infectious disease control in the border region were also discussed with the experts. An important theme was cooperation across the border: viruses do not stop at the border. In the context of this study, some experts referred to the work of euPrevent and EMRIC, the Euregio Meuse-Rhine Incident and Crisis Management, in which fire brigades, technical services and crisis control services from the border region work together, because in the event of a disaster emergency services from a neighbouring country can sometimes reach the scene sooner.

We have EMRIC as a cross-border cooperation and we have personal contacts through the euPrevent projects. And our services also had contacts before the corona outbreak. In particular in the field of infectious disease control and reporting, there are always cases of measles or tuberculosis or a legionella outbreak in the border region, and then you have to cooperate across the border. (D10)

An expert noted that during the COVID-19 pandemic, EMRIC did important work on information and communication at policy level. For example, there was a central point of contact between the three countries and regular updates were made on the measures in place in the countries.

That is, it was mainly on the level of an exchange of information. As soon as there is a legal framework, a new version of a ministerial decree or new rules in force here in Belgium, these were immediately communicated to the central contact point of the Euregio which then draws up a table. And of course, what I am saying also applies to the Dutch side and the German side of the Euregio. ... And of course political meetings take place. I remember that the governors, here, this summer, were brought together by the Belgian Minister of the Interior and by the Dutch Minister of Justice and Security to talk about the border situation and to discuss the principle of 'we will close if we experience a second wave'. However, the answer was really no, somewhere we should not talk about closure ... For this kind of political meetings take place. When we know that we are going to talk about cross-border areas, as we are now, and therefore in certain cases by signing a declaration of honour to allow people to cross the border, things are discussed, but they are prepared by staff. ... So it is mainly information, communication. ... When many Belgian citizens went to the shops in the Netherlands, the Dutch authorities wrote to the governor in Belgium: "Please communicate in Belgium that the shops in Belgium are just as good shops as in the Netherlands, in order to slow down that passenger traffic." And the texts, the press releases, were often made in consultation. My contact in the Netherlands would send me the project and then I would give my opinion, and from then on we would make sure that we published a common text. These are mainly exchanges of information and communication. (B4)

Another expert also has good experiences with multi-level cooperation.

For us, contacts with the Netherlands in the border region that we have built up over the years are very important. You know one another from a number of meetings; the district director, for example, meets his Dutch counterpart. There are also interesting exchanges through Euregio projects ... A lot has already been set in motion and then you have a good start when a pandemic breaks out. (D2)

Staff members of the GGD Zuid Limburg who had previously worked together across the border had intensive contact with colleagues in Aachen and Heinsberg during the pandemic. However, these and other experts also pointed out the major differences between infectious disease control in the three countries and the difficulty of finding one another.

The system for controlling infectious diseases works quite differently. The Dutch do it quite differently from us in Germany, also on the basis of different legal rules. They work in completely different systems, you cannot say otherwise. (D2)

Belgium is a different story. Working with Belgium means working with three different governments... and they have a very different structure for fighting infectious diseases. In Belgium, for partners working on public health care, we have to look outside the public health care system. (N5)

We had admitted several patients from the St. Vith hospital to our ICU, and one of the patients died. We didn't seem to have any contact in Belgium whom we could inform. Not the family, not the authorities in connection with the mortality statistics. I have no contact person for public health care in Belgium. ... There is no structure that corresponds to ours. ... The homepage of the Sciensano website has helped me understand the Belgian system. And I know a senior doctor who ran the COVID department at St Vith hospital, but he has no contact with the Belgian authorities to whom I can turn. (D5)

Infectious disease control is organised in the three countries is quite differently as a consequence of the national context, so before the outbreak of the pandemic, experts in the Netherlands, NRW and Belgium focussed primarily on their national task. They therefore knew relatively little about how their colleagues on the other side of the border worked and had little or no contact with each other.

The only area where we have worked very, very hard on harmonisation is emergency ambulance care. There, we have had clear agreements on cooperation for years, decades. But in all the other areas - medical care, whether intramural or extramural or public health - we only deal with one another sporadically. (D5)

For example, cooperation with the hospital in Sittard worked very, very well. Before the outbreak, they did the same when we called. For example, we have someone with pneumonia from corona or suspected pneumonia. ... Then we can use the hospital system across the border.... [Also] if someone has a stroke, he is sent to Sittard. (D7)

Yes, on the one hand, I think, we never do that, working together with colleagues across the border. But also because, I think, things are arranged and structured differently in different countries. So finding equals in another country is more difficult than doing it here in Flanders with another municipality. That is sometimes difficult, because municipalities also cluster things differently. (B1)

The stories of most experts show that if there is cooperation, it is usually of short duration. Because it is not part of the regular tasks of infection control, there is no time or money available for cooperation on a structural basis.

Yes, communication across the border used to be a big problem. We didn't have telephone numbers and didn't even know they were called the GGD. ... Now there is the SHE project ... so that border regions get to know each other at the level of the health authorities. We now have telephone numbers for the first time. (D9)

Often cooperation depends on the initiative of some people who find cross-border work especially interesting and if those people – for whatever reason – no longer take the lead, then cooperation stops.

We have three GGDs in Gelderland. All three have a border with Germany. ... I think we had a meeting every two years. That is important, to stay in contact. Because there is a lot of border traffic, a lot of people who live in Germany and work in the Netherlands and vice versa. People who live in Germany and are in a Dutch hospital. Then we have to inform colleagues on the other side of the border. ... But we haven't had any meetings in recent years. Due to circumstances, one was postponed three years ago, and then it never happened again. (N4)

Sometimes cooperation is short-lived because it is based on a temporary project, with a specific goal and temporary funding. This extra money temporarily legitimises experts spending time on a cooperation project, but when the funding stops, so does the project.

We have done several projects on dealing with cross-border outbreaks. We made a template for the communication of cases and outbreaks but that was from 2010 to 2012. Then the project stopped. It did result in permanent contacts and a consultation and reporting structure. (N5)

Yes, there was money for meetings and we had an exchange. And there was something Euregional about multi-resistant pathogens ... and I participated in an Interreg programme for a long time. But all that has stopped. (D6)

In the security sector there is a kind of liaison officer who at least keeps track of contacts and knows who to contact on the other side of the border if there is a problem.

We have on the Dutch side, from Groningen to Maastricht, a total of 16 border liaisons. ... That means, if there is a problem, a disaster in Germany, here in the border area, that can have side effects in the direction of Holland for instance ... The border official from Holland then goes there and sits at the table of the crisis team and receives information first hand. And the border liaison officer passes on this information to the Dutch safety regions. The point is simply that such a border liaison can be at the table, in the Netherlands or in Germany, depending on the situation. That is a task, but the border liaison is also, let's say, the information hub. In the same way, a border guard can be

called every now and then and they know the way, in the Netherlands or in Germany, depending on ... And I can imagine that this structure will be developed further. The structures are there, but it is fragile, isn't it? The structure has been in place for three years, but there is still room for improvement. Above all, it is very dependent on one or at most two people. (N6)

As such, this system works well, but it is also vulnerable and requires maintenance.

The fact that the control of infectious diseases is organised nationally on the basis of historical logics, has meant that cooperation with colleagues in a neighbouring country has not been given a structural place in the organisation. Cooperation was therefore always a matter of a personal initiative, temporary project-funding, or an incidental cause: cooperation was never a priority for the organisation and as long as no major cross-border outbreaks occurred, there were no reasons to change that. Although experts who had experience with cross-border cooperation projects greatly appreciated this, the termination of a temporary project also often meant the end of cross-border professional contacts. Work pressure did not allow time to be invested in continuation. Sometimes a mobile phone number remained in this or that contact list, so that an expert could still call a colleague on the other side of the border if there was an incidental problem, but these lists became outdated, and sometimes experts had no idea how and with whom to make contact in the first place if the need arose. The Schengen Agreement stimulated intensive social and economic traffic in the border region between the Netherlands, NRW and Belgium: the lack of cross-border traffic between experts and scientists in infectious disease control stands in stark contrast to this.

4.3 Obstacles to infectious disease control in a border region

Before the pandemic, the differences in infectious disease control between the Netherlands, Germany and Belgium and the lack of structural cross-border cooperation were not seen as an urgent problem, not by national policymakers nor by experts in the border region. During the pandemic, many experts in the border region became aware of the influence of central, national policy, rules and protocols on their work in the border region. In the case of a pandemic in the Netherlands, the infectious disease is defined as a so-called A-disease, which means that it is combatted by means of central direction. However, experts noticed that national protocols sometimes formed an obstacle for local infectious disease control in a border region with intensive border traffic.

For example, an expert told us about the obstacles she experienced around an outbreak of COVID-19 in the border region.

The outbreak in Heinsberg is a good example of the distance between our cross-border problems and the national approach to COVID-19. It is difficult to respond properly locally

because we always have to follow national and international rules, and these are not tailored to the situation in a border region. (N5)

The lack of flexibility was expressed, for example, in the national definition of 'a case' and in a mismatch between actions that would be necessary from the perspective of effective infection control in the border region and what can be done on the basis of national policy.

National policy on contacts was mainly aimed at people returning from China and later from Italy. Those countries were considered high-risk countries. That determined the definition of a case, so these people were tested and had to be quarantined if they had symptoms. But we had a similar problem in the border region of Heinsberg, with a lot of border traffic: a considerable number of people lived in Heinsberg and who a high risk of being infected with the virus during carnival; the parties with family and friends; working in care in the Netherlands. ... And then we realised, it is here, not only on the German side, but also with us. ... In order to monitor and act upon that, we would have to expand the definition of a 'case'. We wanted to test people from Heinsberg who had symptoms. We wanted to warn general practitioners, and especially hospitals and nursing homes. Like, be careful! And indeed, soon after the first infection was detected in Heinsberg, we had an infection in a nursing home. We sequenced the virus and it turned out that it was indeed linked to the case in Heinsberg. ... but extending the case definition of an A disease is very complicated. We asked the RIVM several times, because it would be very helpful for us in this border region, but they said, no, that is not possible. It is surrounded by political sensitivity. If you do that, you make Heinsberg a high-risk district, and it has a lot of consequences for the region. You cannot do that as a region, because it is another country. That is a formal matter, then the WHO will be involved. We kept discussing this with the RIVM, because we wanted to be able to warn, and test, and finally we were able to extend the case definition to Heinsberg, but I think we were already too late. ... We had good contacts with our colleagues in Heinsberg, but we were too late. ... and we were too busy with our own work, and we had no structured plan. (N5)

Other experts noted something similar. The central, national direction and approach to the pandemic has disadvantages in a border region.

The rules come from The Hague, and we have to translate them to Twente, but we hardly have any room to make them suitable for this border region. These rules are a formal 'instruction' from the Minister and there is not much we can do with them. We can close the bars in Twente, but then people will go to another region: the waterbed effect. So you want a uniform policy in the 25 Dutch safety regions, but not all of them border on another country. In The Hague, they don't think about what's happening in Germany. They only look at the Netherlands. So, if the shops close in the Netherlands, they don't

look at the potential cross-border effects. Sometimes we had to explain to our German colleagues what was happening in the Netherlands and why. But in The Hague they work from a Dutch perspective and not an international one. (N9)

Experts were also hampered by the national approach and rules in contact tracing after an infection.

We saw, for example, that if someone had tested positive and had contacts in the Netherlands and vice versa, contact tracing did not always take place because the place of residence of the person determined which public health service was responsible for follow-up. (D7)

Another expert said that the Dutch services do the contact tracing in the Netherlands and the German services in Germany, but that means that the network of possible infections of someone who lives in the Netherlands and has many contacts in Germany is not mapped. This division of labour is partly linked to rules on the exchange of data.

We cannot exchange data across borders. I have lists of names of people who have been in contact with someone who turned out to be infected, Aachen has lists of names, Heinsberg has lists of names, but we cannot share them. That is not allowed by law. The only official information that can be shared is that an infection has been confirmed. (N5)

Many other experts note that sharing data and information across borders is complicated. Because of strict legislation, but also because of ICT systems that are set up very differently.

A final obstacle experts faced was the application of different quarantine regulations in the countries.

For example, there were Belgian workers with COVID-19 and they were released from quarantine relatively quickly, after 7 days, whereas in Germany we have a 14-day minimum. Then the employer would come to us and say: 'He's coming back to work, but he should still be in quarantine, what should I do?' we would agree with the employer, but it does generate tension. (D5)

The quarantine times are different, which is why we have a lot of problems here, that for example the Netherlands has shorter quarantine times than we do, so people [in the Netherlands] are not in quarantine for so long, but we don't want – and nor do employers – people to come back to work in Germany. (D10)

The interviews reveal that the experts working in infectious disease control in the Netherlands, NRW and Belgium did not cooperate much before the outbreak of the COVID-19 pandemic. They found this regrettable, but did not consider it very urgent as there were always other priorities.

During the pandemic, they experienced to a greater degree the limitations of the strong national focus of infectious disease control on their work in the border region. Sometimes experts could find one another across the border and worked well together personally, but structural cooperation in the border region is lacking. Precisely because legislation differs in the three countries, because protocols are established at a national level, because ICT systems differ greatly and because different national legal–cultural conventions apply, cooperation was sorely missed during the pandemic.

4.4 Viruses force cross-border professional contact

How do the experts from the Netherlands, NRW and Belgium see their work in the border region in the near future? It should come as no surprise that, given the experts' comments in the previous section on their professional work in the border region before and during the pandemic, almost everyone thought it was important to invest more in cross-border contacts and cooperation.

There are so many opportunities for cooperation. And it's not bad of course, I mean the fact that those borders are open, that we can travel freely in Europe, I think that's super. But there is still much more room for improvement in terms of knowledge-sharing, in terms of cooperation. Instead of working against one another, make sure there is communication with the Dutch. (B2)

We must have standing collaborations and cooperation networks based on previous work contacts. We have not gone far enough in that. (N2)

Good cross-border personal contacts are crucial, also on a political strategic level. (D1)

In general, I think that on many issues, we should often work more closely together as local authorities with our Dutch colleagues. If there are more ties, then it is indeed easier to make contact with issues that suddenly arise. (B1)

I think it is more important that we in Maasmechelen, for example, should be able to look at a neighbouring Dutch municipality to see how they are doing with their figures. How do you deal with these things? Can we form a joint idea about that? (B5)

Some pointed out that it is also important to better understand how colleagues work across borders. Because, as one expert so eloquently put it, in peacetime you have to prepare for the next conflict.

I think it is important for us, when the war is over, in peacetime, to learn about the working methods of colleagues across the border. How did you deal with this pandemic?

What is the role of the public health service, what role do general practitioners have? Are there protocols you work with? (D5)

All kinds of ideas about these forms of cooperation came to light: they ranged from cross-border internships during training to looking behind the scenes of one another's organisations to regular symposiums on substantive themes.

Others pointed out that it is important to investigate the extent to which obstacles to information-sharing can be removed.

We need permission from the EU to share information across borders under data protection legislation so that this is formally allowed. Now there are too many uncertainties. Of course, in practice we do work together to prevent infections, but there are uncertainties. In order to become more structurally cooperative, we need to find a legal solution for the exchange of information across borders. That is very complicated; it has to be done at government level. But if that could be done, local and regional cooperation would become much easier. (D1)

Yet others wondered whether the special character of border regions could be given more attention in national policy, so that professional regional cooperation across the border is also facilitated from the national policy centres.

It would be good if there was more room in national policy for border regions, so that experts there are better equipped for cooperation with their neighbours. (N9)

I think that in a crisis like this, which we are now experiencing with COVID, you should have much more power locally ... power is not the right word, you should be able to decide more yourself. In Maasmechelen things are different than they are in Kinrooi. And then you should be able to intervene. Whether it's Geleen or Maasmechelen, we are neighbours, we are close to one another. So we need to know what is happening in a crisis. If ... in Geleen ... at DSM, a very big accident were to occur tomorrow and a poison escapes, then surely we will also be informed? Surely we are not Belgium and the Netherlands? We would be one area where something is happening that people need to know about. This was not done at all in the case of COVID. (B5)

An expert asks:

If, with your studies, you can have some influence on how cross-border cooperation between public health authorities is shaped, then the advice should be: this should not be decided in Düsseldorf, Berlin or Brussels, but in Euskirchen, Eupen and Sankt Vith. (D5)

Some experts argued that it is important that the political context also focuses more on cooperation. During the pandemic, countries came up with their own national policies and in trying to justify them, they often looked at the performance of neighbouring countries. Which countries did well, which less well, which badly? In the public and political arena, this created an atmosphere of competition and rivalry that, according to the experts, is not very productive and, in a border region, is even counterproductive.

I think it was in April ... At one point, the mayor of Lanaken gave an interview to a newspaper, in which he said that all Dutch people should stay outside because they constituted too great a risk. ... it was not at all objective what he said The same with the competitiveness about who is going to vaccinate first between Belgium, the Netherlands, Germany, doesn't make any sense at all. Belgium may have been quicker off the mark than the Netherlands, but they did vaccinate, say, three people at the end of December, purely to be able to say politically "we've started". Then it stopped for three weeks and then it finally got going properly. I think every country has its own system of how they register deaths and also in what way ... At a certain point it became a race between who does it best and who does it worst. ... (B2)

Another expert also pointed out the rhetorical–political context in which experts in infectious disease control in the border region have to do their work.

I don't really know how to describe it ... perhaps there used to be fewer differences between Belgium and the Netherlands. Or maybe they were there but they weren't perceived as such, between the Dutch and Belgians.... But it's also a fact that COVID-19 in general causes more tensions and frustrations in society. I think the difference between the Belgians and the Dutch is one of the forms in which this occasionally manifests itself. (B1)

I remember many times those first weeks. "We don't want Germans here" or "We don't want Dutch here". A lot of old sentiments and resentments came up. (D3)

Another expert also pointed out the nationalistic sentiments that surfaced in the rhetorical political context of competition and rivalry.

My neighbour works in Maastricht and has a company car with a Dutch number plate. So he now works permanently at home, but he drives around Maasmechelen with a Dutch number plate and this is very much hold against him. (B5)

Especially in a border region where people are used to living without borders, these sentiments can have a negative impact on everyday life, on relationships with neighbours, family, friends and colleagues.

4.5 Closing statement

In relation to state-building processes in the 19th century, infectious disease control has been put on a national footing. It developed historically as a national practice, with a national legal framework and a national, highly centralised organisation. As a result, infectious disease control practices can vary widely within countries. This also came to the fore in the interviews: the experts experienced considerable differences between infection control in the Netherlands, NRW and Belgium. Because there had been no major epidemics for a long time, these differences did not form a major problem: experts had their own tasks and priorities in their own domestic working area; there was little knowledge of practice in neighbouring countries and little cooperation took place. Insofar as the experts had experience with cooperation, this was usually on a project basis, short-term, not part of their regular work and therefore not a priority in the organisation. A few experts are familiar with collaborative arrangements such as EMRIC and euPrevent, but until the outbreak of COVID-19, entering into collaboration was not urgent.

During the COVID-19 pandemic, national policies were made from a national perspective and were not coordinated with neighbouring countries. In the border region, EMRIC tried to cushion the consequences to some extent through communication and information. But the Netherlands, Germany and Belgium came up with different measures at different times, sometimes accompanied by a rhetoric of competition and rivalry between politicians and experts in the three countries. In the border region in particular, this led to tensions between the cross-border nature of the pandemic, which calls for cross-border cooperation, and the national approach to COVID-19. During the pandemic, the historical lack of cooperation between the control of infectious diseases in the Netherlands, Germany and Belgium on a national and regional level made itself felt even more keenly in the border region. The experts we spoke to suffered from this in various ways in their daily work: in the implementation of exception rules (forms), source and contact tracing, and isolation and quarantine rules; in explaining the rationality of differences in facemask policy, lockdowns, etc.; in reaching people when a person from a neighbouring country died. It is striking that in a border region, with intensive social and economic border traffic, the control of infectious diseases is based on such a national model. It is therefore not surprising that most experts advocate more cooperation across borders, not on a project basis, but as a structural part of their work. They see this as an important part of preparations for any future pandemic.

Thank you

We thank all the experts for their willingness to exchange views with us on the significance of borders in relation to the COVID-19 pandemic in the border region.

Literature

Askitas, N., Tatsiramos, K., & Verheyden, B. (2021). Estimating worldwide effects of non-pharmaceutical interventions on COVID-19 incidence and population mobility patterns using a multiple-event study. *Scientific reports*, 11(1), 1-13

Barlow, P., Schalkwyk, M. C. van, McKee, M., Labonté, R., & Stuckler, D. (2021). COVID-19 and the collapse of global trade: building an effective public health response. *The Lancet Planetary Health*, 5(2), e102–e107. [https://doi.org/10.1016/S2542-5196\(20\)30291-6](https://doi.org/10.1016/S2542-5196(20)30291-6)

Becker, J. (2018) Speaking to The Wall: Reconceptualizing the US–Mexico Border “Wall” from the Perspective of a Realist and Constructivist Theoretical Framework in International Relations. *Journal of Borderland Studies*, <https://doi.org/10.1080/08865655.2018.1482775>

Boffey, D. (2021, February 23). EU tells six countries to lift COVID border restrictions. *The Guardian*. <https://www.theguardian.com/world/2021/feb/23/eu-tells-six-countries-to-lift-COVID-border-restrictions>

Bonardi, J. P., Gallea, Q., Kalanoski, D., & Lalive, R. (2020). Fast and local: How did lockdown policies affect the spread and severity of the COVID-19. *COVID Economics*, 23, 325-351

Burns, J., Movsisyan, A., Stratil, J. M., Biallas, R. L., Coenen, M., Emmert-Fees, K. M., ... & Rehfuess, E. (2021). International travel-related control measures to contain the COVID-19 pandemic: a rapid review. *Cochrane Database of Systematic Reviews*, (3).

CBS (2020) <https://www.cbs.nl/nl-nl/nieuws/2020/13/8-duizend-zorgwerknemers-in-grenspendel-met-duitsland-en-belgie>

Chetail, V. (2020). Crisis without borders: What does international law say about border closure in the context of COVID-19? *Frontiers in Political Science*, 2, 12.

Christidis, P., & Christodoulou, A. (2020). The Predictive Capacity of Air Travel Patterns during the Global Spread of the COVID-19 Pandemic: Risk, Uncertainty and Randomness. In *International Journal of Environmental Research and Public Health* (Vol. 17, Issue 10). <https://doi.org/10.3390/ijerph17103356>

Dijstelbloem, H., Veer, L. van der (2019) The Multiple Movements of the Humanitarian Border: The Portable Provision of Care and Control at the Aegean Islands. *Journal of Borderland Studies*, <https://doi.org/10.1080/08865655.2019.1567371>

du Plessis, G. (2017). When pathogens determine the territory: Toward a concept of non-human borders. *European Journal of International Relations*, 24(2), 391–413. <https://doi.org/10.1177/1354066117710998>

ECDC, European Centre for Disease Prevention and Control. (2021) *Timeline of the ECDC's response to COVID-19*.

Eckardt, M., Kappner, K., & Wolf, N. (2020). *COVID-19 across European regions: The role of border controls*. Rochester: SSRN; Amsterdam: Elsevier.

European Commission. (n.d.). Interreg A - Cross-border cooperation.

https://ec.europa.eu/regional_policy/de/policy/cooperation/european-territorial/cross-border/#1

Genschel, P., & Jachtenfuchs, M. (2021). Postfunctionalism reversed: solidarity and rebordering during the COVID-19 pandemic. *Journal of European Public Policy*, 28(3), 350–369.

<https://doi.org/10.1080/13501763.2021.1881588>

Goodhand, J. (2018) The centrality of margins. The political economy of conflicts and developments in borderlands. Working paper 2. ESRC RES 155-25-0096.

<http://borderlandsasia.org/living-on-the-margins>

Grépin, K. A., Ho, T. L., Liu, Z., Marion, S., Piper, J., Worsnop, C. Z., & Lee, K. (2021). Evidence of the effectiveness of travel-related measures during the early phase of the COVID-19 pandemic: a rapid systematic review. *BMJ Global Health*, 6(3), e004537.

Hacking, I. (1990) *The taming of chance*. Cambridge University Press.

Hinchliffe, S., Allen, J., Lavau, S., Bingham, N., Carter, S. (2013) Biosecurity and the topologies of infected life: from borderlines to borderlands. *Transactions of the Institute of British Geographers*. doi: <https://www.doi.org/10.1111/j.1475-5661.2012.00538.x>

Horstman, K. (1996) *Verzekerd leven. Artsen en levensverzekeringsmaatschappijen 1880-1920*. Babylon de Geus.

Houtem, H. van (2021) Beyond borderism. Overcoming discriminative B/Ordering and Othering. *Journal for Economic and Human Geography*, 34-43. <https://doi.org/10.1111/tesq.12473>

Houwaart, E. (1991) *De hygiënisten. Artsen, staat & volksgezondheid in Nederland 1840-1890*. Historische Uitgeverij Groningen.

Interreg (2021) Grenzpendler; Staatsangehörigkeit, Wohnland, Arbeitsregion (NUTS 3) - 2018. <https://grensdata.eu/#/InterReg/de/dataset/22003ENG/table?ts=1620740332330>.

Janssen, M. (2020) Habsburgers sloten de grenzen voor de pest. *Historisch Nieuwsblad*, 20 april. <https://www.historischnieuwsblad.nl/habsburgers-sloten-de-grenzen-voor-de-pest/>

Kenwick, M. R., & Simmons, B. A. (2020). Pandemic Response as Border Politics. *International Organization*, 74(Supplemental Issue E.1), 20–31. <https://ssrn.com/abstract=3686166>

Lee, K. Grepin, A.K. Worsnop, C., Summer, M., Piper, J., Song, M. (2021) Managing borders during public health emergencies of international concern: A proposed typology of cross-border health measures. Submitted to *Globalization & Health*. <https://cissm.umd.edu/research-impact/publications/managing-borders-during-public-health-emergencies-international>

Limburger, 15 April 2021.

Linka, K., Peirlinck, M., Sahli Costabal, F., & Kuhl, E. (2020). Outbreak dynamics of COVID-19 in Europe and the effect of travel restrictions. *Computer Methods in Biomechanics and Biomedical Engineering*, 23(11), 710-717.

Mateus, A. L., Otete, H. E., Beck, C. R., Dolan, G. P., & Nguyen-Van-Tam, J. S. (2014). Effectiveness of travel restrictions in the rapid containment of human influenza: a systematic review. *Bulletin of the World Health Organization*, 92, 868-880D.

Medeiros, E., Guillermo Ramírez, M., Ocskay, G., & Peyrony, J. (2020). COVIDfencing effects on cross-border deterritorialism: the case of Europe. *European Planning Studies*, 1-21.

Opiłowska, E. (2021). The COVID-19 crisis: the end of a borderless Europe? *European Societies*, 23(sup1), S589-

Ross, K. Razon, N. (2015) Interrogating Boundaries and Acknowledging Fluidity: Shifting Identity Markers in Palestine/Israel. *Journal of Borderland Studies*, <https://doi.org/10.1080/08865655.2015.1046470>

Taylor, P. J. (1994). The state as container: territoriality in the modern world-system. *Progress in Human Geography*, 18(2), 151–162.

Wald, P. (2008) *Contagious. Cultures, Carriers, and the Outbreak Narrative*. Duke University Press.

Walsh, M. G., Sawleshwarkar, S., Hossain, S., & Mor, S. M. (2020). Whence the next pandemic? The intersecting global geography of the animal-human interface, poor health systems and air transit centrality reveals conduits for high-impact spillover. *One Health*, 11, 100177. <https://doi.org/https://doi.org/10.1016/j.onehlt.2020.100177>

WHO, World Health Organization (2021) *Timeline: WHO's COVID-19 response*.

Wille, C., & Kanesu, R. (2020). Bordering in pandemic times. Insights into the COVID-19 lockdown. *Borders in Perspective – UniGR-CBS Thematic Issue*, 4, 105. <https://doi.org/10.25353/ubtr-xxxx-b825-a20b>

Yuval-Davis, N., Wemyss, G., & Cassidy, K. (2019). *Bordering*. Polity Press

Appendix 2 - The Euregional COVID-19 Atlas

The COVID-19 Euregional Atlas



Providing insight into COVID-19 pandemic data in the border regions of
Belgium, Germany and the Netherlands

The COVID -19 Euregional Atlas

De Euregionale COVID-19 atlas / Der euregionale COVID-19-Atlas / L'Atlas eurégional COVID-19

**Providing insight into COVID-19 pandemic data in the border regions of
Belgium, Germany and the Netherlands**

Inzicht verschaffen in gegevens over de COVID-19 pandemie in de grensregio's van België, Duitsland en Nederland.

Einblicke in COVID-19-Pandemiedaten in den Grenzregionen von Belgien, Deutschland und den Niederlanden.

Fournir un aperçu des données sur la pandémie COVID-19 dans les régions frontalières de Belgique, d'Allemagne et des Pays-Bas.



The Euregional COVID-19 Atlas was created to provide insight into the COVID-19 pandemic in the border regions between Belgium, Germany and the Netherlands.

The Euroregions used in this Atlas are:

- Meuse-Rhine Euroregion
- Euregio Rhine-Maas-north
- Euregio Rhine-Waal
- EUREGIO

Some areas are located in two Euroregions and have been allocated to the Euregio to which the area geographically best belongs. The figure shows how the Euroregions were finally divided.

The Atlas was realised through cooperation between the following organisations:

- euPrevent
- GGD Zuid Limburg (NL)
- Sciensano (BE)
- Gesundheitsamt Düren (DE)
- Maastricht University

This Atlas was made possible by a grant from the Province of Limburg (NL).



De Euregionale COVID-19 Atlas is gemaakt om inzicht te geven over de COVID-19 pandemie in de grensregio's tussen België, Duitsland en Nederland.

De Euregio's die binnen deze Atlas gebruikt worden zijn:

- Euregio Maas-Rijn
- Euregio rijn-maas-noord
- Euregio Rijn Waal
- EUREGIO

Sommige gebieden zijn deel van twee Euregio's. Deze zijn onderverdeeld in de Euregio waar dit gebied geografisch het beste bij paste. In de afbeelding is te zien hoe de Euregio's uiteindelijk zijn ingedeeld.

De Atlas is opgebouwd door een samenwerking van de volgende organisaties:

- euPrevent
- GGD Zuid Limburg (NL)
- Sciensano (BE)
- Gesundheitsamt Düren (DE)
- Universiteit Maastricht

Deze Atlas is mede tot stand gekomen door subsidie van de Provincie Limburg (NL).



Der euregionale COVID-19-Atlas wurde erstellt, um einen Einblick in die COVID-19-Pandemie in den Grenzregionen zwischen Belgien, Deutschland und den Niederlanden zu geben.

Die in diesem Atlas verwendeten Euregio' s sind:

- Euregio Maas-Rhein
- Euregio Rhein-Maas-Nord
- Euregio Rhein-Waal
- EUREGIO

Einige Gebiete sind Teil von zwei Euregio' s. Diese Gebiete wurden der Euregio zugeteilt, zu der dieses Gebiet geographisch am besten passt. Die Abbildung zeigt, wie die Euregio' s schließlich aufgeteilt wurden.

Der Atlas wurde in Zusammenarbeit mit den folgenden Organisationen erstellt:

- euPrevent
- GGD Zuid Limburg (NL)
- Sciensano (BE)
- Gesundheitsamt Düren (DE)
- Universität Maastricht

Dieser Atlas wurde durch einen Zuschuss der Provinz Limburg (NL) ermöglicht.



L'Atlas eurégional COVID-19 a été créé pour fournir un aperçu de la pandémie COVID-19 dans les régions frontalières entre la Belgique, l'Allemagne et les Pays-Bas.

Les Eurorégios analysées dans cet Atlas sont les suivantes:

- Eurorégio Meuse-Rhin
- Euregio rhin-maas-nord
- Euregio Rhin Waal
- EUREGIO

Certains territoires font partie de deux eurorégios. Ceux-ci ont été subdivisés en Euregio auxquels ces territoires appartiennent géographiquement le mieux. La figure montre comment les eurorégios ont été finalement répartis.

L'Atlas a été réalisé grâce à la coopération des organisations suivantes:

- euPrevent
- GGD Zuid Limburg (NL)
- Sciensano (BE)
- Gesundheitsamt Düren (DE)
- Université de Maastricht

Cet Atlas a été rendu possible grâce à une subvention de la Province du Limbourg (NL).

mede mogelijk gemaakt door

provincie limburg



Content

Inhoud / Inhalt / Contenu

Foreword

Voorwoord / Vorwort / Avant-propos

8

Reading guide

Leeswijzer / Leitfaden zum Lesen / Guide de lecture

10

Indicators

Indicatoren / Indikatoren / Indicateurs

19

Weekly and eight-weekly dates

Wekelijkse en acht-wekelijkse data / Wöchentliche und achtwöchentliche Daten /
Données sur base hebdomadaire et sur base de huit semaines

23

Validity

Validiteit / Gültigkeit / Validité

54

Country-specific definitions

Landspecifieke definities / Länderspezifische Definitionen / Définitions spécifiques par pays

56

Data sources/source citation

Databronnen-bronvermelding / Datenquellen-Quellennachweis / Sources de données-citation des sources

56

Contact details

Contactgegevens / Kontaktangaben / Données de contact

58

Foreword



International cooperation and knowledge transfer form an important basis for determining whether substantial cross-border transmission of COVID-19 has occurred, and whether closing borders would have had any effect on the spread of the virus.

At the request of the provinces of Limburg, Gelderland and Overijssel, North Rhine-Westphalia (NRW) and the Ministry of the Interior and Kingdom Relations, we conducted both a qualitative and quantitative study to provide insight into whether there are significant differences in the distribution of COVID-19 in the Netherlands and North Rhine-Westphalia. Attention was paid to how these differences relate to the different policy measures. We - euPrevent, GGD Zuid Limburg, Gesundheitsamt Düren and Maastricht University - also investigated whether the spread of the virus in border regions differs from how it spread within the Netherlands, North Rhine-Westphalia and Belgium.

Within this research, many discussions took place with experts from the Netherlands, NRW and Belgium, for which we are very grateful. Without these experts, it would have been difficult, given the situation in which data is collected in different ways in the three countries, to give a good and thorough answer to the questions asked by the clients.

In addition, we were able to use existing databases to provide insight, for the Dutch, Belgian and German regions, into how many tests were carried out, how many infections were detected and also into numbers of hospital admissions and deaths. This data is also available in a dashboard, which can be viewed via the long-standing website, www.euregionalhealthatlas.eu

The atlas, which was compiled based on this data, presents the data geographically from the first weeks of the COVID-19 pandemic until 1 May 2021.

I sincerely thank the aforementioned partners for their cooperation, which has provided a basis for understanding and clarifying the course and transmission of COVID-19. This will help us to prepare for the future, and allow us to work together on the further elimination of COVID-19.

Brigitte van der Zanden
Director of euPrevent



Voorwoord



Internationale samenwerking en kennisoverdracht is een belangrijke basis om na te gaan of er een substantiële overdracht van COVID-19 over de grens heen heeft plaatsgevonden, en of een eventuele grenssluiting enig effect zou hebben gehad op de verspreiding van het virus.

