



PANDEM-2  
PANDEMIC PREPAREDNESS AND RESPONSE

# Dashboard Design

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Deliverable D3.2

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# PANDEM-2

## D3.2 Dashboard design

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# 1 Executive Summary

The aim of PANDEM-2 is to provide a decision support IT system that meets the real-world needs of public health agencies responsible for pandemic preparedness and response (“pandemic managers”), hospitals and first responders across Europe. It will capture and integrate pandemic-relevant data and make it accessible via an online dashboard. Additional high-priority tools for pandemic spread prediction, resource management and visual analytics will be integrated within the dashboard in order to enhance pandemic preparedness processes.

**Deliverable D3.2 is a result of deep collaborative efforts between CLAR, EPIC, NUIG (lead authors of this deliverable) and all technical and end-user partners.**

This deliverable presents the synthesized outputs from design seminars involving both end users (public health agencies, hospitals and first responders) and tool creators. The goal of the user-focused workshops was to define the requirements for the user experience, and also to discuss the design, the technical framework and the application programming interface (API) model for the integration of tools which are hosted by the dashboard.

The design process was conducted (virtually) during the first four months of the project (February 2021-May 2021) and was grounded in the Agile software development approach. Desired features of the dashboard were captured from all the end-users, and then represented as a set of user stories. The benefit of a user story is that it helps create a simplified description of a requirement from an end-user perspective, and it describes the type of user, what they want, and why they want it.

The document contains the following sections:

- An introduction to the *project background*, and the key processes that underlie pandemic planning and preparedness.
- A summary of the *user-focused approach* taken to elicit user requirements.
- A description of the *results* from our design process, which includes the main user stories, a summary of the key data entities, and an overview of the dashboard prototype.
- A summary of the impact of the deliverable, and a key point to mention is that the dashboard design and implementation process is driven by agile software development processes, and
- The appendices document containing the combined list of requirements from all the end users

We will now present each of these sections and describe in detail how each component was created and refined.

## 2 Introduction & Background

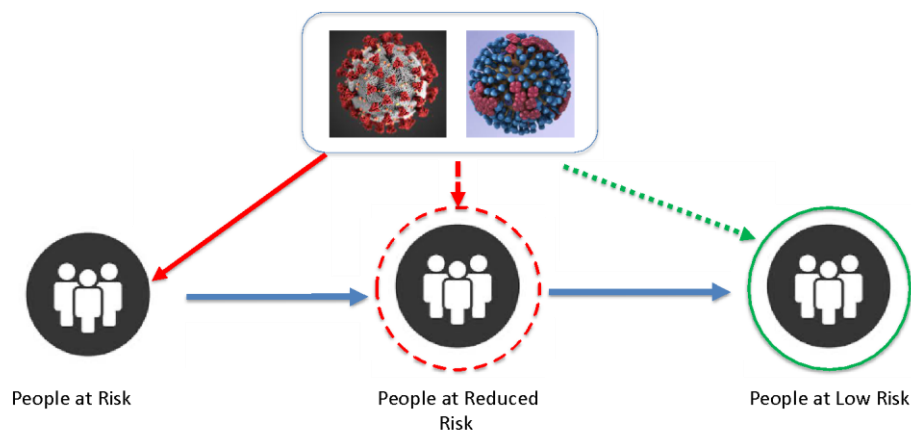
### 2.1 The Context: Health Protection

In designing a system that meets the real-world needs of public health agencies responsible for pandemic preparedness and response, awareness of the context and background of the user's needs are important. This context is health protection, which is defined as:

*“(...) the protection of individuals, groups and populations through the effective collaboration of experts in identifying, preventing and mitigating the impacts of infectious diseases and of environmental, chemical and radiological threats. It is a subset of public health—the science and art of preventing disease, prolonging life and promoting health through the organized efforts of society.”<sup>1</sup>*

In the context of infectious diseases, the aim of health protection, shown in Figure 1, is to move people who are at high risk of a novel pathogen to a situation where that risk is significantly reduced, or eliminated. Countermeasures can take the form of both pharmaceutical and non-pharmaceutical interventions, and ultimately effective vaccinations are required to provide high levels of protection and immunity to the population.

Figure 1. A view of health protection in the context of infectious diseases



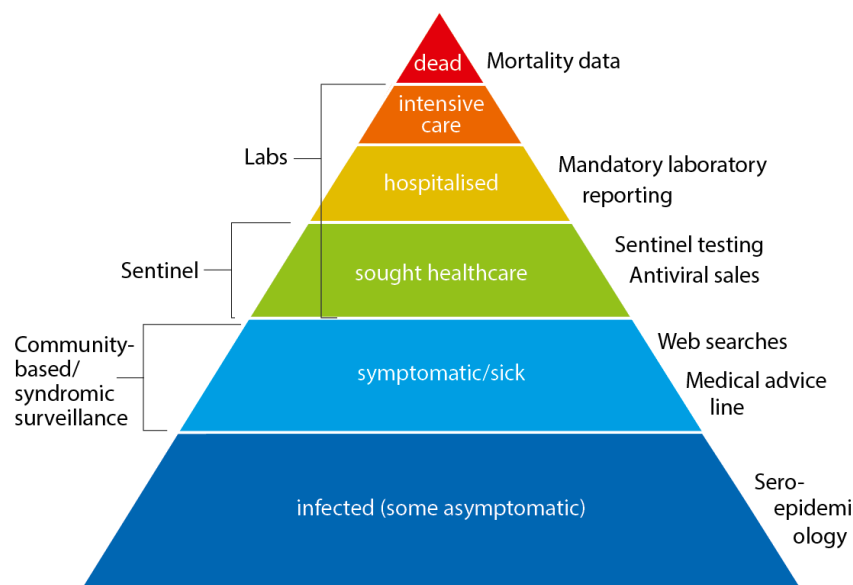
From a decision-making perspective, accurate and timely information is essential, and in the context of infectious disease outbreaks, an information pyramid, shown in Figure 2, is a valuable perspective on the information required to manage a pandemic, and the key sources of that information. This schematic reflects the characteristics of an infectious disease, where at the lower levels we have people who are infected, and a fraction of these can be asymptomatic or undocumented, and may evade detection by the health system.

<sup>1</sup> <https://academic.oup.com/ije/article/46/5/1722/3977801>



As people develop symptoms, they typically seek healthcare, and can be tested to become a confirmed case. Depending on the severity of the infection (which can vary across the population), hospitalization may be required, and in some cases (depending on the disease), patients may have to be treated in intensive care units, where health outcomes are highly dependent on availability of key resources and trained staff. Tracking mortality data is also critical during the management of a pandemic, is used to estimate epidemiological parameters, and can inform the design of effective countermeasures. Disease-specific mortality rates are an indicator for disease severity and measure of whether a treatment intervention is effective.

Figure 2. The information pyramid for infectious diseases<sup>2</sup>



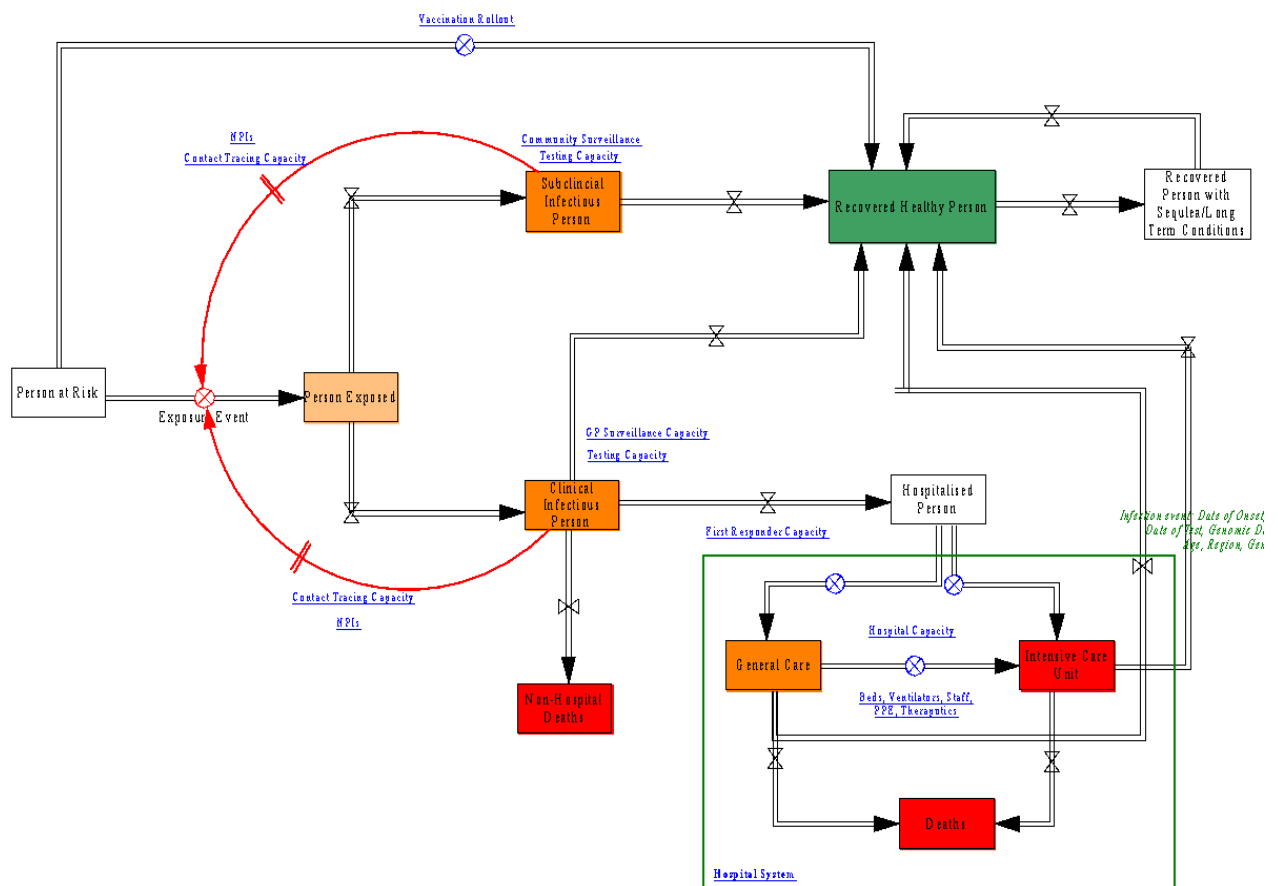
In addition to this information pyramid, another useful perspective on the pandemic preparedness and response processes is to view the *patient pathway* and their interaction points with the healthcare system, to get an indication of demands on key resources. A schematic of this pathway is shown in Figure 3, and it can be interpreted as the possible routes for a patient to “flow” through different “compartments” and interact with the healthcare system. The main points of this diagram, many of which are related to the requirements for the Dashboard, are:

- For a novel pathogen, all the population start in the “Person at Risk” compartment, which means they are at risk of being exposed to the pathogen. In the international context, exposure is normally due to the importation of the virus through air travel routes.
- An exposed person will incubate the virus and may then either move to the “Subclinical Infectious Person” or “Clinical Infectious Person”. A fraction of clinically infectious people will be recorded through the test and trace system, and so become a detected case.

<sup>2</sup> <https://images.app.goo.gl/Xz2TSv8kFVqJZsbe8>

- Non-pharmaceutical interventions (NPIs) such as social distancing can reduce the risk of exposure events, while contact tracing efforts to identify cases and quarantine will also reduce infection rates.
- People in the compartment “Clinical Infectious Person” can either recover or become ill and require hospitalization. In the hospitalization stream, patients will have an impact on key capacities, including first responders, hospital resources, and intensive care unit facilities.
- Within the hospital sector, there are compartments relating to general hospital care, and depending on the severity of the case, intensive care unit and the related resources required here.

Figure 3. Sample patient pathway and intervention points for a novel pathogen<sup>3</sup>



In summary, the value for presenting this schematic is that it indicates what information is typically generated during a pandemic, including infection event related data, shown in the green text. These information categories are also reflected in the information pyramid shown in figure 2. The majority of these information signals have been gathered as dashboard requirements and will be reflected in the upcoming user stories and dashboard designs. Before exploring these requirements in detail, the overall role of D3.2 in the context of PANDEM-2 is now summarised.

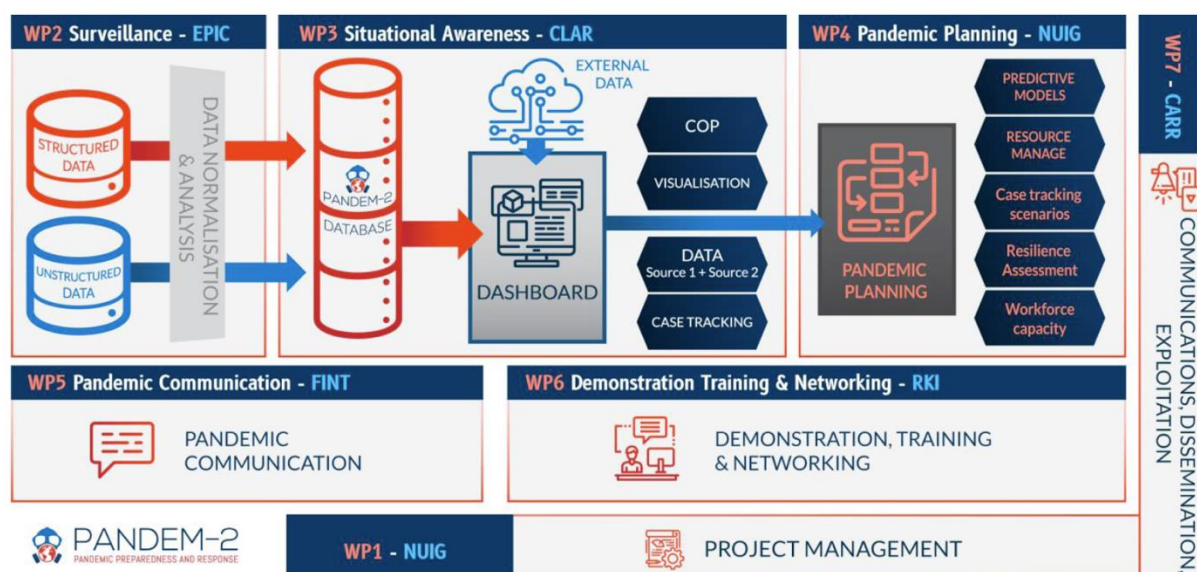
<sup>3</sup> Source ECDC:

<https://www.ecdc.europa.eu/sites/portal/files/media/en/publications/Publications/Data-quality-monitoring-surveillance-system-evaluation-Sept-2014.pdf>

## 2.2 Role of this Deliverable in the Project

Figure 4 shows the overall PANDEM-2 structure in terms of work packages<sup>4</sup>, and D3.2 is embedded within WP3, *Situational Awareness*. The dashboard will provide pandemic managers and responders with access to a suite of situational awareness services, each informed by the integrated multi-source data and by external (maps, statistics, etc.) data. As such, the dashboard realization is a critical component of the PANDEM-2 platform. The information flows from left (WP2) to right (WP3, WP4), where information is gathered, visualisation and utilised as part of the analytics process.

Figure 4. Overall project architecture, and the pivotal role of the Dashboard.



The dashboard is the main interface between the end user and the pandemic preparedness platform. To realise the dashboard the following information was needed:

- the information that end users require to make decisions.
- information regarding what types of dashboards are already in use, how these dashboards present the information to their users and how the users interact with that information.
- what information is available currently or what information will be available.

The information that end users require was collated from the end users themselves and grouped into categories. Gathering these requirements allowed technical partners to investigate what data was available and what data might be available in the future. This work fed directly into D3.1, the development of a data model, allowing the technical team to see what information would be available to the dashboard. Research into the current state of the art COVID-19 dashboards allowed the technical team to create a visualisation catalogue of how the above data was presented to the user and how they interacted with it.

<sup>4</sup> Taken from PANDEM-2 Annex 1 part B. Page 26.

Technical partners adopted an iterative process to ensure they receive information from all partners and the PANDEM-2 platform will respond to their needs. At the end of the effort, to minimize risks, a cross check was done between the efforts of CLAR, EPIC and NUIG.

The results of the requirements gathering process are being used in the following tasks which are part of WP3 and WP4.:

- Task 3.1 Database
- Task 3.2 Dashboard
- Task 3.3 Situational Awareness Tools
- Task 3.4 External APIs
- Task 4.3 Design and Implement Visual Analytics Component

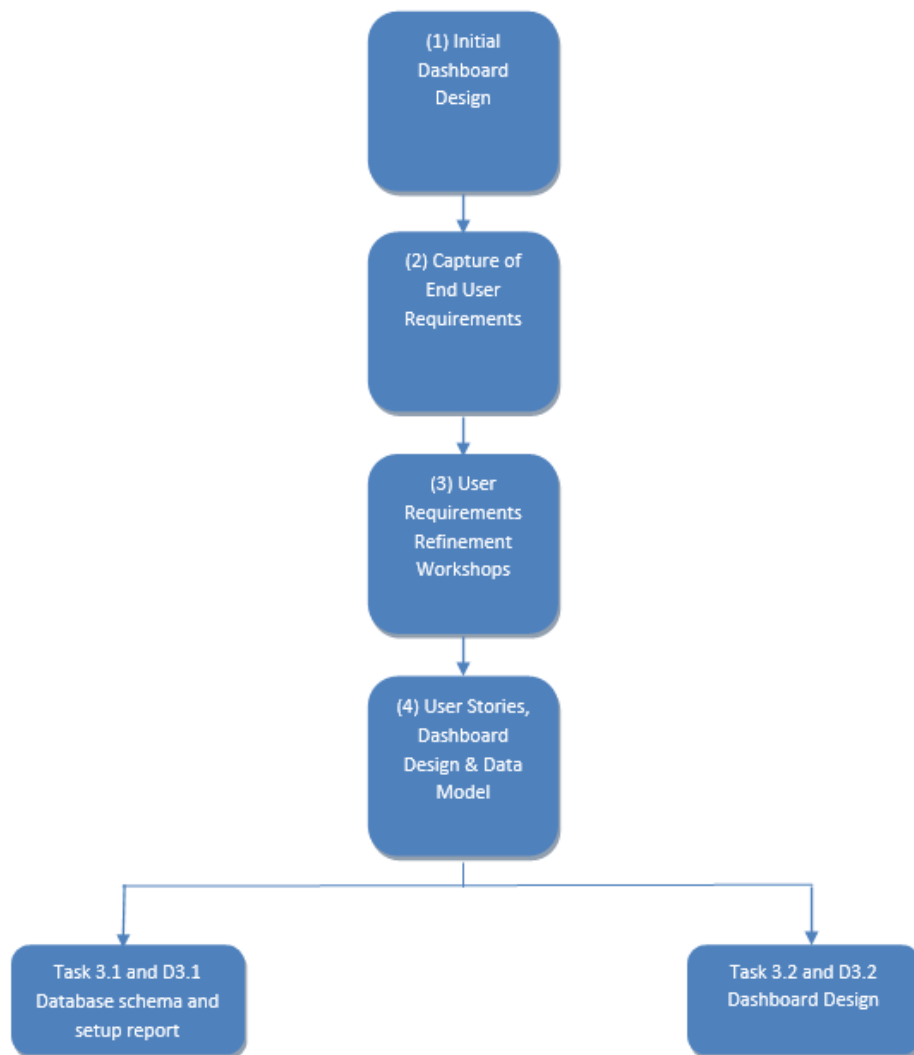
### **3 Approach**

CLAR and technology partners emphasised principles of good design from the start and throughout the entire design phase. These principles encompass the following objectives:

- (1) Understand the users' needs.
- (2) Thoroughly explore solutions and options, incorporate ideas from others.
- (3) Focus on functional design.
- (4) follow User Interface (UI) design patterns.

To accomplish this, the technical partners followed a user-centric approach that involved devising the plan, gathering initial requirements, putting in place a framework that enables innovation and collaboration, creating user stories, designing a dashboard prototype, and designing and refining a data model. The overall approach is summarised in Figure 5 below.

Figure 5. Requirements gathering and validation approach for the Dashboard design

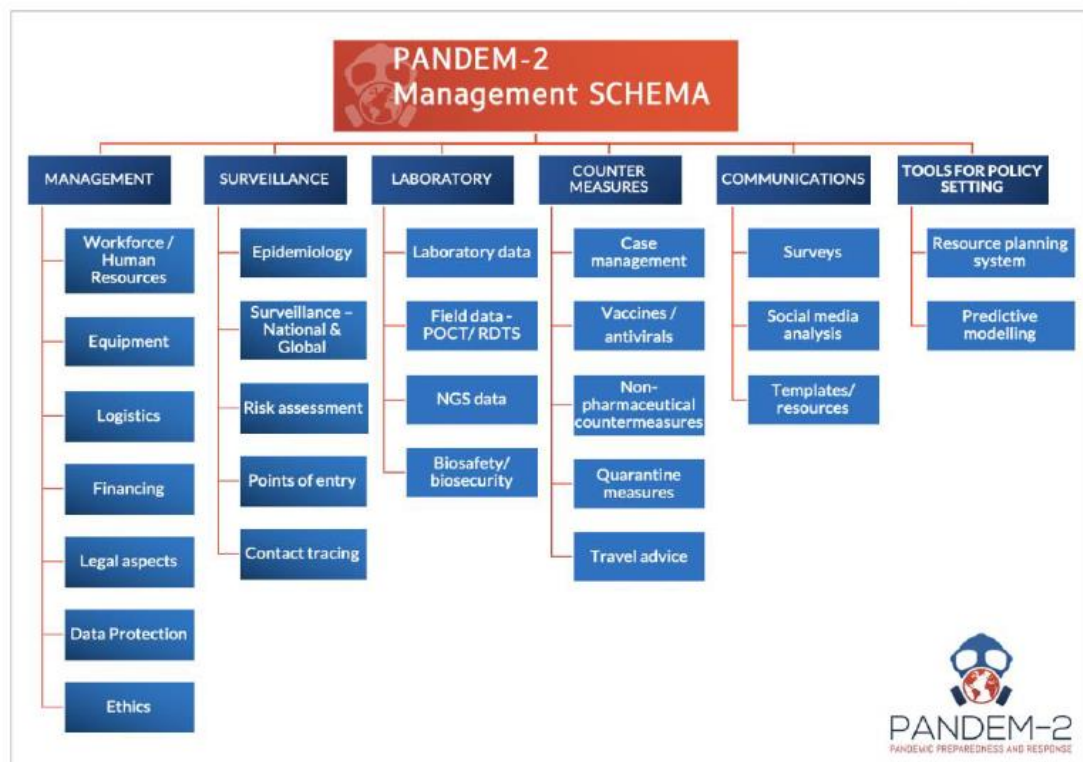


At the beginning of the project, the technology team met regularly to discuss the approach for the project development. While there were few options discussed, we wanted to make sure that having a diverse and large group of experts in the public health sector will translate very well in the implementation of the PANDEM-2 software platform. Given that many participants have interacted with dashboards related to COVID-19 and had to produce reports for their governments, we wanted to use their existing expertise and establish the baseline for what and how us, as technology partners, will need their input. Since in-person meetings and travelling were not feasible due to COVID-19 travel restrictions, we established weekly online seminars with the end users. During the first two seminars, the technical partners described their role and processes which they have been using in similar contexts. Furthermore, we described our capabilities, previous expertise, as well as detailing what is involved in modern software development.

### 3.1 Initial Dashboard Design

Plenary sessions, group sessions and individual user sessions were held in this early stage of the project. Even though users were new to each other and under the stress of the pandemic, the collaboration and active participation have grown considerably from one session to another. Based on the initial PANDEM-2 management schema detailed in PANDEM-2 Annex 1 part B (p.20) – shown in Figure 6, and on the collective experience of PANDEM-2 partners throughout the COVID-19 pandemic, the design team were in a position to leverage this initial information to present an initial design to the end-users.

Figure 6. Original data sources and tools identified for PANDEM-2 .



This preliminary dashboard design focused on the functional areas, to encourage creative thinking to explore the possible features a dashboard could provide. The main functional areas identified in this preliminary design included:

- Demographics and Regions, specifically, a feature to allow each public health agency to represent population and age cohort information through hierarchical regions, in order that this information could be used as a part of epidemiological analysis, and for resource planning purposes.
- Situational Awareness, defined as the perception of environmental elements and events with respect to time or space, the comprehension of their meaning, and the projection of their future status<sup>5</sup>. Situational awareness information captures the “as-is” situation from several

<sup>5</sup> Endsley, M.R. (1995b). "Toward a theory of situation awareness in dynamic systems". *Human Factors*. **37** (1), p. 36



perspectives: surveillance, healthcare capacity, mobility and weather/climate for the analysis of vector borne diseases.

- Case Management and Parameters, including epidemiology parameters of interest, and standing operating procedures for dealing with the clinical effects of the pathogen. It is likely that such a feature will also access document data, for example, latest reports and recommendations on how to deal with an outbreak.
- Scenarios based on models and current data, including projections for the number of cases in a given area, and also scenarios to explore the potential impact of these cases on key resources, including those of first responders, contact tracers, hospital staff, hospital beds, ICU resources, ventilators and personal protective equipment.

### 3.2 Capture of End-User Requirements

After we ensured the end-users and technical team are aligned regarding the development process, we asked the point of contact for each end-user to collect their requirements internally and send them to us for review. The PANDEM-2 consortium contains a unique group of stakeholders and end-users from public health agencies/pandemic managers (FOHM, RKI, RIVM, THL, NIPH, INSA), to first responder and front-line healthcare organisations (RUNMC, ORK, ITRC, INEM). We wanted to make this process as easy as possible for them, and not to require learning other tools. CLAR created the shared space on Google Drive for collecting the requirements. CLAR, NUIG and EPIC then added the initial set of requirements derived from the end user consultations. A sample of requirements gathered from end-users is shown in Figure 7.

Figure 7. Screenshot of requirements from end-users.

ID	Partner	Category	Sub-category	Description
RUNMC-13	RUNMC	Non functional	System Capacity	It is important for all capacity numbers to have insight in the actual consumption
RUNMC-14	RUNMC	Situational Awareness	System Capacity	# Total staff (doctors, nurses, ambulance staff, other essential staff)
RUNMC-15	RUNMC	Situational Awareness	System Capacity	# of nurses / medical staff / doctors needed per ICU bed / per clinic
RUNMC-16	RUNMC	Situational Awareness	System Capacity	# PPE (handgloves, masks, face shields etcetera)
RUNMC-17	RUNMC	Situational Awareness	System Capacity	# Ventilators
RUNMC-18	RUNMC	Situational Awareness	System Capacity	# Optiflow / availability oxygen
RUNMC-19	RUNMC	Situational Awareness	System Capacity	# Antivirals
RUNMC-20	RUNMC	Situational Awareness	System Capacity	# Desinfection
RUNMC-21	RUNMC	Situational Awareness	System Capacity	# ICU-supply
RUNMC-22	RUNMC	Situational Awareness	System Capacity	# Ambulances
RUNMC-23	RUNMC	Situational Awareness	System Capacity	# Specific resources (High Level Infection Unit), specialized nurses / medical staff / doctors
RUNMC-24	RUNMC	Situational Awareness	System Capacity	# Testing material
RUNMC-25	RUNMC	Situational Awareness	System Capacity	# Isolation status / requirements / rooms
RUNMC-26	RUNMC	Situational Awareness	System Capacity	# Staff needed for testing / vaccination
RUNMC-27	RUNMC	Situational Awareness	System Capacity	# of available vaccines (national and per institute)

To support the requirements gathering process, seminars were held where the technical team posed open ended questionnaire for end-users with a few goals in mind, namely to:

- collect additional data from each individual organization in mind.

- create a collaborative space where end-users can share and discuss their practices, processes and needs.
- spur innovation by presenting additional data points that might not be currently available to end users.

Users were encouraged to explore questions such as:

- What do you think is the best publicly available dashboard for COVID-19?
- What has been the most significant information gap during COVID-19?
- Can you think of examples where different countries have had to collaborate during COVID-19, and what was the nature of the collaboration?
- What are the most important information hospitals/responders need from public health agencies, and what is the most important information
- What do public health agencies need from hospitals/responders?
- What lessons have been learned from COVID-19 that could be useful for PANDEM-2?

Following submission of all requirements, the process moved on to the next step, which was to iterate through the requirements to refine them with groups of end-users.

### 3.3 User Requirements Refinement Workshops

To refine requirements, weekly seminars were held online. Groups were created that contained a mix of end users and technical users. Each group was led by one of the technology partners, and had at least one member from each of the technical partners. Users were grouped by their role in pandemic preparedness and response processes, to leverage the benefit of combining groups with similar background, expertise and needs. In addition to group seminars, the technical team had individual meetings and correspondence with the users to further refine the specifications. An overview of the groups is shown in Table 1.

*Table 1: Summary of working groups for refinement tasks*

	Group 1	Group 2	Group 3
<b>Chair</b>	EPIC	CLAR	NUIG
<b>End Users</b>	RIVM FOHM NIPH	THL RKI INSA	RUNMC INEM ORK ITRC
<b>Tech Partner</b>	UCL CLAR EPIC NUIG ISI	CLAR EPIC NUIG	UCL CLAR EPIC NUIG
<b>Comms/Legal Partner</b>	CARR	FINT	TRI

The process for exploring the requirements in more detail with a view to finalizing the design was that in advance of the meeting, all requirements were made available on the Google shared drive, with

comment access enabled for all users. At each user group meeting, the requirements were reviewed along with the user's comments. Tools such as Zoom Collaborate Whiteboard and Google Docs were used to discuss the requirements and provide feedback opportunities for all at the meeting. During these meetings, groups also discussed which diseases they would prioritize at the European level, and if they have any specific indicators/source suggestions for each of their requirements. Following the end-user meetings, a plenary session was hosted where each group updated the consortium on their outputs and moved towards a consensus on the overall requirements.

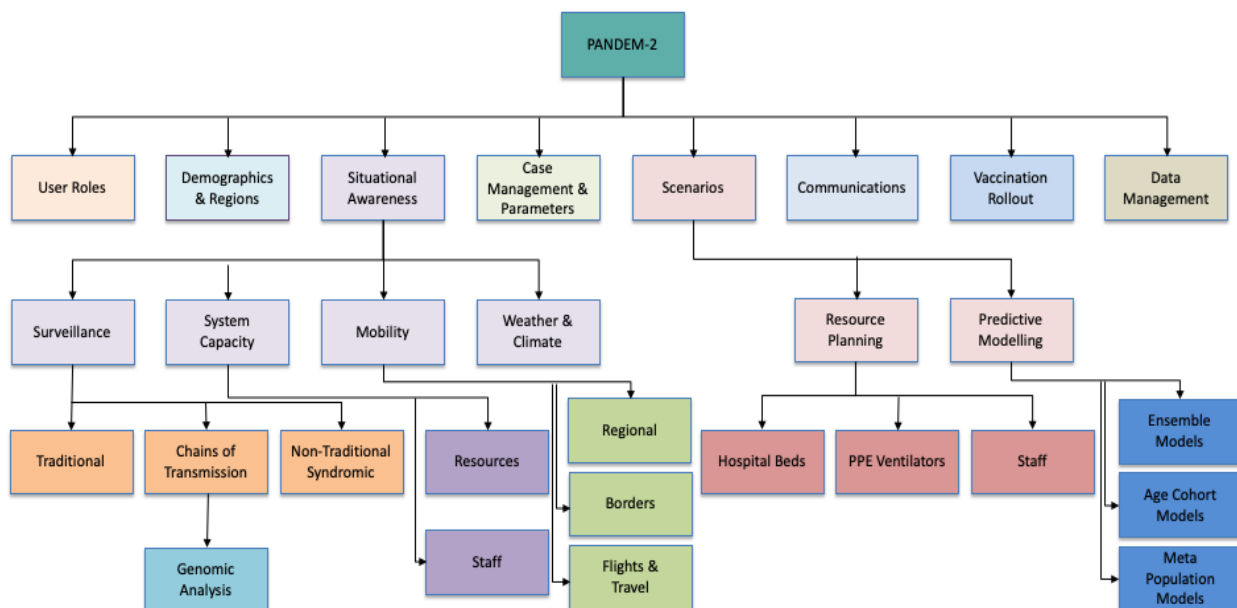
An example of such collaborative effort is the refinement done by CLAR with THL regarding THL's Requirement 1 and 2 of Map and Travel:

As a <National Pandemic Manager>, I can <see COVID-19 cases in my own country and our neighbouring countries on a municipality/hospital district level on a map/table> so I can <assess the risk of cross-border transmission and recommend travel restrictions to decision-makers>.
As a <National Pandemic Manager>, I can <see the likelihood of a disease introduction by country on a map/figure/table based on current volumes of incoming flight passengers from and disease incidence in each country/region> so I can <assess the risk of cross-border transmission and recommend travel restrictions to decision-makers>.

There were four rounds of discussions leading to a design that closely resembles the user's needs. Since THL requirements 1 and 2 had similarities, a design that comprises both was created. This effort translates into reduced implementation costs.

A functional design (Figure 8) was also developed based on this refinement process. This design captured the main elements of the refined user requirements and developed an initial dashboard design hierarchy that captured key pandemic planning and preparedness processes.

Figure 8. A functional overview of user requirements



This process of iteration and user feedback then informed the development of user stories, a detailed dashboard design, and the development of a data model.

### 3.4 User Stories, Dashboard Design, and the Data Model

The next stage in the dashboard prototype design process was writing user stories, generating dashboard designs, and building the data model. The outcome generated at this stage is described in more detail in the Results section, and here we provide a brief overview of the processes.

As an input to this process, research was carried out on the state of COVID-19 dashboards currently in use by the partners and of others that they found to be of interest. Each dashboard was analysed in terms of how they grouped topics, how they presented information, what visual tools and graphs were used, what interactions were available to the user in terms of data exploration and interrogation. Detailed notes of this information along with static images of the graphical user interface and meta data relating to these images was captured. A small visualisation cataloguing web application is in development to allow this information to be uploaded, shared, and filtered by users see [Section 7 Appendix: Visual Examples](#). Such an application will allow developers and end-users to explore the state-of-the-art Graphical User Interface (GUI) elements that are available in a wide variety of COVID-19 dashboards. Furthermore, it will allow the developers to build on the work that has taken place over the last year and a half in the existing COVID-19 dashboard development.

Given the number of user requirements from the different users, it was then decided to split the requirements based on the overall functional design (as shown in Figure 8) and how the requirements fell within that pattern. Each technical partner was given an associated list of requirements with a view to develop user stories for those requirements. The EPIC team, approaching from the position of how to fulfil the requirements in terms of data, looked at all the requirements. They developed a data model from this research, dividing the requirements into data families, the type of requirement, the variables that would be used for the requirement, the geographic nature of the requirement, the need to run modelling scenarios on the requirement, and the resources that feed into the requirement. This data model is described in Deliverable 3.1.

The nature of the requirements led to a crossover of requirements across the functional design, leading to the NUIG group creating new groupings with the goals of reducing the number of requirements to deal with, combining similar requirements, and filtering duplicate requirements. From these groupings, requirements would be combined to create user stories that would be usable across the functional design but without duplication. During this process user requirement *IDs* were tracked and linked to allow tracing of the requirements back to the original end-user and the original requirements document. User stories were then developed from these groupings and summarised as shown in the Results section. Additional examples of current best-practice dashboard design are presented in [Section 7 Appendix: Visual Examples](#).

The CLAR development team used the end-user requirements, along with user stories created by NUIG to create an interactive dashboard prototype with 50+ individual screens ([Appendix 6: Dashboard Prototype](#)). The goal of this stage was to create a functional design. The requirements have been deduplicated and compared with the results produced by NUIG team, so the development effort is optimized. CLAR has deployed widely used ideas from business and consumer applications to create a design that is innovative but remains easy to understand and adapt by end users. This includes the

following features: selectable layers on the map with various information points similar to Google maps; selectable information from timeline overlapping the traditional charts; and a “data player” which allows visualizing data evolution in time overlapped with other layers like a map similar to the weather apps. Along with the development of each user screen, the database model has been updated to ensure that the data is present in the database or can be calculated from existing fields. Moreover, this ensures that the platform is dynamic and can handle future requests without additional coding. The dashboard prototype will then be discussed with the end users for an additional round of fine-tuning in order to ensure that it accurately responds to their current and future needs. The dashboard details are linked with the user stories in the Results section, and specific details are contained in [Appendix 6: Dashboard Prototype](#).

