



Figure 1: corona\_artwork.jpg

## Dataset: COVID-19 case counts in The Netherlands

**CoronaWatchNL** collects numbers on COVID-19 disease count cases in **The Netherlands**. The numbers are collected from various sources on a daily base, like RIVM (National Institute for Public Health and the Environment), LCPS (Landelijk Coördinatiecentrum Patiënten Spreiding), NICE (Nationale Intensive Care Evaluatie), and the National Corona Dashboard. This project standardizes, and publishes data and makes it **Findable, Accessible, Interoperable, and Reusable (FAIR)**. We aim to collect a complete time series and prepare a dataset for reproducible analysis and academic use.

Dutch: > CoronalWatchNL verzamelt ziektecijfers over COVID-19 in Nederland. Dagelijks worden de cijfers verzameld van het RIVM (Rijksinstituut voor de Volksgezondheid en Milieu), LCPS (Landelijk Coördinatiecentrum Patiënten Spreiding), NICE (Nationale Intensive Care Evaluatie) en Nationale Corona Dashboard. Dit project standaardiseert en publiceert de gegevens en maakt ze vindbaar, toegankelijk, interoperabel en herbruikbaar (FAIR). We streven ernaar om een dataset beschikbaar te stellen voor reproduceerbare analyses en wetenschappelijk gebruik.

### Datasets

The datasets available on CoronaWatchNL are updated on a daily base. Availability depends on the publication by the respective sources (N.B. since July 1st, the epidemiological reports published by RIVM will be released on a *weekly* instead of daily basis). The CoronaWatchNL project divides the datasets into four main categories:

- Geographical data
- Descriptive data
- Intensive care data
- Dashboard data
- Miscellaneous datasets

For (interactive) applications based on these datasets, have a look at the applications folder. For predictive models based on these datasets, check out the parallel repository CoronaWatchNL Extended. Please note that the intention of these (too) simplistic models - made by CoronaWatchNL volunteers - is to show how the data can be used for modelling, *not* to answer specific hypotheses or follow scientific protocol.

Please see the Remarks document for notes about the datasets. Do you have remarks? Please let us know

### Geographical datasets

**Reference time: 10:00 AM** These datasets describe the new and cumulative number of confirmed, hospitalized and deceased COVID-19 cases. Every day, the data is retrieved from the central database OSIRIS at 10:00 AM by RIVM. The datasets are categorized by their geographical level (national, provincial, municipal).

For more detail about the specific structure of the geographical datasets, have a look at the **data-geocodebook**.

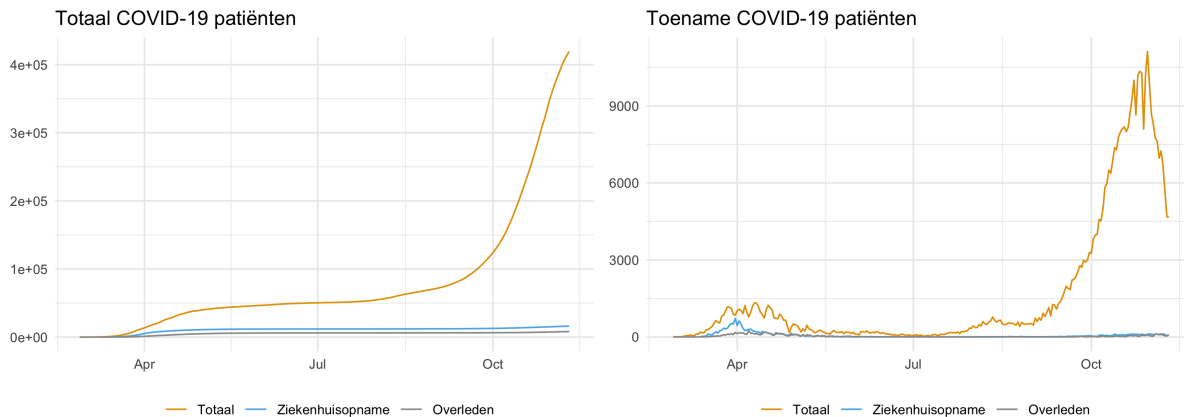
Dataset	Source	Variables
Reported case counts by date in NL	RIVM	Date, Type (Total, hospitalized and deceased COVID-19 cases), (Cumulative) Count
Reported case counts by date in NL per province	RIVM	Date, Province, Type (Total, hospitalized and deceased COVID-19 cases), (Cumulative) Count
Reported case counts by date in NL per municipality	RIVM	Date, Municipality, Province, Type (Total, hospitalized and deceased COVID-19 cases), (Cumulative) Count

**Reference time: by day (0:00 AM)** These datasets describe the new and cumulative number of confirmed, hospitalized and deceased COVID-19 cases per day. The data is retrieved from the central database OSIRIS and counts the number per day (0:00 AM) by RIVM. The dataset concerns numbers on a national level.

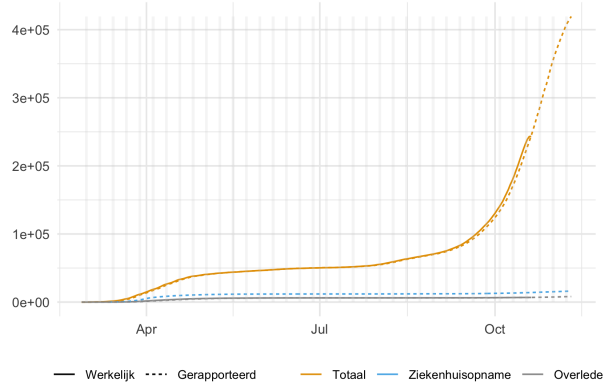
For more detail about the specific structure of the geographical datasets, have a look at the [data-geocodebook](#).