Op verzoek van de provincies Limburg, Gelderland en Overijssel, Noordrijn-Westfalen (NRW) en het ministerie van Binnenlandse Zaken en Koninkrijksrelaties, hebben wij zowel een kwalitatief als een kwantitatief onderzoek uitgevoerd om inzichtelijk te maken of er significante verschillen zijn in de verspreiding van COVID-19 in Nederland en Noordrijn-Westfalen. Daarbij is aandacht voor hoe deze verschillen al dan niet samenhangen met de verschillende beleidsmaatregelen. Ook de vraag of de virusverspreiding in de grensregio's anders is dan de verspreiding in het binnen Nederland hebben wij, euPrevent, GGD Zuid Limburg, Gesundheitsamt Düren en de Universiteit Maastricht onderzocht.

Binnen dit onderzoek hebben er vele gesprekken plaatsgevonden met experts uit Nederland, NRW en België waarvoor wij hen zeer erkentelijk zijn. Zonder deze experts is het moeilijk om in een gegeven situatie, waarin data in de drie landen op verschillende manieren verzameld wordt, een goed en gedegen antwoord te kunnen geven op de vragen gesteld door de opdrachtgevers.

Daarnaast hebben we gebruik kunnen maken van bestaande databases om voor de Nederlandse, Belgische en Duitse regio's inzichtelijk te maken hoeveel testen er zijn afgenomen, hoeveel besmettingen zijn vastgesteld en ook het aantal ziekenhuisopnames en overledenen. Deze data zijn ook beschikbaar in een dashboard, dat via de al langer bestaande website www.euregionalhealthatlas.eu is in te zien. Op basis van deze gegevens is deze atlas samengesteld. De atlas presenteert de data geografisch vanaf de eerste weken van de COVID-19 pandemie tot 1 mei in 2021.

Ik dank eerdergenoemde partners hartelijk voor de samenwerking, omdat dit de basis vormt om inzicht te verkrijgen en duiding te geven over het verloop en de overdracht van COVID-19. Op deze manier zijn we voorbereid op de toekomst, en kunnen we samenwerken aan de verdere uitbanning van COVID-19.

Brigitte van der Zanden
Directeur euPrevent

Vorwort



Die internationale Zusammenarbeit und der Wissenstransfer sind eine wichtige Grundlage, um festzustellen, ob eine wesentliche grenzüberschreitende Übertragung von COVID-19 stattgefunden hat und ob eine Grenzschießung Auswirkungen auf die Verbreitung des Virus gehabt hätte.

Im Auftrag der Provinzen Limburg, Gelderland und Overijssel, Nordrhein-Westfalen (NRW) und des Niederländischen Ministeriums für Inneres und Königsbeziehungen haben wir sowohl eine qualitative als auch eine quantitative Studie durchgeführt, um herauszufinden, ob es signifikante Unterschiede in der Verbreitung von COVID-19 in den Niederlanden und Nordrhein-Westfalen gibt. Es wird untersucht, wie diese Unterschiede mit den verschiedenen politischen Maßnahmen zusammenhängen. Wir, euPrevent, GGD Zuid Limburg, Gesundheitsamt Düren und die Universität Maastricht sind auch der Frage nachgegangen, ob sich die Virusausbreitung in den Grenzregionen von der Verbreitung innerhalb der Niederlande, Nordrhein-Westfalens und Belgiens unterscheidet.

Im Rahmen dieser Forschung wurden viele Gespräche mit Experten aus den Niederlanden, NRW und Belgien geführt, wofür wir sehr dankbar sind. Ohne diese Experten ist es in einer gegebenen Situation, in der die Daten in den drei Ländern auf unterschiedliche Weise erhoben werden, schwierig, eine gute und gründliche Antwort auf die vom Auftraggeber gestellten Fragen zu geben.

Darüber hinaus konnten wir bestehende Datenbanken nutzen, um für die niederländische, belgische und deutsche Region einen Einblick in die Anzahl der durchgeführten Tests, die Anzahl der diagnostizierten Infektionen sowie die Anzahl der Krankenhauseinweisungen und Todesfälle zu erhalten. Diese Daten sind auch in einem Dashboard verfügbar, das über die seit langem bestehende Website www.euregionalhealthatlas.eu abgerufen werden kann. Der vorliegende Atlas wurde auf der Grundlage dieser Daten erstellt. Der Atlas präsentiert die Daten in geografischer Hinsicht von den ersten Wochen der COVID-19-Pandemie bis zum 1. Mai 2021.

Ich danke den genannten Partnern herzlich für ihre Zusammenarbeit, da sie die Grundlage für das Verständnis und die Klärung des Verlaufs und der Übertragung von COVID-19 bildet. Auf diese Weise sind wir für die Zukunft gerüstet, und wir können gemeinsam an der weiteren Bekämpfung von COVID-19 arbeiten.

Brigitte van der Zanden
Direktor von euPrevent

Avant-propos



La coopération internationale et le transfert de connaissances constituent une base importante pour déterminer s'il y a eu une transmission transfrontalière substantielle de la COVID-19, et si une fermeture des frontières aurait eu un quelconque effet sur la propagation du virus.

A la demande des provinces du Limbourg, de la Gueldre et de l'Overijssel, de la Rhénanie du Nord-Westphalie (NRW) et du ministère de l'Intérieur et des Relations interne au Royaume, nous avons mené une étude qualitative et quantitative afin de déterminer s'il existe des différences significatives dans la propagation de la COVID-19 aux Pays-Bas et en Rhénanie du Nord-Westphalie. Une attention particulière est accordée à la manière dont ces différences sont liées aux différentes mesures politiques prises. Nous, euPrevent, GGD Zuid Limburg, Gesundheitsamt Düren et l'Université de Maastricht, avons également cherché à savoir si la propagation du virus dans les régions frontalières était différente de celle observée dans les territoires intérieures des Pays-Bas, de Rhénanie-du-Nord-Westphalie et de Belgique.

Dans le cadre de cette recherche, de nombreuses discussions ont eu lieu avec des experts des Pays-Bas, de NRW et de Belgique. Nous leur en sommes très reconnaissants. Sans ces experts, il aurait été difficile pour une situation donnée, là où les données sont collectées de manières différentes dans les trois pays, de donner une réponse valable et complète aux questions posées par les commanditaires.

Nous avons pu utiliser les bases de données existantes pour donner un aperçu, pour les régions néerlandaise, belge et allemande, du nombre de tests effectués, du nombre d'infections diagnostiquées ainsi que du nombre d'hospitalisations et de décès. Ces données sont également disponibles sous forme d'un tableau de bord consultable via le site web www.euregionalhealthatlas.eu, réalisé il y a déjà un certain temps. Le présent atlas a été élaboré sur la base de ces données. L'atlas présente les données de manière géographique depuis les premières semaines de la pandémie COVID-19 jusqu'au 1er mai 2021.

Je remercie sincèrement les partenaires susmentionnés pour leur coopération, car elle constitue la base pour comprendre et clarifier le processus et la transmission de la COVID-19. De cette manière, nous sommes préparés pour l'avenir et nous pouvons travailler ensemble à la poursuite de l'élimination de la COVID-19.

Brigitte van der Zanden
Directeur d'euPrevent

Reading guide



To answer the question regarding the extent to which border traffic and restrictions on border traffic played a role in the spread of COVID-19, an obvious step was to look at epidemiological data. In this Atlas, based on information systematically collected in the three countries, we have visualised an overview of maps of infection rates (numbers of reports of COVID-19 infections per 100,000 inhabitants, also called cases) and other parameters such as the number of tests per 100,000 inhabitants, hospital admissions and registered deaths in the border region. As the best data available for the different countries is the number of infections, these are presented per week for the 8 weeks since the start of the COVID-19 pandemic. In addition, four maps over an 8-week period are presented cumulatively. These maps are geographical visualisations of data. The maps in this atlas represent 4 Euroregions: Euregio Meuse-Rhine, Euregio Rhine-Meuse-North, Euregio Rhine-Waal, EUREGIO (Enschede-Münster). The maps were designed around these four Euro-regions in order to better explain the orientation and significance of the various geographical units.

Interpretation

Interpreting these maps in the context of border traffic is not easy. It is difficult to determine based on these maps to what extent the regulation of border traffic has had an effect on the spread of the pandemic in the three countries. (This applies not only to traffic between countries as shown in these maps, but also to traffic between cities or provinces within a country). What made it so difficult to determine from these geo-epidemiological maps whether the regulation of cross-border traffic had an effect on the spread of COVID-19?

Differences between the three countries

Firstly, much of the data from the three countries is not fully comparable as it stands. The definition of a ‘reported case’ or a ‘death from COVID-19’ may differ considerably between countries, partly due to cultural practices. The definition of a reports of a case of COVID-19 may differ between countries and over the entire period of the pandemic: what does and does not count as an infection? Do only people with symptoms count or also people without symptoms? Do only people who are tested with a PCR count or also people who have had another test? Answering these questions is important because they influence the infection counter. Moreover, the population group involved in a count (the denominator of the infections) may also differ. For example, there are differences in geographical levels (see overview table on the next page), i.e. data can be available at different geographical levels - for example, a municipal level,

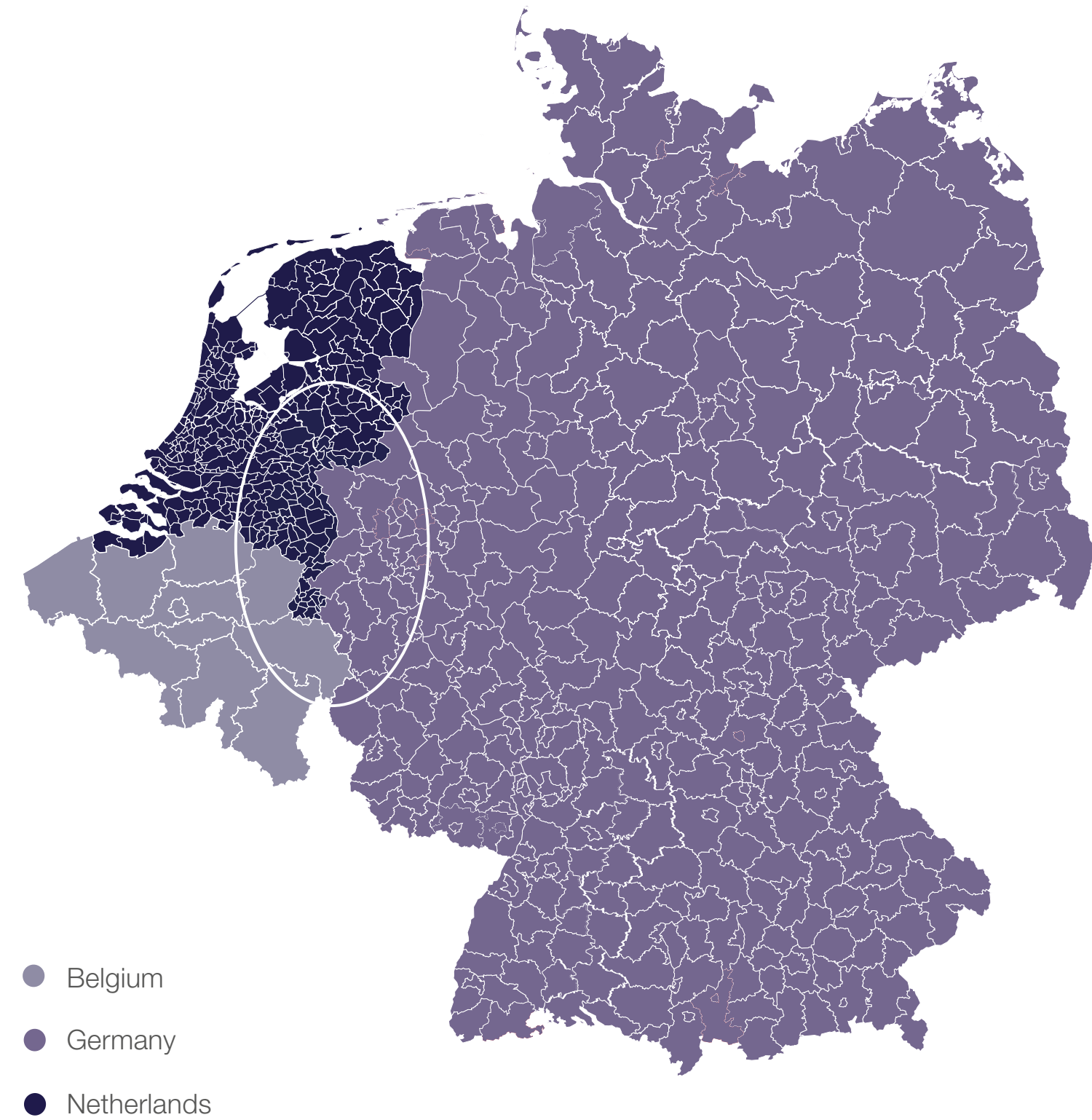
sub-regional level, provincial level, federal level (for Belgium and Germany) or national level. This affects comparability. In addition, time periods for the available data can differ: for instance per day, per week or per two-week period. In the Atlas, we therefore present the most comparable data - infections (or transmissions or cases) per week - and we give data on tests, hospital admissions and deaths per eight weeks. In order to be able to compare knowledge about the spread of COVID-19 in three countries, the number of tests carried out in a given period is very important as this also determines the percentage of positives measured. More testing results in fewer positives going undetected. However, the number of tests done per time unit and per geographical setting differs in the three countries, which makes direct comparison difficult. The final numbers of infections are therefore not comparable on a one-to-one basis because they were compiled based on differences in testing policy (testing in the event of complaints or without complaints), in the type of tests carried out and included (some are more reliable than others) and in test readiness (the number of people who are willing, on the basis of testing policy, to undergo a test). For example, not everyone with symptoms goes to a test centre. For example figures on the number of tests administered in Germany are only available at federal level (North Rhine-Westphalia) and in Belgium only at provincial level. Moreover, in all three countries, usually only tests provided by the government are in the picture, not those of commercial parties. Although the figures imply exactness and precision, they are actually the result of a complex construction process and figures that claim to refer to the same phenomenon are often not 100% comparable. In Belgium, for example, deaths for which a link with COVID-19 is plausible but has not been demonstrated - many deaths among the elderly for example - are reported as COVID-19-related deaths, while the Netherlands does not count these deaths in the registration of COVID-19 mortality.

Secondly, to comment on the role that the regulation of cross-border traffic plays in the spread of COVID-19 on the basis of the statistics available in the three countries is complicated to say the least. For instance, the registration of an infection is not based on place of infection, but on place of residence. All infection data is therefore linked to a person's place of residence, though not all infections occur at home. The place of infection is often unknown. The infection may have occurred in connection with cross-border mobility of the person him/herself or of family members, friends or colleagues, and infection locations, e.g. work, catering establishments, parties or train journeys, are extremely diverse. Statistics on reports of COVID-19 therefore say little about cross-border spread. Reports of infections in a certain period of time and in municipalities or regions do not tell us how much transmission is due to border traffic.

Finally, in order to answer the question of whether border traffic contributes to the spread of COVID-19, it is necessary to know whether the same variant spreads from one person to another. This can be demonstrated by analysing the genetic code of the virus. Using an advanced and time-consuming test (sequencing), a kind of fingerprint of the virus can be determined after it has been detected in a patient using a PCR test. That fingerprint of the virus is needed to prove transmission. Obviously, such data is only not available for all reported cases but only for a sample of cases. This data is not therefore visible in the maps. However, we did use this fingerprint to identify clusters and to show which virus variants are circulating.

Course

The Atlas shows the course of the COVID-19 pandemic in the border region, from which contextual indications and clues can be drawn.



Leeswijzer



Om de vraag te beantwoorden in hoeverre grensverkeer en beperkingen van grensverkeer een rol speelden bij de verspreiding van COVID-19, ligt het voor de hand om te kijken wat epidemiologische gegevens daarover kunnen zeggen. Op basis van informatie die in de drie landen systematisch wordt verzameld, hebben wij in deze Atlas overzichtskaarten van infectiecijfers (het aantal meldingen van COVID-19 infecties per 100.000 inwoners, ook wel cases genoemd) en andere parameters zoals het aantal testen per 100.00 inwoners, ziekenhuisopnames en geregistreerde overlijdens voor de grensregio gevisualiseerd. Omdat de beste data die voor de verschillende landen beschikbaar is, het aantal infecties zijn, worden deze steeds per week gedurende 8 weken sinds de start van de COVID-19 pandemie gepresenteerd. Daarnaast worden er vier kaarten over een periode van 8 weken cumulatief gepresenteerd. Deze kaarten zijn geografische visualisaties van data. De kaarten in deze atlas representeren 4 euregio's: Euregio Maas-Rijn, euregio rijn-maas-noord, Euregio Rijn-Waal, EUREGIO (Enschede-Münster). Om de oriëntatie en de betekenis van de verschillende geografische eenheden beter te kunnen duiden zijn de kaartjes vormgegeven rondom deze 4 Euregio's.

Interpretatie

De interpretatie van deze kaarten in het kader van grensverkeer is niet eenvoudig. Het is lastig om op basis van deze kaarten vast te stellen in hoeverre het reguleren van grensverkeer effect heeft gehad op de verspreiding van de pandemie in de drie landen. (Dit geldt overigens niet alleen voor verkeer tussen landen zoals in deze kaarten zichtbaar is, dit geldt ook voor verkeer tussen steden of provincies binnen een land zelf.) Waarom is het zo lastig om op basis van deze geografisch-epidemiologische kaarten vast te stellen of regulering van grensoverschrijdend verkeer effect had op de verspreiding van COVID-19?

Verschillen drie landen

In de eerste plaats zijn veel gegevens uit de drie landen op zich al niet volledig vergelijkbaar. De definitie van een 'melding' of van 'overlijden als gevolg van COVID-19' kan in de landen - mede ingegeven door culturele praktijken - behoorlijk verschillen. De case-definitie van meldingen van COVID-19 kan verschillend zijn tussen de landen en over de hele periode van de pandemie: wat geldt als een infectie en wat telt wel en niet mee? Tellen alleen mensen mee die klachten hebben of ook mensen zonder klachten? Tellen alleen mensen mee die met een PCR zijn getest of ook mensen die een andere test hebben ondergaan? Het antwoord op deze vragen is

belangrijk omdat ze invloed hebben op de teller van de infecties. Maar ook de bevolkingsgroep waaronder geteld wordt (de noemer van de infecties) kan verschillen. Zo zijn er verschillen in de geografische niveaus (zie overzichtstabel op de volgende pagina), dat wil zeggen dat data beschikbaar kunnen zijn op verschillende geografische niveaus - bijvoorbeeld gemeenteniveau, sub regio niveau, regioniveau, provincieniveau, federaal niveau (voor België en Duitsland) of landelijk niveau. Dit heeft effect op de vergelijkbaarheid. Ook in tijd kan data-beschikbaarheid verschillen: bijvoorbeeld per dag, per week of per twee weken periode. In de Atlas presenteren we daarom de meest vergelijkbare data - de infecties (of besmettingen of meldingen) per week - en geven we data over testen, ziekenhuisopnames en overlijdens per acht weken. Om kennis over de verspreiding van COVID-19 in drie landen te kunnen vergelijken, is het aantal testen dat in een bepaalde periode is uitgevoerd erg belangrijk omdat dat mede bepaalt wat het percentage positieven is dat gemeten wordt. Hoe meer er getest wordt, hoe minder positieven onopgemerkt zullen zijn. Het aantal testen dat per tijdseenheid en geografische setting is gedaan in de drie landen verschilt echter, waardoor een directe vergelijking lastig is. Het uiteindelijke aantal infecties zijn dus niet één op één vergelijkbaar omdat ze gebaseerd zijn op verschillen in testbeleid (testen bij klachten of zonder klachten), in het soort testen dat wordt uitgevoerd en wordt meegerekend (sommige betrouwbaarder dan andere) en in testbereidheid (het aantal mensen dat bereid is op basis van het testbeleid ook een test te laten doen). Niet iedereen gaat bijvoorbeeld met klachten naar de teststraat. Cijfers over het aantal afgenomen testen zijn in Duitsland bijvoorbeeld alleen beschikbaar op federaal niveau (Noordrijn-Westfalen) en in België alleen op provincieniveau. Bovendien zijn in alle drie de landen meestal alleen de overheidstesten in beeld en niet die van commerciële partijen. Hoewel cijfers exactheid en precisie suggereren, zijn ze het resultaat van een complex constructieproces en cijfers die zeggen naar hetzelfde fenomeen te refereren, zijn toch vaak niet 100% vergelijkbaar. In België worden bijvoorbeeld ook overlijdens waarbij een verband met COVID-19 niet is aangetoond, maar wel aannemelijk is - veel sterfte onder ouderen bijvoorbeeld - gerapporteerd als COVID-19 sterfte, terwijl Nederland die overlijdens niet meetelt in de registratie van COVID-19 sterfte.

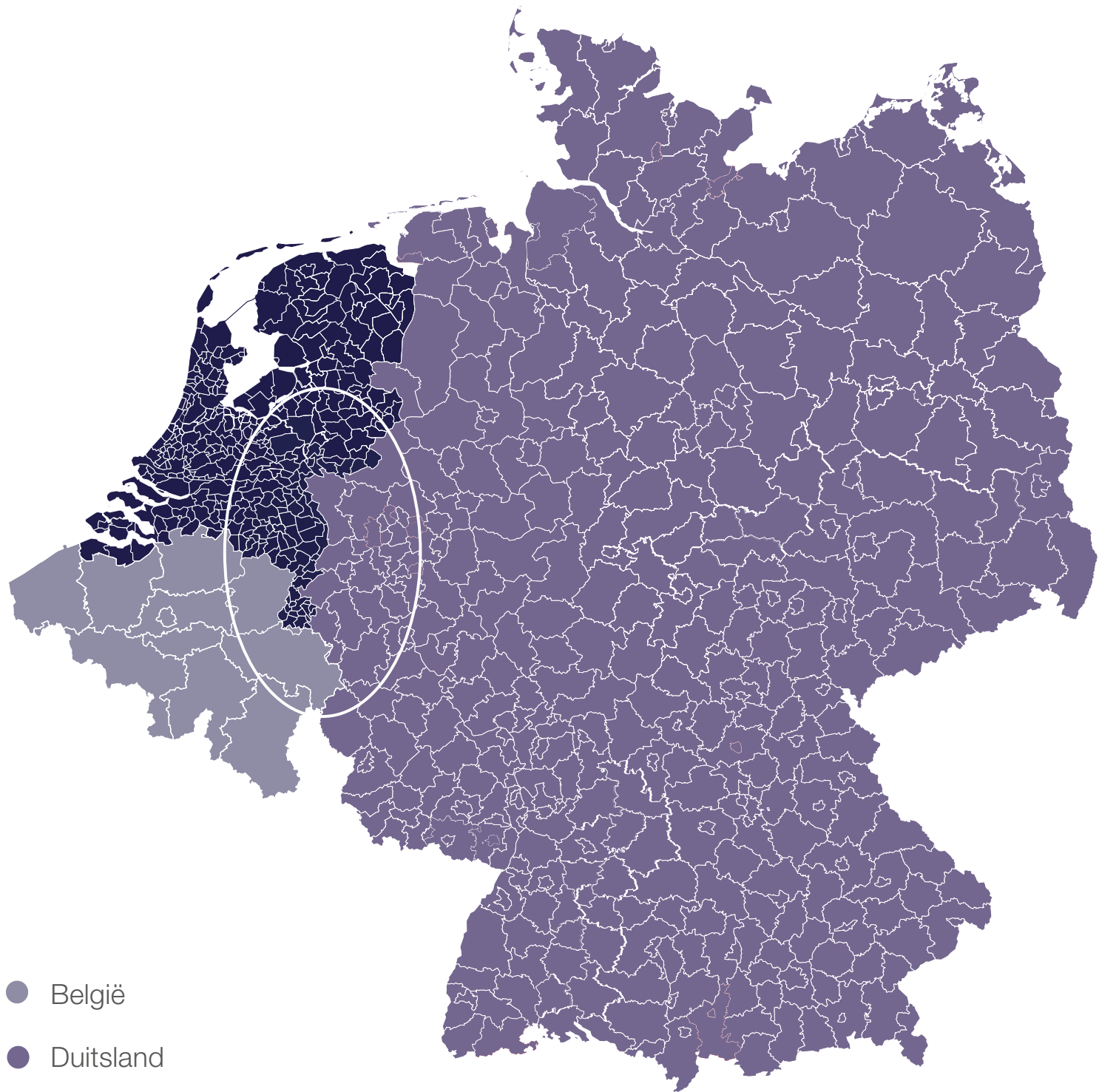
Op de tweede plaats is het ingewikkeld om op basis van de beschikbare cijfers in de drie landen iets te zeggen over de rol die regulering van grensoverschrijdend verkeer speelt in de verspreiding van COVID-19. Zo is de registratie van een besmetting niet gebaseerd op besmettingsplaats, maar op woonplaats. Alle infectiegegevens zijn dus gekoppeld aan de woonplaats van een persoon en niet alle besmettingen vinden thuis plaats. De plaats van besmetting is vaak onbekend. De besmetting kan hebben plaatsgevonden in relatie tot grensoverschrijdende mobiliteit van de

persoon zelf of van familieleden, vrienden of collega's en er is dus een grote diversiteit aan besmettingslocaties, zoals werk, horeca, feestjes of treinreizen. Aantallen meldingen van COVID-19 zeggen dus niets over cross-borderverspreiding. Meldingen van besmettingen in een bepaalde tijd en in gemeenten of regio's zeggen niet hoeveel transmissie er is door grensverkeer.

Tenslotte, om de vraag te beantwoorden of grensverkeer bijdraagt aan verspreiding van COVID-19 is bij het daadwerkelijk aantonen van transmissie nodig om te weten of dezelfde variant van de ene persoon naar de andere persoon verspreidt. Dit kan worden aangetoond door de genetische code van het virus te analyseren. Met behulp van een geavanceerde en tijdrovende test (sequencing) kan een soort vingerafdruk van het virus worden bepaald nadat die via een PCR-test is aangetoond bij een patiënt. Die vingerafdruk van het virus is nodig om transmissie te bewijzen. Het is duidelijk dat dergelijke gegevens alleen beschikbaar zijn voor slechts een steekproef van meldingen en dus niet alle meldingen. Deze gegevens zijn daarom ook niet zichtbaar in de kaarten. Deze vingerafdruk wordt wel gebruikt om clusters aan te tonen en om aan te tonen welke virusvarianten rondgaan.

Verloop

De Atlas laat het verloop van de COVID-19 pandemie zien in de grensregio. Hieruit zijn contextuele indicaties en aanwijzingen te halen.



- België
- Duitsland
- Nederland

Leitfaden zum Lesen



Um die Frage zu beantworten, inwieweit der Grenzverkehr und die Beschränkungen des Grenzverkehrs eine Rolle bei der Ausbreitung von COVID-19 gespielt haben, liegt es nahe, epidemiologische Daten zu betrachten. Auf der Grundlage der in den drei Ländern systematisch gesammelten Informationen haben wir in diesem Atlas Übersichtskarten zu den Infektionsraten (Anzahl der gemeldeten COVID-19-Infektionen pro 100.000 Einwohner, auch Fälle genannt) und anderen Parametern wie der Anzahl der Tests pro 100.000 Einwohner, der Krankenhaus-einweisungen und der registrierten Todesfälle in der Grenzregion erstellt. Da die besten verfügbaren Daten für die verschiedenen Länder die Anzahl der Infektionen sind, werden diese pro Woche für 8 Wochen seit Beginn der COVID-19-Pandemie dargestellt. Darüber hinaus werden vier Karten über einen Zeitraum von 8 Wochen kumuliert dargestellt. Diese Karten sind geografische Visualisierungen von Daten. Die Karten in diesem Atlas stellen 4 Euregio's dar: Euregio Maas-Rhein, Euregio Rhein-Maas-Nord, Euregio Rhein-Waal, EUREGIO (Enschede-Münster). Die Karten wurden um diese vier Euregio's herum entworfen, um die Ausrichtung und Bedeutung der verschiedenen geografischen Einheiten besser zu erklären.

Interpretation

Die Interpretation dieser Karten im Zusammenhang mit dem Grenzverkehr ist nicht einfach. Anhand dieser Karten lässt sich nur schwer feststellen, inwieweit sich die Regelung des Grenzverkehrs auf die Ausbreitung der Pandemie in den drei Ländern ausgewirkt hat. (Dies gilt nicht nur für den Verkehr zwischen Ländern, wie in diesen Karten dargestellt, sondern auch für den Verkehr zwischen Städten oder Provinzen innerhalb eines Landes). Warum ist es so schwierig, anhand dieser geoepidemiologischen Karten festzustellen, ob die Regulierung des grenzüberschreitenden Verkehrs Auswirkungen auf die Verbreitung von COVID-19 hatte?

Unterschiede zwischen drei Ländern

Erstens sind viele Daten aus den drei Ländern an sich nicht vollständig vergleichbar. Die Definition einer 'Meldung' oder eines 'Todesfalls durch COVID-19' kann von Land zu Land sehr unterschiedlich sein, was zum Teil auf kulturelle Gepflogenheiten zurückzuführen ist. Die Falldefinition von COVID-19-Meldungen kann von Land zu Land und über den gesamten Zeitraum der Pandemie hinweg unterschiedlich sein: Was zählt als Infektion und was nicht? Zählen nur Menschen mit Symptomen oder auch Menschen ohne Symptome? Zählen nur Personen, die mit einem PCR-Test getestet wurden, oder auch Personen, die einen anderen Test gemacht haben?

Die Antwort auf diese Fragen ist wichtig, denn sie beeinflusst den Infektionszähler. Aber auch die Bevölkerungsgruppe, zu der gezählt wird (der Nenner der Infektionen), kann sich unterscheiden. So gibt es beispielsweise Unterschiede bei den geografischen Ebenen (siehe Übersichtstabelle auf der nächsten Seite), d. h. Daten können auf verschiedenen geografischen Ebenen verfügbar sein - z. B. auf Gemeindeebene, subregionaler Ebene, Provinzebene, Bundesebene (für Belgien und Deutschland) oder nationaler Ebene. Dies hat Auswirkungen auf die Vergleichbarkeit. Auch zeitlich kann die Datenverfügbarkeit unterschiedlich sein: zum Beispiel pro Tag, pro Woche oder pro Zwei-Wochen-Zeitraum. Im Atlas werden daher die am ehesten vergleichbaren Daten - die Infektionen (bzw. Infektionen oder Meldungen) pro Woche - und die Daten zu Tests, Krankenhauseinweisungen und Todesfällen pro acht Wochen dargestellt. Um den Kenntnisstand über die Verbreitung von COVID-19 in den drei Ländern vergleichen zu können, ist die Zahl der in einem bestimmten Zeitraum durchgeführten Tests sehr wichtig, da sie auch den Prozentsatz der gemessenen positiven Ergebnisse bestimmt. Je mehr Tests durchgeführt werden, desto weniger positive Ergebnisse bleiben unentdeckt. Die Anzahl der Tests pro Zeiteinheit und die geografische Lage sind jedoch in den drei Ländern unterschiedlich, was einen direkten Vergleich erschwert. Die endgültigen Infektionszahlen sind daher nicht eins zu eins vergleichbar, da sie auf Unterschieden in der Testpolitik (Tests bei Symptomen oder ohne Symptome), in der Art der durchgeführten und einbezogenen Tests (einige sind zuverlässiger als andere) und in der Testbereitschaft (die Anzahl der Personen, die aufgrund der Testpolitik bereit sind, einen Test durchführen zu lassen) beruhen. Zum Beispiel geht nicht jeder mit Symptomen ins Testzentrum. Daten über die Anzahl der durchgeführten Tests sind in Deutschland beispielsweise nur auf Bundesebene (Nordrhein-Westfalen) und in Belgien nur auf Provinzebene verfügbar. Darüber hinaus werden in allen drei Ländern in der Regel nur die staatlich durchgeführten Tests und nicht die der kommerziellen Parteien berücksichtigt. Obwohl Zahlen Genauigkeit und Präzision suggerieren, sind sie das Ergebnis eines komplexen Konstruktionsprozesses, und Zahlen, die sich angeblich auf dasselbe Phänomen beziehen, sind oft nicht zu 100 % vergleichbar. In Belgien beispielsweise werden Todesfälle, für die ein Zusammenhang mit COVID-19 zwar nicht nachgewiesen, aber plausibel ist - zum Beispiel viele Todesfälle unter älteren Menschen - als COVID-19-Todesfälle gemeldet, während die Niederlande diese Todesfälle bei der Registrierung der COVID-19-Mortalität nicht berücksichtigen.

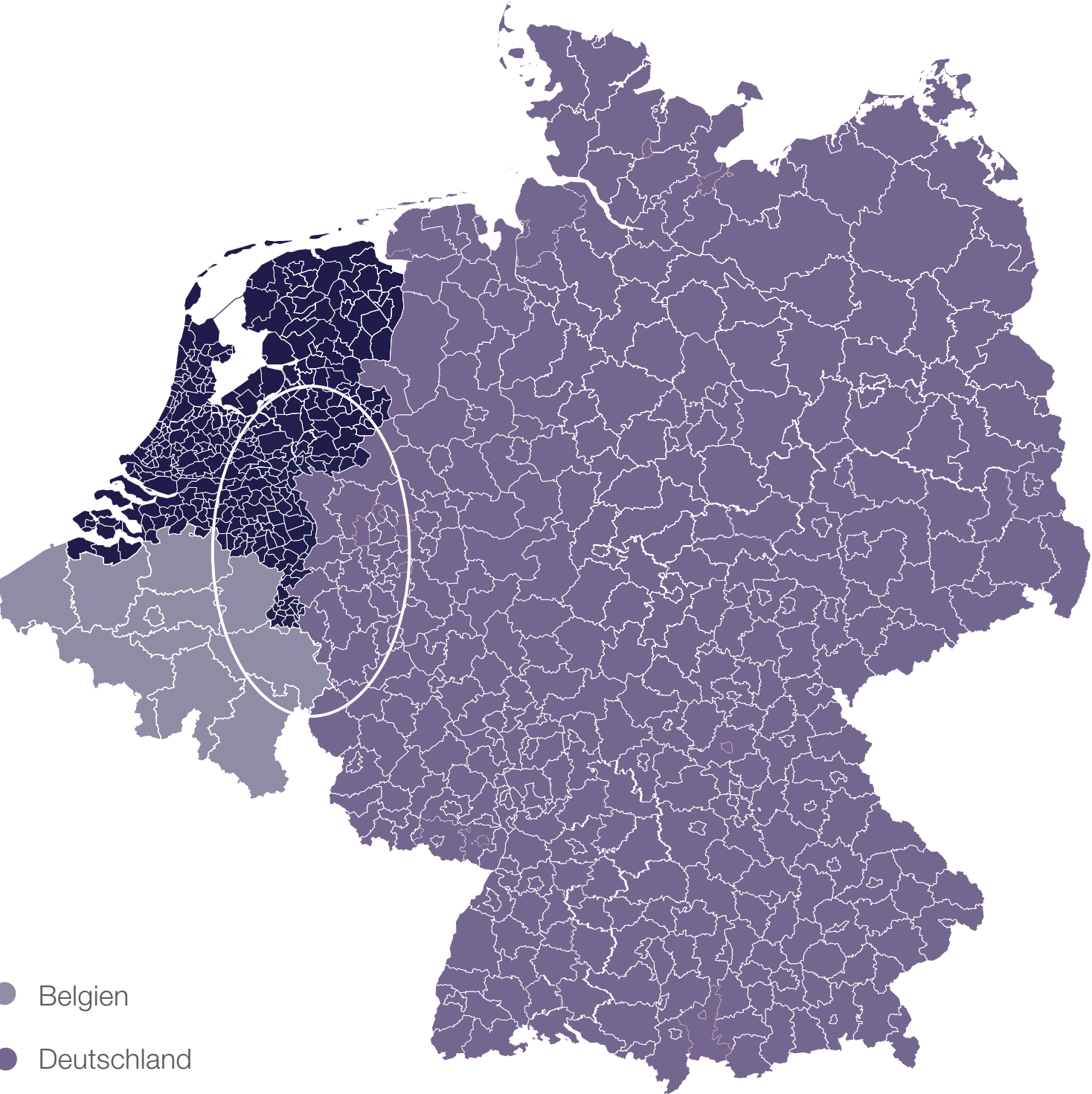
Zweitens ist es schwierig, auf der Grundlage der in den drei Ländern verfügbaren Zahlen etwas über den Einfluss der Regulierung des grenzüberschreitenden Verkehrs bei der Verbreitung von COVID-19 zu sagen. Die Registrierung einer Infektion richtet sich beispielsweise nicht nach dem Ort der Infektion, sondern nach dem Wohnort. Alle Infektionsdaten sind daher mit dem Wohnort

einer Person verknüpft, und nicht alle Infektionen treten zu Hause auf. Der Ort der Infektion ist oft unbekannt. Die Infektion kann im Zusammenhang mit der grenzüberschreitenden Mobilität der Person selbst oder von Familienmitgliedern, Freunden oder Kollegen erfolgt sein, und es gibt daher eine große Vielfalt von Infektionsorten, wie z. B. Arbeit, Gastronomiebetriebe, Partys oder Zugreisen. Die Zahlen der COVID-19-Meldungen sagen daher nichts über die grenzüberschreitende Verbreitung aus. Berichte über Infektionen in einem bestimmten Zeitraum und in Gemeinden oder Regionen sagen nichts darüber aus, wie viel Übertragung es durch den Grenzverkehr gibt.