### 3.5 Risk Analysis

Dashboard risk analysis was the phase to perform an informed design that took in consideration implementation risks. In all stages, the technology partners of the consortium have considered various risks that are: (1) inherent to software development; (2) specific to pandemic circumstances; (3) legal/privacy concerns, and (4) data availability. The design and process we employed reflected the data availability, newness of some users to software design, and lessons learned by all users from the COVID-19 pandemic.

To summarise, this section has outlined our approach to the dashboard design process. It has taken the key project aims from the original proposal into consideration. It also aligned important understandings from the European COVID-19 response, given the experiences of our end-users including public health agencies and responders. The process undertaken was based on the Agile methodology and involved a four-stage process as follows: (1) designing an initial dashboard, (2) capturing the requirements of end-users, (3) conducting user requirements refinement workshops, and finally (4) converting these requirements into user stories which informed the design of an interactive dashboard and a refined data model. The next section provides further detail on these design outputs.

## 4 Results

The results are grouped in two categories: **user stories** and **dashboard design prototype**.

### 4.1 User Stories

As discussed at the outset, the benefit of a user story is that it helps create a simplified description of a requirement from an end-user perspective. Moreover, it describes the type of user, what they want, and why they want it. The strength of this approach lies in maximising the engagement with users and focusing the attention on how the information system will best serve the needs of their processes. In the context of pandemic preparedness and response, the goal is to ensure the protection of the public through a combination of non-pharmaceutical and pharmaceutical interventions. Throughout this stage of the project, a useful approach was deployed to capture user stories and requirements, and this was:

*As a <ROLE>, I want <CAPABILITY> so I can <BENEFIT>.*

This template provided the following: (1) a focus for the role of the user; for example, this could be a public health agency planner or a first responder, (2) what they need from the system; for example, an indication of the daily test positivity rate for a region, and (3) the benefit they obtain from this information; for example, a benefit from knowing the test positivity rate would be to provide an assessment of whether the value would suggest immediate public health interventions or not. To clarify this last example, for instance, the World Health Organization have previously recommended that the percent positive tests remain below 5% for at least two weeks before governments consider reopening and relaxing non-pharmaceutical interventions<sup>6</sup>. Our approach is to present the user stories and dashboard prototype either in groups or overall categories. These broadly relate back to the original architecture of the project (as shown in Figure 4) and are informed by the process followed at the outset of the project (as shown in Figure 5).

## 4.2 Dashboard Design Prototype

The resulted dashboard prototype has been generated using Axure RP and is live at the following URL:

[https://i49g0z.axshare.com/#id=ykv7wc&p=incidents\\_overview&g=1](https://i49g0z.axshare.com/#id=ykv7wc&p=incidents_overview&g=1)

Because the prototype contains a wealth of details regarding the user interaction with the dashboard, it will allow us to gather further feedback from the end-users before actual development starts.

The individual pages have been grouped by the categories presented in the functional design, such associations can be later modified with minimal effort.

The detail of each individual page is presented in the Section 6 [Appendix: Dashboard Prototype](#) as follows:

- Surveillance
- Mobility
- System Capacity
- Scenarios
- Public Sentiment
- Vaccination Rollout
- One Health

The Epic / User Stories below contain a reference to the dashboard design for cross checking and easy navigation.

---

<sup>6</sup> <https://www.jhsph.edu/covid-19/articles/covid-19-testing-understanding-the-percent-positive.html>

## 4.3 Surveillance

### 4.3.1 Case Numbers

#### Epic / User Stories

*As a policy advisor/health care professional I want to be able to see the number of cases, stratified and broken down by age, sex, time, area, severity. I want to be able to monitor the situation, see clusters, and get an overview of how the virus is spreading over time.*

#### Overview

A detailed breakdown of the number of cases over time and in which areas is important. Cases should be filterable by a variety of characteristics where possible; including age, sex, underlying conditions, subgroup, and the type of the pathogen.

#### Data Families

Cases, Patients

#### Geographical

NUTS3, National, Municipality, Individual

#### Dashboard Prototype

The Dashboard prototype for surveillance of cases is shown in the Appendix 6.1, [Surveillance](#) section. Visualisations of current dashboards with case numbers are shown in [Appendix 7.1.1: Surveillance-Case Numbers](#).

#### Use case: Case Numbers

In terms of case surveillance the user requested queries are listed in Table 2.

*Table 2. Query information for surveillance cases*

Query	Functional Category	Links	Query Resources
Number of Cases	Situational Awareness, Scenarios	<a href="#">RUNMC-36</a> , <a href="#">ORK-14</a> , <a href="#">ORK-15</a> , <a href="#">ORK-16</a> , <a href="#">RKI-24</a> , <a href="#">RKI-26</a> , <a href="#">INEM-02</a> , <a href="#">INEM-05</a> , <a href="#">RIVM-12</a> , <a href="#">RIVM-16</a> ,	<ul style="list-style-type: none"> <li>- Total Number</li> <li>- With proven infection</li> <li>- With suspected infection</li> <li>- Severity of cases</li> <li>- Genetic subtype of pathogen</li> <li>- New cases over time/Incidence rates</li> <li>- With isolation status</li> </ul>

		<a href="#">RIVM-20</a> , <a href="#">RIVM-27</a> , <a href="#">NIPH-01</a> , <a href="#">NIPH-02</a> , <a href="#">NIPH-03</a> , <a href="#">FOHM-12</a>	<ul style="list-style-type: none"> <li>- 7 day incidence per 100,000</li> <li>- Cluster by T-SNE analysis</li> <li>- Characteristics of patients (monitor outbreak and determine at risk groups)</li> <li>- Stratified by age group</li> <li>- Stratified by sex</li> <li>- Underlying Condition</li> <li>- Stratified over time</li> <li>- Change in trend</li> <li>- Vulnerable groups</li> <li>- Effect/outcome (?) of treatment (e.g. change of hospitalisation status and/or death)</li> <li>- Personal Info: Name, personal case identifier, age, gender, address, phone, occupation</li> </ul>
View over Time			Daily, weekly, monthly, yearly
View by Area			<ul style="list-style-type: none"> <li>- Local, Regional, National, NUTS</li> <li>- Identify and visualise clusters of cases.</li> </ul>

### 4.3.2 Hospitalised

#### Epic / User Stories

*As a policy advisor/health care professional I want to be able to see the number of cases that led to hospitalisation, stratified and broken down by age, sex, time, area, severity. I want to be able to monitor the situation, observe clusters, and obtain an overview of the impact of the virus on the number of clinical cases that require hospitalisation.*

#### Overview

A detailed breakdown of the number of cases over time and in which areas is important. Cases should be filterable by a variety of characteristics where possible, including age, sex, underlying conditions, subgroup, and the type of the virus.

#### Data Families

Deaths, Cases, Patients



**Geographical**

NUTS3, National, Municipality, Individual

**Dashboard Prototype**

The dashboard prototype for surveillance of hospitalised cases is shown in Appendix 6.2, [Hospitalisations](#) section. Visualisations of current dashboards with hospitalised cases are shown in [Appendix 7.1.2: Surveillance- Hospitalised](#)

**Use case: Case Numbers**

The queries on case numbers in hospitals are listed in Table 3.

*Table 3. Queries relating to case numbers in hospitals*

Query	Functional Category	Links	Query Resources
Number of cases Hospitalised	Situational Awareness, Scenarios	<a href="#">RUNMC-38</a> , <a href="#">RUNMC-39</a> , <a href="#">RUNMC-40</a> , <a href="#">RUNMC-41</a> , <a href="#">RUNMC-42</a> , <a href="#">RUNMC-44</a> , <a href="#">RUNMC-45</a> , <a href="#">RUNMC-46</a> , <a href="#">RUNMC-47</a> , <a href="#">RKI-23</a> , <a href="#">RIVM-16</a> , <a href="#">NIPH-01</a> , <a href="#">NIPH-06</a> , <a href="#">NIPH-07</a> ,	<ul style="list-style-type: none"> <li>- Proven Infection</li> <li>- Suspected Infection</li> <li>- Department (ICU, clinic, total)</li> <li>- With Ventilation/Oxygen (# and %)</li> <li>- Status: alive, hospitalised, dead</li> <li>- Duration in Hospital</li> <li>- Patient Residency</li> <li>- Age (plus mean and standard deviation)</li> <li>- Sex</li> <li>- Underlying condition</li> <li>- Weekly incidence in a subgroups/100000</li> <li>- Proportion of cases hospitalised</li> </ul>
Time element			All of the above, if possible, filterable Daily, Weekly, Monthly, Yearly
Geography			All of the above, if possible, filterable Local, Regional, National, NUTS

### 4.3.3 Mortality

#### Epic / User Stories

*As a policy advisor/health care professional I want to be able to see the mortality of a virus, stratified and broken down by age, sex, time, area, severity. I want to be able to monitor the situation, see clusters, and get an overview of how the virus is affecting certain groups.*

#### Overview

During a pandemic Public Health officials need to have an overview of the toll of the virus. Tracking mortality is necessary for public information, policy advisors, and health care professionals. Mortality should be filterable by a variety of characteristics where possible; including age, sex, underlying conditions, subgroup, and the type of the virus.

#### Data Families

Deaths

#### Geographical

NUTS3, National, Municipality, Individual

#### Dashboard Prototype

The Dashboard prototype for surveillance of mortality is shown in Appendix 6.2, [Hospitalisations](#) section. Visualisations of current dashboards with mortality information are shown in [Appendix 7.1.3: Surveillance- Mortality](#).

#### Use case: Mortality

The queries on case numbers in hospitals are listed in Table 4.

*Table 4. Queries relating to mortality*

Query	Functional Category	Links	Query Resources
Mortality	Surveillance	<a href="#">RUNMC-41</a> , <a href="#">RKI-18</a> , <a href="#">RIVM-13</a> , <a href="#">INEM-02</a> , <a href="#">NIPH-01</a> , <a href="#">NIPH-04</a> , <a href="#">NIPH-05</a>	<ul style="list-style-type: none"> <li>- Number of Deaths</li> <li>- Age group</li> <li>- Sex</li> <li>- Subgroup (nursing home etc)</li> <li>- Mortality rates (new deaths over time)</li> <li>- Dates of deaths</li> <li>- Places of death (hospital, home, ambulance)</li> </ul>

			- Underlying condition
Time element			All of the above, if possible, filterable Daily, Weekly, Monthly, Yearly
Geography			All of the above, if possible, filterable Local, Regional, National, NUTS

#### 4.3.4 Mobility

##### User Story

*As a policy advisor/health care professional I want to be able to observe social mobility patterns, based on signals from surveys, travel information, mobile phone statistics and other indicators of mobility, in order to inform the level of non-pharmaceutical interventions required, and also to explore the impact of mobility on incidence and other key indicators.*

##### Data Families

Contact tracing

##### Geographical

NUTS3, National, Municipality, Individual

##### Dashboard Prototype

The Dashboard prototype for mobility data is included in [Appendix 6.1: Surveillance](#) ([6.1.19 – Number of Visitors](#) and [6.1.23 – Countries I can travel to](#)).

##### Use case: Mobility

The queries relating to mobility are listed in table 5.

*Table 5. Queries relating to Mobility*

Query	Functional Category	Links	Query Resources
Travel	Situational awareness	<a href="#">RIVM-42</a> , <a href="#">RIVM-18</a>	- List of countries allowed to travel.

			<ul style="list-style-type: none"> <li>- Local travel recommendations</li> <li>- Travel history of positive cases</li> </ul>
Incoming flight	Situational awareness	<a href="#">NIPH-24</a> , <a href="#">THL-02</a>	<ul style="list-style-type: none"> <li>- Number of people entering the country from abroad</li> <li>- Current volumes of incoming flight passengers</li> <li>- Disease incidence in each country/region from incoming flights</li> </ul>
Time			Daily, Weekly, Monthly
Geography			NUTS-3, regional, National, airport

## 4.4 Healthcare Capacity

### 4.4.1 Staff

#### Epic / User Stories

*As a hospital manager/Public Health official I want to be able to see the number of staff needed, and available, broken down by bed and unit type. I want to see case number figures for staff. I want to be able to see this data by hospital, by locality, by region, and nationally.*

#### Overview

During a pandemic Public Health officials need to have an overview of the resources available to them so they can make decisions regarding case management and plan for further outbreaks or surges.

A key indicator in the public health service is staff and their availability. The public health official needs to know the system capacity, in terms of staff, in various departments, and in each geography; hospital, regional, national.

This use case should track the numbers of staff available, the number of staff needed, and the type of staff. Case numbers within the staff should also be tracked.

#### Data Families

Patient, Resource

#### Geographical

NUTS3, National, Municipality, Individual

### **Dashboard Prototype**

The Dashboard prototype for healthcare capacity is included in Appendix 6.3, [Healthcare Capacity](#) section. Visualisations of current dashboards with staffing information are shown in [Appendix 7.2.1: Healthcare Capacity- Staff](#).

### **Use case: Staff**

Information regarding the availability of staff for hospital administration is important to plan for coping with the pandemic. The queries are listed in Table 6.

*Table 6. Queries related to staff resources*

Query	Functional Category	Links	Query Resources
Total number of staff/operational personnel	System Capacity, Scenarios	<a href="#">RIVM-05</a> , <a href="#">NIPH-49</a> , <a href="#">RUNMC-50</a> , <a href="#">RUNMC-14</a> , <a href="#">RUNMC-15</a> <a href="#">ORK-10</a>	<ul style="list-style-type: none"> <li>- Doctors</li> <li>- Nurses</li> <li>- Ambulance staff</li> <li>- Other essential staff</li> <li>- Specialised nurses</li> <li>- Specialised medical staff</li> <li>- Specialised doctors</li> <li>- Emergency services staff</li> </ul>
Number of Staff Needed	System Capacity, Scenarios	<a href="#">RIVM-05</a> , <a href="#">NIPH-49</a> , <a href="#">RUNMC-50</a> , <a href="#">ORK-12</a>	<ul style="list-style-type: none"> <li>- Total Number</li> <li>- Each type of staff needed per ICU bed and per clinic</li> <li>- Baseline</li> <li>- Surge Number</li> <li>- Triage</li> </ul>
Number and percentage of staff available	Scenarios	<a href="#">RIVM-05</a> , <a href="#">NIPH-49</a> , <a href="#">RUNMC-50</a>	<ul style="list-style-type: none"> <li>- Baseline</li> <li>- Surge Number</li> <li>- Triage</li> </ul>
Number of staff tested positive	Scenarios	<a href="#">RUNMC-50</a>	<ul style="list-style-type: none"> <li>- Scenarios</li> <li>- Per day and total</li> <li>- No tested vs total % positive in current week per week</li> <li>- Housemates per day &amp; total.</li> <li>- Housemates - no tested vs tidal % positive in current week per week.</li> </ul>

Number of Absent Staff	Scenarios	<a href="#">RUNMC-51</a>	- of total staff - No of absent staff (critical to care): % per function category and total % per day % per day per function
Capability of trained staff	System Capacity	<a href="#">RKI-21</a>	
View over Time			Daily, Weekly, Monthly, Yearly
View by Area			Local, Regional, National, NUTS

#### 4.4.2 Beds

##### Epic / User Stories

*As a hospital manager I want to be able to see the number of beds needed, and available, broken down by bed and unit type, and the length of time the bed is in use. I want to be able to see this data by hospital, by locality, by region, and nationally.*

##### Overview

A key indicator in the public health service is the number of beds and their availability. Public health officials need to know the system capacity, in terms of beds, which departments they are in, which hospital they are in, and which broader geographical locations they are in, regional or national. This use case should track admissions, the numbers of beds available, the number of beds needed, how long those beds are used for, and when they are freed.

##### Data Families

Patient, Resource

##### Geographical

NUTS3, National, Municipality, Individual

##### Dashboard Prototype

The Dashboard prototype for healthcare capacity is included in Appendix 6.3, [Healthcare Capacity](#) section. Visualisations of current dashboards with bed information are shown in [Appendix 7.2.1: Healthcare Capacity- Beds](#).

**Use case: Beds**

The queries for beds as a capacity resource are listed in Table 7.

*Table 7. Queries related to beds as a capacity resource*

Query	Functional Category	Links	Query Resources
Number of Admissions and of discharges	System Capacity	<a href="#">NIPH-11</a>	<ul style="list-style-type: none"> <li>- Per hospital per day</li> <li>- Change to previous days numbers</li> <li>- vs capacity of emergency depts</li> </ul>
Average Length of Stay	System Capacity, Case Management	<a href="#">NIPH-44</a> , <a href="#">NIPH-46</a> , <a href="#">RIVM-03</a>	<ul style="list-style-type: none"> <li>- Per Hospital</li> <li>- Per ICU</li> <li>- How often are patients moved between hospitals?</li> </ul>
Number of specific resources	System Capacity	<a href="#">RUNMC-23</a>	<ul style="list-style-type: none"> <li>- High Level Infection Unit</li> </ul>
Isolation Rooms	System Capacity	<a href="#">RUNMC-25</a>	<ul style="list-style-type: none"> <li>- Available</li> <li>- Occupied</li> <li>- Total Capacity</li> </ul>
ICU Capacity	System Capacity	<a href="#">RUNMC-48</a> , <a href="#">NIPH-50</a> , <a href="#">RKI-19</a> , <a href="#">RIVM-02</a> , <a href="#">NIPH-11</a> , <a href="#">INEM-03</a>	<ul style="list-style-type: none"> <li>- Available</li> <li>- Occupied</li> <li>- Total Capacity</li> <li>- Pathogen-specific capacity</li> <li>- Differentiated by beds with invasive ventilation technique &amp; trained personnel to operate</li> <li>- Proven cases</li> <li>- Suspected cases</li> <li>- Non-infected cases</li> </ul>

Clinic Capacity	System Capacity	<a href="#">RUNMC-49</a> , <a href="#">NIPH-50</a> , <a href="#">RKI-19</a> , <a href="#">RIVM-02</a> , <a href="#">NIPH-11</a> , <a href="#">INEM-03</a>	<ul style="list-style-type: none"> <li>- Available</li> <li>- Occupied</li> <li>- Total Capacity</li> <li>- Proven cases</li> <li>- Suspected cases</li> <li>- Non-infected cases</li> </ul>
Other Bed Capacity	System Capacity	<a href="#">NIPH-50</a> , <a href="#">RKI-19</a> , <a href="#">RIVM-02</a> , <a href="#">NIPH-11</a> , <a href="#">INEM-03</a>	<ul style="list-style-type: none"> <li>- Available</li> <li>- Occupied</li> <li>- Total Capacity</li> <li>- Proven cases</li> <li>- Suspected cases</li> <li>- Non-infected cases</li> <li>- Infected with other pathogen</li> <li>- Beds dedicated to infectious disease cases</li> </ul>
View over Time			Daily, Weekly, Monthly, Yearly
View by Area			Local, Regional, National, NUTS

#### 4.4.3 Pre-Hospital/Emergency

##### Epic / User Stories

*As an emergency service manager, I want to be able to monitor the evolution of the pandemic, hospital pressure in the emergency services, and compare it to non-pandemic situations*

##### Overview

During a pandemic emergency services need an overview of the resources available to make decisions regarding call-out, case management, and planning for outbreaks or surges. A key indicator are emergency calls, their types, and the resources and staff needed to deal with them.

##### Data Families

Emergency calls

##### Geographical

NUTS3, National, Municipality, Individual



### **Dashboard Prototype**

The Dashboard prototype for healthcare capacity is included in [Appendix 6.3: Healthcare Capacity](#). Visualisations of current dashboards are shown in [Appendix 7.2.3: Healthcare Capacity- Pre-Hospital/Emergency](#).

### **Use case: Pre-Hospital/Emergency**

The queries related to the pre-hospital/emergency stage of the process are listed in Table 8.

*Table 8. Prehospital/Emergency queries*

Query	Functional Category	Links	Query Resources
Emergency Line Calls	System Capacity	<a href="#">INEM-04</a> , <a href="#">INEM-05</a>	<ul style="list-style-type: none"> <li>- Number of emergency line calls</li> <li>- Severity of medical emergencies</li> <li>- Severity of victims at scene</li> <li>- Specific/adapted action protocols</li> <li>- Number of potentially related case calls (fever/cough)</li> <li>- Number of cases identified in the first contact</li> </ul>
Transports	Case Management	<a href="#">INEM-04</a>	<ul style="list-style-type: none"> <li>- Number of transports to hospital carried out</li> <li>- Proven</li> <li>- Suspected</li> <li>- Non-covid</li> </ul>
Comparative Monitoring	System Capacity	<a href="#">INEM-04</a>	<ul style="list-style-type: none"> <li>- Comparative monitoring in relation to non-pandemic periods: Number of acute myocardial infarction, strokes, out-of-hospital cardiac arrests, trauma, etc. (indicators with the highest prevalence in morbidity and mortality).</li> </ul>

View over Time			Daily, Weekly, Monthly, Yearly
View by Area			Local, Regional, National, NUTS

#### 4.4.4 Resources

##### Epic / User Stories

*As a hospital manager, I want to be able to see information about PPE stock for purchasing and distribution. I want to be able to see the Intensive Care Units (ICUs) medical resources such as drugs, supplies and equipment for case management and planning purposes.*

##### Overview

The health care supply encountered unprecedented strain over the past year due to the high demand for personal protective equipment and other medical supplies during peak periods of the COVID-19 pandemic. The public health official needs to know the system capacity, in terms of PPE, ventilators, optiflow, oxygen capacity, antivirals, among other at hospital, regional, national level.

##### Data Families

Resource capacity, Cases, Patient, Transport

##### Geographical

NUTS3, National, Health institute, hospital

##### Dashboard Prototype

The Dashboard prototype for resources as part of healthcare capacity is included in [Appendix 6.3: Healthcare Capacity](#). Visualisations of current dashboards are shown in [Appendix 7.2.4: Healthcare Capacity- Resources](#).

##### Use case: Insight into Resources

The queries related to PPE and medical resources are listed in Table 9.

*Table 9. Queries related to resources*

Query	Functional Category	Links	Query Resources
ICU Supply	System capacity	<a href="#">NIPH-11</a> <a href="#">NIPH-51</a> <a href="#">RUNMC-17</a>	- Number of Ventilators - Number of Optiflow

		<a href="#">RUNMC-18</a> <a href="#">RUNMC-19</a> <a href="#">RUNMC-20</a> <a href="#">RUNMC-21</a>	- Number of availability oxygen - Number of Disinfection - Number of Antivirals
Personal Protective Equipment (PPE) Stock		<a href="#">RKI-22</a> <a href="#">RUNMC-16</a> <a href="#">RIVM-01</a> <a href="#">NIPH-52</a>	- Number of PPE - Type PPE (hand gloves, masks, face shields etcetera) - Stock availability
Prehospital Resource Planning	System Capacity, Scenario	<a href="#">ORK-11</a> <a href="#">INEM-06</a> <a href="#">RUNMC-22</a>	- Operational resources (e.g., cars, tents) <ul style="list-style-type: none"> <li>• Over time</li> <li>• totals</li> </ul> - Number of Ambulances.
View by Area			National, regional, health institute, hospital

#### 4.4.5 Laboratories

##### Epic / User Stories

*As a healthcare manager I want to ensure that there are enough laboratories, materials that can be used for testing during the outbreak. I want to be able to see this data by laboratory, county, region, and nationally*

##### Overview

Test and trace systems used by public health need to perform laboratory testing to help identify symptomatic individuals infected with coronavirus. The signs and symptoms of the coronavirus can overlap with those of other respiratory pathogens. An overview of the current laboratories situation will help to have an adequate stock of materials used for testing.

##### Data Families

Tests, Lab

##### Geographical

Vaccination Centre up to National.

### **Dashboard Prototype**

The Dashboard prototype for laboratory information as part of healthcare capacity is included in [Appendix 6.3: Healthcare Capacity](#). Visualisations of current dashboards are shown in [Appendix 7.2.5: Healthcare Capacity- Laboratories](#).

### **Use case: Laboratories**

The queries relating to laboratory resources and testing are listed in Table 10.

*Table 10. Queries related to laboratories*

Query	Functional Category	Links	Query Resources
Laboratory	System Capacity,	<a href="#">RIVM-04</a> <a href="#">NIPH-15</a>	- Proportion of laboratories with exceeded capacity - Diagnostic lab capacity
Reagents stocks	System Capacity	<a href="#">RUNMC-24</a> <a href="#">NIPH-16</a>	- Material available - Proportion of laboratories with zero reagents stocks - Type
Time			Daily, Weekly, Monthly
Geography			per laboratory, county and country

## **4.5 Contact Tracing**

### **4.5.1 Staff**

#### **Epic / User Stories**

*As a healthcare manager, I want to be able to see the number of staff needed, and available, for testing and contact tracing. I want to be able to see this data by hospital, by locality, by region, and nationally.*

#### **Overview**

Test and trace systems are core components of the public health response in addition to other measures such as social distancing. The opportune and accurate testing ensures that anyone who develops symptoms can quickly be tested and close recent contacts should be traced. Public health officials should have an overview of the testing and contact tracing workforce. Thus, they can guarantee an adequate response to control the epidemic.

**Data Families**

Tests

**Dashboard Prototype**

The Dashboard prototype for vaccination data is included in [Appendix 6.3: Healthcare Capacity](#). Visualisations of current dashboards are shown in [Appendix 7.3.1: Contact Tracing: Staff](#).

**Geographical**

NUTS3, locality, region, and nationally.

**Use case: Staff**

The queries related to contact tracing staff are listed in Table 11.

*Table 11. Queries relating to contact tracing staff*

Query	Functional Category	Links	Query Resources
Total number of staff/operational personnel	System Capacity, Scenarios	<a href="#">RIVM-06</a> <a href="#">RIVM-08</a> <a href="#">RUNMC-26</a>	- Total - For testing facility - For contact tracing; available & needed
Time			Daily, Weekly, Monthly
Geography			Regional, National

**4.5.2 Tests****Epic / User Stories**

*As a healthcare officer, I want to see the number of people tested, number and percentage of tested positive to accurately monitor the disease transmission rates and severity, to detect clusters and to isolate people testing positive.*

**Overview**

The public health official needs to know the system capacity in terms of testing. Tracking key indicators are necessary for general information, policy advisors, and patient management.

**Data Families**

Tests

**Geographical**

NUTS-3, city, county and country

**Dashboard Prototype**

The Dashboard prototype for test data is included in [Appendix 6.1: Surveillance \(6.1.14 – Tested Persons\)](#). Visualisations of current dashboards are shown in [Appendix 7.3.2: Contact Tracing: Test](#).

**Use case: Tests**

The queries related to contact tracing tests are documented in Table 12

*Table 12. Queries relating to contact tracing tests*

Query	Functional Category	Links	Query Resources
Tests	System Capacity, Scenarios	<a href="#">NIPH-12</a> <a href="#">NIPH-13</a> <a href="#">NIPH-14</a> <a href="#">RUNMC-17</a> <a href="#">RUNMC-37</a>	- Total - Type - Number of test performed - Number of people tested - Number tested positive - Percentage tested positive
Testing Capacity	System Capacity	<a href="#">RIVM-07</a>	- Capacity of testing in the field
Time			Daily, Weekly, Monthly
Geography			City, County and Country

**4.5.3 Trace Contacts****Epic / User Stories**

*As a healthcare manager, I want to be able to track the contact tracing performance.*

**Overview**

Public Health officials aim to reduce infections in the population by tracing the contacts of infected individuals. To achieve this, Public Health officials need to have an overview of the contact tracing performance over time.

**Data Families**

Tests, Contact Tracing

**Geographical**

NUT-3, regional, National

**Dashboard Prototype**

The Dashboard prototype for contact tracing data is included in [Appendix 6.1: Surveillance \(6.1.15 – Monitored Contacts\)](#). Visualisations of current dashboards are shown in [Appendix 7.3.3: Contact Tracing](#).

**Use case: Contact Tracing**

The queries relating to contact tracing contacts are listed Table 13.

*Table 13. Queries relating to contact tracing*

Query	Functional Category	Links	Query Resources
Contact Tracing	System Capacity, Scenarios	<a href="#">RIVM-21</a>	- Performance (e.g. time from contact to index case until implementation of measures)
Performance	System Capacity	<a href="#">RKI-25</a>	- Number of contact tracing possible under the current situation - Percentage of those contacts positive infected
Time			Daily, Weekly, Monthly
Geography			NUT-3, regional, National

## 4.6 Interventions

### Epic / User Stories

*As a policy maker, I want to be able to see the intervention applied and the impact on the number of cases over time broken down by country, and intervention type.*

### Overview

To assess the effectiveness of interventions to inform future preparedness response plans, public health officers need to know which intervention was applied over time and their impact on the disease spread.

### Data Families

Cases, Measures

### Geographical

NUTS3, National, Municipality, Individual

### Dashboard Prototype

The dashboard prototype for intervention data is included in [Appendix 6.5: Interventions](#).

Visualisations of current dashboards are shown in [Appendix 7.4: Interventions](#).

### Use case: Insight into Intervention.

In terms of policy interventions and their effects the related queries are listed in Table 14.

*Table 14. Queries relating to interventions and decisions and their effects*

Query	Functional Category	Links	Query Resources
Intervention	Case management	<a href="#">NIPH-48</a>	<ul style="list-style-type: none"> <li>- The type of intervention</li> <li>- Timeframe of the intervention applied</li> <li>- The effects of the intervention</li> </ul>
Quarantine	Case management	<a href="#">RUNMC- 33</a> <a href="#">NIPH- 47</a>	<ul style="list-style-type: none"> <li>- Quarantine introduction</li> <li>- Lift quarantine</li> <li>- Quarantine extension</li> <li>- Duration</li> </ul>



Decisions vs impact	Scenarios	<a href="#">ORK-20</a> <a href="#">ORK-23</a>	<ul style="list-style-type: none"> <li>- Epicurve combined with decisions made</li> <li>- Which interventions had the greatest impact</li> <li>- Decisions' impact over time in other countries</li> </ul>
View by Area			Territory unit, county, country

## 4.7 Disease Profile

### Epic / User Stories

*As a public health official/ epidemiologist, I want to be able to see the characteristics of the pathogen spread to estimate effectiveness of countermeasures.*

### Overview

Understanding the parameters that influence the course of an epidemic is key for health-related decision-making. It allows for planning strategies to control diseases as well as providing care to those infected and sick.

### Data Families

Referential, Cases

### Geographical

NUTS3, National, Municipality, Individual

### Dashboard Prototype

The Dashboard prototype for Disease Profile is included in [Appendix 6.6: Disease Profile](#). Visualisations of current dashboards are shown in [Appendix 7.5: Disease Profile](#).

### Use case: Insight Virus profile

The queries related to the virus profile are listed in Table 15.

Table 15. Queries relating to disease profile

Query	Functional Category	Links	Query Resources
Virus Information	Case management	<a href="#">RUNMC-28</a> <a href="#">RUNMC-29</a> <a href="#">RUNMC-30</a> <a href="#">RUNMC-31</a> <a href="#">RUNMC-34</a>	<ul style="list-style-type: none"> <li>- Latency time</li> <li>- Vector</li> <li>- Host</li> <li>- Symptoms</li> <li>- Information on contagiousness</li> </ul>
Epidemic Parameter	Case management	<a href="#">ORK-24</a> <a href="#">RIVM-22</a> <a href="#">NIPH-45</a>	<ul style="list-style-type: none"> <li>- Epidemiological params from other countries (incidence rate, mortality rate, reproduction rate, etc )</li> <li>- Incubation period</li> <li>- Susceptibility</li> <li>- Infectiousness</li> <li>- Differentiate epidemiological parameters based on source (primary care, hospital care, long term care)</li> </ul>

## 4.8 Vaccines

### 4.8.1 Vaccine Delivery

#### Epic / User Stories

*As a policy advisor/health care professional, I want to be able to see the current situation with vaccinations, stratified and broken down by availability, type, time, area.*

#### Overview

During a pandemic, Public Health officials need to have an overview of the response to the pathogen. Tracking the vaccination numbers is necessary for public information, policy advisors, and healthcare professionals. A detailed breakdown of vaccinations over time and in which areas is important.

#### Data Families

Hospital Resources, Public Health Resources, Lab

**Geographical**

NUTS3, Local, Regional, National

**Dashboard Prototype**

The Dashboard prototype for vaccination data is included in [Appendix 6.7: Vaccinations](#).

Visualisations of current dashboards are shown in [Appendix 7.6.1: Vaccines- Vaccine Delivery](#).

**Use case: Vaccine: Delivery**

The queries related to vaccine delivery are listed in table 16.

*Table 16. Queries relating to Vaccine Delivery*

Query	Functional Category	Links	Query Resources
Vaccine Delivery	Case Management, Scenarios, Surveillance	<a href="#">RUNMC-27</a> , <a href="#">RUNMC-35</a> , <a href="#">RIVM-10</a> , <a href="#">RKI-29</a> , <a href="#">NIPH-53</a> , <a href="#">NIPH-54</a>	- Vaccination rates - Types of antiviral and vaccine - Availability of each type: - Delivery schedule
Time element			All of the above, if possible, filterable Daily, Weekly, Monthly, Yearly
Geography			All of the above, if possible, filterable Local, Regional, National, NUTS

**4.8.2 Vaccine Staff****Epic / User Stories**

*As a Healthcare Manager, I want to be able to see how much staff is available and needed for vaccination sites.*

**Overview**

During a pandemic, Public Health officials need to have an overview of the response to the virus. Tracking the required staff and their availability to deliver vaccinations are essential aspects to manage the vaccine rollout. A detailed breakdown of staff availability over time and in which areas is important.

**Data Families**

Hospital Resources, Public Health Resources

**Geographical**

NUTS3, National, Municipality, Individual

**Dashboard Prototype**

The Dashboard prototype for vaccination data is included in [Appendix 6.7: Vaccinations](#).

Visualisations of current dashboards are shown in [Appendix 7.6.2: Vaccines- Vaccine Staff](#).

**Use case: Vaccine: Staff**

The queries related to staff requirements and availability and listed in table 17.

*Table 17. Queries relating to Staff resources for Vaccination*

Query	Functional Category	Links	Query Resources
Vaccine Staff	Surveillance	<a href="#">RIVM-09</a> , <a href="#">RUNMC-26</a>	- Needed for vaccinations - Available for vaccinations
Time element			All of the above, if possible, filterable Daily, Weekly, Monthly, Yearly
Geography			All of the above, if possible, filterable Local, Regional, National, NUTS

**4.8.3 Vaccine Scenarios****Epic / User Stories**

*As a Healthcare manager, I want to see the expected number of vaccine deliveries over time and the required staff at vaccinations sites to apply these vaccines. I want to see estimates under various delivery scenarios. With this information, I will be able to plan and see how different outcomes will affect the availability of staff and vaccines.*

**Overview**

During a pandemic, Public Health Officials need to have an overview of the response to the virus. Tracking different scenarios, and how they affect staff and vaccinations, is necessary to plan for the vaccination rollout.

**Data Families**

Vaccination

**Geographical**

Vaccination centre up to National.

**Dashboard Prototype**

The Dashboard prototype for vaccination data is included in [Appendix 6.7: Vaccinations](#).

Visualisations of current dashboards are shown in [Appendix 7.6.3: Vaccines- Scenarios](#).

**Use Case: Vaccine Scenarios**

The queries relating to vaccination modelling scenarios are listed in table 18.