Dataset	Source	Variables
Case counts by date in NL	RIVM	Date, Type (Total, hospitalized and deceased patients), (Cumulative) Count

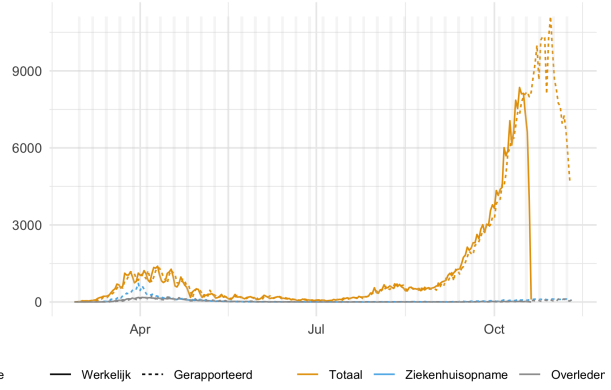
**Visualizations geographical data** To get a better picture of the content of the geographical datasets, have a look at the following visuals. These visuals show the development of the COVID-19 disease outbreak on a national level.



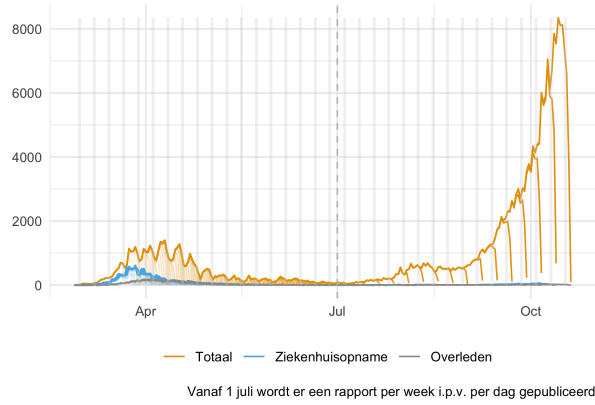
Totaal: Werkelijk vs. Gerapporteerd

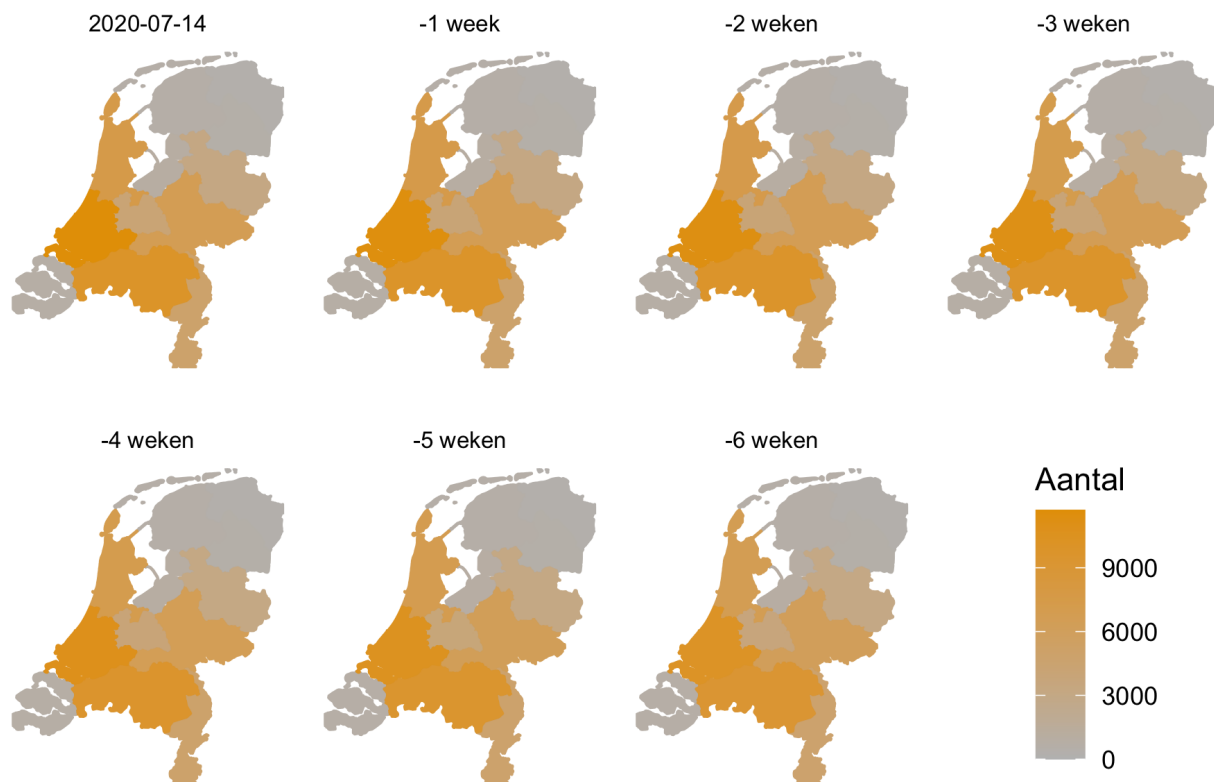


Toename: Werkelijk vs. Gerapporteerd