Um **schließlich** die Frage zu beantworten, ob der Grenzverkehr zur Ausbreitung von COVID-19 beiträgt, muss man wissen, ob dieselbe Variante von einer Person zur anderen übertragen wird. Dies lässt sich durch eine Analyse des genetischen Codes des Virus nachweisen. Mit Hilfe eines fortschrittlichen und zeitaufwändigen Tests (Sequenzierung) kann eine Art Fingerabdruck des Virus bestimmt werden, nachdem es bei einem Patienten durch einen PCR-Test nachgewiesen wurde. Dieser Fingerabdruck des Virus ist für den Nachweis der Übertragung erforderlich. Natürlich sind solche Daten nur für eine Stichprobe von Meldungen und nicht für alle Meldungen verfügbar. Daher sind diese Daten in den Karten nicht sichtbar. Dieser Fingerabdruck wird jedoch zur Identifizierung von Clustern verwendet und zeigt, welche Virusvarianten im Umlauf sind.

Kurs

Der Atlas zeigt den Verlauf der COVID-19-Pandemie in der Grenzregion. Daraus lassen sich kontextuelle Hinweise und Anhaltspunkte ableiten.



- Belgien
- Deutschland
- Niederlanden

Guide de lecture



Pour répondre à la question de savoir dans quelle mesure le trafic frontalier et les restrictions du trafic frontalier ont joué un rôle dans la propagation de la COVID-19, une étape évidente consiste à examiner les données épidémiologiques. Sur la base des informations systématiquement collectées dans les trois pays, nous avons intégré dans cet Atlas des cartes de synthèse des taux d'infection (le nombre d'infections, communément appelé cas, COVID-19 rapportés pour 100 000 habitants) et d'autres paramètres tels que le nombre de tests pour 100 000 habitants, les admissions à l'hôpital et les décès enregistrés pour la région frontalière. Les meilleures données disponibles pour les différents pays étant le nombre d'infections, celles-ci sont présentées par semaine sur un cycle de 8 semaines à partir du début de la pandémie COVID-19. Quatre cartes, basées chacune sur une période de 8 semaines, sont présentées de manière cumulative. Ces cartes sont des visualisations géographiques de données. Les cartes de cet atlas représentent 4 Eurorégions : Euregio Meuse-Rhin, Euregio Rhin-Meuse-Nord, Euregio Rhin-Waal, EUREGIO (Enschede-Münster). Les cartes ont été conçues autour de ces quatre eurorégions afin de mieux expliquer l'orientation et la signification des différentes unités géographiques.

Interprétation

L'interprétation de ces cartes dans le contexte du trafic frontalier n'est pas aisée. Il est difficile de déterminer sur la base de ces cartes dans quelle mesure la réglementation du trafic frontalier a eu un effet sur la propagation de la pandémie dans les trois pays. (Cela ne s'applique pas seulement au trafic entre les pays comme indiqué sur ces cartes, mais aussi au trafic entre les villes ou les provinces d'un même pays). Pourquoi est-il si difficile de déterminer à partir de ces cartes géo-épidémiologiques si la régulation du trafic transfrontalier a eu un effet sur la propagation du COVID-19 ?

Differences between the three countries

Tout d'abord, de nombreuses données provenant des trois pays ne sont pas entièrement comparables. La définition d'une 'déclaration' ou d'un 'décès dû à la COVID-19' peut varier considérablement d'un pays à l'autre, par exemple en raison des pratiques culturelles. La simple définition de cas COVID-19 peut différer entre les pays et a pu différer sur toute la période de la pandémie: qu'est-ce qui est comptabilisé comme infection et qu'est-ce qui n'est pas comptabilisé? Doivent être comptabilisées seulement les personnes présentant des symptômes ou doit-on comptabiliser les personnes sans symptômes également ? Est-ce que seules les personnes

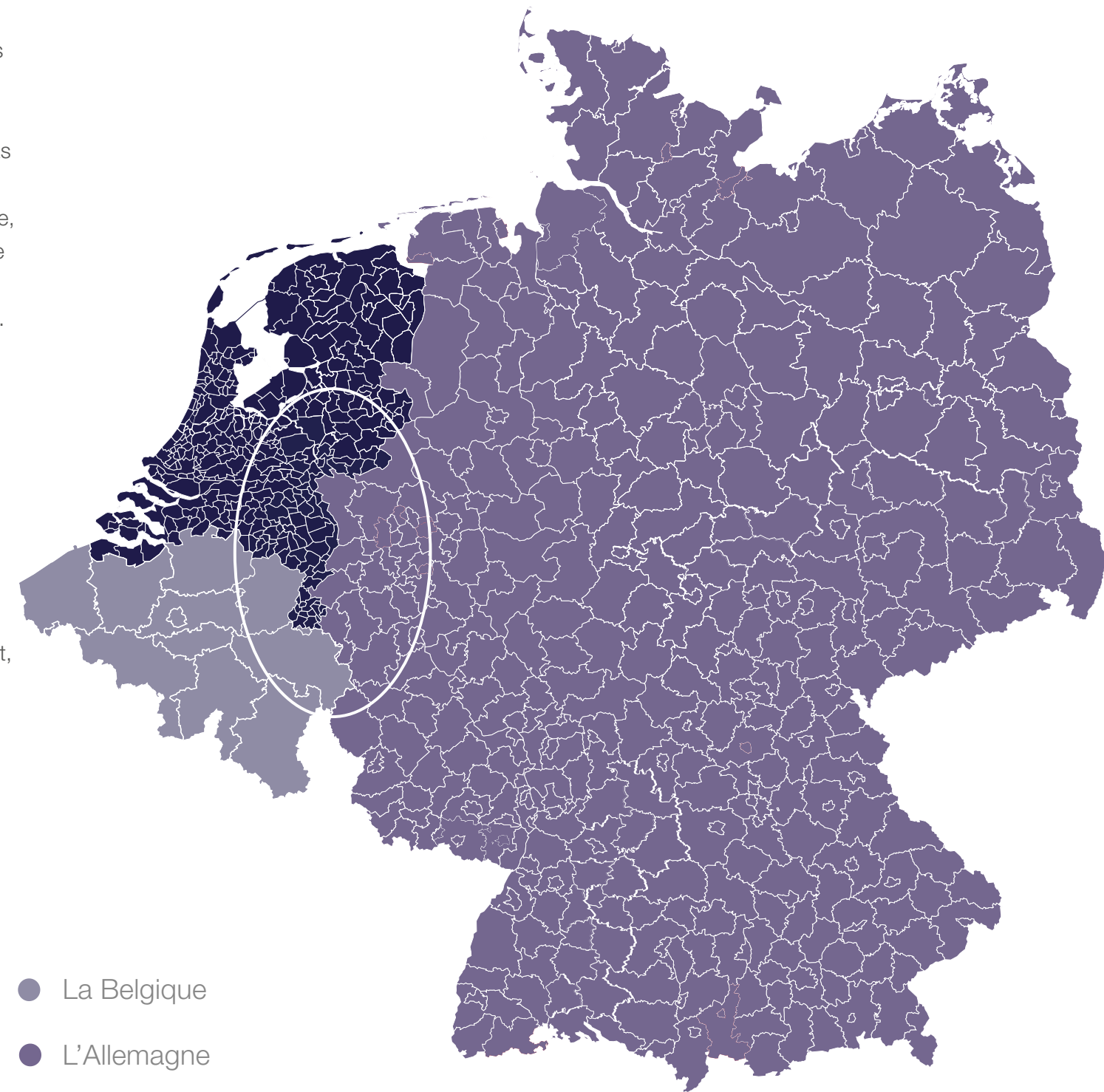
testées par PCR doivent être comptabilisées ou doit-on y intégrer également celles qui ont subi un autre test? La réponse à ces questions est importante car elle influence le nombre rapporté d'infection. Mais le groupe de population parmi lequel le dénombrement est effectué (le dénominateur des infections) peut également différer. Par exemple, il existe des différences dans les niveaux géographiques (voir le tableau récapitulatif à la page suivante), c'est-à-dire que les données peuvent être disponibles à différents niveaux géographiques - par exemple, le niveau municipal, le niveau sous-régional, le niveau provincial, le niveau fédéral (pour la Belgique et l'Allemagne) ou le niveau national. Cela a un effet sur la comparabilité. La disponibilité des données peut également varier dans le temps : par exemple, par jour, par semaine ou par période de deux semaines. Dans l'Atlas, nous présentons donc les données les plus comparables - les infections (ou les infections ou les cas rapportés) par semaine - et nous donnons des données sur les tests, les admissions à l'hôpital et les décès par cycle de huit semaines. Afin de pouvoir comparer les connaissances sur la propagation de la COVID-19 dans trois pays, le nombre de tests effectués au cours d'une période donnée est très important, car il détermine également le pourcentage de positivité. Plus le nombre de tests effectués est élevé, moins il y aura de positifs non détectés. Cependant, le nombre de tests effectués par unité de temps et par milieu géographique diffère dans les trois pays, ce qui rend difficile une comparaison directe. Les nombres finaux d'infections ne sont donc pas comparables entre eux, car ils sont basés sur des différences dans la politique de dépistage (dépistage en cas de plainte ou sans plainte), dans le type de tests effectués (certains sont plus fiables que d'autres) et dans la préparation au test (le nombre de personnes qui sont prêtes, sur la base de la politique de dépistage, à faire un test). Par exemple, tout le monde ne se présente pas pour un dépistage à la suite de plaintes. En Allemagne, par exemple, les chiffres sur le nombre de tests passés ne sont disponibles qu'au niveau fédéral (Rhénanie-du-Nord-Westphalie) et en Belgique qu'au niveau provincial. En outre, dans ces trois pays, seuls les tests gouvernementaux sont généralement pris en compte, et non ceux délivrés par des acteurs privés. Bien que les chiffres suggèrent l'exactitude et la précision, ils sont le résultat d'un processus de construction complexe et les chiffres qui prétendent se référer au même phénomène ne sont souvent pas comparables à 100%. En Belgique, par exemple, les décès pour lesquels un lien avec la COVID-19 n'a pas été démontré, mais est plausible - de nombreux décès chez les personnes âgées par exemple - sont signalés comme des décès dus à la COVID-19, alors que les Pays-Bas ne comptent pas ces décès dans l'enregistrement de la mortalité due à la COVID-19.

Deuxièmement, il est complexe de se prononcer sur le rôle que joue la réglementation du trafic transfrontalier dans la propagation de la COVID-19 sur la base des chiffres disponibles dans les trois pays. Par exemple, l'enregistrement d'une infection n'est pas basé sur le lieu d'infection, mais sur le lieu de résidence. Toutes les données relatives aux infections sont donc liées au lieu de résidence d'une personne, et toutes les infections ne se produisent pas à domicile. Le lieu de l'infection est souvent inconnu. L'infection peut avoir eu lieu dans le cadre de la mobilité transfrontalière de la personne elle-même ou des membres de sa famille, de ses amis ou de ses collègues. Il existe une grande diversité de lieux d'infection, comme le travail, les établissements de restauration, les fêtes ou les voyages en train. Les chiffres rapportés sur les cas de COVID-19 ne disent donc rien sur la propagation transfrontalière. Les rapports sur les infections au cours d'une certaine période et dans les municipalités ou les régions ne disent pas quel est le degré de transmission dû au trafic frontalier.

Enfin, pour répondre à la question de savoir si le trafic frontalier contribue à la propagation de la COVID-19, il est nécessaire de savoir si le même variant se propage d'une personne à l'autre. Cela peut être démontré en analysant le code génétique du virus. En utilisant un test avancé et long (séquençage), une sorte d'empreinte digitale du virus peut être déterminée après qu'il a été détecté chez un patient par un test PCR. Cette empreinte digitale du virus est nécessaire pour prouver la transmission. Évidemment, ces données ne sont disponibles que pour un échantillon de cas et non pour tous les cas. Par conséquent, ces données ne sont pas visibles dans les cartes. Cependant, cette empreinte digitale est utilisée pour identifier les clusters et pour montrer quel variant du virus est en circulation.

Cours

L'Atlas montre l'évolution de la pandémie de COVID-19 dans la région frontalière. Des indications et des indices contextuels peuvent en être tirés.



- La Belgique
- L'Allemagne
- Les Pays-Bas

1. Hardenberg

2. Ommen

3. Twenterand

4. Hellendoorn

5. Almelo

6. Dinkelland

7. Rijssen-Holten

8. Enschede

9. Rijssen-Holten

10. Losser

11. Enschede

12. Appeldoorn

13. Hof van Twente

14. LK Steinfurt

15. Ede

16. Arnhem

17. Rheden

18. Oost Gelre

19. Berkelland

20. LK Borken

21. SK Münster

22. LK Coesfeld

22. West Maas en waal

23. Overbetuwe

24. Zevenaar

25. Winterswijk

26. Oude IJsselstreek

27. Wijchen

28. Cuijk

29. Mill en Sint Hubert

30. Gennep

31. Boxmeer

32. LK Kleve

33. LK Wesel

34. LK Recklinghausen

35. Venray

36. Horst aan de Maas

37. Venlo

38. SK Krefeld
39. Nederweert

40. Roermond

41. LK Viersen

42. SK Mönchengladbach

43. Echt-Susteren

44. LK Heinsberg

45. Meerssen

46. Beek

47. Stein

48. Valkenburg aan de Geul

49. Gulpen-Wittem

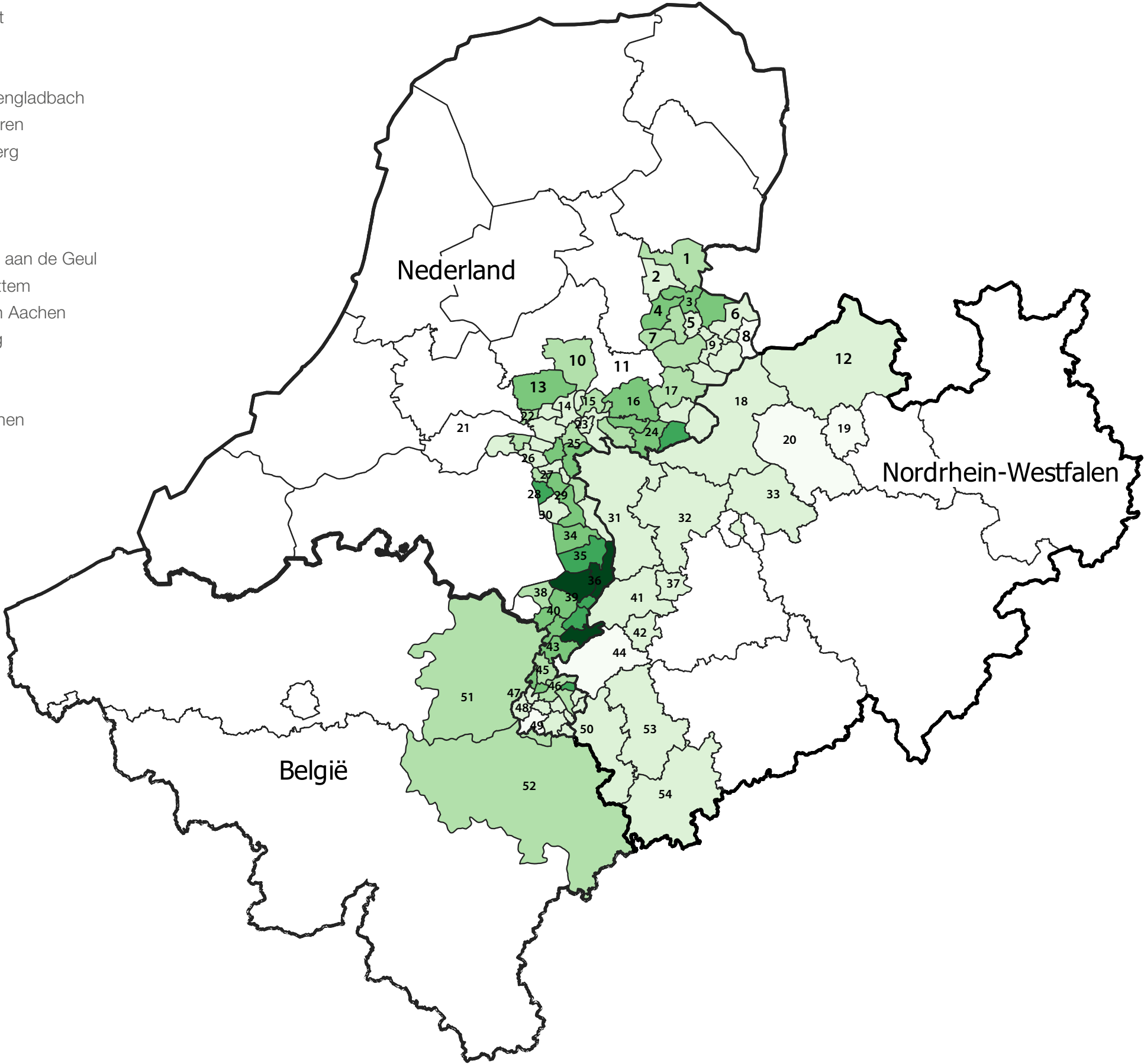
50. Städregion Aachen

51. Pr. Limburg

52. Pr. Liège

53. LK Duuren

54. LK Euskirchen



Indicators

Below are the indicators that we were either able to collect or to create ourselves using existing data sets. The time span varies from weekly to once every 8 weeks. In order to calculate percentages, the population status on 31-12-2019 was used for each country.

Care must be taken with the indicators because different definitions, ambiguities and differences in data collection and management can lead to uncertain results.



| Data/indicator | NRW/Germany | | | | Belgium | | | | The Netherlands | | | | |
|-------------------------------------------------------------------------|--------------|----------------|-----|---------|--------------|----------|--------|---------|-----------------|------------|---------------|----------|---------|
| | Municipality | Region (Kreis) | NRW | Country | Municipality | Province | Region | Country | Municipality | GGD region | Safety region | Province | Country |
| Number of COVID infections / 100,000 inhabitants | | x | x | x | x | x | x | x | x | x | x | x | x |
| Number of COVID tests done / 100,000 inhabitants | | | x | x | | x | x | x | | x | | x | x |
| Number COVID Hospital admissions/ 100,000 inhabitants | | x | x | x | | x | x | | x | x | x | x | x |
| Number of deaths (in relation to) COVID diagnosis / 100,000 inhabitants | | x | x | x | | | x | x | x | x | x | x | x |

Indicatoren



Hieronder vindt u de indicatoren die we konden verzamelen of zelf konden creëren aan de hand van bestaande datasets. De tijdsperiode varieert van wekelijks tot éénmaal per 8 weken. Om percentages te kunnen berekenen, is er voor elk land gebruikgemaakt van de stand van de

bevolking op 31.12.2019. Er moet zorgvuldig met de indicatoren worden omgegaan omdat verschillende definities, onduidelijke definities en verschillen bij het verzamelen en beheren van gegevens tot onzekere resultaten kunnen leiden.

| Data/Indicator | NRW/Duitsland | | | | België | | | | Nederland | | | | |
|-----------------------------------------------------------------|---------------|---------------|-----|------|----------|-----------|-------|------|-----------|-----------|-------------------|-----------|------|
| | Gemeente | Regio (Kreis) | NRW | Land | Gemeente | Provincie | Regio | Land | Gemeente | GGD regio | Veiligheids-regio | Provincie | Land |
| Aantal COVID infecties / 100.000 inwoners | | x | x | x | x | x | x | x | x | x | x | x | x |
| Aantal COVID tests gedaan / 100.000 inwoners | | | x | x | | x | x | x | | x | | x | x |
| Aantal COVID Ziekenhuisopnames/ 100.000 inwoners | | x | x | x | | x | x | | x | x | x | x | x |
| Aantal doden (in relatie tot) COVID diagnose / 100.000 inwoners | | x | x | x | | | x | x | x | x | x | x | x |

Indikatoren



Nachfolgend sind die Indikatoren aufgeführt, die wir sammeln oder anhand vorhandener Datensätze selbst erstellen konnten. Die Zeitspanne variiert von wöchentlich bis alle 8 Wochen. Für die Berechnung der Prozentsätze wird für jedes Land der Bevölkerungsstand vom 31.12.2019

verwendet. Bei den Indikatoren ist Vorsicht geboten, da unterschiedliche Definitionen, Unklarheiten und Unterschiede bei der Datenerhebung und -verwaltung zu unsicheren Ergebnissen führen können.

| Daten/Indikator | NRW/Deutschland | | | | Belgien | | | | Niederlande | | | | |
|--------------------------------------------------------------------------|-----------------|-------|-----|------|---------|---------|--------|------|-------------|------------|-------------------|---------|------|
| | Kommune | Kreis | NRW | Land | Kommune | Provinz | Region | Land | Kommune | GGD-Region | Sicherheitsregion | Provinz | Land |
| Anzahl der COVID-Infektionen / 100.000 Einwohner | | x | x | x | x | x | x | x | x | x | x | x | x |
| Anzahl der durchgeführten COVID-Tests / 100.000 Einwohner | | | x | x | | x | x | x | | x | | x | x |
| Anzahl COVID-Krankenhauseinweisungen/ 100.000 Einwohner | | x | x | x | | x | x | | x | x | x | x | x |
| Anzahl der Todesfälle (in Bezug auf) COVID-Diagnosen / 100.000 Einwohner | | x | x | x | | | x | x | x | x | x | x | x |

Indicateurs



Vous trouverez ci-dessous les indicateurs que nous avons pu collecter ou créer nous-mêmes en utilisant des ensembles de données existants. La périodicité varie d’une semaine à une fois toutes les 8 semaines. Afin de calculer les pourcentages, l’état de la population au 31.12.2019 est utilisé

pour chaque pays. Il faut être prudent avec les indicateurs car des définitions différentes, des ambiguïtés et des différences dans la collecte et la gestion des données peuvent conduire à des résultats incertains.

| Données/ Indicateur | NRW/Allemagne | | | | Belgique | | | | Pays-Bas | | | | |
|----------------------------------------------------------------------------|---------------|-------|-----|------|--------------|----------|--------|------|--------------|------------|--------------------|----------|------|
| | Municipalité | Kreis | NRW | Pays | Municipalité | Province | Région | Pays | Municipalité | Région GGD | Région de sécurité | Province | Pays |
| Nombre d’infections par le COVID / 100 000 habitants | | x | x | x | x | x | x | x | x | x | x | x | x |
| Nombre de tests COVID effectués / 100 000 habitants | | | x | x | | x | x | x | | x | | x | x |
| Nombre d’admissions à l’hôpital COVID/ 100 000 habitants | | x | x | x | | x | x | | x | x | x | x | x |
| Nombre de décès (en relation avec) le diagnostic COVID / 100 000 habitants | | x | x | x | | | x | x | x | x | x | x | x |

Weekly dates and dates per 8 weeks*

Wekelijkse data en data per 8 weken* / Wöchentliche Daten und Daten über 8 Wochen* / Dates hebdomadaires et dates par 8 semaines*

* Outside investigated Euroregions, no data available * Buiten onderzochte euregio's, geen data beschikbaar * Außerhalb der untersuchten Euroregionen sind keine Daten verfügbar
* En dehors des eurorégios étudiées, pas de données disponibles

Infections
Infectiecijfers - Infektionsraten - Taux d’infection

Amount of tests
Aantal tests - Anzahl Tests - Nombre de tests

Hospitalizations
Ziekenhuisopnames - Krankenhauseinweisungen - Admission à l’hôpital

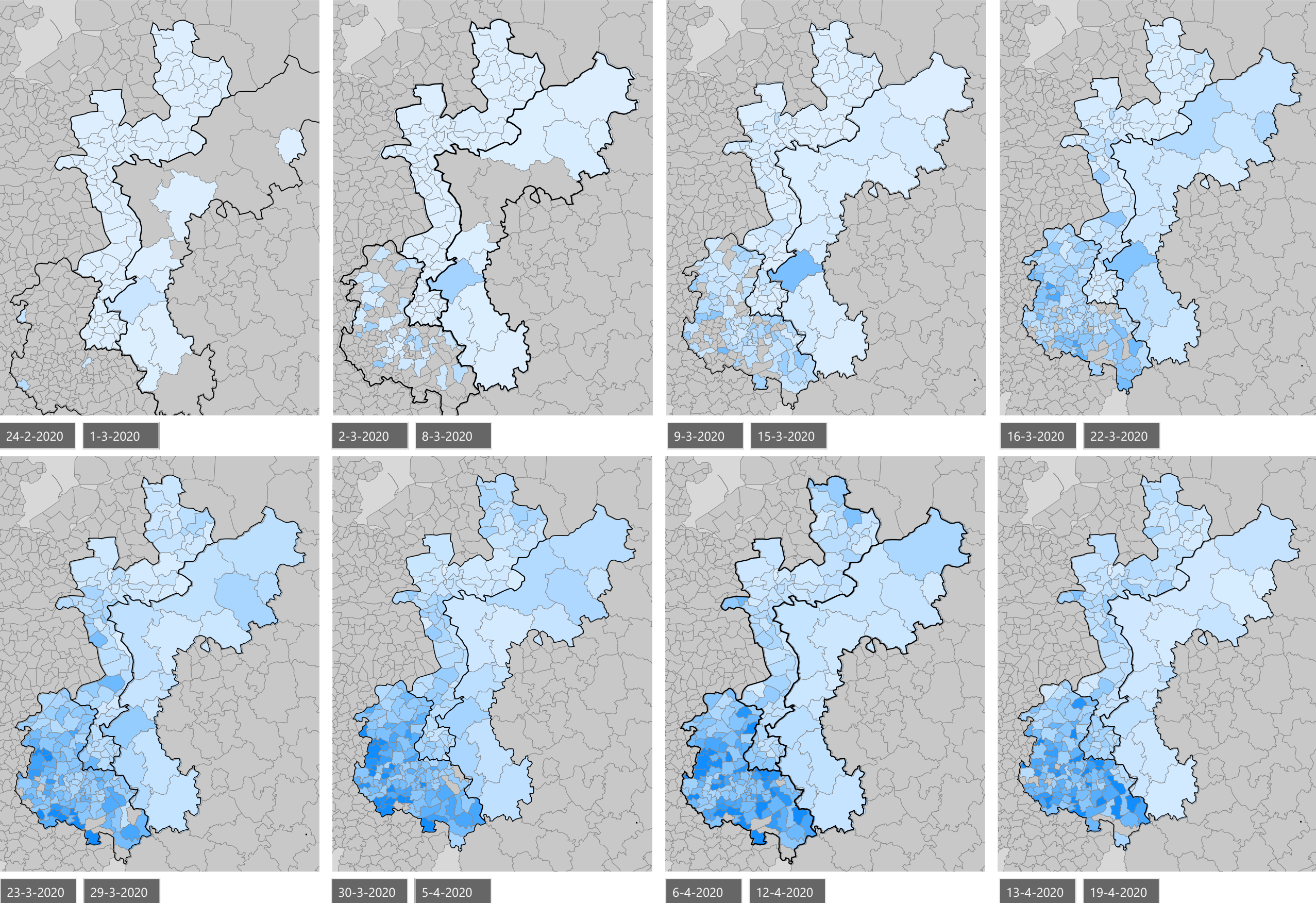
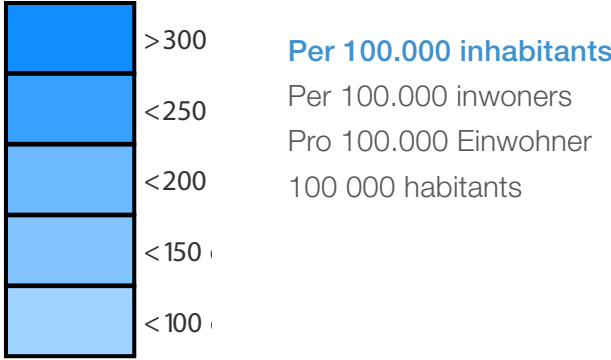
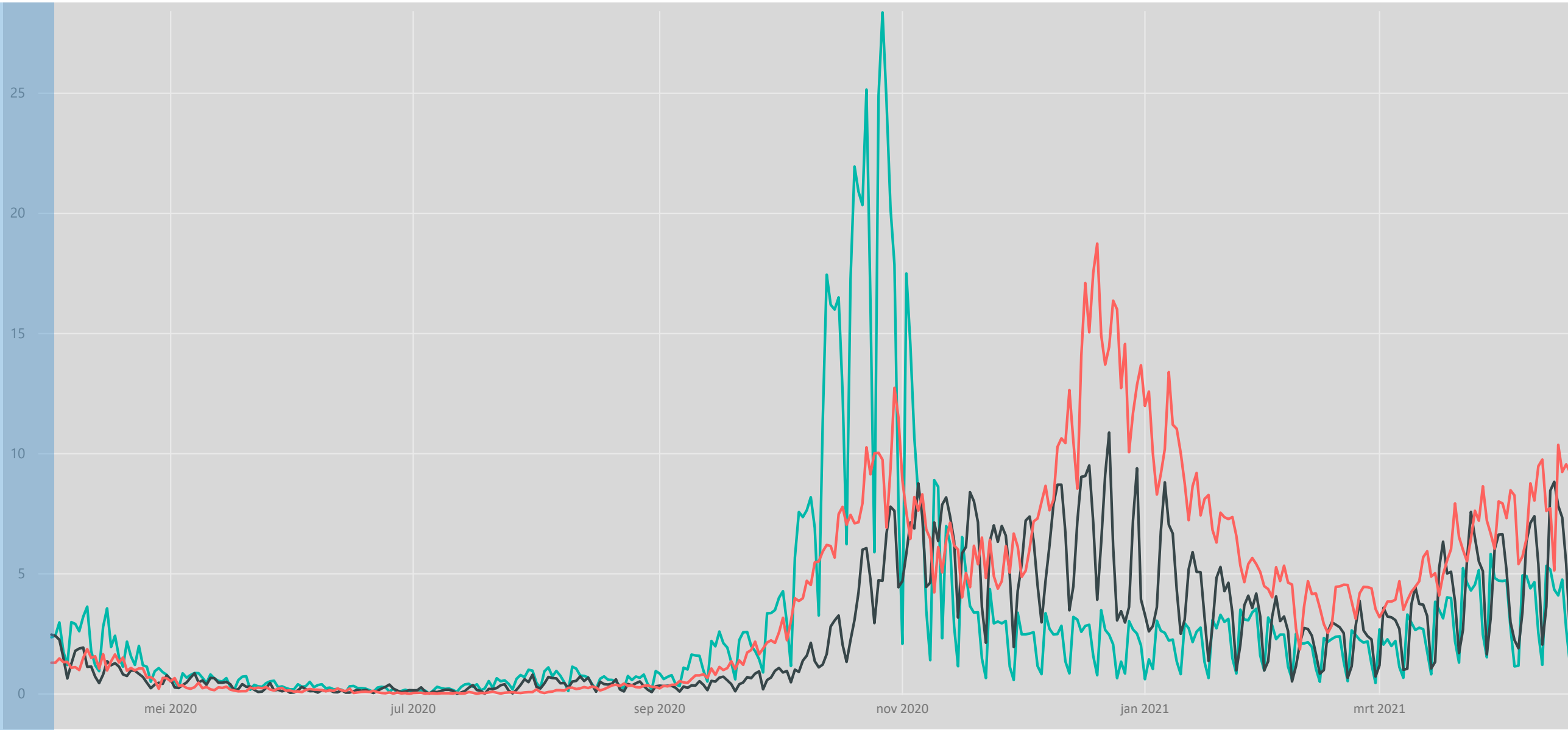
Deaths
Sterfgevallen - Todesfälle – Mortalité