*Table 18. Queries relating to vaccination scenarios*

Query	Functional Category	Links	Query Resources
Vaccine Staff	Surveillance	<a href="#">NIPH-53</a> , <a href="#">NIPH-54</a> , <a href="#">RIVM-09</a> , <a href="#">RIVM-10</a>	- Needed for vaccinations - Available for vaccinations
Geography			All of the above, if possible, filterable Vaccination centre to National

## 4.9 Scenarios

### 4.9.1 Epi Cases

#### Epic / User Stories

*As a policy advisor/health care professional, I want to obtain estimates over time under various scenarios for reported and true incidences. I want to see those estimates at national and regional levels. I want to be able to disaggregate the estimates by age. I want this information so that I can make informed decisions.*

#### Overview

Pandemic management is a complex task in which public health officials would like to evaluate the likely impact of proposed strategies before implementing them. Consequently, scenario modelling should be available to officers; simulation models, and a set of modifiable parameters that represent policy-making decisions whereby they can quantify (expected behaviour and uncertainty) the effects of their decisions on future incidence at aggregated and disaggregated levels.

#### Data Families

Cases, Geographical

#### Geographical

National

#### Visualisations

Visualisations of current dashboards are shown in [Appendix 7.7.1: Scenarios- Epi Cases](#).

#### Use case: Cases: Scenarios

The resources for modelling scenarios are listed in table 19.

*Table 19. Queries relating to epi cases scenarios*

Query	Functional Category	Links	Query Resources
Simulation model	Scenarios	<a href="#">ORK-19</a> , <a href="#">RKI-12</a> , <a href="#">RIVM-14</a> , <a href="#">RIVM-49</a> , <a href="#">FOHM-08</a>	<ul style="list-style-type: none"> <li>- Linear and exponential</li> <li>- Stratified by age</li> <li>- Stratified over time</li> <li>- Stratified by region - where are people likely to acquire infections</li> </ul>

			- Filterable by department: ICU, clinic, other - Predict Infection trends
View over Time			Daily, Weekly, Monthly, Yearly
View by Area			- National, NUTS

## 4.9.2 Hospital Cases

### Epic / User Stories

*As a public health official, I want to be able to see how different scenarios might affect capacity. I want to be able to provide data to a model and have it return scenarios in relation to beds, staff, and workload.*

### Overview

During a pandemic, public health officials have to try and plan beyond the immediate present. Providing them with a predictive modelling service will allow them to test various scenarios so they can plan accordingly.

### Data Families

Hospital resources, Hospitalisations, Patient transfers

### Geographical

NUTS3, National, Municipality, Individual

### Visualisations

Visualisations of current dashboards are shown in [Appendix 7.7.2: Scenarios- Hospital Cases](#).

### Use case: Insight into Hospital capacity: Scenarios

The queries related to hospital capacity scenario and availability are listed in table 20.

Table 20. Queries relating to hospital cases scenario

Query	Functional Category	Links	Query Resources
Need for Beds	System Capacity, Scenarios	<a href="#">ORK-21</a> , <a href="#">RIVM-02</a> , <a href="#">RKI-19</a> , <a href="#">NIPH-11</a> , <a href="#">INEM-03</a> , <a href="#">RUNMC-48</a> , <a href="#">RUNMC-49</a> , <a href="#">FOHM-09</a>	- Uncertainty should be made clear
Need for Staff	System Capacity, Scenarios	<a href="#">RIVM-05</a> , <a href="#">RUNMC-50</a> , <a href="#">NIPH-49</a>	
Transport of patients	Scenarios, Situational Awareness	<a href="#">INEM-07</a> , <a href="#">INEM-08</a>	- Will it be necessary to make transfers between hospitals? - Will it be necessary to activate a mass patient transport response?
Workload	Scenarios	<a href="#">RUNMC-52</a>	- defined as “the number of clinical days” and “the number of ICU treatment days” - ICU days: <ul style="list-style-type: none"> <li>● Number of Infection related care per week</li> <li>● Number of Non-infection related care per week</li> </ul> - Clinic days <ul style="list-style-type: none"> <li>● Number of Infection related care per week</li> <li>● Number of Non-infection related care per week</li> </ul> - Combinations of the above - Number of treatment days that are registered with a “standard care product” per day, per week, per month.



## 5 Impact & Conclusion

The objective was to design in an agile manner the dashboard in consultation with our public health stakeholders and responders.

The iterative and inclusive approach taken has contributed to a dashboard design that captures the requirements of the end user. The process of refining the requirements and developing user stories will allow prioritisation of requirements within the dashboard, delivering the most sought-after requirements first. The development of the data model, see Deliverable D3.1, will allow further refinement of the requirements based on what is available or likely to be available. The research of current dashboards and the development of a visual catalogue will allow the development of a familiar, user centred dashboard.

The user stories resulting in the dashboard design have been added to the JIRA project management tool and have been linked in the requirements list for future references. Having a deduplicated list and combined similar user requirements, the development time will be reduced.

The dashboard prototype will allow the tech team to further refine the decision support tools through end user interaction and feedback. As such, this is a living document and design will continue to be refined throughout the development of the dashboard and platform.

## 6 Appendix: Dashboard Prototype

The user can select individual widgets to be presented on the main dashboard or can view further details on separate pages. Such widget details are presented in this appendix and grouped as follows:

- Surveillance
- Mobility
- System Capacity
- Scenarios
- Public Sentiment
- Vaccination Rollout
- One Health

The resulted dashboard prototype has been generated using Axure RP and is live at the following URL:

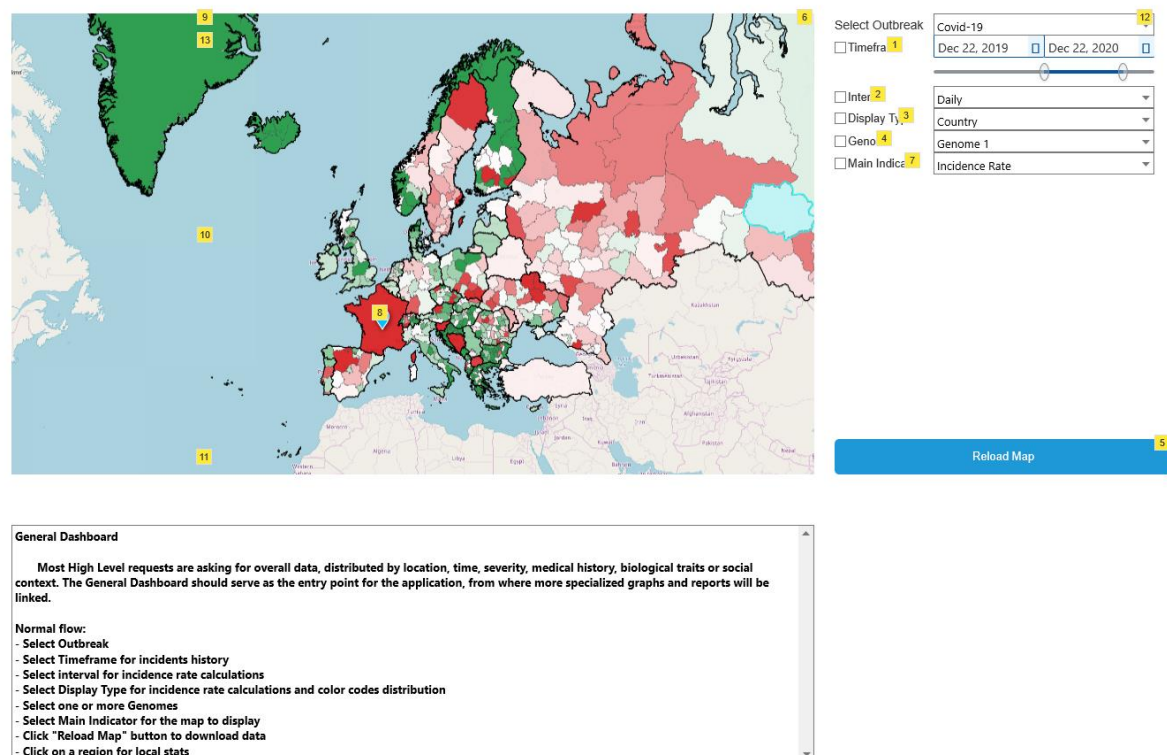
[https://i49g0z.axshare.com/#id=ykv7wc&p=incidents\\_overview&g=1](https://i49g0z.axshare.com/#id=ykv7wc&p=incidents_overview&g=1)

### 6.1 Surveillance

#### 6.1.1 Incidence Overview

##### 6.1.1.1 User Interface

Figure 9. Prototype for a general dashboard page<sup>7</sup>



<sup>7</sup> <https://images.app.goo.gl/W2UU4uwRFtUEKcN9>

### 6.1.1.2 User Stories

Table 21. User stories and tasks for the general dashboard prototype

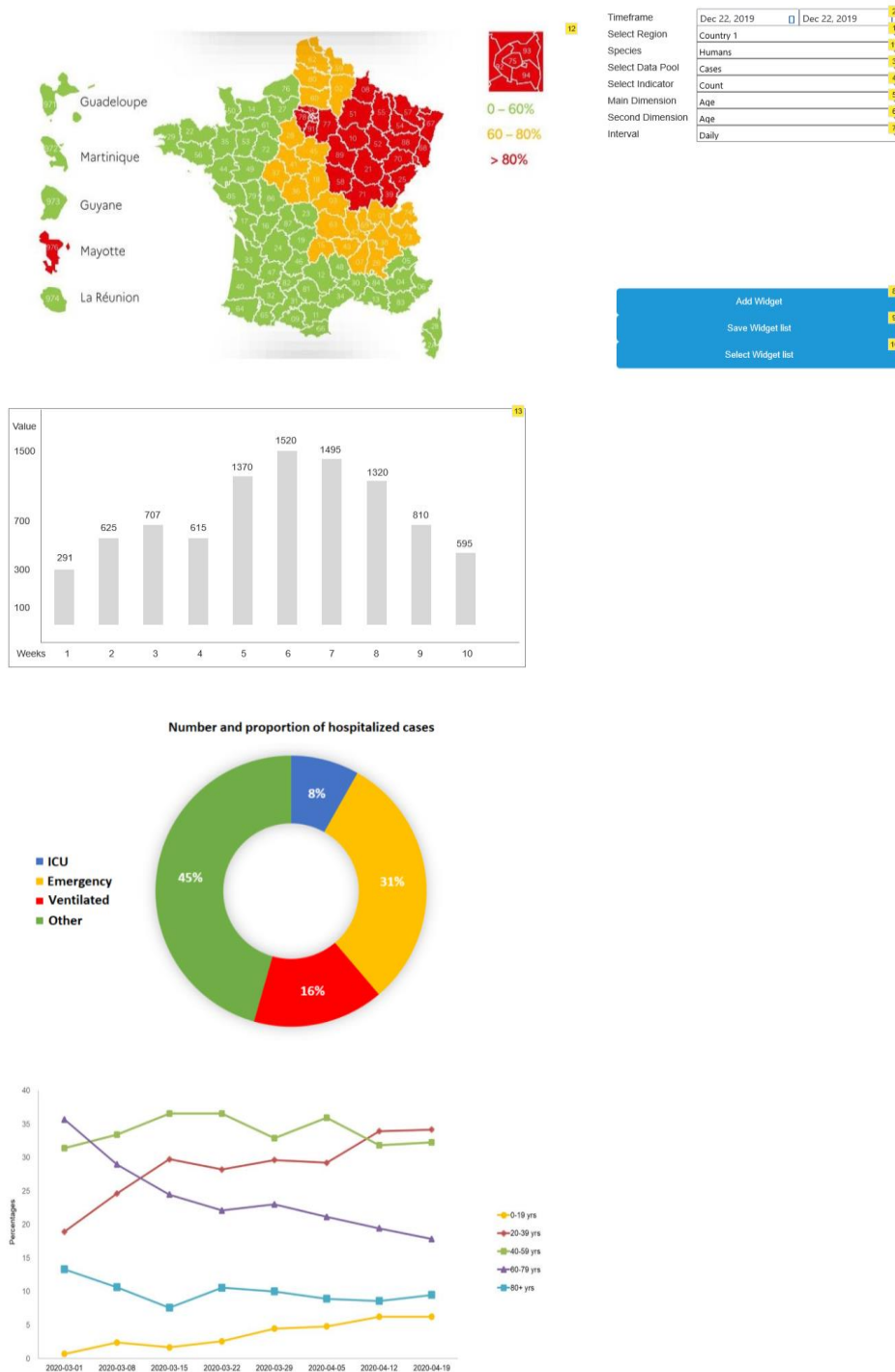
Note number	Note
1	<ul style="list-style-type: none"> <li>● As a user I can select specific dates for the widget to display.</li> <li>● As a user I can see all time stats by unchecking the Timeframe checkbox.</li> </ul>
2	<ul style="list-style-type: none"> <li>● As a user I can generate a report where data is distributed for specific intervals (daily, on 7 days, on 14 days, monthly, etc.)</li> <li>● As a user I can generate a report where data is aggregated in overall totals by unchecking the Interval checkbox.</li> </ul>
3	<ul style="list-style-type: none"> <li>● As a user I can see graphs with custom display settings (reference numbers, colour codes, etc.) - these settings are predefined by admins for users to use.</li> <li>● As a user I can see reports with default display settings by unchecking the respective checkbox.</li> </ul>
4	<ul style="list-style-type: none"> <li>● As a user I can see reports for specific genetic variants of the pathogen.</li> <li>● As a user I can see reports for all genomes by unchecking the respective checkbox.</li> </ul>
5	<ul style="list-style-type: none"> <li>● As a user I can apply selected options and populate the map widget with respective data.</li> </ul>
6	<ul style="list-style-type: none"> <li>● As a user I can see the map widget populated with data according to their selected options.</li> </ul>
7	<ul style="list-style-type: none"> <li>● As a user I can generate reports for incidence rate.</li> <li>● As a user I can generate reports for total incidents.</li> <li>● As a user I can generate reports for mortality rate.</li> <li>● As a user I can generate reports for positivity rate.</li> </ul>
8	<ul style="list-style-type: none"> <li>● As a user I can see detailed reports for each region (detailed reports will be displayed above the map).</li> </ul>
9	<ul style="list-style-type: none"> <li>● As a user I can see a widget showing the number of incidents distributed by selected time intervals.</li> <li>● As a user I can see a widget showing the number of incidents distributed by age.</li> <li>● As a user I can see a widget showing the number of incidents distributed by gender.</li> <li>● As a user I can see a widget showing the number of incidents distributed by severity.</li> <li>● As a user I can see a widget showing the number of incidents distributed by status.</li> <li>● As a user I can see a widget showing the number of incidents distributed by social context.</li> <li>● As a user I can see available ICU beds for each institution in the selected area.</li> </ul>
10	<ul style="list-style-type: none"> <li>● As a user I can see a more detailed map widget for the selected country or region.</li> </ul>

	<ul style="list-style-type: none"> <li>● As a user I can select a defined territorial unit from the selected country or region (selected territorial unit will be displayed in more details on the mini map).</li> </ul>
11	<ul style="list-style-type: none"> <li>● As a user I can go to a details page for the selected country or region.</li> </ul>
12	<ul style="list-style-type: none"> <li>● As a user I can select an outbreak (data displayed on the widgets will belong to the respective outbreak).</li> </ul>
13	<ul style="list-style-type: none"> <li>● As a user I can see timely distribution of cases, grouped by sex.</li> </ul>

## 6.1.2 Country stats

### 6.1.2.1 User Interface

Figure 10. Prototype for a country/region dashboard page<sup>8910</sup>



<sup>8</sup> <https://images.app.goo.gl/V57z7PsZUmBUbNzR6>

<sup>9</sup> <https://images.app.goo.gl/THp8ci6WE97Tu2Bs6>

<sup>10</sup> <https://www.medrxiv.org/content/medrxiv/early/2020/05/23/2020.05.21.20109389/F1.large.jpg>

### 6.1.2.2 User Stories

Table 22. User stories and tasks for the country dashboard prototype

Note number	Note
1	● As a user I can change the country whose stats are visualized on this Dashboard.
2	● As a user I can select a timeframe for the presented data.
3	● As a user I can select a data pool from where the widget will be generated (cases, contacts, deaths, genomes, etc.).
4	● As a user I can select a main indicator for the generated widget (total numbers, incidence rate, reproduction rate, mortality, etc.)
5	● As a user I can select a main dimension on which the indicator is distributed (total number by age, mortality by gender, etc.).
6	● As a user I can select a secondary dimension on which the indicator would be distributed (mortality distributed by age and gender, reproduction distributed by time and gender, cases distributed by severity over time, etc.). The implementation of secondary dimension is out of scope for the project.
7	● As a user I can select an interval when one of the dimensions from previous selections is Time (daily, weekly, monthly, yearly).
8	<ul style="list-style-type: none"> <li>● As a user I can see a graph generated for the selected settings.</li> <li>● As a user I can see the generated widget added to the current list of widgets from the current page.</li> </ul>
9	● As a user I can save the current list of widgets to their profile.
10	● As a user I can select from previously saved lists of widgets and load them onto the dashboard.
11	● As a user I can select a species for which the widget will be generated (humans, cats, dogs, pigs, etc.).
12	● As a user I can see a default map with the country they have selected, split by regions.
13	● As a user I can see a new widget inserted for each group of settings they generate with the Add Widget button.

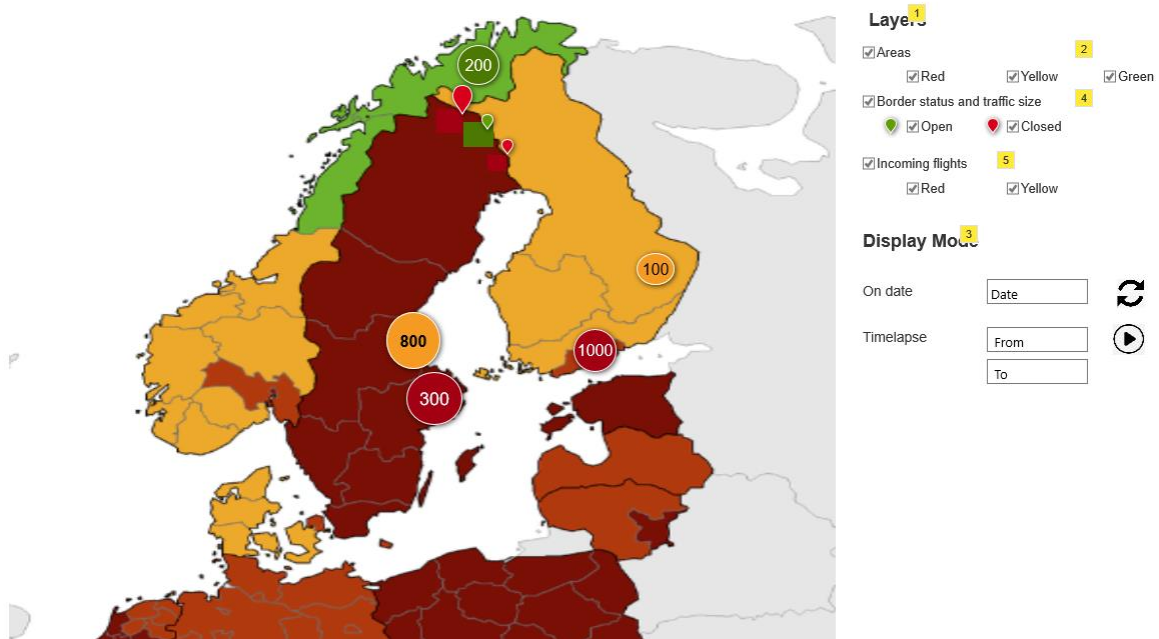
### 6.1.3 THL01 / THL02 - Map and Travel

#### 6.1.3.1 User Interface

Figure 11. Map and Travel dashboard prototype<sup>11</sup>

THL-01: As a <National Pandemic Manager>, I can <see COVID-19 cases in my own country and our neighboring countries on a municipality/hospital district level on a map/table> so I can <assess the risk of cross-border transmission and recommend travel restrictions to decision-makers>.

As a <National Pandemic Manager>, I can <see the likelihood of a disease introduction by country on a map/figure/table based on current volumes of incoming flight passengers from and disease incidence in each country/region> so I can <assess the risk of cross-border transmission and recommend travel restrictions to decision-makers>.



#### 6.1.3.2 User Stories

Table 23. User stories and tasks for the Map and Travel dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>● As a user I can select various layers for the map: <ul style="list-style-type: none"> <li>○ areas</li> <li>○ borders</li> <li>○ flights</li> </ul> </li> </ul>
2	<ul style="list-style-type: none"> <li>● As a user I can manage its own colours for areas based on the number of cases / thousands of people.</li> <li>● As PANDEM-2 Country admin I can manage its country colours for areas based on the number of cases / 100,000 population.</li> <li>● As PANDEM-2 Admin I can manage system-wide colours for areas based on the number of cases / 100,000 population.</li> <li>● Allow the system to collect density of cases by location.</li> <li>● As PANDEM-2 Admin I can manage locations.</li> </ul>

<sup>11</sup> <https://images.app.goo.gl/7YgPggZVV7uaPcsv5>

	<ul style="list-style-type: none"> <li>● As PANDEM-2 Country admin I can manage country locations.</li> </ul>
3	<ul style="list-style-type: none"> <li>● As a user I can select display mode: <ul style="list-style-type: none"> <li>○ date</li> <li>○ time lapse between certain periods days</li> </ul> </li> </ul>
4	<ul style="list-style-type: none"> <li>● As a Country/PANDEM-2 Admin I can manage POI border crossing (name, location, countries).</li> <li>● As Country Admin I can manage POI border crossings status (open/closed/limited, from date, to date).</li> <li>● As Country Admin I can manage POI border crossing traffic (date, actual crossing, estimated crossing, direction, source country, destination country, transportation type).</li> <li>● Allow the system to forecast border crossing traffic (date, actual crossing, estimated crossing, direction, source country, destination country, transportation type)?</li> </ul>
5	<ul style="list-style-type: none"> <li>● As a user I can show or hide traffic from incoming travel (flights, ships, etc)</li> </ul>



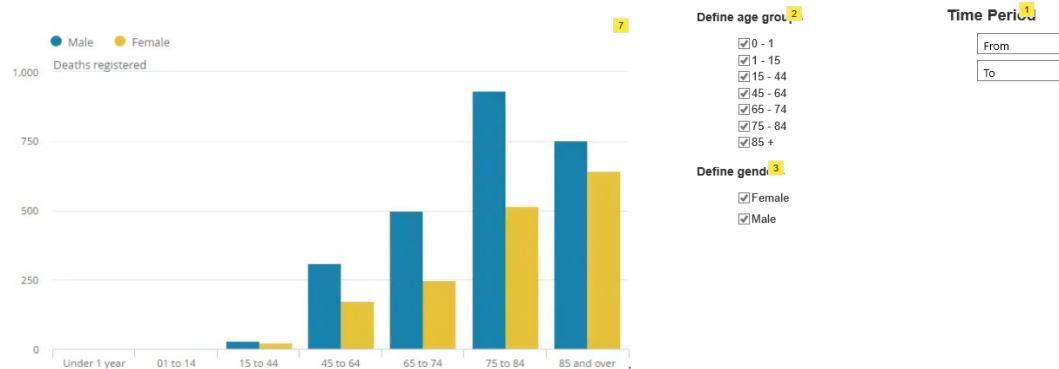
## 6.1.4 RKI-18 / RIVM-17 - Data on Mortality

### 6.1.4.1 User Interface

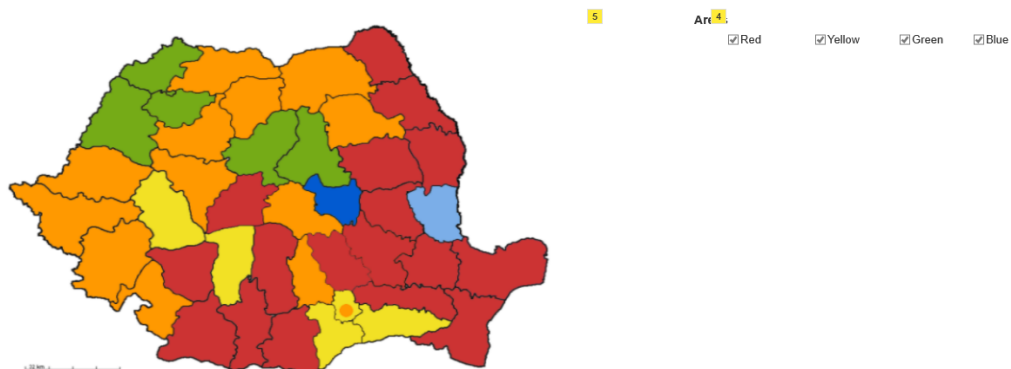
Figure 12. Data on Mortality dashboard prototype<sup>121314</sup>

RKI-18: Data on mortality, i.e. stratified by age, sex, geographic area/municipality/district, subgroups like living in nursing homes  
RIVM-17: I want to know the age stratification of patients and deaths

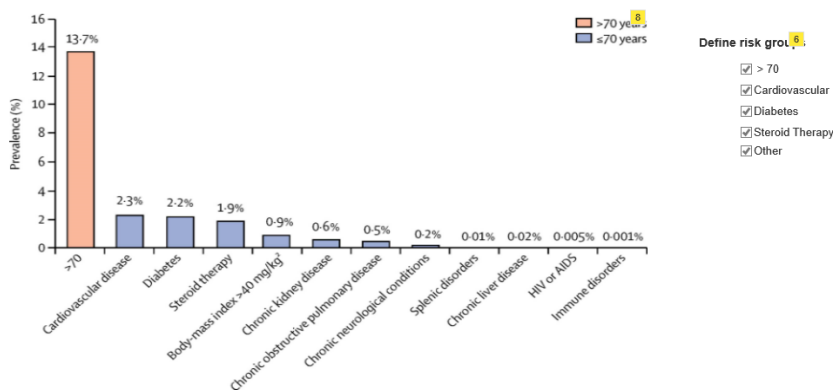
Data on mortality, i.e. stratified by age, sex



Data on mortality, i.e. stratified by geographic area/municipality/district



Data on mortality, i.e. stratified by subgroups like living in nursing homes



<sup>12</sup> <https://images.app.goo.gl/t2yut1dpsGdT9mJm7>

<sup>13</sup> <https://images.app.goo.gl/p1wB1UJK37NN3KHh7>

<sup>14</sup> <https://images.app.goo.gl/gieTfQ2K6n3Y2YgH6>

### 6.1.4.2 User Stories

Table 24. User stories and tasks for the Data on Mortality dashboard prototype

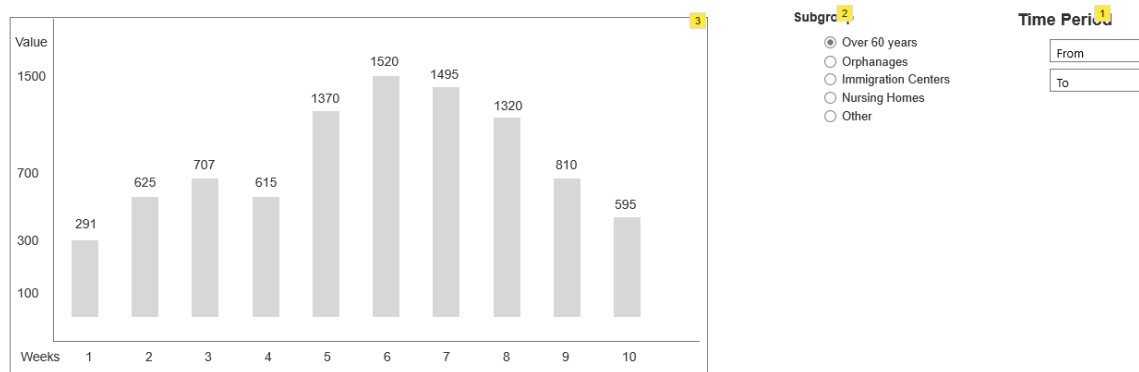
Note number	Note
1	<ul style="list-style-type: none"> <li>● As a user I can select the period of time for which the widgets will display data.</li> </ul>
2	<ul style="list-style-type: none"> <li>● As admin I can define age groups for the widget to display.</li> <li>● As a user I can select for which age groups they want data to be displayed.</li> </ul>
3	<ul style="list-style-type: none"> <li>● As admin I can define gender categories for the widget to display.</li> <li>● As a user I can select for which genders they want data to be displayed.</li> </ul>
4	<ul style="list-style-type: none"> <li>● As admin I can define colour codes for the map widget to display.</li> <li>● As a user I can select for which regions they want data to be displayed.</li> </ul>
5	<ul style="list-style-type: none"> <li>● As a user I can see mortality rates distributed by territorial units.</li> </ul>
6	<ul style="list-style-type: none"> <li>● As admin I can define risk groups for the widget to display.</li> <li>● As a user I can select for which risk group they want data to be displayed.</li> </ul>
7	<ul style="list-style-type: none"> <li>● As a user I can see mortality data distributed by age groups and sex.</li> </ul>
8	<ul style="list-style-type: none"> <li>● As a user I can see mortality rates distributed by risk groups.</li> </ul>

## 6.1.5 RKI-23 - Data on vulnerable groups

### 6.1.5.1 User Interface

Figure 13. Data on vulnerable groups dashboard prototype

RKI-23: Weekly incidence of hospitalised cases a vulnerable subgroup, i.e. aged over 60 years (per 100,000)



### 6.1.5.2 User Stories

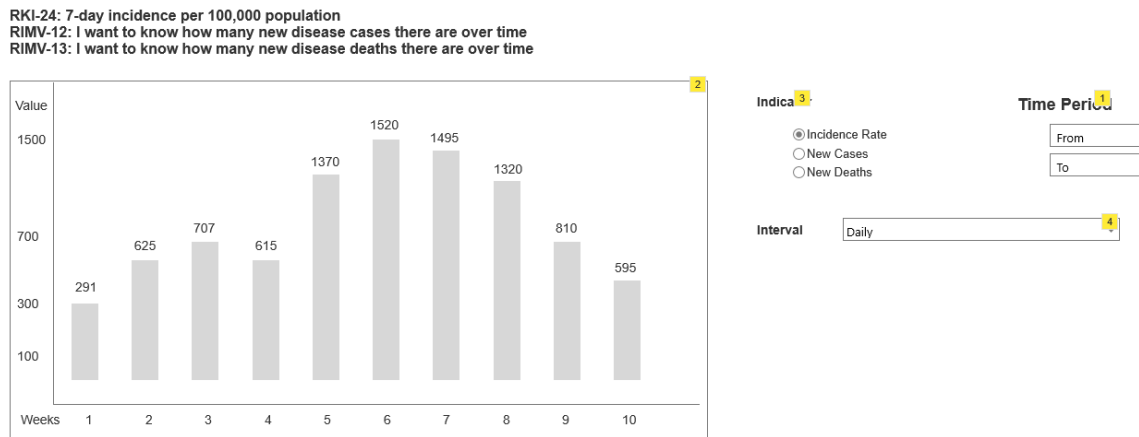
Table 25. User stories and tasks for the Data on vulnerable groups dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>As a user I can select the period of time for which the widget will display data.</li> </ul>
2	<ul style="list-style-type: none"> <li>As admin I can define vulnerable subgroups.</li> <li>As a user I can select vulnerable subgroups for which the widget will display data.</li> </ul>
3	<ul style="list-style-type: none"> <li>As a user I can see a weekly distribution of hospitalized cases by vulnerable subgroups.</li> </ul>

## 6.1.6 RKI-24 / RIMV-12 / RIMV-13 - Incidence over time

### 6.1.6.1 User Interface

Figure 14. Incidence over time dashboard prototype



### 6.1.6.2 User Stories

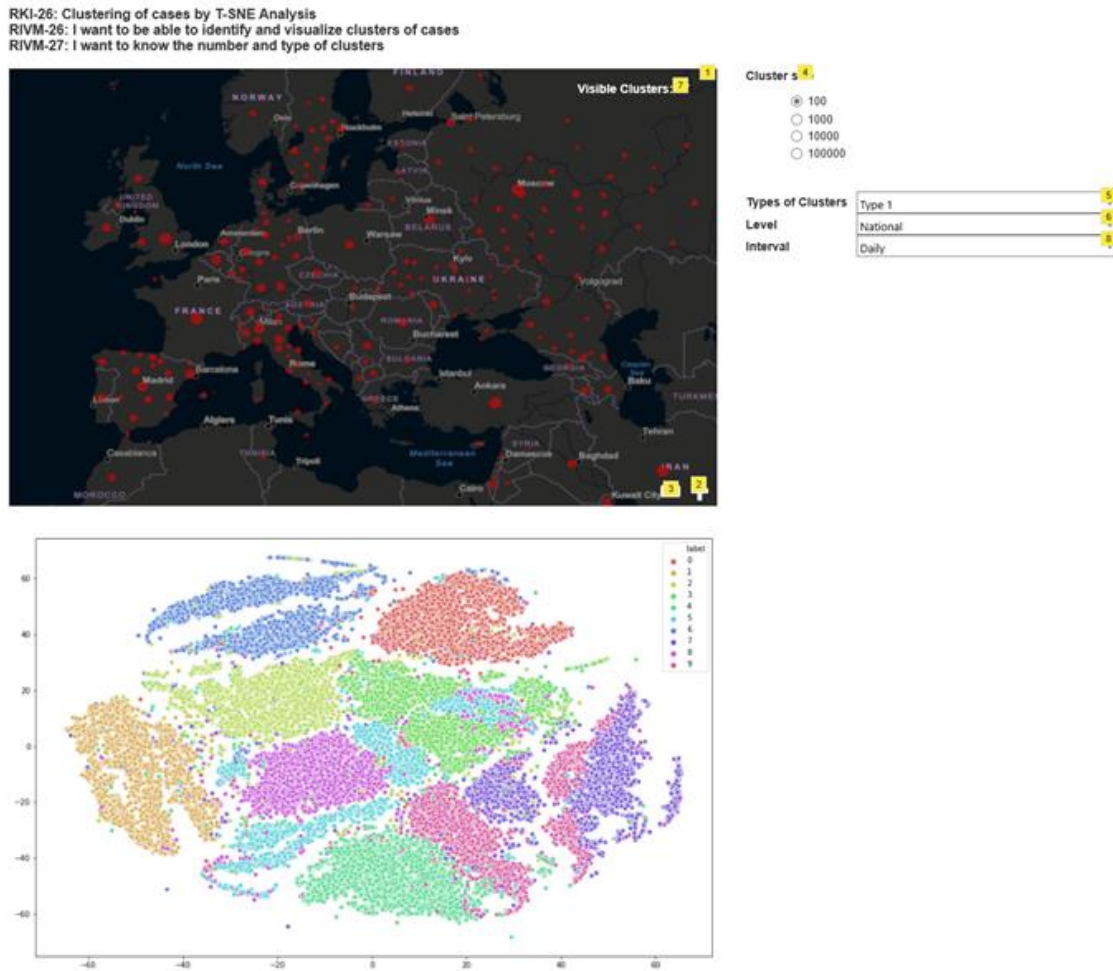
Table 26. User stories and tasks for the Incidents over time dashboard prototype

Note number	Note
1	● As a user I can select the period of time for which the widget will display data.
2	● As a user I can see a distribution of the selected indicator (Incidence, New Cases, New Deaths) over the selected interval (daily, weekly, etc.).
3	● As admin I can define new epidemiological parameters. ● As a user I can select an epidemiological parameter to be displayed in the widget.
4	● As a user I can select an interval for the distribution of data

### 6.1.7 RKI-26 / RIVM-20 / RIVM-27 - Clusters by T-SNE

#### 6.1.7.1 User Interface

Figure 15. Clusters by T-SNE dashboard prototype<sup>1516</sup>



#### 6.1.7.2 User Stories

Table 27. User stories and tasks for the Clusters by T-SNE dashboard prototype

Note number	Note
1	● As a user I can see the number of active cases distributed into clusters.
2	● As a user I can zoom in on the map and see smaller clusters of active cases.