Gerappteerde COVID-19 patiënten per rapportagedatum





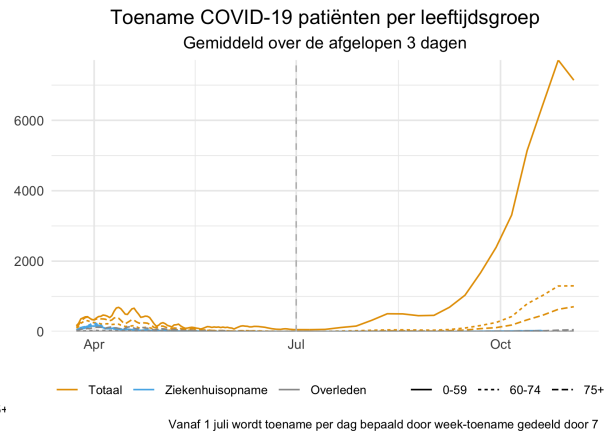
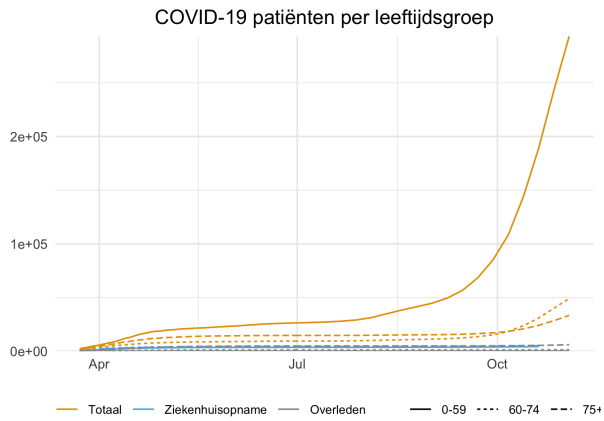
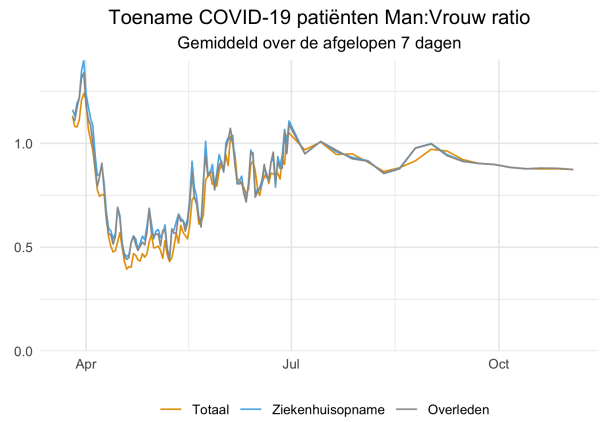
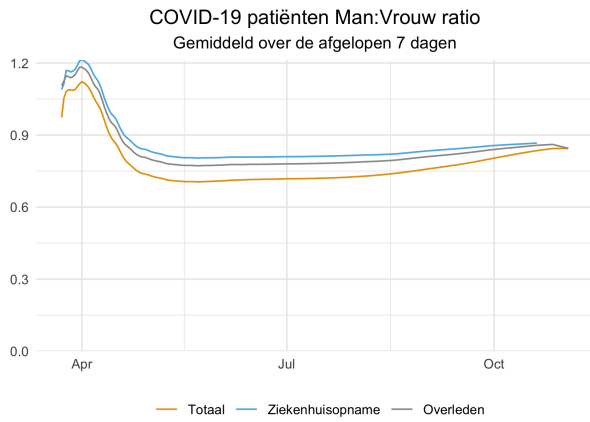
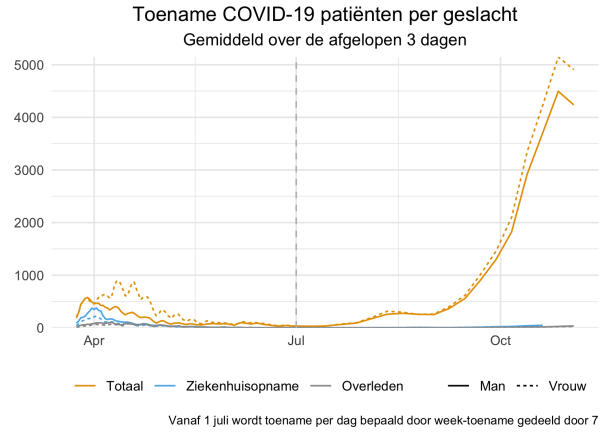
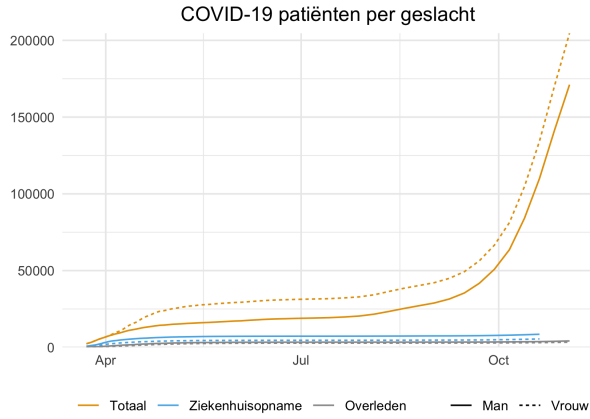
### Descriptive datasets

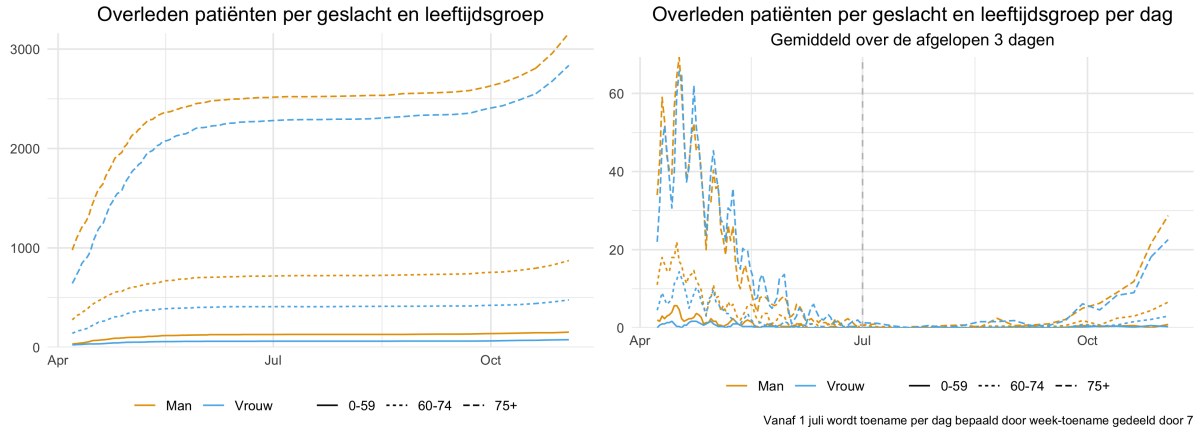
The datasets in this section describe the new and cumulative number of confirmed, hospitalized and deceased COVID-19 cases per day and contain variables like age and sex.