Infections

Infectiecijfers - Infektionsraten - Taux d'infection

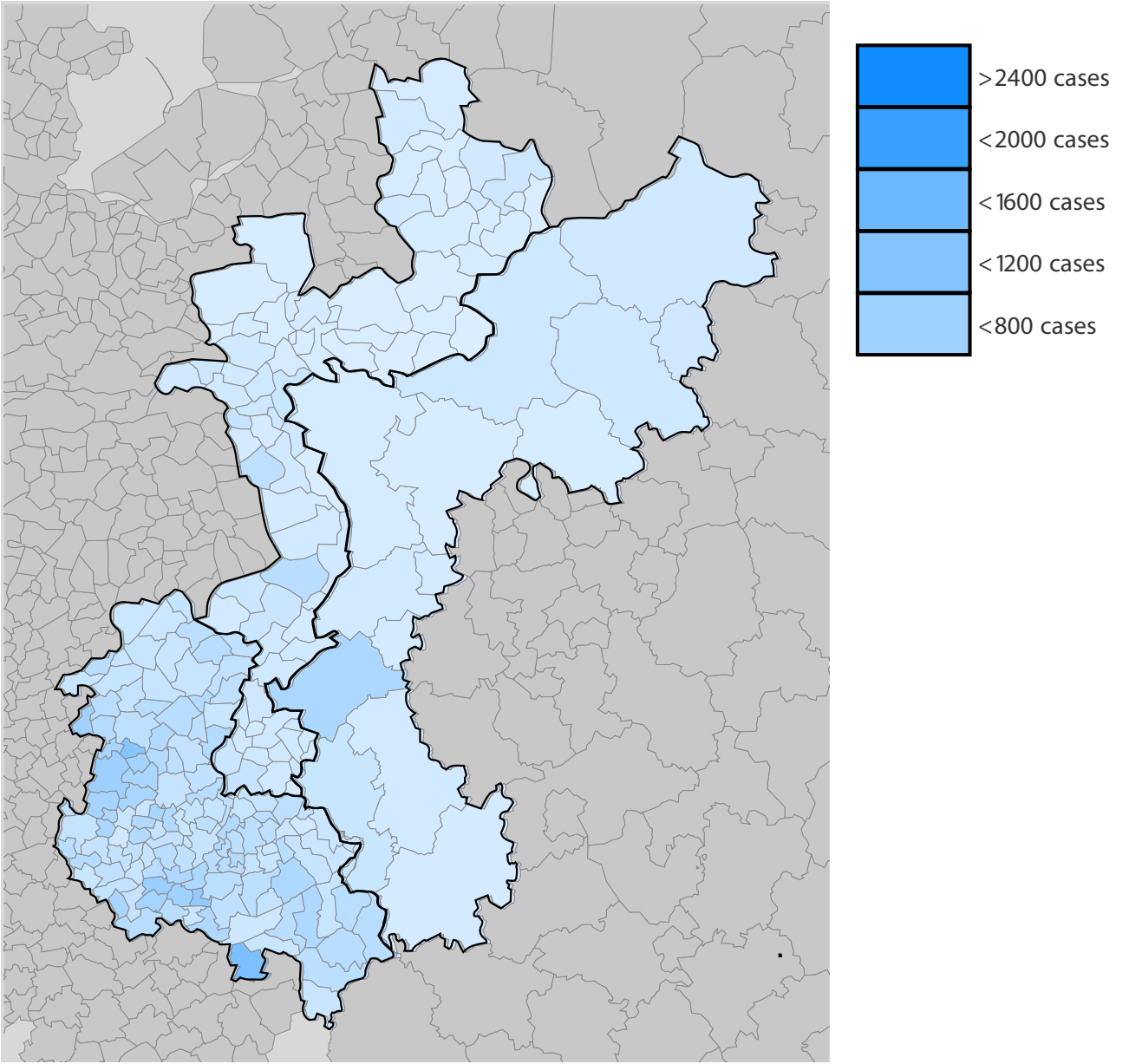
Belgium Germany The Netherlands

24-2-2020 19-4-2020



Infections

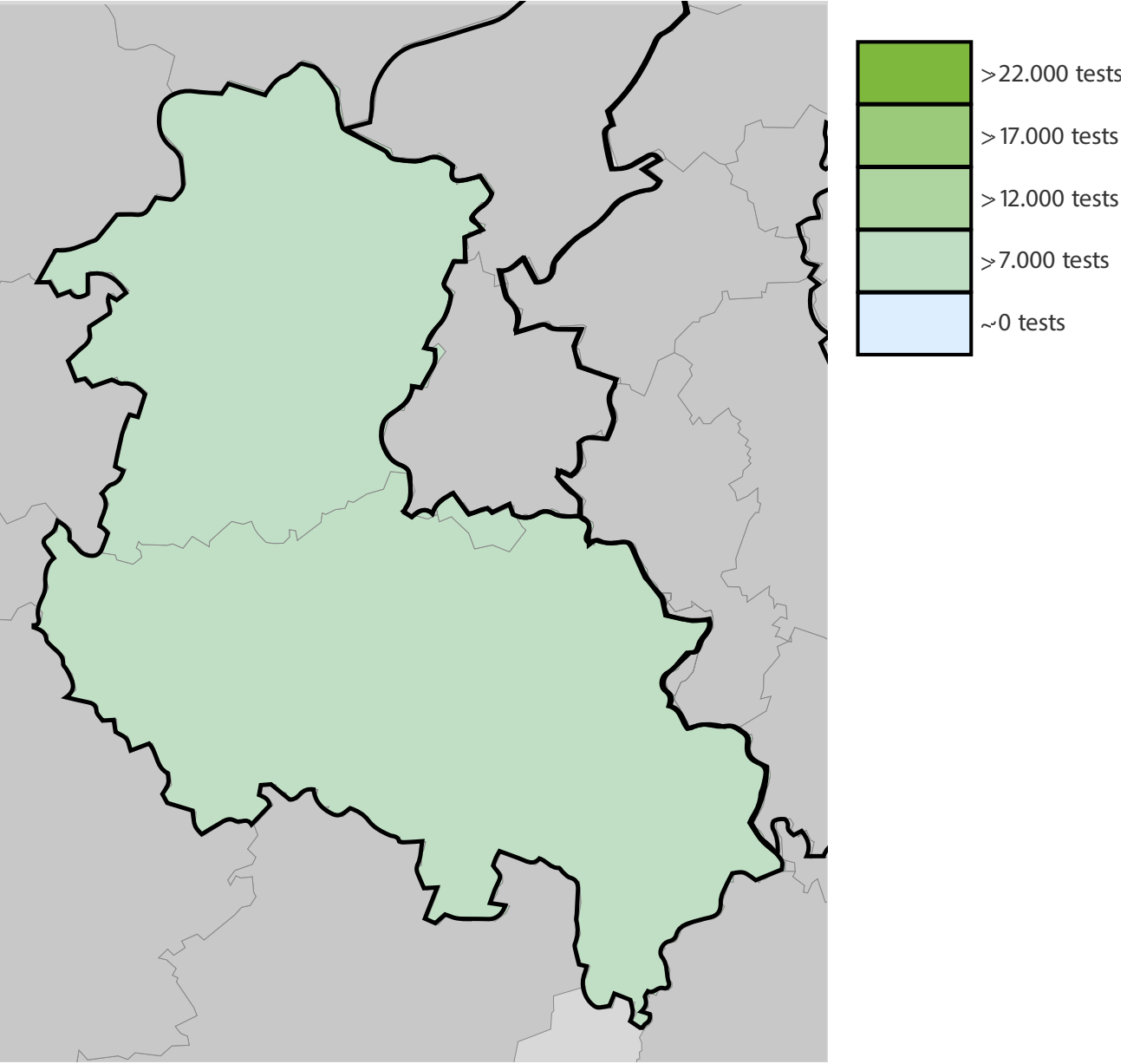
Infectiecijfers - Infektionsraten - Taux d'infection



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Amount of tests

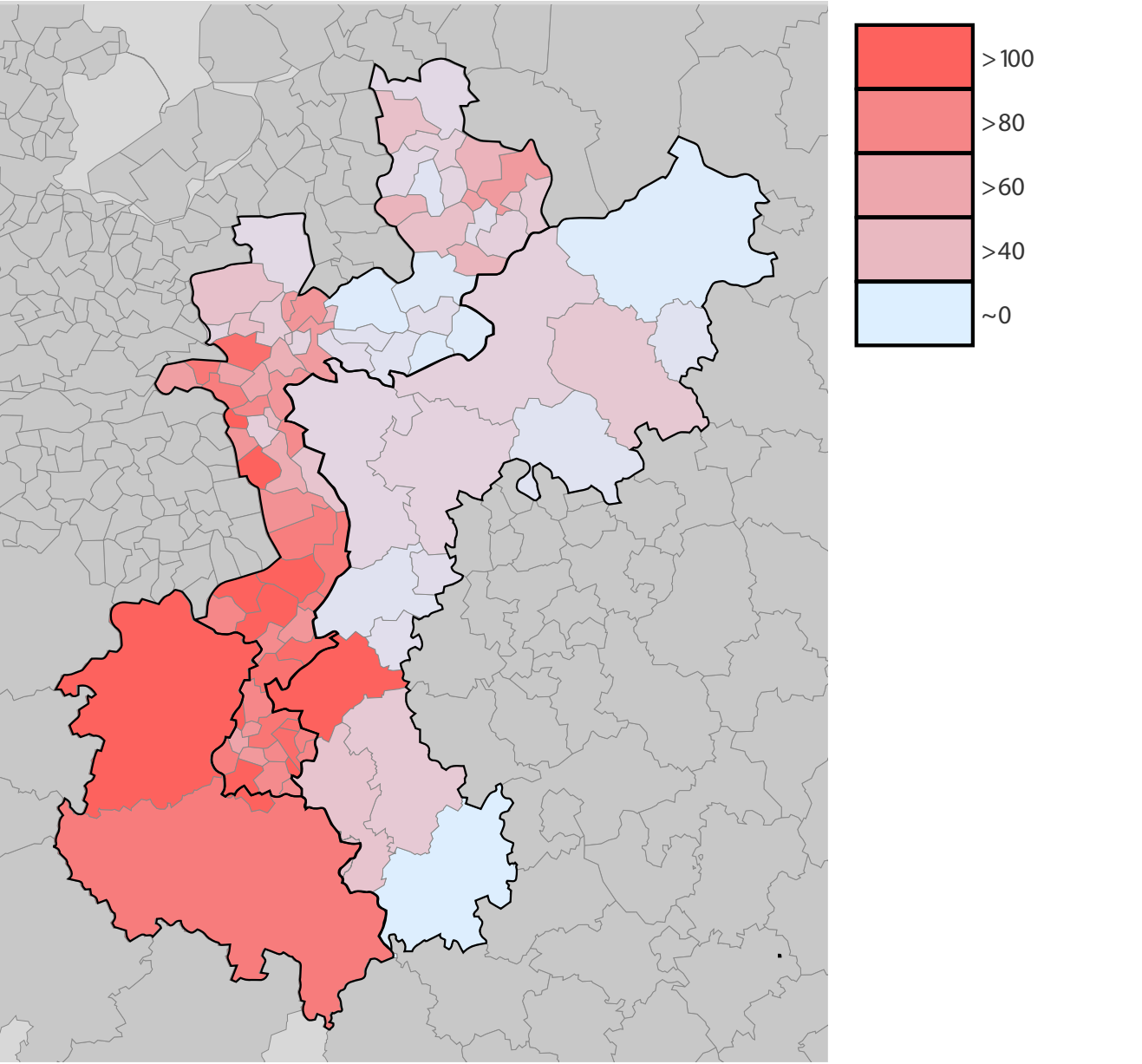
Aantal tests - Anzahl Tests - Nombre de tests



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Hospitalizations

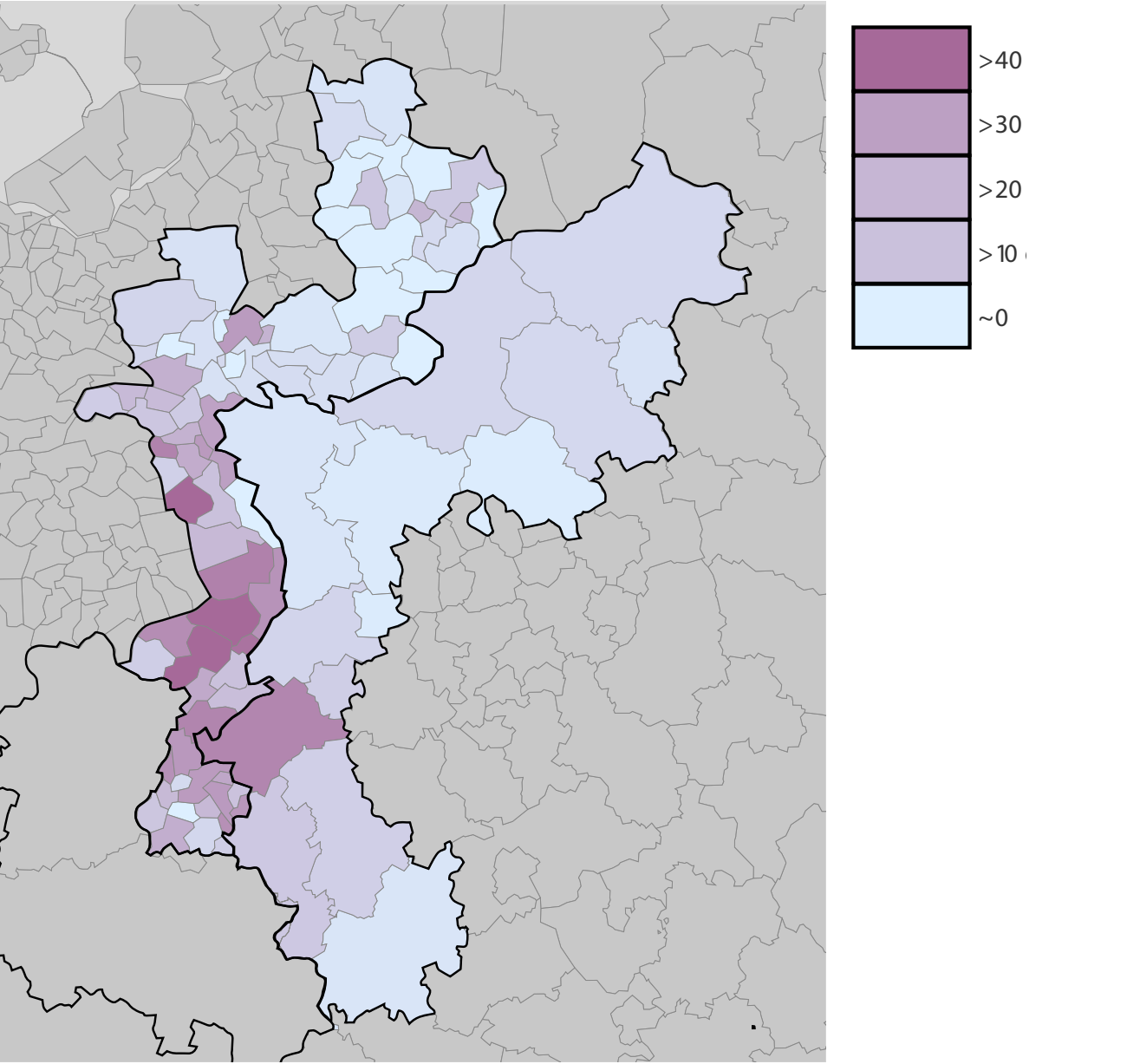
Ziekenhuisopnames - Krankenhauseinweisungen - Admission à l'hôpital



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Deaths

Sterfgevallen - Sterfgevallen - Todesfälle - Mortalité



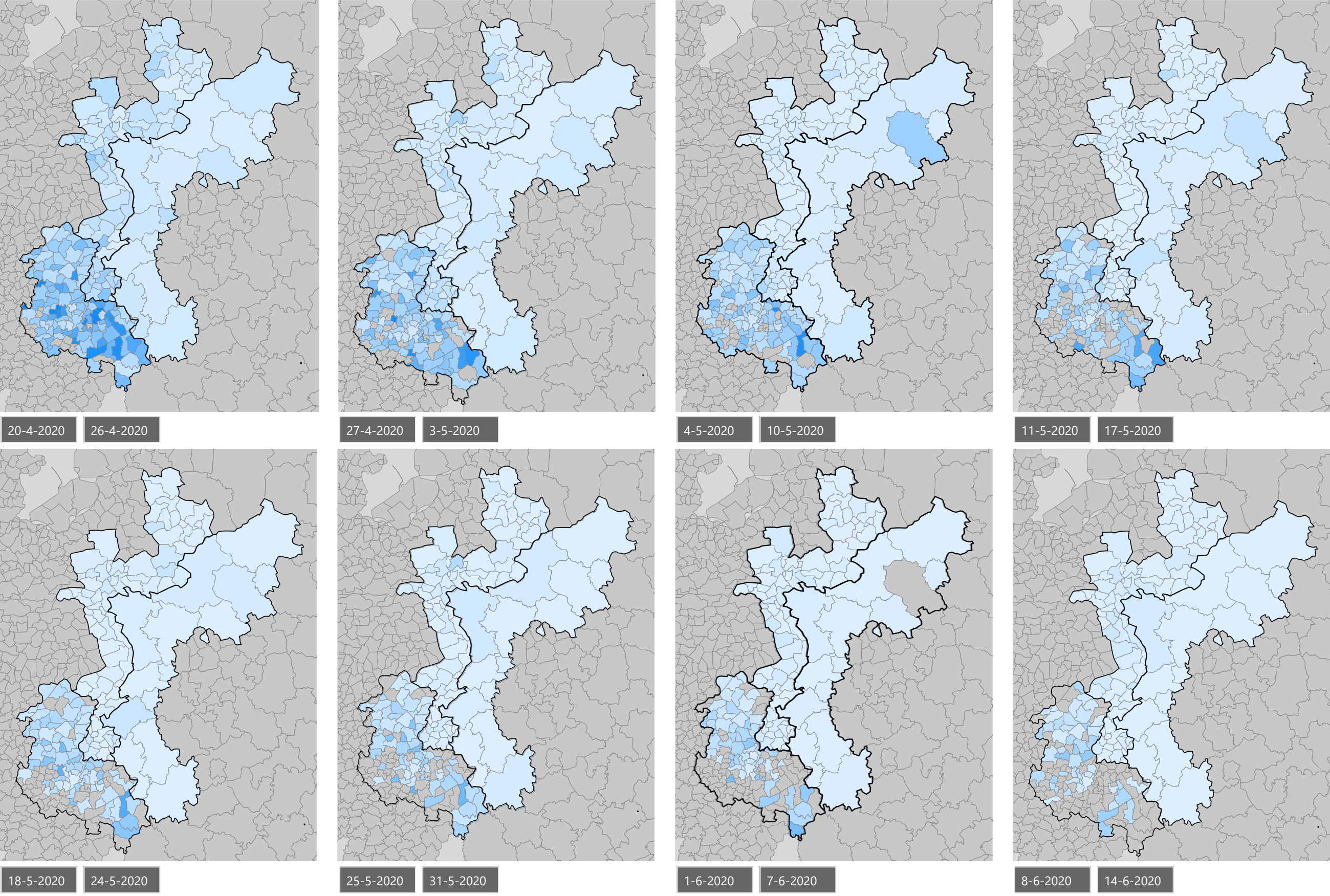
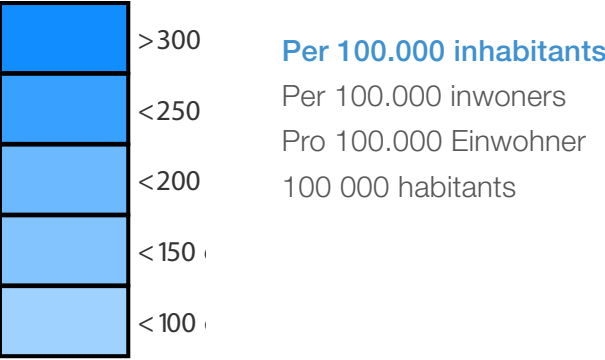
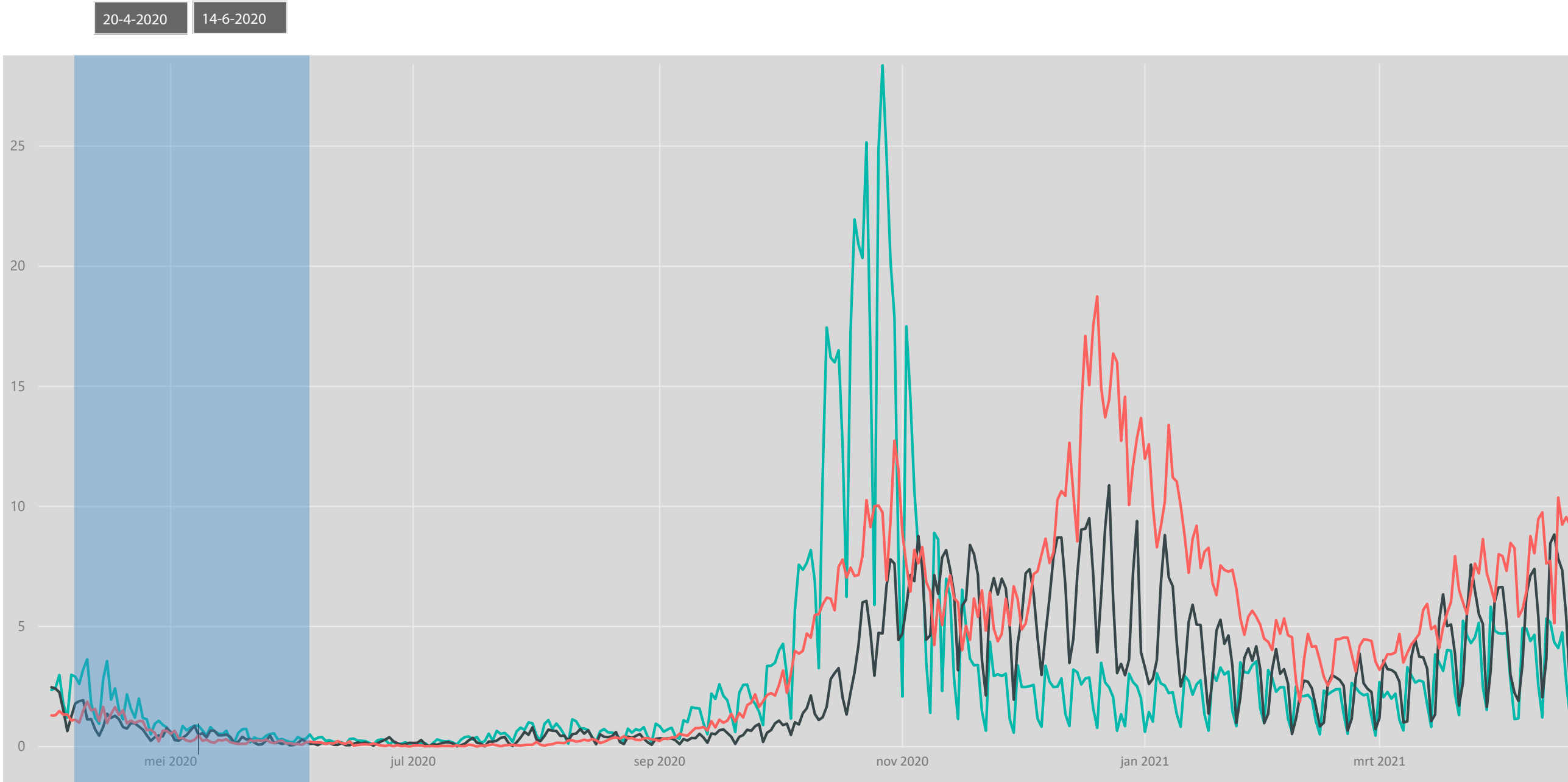
Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants



Infections

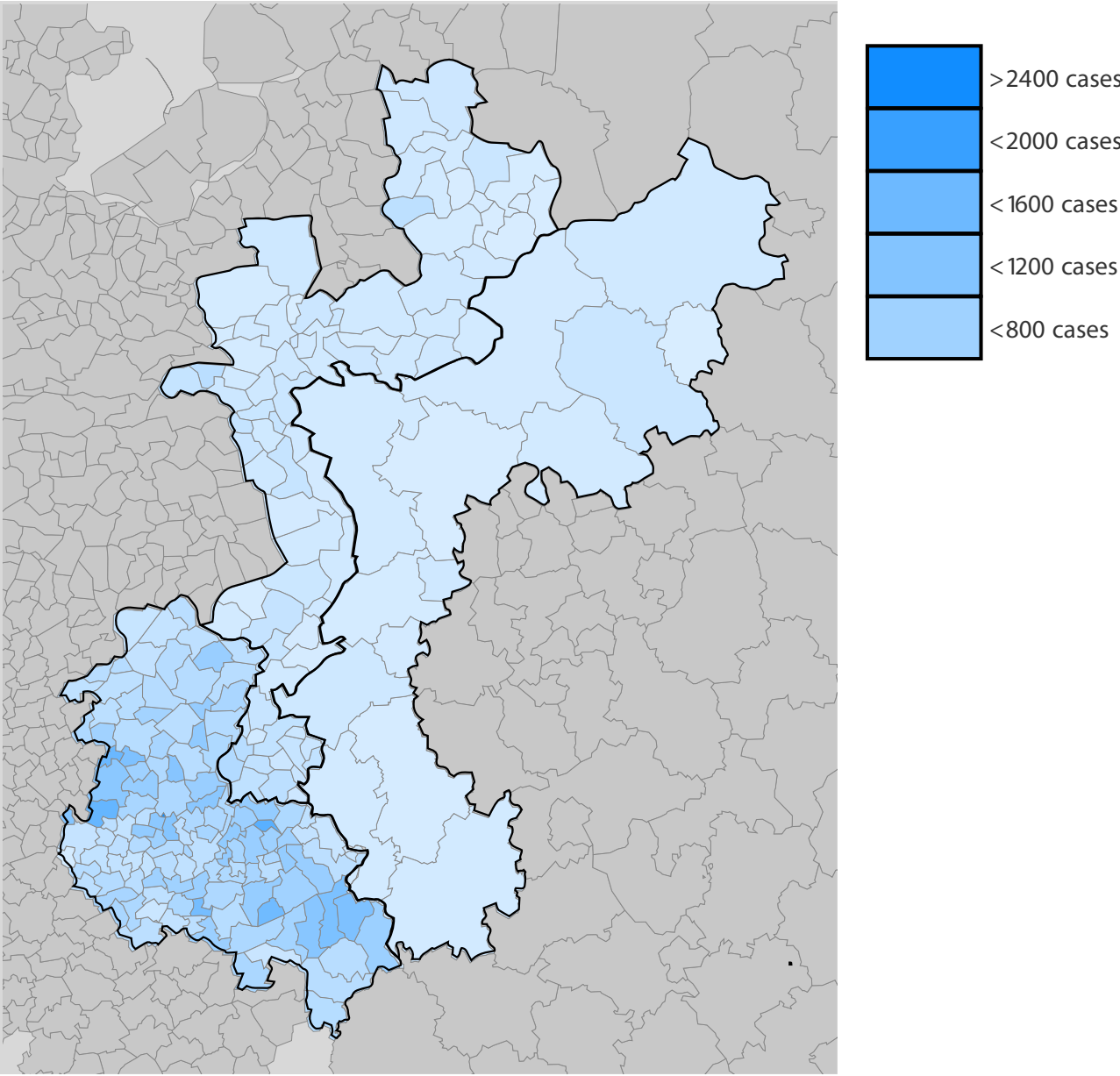
Infectiecijfers - Infektionsraten - Taux d'infection

Belgium Germany The Netherlands



Infections

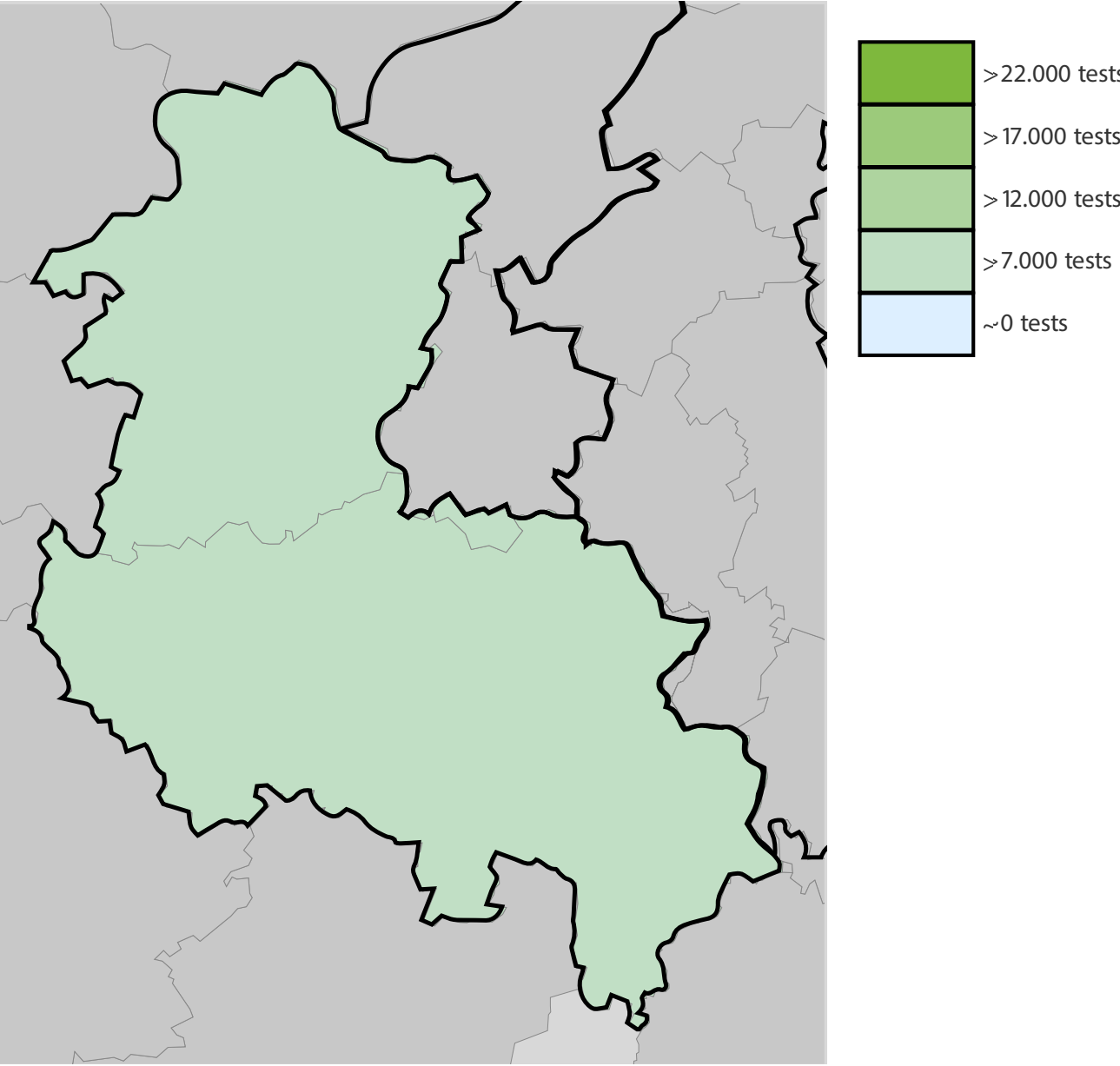
Infectiecijfers - Infektionsraten - Taux d'infection



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Amount of tests

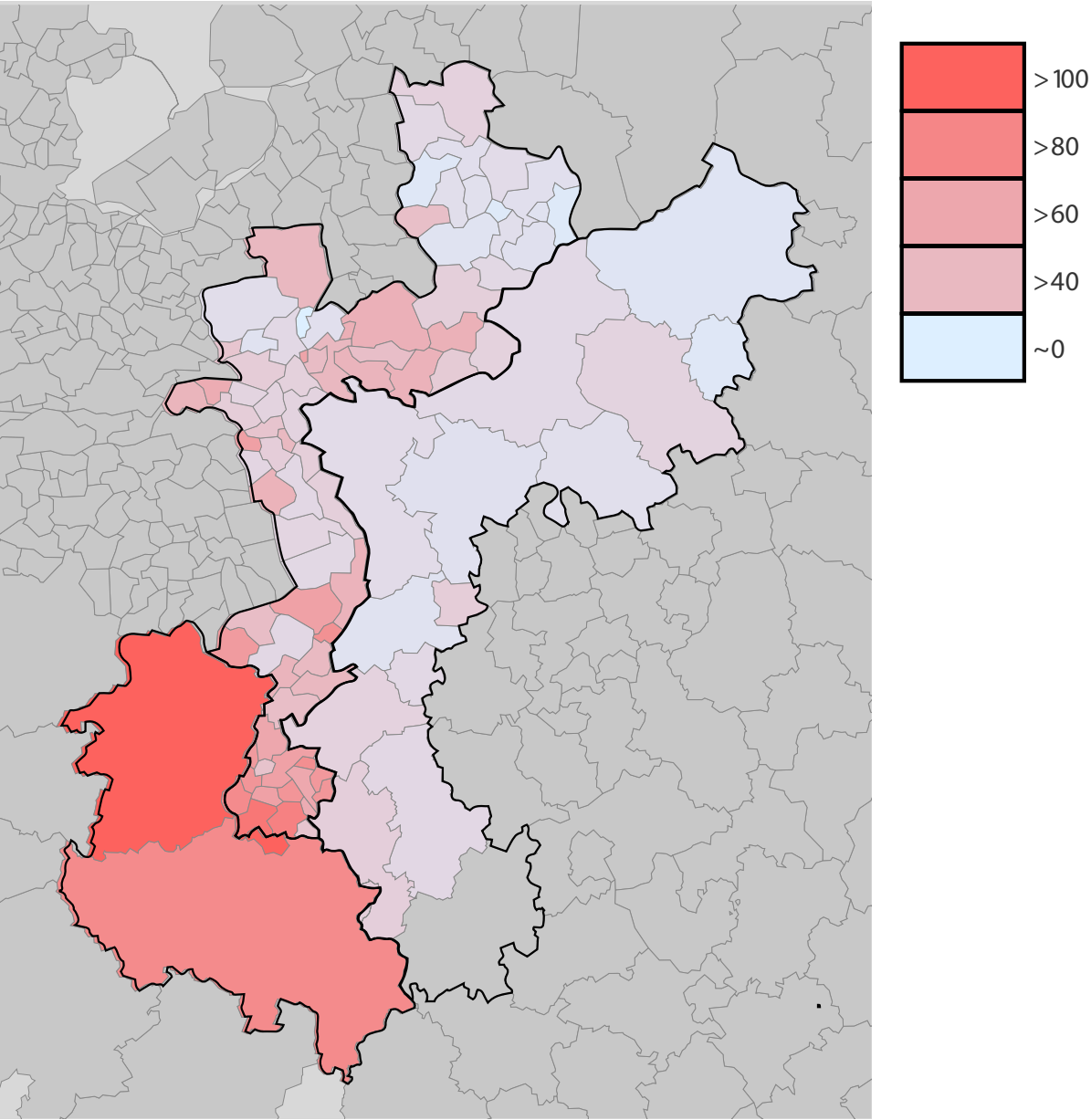
Aantal tests - Anzahl Tests - Nombre de tests