<sup>15</sup> <https://images.app.goo.gl/6KXv8pRw45R1sAaf7>

<sup>16</sup> <https://images.app.goo.gl/udZfeAU6waKakid46>

3	<ul style="list-style-type: none"> <li>● As a user I can zoom out on the map and see larger clusters of active cases.</li> </ul>
4	<ul style="list-style-type: none"> <li>● As a user I can select the minimum size of clusters.</li> </ul>
5	<ul style="list-style-type: none"> <li>● As admin I can define new cluster types.</li> <li>● As a user I can see clusters of cases for the selected cluster type category.</li> </ul>
6	<ul style="list-style-type: none"> <li>● As admin I can add or remove regions or institutions.</li> <li>● As a user I can select a region or a health institute for which the widget will display data.</li> </ul>
7	<ul style="list-style-type: none"> <li>● As a user I can see a counter for the clusters visible on the map.</li> </ul>

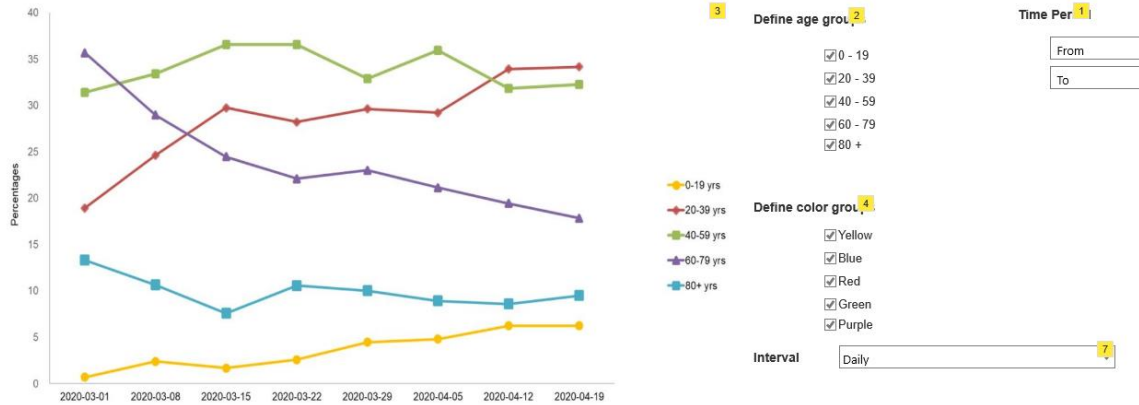
## 6.1.8 RKI-28 / RIVM-17 - Data on Cases

### 6.1.8.1 User Interface

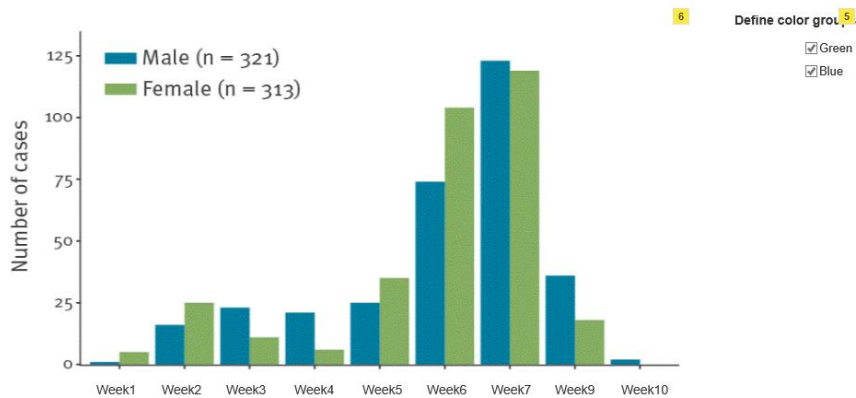
Figure 16. Data on Cases dashboard prototype<sup>17,18</sup>

RKI-28: Cases stratified by age group or sex over time (Development over time: change in trend, vulnerable groups, effect of treatment)  
RIVM-17: I want to know the age stratification of patients and deaths

Cases stratified by age group over time



Cases stratified by sex over time



<sup>17</sup> <https://www.medrxiv.org/content/medrxiv/early/2020/05/23/2020.05.21.20109389/F1.large.jpg>

<sup>18</sup> <https://images.app.goo.gl/g1eGDG4cHzdtL3PB9>

### 6.1.8.2 User Stories

Table 28. User stories and tasks for the Data on cases dashboard prototype

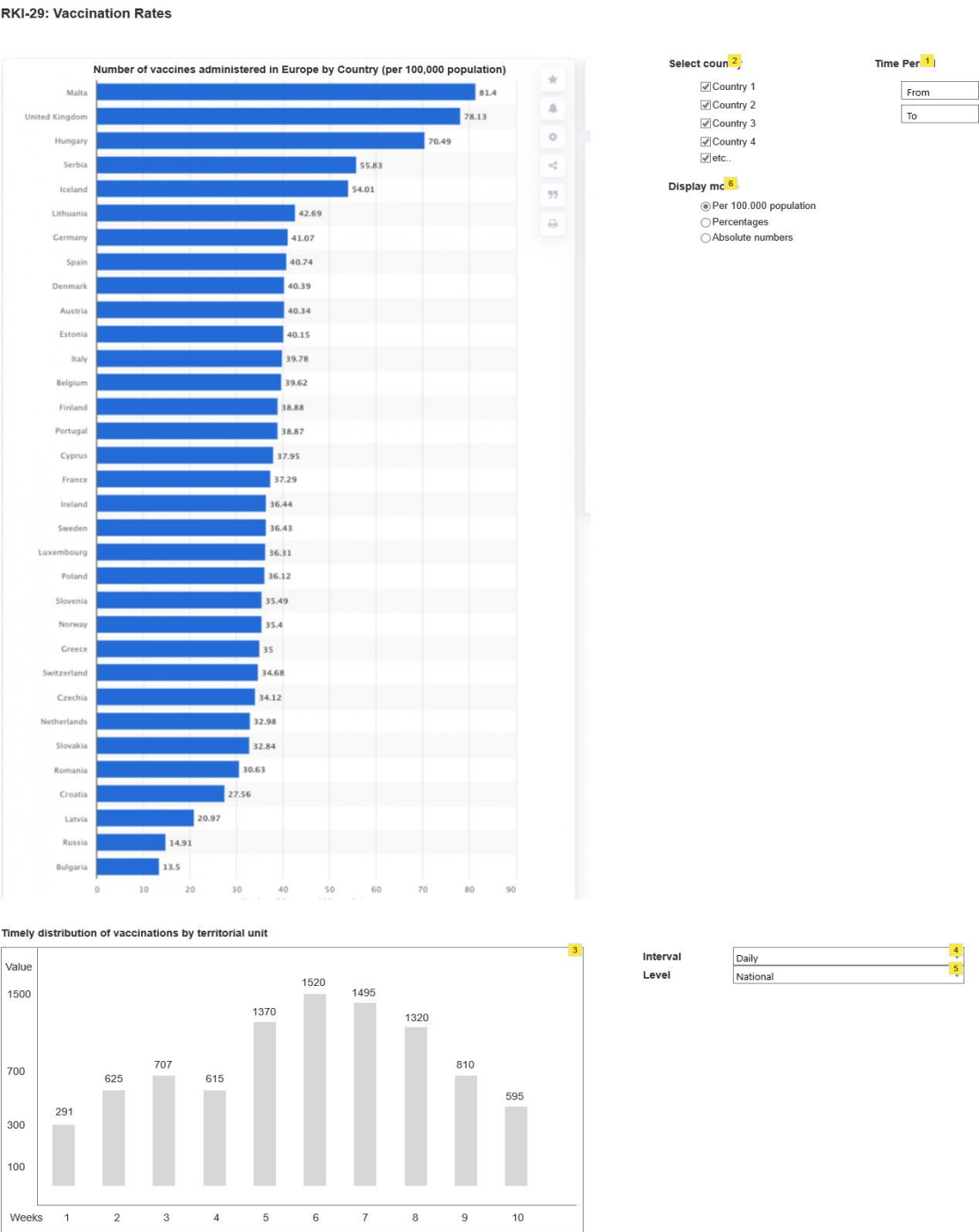
Note number	Note
1	<ul style="list-style-type: none"> <li>● As a user I can select the period for which the widgets will display data.</li> </ul>
2	<ul style="list-style-type: none"> <li>● As admin I can define age groups for the widget to display.</li> <li>● As a user I can select one or more age groups to be displayed.</li> </ul>
3	<ul style="list-style-type: none"> <li>● As a user I can see a timely distribution of cases for each selected age group.</li> </ul>
4	<ul style="list-style-type: none"> <li>● As admin I can define colour groups for the first widget to display.</li> <li>● As a user I can select one or more colour groups to be displayed.</li> </ul>
5	<ul style="list-style-type: none"> <li>● As admin I can define colour groups for the second widget to display.</li> <li>● As a user I can select one or more colour groups to be displayed.</li> </ul>
6	<ul style="list-style-type: none"> <li>● As a user I can see a timely distribution of cases grouped by sex.</li> </ul>
7	<ul style="list-style-type: none"> <li>● As a user I can select an interval for the distribution of data.</li> </ul>



6.1.9 RKI-29 - Vaccination Rates

6.1.9.1 User Interface

Figure 17. Vaccination Rates dashboard prototype<sup>19</sup>



<sup>19</sup> <https://images.app.goo.gl/Mn6qQtHj7cfR1Ss7A>

### 6.1.9.2 User Stories

Table 29. User stories and tasks for the Vaccination rates dashboard prototype

Note number	Note
1	● As a user I can select the period to see the dashboard.
2	<ul style="list-style-type: none"> <li>● As admin I can add or remove countries to/from the list.</li> <li>● As a user I can select for which countries they want to see data displayed.</li> </ul>
3	● As a user I can see a timely distribution of vaccinations for the selected country.
4	● As a user I can select an interval for which the widgets will display data.
5	<ul style="list-style-type: none"> <li>● As admin I can add or remove regions or institutions.</li> <li>● As a user I can select a region or a health institute for which the widget will display data.</li> </ul>

## 6.1.10 INEM-5 - Typology and Severity

### 6.1.10.1 User Interface

Figure 18. Typology and Severity dashboard prototype

INEM-5: Monitoring the typology and severity of victims

- Severity of the 112 calls
- Severity of the victims at scene
- Number of ventilated patients
- Specific / adapted action protocols

Incident ID	Name	ADDR	Severity	No. of Victims	Ventilated victims	Protocol	Check details
2476039487	John Doe	077440	Orange Code	3	1	Protocol 1	<input checked="" type="checkbox"/>
128749354	Jane Doe	1110389	Yellow Code	2	0	Protocol 2	<input type="checkbox"/>

Time Per <sup>1</sup>

From

To

Filt <sup>5</sup> Incident ID

Incident ID	Victim Name	Injuries	Severity	Actions taken	Ventilated?
2476039487	John Doe 1	COVID symptoms	Critical	Hospitalized at Hospital 1	Yes
2476039487	John Doe 2	COVID symptoms	Medium	Prescribed medication	No
2476039487	John Doe 3	COVID symptoms	Low	None	No

### 6.1.10.2 User Stories

Table 30. User stories and tasks for the Typology and Severity dashboard prototype

Note number	Note
1	● As a user I can select the period for the tables to display data.
2	<ul style="list-style-type: none"> <li>● As a user I can see a list of 112 calls and their specific details.</li> <li>● As a user I can scroll through the list if there are too many entries for the selected filters.</li> </ul>
3	● As a user I can select an entry and see detailed info about each victim of the incident in the second table.
4	● As a user I can see detailed descriptions of each victim connected to a specific 112 call.
5	● As a user I can filter the table by a given column or criteria.

### 6.1.11 ORK-14 - Affected over time

#### 6.1.11.1 User Interface

Figure 19. Affected over time dashboard prototype<sup>20</sup>

ORK-14: Affected persons total number (diagram over time)



#### 6.1.11.2 User Stories

Table 31. User stories and tasks for the Affected over time dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>As a user I can select the period for which the widget will display data.</li> </ul>
2	<ul style="list-style-type: none"> <li>As a user I can generate a graph where data is distributed for specific intervals (daily, weekly, monthly, etc.)</li> <li>As a user I can generate a graph where data is aggregated in overall totals, by unchecking the respective checkbox.</li> </ul>
3	<ul style="list-style-type: none"> <li>As a user I can generate a graph where data is distributed for specific territorial units.</li> <li>As a user I can generate a graph where data is aggregated in overall totals, by unchecking the respective checkbox.</li> </ul>
4	<ul style="list-style-type: none"> <li>As a user I can see a diagram of total affected persons distributed over time, in selected intervals.</li> </ul>

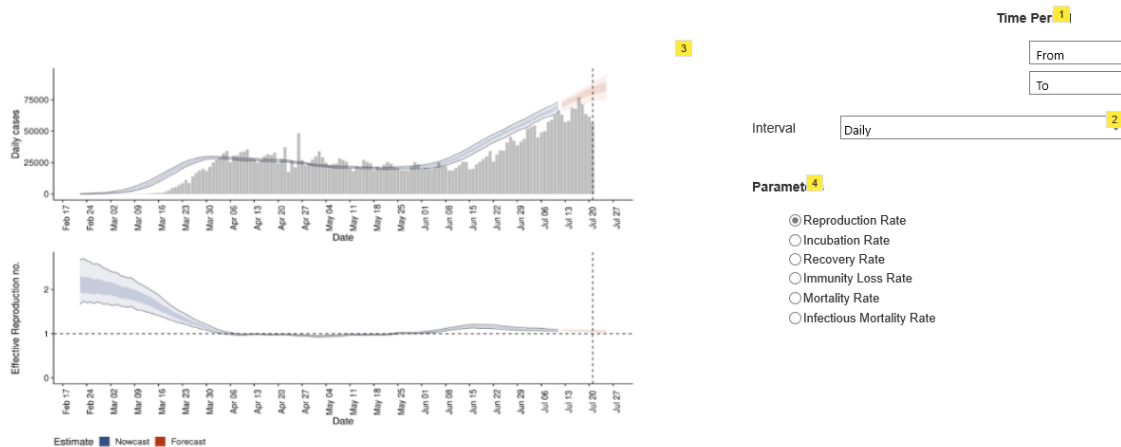
<sup>20</sup> <https://www.alaskapublic.org/wp-content/uploads/2020/06/Purdy-graphic-600x300.png>

## 6.1.12 ORK-17 - Reproduction Number

### 6.1.12.1 User Interface

Figure 20. Reproduction Number dashboard prototype<sup>21</sup>

ORK-17: Epidemiological parameters (e.g reproduction rate) over time



### 6.1.12.2 User Stories

Table 32. User stories and tasks for the Reproduction Rate dashboard prototype

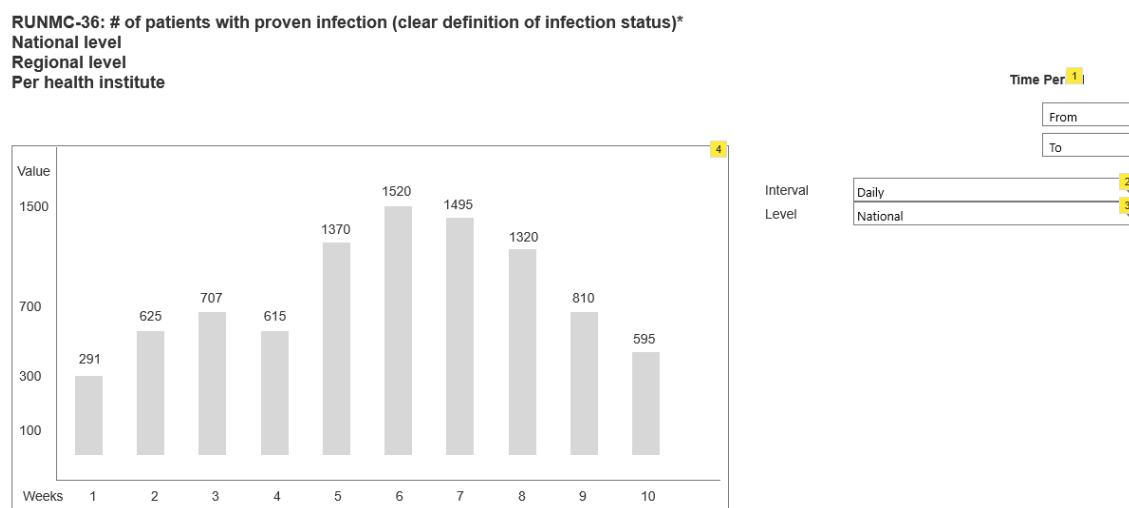
Note number	Note
1	<ul style="list-style-type: none"> <li>As a user I can select the period for which the widget will display data.</li> </ul>
2	<ul style="list-style-type: none"> <li>As a user I can select an interval for the distribution of data on the widget.</li> </ul>
3	<ul style="list-style-type: none"> <li>As a user I can see data for the selected parameter, distributed over the selected time interval.</li> </ul>
4	<ul style="list-style-type: none"> <li>As admin I can define new epidemiological parameters.</li> <li>As a user I can select an epidemiological parameter to be displayed in the widget.</li> </ul>

<sup>21</sup> <https://images.app.goo.gl/Fjw8ENN9AMpHWwKc7>

### 6.1.13 RUNMC-36 - Proven Infections

#### 6.1.13.1 User Interface

Figure 21. Proven Infections dashboard prototype



#### 6.1.13.2 User Stories

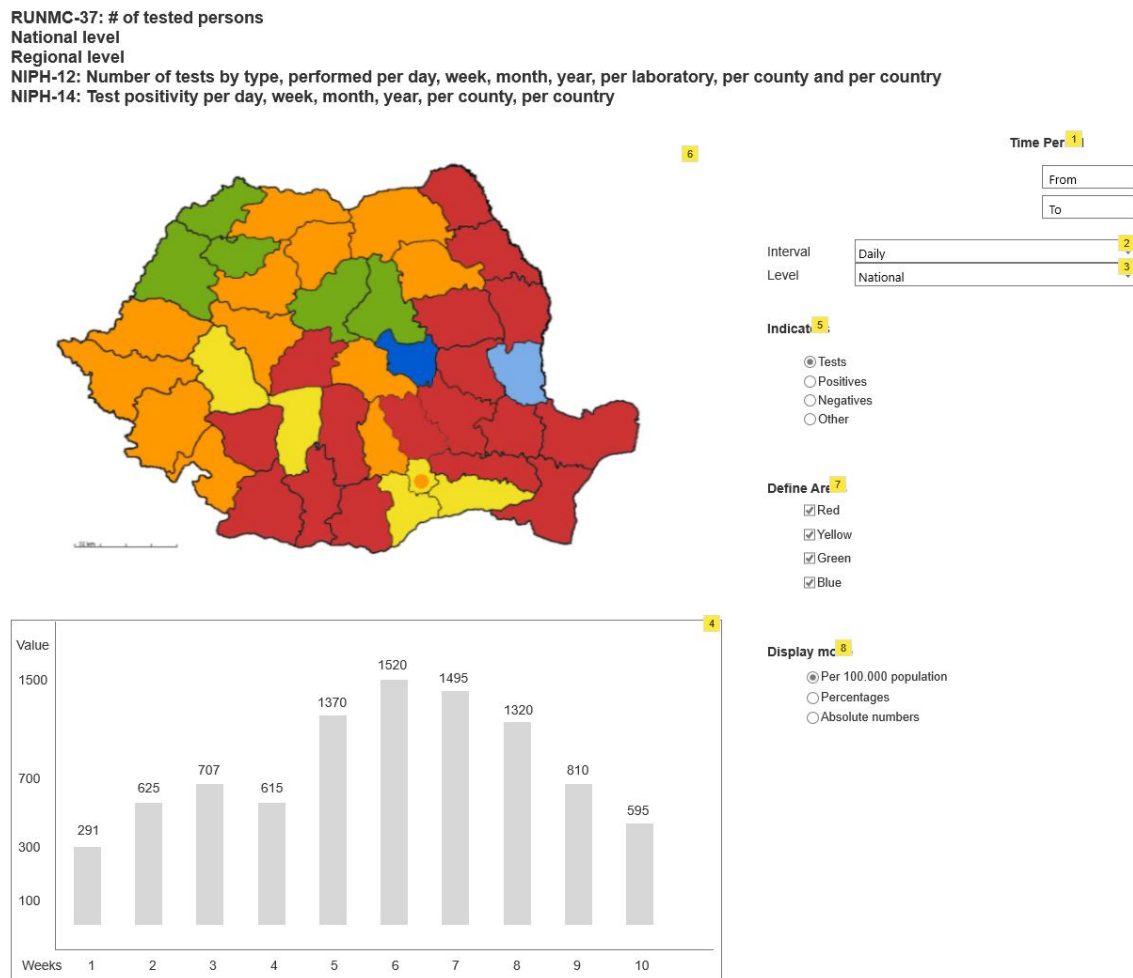
Table 33. User stories and tasks for the Proven Infections dashboard prototype

Note number	Note
1	● As a user I can select the period for which the widget will display data.
2	● As a user I can select an interval for the distribution of data
3	● As admin I can add or remove regions or institutions. ● As a user I can select a region or a health institute for which the widget will display data.
4	● As a user I can see the number of proven infections timely distributed for each region or health institute selected.

### 6.1.14 RUNMC-37 / NIPH-12 / NIPH-14 - Tested Persons

#### 6.1.14.1 User Interface

Figure 22. Tested Persons dashboard prototype<sup>22</sup>



#### 6.1.14.2 User Stories

Table 34. User stories and tasks for the Tested Persons dashboard prototype

Note number	Note
1	● As a user I can select the period for which the widgets will display data.
2	● As a user I can select an interval for the distribution of data
3	● As admin I can add or remove regions or institutions. ● As a user I can select a region or a health institute for which the widget will display data.

<sup>22</sup> <https://images.app.goo.gl/DeB5mQduSckpTvUa6>

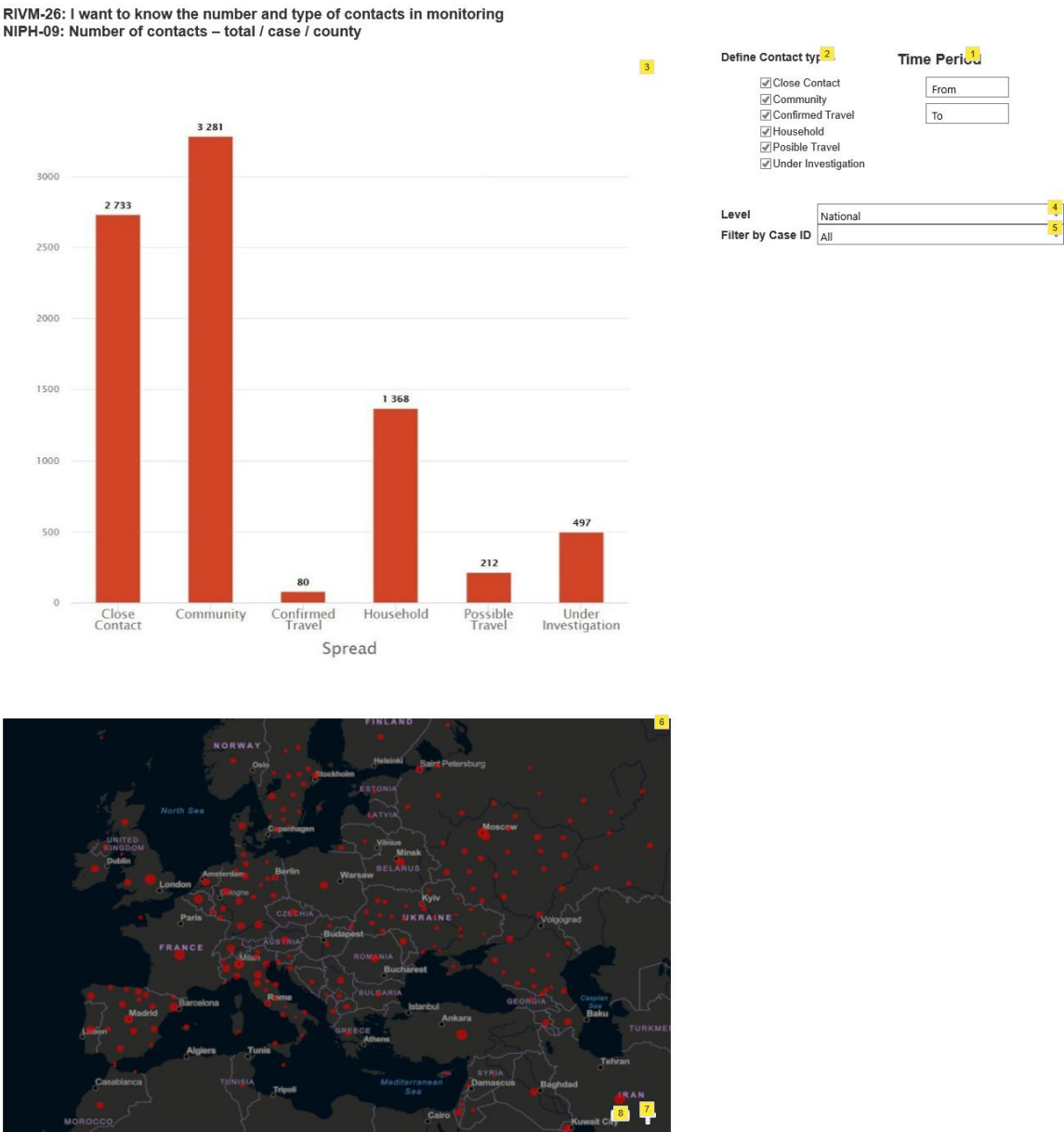
4	<ul style="list-style-type: none"><li>● As a user I can see selected data distributed timely for each region or health institute selected.</li></ul>
5	<ul style="list-style-type: none"><li>● As admin I can define new indicators.</li><li>● As a user I can select an indicator to be displayed in the widgets (tests, test results, etc.).</li></ul>
6	<ul style="list-style-type: none"><li>● As a user I can see data for the selected indicator (tests, test results, etc.) distributed by territorial units.</li></ul>
7	<ul style="list-style-type: none"><li>● As admin I can define colour codes for the map widget to display.</li></ul>



6.1.15 RIVM-26 / NIPH-09 - Monitored contacts

6.1.15.1 User Interface

Figure 23. Monitored contacts dashboard prototype<sup>2324</sup>



<sup>23</sup> <https://images.app.goo.gl/j8JNWRNrwcgEDpJA>

<sup>24</sup> <https://images.app.goo.gl/2p8GKawhBva4ys3i9>

**6.1.15.2 User Stories***Table 35. User stories and tasks for the Monitored Contacts dashboard prototype*

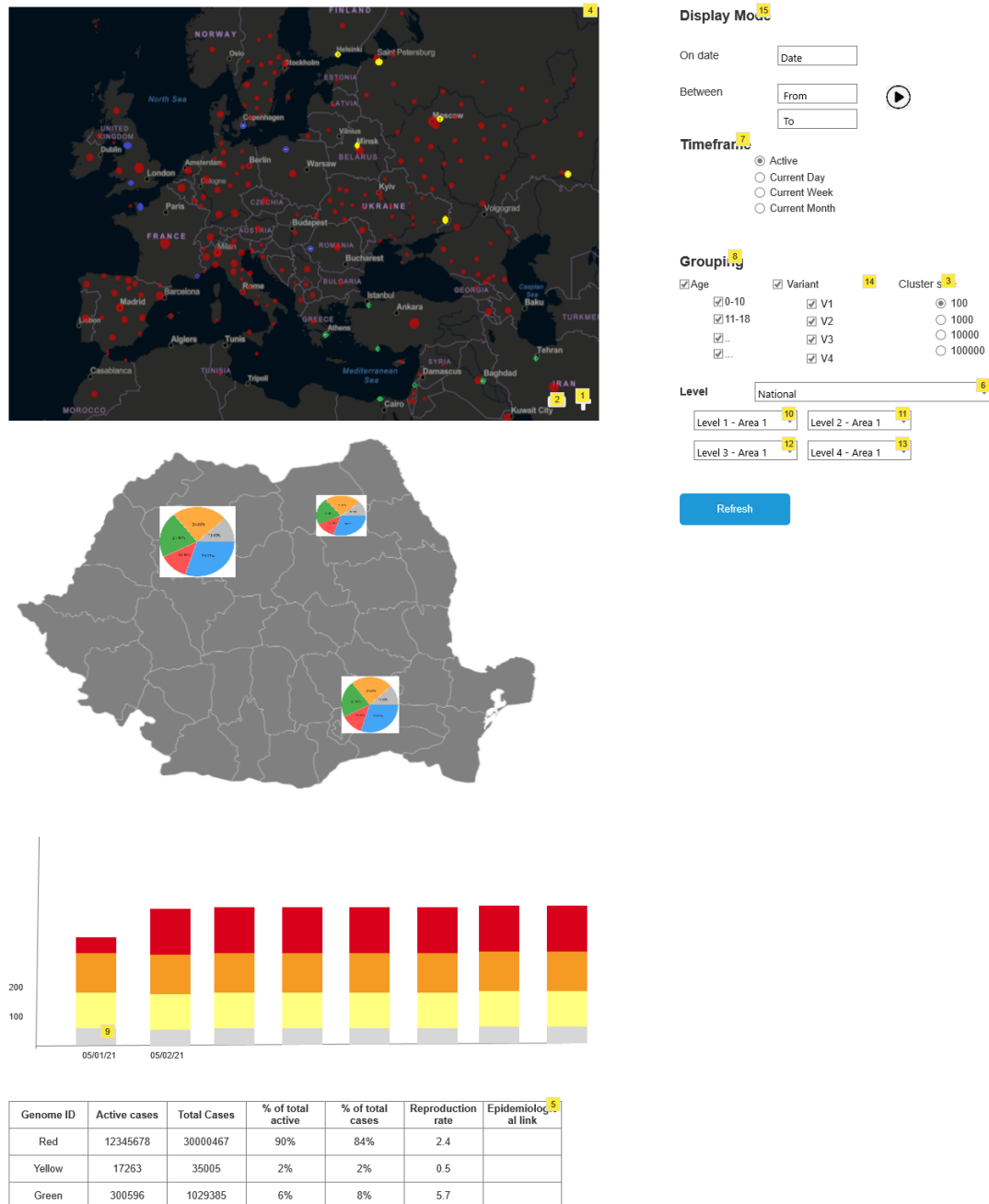
Note number	Note
1	● As a user I can select the period for which the widget will display data.
2	<ul style="list-style-type: none"> <li>● As admin I can define types of contacts for the widget to display.</li> <li>● As a user I can select one or more contact groups to be displayed in the widget.</li> </ul>
3	● As a user I can see the number of contacts in monitoring, distributed by types.
4	<ul style="list-style-type: none"> <li>● As admin I can add or remove regions or institutions.</li> <li>● As a user I can select a region or a health institute for which the widget will display data.</li> </ul>
7	● As a user I can zoom in on the map and see smaller clusters of contacts.
8	● As a user I can zoom out on the map and see larger clusters of contacts.

## 6.1.16 RIVM-28 / NIPH-08 / FOHM-12 - Genome sequencing data

### 6.1.16.1 User Interface

Figure 24. Genome sequencing data dashboard prototype<sup>2526</sup>

RIVM-28: I want to combine whole-genome sequencing with epidemiological/contact tracing data  
 RIVM-33: I want to track spread of disease genetic variants  
 NIPH-08: Distribution of genetic sequences by type, by county, per week, by type of epidemiological link  
 FOHM-12: No of confirmed cases by day, week, region, agegroup and genetic subtype of pathogene



<sup>25</sup> <https://images.app.goo.gl/2p8GKawhBva4ys3i9>

<sup>26</sup> <https://images.app.goo.gl/f91KmNjpZsnT93M5A>

### 6.1.16.2 User Stories

Table 36. User stories and tasks for the Genome sequencing data dashboard prototype

Note number	Note
1	● As a user I can zoom in on the map and see smaller clusters of active cases.
2	● As a user I can zoom out on the map and see larger clusters of active cases.
3	● As a user I can select the minimum size of clusters.
4	● As a user I can see active cases distributed into clusters, individually coloured for each selected genome.
5	● As a user I can see detailed descriptions of each genome sequencing epidemiological data.
6	<ul style="list-style-type: none"> <li>● As admin I can add or remove regions or institutions.</li> <li>● As a user I can select a region or a health institute for which the widget will display data.</li> </ul>
7	● As a user I can select a preferred time frame for the data displayed in the widget.
8	● As a user I can select the census group.
9	● As a user I can see a stacked chart of cases based on a certain census group or variants.
10	● As a user I can select at the location level, multi-select allowed
11	● As a user I can select at the location level, multi-select allowed
12	● As a user I can select at the location level, multi-select allowed
13	● As a user I can select at the location level, multi-select allowed
14	● As a user I can select the variants in census grouping.
15	<ul style="list-style-type: none"> <li>● As a user I can select display mode:</li> <li>● - date</li> <li>● - time lapse between certain periods days</li> </ul>



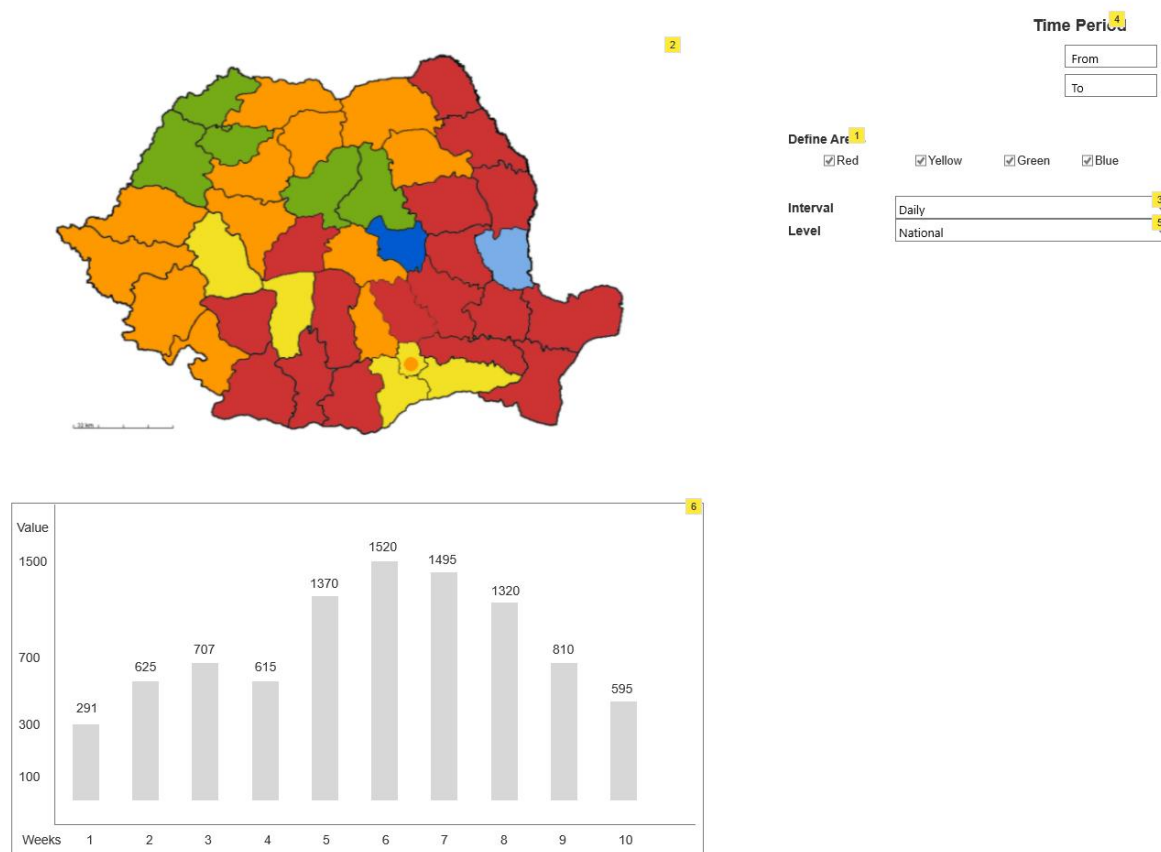
	<ul style="list-style-type: none"> <li>● As a user I can select a region or a health institute for which the widget will display data.</li> </ul>
6	<ul style="list-style-type: none"> <li>● As a user I can see the requested data timely distributed for each region or health institute selected.</li> </ul>
7	<ul style="list-style-type: none"> <li>● As admin I can define new epidemiological parameters.</li> <li>● As a user I can select epidemiological parameters to be displayed in the widget.</li> </ul>

### 6.1.18 NIPH-43 - Tests Positivity

#### 6.1.18.1 User Interface

Figure 26. Tests Positivity dashboard prototype<sup>28</sup>

NIPH-43: Test positivity/disease/week/month/year/ commune/city /county/country



#### 6.1.18.2 User Stories

Table 38. User stories and tasks for the Tests positivity dashboard prototype

Note number	Note
1	● As admin I can define colour codes for the map widget to display.
2	● As a user I can see positive tests distributed by territorial units.
3	● As a user I can select a time interval for which the widgets calculate data.
4	● As a user I can select the period for which the widgets will display data.
5	● As admin I can add or remove regions or institutions.