For more detail about the specific structure of the descriptive datasets, have a look at the [data-desc](#)codebook.

Dataset	Source	Variables
Case counts in NL per age	RIVM	Date, Age group, Type (Total, hospitalized and deceased COVID-19 cases), (Cumulative) Count
Case counts in NL per sex	RIVM	Date, Sex, Type (Total, hospitalized and deceased COVID-19 cases), (Cumulative) Count
Deceased case counts in NL per sex and age group	RIVM	Date, Age group, Sex, (Cumulative) Count of deceased cases

**Visualizations descriptive data** The graphs below visualize the development of the COVID-19 disease outbreak per sex and age group.





### Intensive care datasets

The intensive care datasets describe the new and cumulative number of COVID-19 intensive care unit (ICU) admissions per day. The datasets are categorized by their source. Compared to RIVM (reporting COVID-19 hospital admissions), CoronaWatchNL collects COVID-19 related intensive care data from LCPS and NICE.

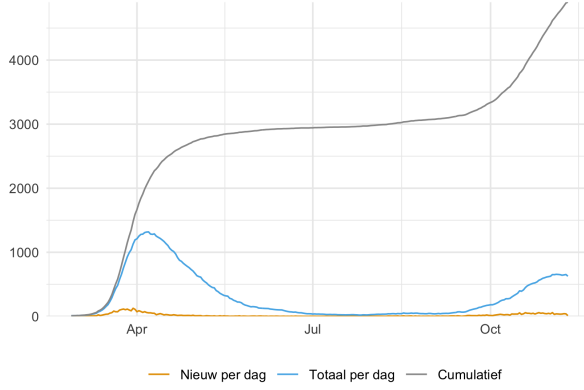
- **RIVM** reports hospitalized COVID-19 cases, including - but not limited to - the intensive care unit (ICU) admissions. These are the largest numbers and most inclusive counts.
- **NICE** only reports COVID-19 cases that are admitted to the ICU.
- **LCPS**, similarly to NICE, reports COVID-19 ICU admissions. However, LCPS tries to compensate for the reporting lag, by estimating its size and adding it to the numbers reported by NICE.

For more detail about the specific structure of the intensive care datasets, have a look at the `data-ic` codebook.

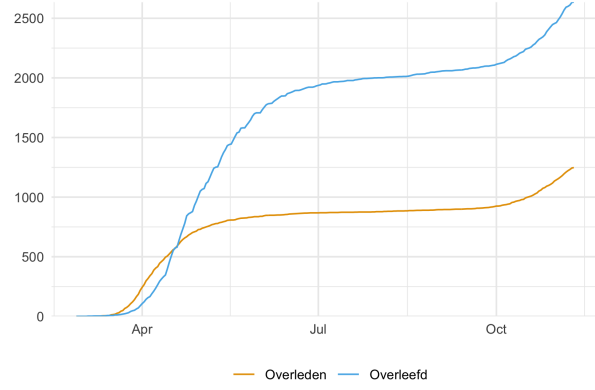
Dataset	Source	Variables
COVID-19 intensive care patient counts in NL	Stichting NICE	Date, New, Total and Cumulative ICU admissions per day, Number of ICUs with at least one COVID-19 case, New and Cumulative fatal, survived and discharged ICU admissions
COVID-19 intensive care patient counts with country of hospitalisation	LCPS	Date, Country of Hospitalization, Total COVID-19 ICU admissions

**Visualizations intensive care** The first two graphs show the number of new (*Nieuw*), total (*Actueel*), cumulative (*Cumulatief*), deceased (*Overleden*), and survived (*Overleefd*) COVID-19 ICU admissions per day, as declared by NICE. The total number of ICU admissions per day as reported by LCPS is also shown.

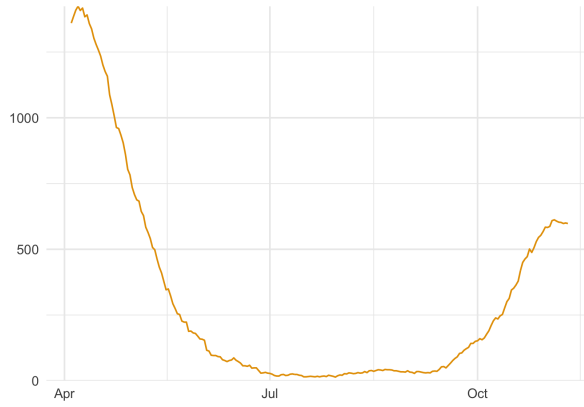
NICE: Aantal IC-opnamen van COVID-19 patiënten



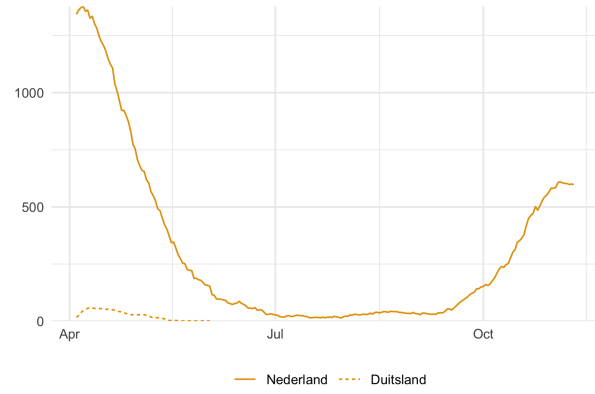
NICE: Vrijkomst IC-bedden COVID-19 patiënten