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Hospitalizations

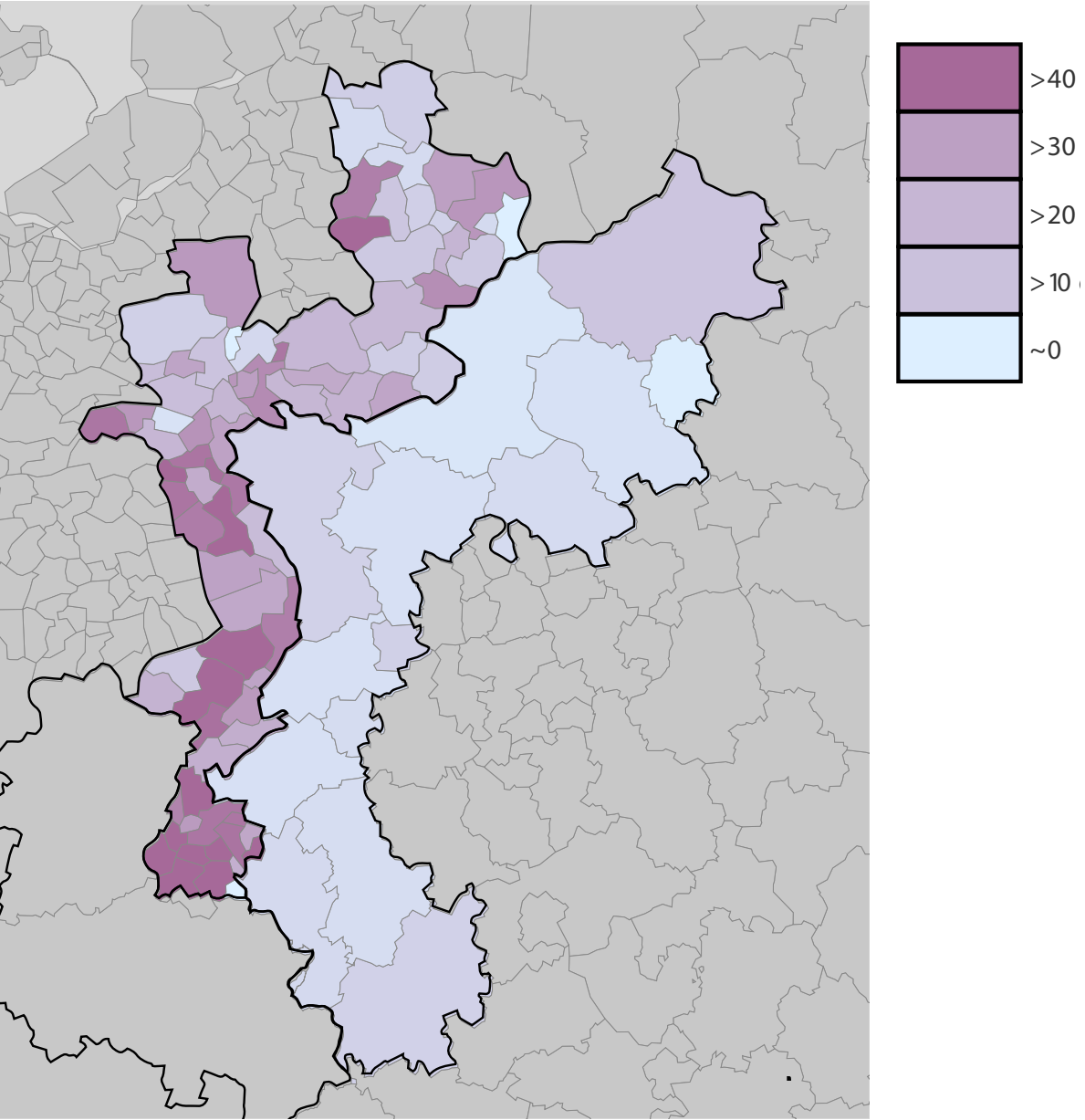
Ziekenhuisopnames - Krankenhauseinweisungen - Admission à l'hôpital



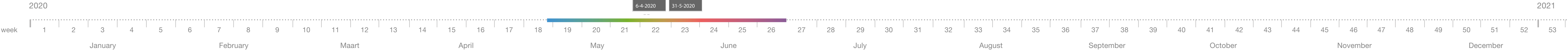
Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Deaths

Sterfgevallen - Sterfgevallen - Todesfälle - Mortalité



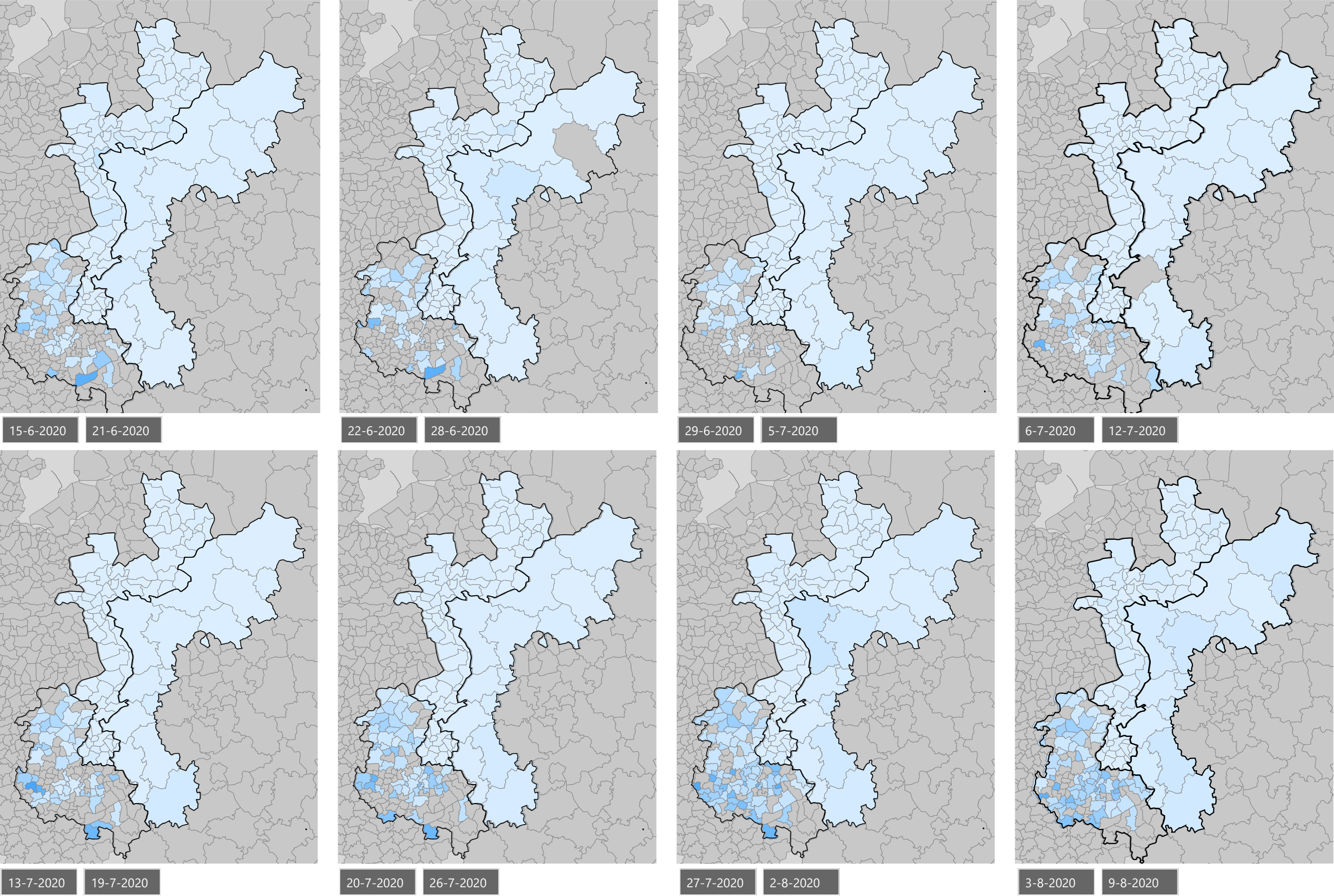
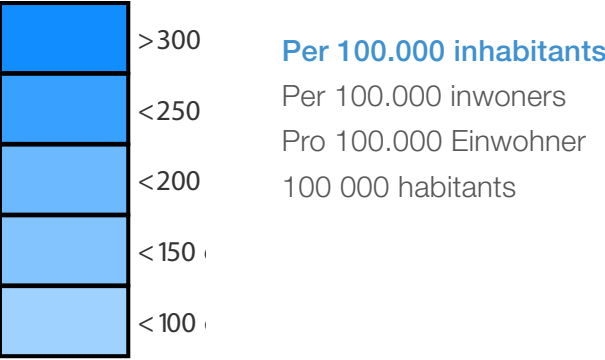
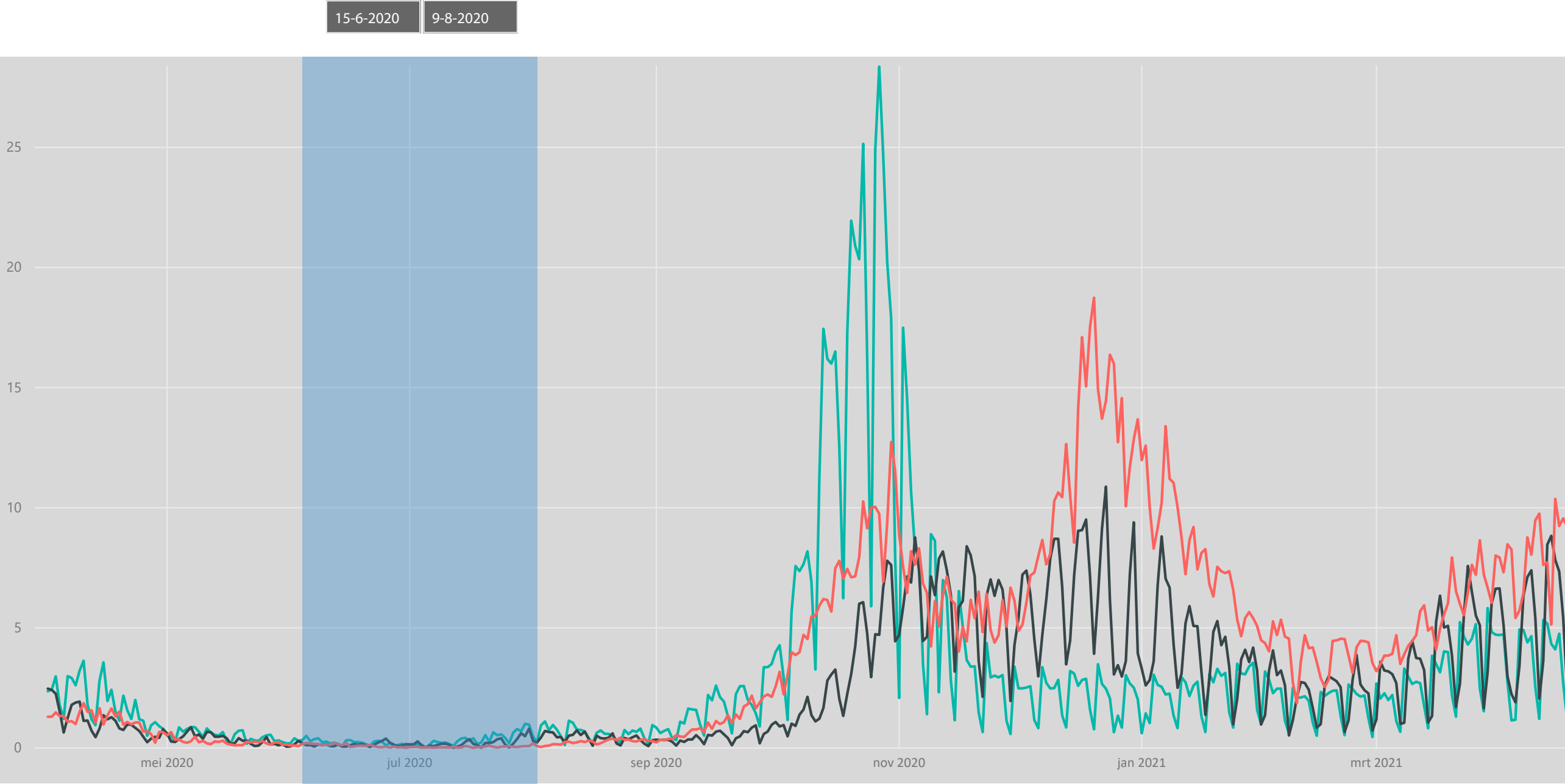
Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants



Infections

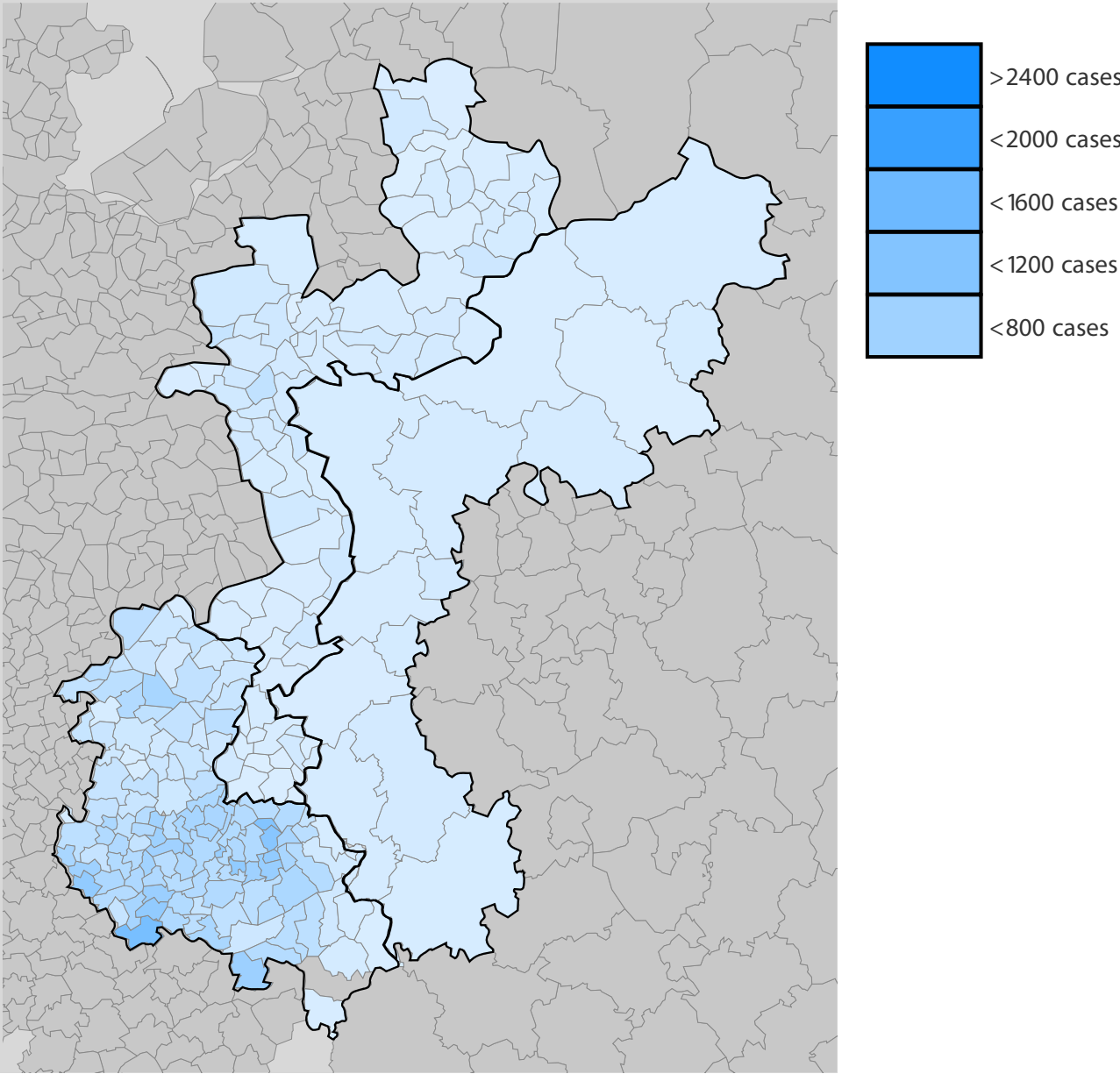
Infectiecijfers - Infektionsraten - Taux d'infection

Belgium Germany The Netherlands



Infections

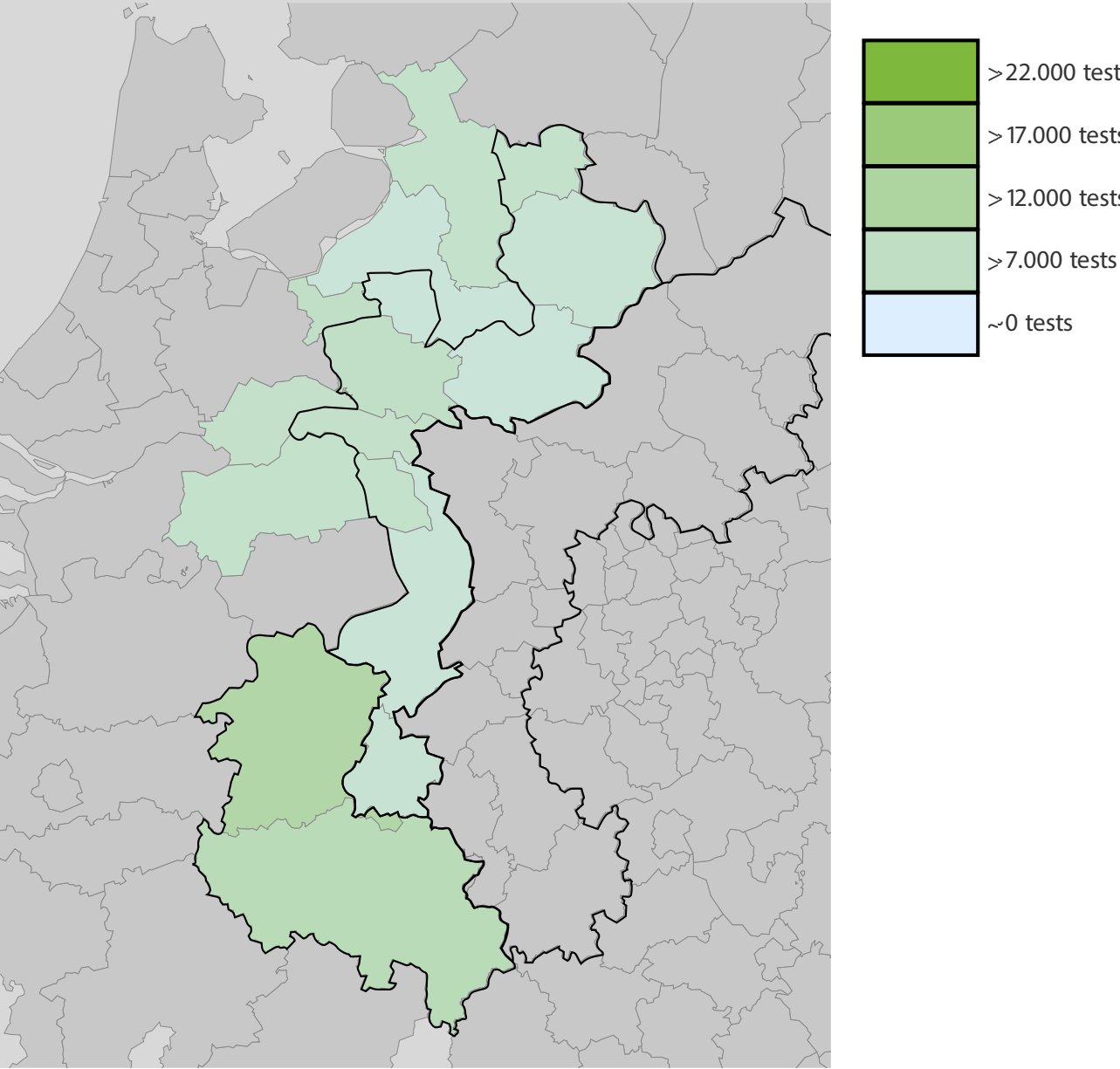
Infectiecijfers - Infektionsraten - Taux d'infection



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Amount of tests

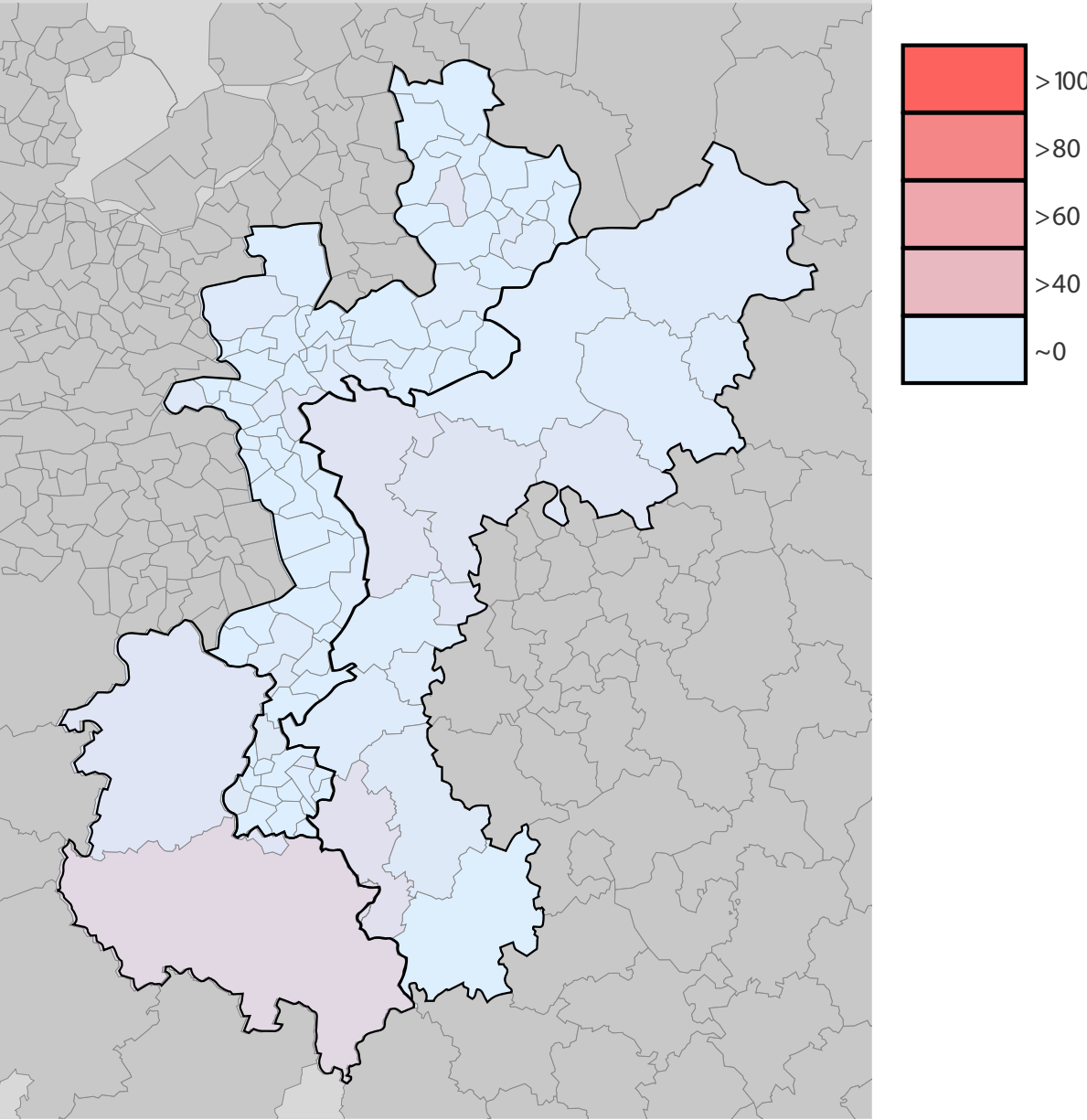
Aantal tests - Anzahl Tests - Nombre de tests



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Hospitalizations

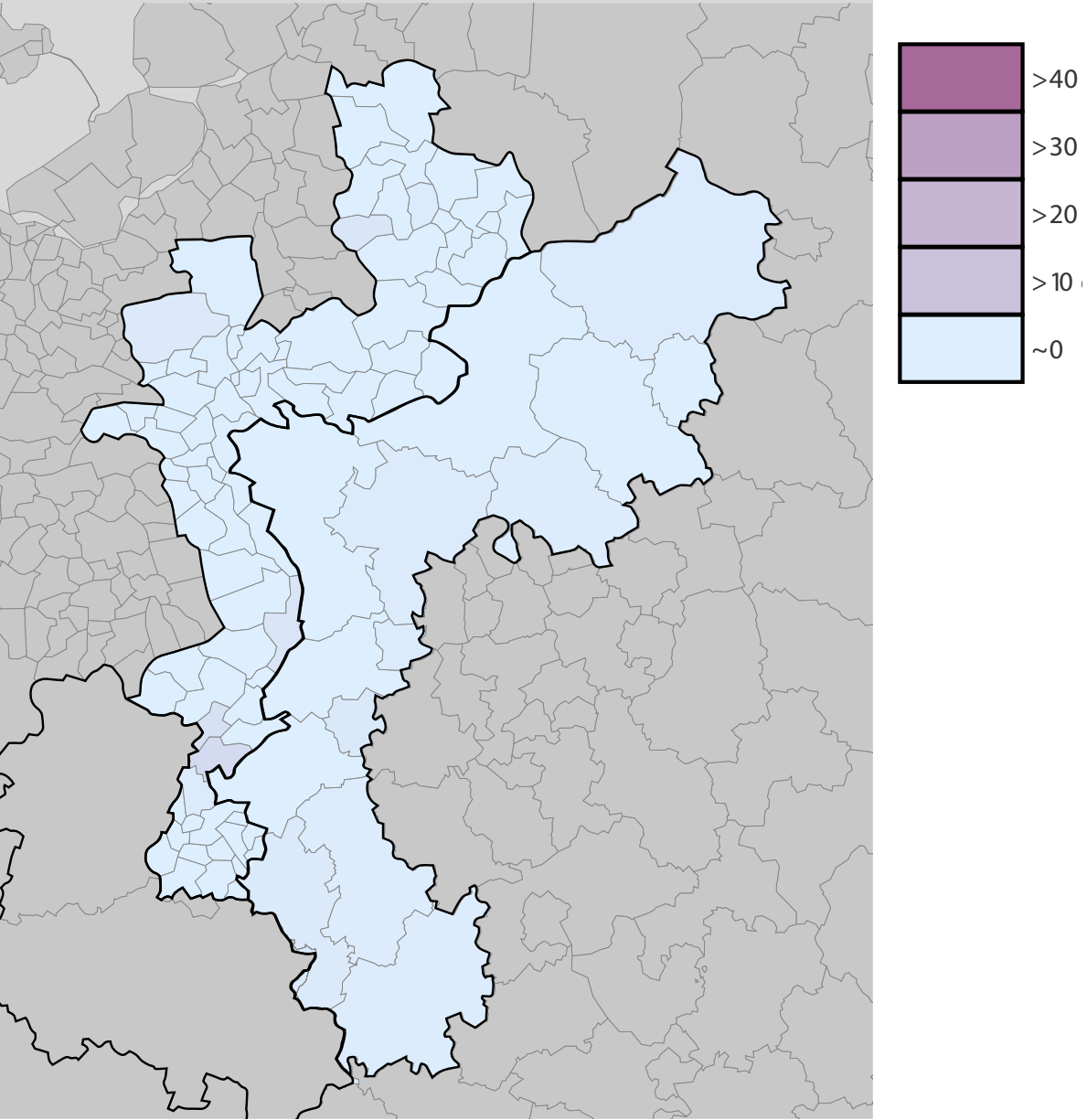
Ziekenhuisopnames - Krankenhauseinweisungen - Admission à l'hôpital



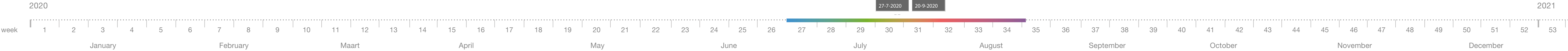
Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Deaths

Sterfgevallen - Sterfgevallen - Todesfälle - Mortalité



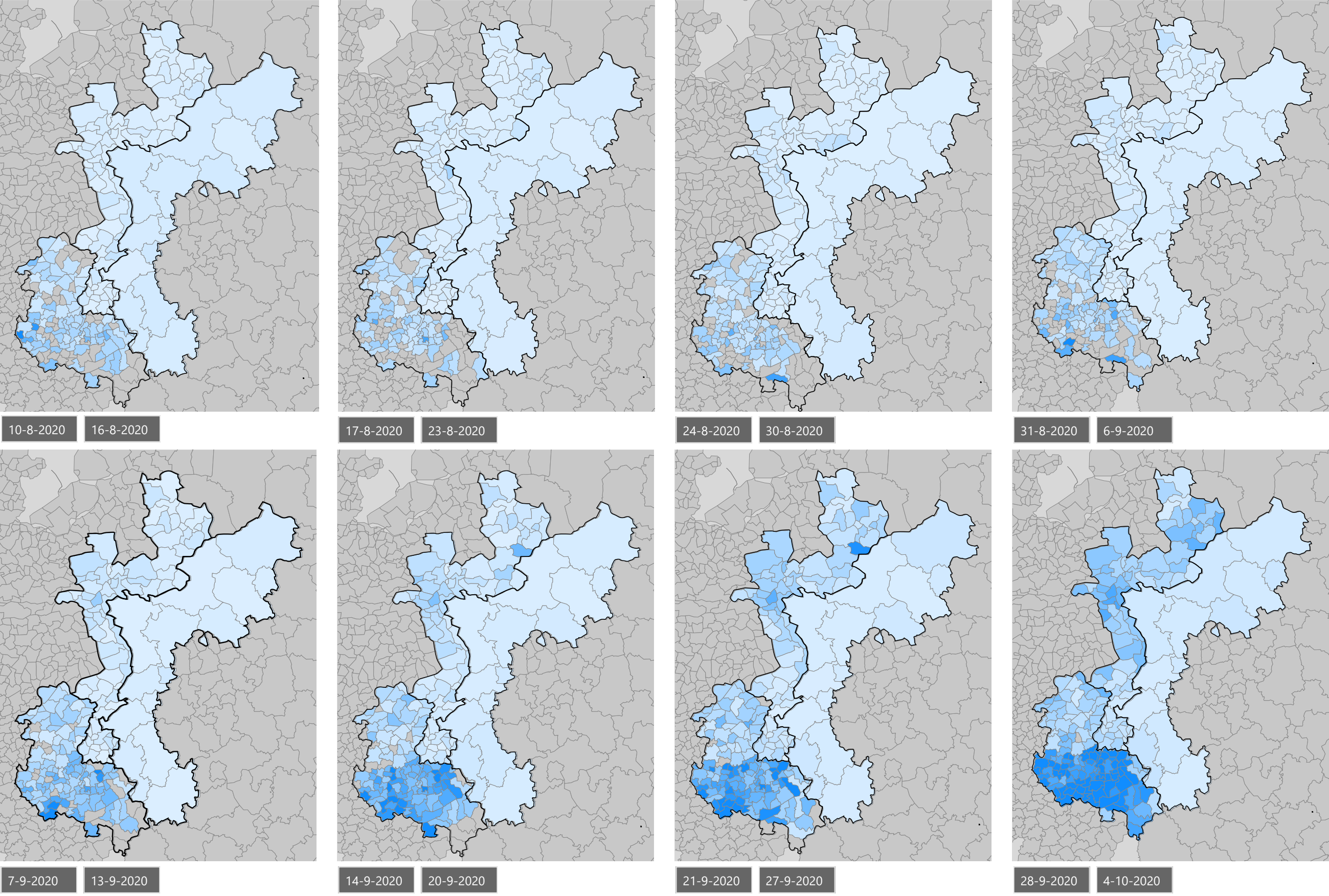
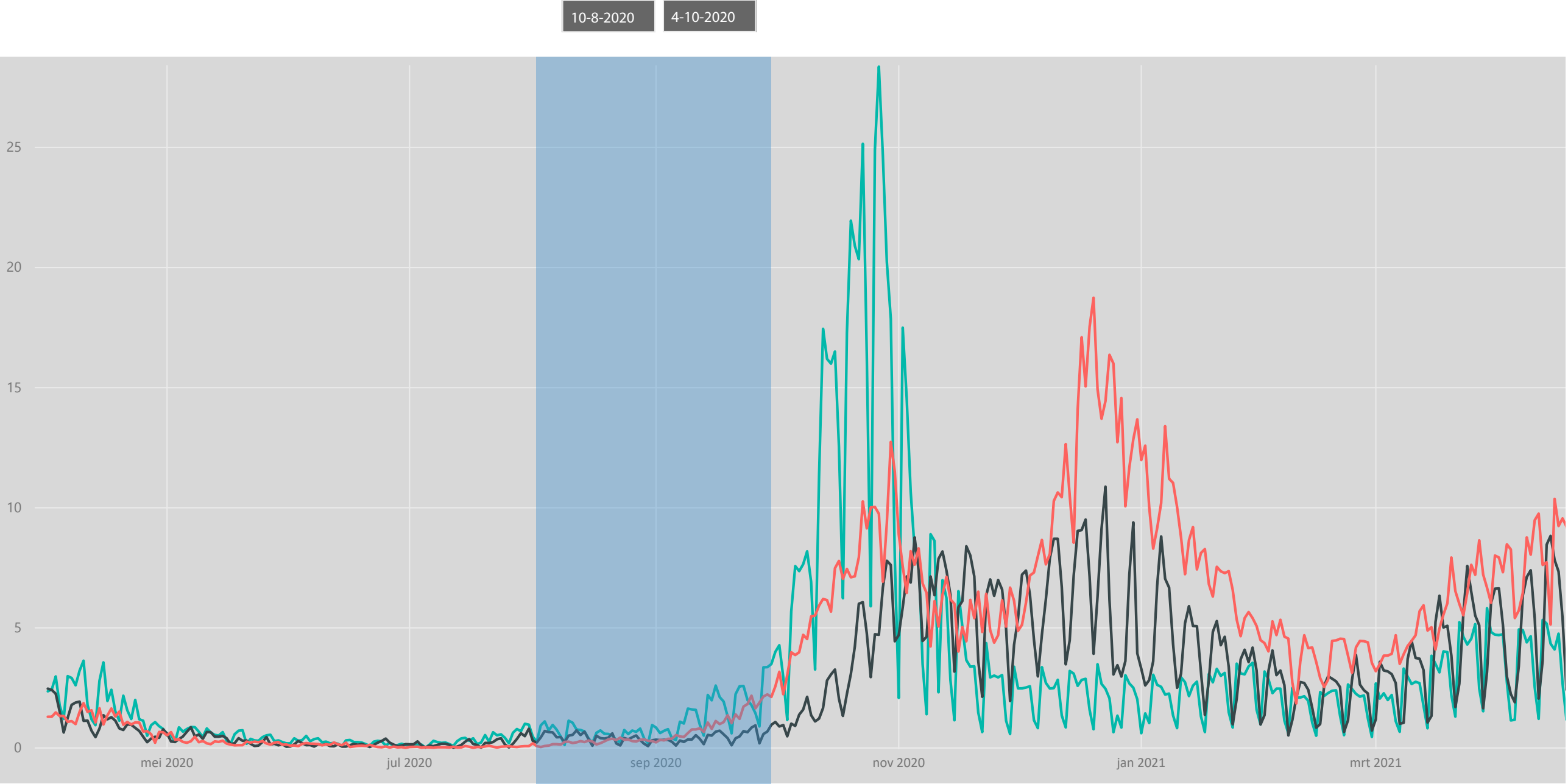
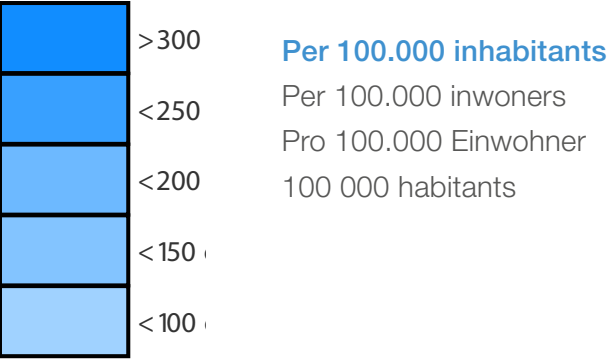
Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants



Infections

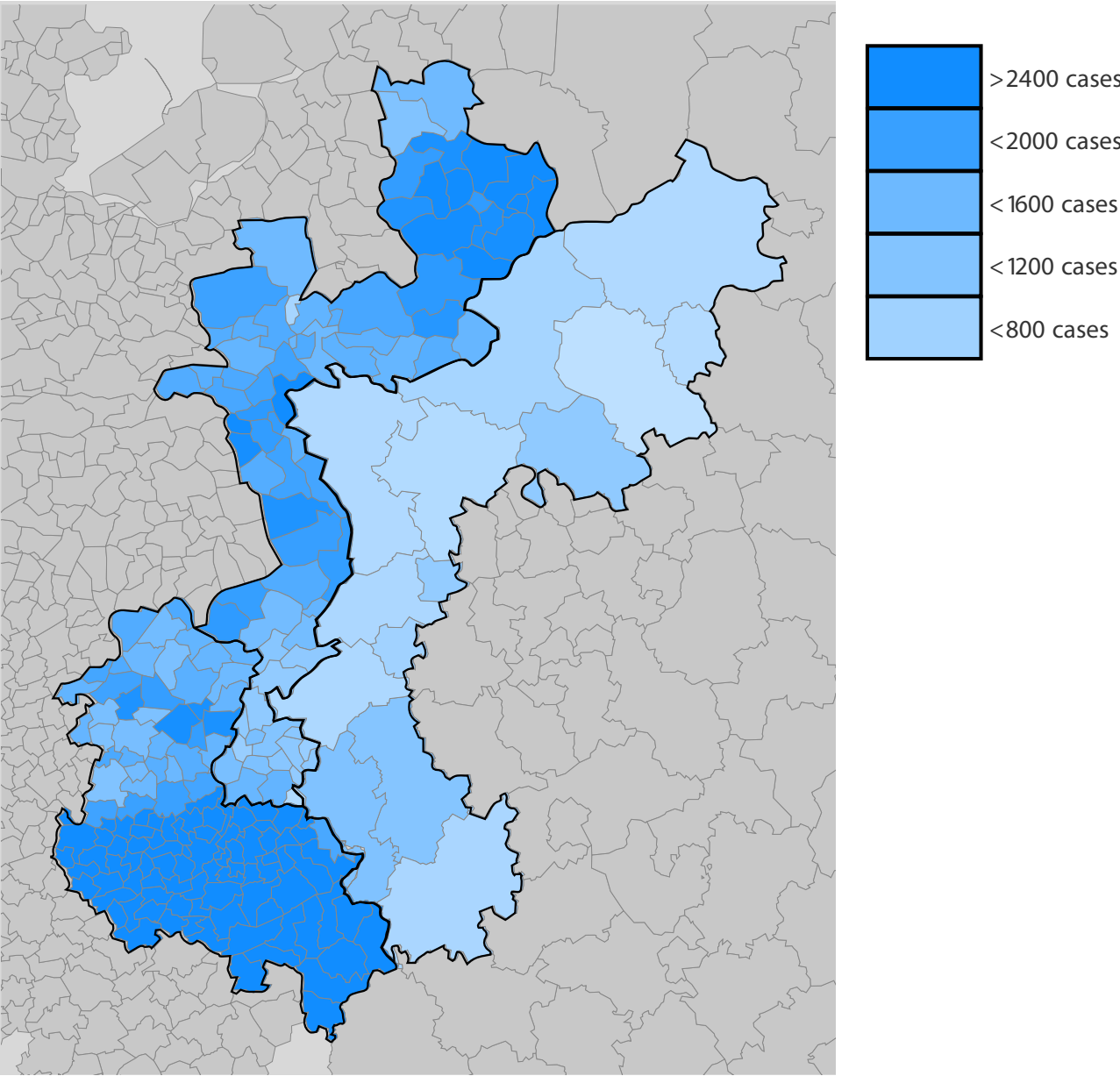
Infectiecijfers - Infektionsraten - Taux d'infection

Belgium Germany The Netherlands



Infections

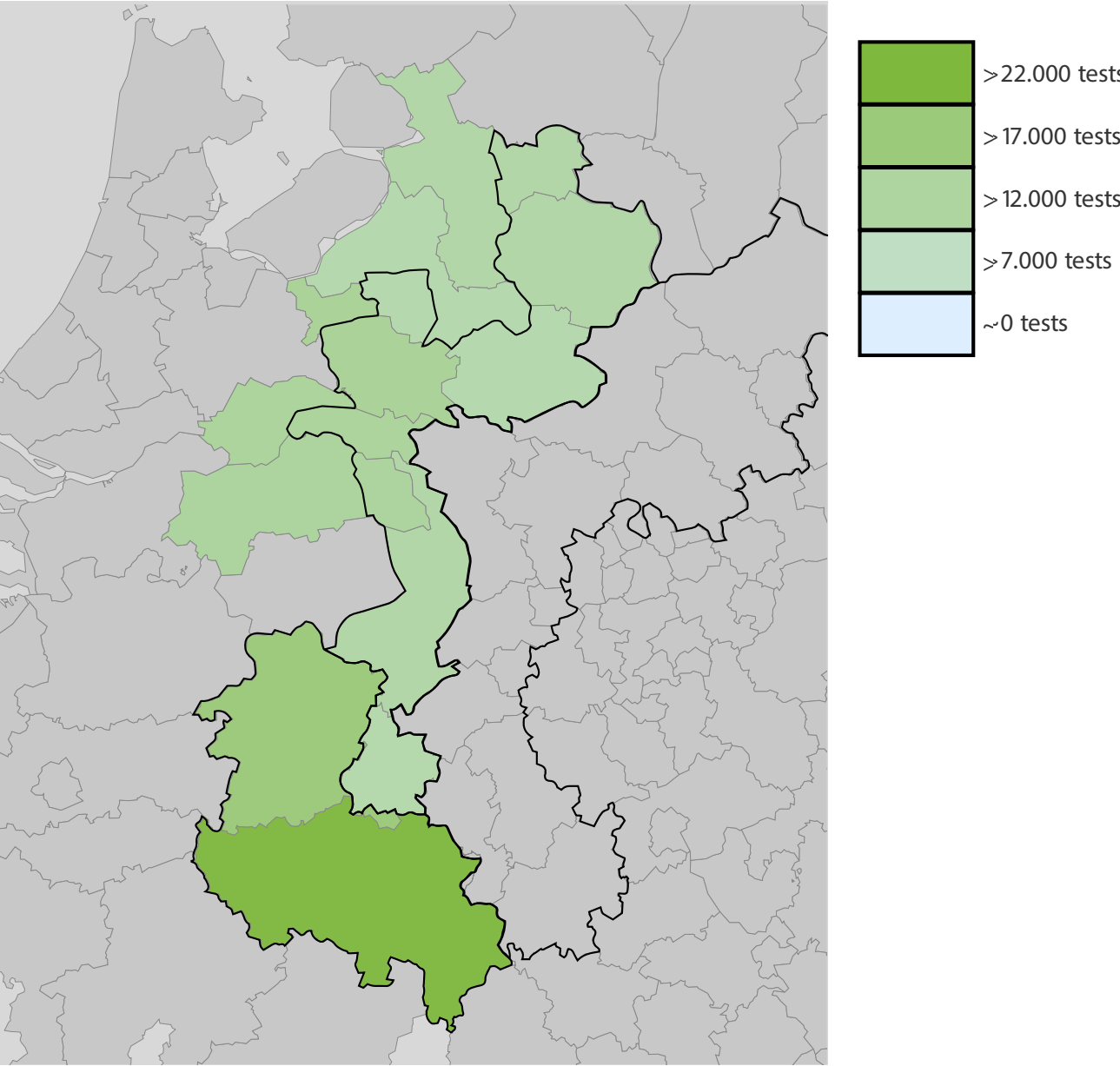
Infectiecijfers - Infektionsraten - Taux d'infection



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Amount of tests

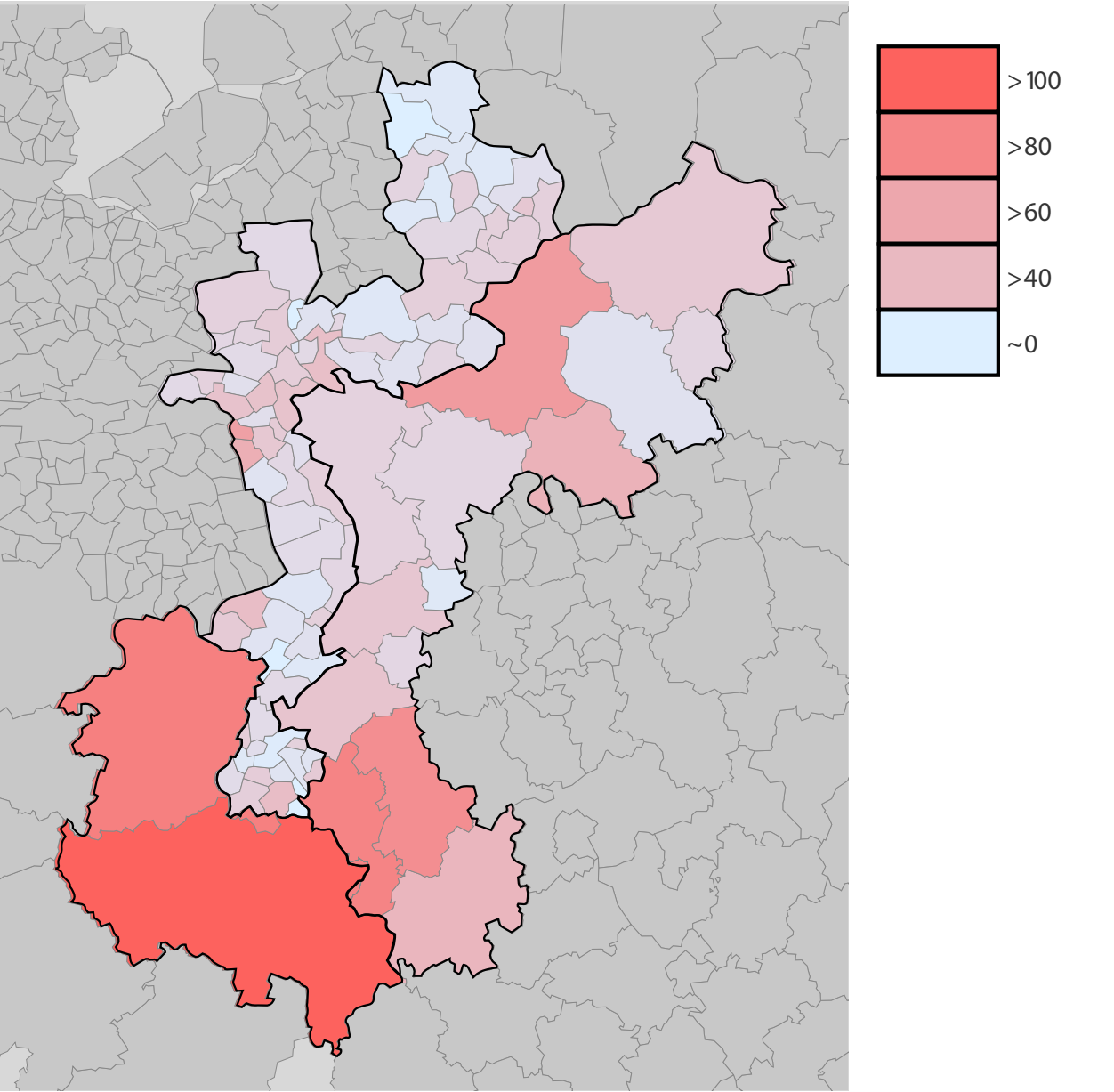
Aantal tests - Anzahl Tests - Nombre de tests



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Hospitalizations

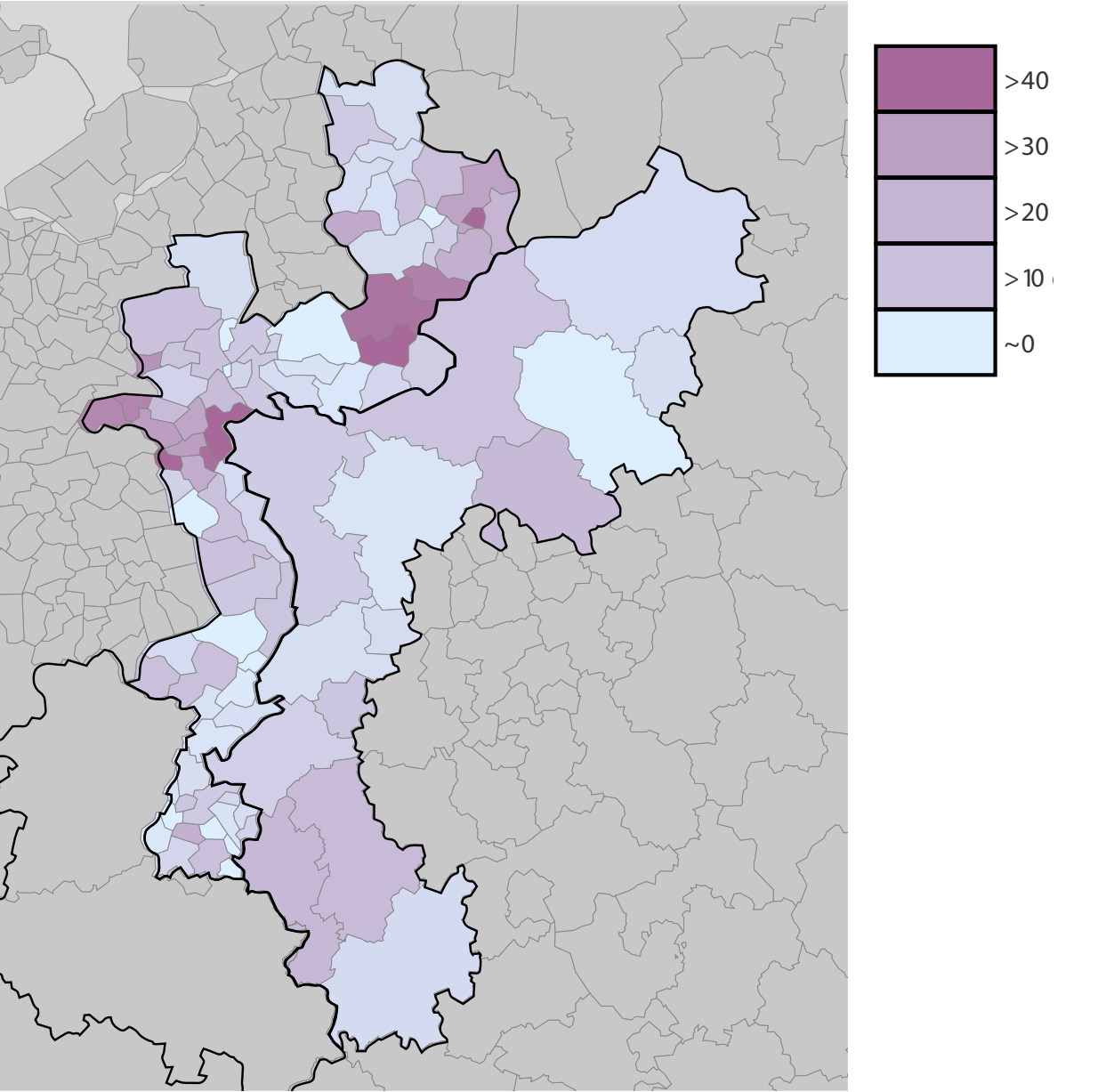
Ziekenhuisopnames - Krankenhauseinweisungen - Admission à l'hôpital



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Deaths

Sterfgevallen - Sterfgevallen - Todesfälle - Mortalité



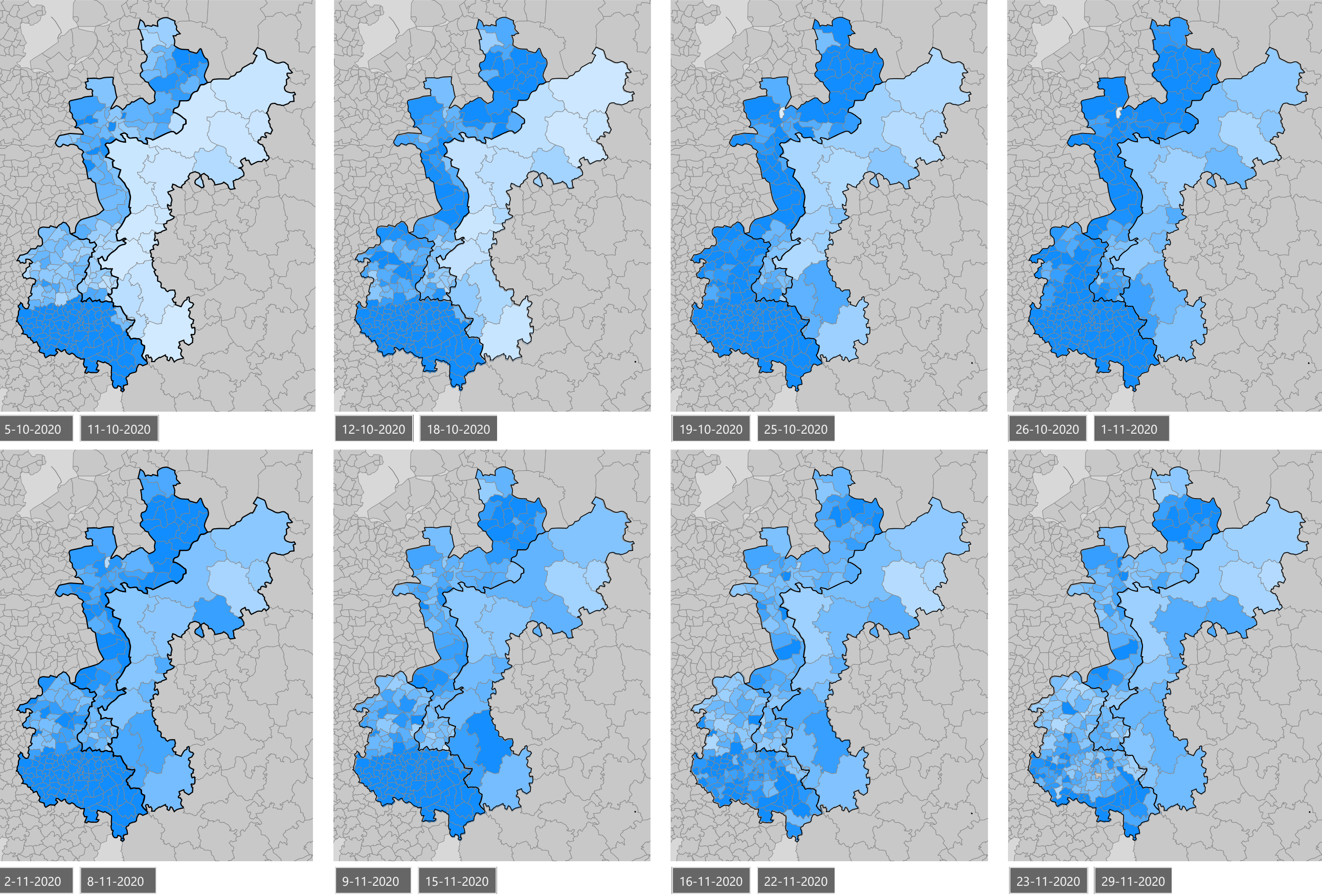
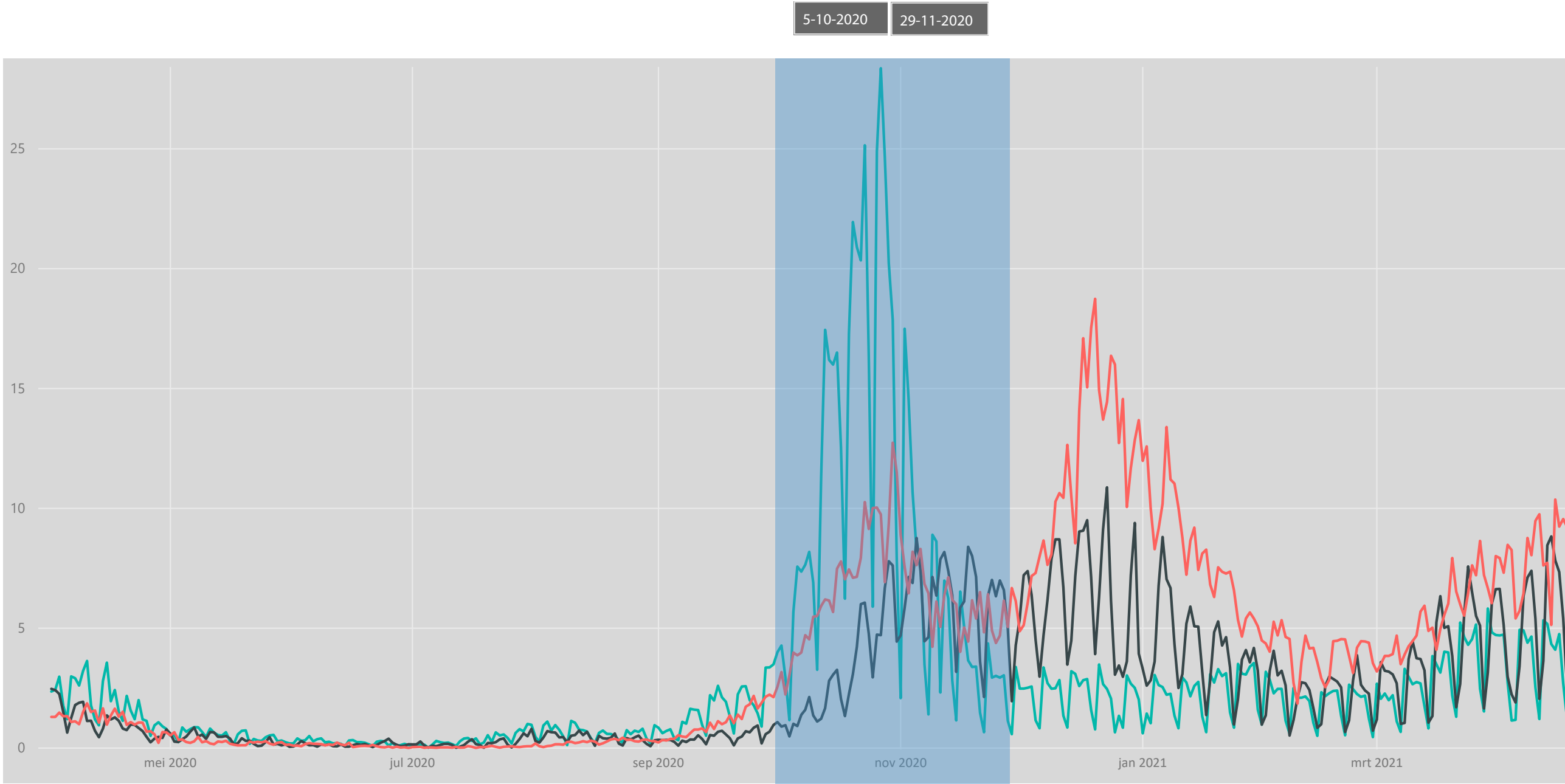
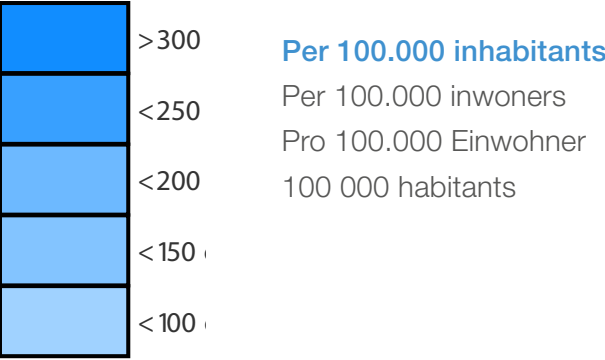
Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants



Infections

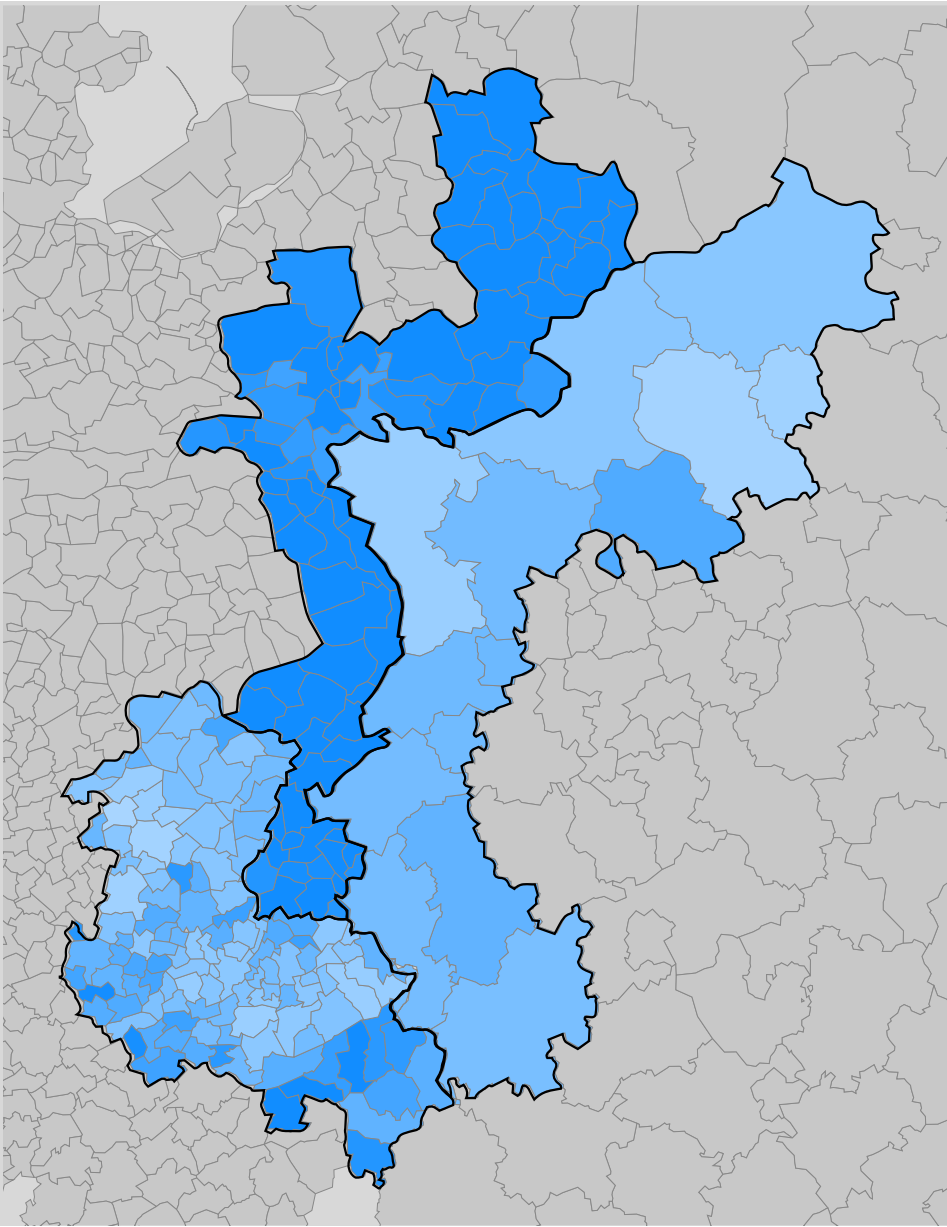
Infectiecijfers - Infektionsraten - Taux d'infection

Belgium Germany The Netherlands



Infections

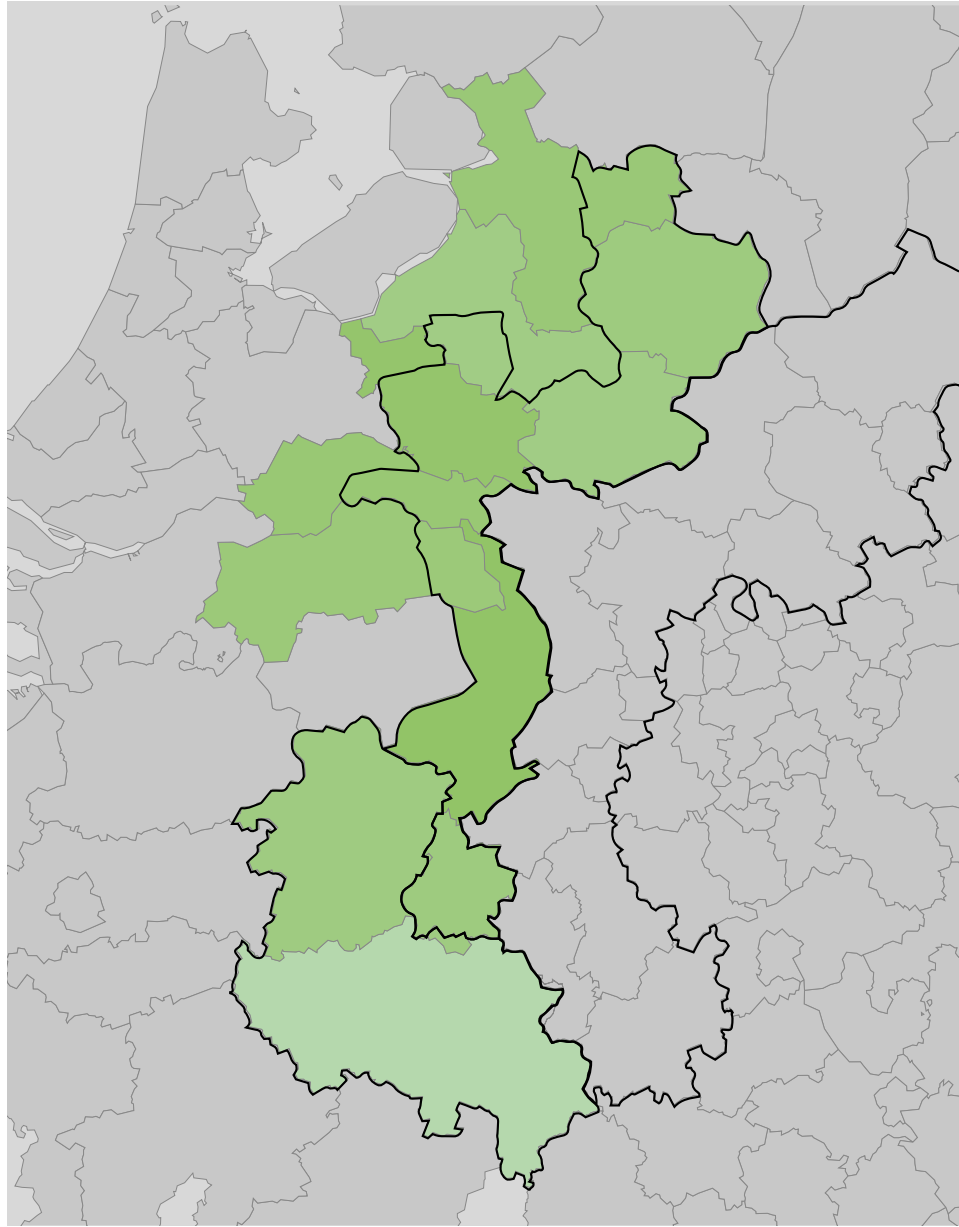
Infectiecijfers - Infektionsraten - Taux d'infection



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Amount of tests

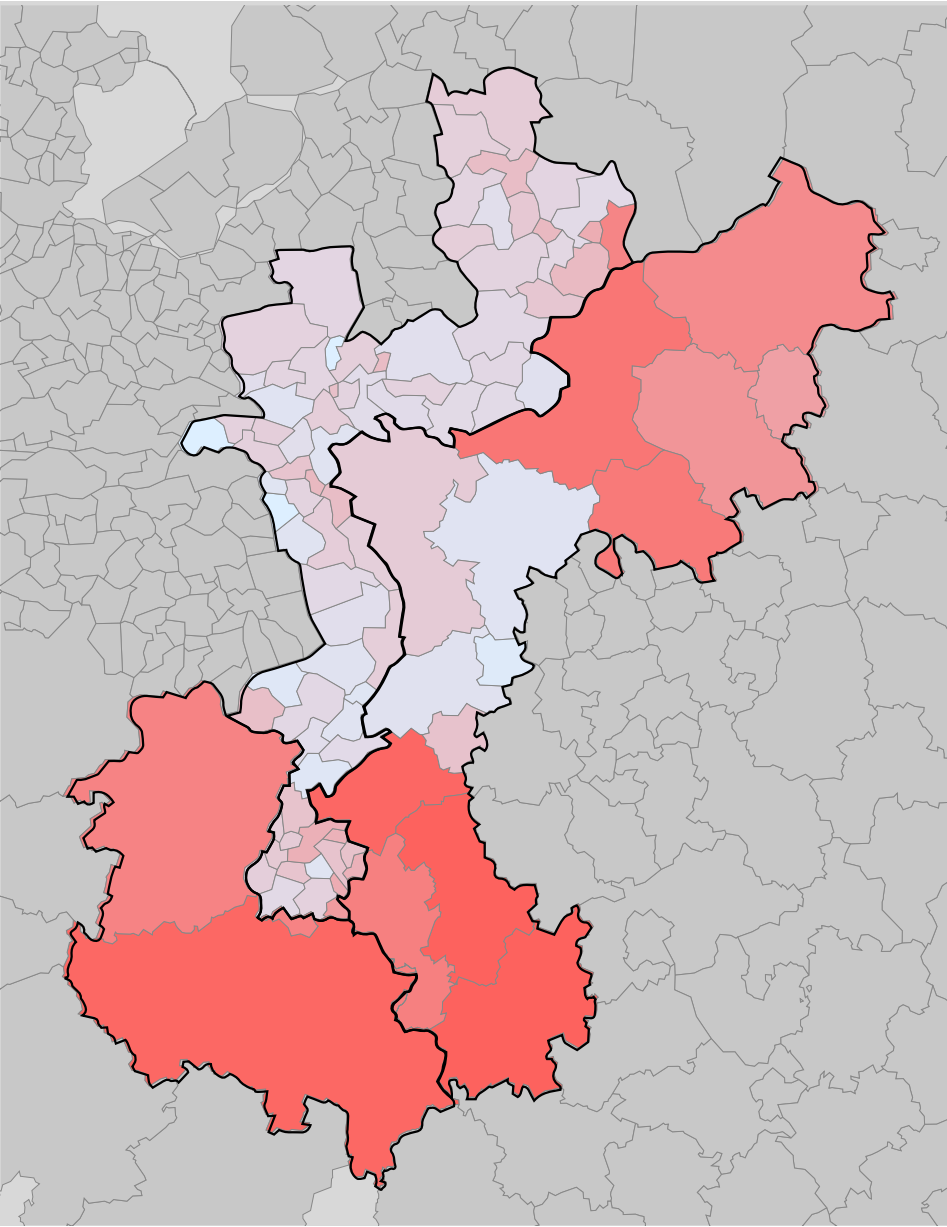
Aantal tests - Anzahl Tests - Nombre de tests