<sup>28</sup> <https://images.app.goo.gl/DeB5mQduScKpTvUa6>

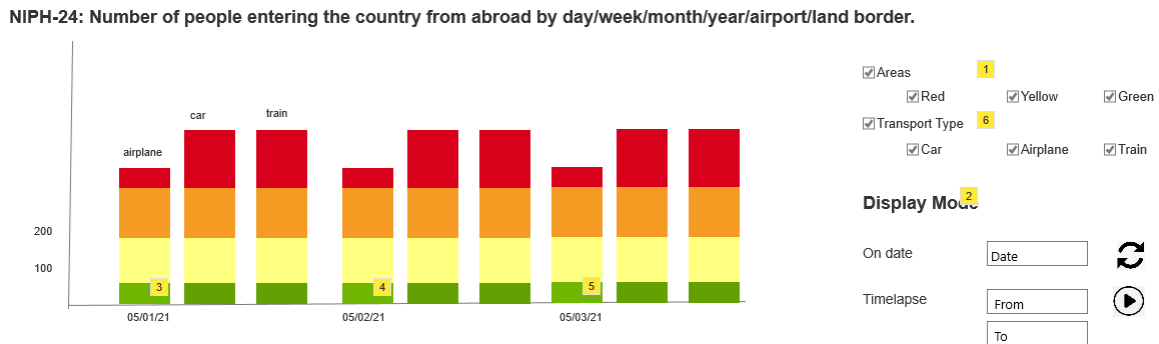
	<ul style="list-style-type: none"><li>● As a user I can select a region or a health institute for which the widget will display data.</li></ul>
6	<ul style="list-style-type: none"><li>● As a user I can see timely evolution for tests positivity according to the selected time interval.</li></ul>



## 6.1.19 NIPH-24 Number of people entering country

### 6.1.19.1 User Interface

Figure 27. Number of people entering the country dashboard prototype



### 6.1.19.2 User Stories

Table 39. User stories and tasks for the Number of people entering the country dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>● As a user I can manage colours for areas based on the number of cases / 100,000 population.</li> <li>● As PANDEM-2 Country admin I can manage country colours for areas based on the number of cases / 100,000 population.</li> <li>● As PANDEM-2 Admin I can manage system-wide colours for areas based on the number of cases / 100,000 population.</li> <li>● Allow the system to collect density of cases by location.</li> <li>● As PANDEM-2 Admin I can manage locations.</li> <li>● As PANDEM-2 Country admin I can manage country locations.</li> </ul>
2	<ul style="list-style-type: none"> <li>● As a user I can select display mode: <ul style="list-style-type: none"> <li>○ date</li> <li>○ time lapse between certain periods days</li> </ul> </li> </ul>
3	<ul style="list-style-type: none"> <li>● As a user I can see a stacked chart of cases based on a certain attribute,</li> <li>● As a user I can manage its own colours for each value of attribute of the case.</li> <li>● As a user I can manage its country colours for each value of attribute of the case.</li> <li>● As PANDEM-2 Admin I can manage system colours for each value of attribute of the case.</li> <li>● Allow the system to collect case attributes and values.</li> </ul>
4	<ul style="list-style-type: none"> <li>● As a user I can see a stacked chart of cases based on a certain attribute,</li> <li>● As a user I can manage its own colours for each value of attribute of the case.</li> </ul>

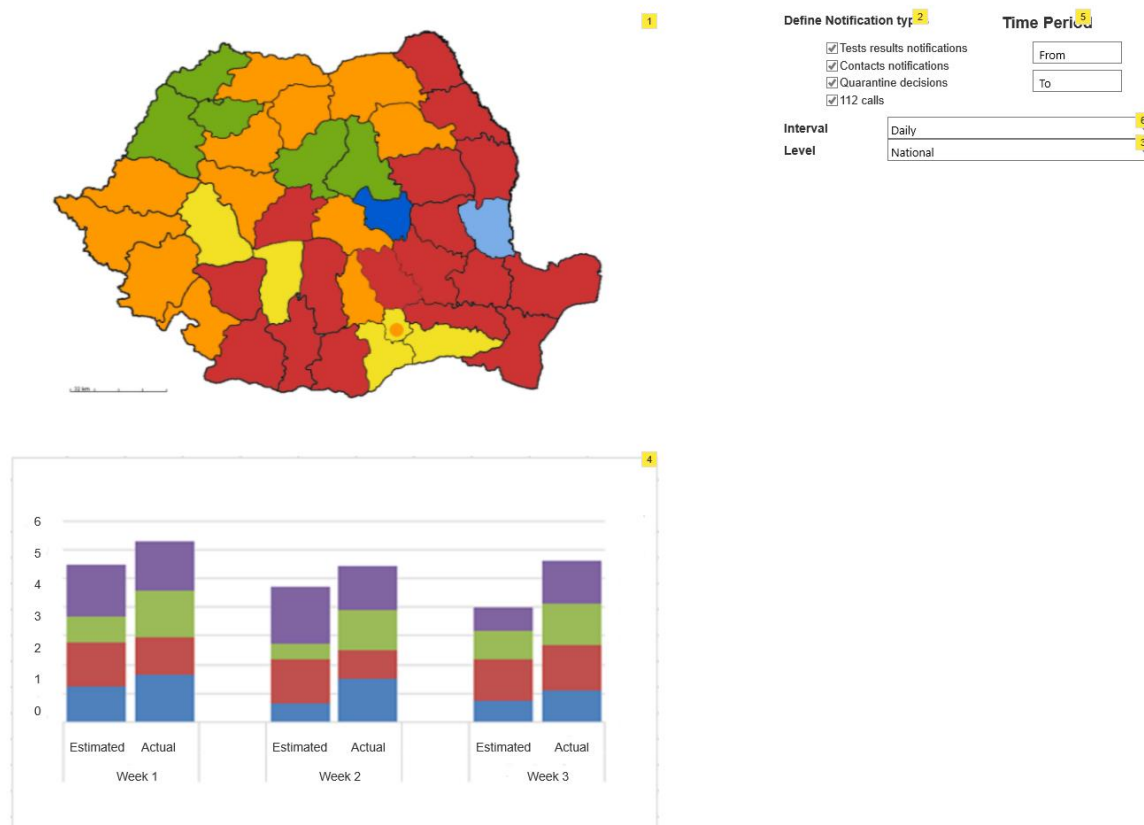
	<ul style="list-style-type: none"> <li>● As a user I can manage its country colours for each value of attribute of the case.</li> <li>● As PANDEM-2 Admin I can manage system colours for each value of attribute of the case.</li> <li>● Allow the system to collect case attributes and values.</li> </ul>
5	<ul style="list-style-type: none"> <li>● As a user I can see a stacked chart of cases based on a certain attribute,</li> <li>● As a user I can manage its own colours for each value of attribute of the case.</li> <li>● Allow the user to manage its country colours for each value of attribute of the case.</li> <li>● As PANDEM-2 Admin I can manage system colours for each value of attribute of the case.</li> <li>● Allow the system to collect case attributes and values.</li> </ul>
6	<ul style="list-style-type: none"> <li>● As a user I can manage types of transportation.</li> </ul>

## 6.1.20 RKI-27 - Notifications Delay

### 6.1.20.1 User Interface

Figure 28. Notifications Delay dashboard prototype<sup>2930</sup>

RKI-27: Estimation of notification delay



### 6.1.20.2 User Stories

Table 40. User stories and tasks for the Notifications delay dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>● As a user I can see delays distributed by territorial units.</li> </ul>
2	<ul style="list-style-type: none"> <li>● As admin I can define types of notifications for the widgets to display.</li> <li>● As a user I can select one or more notification types to be displayed in the widget.</li> </ul>
3	<ul style="list-style-type: none"> <li>● As admin I can add or remove regions or institutions.</li> <li>● As a user I can select a region or a health institute for which the widget will display data.</li> </ul>

<sup>29</sup> <https://images.app.goo.gl/DeB5mQduScKpTvUa6>

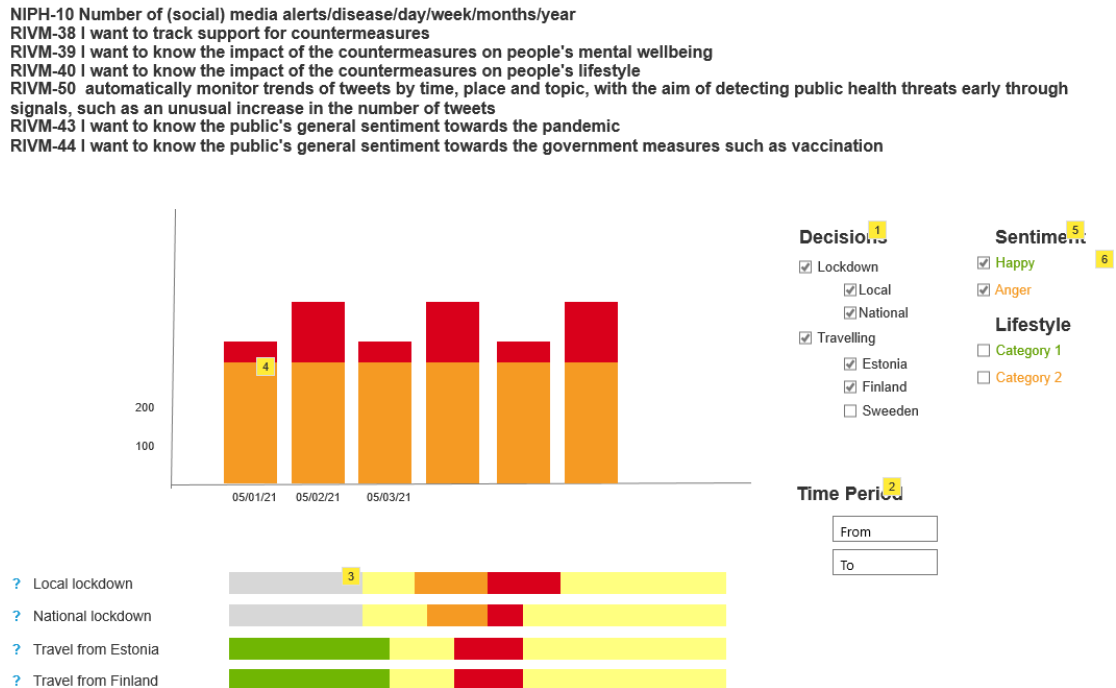
<sup>30</sup> <https://images.app.goo.gl/sNpDkrvjZyBBY2YM6>

4	● As a user I can see estimated and actual notification delays for the selected time period and intervals.
5	● As a user I can select the period for which the widget will display data.
6	● As a user I can select an interval for the distribution of data

## 6.1.21 NIPH-10 / RIVM-38-44 / RIVM-50 - Number of social media alerts/disease/day/week/months/year

### 6.1.21.1 User Interface

Figure 29. Number of social media events dashboard prototype



### 6.1.21.2 User Stories

Table 41. User stories and tasks for the Number of social media events dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>● As a user I can select the decisions by category and subcategory.</li> <li>● Allow system to collect/user to manage the decisions: category, severity, effective starts from, effective ends on, location(s) affected, location(s) related to</li> <li>● As a user I can manage decision categories.</li> <li>● As a user I can manage decision sub-categories.</li> </ul>
2	<ul style="list-style-type: none"> <li>● As a user I can select the period to see the dashboard.</li> </ul>
3	<ul style="list-style-type: none"> <li>● As a user I can manage its own colours for each decision category, severity.</li> <li>● As a user I can manage its country colours for each decision category, severity.</li> <li>● As PANDEM-2 Admin I can manage system colours for each decision category, severity.</li> </ul>
4	<ul style="list-style-type: none"> <li>● As a user I can view the number of social media mentions stacked by category and sub-category</li> </ul>

	<ul style="list-style-type: none"> <li>● Allow the system to collect the number of social media mentions stacked by category and subcategory.</li> </ul>
5	<ul style="list-style-type: none"> <li>● As a user I can manage the mentioned categories.</li> <li>● As a user I can manage the mentioned sub-categories.</li> <li>● As a user I can select the mention by category and subcategory.</li> </ul>
6	<ul style="list-style-type: none"> <li>● As a user I can select the sub-category of social media mentions.</li> </ul>

## 6.1.22 RIVM-42 - Countries I can travel to

### 6.1.22.1 User Interface

Figure 30. Countries I can travel to dashboard prototype

RIVM-42: I want to know the countries I can travel to and what the local measures are.

Decisions made by:  Effective d.  From  Category   
 Decisions applied to:  To  Sub-Category

Country	Area	Decision	Effective From	Effective To	Applies to	Category	Sub-Category	Details
Romania	Country	Lockdown	1/1/21	1/31/21	Romania	Lockdown	National Lockdown	Wear masks at stores, closing at 8PM
Romania	Bucharest	Lockdown	1/1/21	1/31/21	Romania	Lockdown	Local Full Lockdown	Stay at home
Romania		countries green list	1/1/21		Austria, Germany	Incoming Travel		The following countries are on the green list: Austria, Germany ....
Romania			1/15/21		all	Incoming Travel		PCR test required at entry

### 6.1.22.2 User Stories

Table 42. User stories and tasks for the Countries I can travel to dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>As a user I can view the list of travel restrictions from other countries.</li> <li>As a user I can view the list of local measures from other countries.</li> </ul>
2	As a user I can select at the location level, multi-select allowed
3	As a user I can select at the location level, multi-select allowed
4	As a user I can select the category of the decision
5	As a user I can select the subcategory of the decision
6	As a user I can select effective date of the decisions

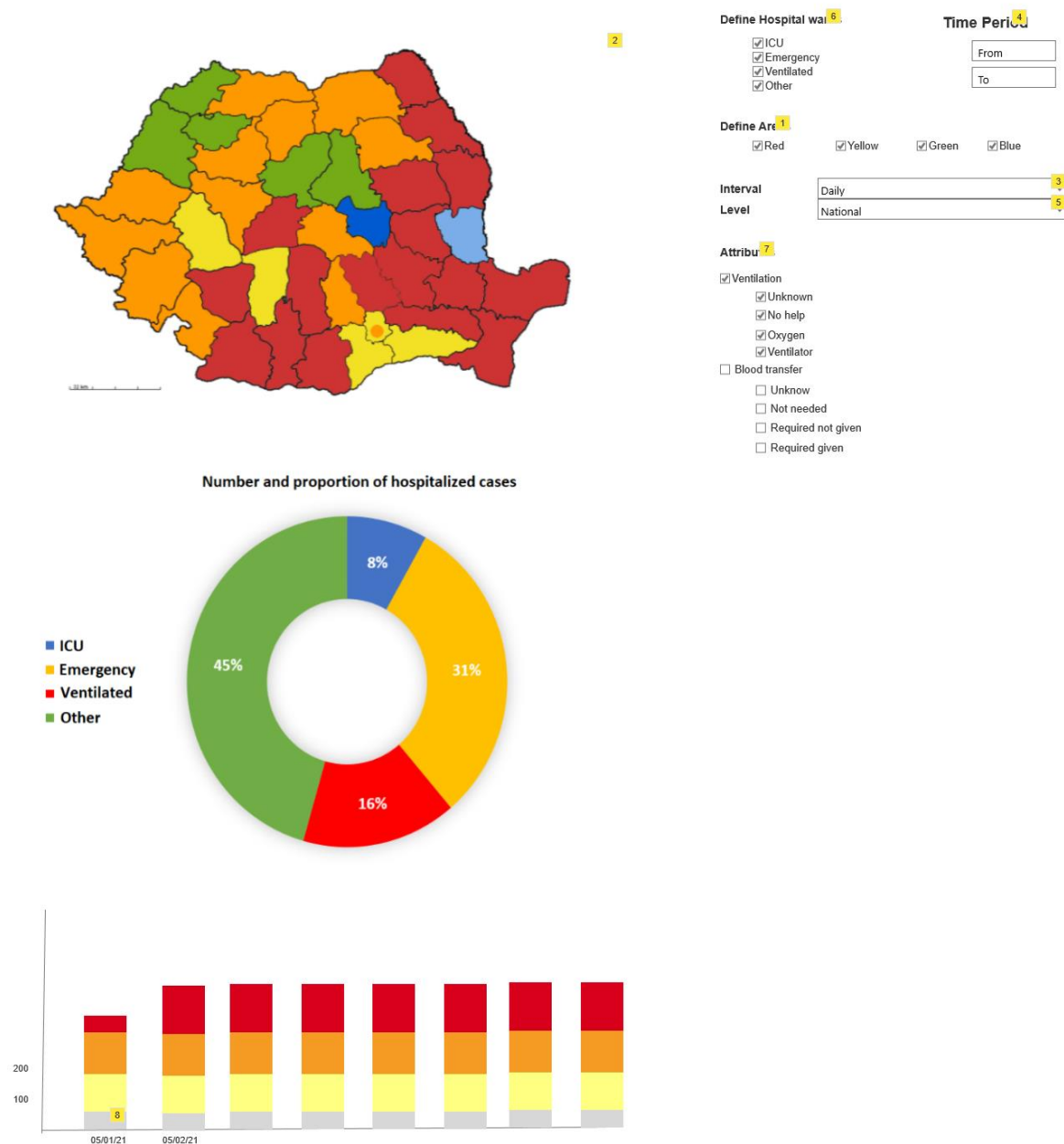
## 6.2 Hospitalisations

### 6.2.1 NIPH-06 / NIPH-07- Hospitalized cases

#### 6.2.1.1 User Interface

Figure 31. Hospitalized cases dashboard prototype<sup>31,32</sup>

NIPH-06: Number and proportion of hospitalized cases – total/in ICU/in other wards, prehospital/week/county/region/country  
NIPH-07: Number and proportion of cases with ventilation/oxygen



<sup>31</sup> <https://images.app.goo.gl/DeB5mQduScKpTvUa6>

<sup>32</sup> <https://images.app.goo.gl/sw6WjBLw8aH7BbHY6>



### 6.2.1.2 User Stories

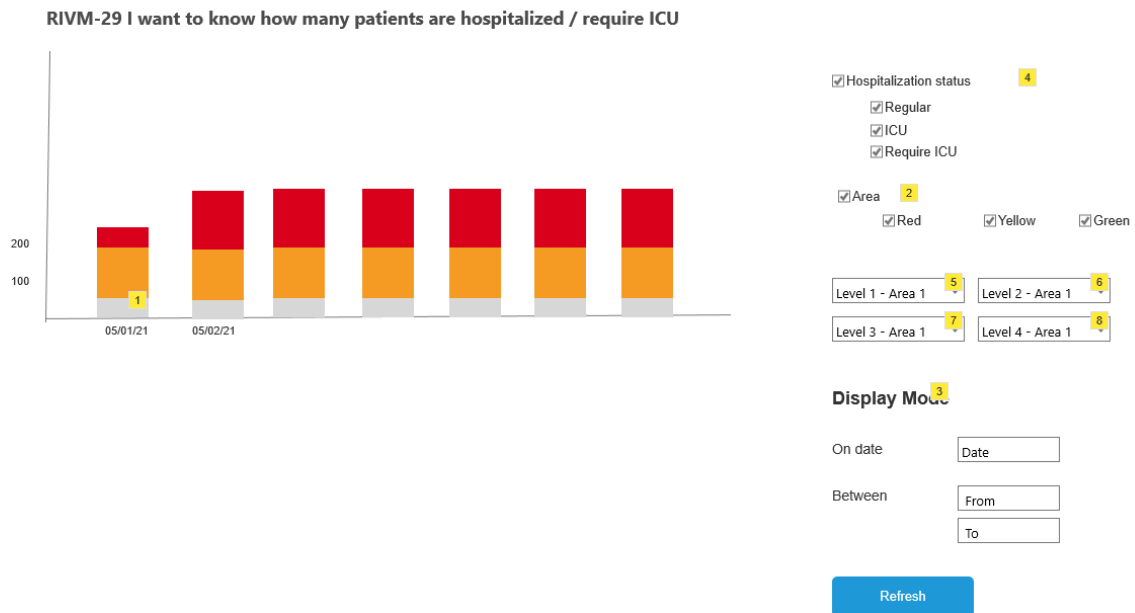
Table 43. User stories and tasks for the Hospitalized cases dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>● As admin I can define colour codes for the map widget to display.</li> </ul>
2	<ul style="list-style-type: none"> <li>● As a user I can see hospitalizations distributed by territorial units.</li> </ul>
3	<ul style="list-style-type: none"> <li>● As a user I can select a time interval by which data is grouped.</li> </ul>
4	<ul style="list-style-type: none"> <li>● As a user I can select the period for which the widgets will display data.</li> </ul>
5	<ul style="list-style-type: none"> <li>● As admin I can add or remove regions or institutions.</li> <li>● As a user I can select a region or a health institute for which the widget will display data.</li> </ul>
6	<ul style="list-style-type: none"> <li>● As admin I can define new specialised hospital wards.</li> <li>● As a user I can select hospital wards to be displayed in the widget.</li> </ul>
7	<ul style="list-style-type: none"> <li>● As a user I can select the case attributes and values by category and subcategory.</li> <li>● Allow the system to collect/user to manage the case attributes and values.</li> </ul>
8	<ul style="list-style-type: none"> <li>● As a user I can see a stacked chart of cases based on a certain attribute,</li> <li>● As a user I can manage its own colours for each value of attribute of the case.</li> <li>● As a user I can manage its country colours for each value of attribute of the case.</li> <li>● As PANDEM-2 Admin I can manage system colours for each value of attribute of the case.</li> <li>● Allow the system to collect case attributes and values.</li> </ul>

## 6.2.2 RIVM-29 / RUNMC-43 Hospitalized patients in need of ICU

### 6.2.2.1 User Interface

Figure 32. Hospitalized patients in need of ICU dashboard prototype



### 6.2.2.2 User Stories

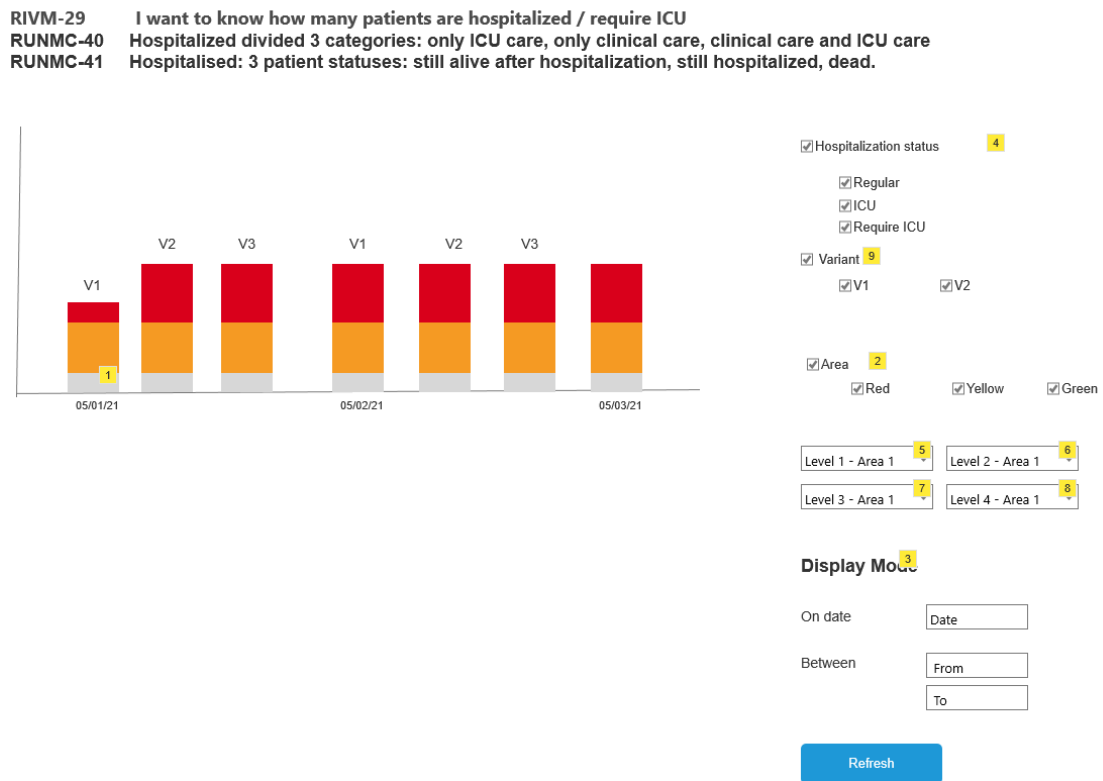
Table 44. User stories and tasks for the Hospitalized patients in need of ICU dashboard prototype

Note number	Note
1	● As a user I can see a stacked chart of hospitalized cases based on the hospitalization status
2	● As a user I can select the area types by level of disease spread.
3	● As a user I can select display mode: ● - date ● - time lapse between certain periods days
4	● As a user I can select cases by hospitalization status category
5	● As a user I can select at the location level, multi-select allowed
6	● As a user I can select at the location level, multi-select allowed
7	● As a user I can select at the location level, multi-select allowed
8	● As a user I can select at the location level, multi-select allowed

## 6.2.3 RIVM-29 / RUNMC-40 / RUNMC-41 - I want to know how many patients are hospitalized / require ICU

### 6.2.3.1 User Interface

Figure 33. Hospitalized patients divided by category dashboard prototype



### 6.2.3.2 User Stories

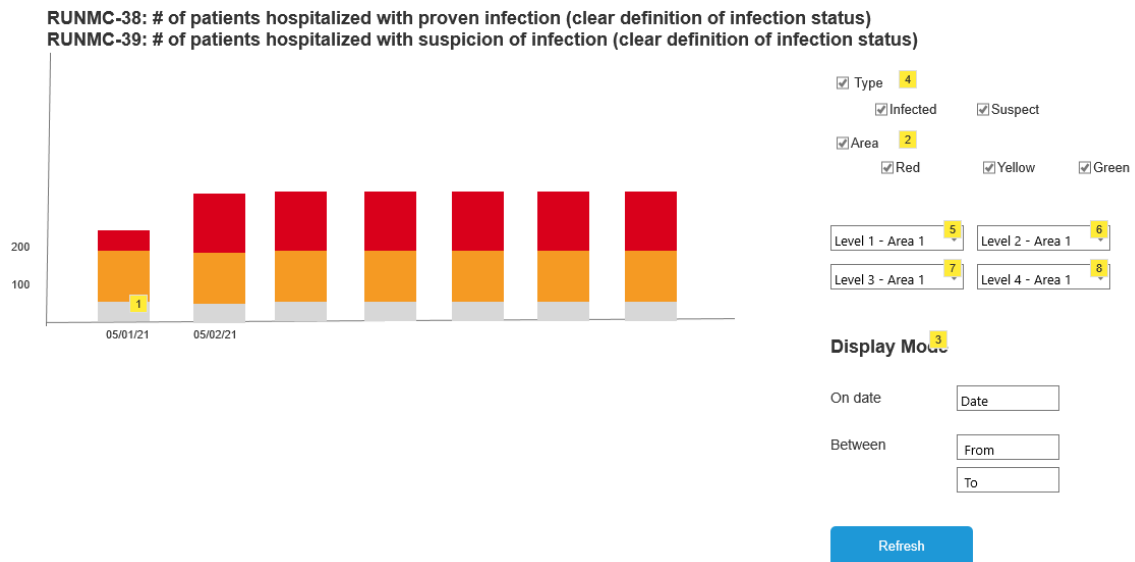
Table 45. User stories and tasks for the Hospitalized patients divided by category dashboard prototype

Note number	Note
1	● As a user I can see a stacked chart of hospitalized cases based on the hospitalization status
2	● As a user I can select the area types by level of disease spread.
3	● As a user I can select display mode: ● - date ● - time lapse between certain periods days
4	● As a user I can select cases by hospitalization status category
5	● As a user I can select at the location level, multi-select allowed
6	● As a user I can select at the location level, multi-select allowed
7	● As a user I can select at the location level, multi-select allowed
8	● As a user I can select at the location level, multi-select allowed
9	● As a user I can select variants

## 6.2.4 RUNMC-38 / RUNMC-39 - # of patients hospitalized with proven infection (clear definition of infection status)

### 6.2.4.1 User Interface

Figure 34. Number of patients with proven infection dashboard prototype



### 6.2.4.2 User Stories

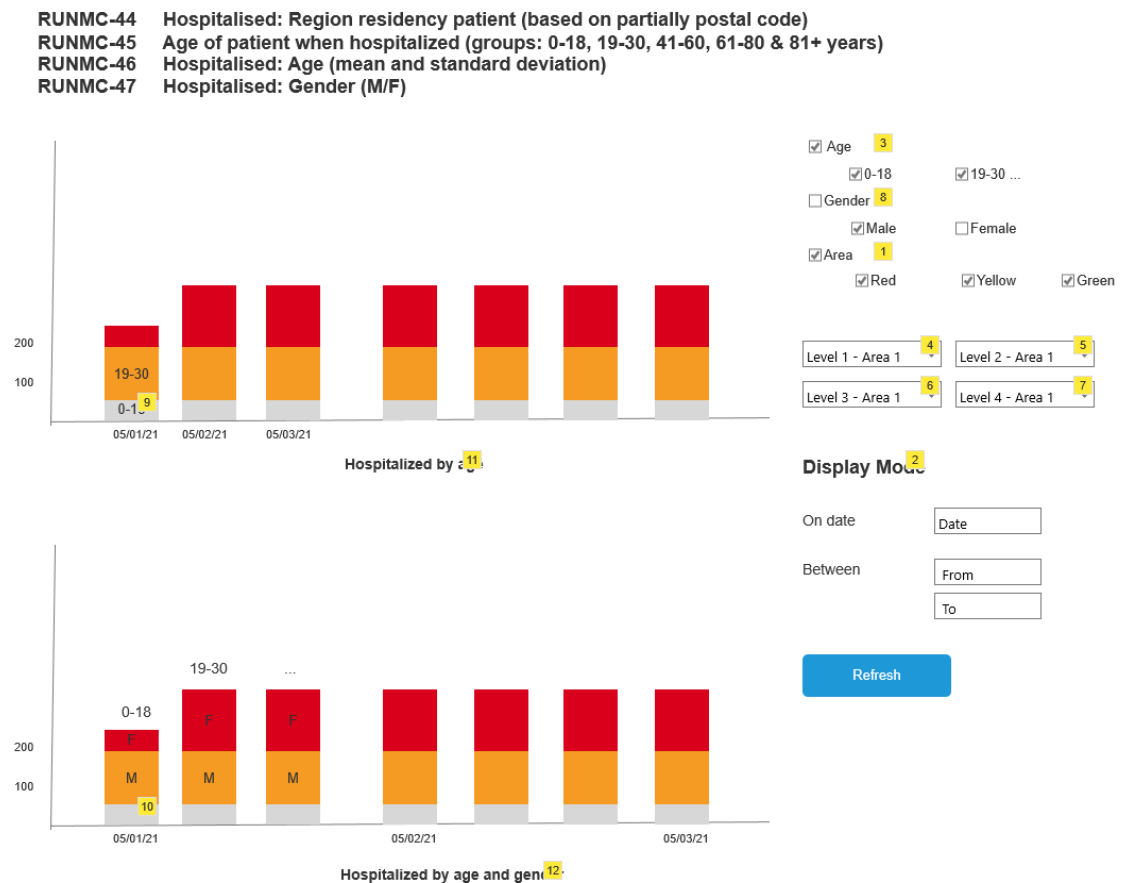
Table 46. User stories and tasks for the Number of patients with proven infection dashboard prototype

Note number	Note
1	● As a user I can see a stacked chart of hospitalized cases based on the category,'
2	● As a user I can select the area types by level of disease spread.
3	● As a user I can select display mode: <ul style="list-style-type: none"> <li>○ date</li> <li>○ time lapse between certain periods days</li> </ul>
4	● As a user I can select category of case
5	● As a user I can select at the location level, multi-select allowed
6	● As a user I can select at the location level, multi-select allowed
7	● As a user I can select at the location level, multi-select allowed
8	● As a user I can select at the location level, multi-select allowed

## 6.2.5 RUNMC-44 / RUNMC44-47 - Hospitalised: Region, Gender, Age

### 6.2.5.1 User Interface

Figure 35. Hospitalised patients by region, gender, age dashboard prototype



### 6.2.5.2 User Stories

Table 47. User stories and tasks for the Hospitalized patients by region, gender, age dashboard prototype

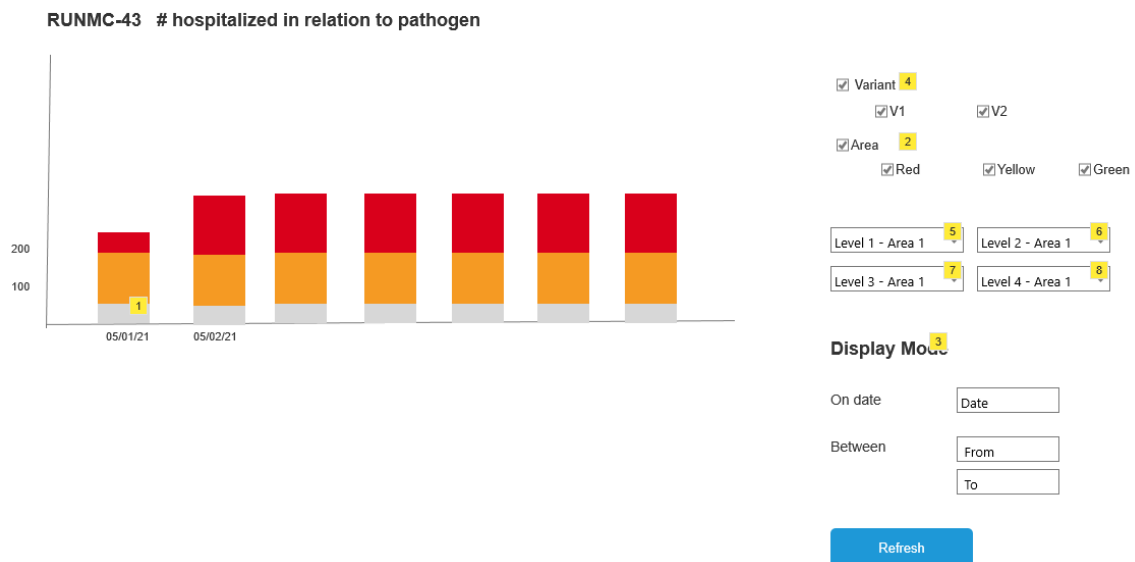
Note number	Note
1	● As a user I can select the area types by level of disease spread.
2	● As a user I can select display mode: <ul style="list-style-type: none"> <li>○ date</li> <li>○ time lapse between certain periods days</li> </ul>
3	● As a user I can select age ranges Allow pandemic managers to manage age ranges.
4	● As a user I can select at the location level, multi-select allowed
5	● As a user I can select at the location level, multi-select allowed
6	● As a user I can select at the location level, multi-select allowed
7	● As a user I can select at the location level, multi-select allowed
8	● As a user I can select gender

9	● As a user I can see a stacked chart of hospitalized cases based on the hospitalization status
10	● As a user I can see a stacked chart of hospitalized cases based on the hospitalization status
11	● As a user I can view the hospitalized split by one dimension.
12	● As a user I can view the hospitalized split by two dimensions.