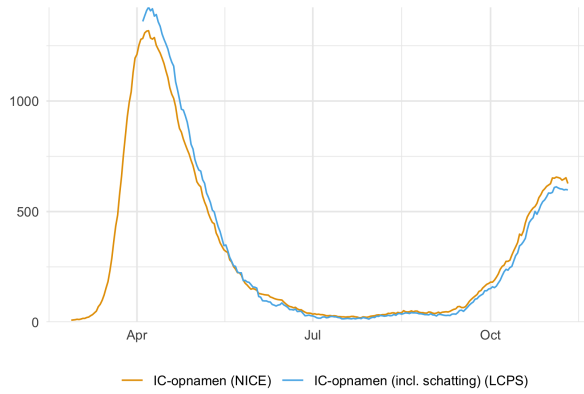
LCPS: Aantal IC-opnamen COVID-19 patiënten



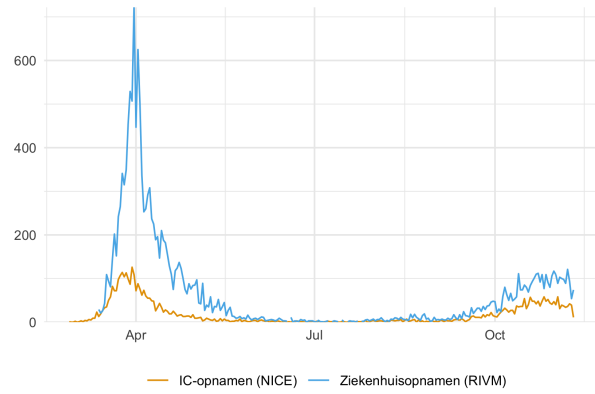
LCPS: Aantal IC-opnamen COVID-19 patiënten per land

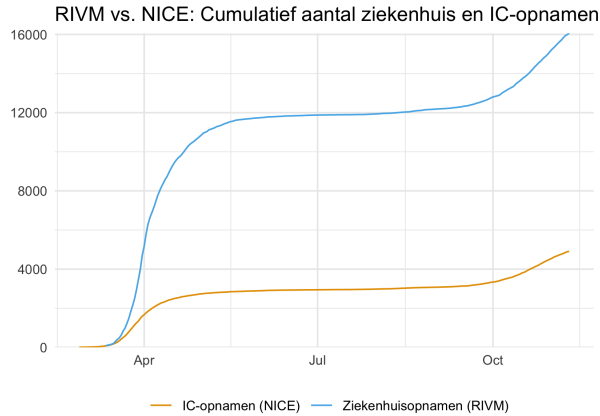


NICE vs. LCPS: Totaal aantal IC-opnamen per dag



RIVM vs. NICE: Nieuwe ziekenhuis en IC-opnamen per dag





## Dashboard datasets

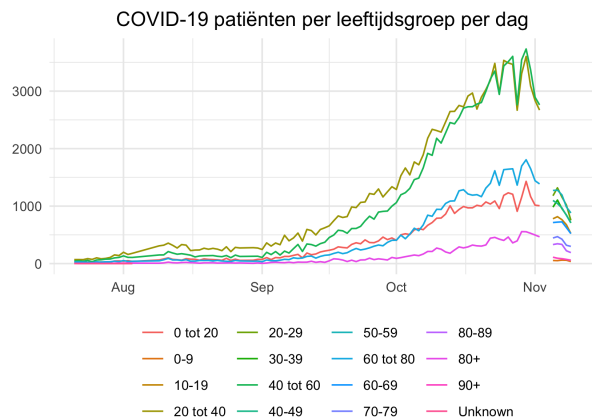
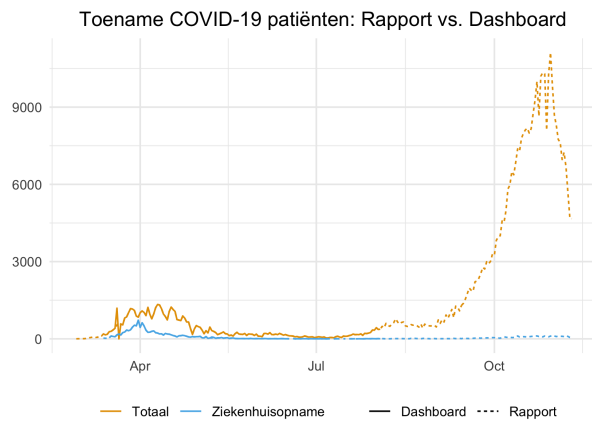
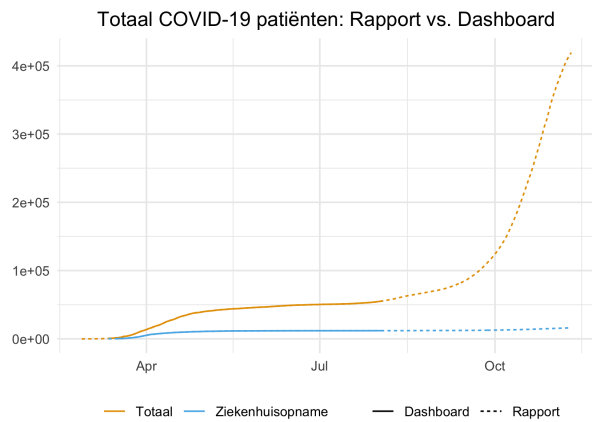
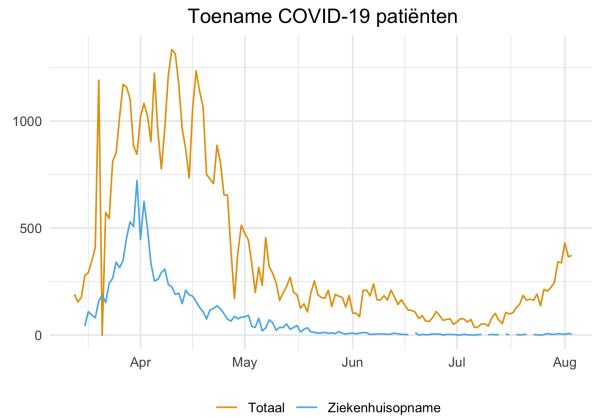
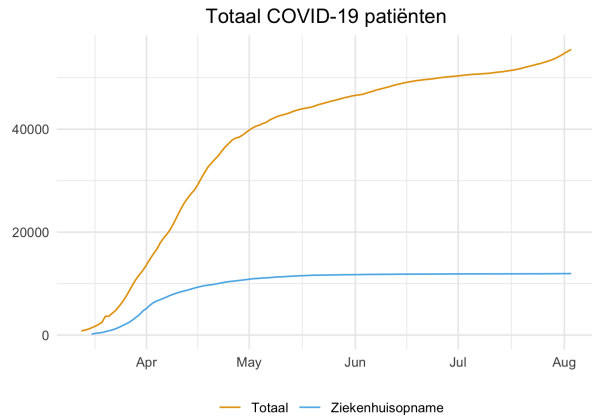
The datasets underlying the National Dashboard are listed in this folder. These datasets concern various topics, such as an overview of the number and age distribution of hospitalized, positively tested, and suspected cases, an estimate of the number of contagious people, the reproduction index, the number of (deceased) infected nursery home residents, and the amount of virus particles measured in the sewage water.