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Hospitalizations

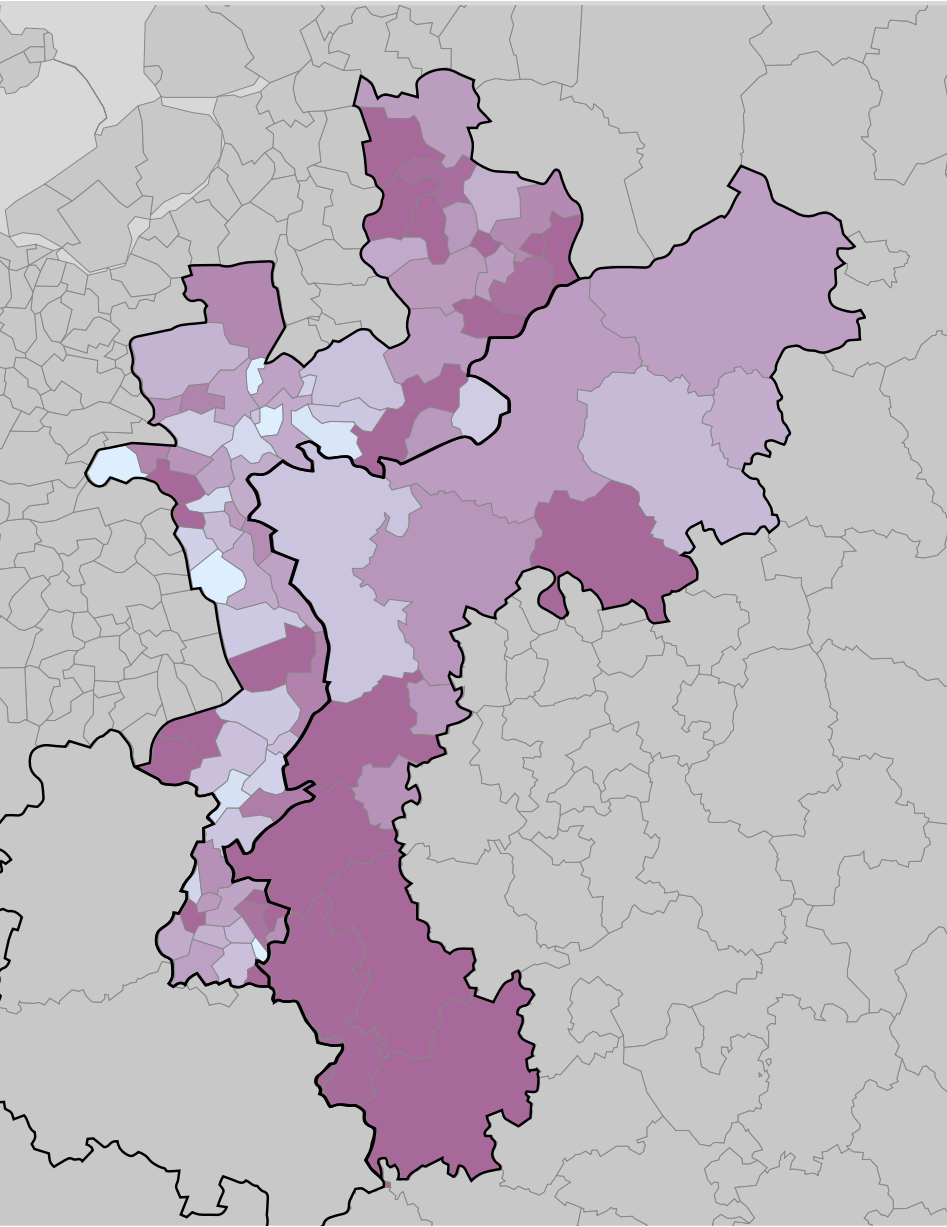
Ziekenhuisopnames - Krankenhauseinweisungen - Admission à l'hôpital



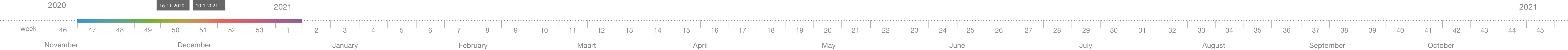
Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Deaths

Sterfgevallen - Sterfgevallen - Todesfälle - Mortalité



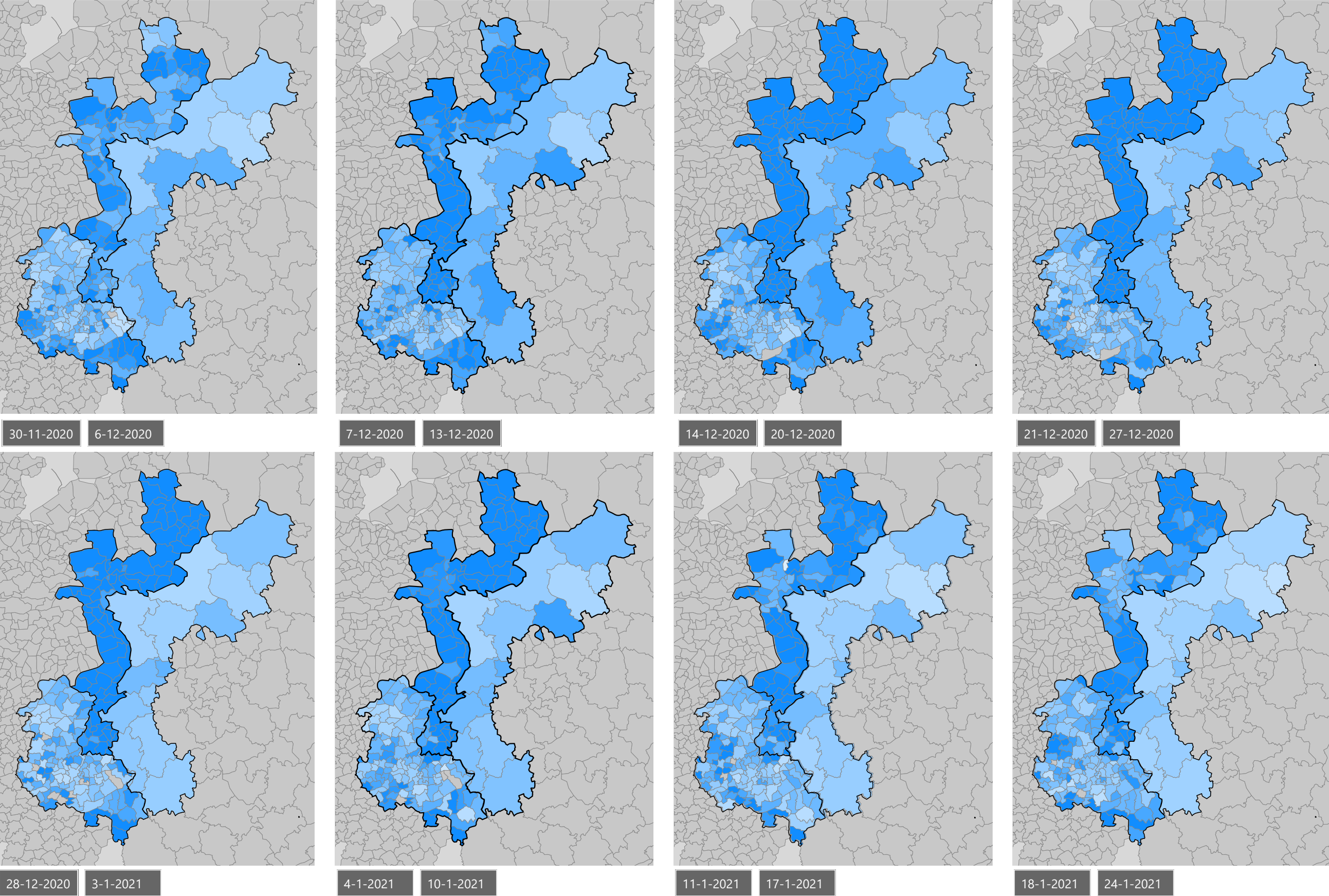
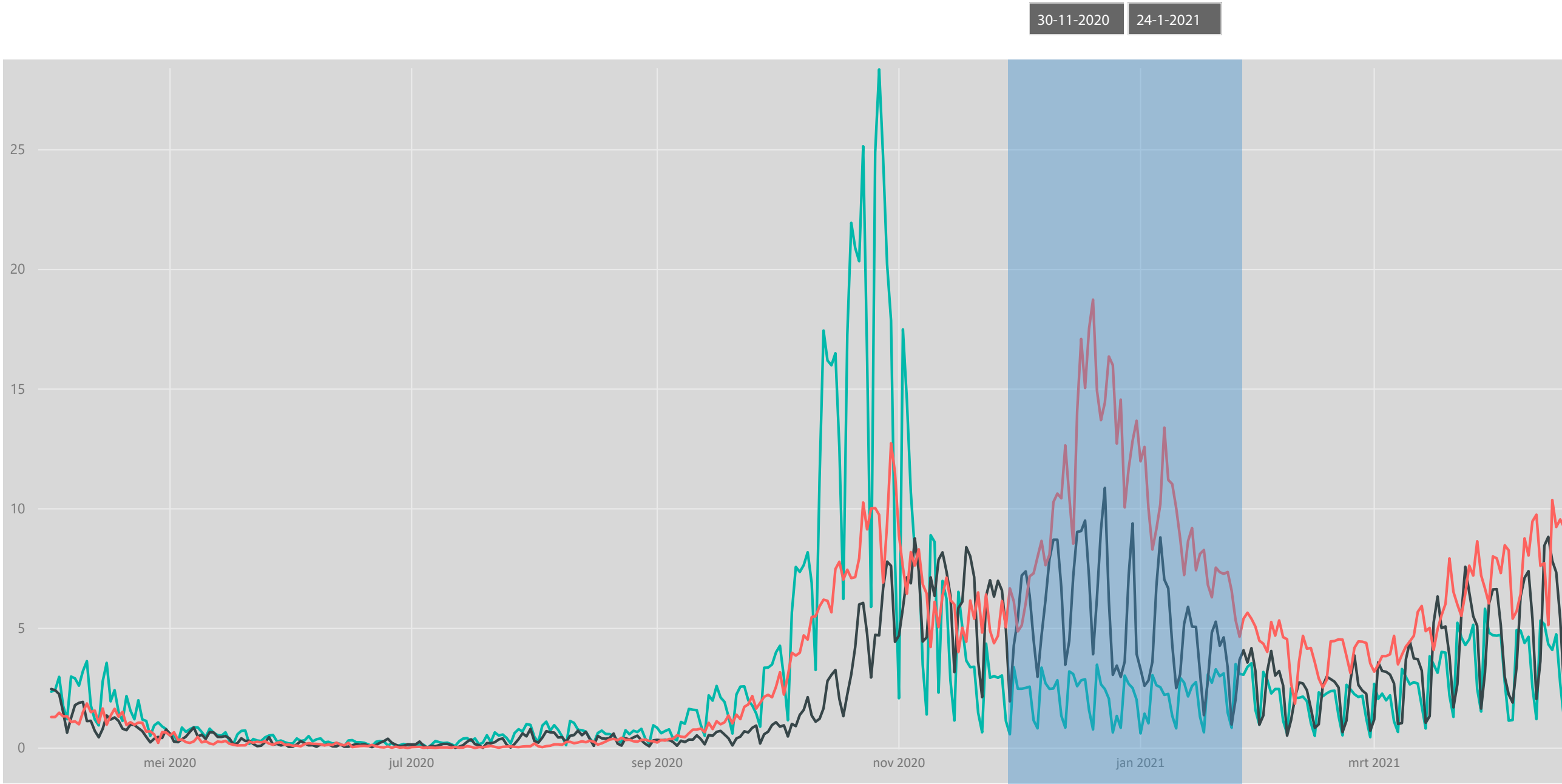
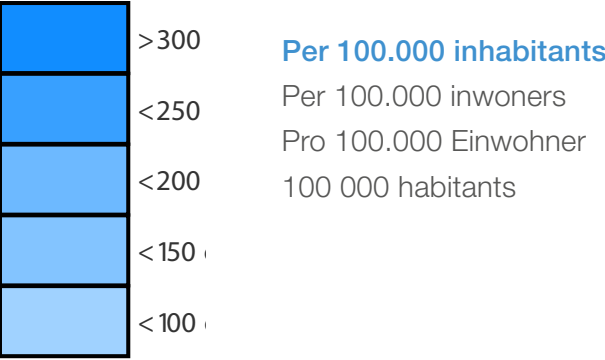
Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants



Infections

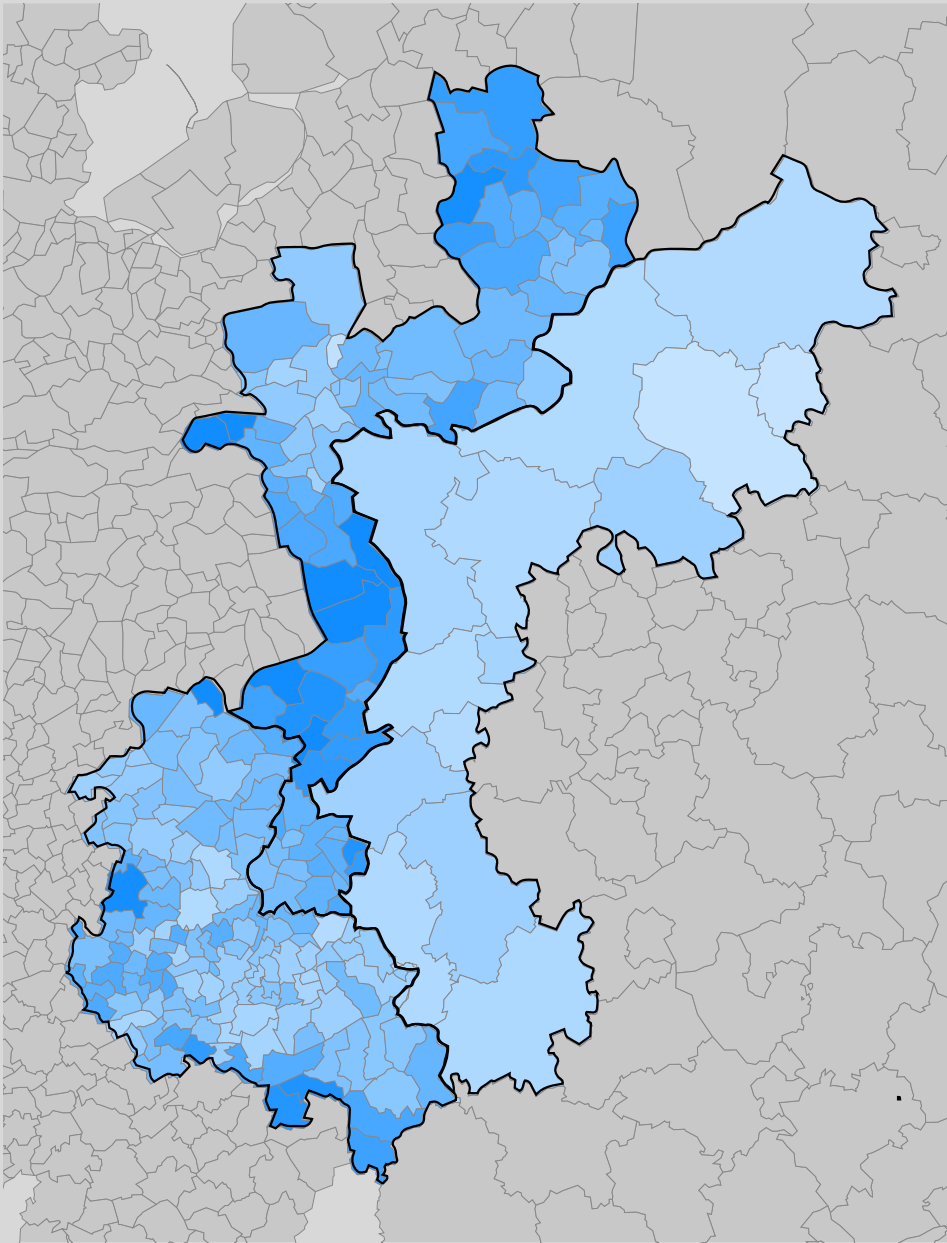
Infectiecijfers - Infektionsraten - Taux d'infection

Belgium Germany The Netherlands



Infections

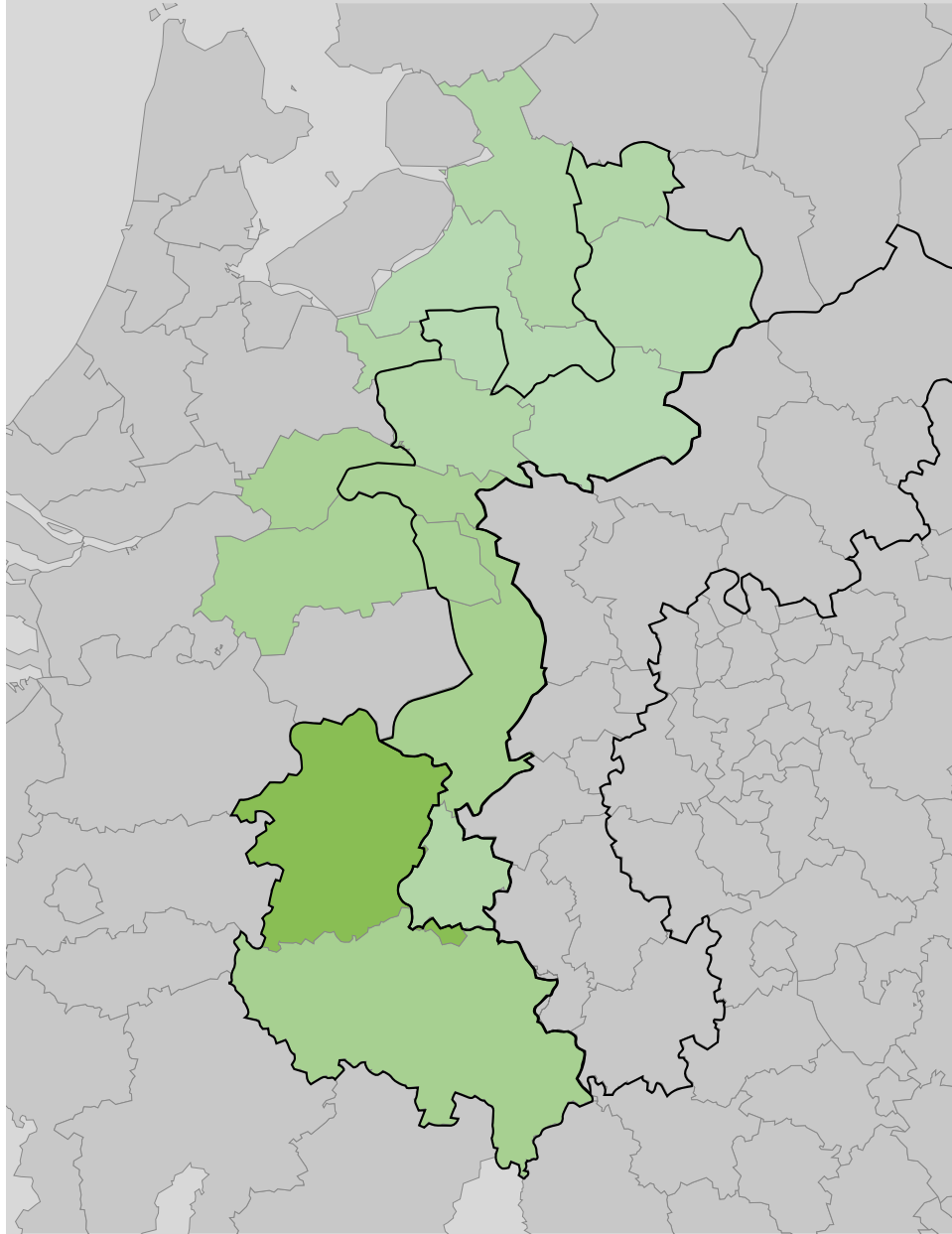
Infectiecijfers - Infektionsraten - Taux d'infection



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Amount of tests

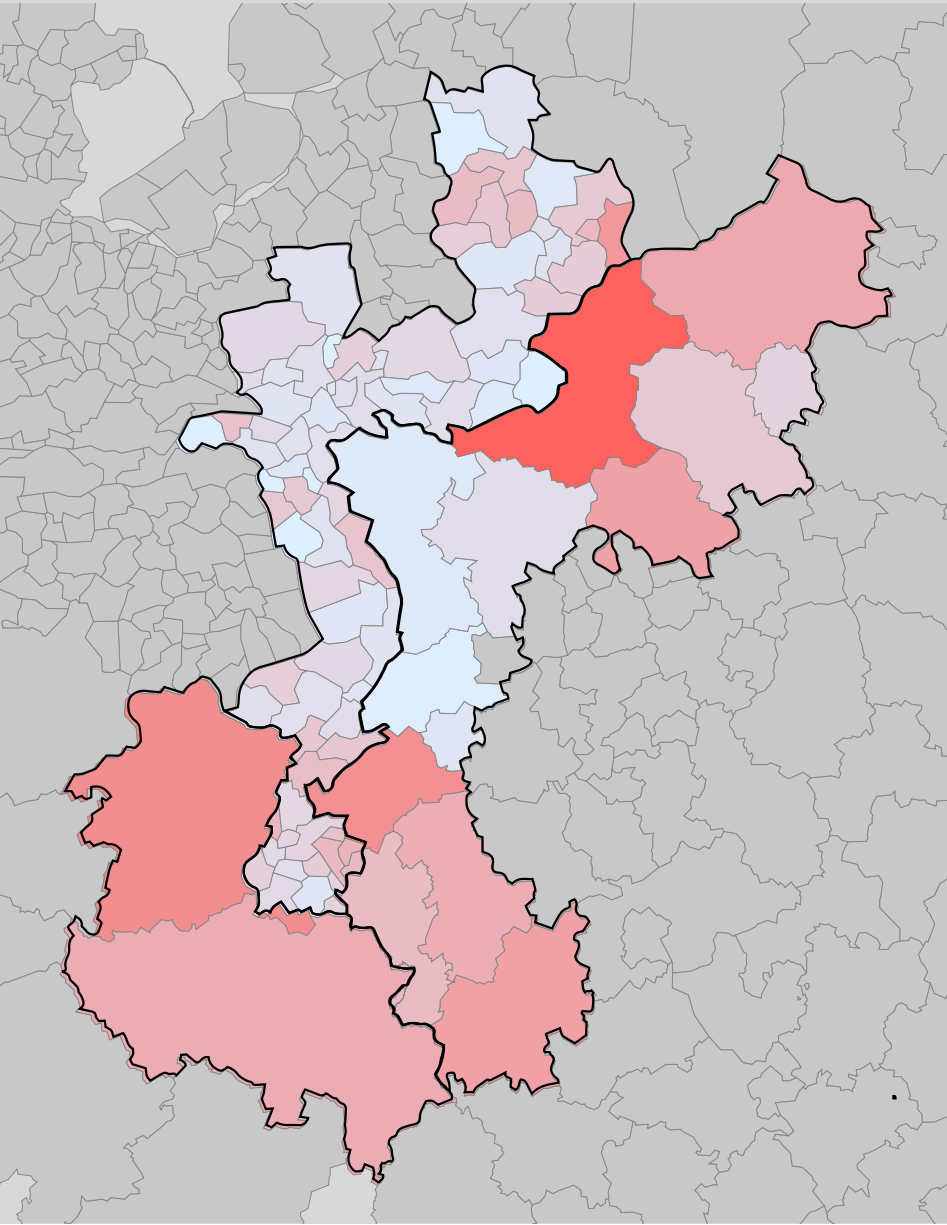
Aantal tests - Anzahl Tests - Nombre de tests



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Hospitalizations

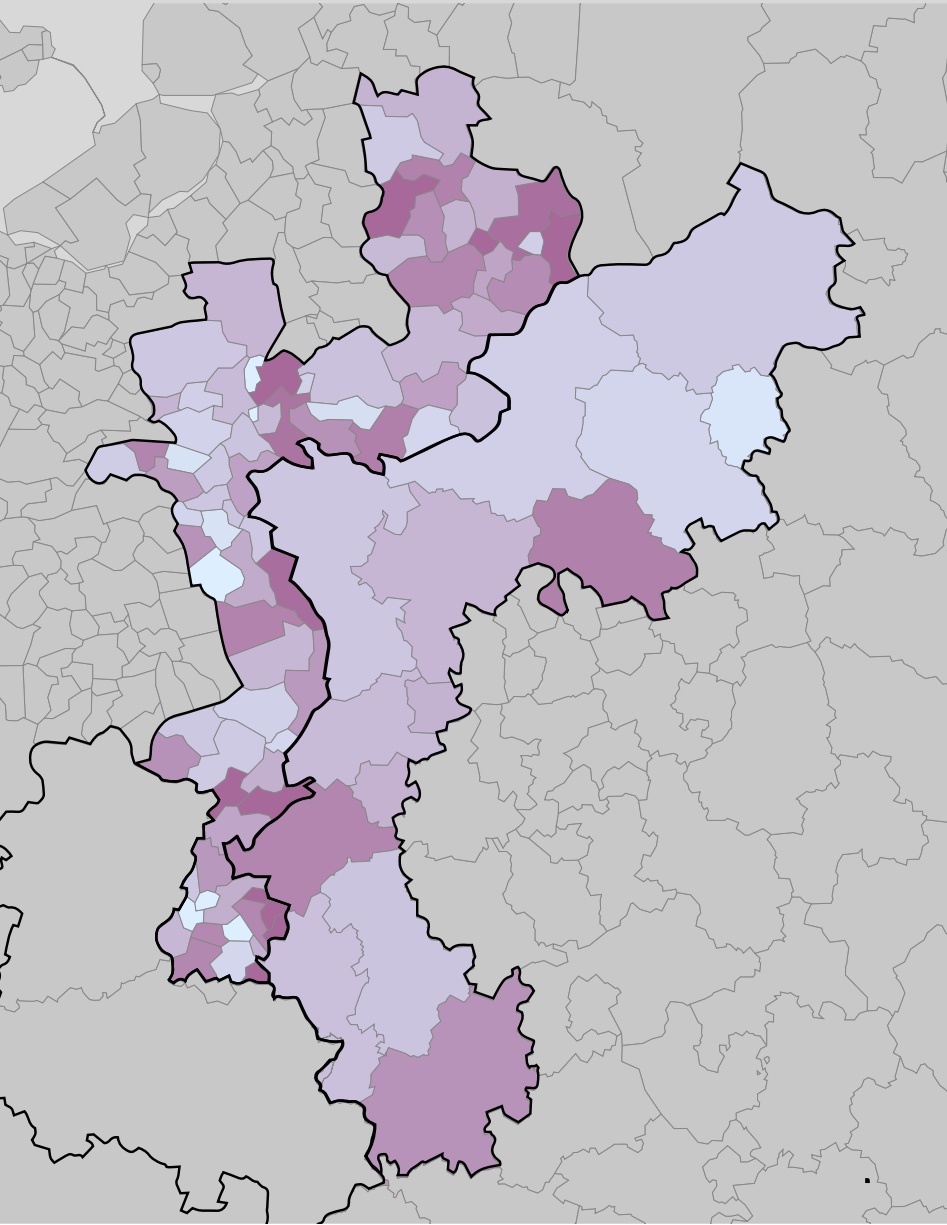
Ziekenhuisopnames - Krankenhauseinweisungen - Admission à l'hôpital



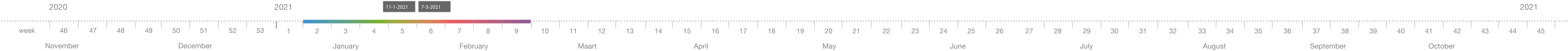
Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Deaths

Sterfgevallen - Sterfgevallen - Todesfälle - Mortalité



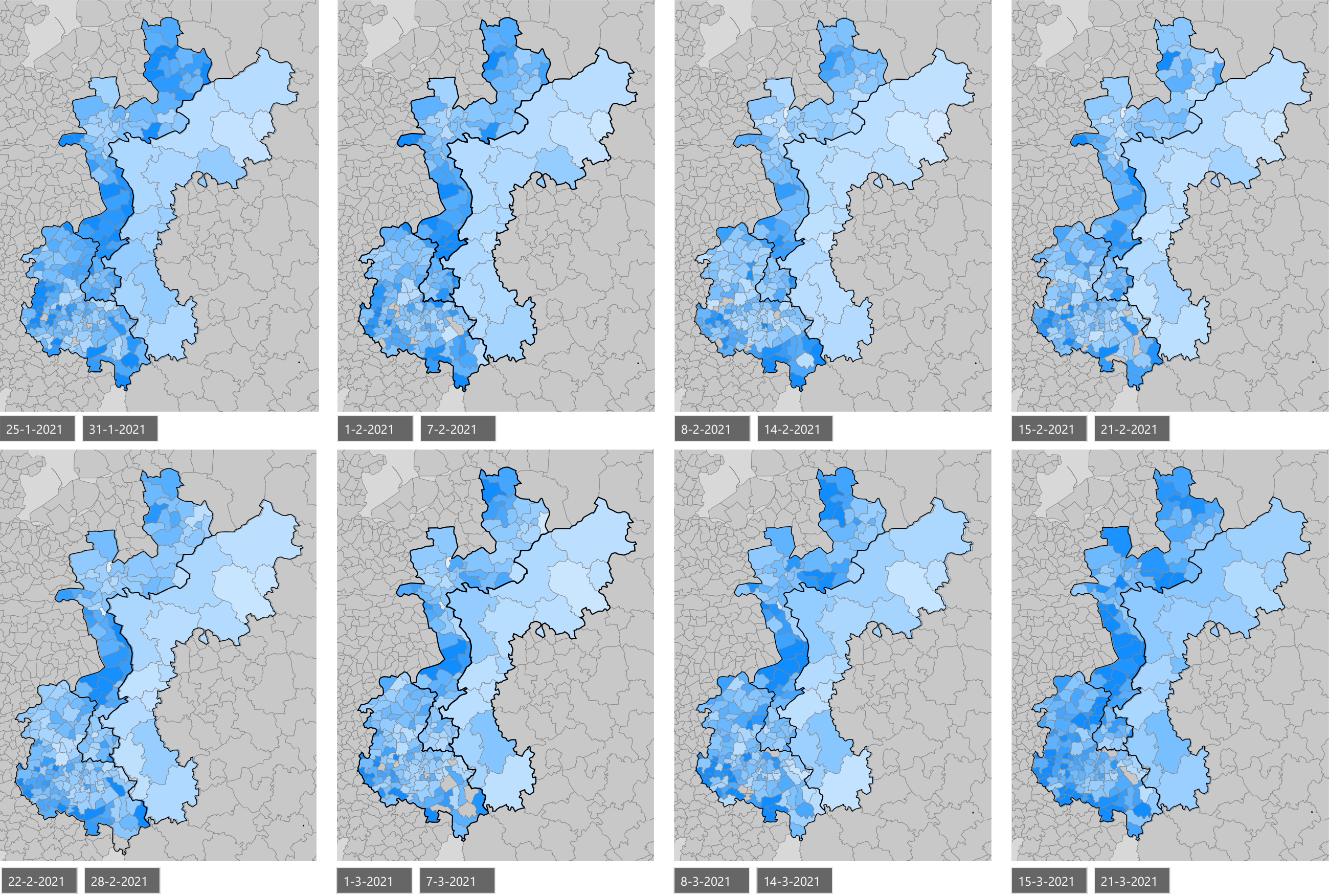
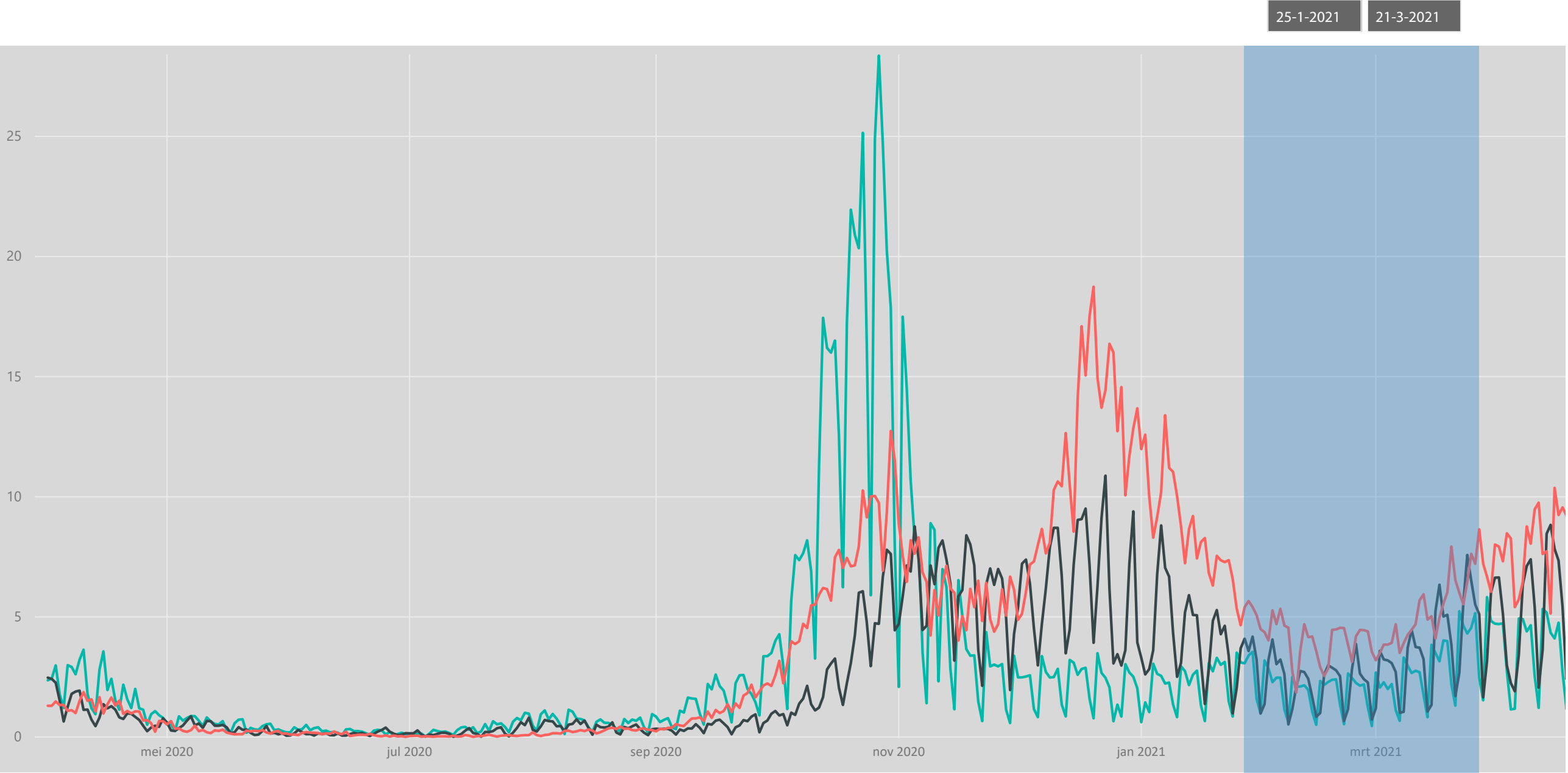
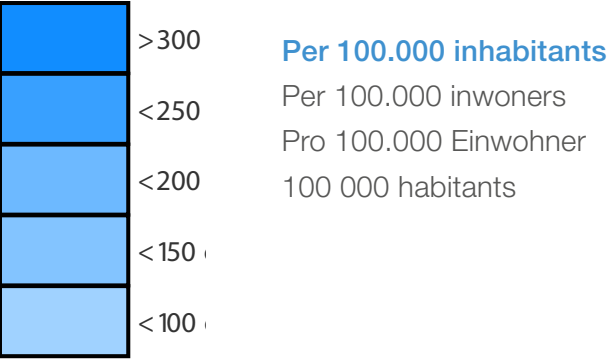
Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants



Infections

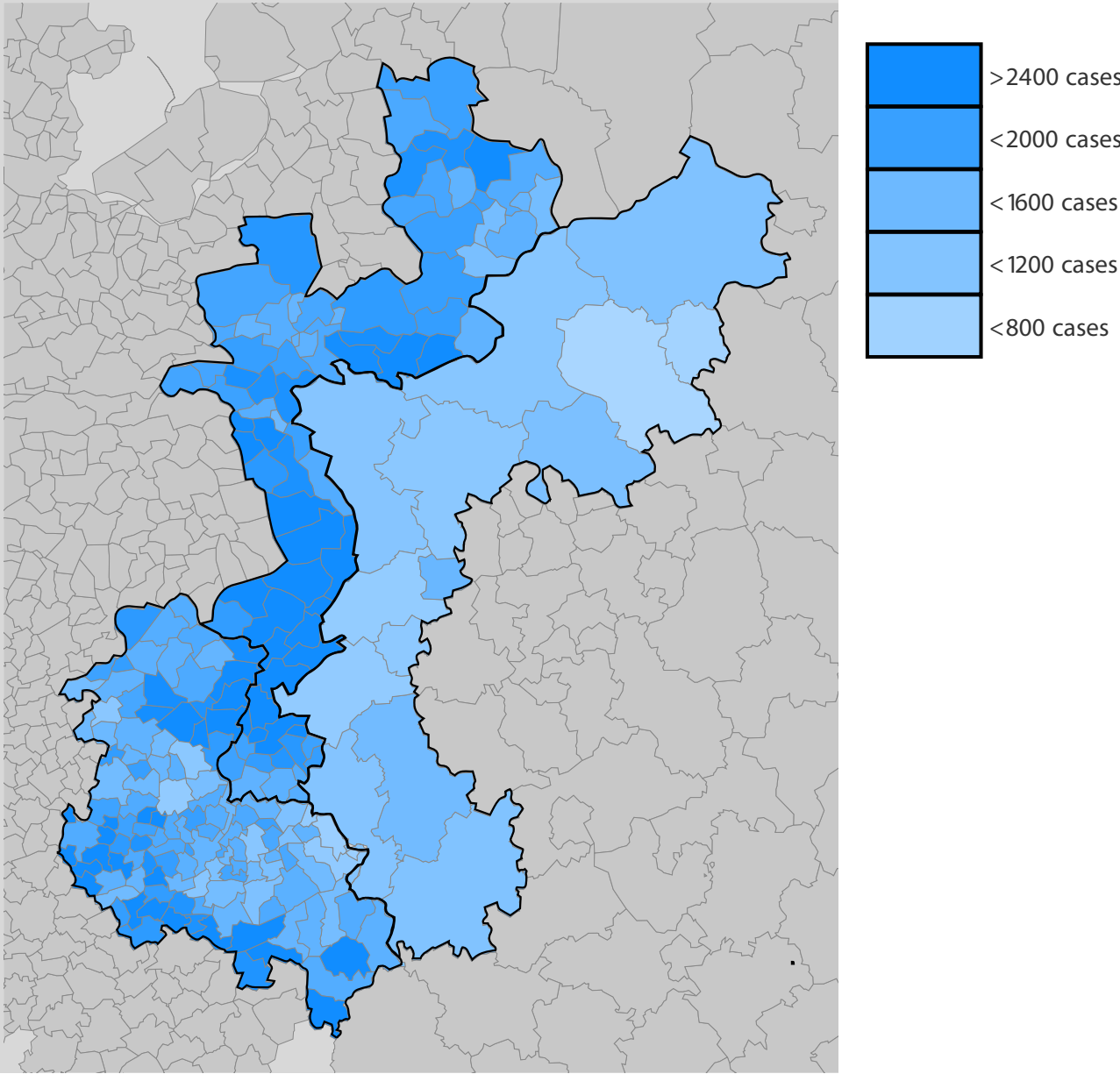
Infectiecijfers - Infektionsraten - Taux d'infection

Belgium Germany The Netherlands



Infections

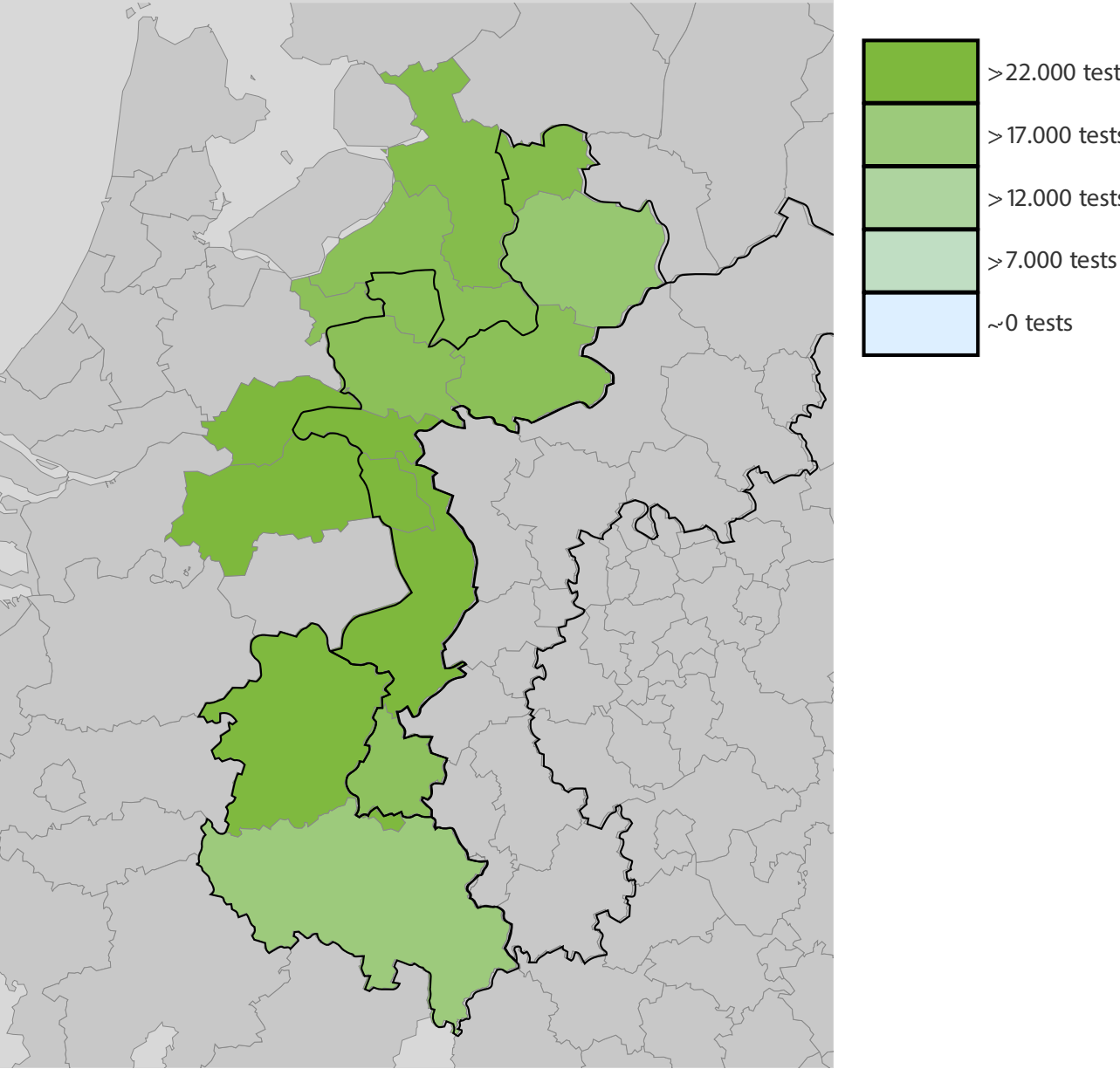
Infectiecijfers - Infektionsraten - Taux d'infection



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Amount of tests

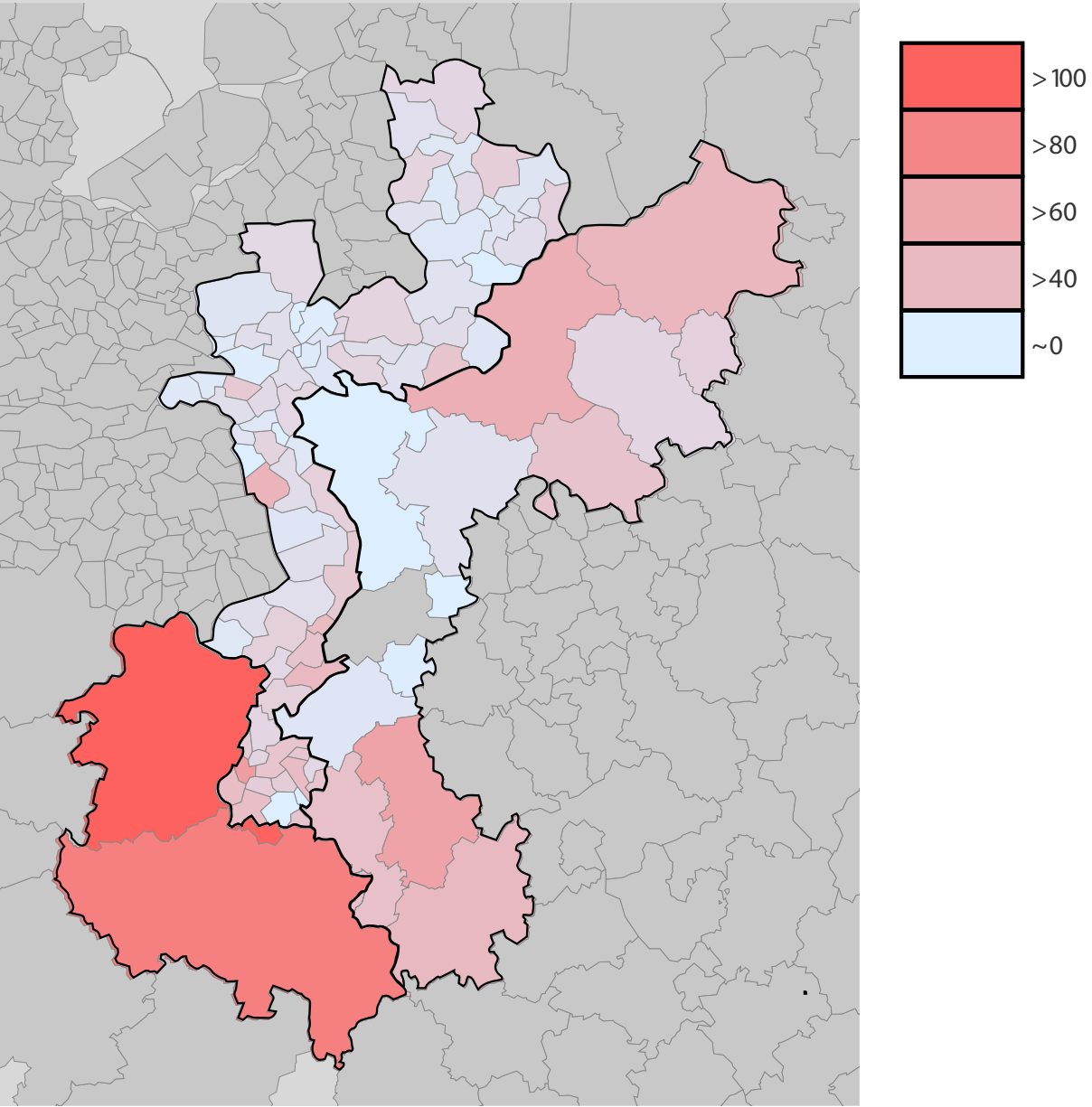
Aantal tests - Anzahl Tests - Nombre de tests



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Hospitalizations

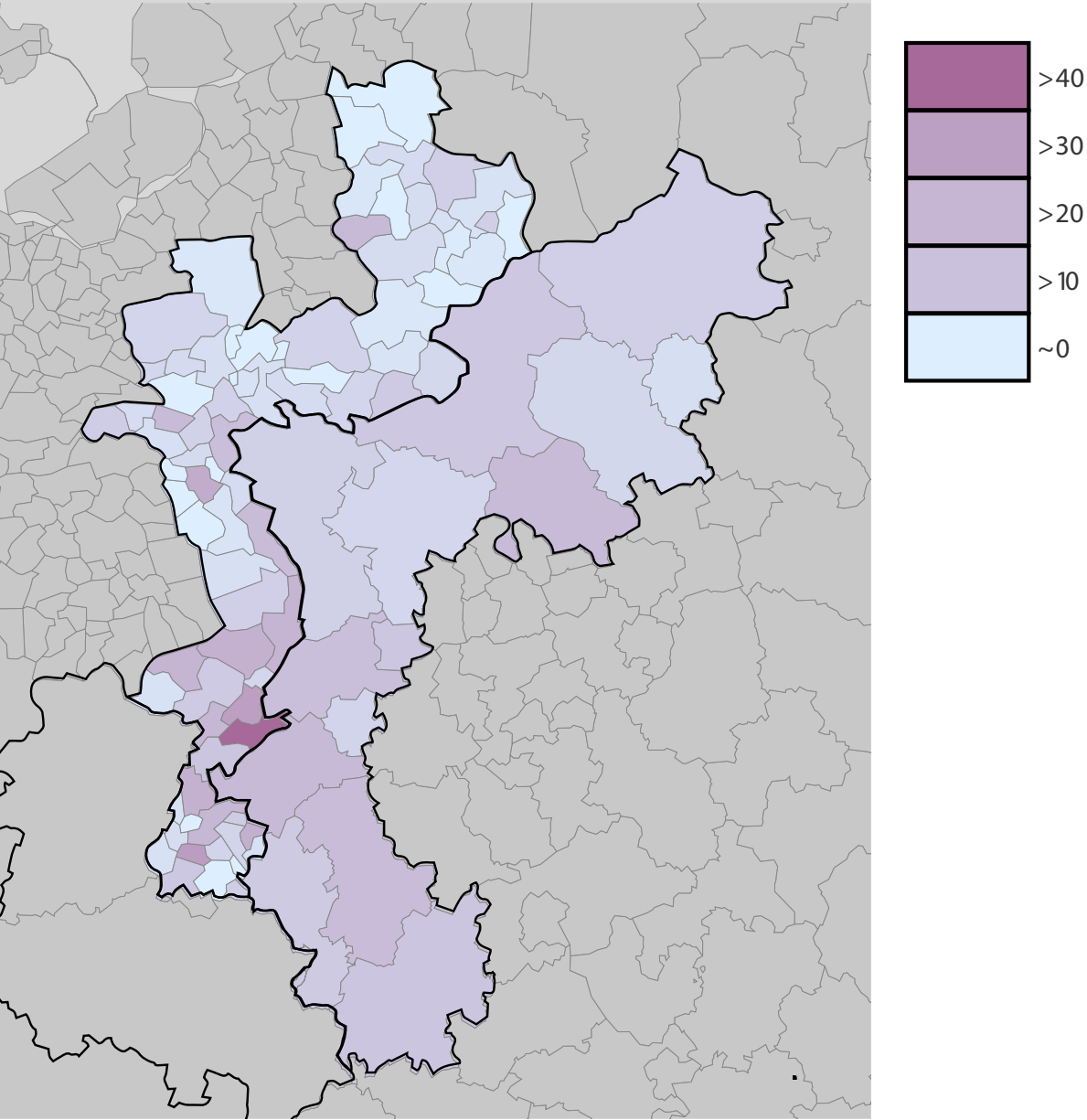
Ziekenhuisopnames - Krankenhauseinweisungen - Admission à l'hôpital



Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants

Deaths

Sterfgevallen - Sterfgevallen - Todesfälle - Mortalité



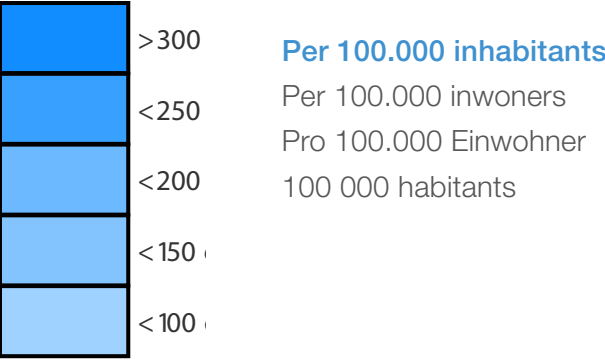
Per 8 weeks
Per 8 weken - Pro 8 Wochen - Par 8 semaines
Per 100.000 inhabitants
Per 100.000 inwoners - Pro 100.000 Einwohner - 100 000 habitants



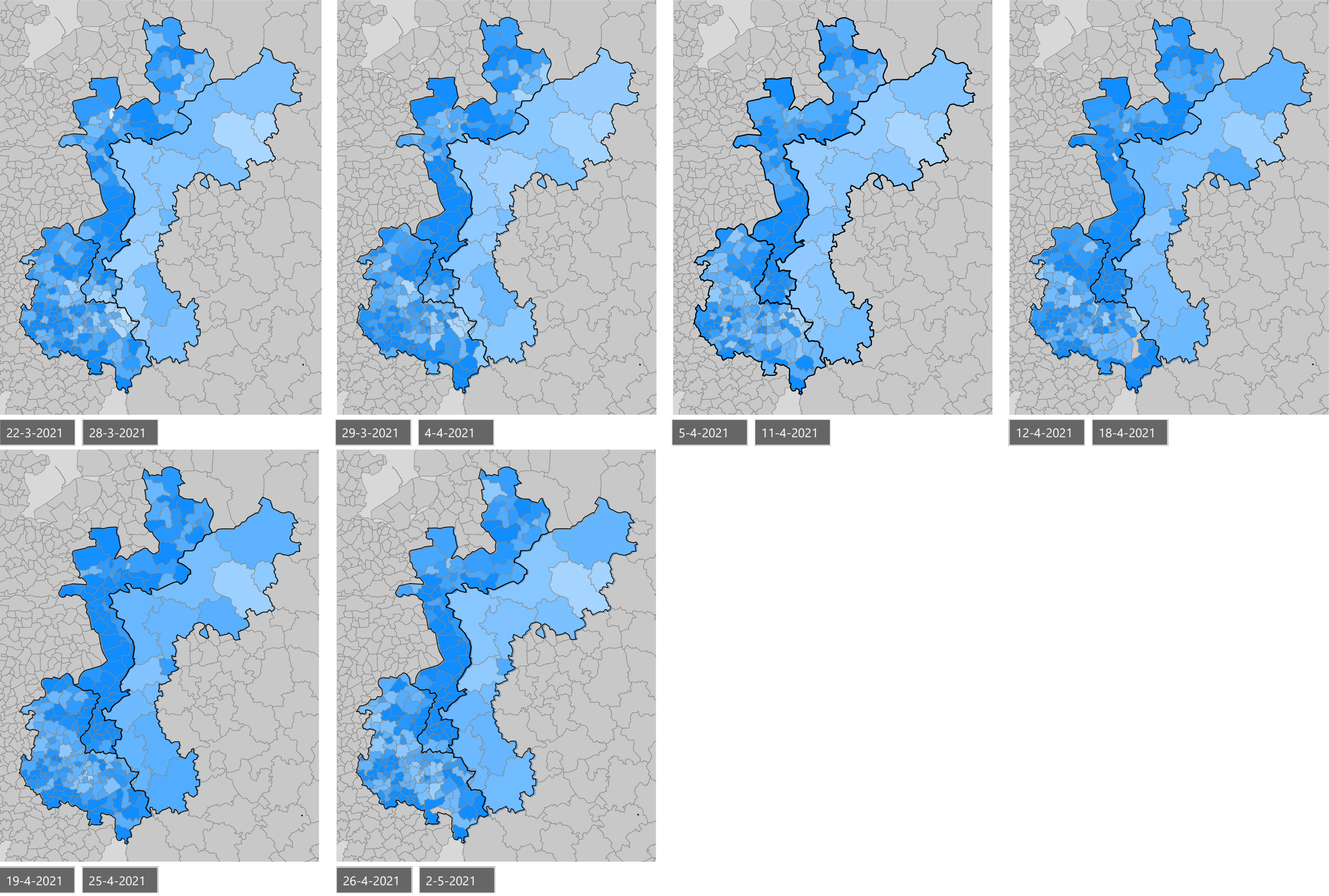
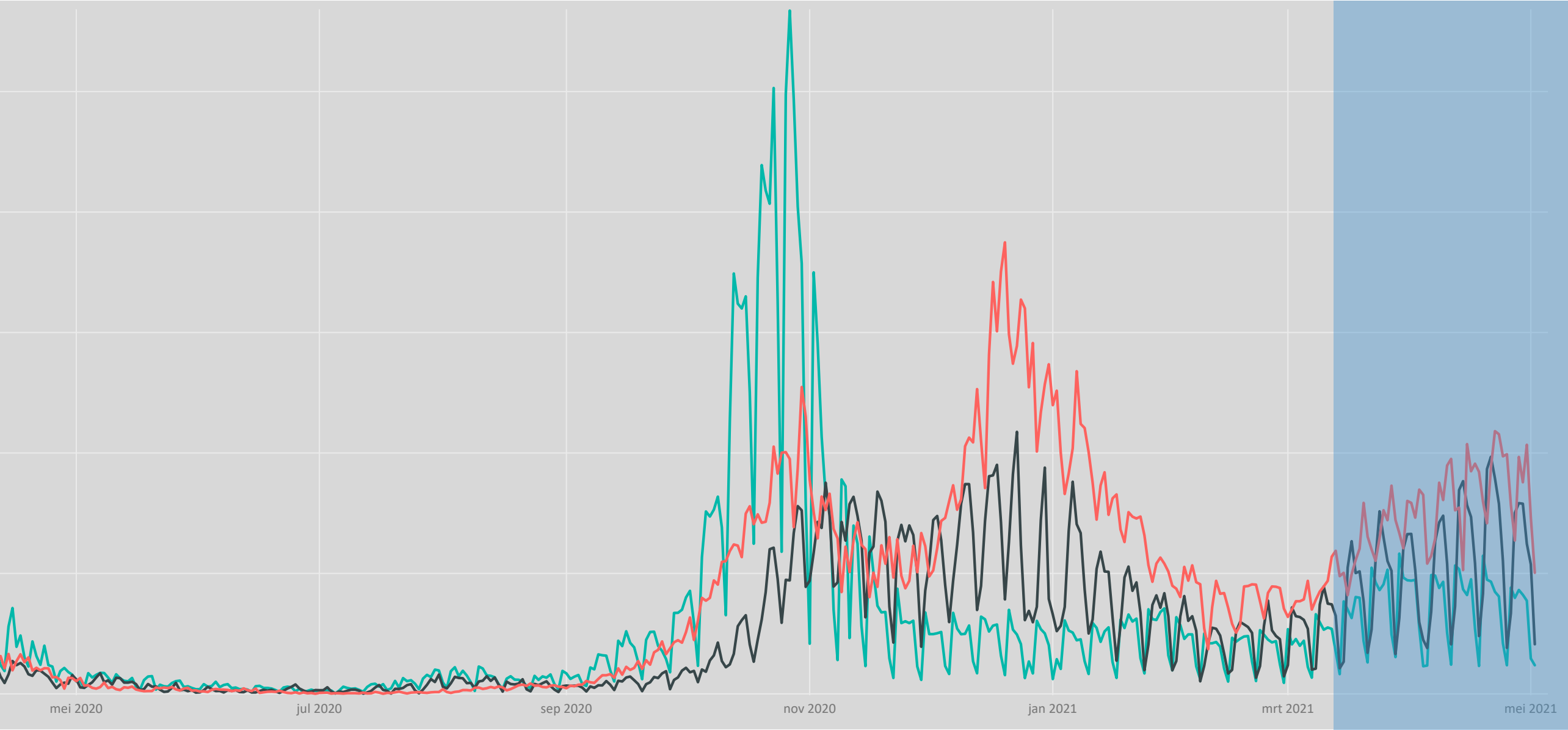
Infections

Infectiecijfers - Infektionsraten - Taux d'infection

Belgium Germany The Netherlands



22-3-2021 2-5-2021



Validity



Validiteit



Gültigkeit



Validité



It is important that an Atlas is reliable (valid). A high reliability is important for insight and acceptance of the results. Various forms of reliability (validity) are important. Some things can be measured easily and reliably, for other concepts this is more difficult. With this Atlas, we have made various forms of information on the same subject transparent by means of mapping. Together these form a map and give a reliable picture of the concept to be measured.

The Atlas is being used as a development tool to provide insight into numbers of people tested, infections, hospitalisations and deaths related to COVID-19. This Atlas shows an overview from March 2020 to May 2021. To obtain the most up to date information on a daily basis, you can view it via the digital dashboard on www.euregionalhealthatlas.eu

In addition to this quantitative Atlas, a qualitative study was also carried out.
To read this report, go to www.euprevent.eu

Het is belangrijk dat een Atlas betrouwbaar (valide) is. Een goede betrouwbaarheid is van belang voor inzicht en acceptatie van de resultaten. Er zijn diverse vormen van betrouwbaarheid (validiteit) van belang. Sommige zaken kunnen eenvoudig en betrouwbaar gemeten worden, bij andere begrippen is dit moeilijker. Met deze Atlas hebben we verschillende vormen van informatie over hetzelfde onderwerp inzichtelijk gemaakt via kaarten. Deze vormen gezamenlijk een kaart en geven een betrouwbaar beeld van het te meten begrip.

De Atlas wordt ingezet als ontwikkelinstrument, om zo inzicht te geven in het aantal geteste personen, infecties, ziekenhuisopnames en sterfgevallen in verband met COVID-19. Deze Atlas toont een overzicht van maart 2020 tot en met mei 2021. Wilt u dagelijks de meest up to date informatie dan kunt u deze terugzien in het digitale dashboard www.euregionalhealthatlas.eu

Naast deze kwantitatieve Atlas heeft er ook een kwalitatief onderzoek plaatsgevonden.
Wilt u dit rapport lezen? Ga dan naar www.euprevent.eu

Es ist wichtig, dass ein Atlas zuverlässig (gültig) ist. Eine gute Zuverlässigkeit ist wichtig für die Einsicht und Akzeptanz der Ergebnisse. Verschiedene Formen der Zuverlässigkeit (Gültigkeit) sind wichtig. Manche Dinge lassen sich leicht und zuverlässig messen, bei anderen Konzepten ist dies schwieriger. Mit diesem Atlas haben wir verschiedene Informationen zu ein und demselben Thema in Form von Karten transparent gemacht. Zusammen bilden sie eine Karte und ergeben ein zuverlässiges Bild des zu messenden Konzepts.

Der Atlas wird als Entwicklungsinstrument eingesetzt, um einen Einblick in die Anzahl der getesteten Personen, Infektionen, Krankenhausaufenthalte und Todesfälle im Zusammenhang mit COVID-19 zu geben. Dieser Atlas zeigt eine Übersicht von März 2020 bis Mai 2021.
Wenn Sie tagesaktuelle Informationen wünschen, können Sie diese auf dem digitalen Dashboard www.euregionalhealthatlas.eu abrufen.

Zusätzlich zu diesem quantitativen Atlas wurde auch eine qualitative Studie durchgeführt.
Möchten Sie diesen Bericht lesen? Dann gehen Sie auf www.euprevent.eu

Il est important qu'un Atlas soit fiable (valide). Une bonne fiabilité est importante pour la compréhension et l'acceptation des résultats. Diverses formes de fiabilité (validité) sont importantes. Certaines choses peuvent être mesurées facilement et de manière fiable, pour d'autres concepts, c'est plus difficile. Avec cet Atlas, nous avons rendu transparentes diverses formes d'information sur un même sujet au moyen de cartes. Ensemble, ils forment une carte et donnent une image fiable du concept à mesurer.

L'Atlas est utilisé comme outil de développement pour fournir un aperçu du nombre de personnes testées, des infections, des hospitalisations et des décès liés à la COVID-19. Cet Atlas donne un aperçu de la période allant de mars 2020 à mai 2021. Si vous souhaitez disposer des informations les plus récentes au quotidien, vous pouvez les consulter sur le tableau de bord numérique www.euregionalhealthatlas.eu

En plus de cet Atlas quantitatif, une étude qualitative a également été réalisée.
Vous souhaitez lire ce rapport ? Allez ensuite sur www.euprevent.eu

Data sources/ Source citation

The Dutch data is taken from the National Institute for Public Health and the Environment (RIVM).
The official Dutch dashboard can be found at:
<https://coronadashboard.rijksoverheid.nl/>

The Belgian data are from Sciensano. The official Belgian dashboard can be found at:
<https://datastudio.google.com/embed/reporting/c14a5cfc-cab7-4812-848c-0369173148ab/page/ZwmOB>

The German data comes from the Robert Koch Institute (RKI).
The official German dashboard can be found at:
<https://experience.arcgis.com/experience/478220a4c454480e823b17327b2bf1d4>

Country-specific definitions

| |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Netherlands: https://coronadashboard.government.nl/verantwoording#confirmed-cases https://coronadashboard.government.nl/verantwoording#hospitals |
| Belgium: https://COVID-19.sciensano.be/sites/default/files/COVID19/COVID_19_FAQ_ENG_final.pdf COVID-19.sciensano.be/sites/default/files/COVID19/COVID_19_FAQ_ENG_final.pdf |
| Germany: https://www.rki.de/DE/Content?InfAZ/N/Neuartiges_Corona-virus/Falldefinition.html |

Databronnen/ Bronvermelding

De Nederlandse gegevens zijn afkomstig van het Rijksinstituut voor Volksgezondheid en Milieu (RIVM). Het officiële Nederlandse dashboard is te vinden op:
<https://coronadashboard.rijksoverheid.nl/>

De Belgische gegevens zijn afkomstig van Sciensano.
Het officiële Belgische dashboard is te vinden op:
<https://datastudio.google.com/embed/reporting/c14a5cfc-cab7-4812-848c-0369173148ab/page/ZwmOB>

De Duitse gegevens zijn afkomstig van het Robert Koch Instituut (RKI).
Het officiële Duitse dashboard is te vinden op:
<https://experience.arcgis.com/experience/478220a4c454480e823b17327b2bf1d4>

Landspecifieke definities

| |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nederland: https://coronadashboard.government.nl/verantwoording#confirmed-cases https://coronadashboard.government.nl/verantwoording#hospitals |
| België: https://COVID-19.sciensano.be/sites/default/files/COVID19/COVID_19_FAQ_ENG_final.pdf |
| Duitsland: https://www.rki.de/DE/Content?InfAZ/N/Neuartiges_Corona-virus/Falldefinition.html |

Datenquellen/Quellennachweis

Die niederländischen Daten stammen vom Nationalen Institut für öffentliche Gesundheit und Umwelt (RIVM). Das offizielle niederländische Dashboard ist zu finden unter:
<https://coronadashboard.rijksoverheid.nl/>

Die belgischen Daten stammen von Sciensano.
Das offizielle belgische Dashboard ist zu finden unter:
<https://datastudio.google.com/embed/reporting/c14a5cfc-cab7-4812-848c-0369173148ab/page/ZwmOB>

Die deutschen Daten stammen vom Robert-Koch-Institut (RKI).
Das offizielle deutsche Dashboard ist zu finden unter:
<https://experience.arcgis.com/experience/478220a4c454480e823b17327b2bf1d4>

Länderspezifische Definitionen

| |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Niederlande: https://coronadashboard.government.nl/verantwoording#confirmed-cases https://coronadashboard.government.nl/verantwoording#hospitals |
| Belgien: https://COVID-19.sciensano.be/sites/default/files/COVID19/COVID_19_FAQ_ENG_final.pdf COVID-19.sciensano.be/sites/default/files/COVID19/COVID_19_FAQ_ENG_final.pdf |
| Deutschland: https://www.rki.de/DE/Content?InfAZ/N/Neuartiges_Corona-virus/Falldefinition.html |

Sources de données/ Citation des sources

Les données néerlandaises proviennent de l'Institut national pour la santé publique et l'environnement (RIVM). Le tableau de bord officiel néerlandais peut être consulté à l'adresse suivante: <https://coronadashboard.rijksoverheid.nl/>

Les données belges proviennent de Sciensano.
Le tableau de bord officiel de la Belgique peut être consulté à l'adresse suivante:
<https://datastudio.google.com/embed/reporting/c14a5cfc-cab7-4812-848c-0369173148ab/page/ZwmOB>.

Les données allemandes proviennent de l'Institut Robert Koch (RKI).
Le tableau de bord officiel allemand peut être consulté à l'adresse suivante:
<https://experience.arcgis.com/experience/478220a4c454480e823b17327b2bf1d4>

Définitions spécifiques par pays

| |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pays-Bas : https://coronadashboard.government.nl/verantwoording#confirmed-cases https://coronadashboard.government.nl/verantwoording#hospitals |
| Belgique: https://COVID-19.sciensano.be/sites/default/files/COVID19/COVID_19_FAQ_ENG_final.pdf COVID-19.sciensano.be/sites/default/files/COVID19/COVID_19_FAQ_ENG_final.pdf |
| Allemagne: https://www.rki.de/DE/Content?InfAZ/N/Neuartiges_Corona-virus/Falldefinition.html |

Contact details

Primary location Heerlen (The Netherlands)

Het Overloon 2, 6411 TE Heerlen
P.O. Box 33, 6400 AA Heerlen
T (+31) 88 - 880 5000

Information about the project

Christian Hoebe, physician-epidemiologist M&G Infectious Disease Control

Colophon

Printing: euPrevent
Design: Margret Reijnders - Creatieve Communicatie



Contactgegevens

Hoofdlocatie Heerlen (Nederland)

Het Overloon 2, 6411 TE Heerlen
Postbus 33, 6400 AA Heerlen
T (+31) 88 - 880 5000

Informatie over het project

Christian Hoebe, arts-epidemioloog M&G Infectieziektebestrijding
infoSIM@ggdzl.nl
www.euprevent.eu/COVID

Colofon

Druk: euPrevent
Vormgeving: Margret Reijnders - Creatieve Communicatie



Kontaktangaben

Hauptstandort Heerlen (Die Niederlande)

Het Overloon 2, 6411 TE Heerlen
Postfach 33, 6400 AA Heerlen
T (+31) 88 - 880 5000

Informationen über das Projekt

Christian Hoebe, Arzt-Epidemiologe M&G Infectious Disease Control

Kolophon

Druck: euPrevent
Gestaltung: Margret Reijnders - Creatieve Communicatie



Données de contact

Localisation principale Heerlen (Les Pays-Bas)

Het Overloon 2, 6411 TE Heerlen
P.O. Box 33, 6400 AA Heerlen
T (+31) 88 - 880 5000

Informations sur le projet

Christian Hoebe, médecin-épidémiologiste M&G Contrôle des maladies infectieuses

Colophon

Impression : euPrevent
Conception : Margret Reijnders - Creatieve Communicatie



www.euregionalhealthatlas.eu

mede mogelijk gemaakt door
provincie limburg