## 6.2.6 RUNMC-43 - # hospitalized in relation to pathogen

### 6.2.6.1 User Interface

Figure 36. Number of hospitalized in relation to pathogen dashboard prototype



### 6.2.6.2 User Stories

Table 48. User stories and tasks for the Number of hospitalized in relation to pathogen dashboard prototype

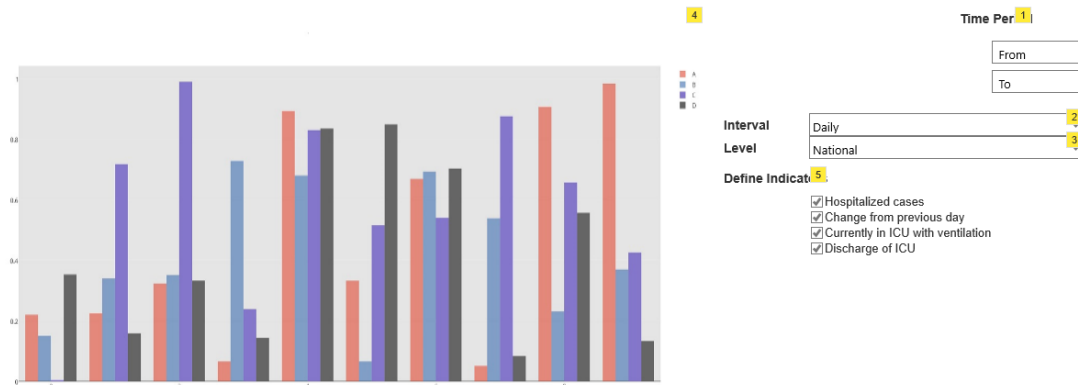
Note number	Note
1	● As a user I can see a stacked chart of hospitalized cases based on the variant
2	● As a user I can select the area types by level of disease spread.
3	● As a user I can select display mode: <ul style="list-style-type: none"> <li>○ date</li> <li>○ time lapse between certain periods days</li> </ul>
4	● As a user I can select variants
5	● As a user I can select at the location level, multi-select allowed
6	● As a user I can select at the location level, multi-select allowed
7	● As a user I can select at the location level, multi-select allowed
8	● As a user I can select at the location level, multi-select allowed

## 6.2.7 RKI-20 - Cases in Hospitals

### 6.2.7.1 User Interface

Figure 37. Cases in Hospitals dashboard prototype<sup>33</sup>

RKI-20: cases treated in hospitals, change to previous day in numbers, currently in ICU with invasive ventilation, discharge of ICU, thereof deaths



### 6.2.7.2 User Stories

Table 49. User stories and tasks for the Cases in Hospitals dashboard prototype

Note number	Note
1	● As a user I can select the period for which the widget will display data.
2	● As a user I can select an interval for the distribution of data
3	<ul style="list-style-type: none"> <li>● As admin I can add or remove regions or institutions.</li> <li>● As a user I can select a region or a health institute for which the widget will display data.</li> </ul>
4	● As a user I can see a graphical representation of the selected indicators, grouped by selected time intervals.
5	<ul style="list-style-type: none"> <li>● As admin I can define new indicators for the graph to display.</li> <li>● As a user I can select one or more indicators to be tracked on the widget.</li> </ul>

<sup>33</sup> <https://images.app.goo.gl/fjCq7DjKwJMrx2dY9>

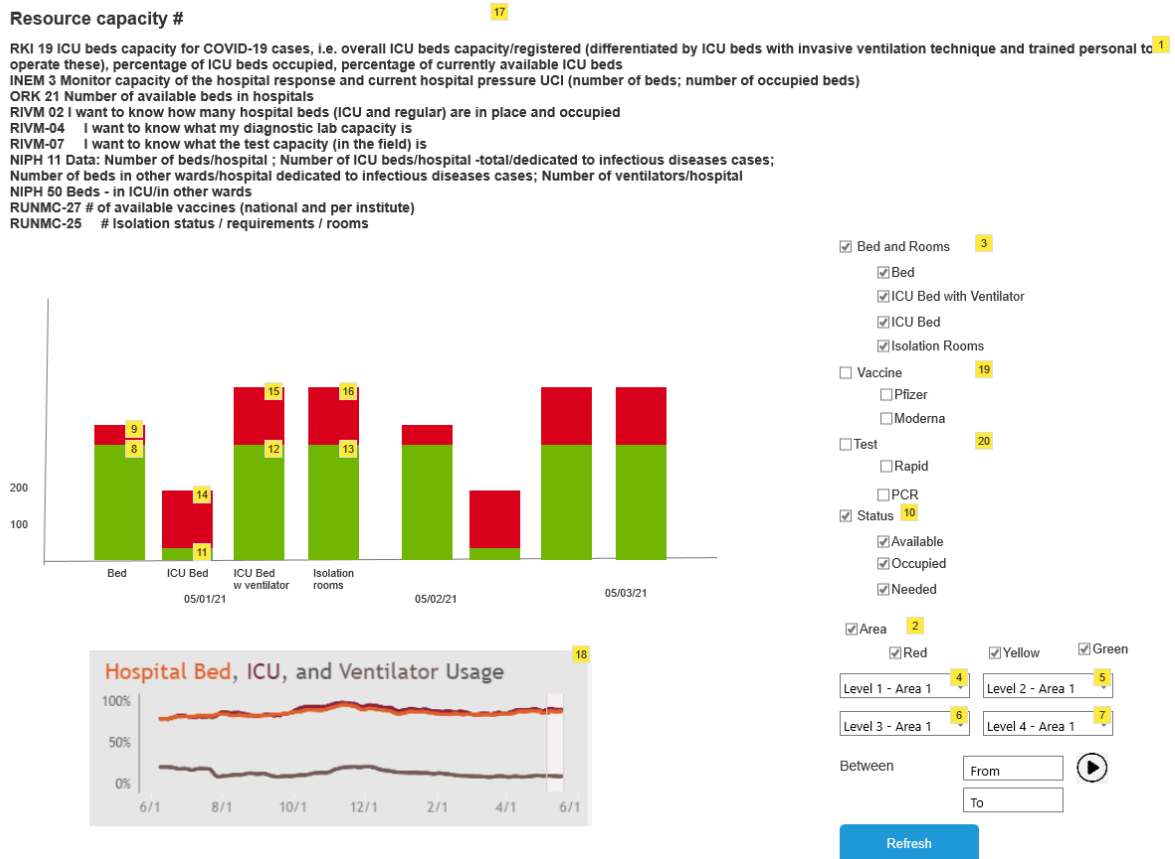


## 6.3 Healthcare Capacity

### 6.3.1 RKI-19 INEM3 ORK21 RIVM02, 07 NIPH11 NIPH50 RUNMC25, 27 RIVM04 - Resource capacity #

#### 6.3.1.1 User Interface

Figure 38. Resource capacity dashboard prototype<sup>34</sup>



#### 6.3.1.2 User Stories

Table 50. User stories and tasks for the Resource Capacity dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>As a user I can view the chart of cases by different genetic variants</li> <li>Allow the system to collect data about resources: location, type, status, count, date.</li> </ul>
2	<ul style="list-style-type: none"> <li>As a user I can select the area types by level of disease spread.</li> </ul>

<sup>34</sup> <https://www.dhs.wisconsin.gov/covid-19/hosp-data.htm#capacity>

3	<ul style="list-style-type: none"> <li>● As a user I can select the resources category and subcategory they want to see in the graph.</li> <li>● As a user I can manage the types of resources.</li> </ul>
4	● As a user I can select at the location level, multi-select allowed
5	● As a user I can select at the location level, multi-select allowed
6	● As a user I can select at the location level, multi-select allowed
7	● As a user I can select at the location level, multi-select allowed
8	● Show number of beds with status available.
9	● Show number of beds with status occupied.
10	<ul style="list-style-type: none"> <li>● As a user I can select the status of resources they want to see in the graph.</li> <li>● As a user I can manage the status of the resources.</li> </ul>
11	● Show number of ICU beds with status available.
12	● Show number of ICU beds with ventilators and status available.
13	● Show number of isolation rooms with status available.
14	● Show number of ICU beds with status occupied.
15	● Show number of ICU beds with ventilators and status occupied.
16	● Show number of isolation rooms with status occupied.
17	● As a user I can view the chart of with resource capacity
18	● Show the usage percentage (occupied / total) of each resource selected for the time interval
19	<ul style="list-style-type: none"> <li>● As a user I can select the resources category and subcategory they want to see in the graph.</li> <li>● As a user I can manage the types of resources.</li> </ul>
20	<ul style="list-style-type: none"> <li>● As a user I can select the resources category and subcategory they want to see in the graph.</li> <li>● As a user I can manage the types of resources.</li> </ul>

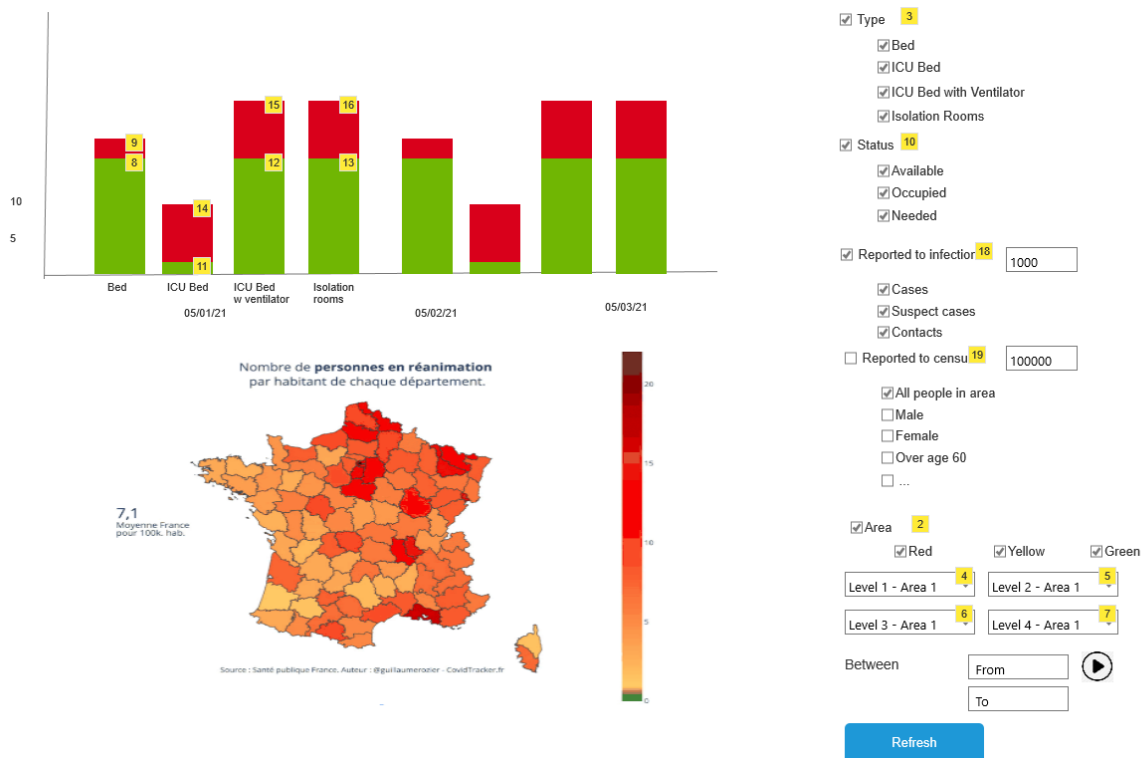
### 6.3.2 RKI-19 INEM3 ORK21 RIVM02 NIPH11 NIPH50 RUNMC25, 27 - Map Resource capacity vs Number of infections/people in the area

#### 6.3.2.1 User Interface

Figure 39. Map resource capacity vs number of infections dashboard prototype<sup>35</sup>

##### Resource capacity vs Number of infections/people in the area

RKI 19 ICU beds capacity for COVID-19 cases, i.e. overall ICU beds capacity/registered (differentiated by ICU beds with invasive ventilation technique and trained personal to operate these), percentage of ICU beds occupied, percentage of currently available ICU beds  
INEM 3 Monitor capacity of the hospital response and current hospital pressure UCI (number of beds; number of occupied beds)  
ORK 21 Number of available beds in hospitals  
RIVM 02 I want to know how many hospital beds (ICU and regular) are in place and occupied  
NIPH 11 Data: Number of beds/hospital ; Number of ICU beds/hospital -total/dedicated to infectious diseases cases;  
Number of beds in other wards/hospital dedicated to infectious diseases cases; Number of ventilators/hospital  
NIPH 50 Beds - in ICU/in other wards



#### 6.3.2.2 User Stories

Table 51. User stories and tasks for the Map resource capacity vs number of infections dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>As a user I can view the chart of cases by different genetic variants</li> <li>Allow the system to collect data about resources: location, type, status, count, date.</li> </ul>
2	<ul style="list-style-type: none"> <li>As a user I can select the area types by level of disease spread.</li> </ul>
3	<ul style="list-style-type: none"> <li>As a user I can select the types of resources they want to see in the graph.</li> </ul>

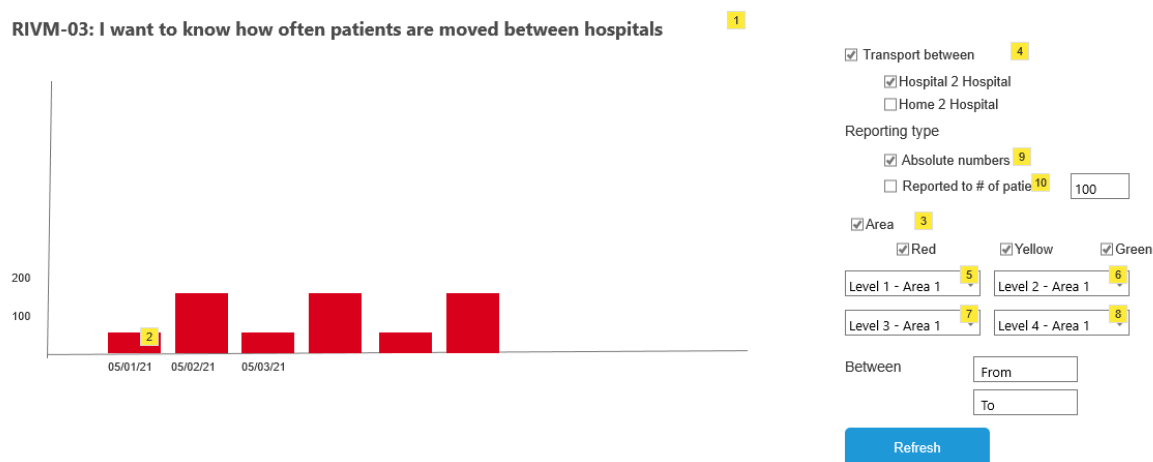
<sup>35</sup> <https://covidtracker.fr/>

	● As a user I can manage the types of resources.
4	● As a user I can select at the location level, multi-select allowed
5	● As a user I can select at the location level, multi-select allowed
6	● As a user I can select at the location level, multi-select allowed
7	● As a user I can select at the location level, multi-select allowed
8	● Show number of beds with status available / number of people in the area
9	● Show number of beds with status occupied / number of people in the area
10	● As a user I can select the status of resources they want to see in the graph. ● As a user I can manage the status of the resources.
11	● Show number of ICU beds with status available / number of people in the area
12	● Show number of ICU beds with ventilators and status available / number of people in the area
13	● Show number of isolation rooms with status available / number of people in the area
14	● Show number of ICU beds with status occupied / number of people in the area
15	● Show number of ICU beds with ventilators and status occupied / number of people in the area
16	● Show number of isolation rooms with status occupied / number of people in the area
17	● As a user I can view the chart with resource capacity vs number of people in the area.
18	● As a user I can select the case status from the list. If multiple status are selected, the numbers will add.
19	● As a user I can select the various groups from the census.

### 6.3.3 RIVM-03 - How often patients are moved between hospitals

#### 6.3.3.1 User Interface

Figure 40. Transferred patients dashboard prototype



#### 6.3.3.2 User Stories

Table 52. User stories and tasks for the Transferred patients dashboard prototype

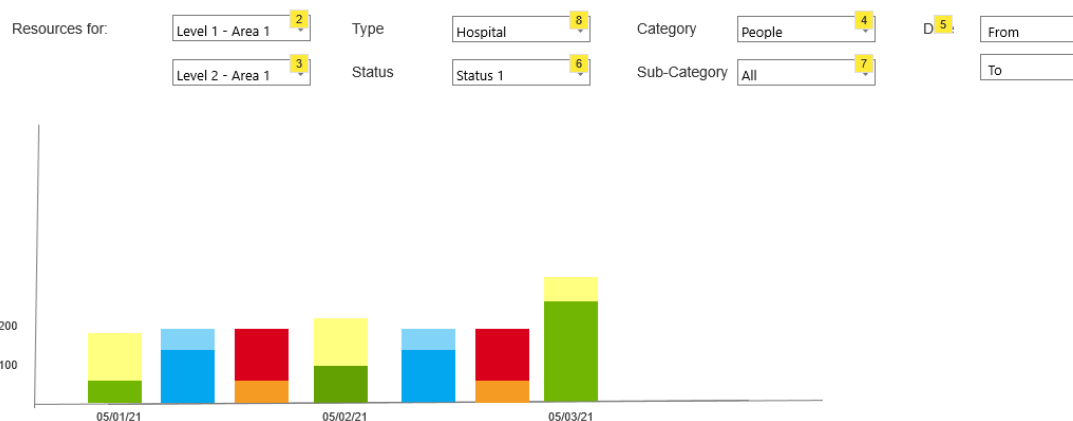
Note number	Note
1	● As a user I can view how often patients are moved between hospitals
2	● Show number of quarantines for selected areas and date.
3	● As a user I can select the area types by level of disease spread.
4	● As a user I can select types of PoI they want to see in the graph.
5	● As a user I can select at the location level, multi-select allowed
6	● As a user I can select at the location level, multi-select allowed
7	● As a user I can select at the location level, multi-select allowed
8	● As a user I can select at the location level, multi-select allowed
9	● As a user I can select the report as absolute number count.
10	● As a user I can select the movement reported to number of patients

### 6.3.4 RKI-21 - Capability of trained staff (1)

#### 6.3.4.1 User Interface

Figure 41. Capability of trained staff (1) dashboard prototype

RKI-21 Capability of trained staff 1  
 RKI-16 Data on capacity of public health service, i.e. assessment of health professionals available for pandemic response, contact tracing/search capacity  
 ORK-10 Diagram over time of operational personal (with totals)  
 RUNMC-14 # Total staff (doctors, nurses, ambulance staff, other essential staff)  
 RIVM-05 I want to know how many hospital staff is needed and available (baseline/surge/triage)  
 RIVM-06 I want to know how many contact tracers are needed and available  
 RIVM-08 I want to know how many staff are needed and available for testing facilities  
 RIVM-09 I want to know how many staff are needed and available for vaccination sites



#### 6.3.4.2 User Stories

Table 53. User stories and tasks for the Capability of trained staff (1) dashboard prototype

Note number	Note
1	● As a user I can view the people by category and subcategory.
2	● As a user I can select at the location level, multi-select allowed
3	● As a user I can select at the location level, multi-select allowed
4	● As a user I can select the category of the resource
5	● As a user I can select the date interval
6	● As a user I can select the status of the resource
7	● As a user I can select the subcategory of the resource
8	● As a user I can select the type for the point of interest

### 6.3.5 RKI-16, 21 ORK10 RUNMC14 RIVM06,08,09 - Capability of trained staff

#### 6.3.5.1 User Interface

Figure 42. Capability of trained staff dashboard prototype

RKI-21 Capability of trained staff 1  
 RKI-16 Data on capacity of public health service, i.e. assessment of health professionals available for pandemic response, contact tracing/search capacity  
 ORK-10 Diagram over time of operational personal (with totals)  
 RUNMC-14 # Total staff (doctors, nurses, ambulance staff, other essential staff)  
 RIVM-05 I want to know how many hospital staff is needed and available (baseline/surge/triage)  
 RIVM-06 I want to know how many contact tracers are needed and available  
 RIVM-08 I want to know how many staff are needed and available for testing facilities  
 RIVM-09 I want to know how many staff are needed and available for vaccination sites

Resources for:

Level 1 - Area 1 2  
 Level 2 - Area 1 3

Type: Hospital 8  
 Status: Status 1 6

Category: People 4  
 Sub-Category: All 7

D 5: 5  
 From: 9  
 To:

Country	Status	Date	Doctors	Nurses	Drivers
Romania	Available	1/1/21	2000	2000	2000
Romania	Sick	1/1/21	20	20	20
					2000
					2000

#### 6.3.5.2 User Stories

Table 54. User stories and tasks for the Capability of trained staff dashboard prototype

Note number	Note
1	● As a user I can view the people by category and subcategory.
2	● As a user I can select at the location level, multi-select allowed
3	● As a user I can select at the location level, multi-select allowed
4	● As a user I can select the category of the resource
5	● As a user I can select the date interval
6	● As a user I can select the status of the resource
7	● As a user I can select the subcategory of the resource
8	● As a user I can select the type for the point of interest

### 6.3.6 INEM-04 - Monitoring pre-hospital service

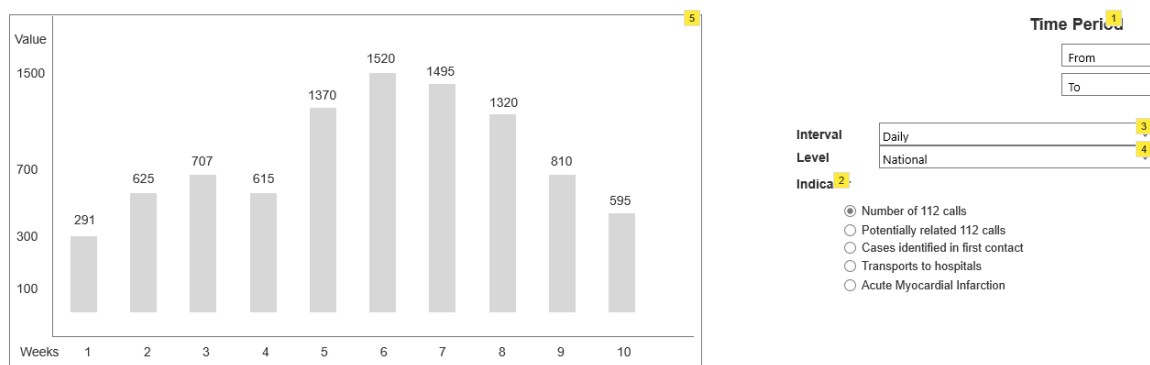
#### 6.3.6.1 User Interface

Figure 43. Monitoring pre-hospital service dashboard prototype

##### INEM-04:

Monitoring of activity / pressure on the pre-hospital emergency service.

- Number of 112 (emergency line) calls
  - Number of potentially related cases 112 calls (Ex: dyspnea / fever / cough)
  - Number of cases identified in the first contact ("I am a covid +")
  - Number of transports to hospital carried out (Ex: suspected covid / covid and non-covid)
  - Times (Ex: arrival at the location)
  - Comparative monitoring in relation to non-pandemic periods of unrelated situations
- Number of acute myocardial infarction, strokes, out-of-hospital cardiac arrests, trauma, etc. (indicators with the highest prevalence in morbidity and mortality).



#### 6.3.6.2 User Stories

Table 55. User stories and tasks for the Monitoring pre-hospital service dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>● As a user I can select the period for which the widget will display data.</li> </ul>
2	<ul style="list-style-type: none"> <li>● As admin I can define pre-hospital emergency monitorization indicators.</li> <li>● As a user I can select an indicator for which the widget will display data</li> </ul>
3	<ul style="list-style-type: none"> <li>● As a user I can select an interval for the distribution of data</li> </ul>
4	<ul style="list-style-type: none"> <li>● As admin I can add or remove regions or institutions.</li> <li>● As a user I can select a region or a health institute for which the widget will display data.</li> </ul>
5	<ul style="list-style-type: none"> <li>● As a user I can see a timely distribution of values for the selected indicator, according to the selected time interval and region.</li> </ul>



## 6.3.7 INEM-8 - Patients Transportation

### 6.3.7.1 User Interface

Figure 44. Patients Transportation dashboard prototype

INEM-08: Will it be necessary to activate a mass patient transport response?

If so, what are the known options? Bus, train, plane? What do we know about these methods? What are the Guidelines for each?

Situational Awareness by Institution

Institution name	No. Patients	Capacity	Occupation Rate per day	Days to full occupation	Nearest Institution	Available Transports
All	1245	1370	5	25	N/A	N/A
Hospital 1	435	500	1.5	43	Private Hospital 3	Bus Helicopter
Clinic Institute						
Private Hospital 3						

☐ Institution

All

### 6.3.7.2 User Stories

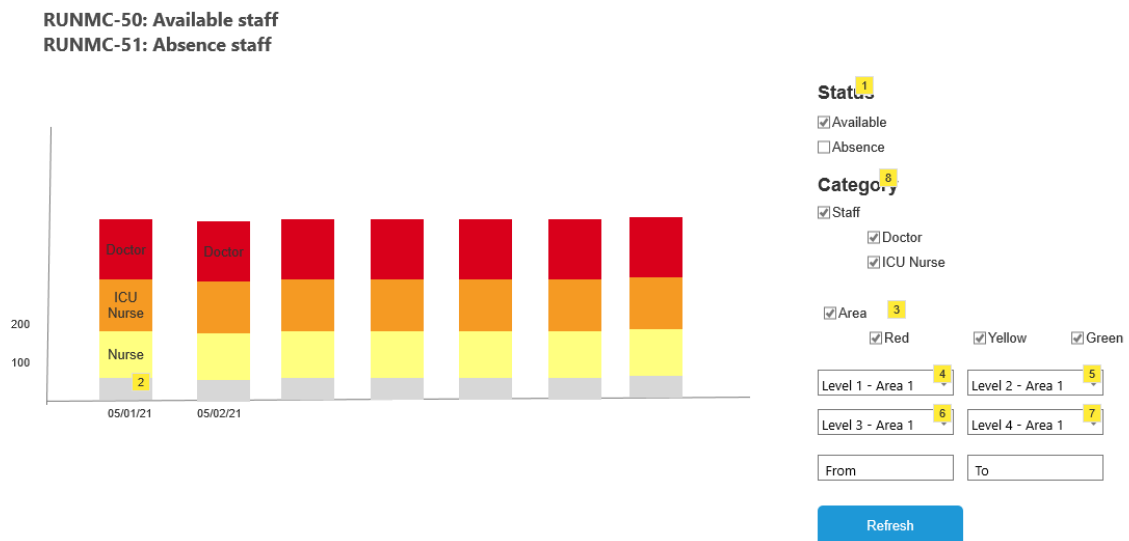
Table 56. User stories and tasks for the Patients Transportation dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>As a user I can see occupation and capacity for each involved institution.</li> <li>As a user I can see the nearest institution where patients can be distributed.</li> <li>As a user I can see available transportation methods for each institution.</li> </ul>
2	<ul style="list-style-type: none"> <li>As admin I can add new institutions for the surveyed list.</li> <li>As a user I can filter the list of institutions to be displayed in the adjacent table.</li> </ul>

### 6.3.8 RUNMC 50 /RUNMC-51 - Available Absence Staff

#### 6.3.8.1 User Interface

Figure 45. Available Absence staff dashboard prototype



#### 6.3.8.2 User Stories

Table 57. User stories and tasks for the Available Absence staff dashboard prototype

Note number	Note
1	● As a user I can select the status of a resource (available, absence, contact, etc.)
2	● As a user I can see a stacked chart of cases based on a certain census group or variants.
3	● As a user I can select the area types by level of disease spread.
4	● As a user I can select at the location level, multi-select allowed
5	● As a user I can select at the location level, multi-select allowed
6	● As a user I can select at the location level, multi-select allowed
7	● As a user I can select at the location level, multi-select allowed
8	● As a user I can select the categories of staff to be listed in a graph.

## 6.4 Resources

### 6.4.1 RKI-22 RUNMC16-22 24 RIVM01 NIPH-51-54 RIVM10 - Personal protective equipment (PPE) (1)

#### 6.4.1.1 User Interface

Figure 46. Personal protective equipment dashboard prototype



#### 6.4.1.2 User Stories

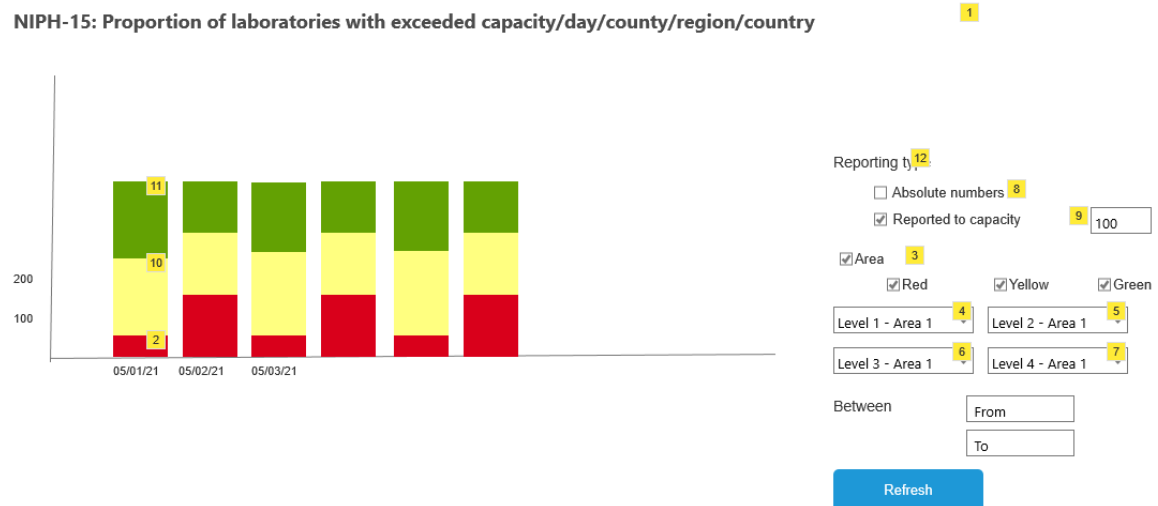
Table 58. User stories and tasks for the Personal protective equipment dashboard prototype

Note number	Note
1	● As a user I can view the chart of resources by category and subcategory.
2	● As a user I can select at the location level, multi-select allowed
3	● As a user I can select at the location level, multi-select allowed
4	● As a user I can select the category of the resource
5	● As a user I can select the date interval
6	● As a user I can select the status of the resource
7	● As a user I can select the subcategory of the resource
8	● As a user I can select the type for the point of interest

## 6.4.2 NIPH-15 - Proportion of laboratories with exceeded capacity/day/county/region/country

### 6.4.2.1 User Interface

Figure 47. Proportion of laboratories with exceeded capacity dashboard prototype



### 6.4.2.2 User Stories

Table 59. User stories and tasks for the Proportion of laboratories with exceeded capacity dashboard prototype

Note number	Note
1	● As a user I can view how often patients are moved between hospitals
2	● Show number or percentage of laboratories with exceeded capacity in red (user preference)
3	● As a user I can select the area types by level of disease spread.
4	● As a user I can select at the location level, multi-select allowed
5	● As a user I can select at the location level, multi-select allowed
6	● As a user I can select at the location level, multi-select allowed
7	● As a user I can select at the location level, multi-select allowed
8	● As a user I can select the tests done divided by resource of type test capacity, displayed in user preference
9	● As a user I can select the movement reported to number of patients
10	● Show number or percentage of laboratories with exceeded capacity in yellow (user preference)
11	● Show number or percentage of laboratories with exceeded capacity in green (user preference)
12	● Will report tests done

### 6.4.3 RKI-22 RUNMC16-22 24 RIVM01 NIPH-51-54 RIVM10 - Personal protective equipment (PPE), Vaccine

#### 6.4.3.1 User Interface

Figure 48. Medical equipment dashboard prototype

RKI-22 personal protective equipment (PPE) 1

RUNMC-16 # PPE (handgloves, masks, face shields etcetera)

RUNMC-17 # Ventilators RUNMC-18 # Optiflow / availability oxygen

RUNMC-19 # Antivirals RUNMC-20 # Desinfection RUNMC-21 # ICU-supply

RUNMC-22 # Ambulances RUNMC-24 # Testing material

RIVM-01 I want to know how much PPE stock is available

NIPH-51 Ventilators NIPH-52 PPE NIPH-53 Antivirals NIPH-54 Vaccine

RIVM-10 I want to know the availability/delivery of the (various) vaccins

Resources for: 2 Level 1 - Area 1 Type 8 Hospital Category 4 PPE 5 D From

3 Level 2 - Area 1 Status 6 Status 1 Sub-Category 7 All To

Country	Status	Date	Face Masks	Gloves	N95	Ventilators
Romania	Obtained	1/1/21	20M	20M	20M	100
Romania	Distributed	1/1/21	12M	12M	12M	80
Romania	Inventory	1/1/21	8M	8M	8M	20
Romania	Ordered	1/15/21	1M	1M	1M	10

#### 6.4.3.2 User Stories

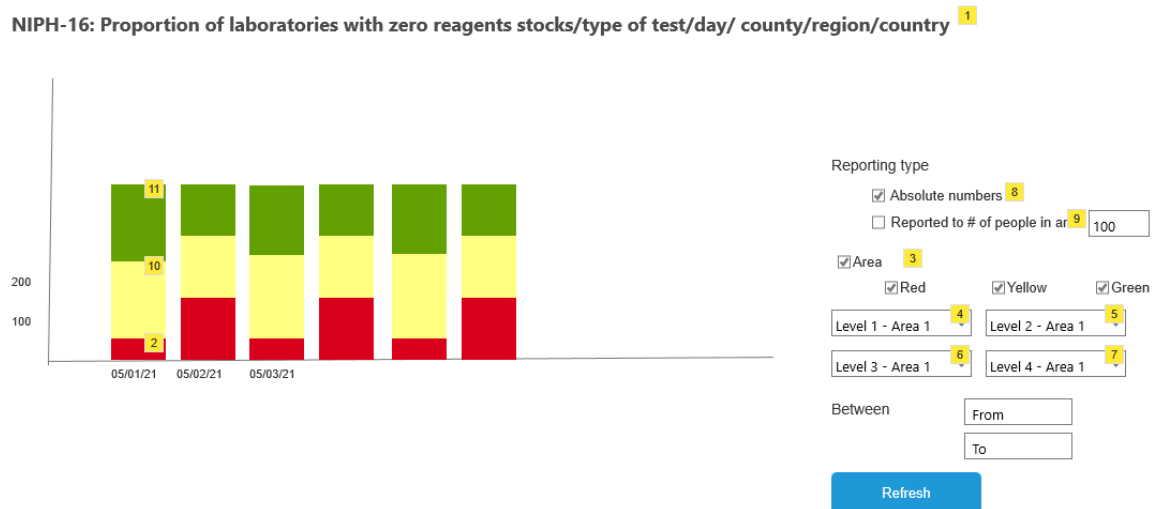
Table 60. User stories and tasks for the Medical equipment dashboard prototype

Note number	Note
1	● As a user I can view the number of resources by category and subcategory.
2	● As a user I can select at the location level, multi-select allowed
3	● As a user I can select at the location level, multi-select allowed
4	● As a user I can select the category of the resource
5	● As a user I can select the date interval
6	● As a user I can select the status of the resource
7	● As a user I can select the subcategory of the resource
8	● As a user I can select the type for the point of interest

#### 6.4.4 NIPH-16 - Proportion of laboratories with zero reagents stocks/type of test/day/ county/region/country

##### 6.4.4.1 User Interface

Figure 49. Proportion of laboratories with zero reagent stocks dashboard prototype



##### 6.4.4.2 User Stories

Table 61. User stories and tasks for the Proportion of laboratories with zero reagent stocks dashboard prototype

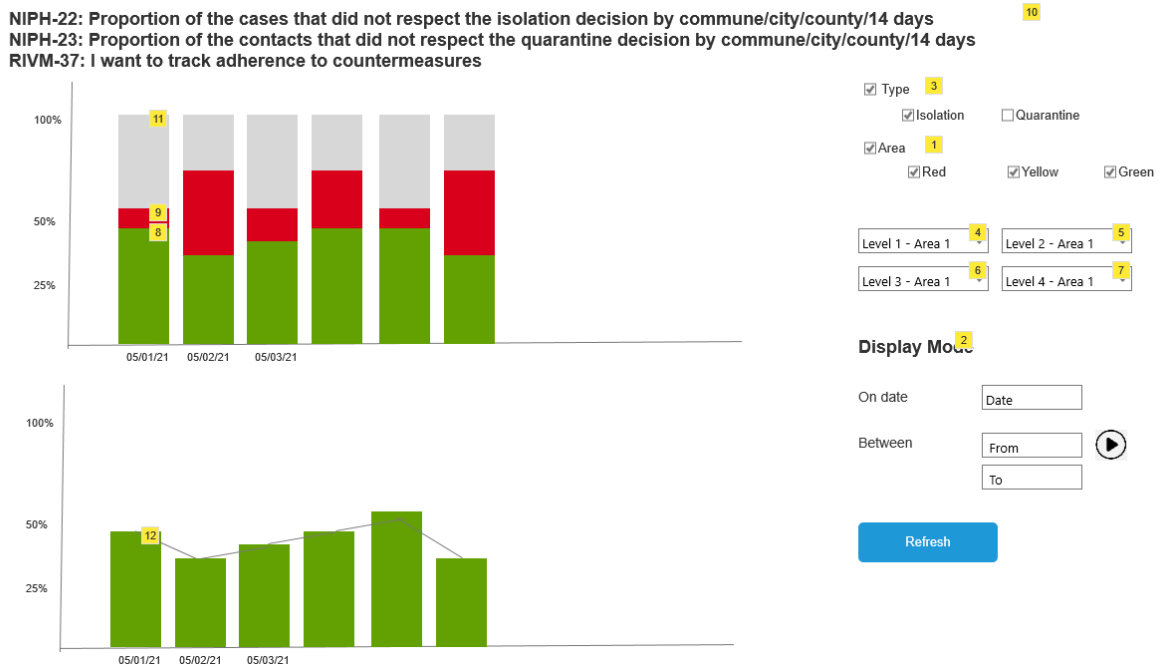
Note number	Note
1	● As a user I can view how often patients are moved between hospitals
2	● show number or percentage of laboratories with red (0 tests) in stock
3	● As a user I can select the area types by level of disease spread.
4	● As a user I can select at the location level, multi-select allowed
5	● As a user I can select at the location level, multi-select allowed
6	● As a user I can select at the location level, multi-select allowed
7	● As a user I can select at the location level, multi-select allowed
8	● As a user I can select the report as absolute number count.
9	● As a user I can select the tests divided by number of people
10	● Show number or percentage of laboratories with yellow (user preference tests) in stock
11	● Show number or percentage of laboratories with green (user preference tests) in stock

## 6.5 Interventions

### 6.5.1 NIPH-22 / NIPH-23 / RIVM-37 - Isolation decisions

#### 6.5.1.1 User Interface

Figure 50. Isolation decisions dashboard prototype



#### 6.5.1.2 User Stories

Table 62. User stories and tasks for the Isolation decisions dashboard prototype

Note number	Note
1	● As a user I can select the area types by level of disease spread.
2	● As a user I can select display mode: <ul style="list-style-type: none"> <li>○ date</li> <li>○ time lapse between certain periods days</li> </ul>
3	● As a user I can select types of person separation level: isolation, quarantine
4	● As a user I can select at the location level, multi-select allowed
5	● As a user I can select at the location level, multi-select allowed
6	● As a user I can select at the location level, multi-select allowed
7	● As a user I can select at the location level, multi-select allowed
8	● Show the percentage of isolation decisions implemented for selected areas and date.
9	● Show percentage of isolation decisions not implemented for selected areas and date.
10	● As a user I can view the chart with percentages of implementation for separation decisions by area and date.