For more detail about the specific structure of the dashboard datasets, have a look at the [data-dashboardcodebook](#).

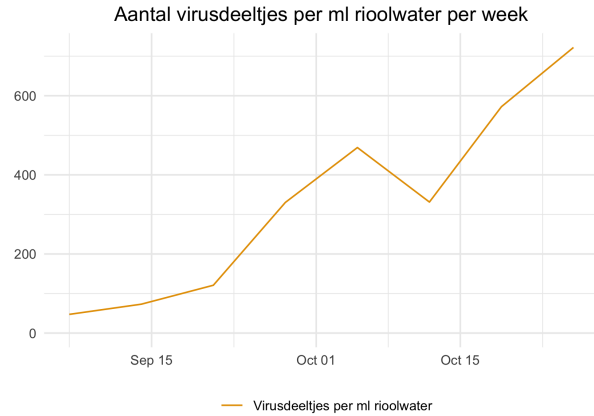
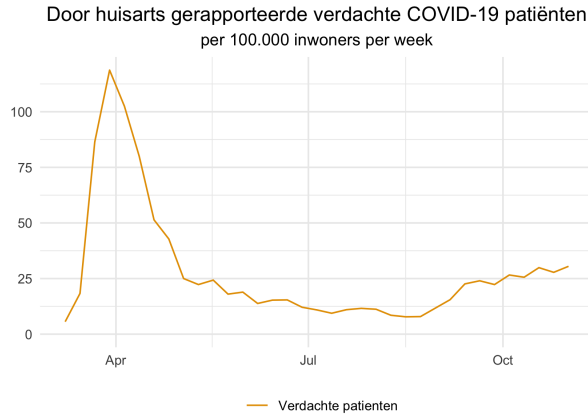
Dataset	Source	Variables
Reported case counts in NL	National Dashboard	Date, Type of measure, (Cumulative) Count
Age distribution of reported cases in NL	National Dashboard	Date, Age group, Count
Suspected patients in NL	National Dashboard	Date, Type of measure, Count
COVID-19 particles in sewage	National Dashboard	Date, Type of measure, Count
Reproduction index COVID-19 virus	National Dashboard	Date, Type of measure, Value
Contagion estimate COVID-19 virus	National Dashboard	Date, Type of measure, Value
Number of infected and deceased nursery home cases	National Dashboard	Date, Type of measure, (Cumulative) Count

**Visualizations dashboard data** These visuals show the development of the COVID-19 disease outbreak on a national level as reported by the National Dashboard and by the RIVM reports.

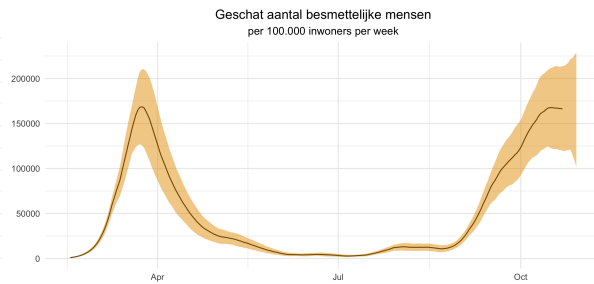
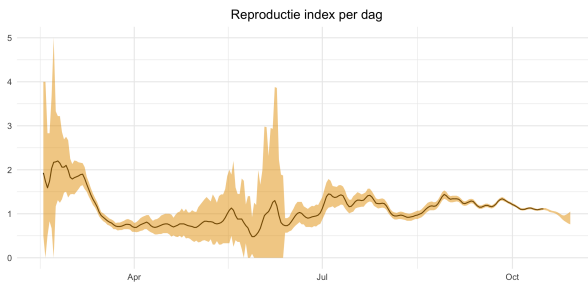




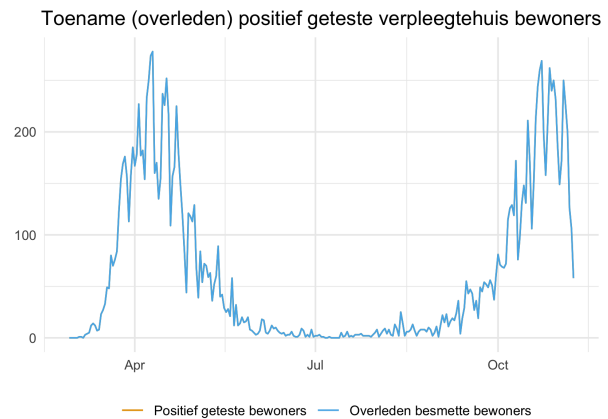
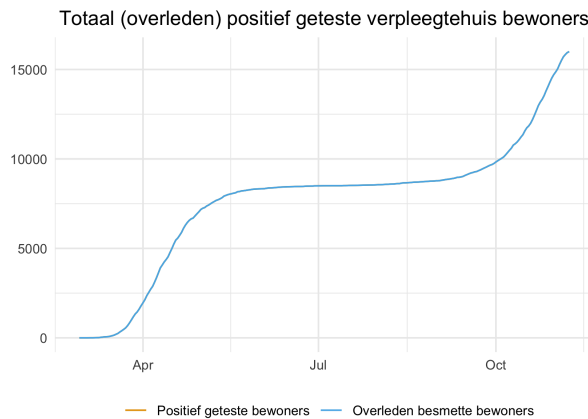
Below, the number of suspected COVID-19 patients as registered by the GPs, and the amount of COVID-19 particles per milliliter sewage water are depicted.

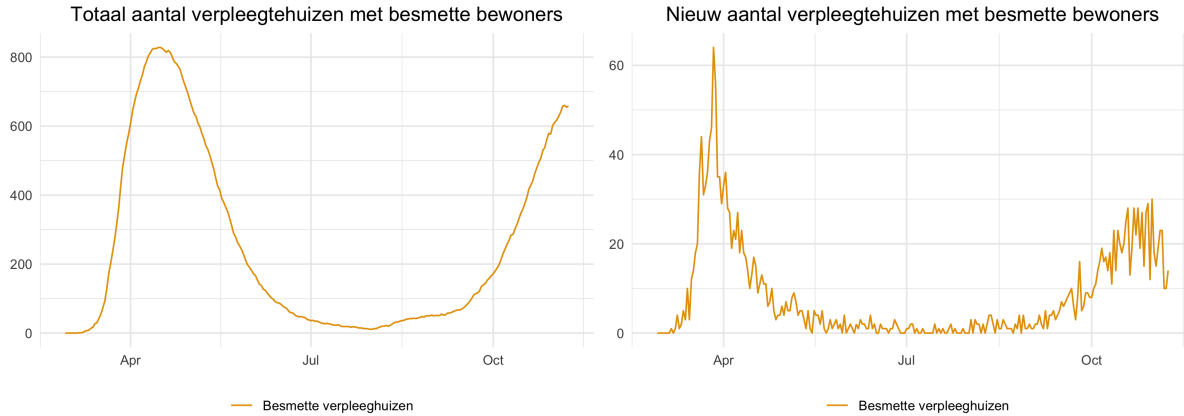


The reproduction index and estimated contagious people are plotted with their corresponding minimum and maximum values. The reproduction index indicates how quickly the COVID-19 virus is spreading in the Netherlands. The estimated contagious people represent the number of COVID-19 people per 100.000 inhabitants that are contagious for others.



The number of (deceased) nursery home residents infected with COVID-19 are shown here.





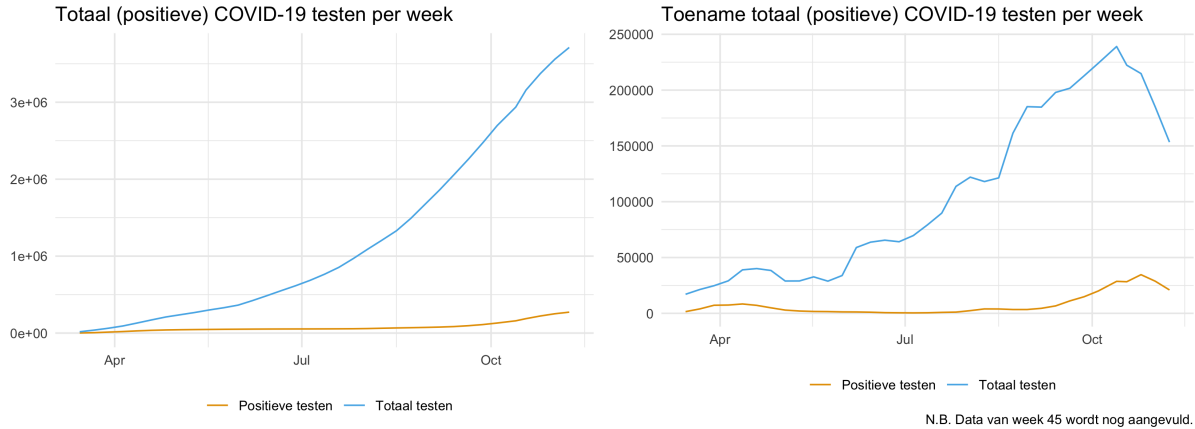
### Miscellaneous datasets

This folder contains datasets describing various miscellaneous topics, such as the number of (positively) tested people, the underlying conditions and/or pregnancy of deceased cases younger than 70, an overview of the reinforced measures and press releases in the Netherlands, and a list of companies that requested and received an advance on their reimbursement.

For more detail about the specific structure of the miscellaneous datasets, have a look at the `data-misc` codebook.