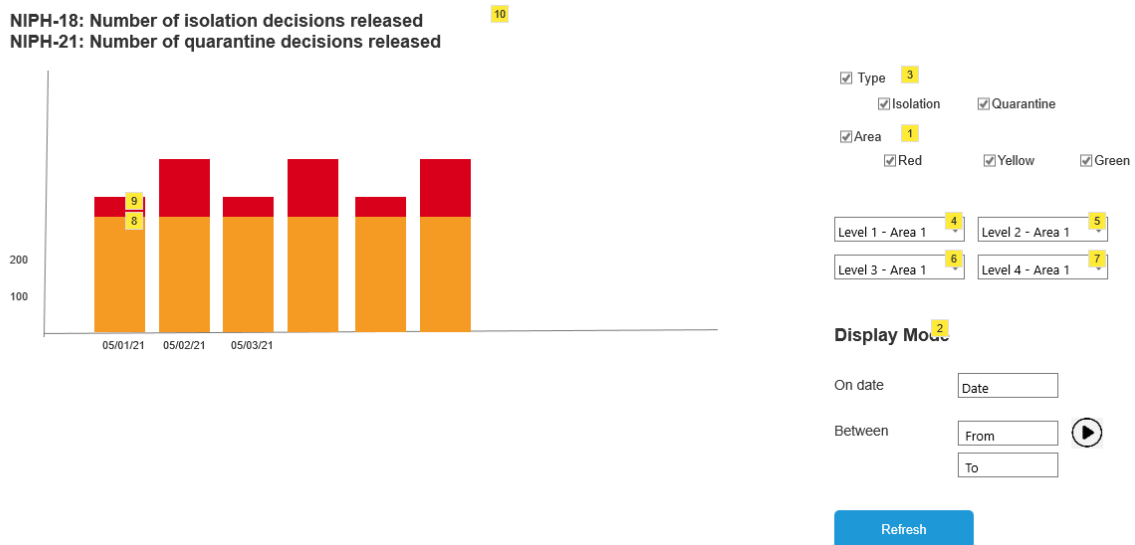
11	● Show percentage of isolations decisions unknown implemented for selected areas and date.
12	● Show percentage of isolation decisions implemented for selected areas and date.



## 6.5.2 NIPH-18 / NIPH-21 Isolation and Quarantine

### 6.5.2.1 User Interface

Figure 51. Isolation and Quarantine dashboard prototype



### 6.5.2.2 User Stories

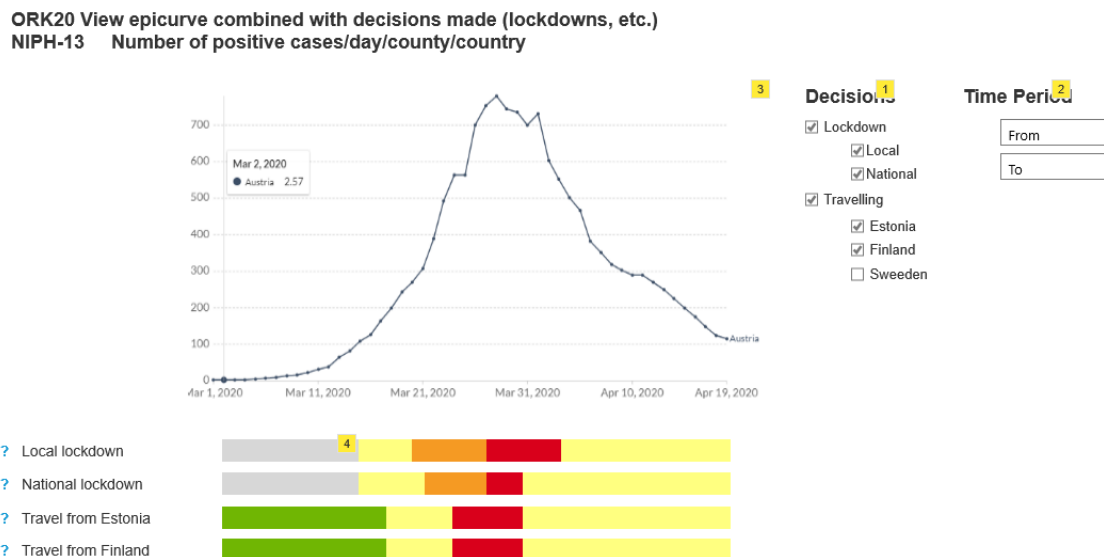
Table 63. User stories and tasks for the Isolation and Quarantine dashboard prototype

Note number	Note
1	● As a user I can select the area types by level of disease spread.
2	● As a user I can select display mode: <ul style="list-style-type: none"> <li>○ date</li> <li>○ time lapse between certain periods days</li> </ul>
3	● As a user I can select types of person separation level: isolation, quarantine.
4	● As a user I can select at the location level, multi-select allowed
5	● As a user I can select at the location level, multi-select allowed
6	● As a user I can select at the location level, multi-select allowed
7	● As a user I can select at the location level, multi-select allowed
8	● show number of isolations for selected areas and date.
9	● show number of quarantines for selected areas and date.
10	● As a user I can view the chart of person isolation by type, date, area.

### 6.5.3 ORK20 - Cases and Decisions

#### 6.5.3.1 User Interface

Figure 52. Cases and Decisions dashboard prototype<sup>36</sup>



#### 6.5.3.2 User Stories

Table 64. User stories and tasks for the Cases and Decisions dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>● As a user I can select the decisions by category and subcategory.</li> <li>● Allow system to collect/user to manage the decisions: category, severity, effective starts from, effective ends on, location(s) affected, location(s) related to</li> <li>● As a user I can manage decision categories.</li> <li>● As a user I can manage decision sub-categories.</li> </ul>
2	<ul style="list-style-type: none"> <li>● As a user I can select the period to see the dashboard.</li> </ul>
3	<ul style="list-style-type: none"> <li>● As a user I can view the EPI curve (count of total cases) for the selected period and location.</li> <li>● As a user I can view the EPI curve (count of total cases stratified by case type) for the selected period and location.</li> <li>● Allow system to collect the count of cases by: <ul style="list-style-type: none"> <li>○ date</li> <li>○ location</li> <li>○ type (confirmed, suspect, ...)</li> </ul> </li> <li>● As a user I can manage case type lists.</li> </ul>

<sup>36</sup> <https://ourworldindata.org/coronavirus/country/austria>

4	<ul style="list-style-type: none"><li>● As a user I can manage its own colours for each decision category, severity.</li><li>● As a user I can manage its country colours for each decision category, severity.</li><li>● As PANDEM-2 Admin I can manage system colours for each decision category, severity.</li></ul>
---	---

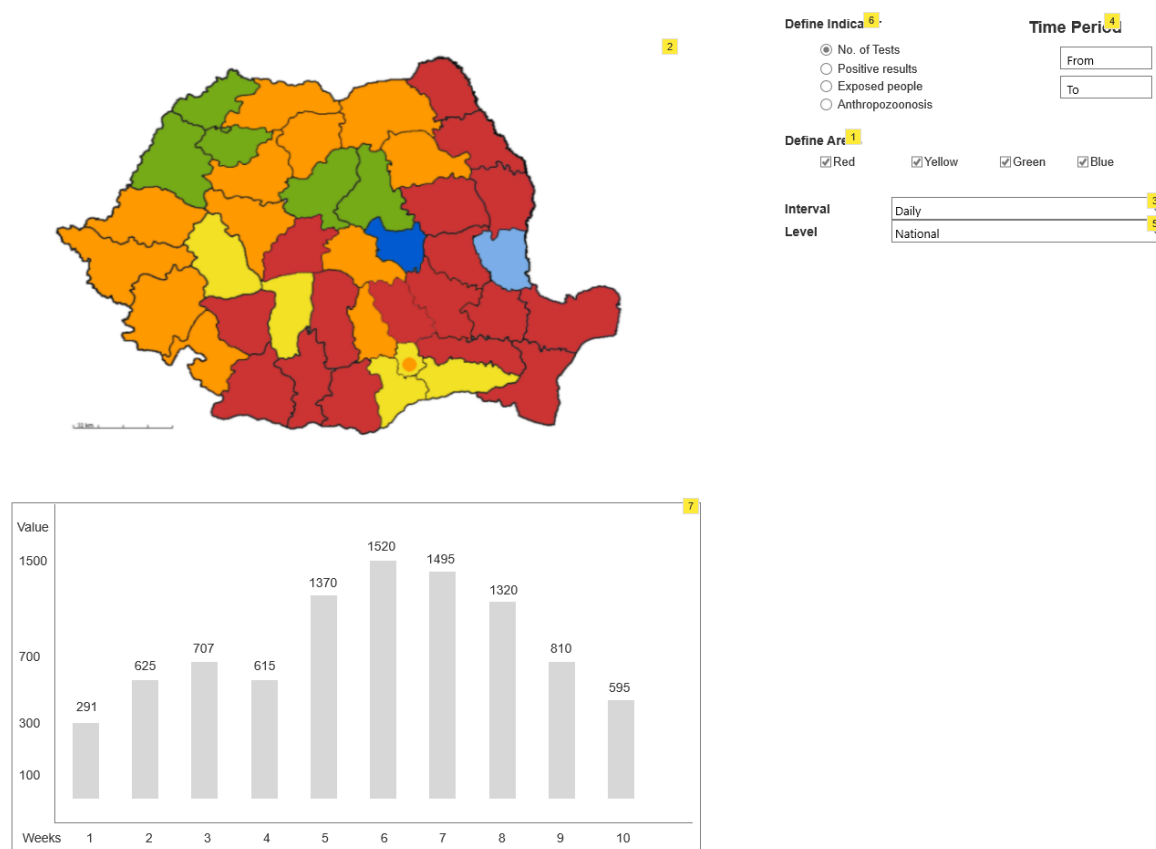
## 6.6 Disease Profile

### 6.6.1 NIPH-42 - Zoonosis

#### 6.6.1.1 User Interface

Figure 53. Zoonosis dashboard prototype<sup>37</sup>

NIPH - 42: Data: Number of zoonosis/disease/week/month/year/commune/city/county/country  
 Number of tests performed in animals/ disease / week / month / year / commune/city/county / country  
 Number of positive results in animals/ disease / week / month / year / commune/city/county / country  
 Number of exposed people/disease/week/month/year/commune/city/county/country  
 Number of anthrozoosis / disease / week / month / year / commune / city / county / country



#### 6.6.1.2 User Stories

Table 65. User stories and tasks for the Zoonosis dashboard prototype

Note number	Note
1	● As admin I can define colour codes for the map widget to display.

<sup>37</sup> <https://images.app.goo.gl/DeB5mQduSckpTvUa6>

2	<ul style="list-style-type: none"> <li>● As a user I can see zoonosis cases distributed by territorial units.</li> </ul>
3	<ul style="list-style-type: none"> <li>● As a user I can select an interval for the widgets to display.</li> </ul>
4	<ul style="list-style-type: none"> <li>● As a user I can select the period for the widgets to display data.</li> </ul>
5	<ul style="list-style-type: none"> <li>● As admin I can add or remove regions or institutions.</li> <li>● As a user I can select a region or a health institute for which the widget will display data.</li> </ul>
6	<ul style="list-style-type: none"> <li>● As admin I can define new indicators.</li> <li>● As a user I can select an indicator to be displayed by the widgets.</li> </ul>
7	<ul style="list-style-type: none"> <li>● As a user I can see a timely evolution for the selected indicator, distributed by the selected interval.</li> </ul>

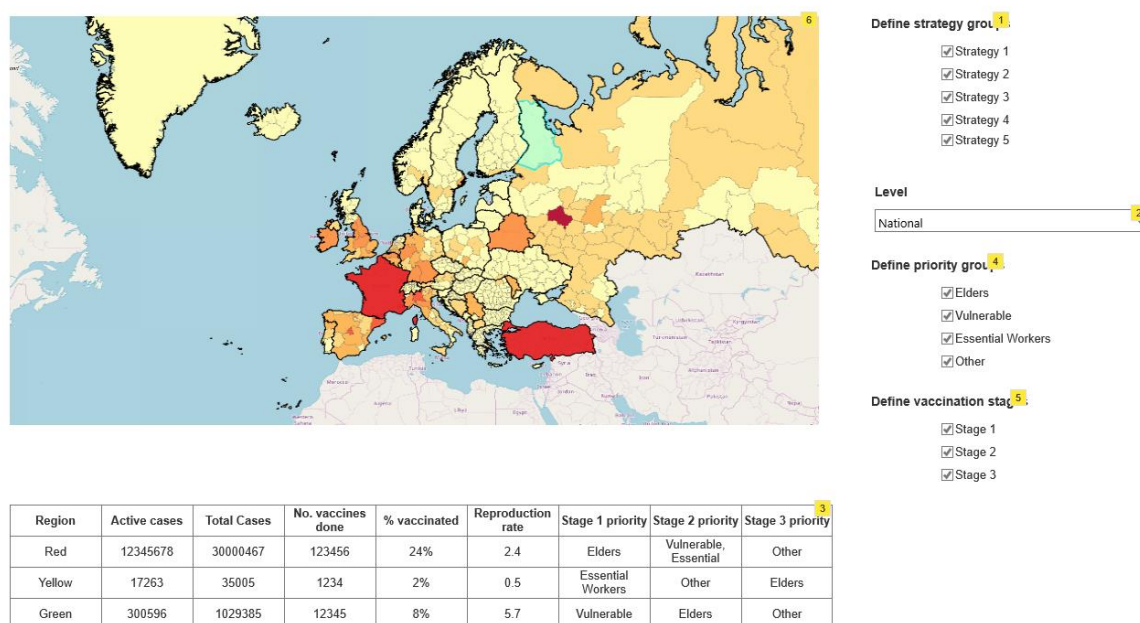
## 6.7 Vaccinations

### 6.7.1 RIVM-11 - Vaccination Strategy

#### 6.7.1.1 User Interface

Figure 54. Vaccination Strategy dashboard prototype<sup>38</sup>

RIVM-11: I want to know/share the vaccination strategy



#### 6.7.1.2 User Stories

Table 66. User stories and tasks for the Vaccination Strategy dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>As admin I can define strategy groups for the map widget to display.</li> <li>As a user I can select one or more strategy groups to be displayed.</li> </ul>
2	<ul style="list-style-type: none"> <li>As admin I can add or remove regions or institutions.</li> <li>As a user I can select a region or a health institute for which the widget will display data.</li> </ul>
3	<ul style="list-style-type: none"> <li>As a user I can see detailed descriptions of each selected region's vaccination strategy.</li> </ul>
4	<ul style="list-style-type: none"> <li>As admin I can define priority groups for the widgets to display.</li> </ul>

<sup>38</sup> <https://images.app.goo.gl/j7bMLGVtZrBoAafn7>

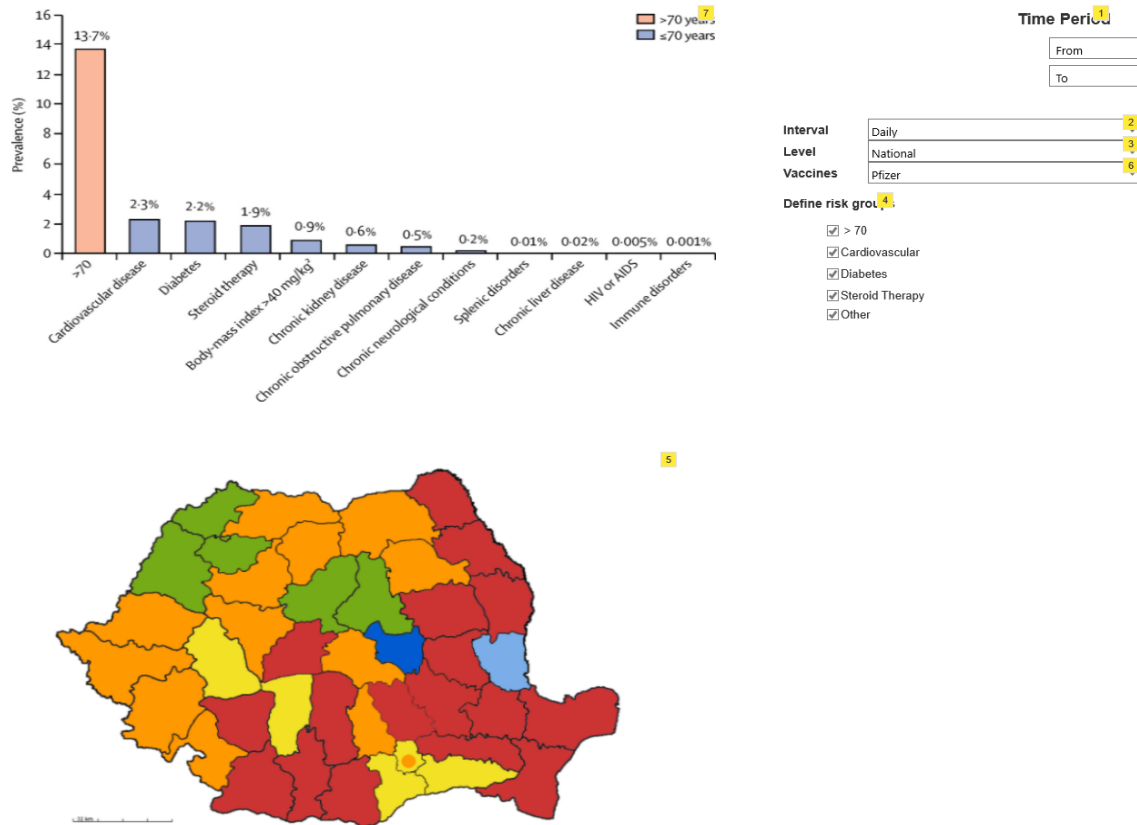
	<ul style="list-style-type: none"><li>● As a user I can select one or more priority groups to be displayed.</li></ul>
5	<ul style="list-style-type: none"><li>● As admin I can define vaccination stages for the first widget to display.</li><li>● As a user I can select one or more vaccination stages to be displayed.</li></ul>
6	<ul style="list-style-type: none"><li>● As a user I can see a graphical representation of each region's vaccination strategy.</li></ul>

## 6.7.2 RIVM-23 - Vaccination Side Effects

### 6.7.2.1 User Interface

Figure 55. Vaccination Side Effects dashboard prototype<sup>3940</sup>

RIVM-23: I want to know how many side effects of vaccinations have been reported



### 6.7.2.2 User Stories

Table 67. User stories and tasks for the Vaccination Side Effects dashboard prototype

Note number	Note
1	● As a user I can select the period for which the widgets will display data.
2	● As a user I can select an interval for the distribution of data.
3	● As admin I can add or remove regions or institutions. ● As a user I can select a region or a health institute for which the widget will display data.

<sup>39</sup> <https://images.app.goo.gl/tXcYu4Un2VHJDF159>

<sup>40</sup> <https://images.app.goo.gl/DeB5mQduScKpTvUa6>

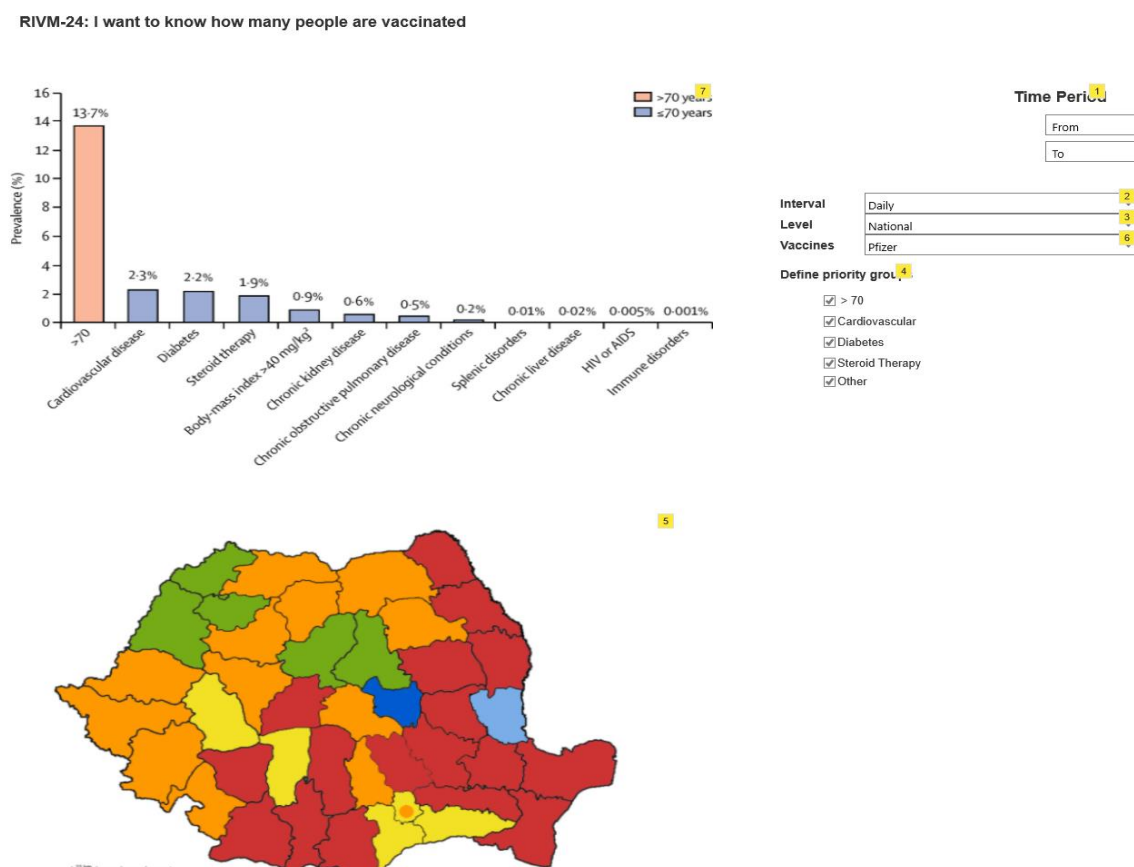


4	<ul style="list-style-type: none"> <li>● As admin I can define risk groups for the widget to display.</li> <li>● As a user I can select for which risk group they want data to be displayed.</li> </ul>
5	<ul style="list-style-type: none"> <li>● As a user I can see vaccination side effects distributed by territorial units.</li> </ul>
6	<ul style="list-style-type: none"> <li>● As admin I can add or remove vaccines or vaccine batches.</li> <li>● As a user I can select a vaccine or a vaccine batch for which the widget will display data.</li> </ul>
7	<ul style="list-style-type: none"> <li>● As a user I can see the number/rate of side effects for the selected vaccines, distributed by risk groups</li> </ul>

### 6.7.3 RIVM-24 - Vaccinations

#### 6.7.3.1 User Interface

Figure 56. Vaccinations dashboard prototype<sup>41,42</sup>



#### 6.7.3.2 User Stories

Table 68. User stories and tasks for the Vaccinations dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>As a user I can select the period for which the widgets will display data.</li> </ul>
2	<ul style="list-style-type: none"> <li>As a user I can select an interval for the distribution of data.</li> </ul>
3	<ul style="list-style-type: none"> <li>As admin I can add or remove regions or institutions.</li> <li>As a user I can select a region or a health institute for which the widget will display data.</li> </ul>

<sup>41</sup> <https://images.app.goo.gl/tXcYu4Un2VHJDF159>

<sup>42</sup> <https://images.app.goo.gl/DeB5mQduScKpTvUa6>

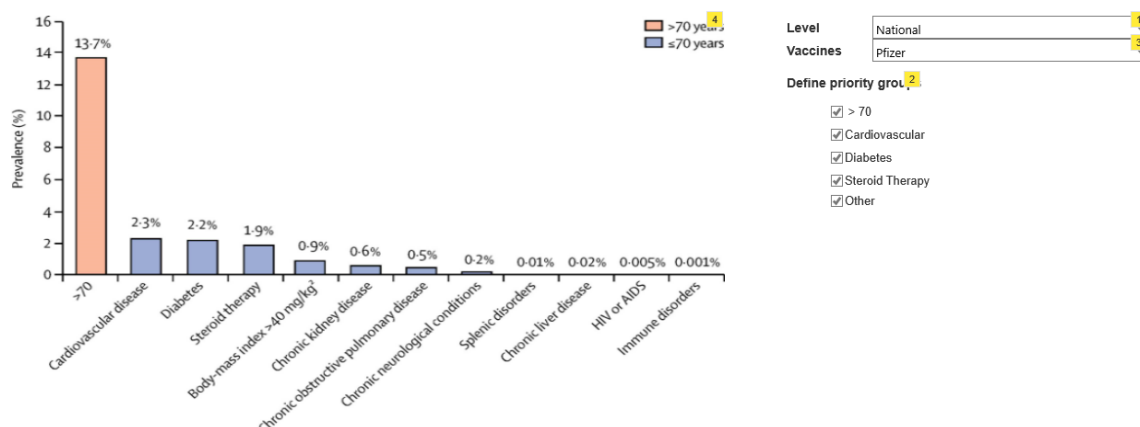
4	<ul style="list-style-type: none"> <li>● As admin I can define priority groups for the widget to display.</li> <li>● As a user I can select for which priority group they want data to be displayed.</li> </ul>
5	<ul style="list-style-type: none"> <li>● As a user I can see vaccination rates distributed by territorial units.</li> </ul>
6	<ul style="list-style-type: none"> <li>● As admin I can add or remove vaccines or vaccine batches.</li> <li>● As a user I can select a vaccine or a vaccine batch for which the widget will display data.</li> </ul>
7	<ul style="list-style-type: none"> <li>● As a user I can see the number/rate of vaccinations for the selected vaccines, distributed by priority groups</li> </ul>

## 6.7.4 RIVM-25 - Scheduled Vaccinations

### 6.7.4.1 User Interface

Figure 57. Scheduled Vaccinations dashboard prototype<sup>43</sup>

RIVM-25: I want to know the scheduled vaccinations for upcoming week



### 6.7.4.2 User Stories

Table 69. User stories and tasks for the Scheduled Vaccinations dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>● As admin I can add or remove regions or institutions.</li> <li>● As a user I can select a region or a health institute for which the widget will display data.</li> </ul>
2	<ul style="list-style-type: none"> <li>● As admin I can define priority groups for the widget to display.</li> <li>● As a user I can select for which priority group they want data to be displayed.</li> </ul>
3	<ul style="list-style-type: none"> <li>● As admin I can add or remove vaccines or vaccine batches.</li> <li>● As a user I can select a vaccine or a vaccine batch for which the widget will display data.</li> </ul>
4	<ul style="list-style-type: none"> <li>● As a user I can see the number/rate of scheduled vaccinations for the selected vaccines, distributed by priority groups</li> </ul>

<sup>43</sup> <https://images.app.goo.gl/tXcYu4Un2VHJDF159>

## 6.7.5 NIPH-25 - Vaccination coordination

### 6.7.5.1 User Interface

Figure 58. Vaccination coordination dashboard prototype

#### NIPH-25:

Data: National deposit – name, coordinator name, surname, mobile number, e-mail address

Regional deposit – name, coordinator name, surname, mobile number, e-mail address

County public health authority deposit – name, coordinator name, surname, mobile number, e-mail address

Vaccination centre – name, coordinator name, surname, mobile number, e-mail address

Number of doses which entered the country by date/type of vaccine/ producer/ batch number

Number of doses distributed from the national/regional deposit/day/county public health authority/vaccination center/type of vaccine/ producer/ batch number

Vaccine doses in stock by date/type of deposit/type of vaccine/ producer/ batch number

Vaccine doses lost (by type of loss)

Name, surname, Personal identifier (CNP), date of vaccination, type of vaccine/ producer/ batch number – link with the National

Electronic Vaccination Registry (RENV)

Name, surname, Personal identifier (CNP), date of vaccination, type of vaccine/ producer/ batch number, type of AEFI – link with the National Electronic Vaccination Registry (RENV)

Population / territory unit by age groups/occupation (e.g.HCW, teachers)/LTCF

Country	Area	Deposit Name	Vaccination Center	Population	Available doses	Vaccinated	Lost Doses	Contact details
Romania	Country	Deposit 1	Center 1	20.000.000	Pfizer: 100.000 Moderna: 35.000 AstraZeneca: 85.000	3.200.000	35.000	Coordinator Name: Phone: Email:
Romania	Bucharest	Deposit 2	Center 2.1	500.000	Pfizer: 50.000	175.000	N/A	Coordinator Name: Phone: Email:
Romania	Bucharest	Deposit 2	Center 2.2	650.000	AstraZeneca: 65.000	225.000	15.000	Coordinator Name: Phone: Email:
Romania								

### 6.7.5.2 User Stories

Table 70. User stories and tasks for the Vaccination coordination dashboard prototype

Note number	Note
1	<ul style="list-style-type: none"> <li>As a user I can see a table with relevant data for vaccination campaign coordination.</li> </ul>

## 7 Appendix: Visual Examples

This appendix contains relevant examples from EU dashboards that can be a guide to the development team.