Dataset	Source	Variables
COVID-19 tests in NL per week	RIVM	Year, Calendar week, Start date (Monday), End date (Sunday), Included labs, Type (Total and positive tests), Count
COVID-19 tests in NL per week by GGD-GHOR	GGD-GHOR	Year, Calendar week, Start date (Monday), End date (Sunday), Type (Total), Count
Underlying conditions and/or pregnancy in deceased COVID-19 cased under the age of 70	RIVM	Date, Type of condition, Cumulative count
COVID-19 measures by the government	European Commission Joint Research Centre	Various variables on governmental measures (in English)
RIVM press releases	RIVM	Date and Time, Content of press release
NOW registry	UWV	Company, Location, Advance

**Visualizations miscellaneous data** These graphs display the number of (positively) tested people per week. The end date of each week - Sunday - is used as indicator for the respective week.



Below, the cumulative number of deceased COVID-19 cases younger than 70 with and without underlying conditions and/or pregnancy are displayed per notification date.

```
[(plots/conditions_statistics.png" width="700">
```

The cumulative number of specific conditions found in these deceased COVID-19 cases are shown here.

```
[(plots/underlying_conditions.png" width="700">
```

## Inactive/deprecated datasets

### Deprecated (pending)

The following datasets are awaiting deprecation. They are replaced by new datasets.

Dataset	URL	Source	Variables	Alternative
COVID-19 disease case counts in NL	RIVM	Date, Number of positive COVID-19 disease cases in NL	rivm_NL_covid19_n...	COVID-19 case counts in NL
COVID-19 fatalities in NL	RIVM	Date, Number of COVID-19 fatalities in NL	rivm_NL_covid19_n...	COVID-19 case counts in NL
COVID-19 hospitalizations in NL	RIVM	Date, Number of COVID-19 hospitalized patients in NL	rivm_NL_covid19_n...	COVID-19 case counts in NL
Newly reported relative case counts by date in NL per municipality (PDF maps)*	RIVM	Date, Type, Number of positive COVID-19 disease cases, hospitalizations and fatalities per 100.000 people, Municipality, Province		

\* This dataset is extracted from the maps in the PDF's. The values are relative counts per 100.000 residents in the municipality.

## Inactive

The following datasets are no longer appended with new data (because RIVM is no longer providing the data).

Dataset	URL	Source	Variables	Expire date
COVID-19 disease case counts in NL*	[long format] [wide format]	RIVM	Date, Number of positive COVID-19 disease cases in NL, Municipality of residence, Municipality code (2019), Province	2020-03-30
Test count (before 2020-04-20)	Test count	RIVM	PublicatieDatum, Datum, Labs, Type, Aantal	2020-04-20

\* Nowadays, the data is published again. Please use dataset data-geo#municipal.

## Raw data

CoronaWatchNL collects copies of the raw data such that data collection is verifiable. Copies of the collected data can be found in the folder raw\_data. The data isn't standardised.

## Data collection sources

The following sources are used for data collection.

Source	Institute	Variables
<a href="https://www.rivm.nl/coronavirus-covid-19/actueel">https://www.rivm.nl/coronavirus-covid-19/actueel</a>	RIVM	National cumulative numbers and press releases
<a href="https://www.rivm.nl/coronavirus-covid-19/grafieken">https://www.rivm.nl/coronavirus-covid-19/grafieken</a>	RIVM	Case counts per day
<a href="https://www.rivm.nl/documenten/dagelijkse-update-epidemiologische-situatie-covid-19-in-nederland">https://www.rivm.nl/documenten/dagelijkse-update-epidemiologische-situatie-covid-19-in-nederland</a>	RIVM	Epidemiological report
<a href="https://ggdghor.nl/actueel-bericht/">https://ggdghor.nl/actueel-bericht/</a>	GGD-GHOR	Test data
<a href="https://www.stichting-nice.nl/">https://www.stichting-nice.nl/</a>	Stichting NICE	Intensive care numbers on COVID-19 patients
<a href="https://www.lcsp.nu/">https://www.lcsp.nu/</a>	LCPS	Intensive care numbers on COVID-19 patients
<a href="https://coronadashboard.rijksoverheid.nl/">https://coronadashboard.rijksoverheid.nl/</a>	National Dashboard	Various variables and estimations like Reproduction Index
<a href="https://covid-statistics.jrc.ec.europa.eu/">https://covid-statistics.jrc.ec.europa.eu/</a>	European Commission Joint Research Centre	Governmental measures database
<a href="https://www.uwv.nl/overuwv/personeel/overuwv-2020/gegevens-ontvangers-now-1-0-regeling.aspx/">https://www.uwv.nl/overuwv/personeel/overuwv-2020/gegevens-ontvangers-now-1-0-regeling.aspx/</a>	Employment in 2020 Agency	NOW registry

## License and academic use

The graphs and data are licensed CC0. The original data is copyright RIVM.

For academic use, use persistent data from [DOI 10.5281/zenodo.3711574](https://doi.org/10.5281/zenodo.3711574) . This is a persistent copy of the data. Version number refer to the date. Please cite:

De Bruin, J. (2020). Number of diagnoses with coronavirus disease (COVID-19) in The Netherlands (Version v2020.3.15) [Data set]. Zenodo. <http://doi.org/10.5281/zenodo.3711575>

Image from iXimus via Pixabay

## CoronaWatchNL

CoronaWatchNL is collective of researchers and volunteers in The Netherlands. We aim to make the reported number on COVID-19 disease in The Netherlands FAIR. The project is initiated and maintained by Utrecht University Research Data Management Support and receives support from Utrecht University Applied Data Science.

Help on this project is appreciated. We are looking for new datasets, data updates, graphs and maps. Please report issues in the Issue Tracker. Want to contribute? Please check out the **help wanted** tag in the Issue Tracker. Do you wish to share an application based on these datasets? Have a look at the applications folder. For predictive models, check out the parallel repository CoronaWatchNL Extended.

Please send an email to [jonathandebuin@gmail.com](mailto:jonathandebuin@gmail.com) and/or [r.voorvaart@uu.nl](mailto:r.voorvaart@uu.nl)