### 7.1 Visual Catalogue

Figure 59. Visual catalogue (1)

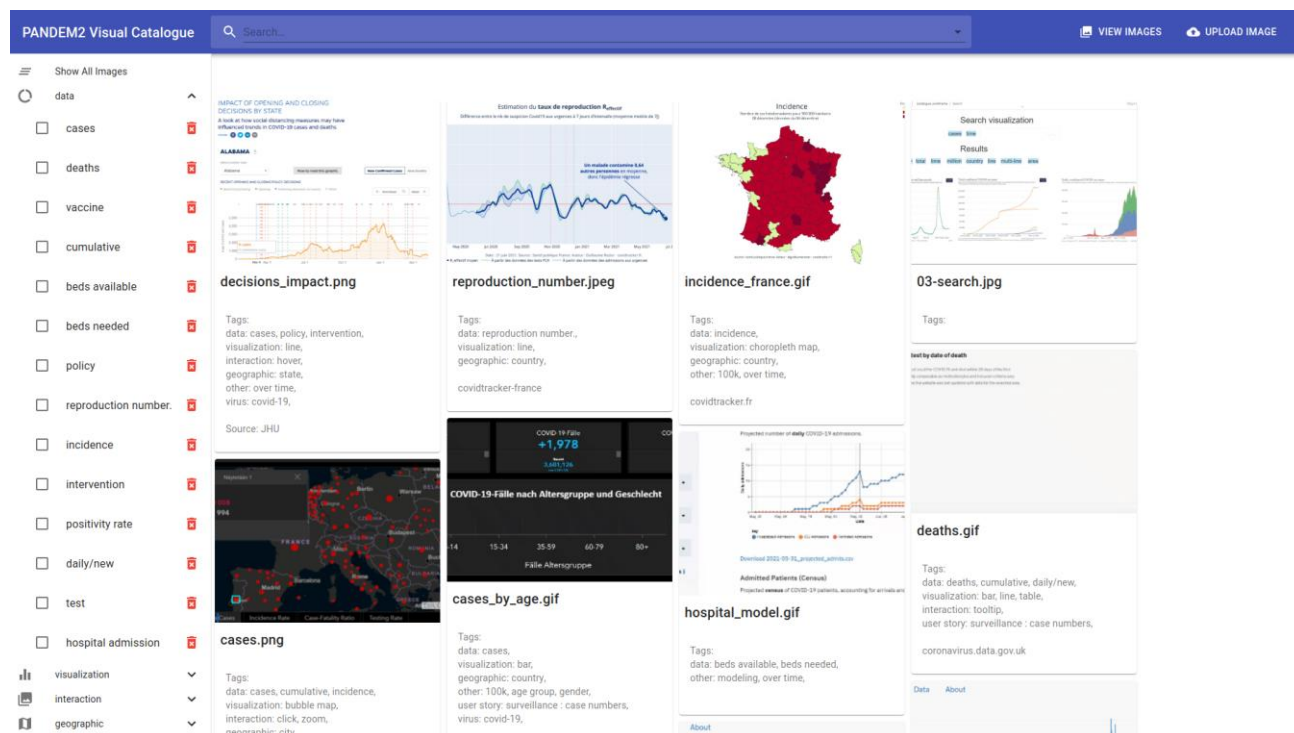
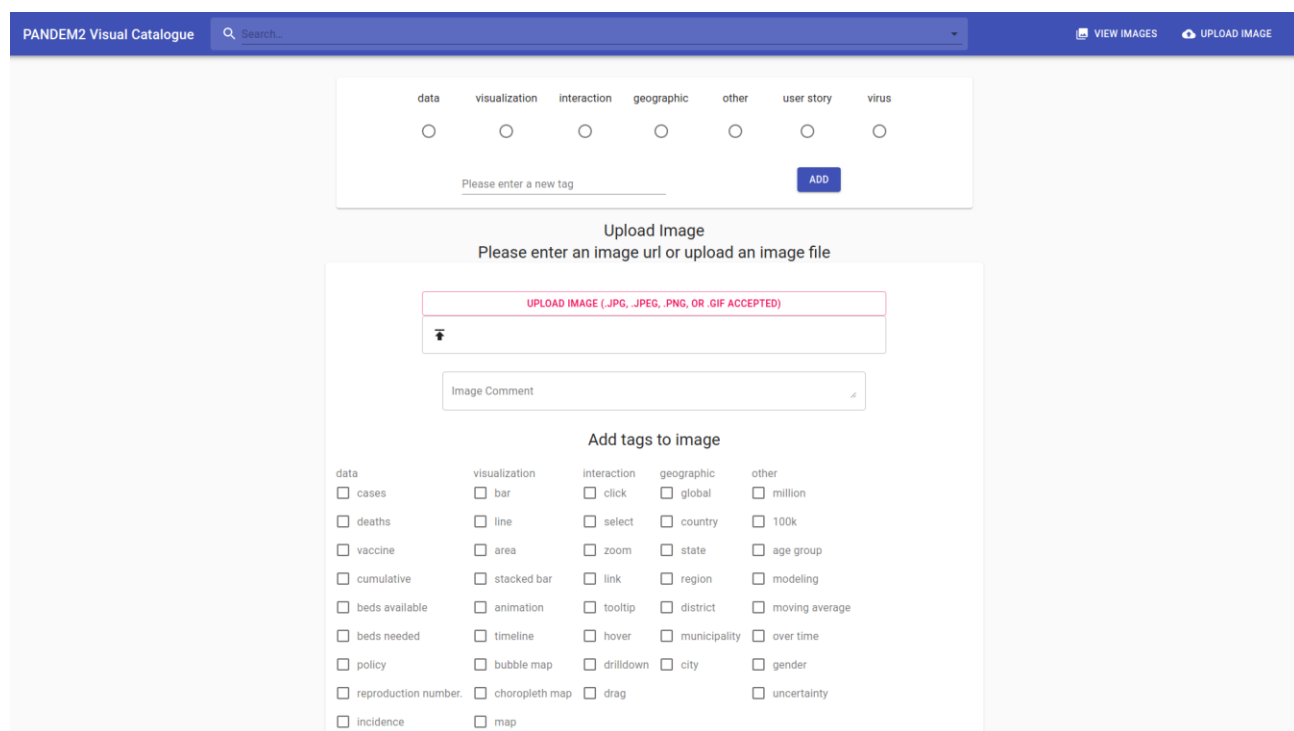


Figure 60. Visual catalogue (2)



## 7.2 Surveillance

### 7.2.1 Case Numbers

Figure 61. Cumulative cases - <https://coronavirus.jhu.edu/map.html>

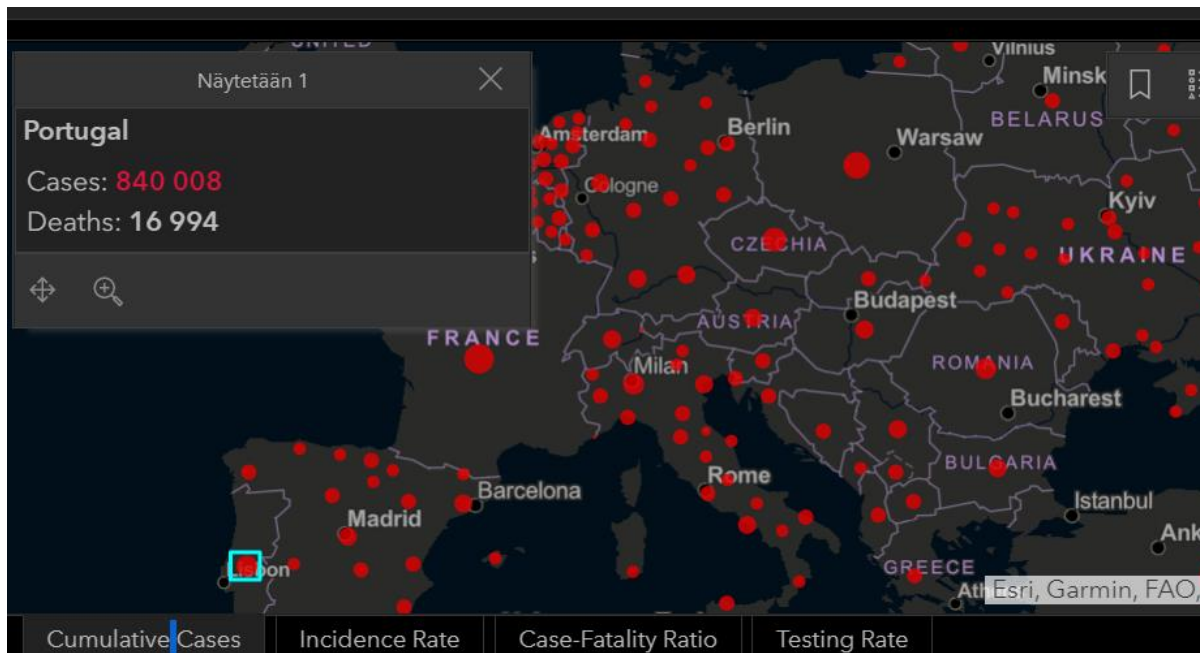


Figure 62. Daily case over time plus 7-day average- - <https://coronavirus.data.gov.uk/>

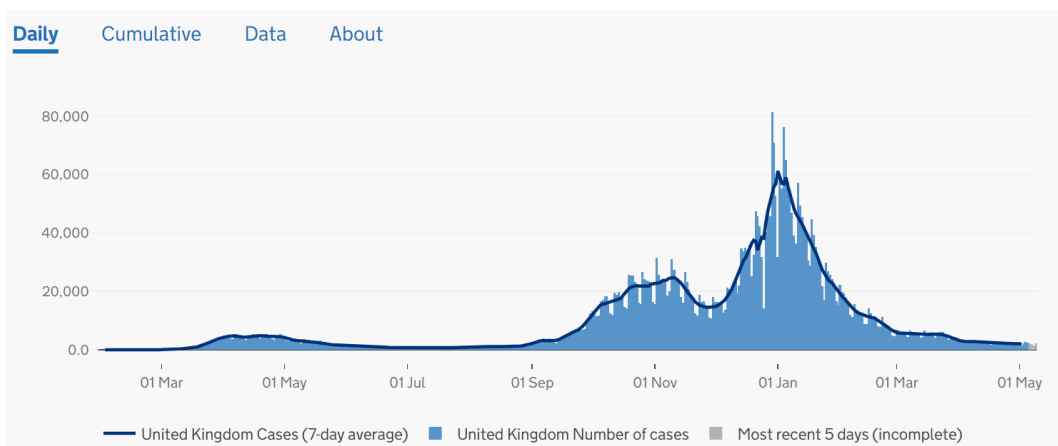


Figure 63. Cases per 100k population in 7-day period

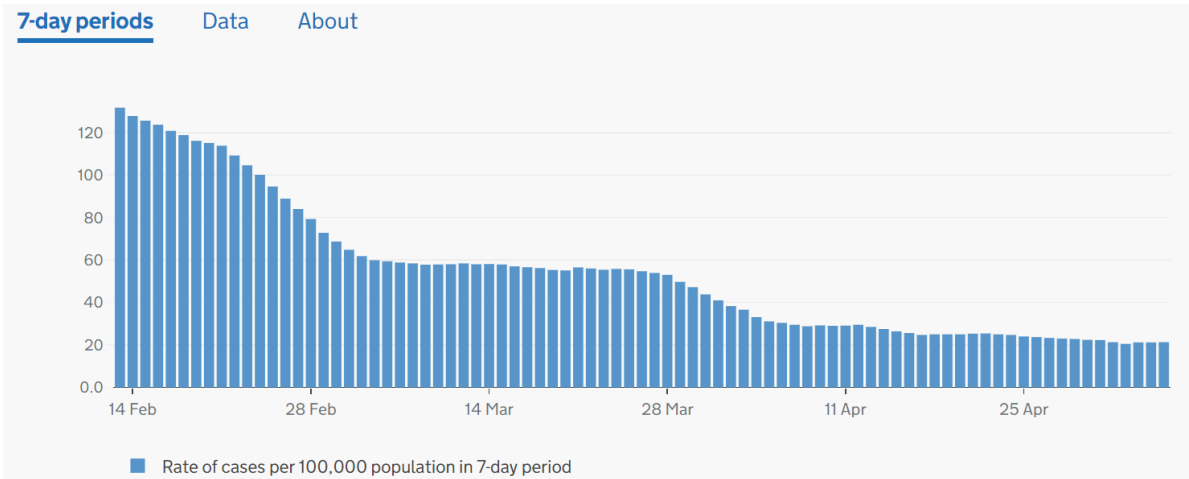


Figure 64. Daily confirmed new cases (7-day moving average) by state - [Johns Hopkins \(jhu.edu\)](#)

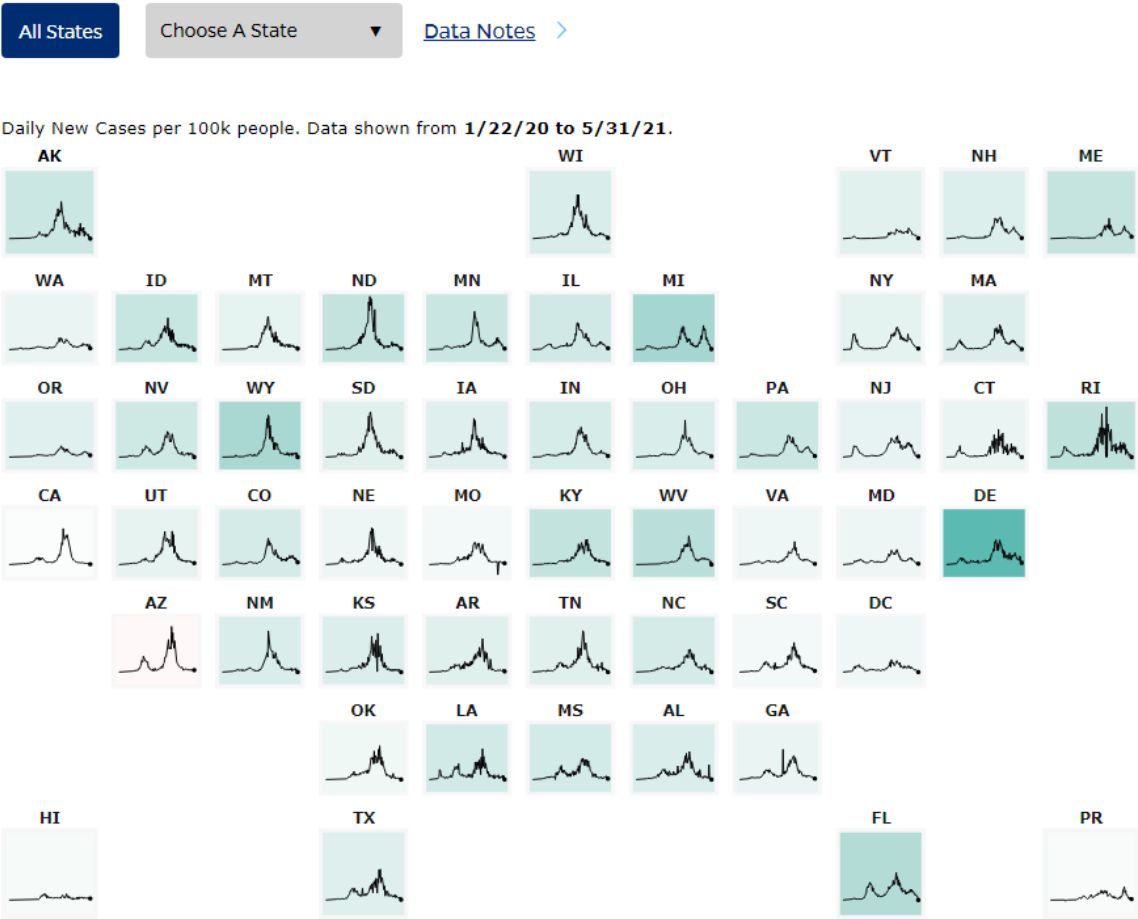




Figure 65. Cases Stratified by sex- [RKI COVID-19 Germany](#)

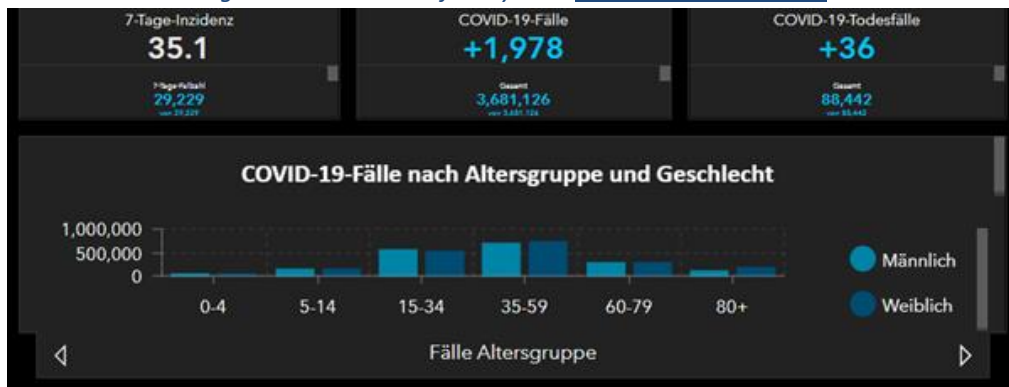


Figure 66. Cases over time Stratified by age and region - <https://covidtracker.fr/>

Taux d'incidence par région et âge

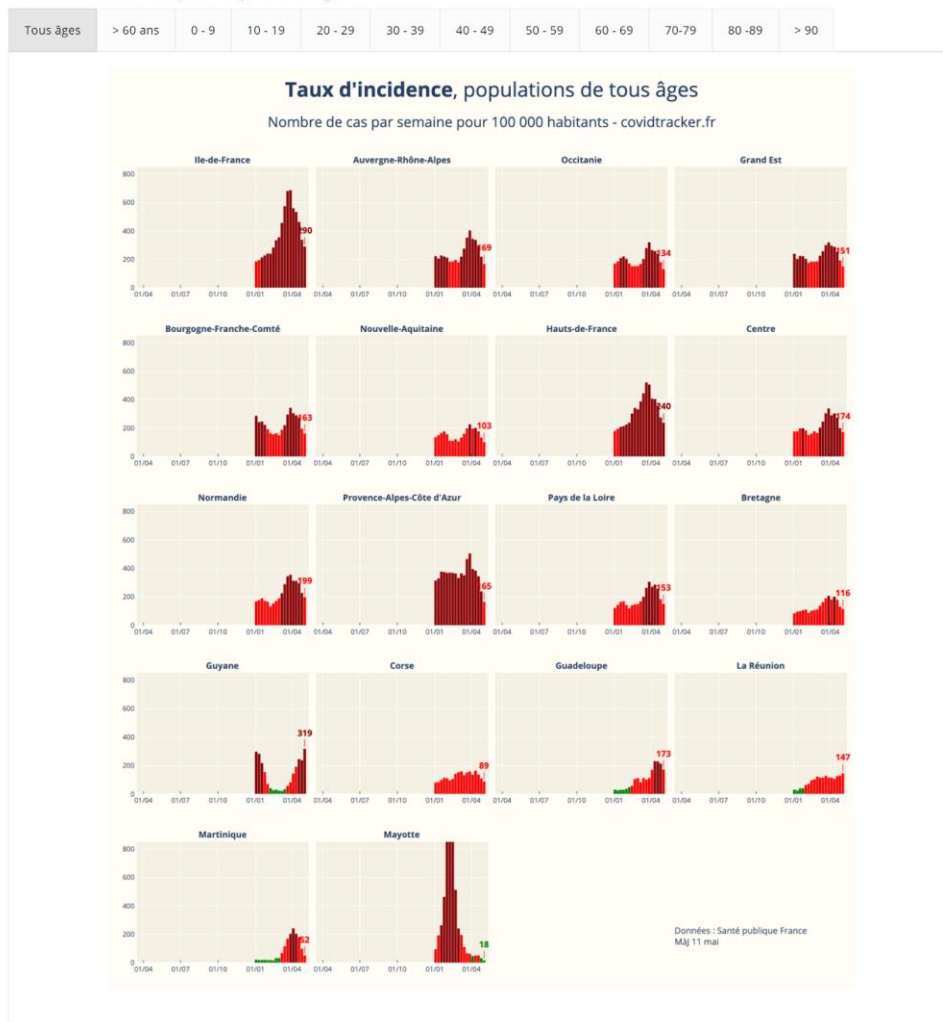


Figure 67. Cases over time Stratified by age - <https://coronadashboard.government.nl/>

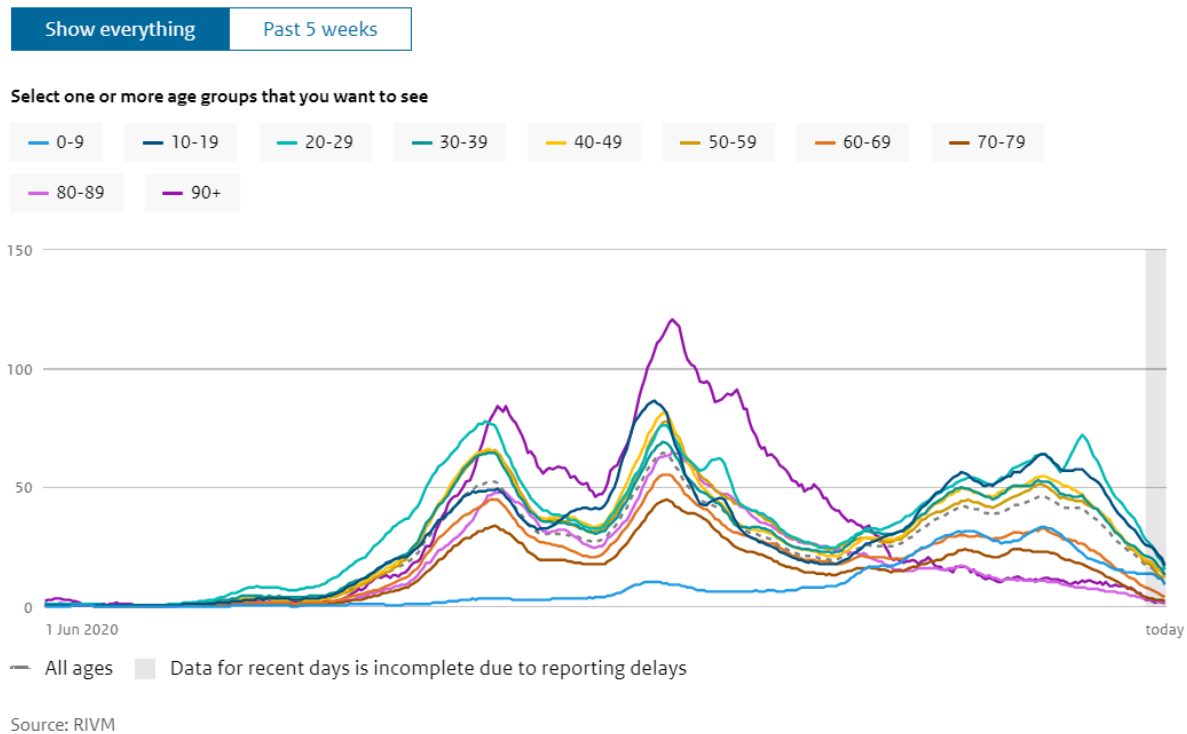


Figure 68. Cases over time stratified by age - CovidTracker - United Kingdom

### Nombre de cas positifs quotidiens pour Covid19

- @guillaumerozier - covidtracker.fr - 30 mai 2021

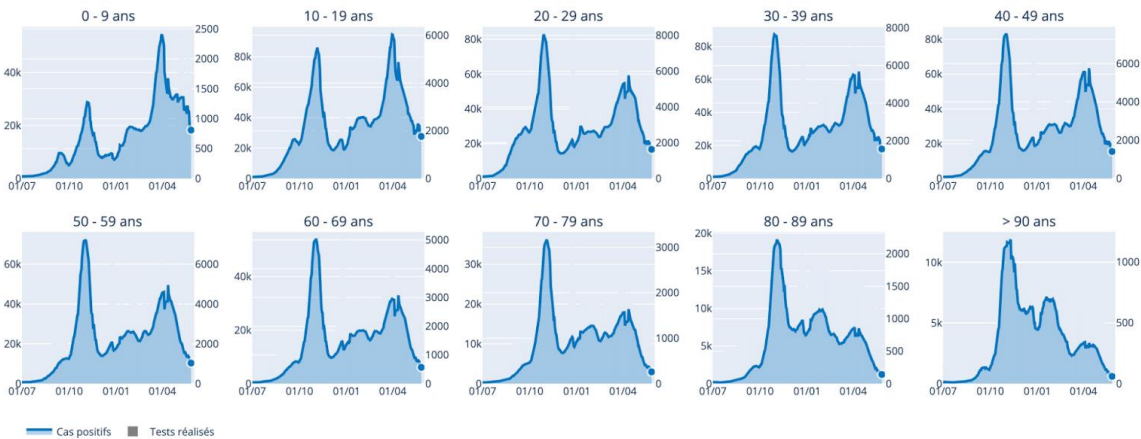


Figure 69. Cases over time plus uncertainty- [Besmettelijke mensen](#) / [Coronadashboard](#) / [Rijksoverheid.nl](#)

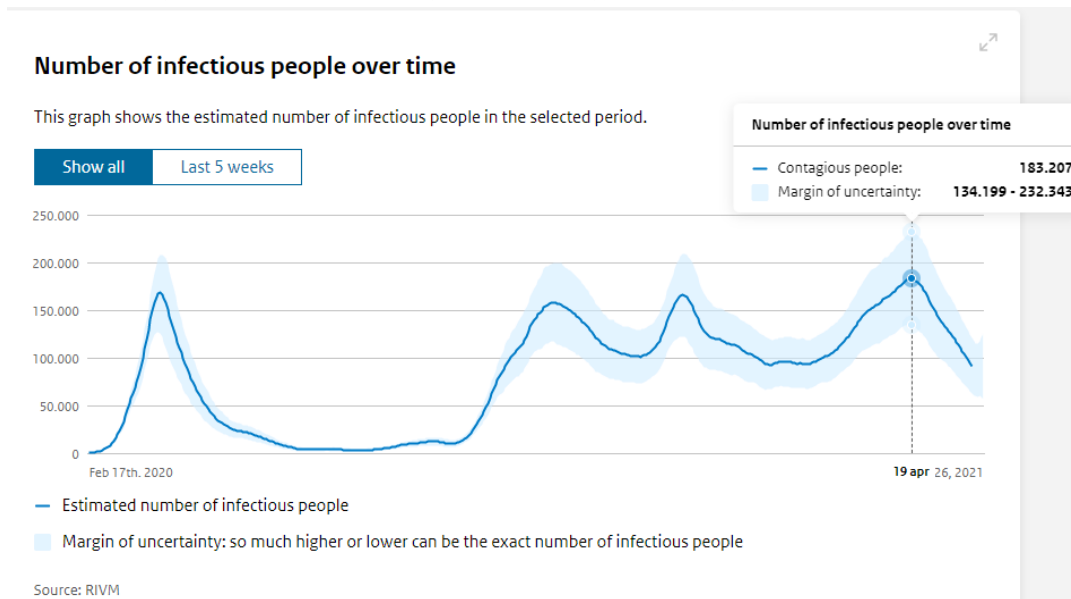


Figure 70. Incidence Over time stratified by age - [CovidTracker - France](#)

### Age distribution of cases

This map shows the incidence, i.e. the number of positive tests over a week in each department, reduced to 100,000 inhabitants. A department is considered red if its incidence exceeds 50 cases per 100k inhabitants.

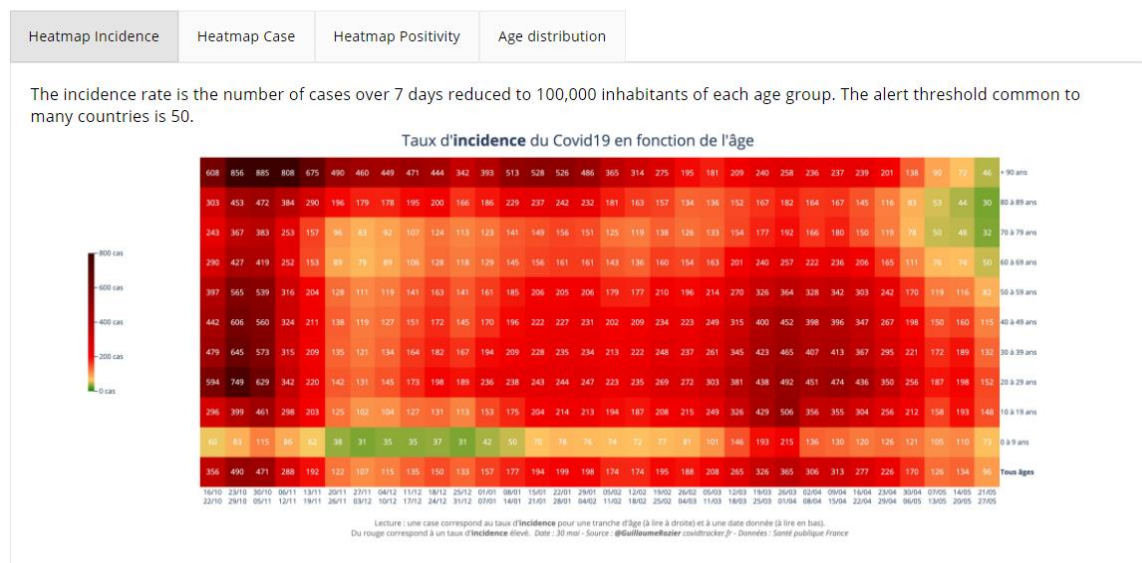


Figure 71. Cases by country - [Worldometer \(worldometers.info\)](https://www.worldometers.info/)

MAIN WEEKLY TRENDS

Now Yesterday 2 Days Ago Columns Search:

All Europe North America Asia South America Africa Oceania

#	Country, Other	Total Cases	New Cases	Total Deaths	New Deaths	Total Recovered	Active Cases	Serious, Critical	Tot Cases/ 1M pop	Deaths/ 1M pop	Total Tests	Tests/ 1M pop	Population
	World	171,229,815	+208,889	3,560,939	+4,309	153,663,219	14,005,657	91,738	21,967	456.8			
1	USA	34,043,227	+159	609,551	+7	27,840,884	5,592,792	6,130	102,302	1,832	479,498,588	1,440,930	332,770,250
2	India	28,161,668	+114,711	331,607	+2,480	25,917,521	1,912,540	8,944	20,226	238	344,866,883	247,688	1,392,345,967
3	Brazil	16,515,120		462,092		14,912,744	1,140,284	8,318	77,197	2,160	49,403,998	230,930	213,934,926
4	France	5,666,113		109,402		5,315,150	241,561	2,993	86,631	1,673	84,787,739	1,296,346	65,405,173
5	Turkey	5,242,911		47,405		5,105,042	90,464	1,390	61,562	557	53,919,848	633,127	85,164,357

## 7.2.2 Hospitalised

### Insight into Cases: Hospitalised: Visual Examples

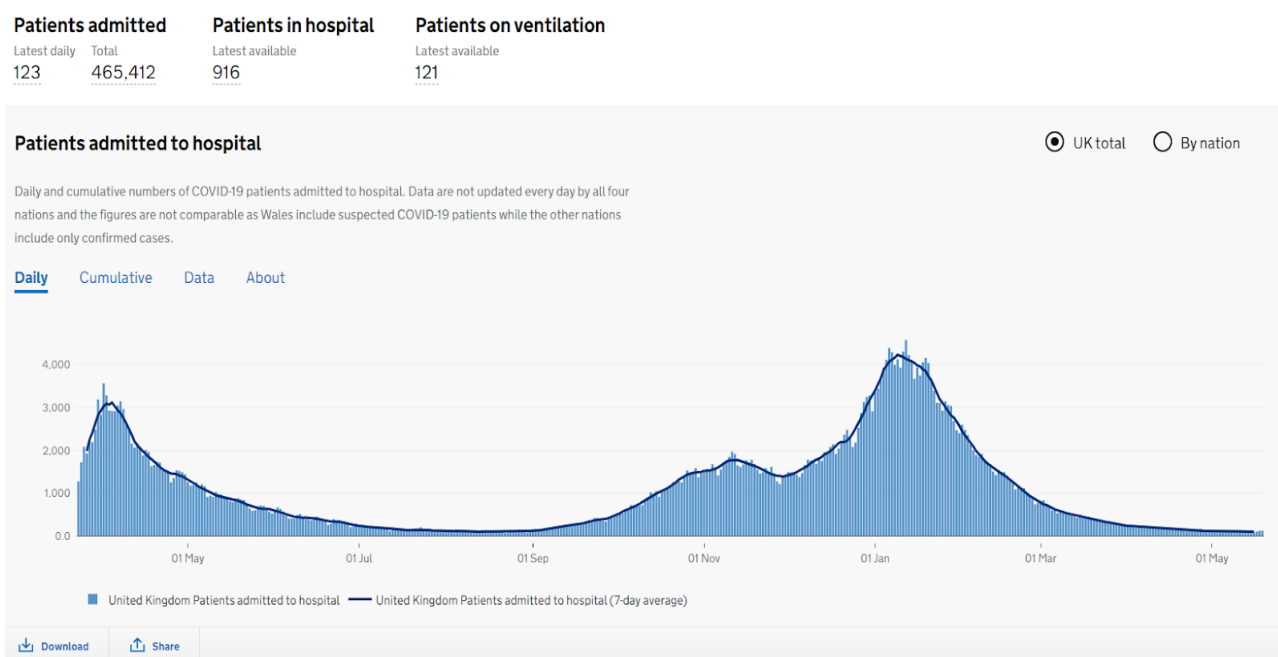
Figure 72. Admissions - <https://coronavirus.data.gov.uk/>

Figure 73. ICU patients by region over time: - <https://covidtracker.fr/>

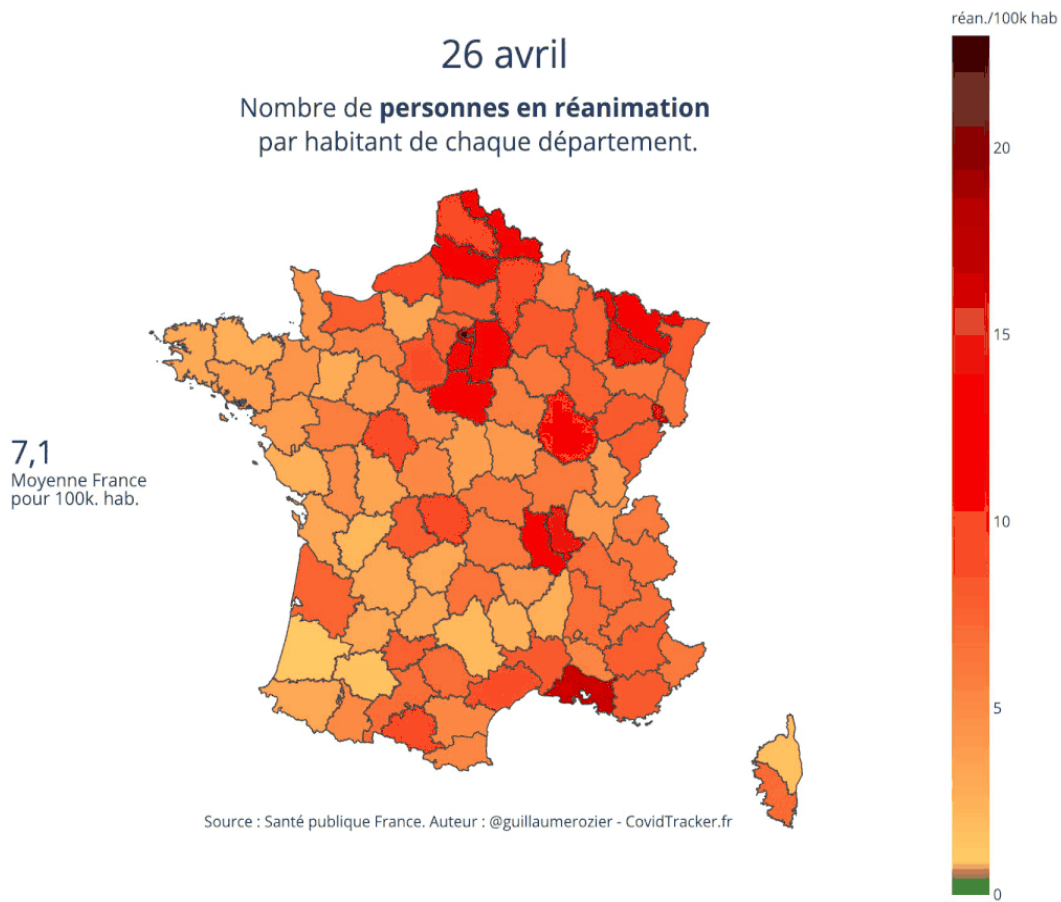
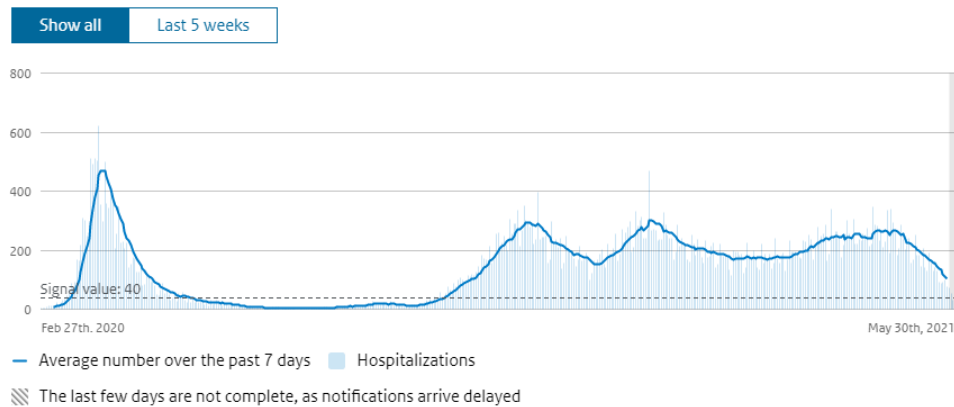


Figure 74. Hospitalization over time - [Coronadashboard | Rijksoverheid.nl](#)

### Hospitalizations over time, by date of admission

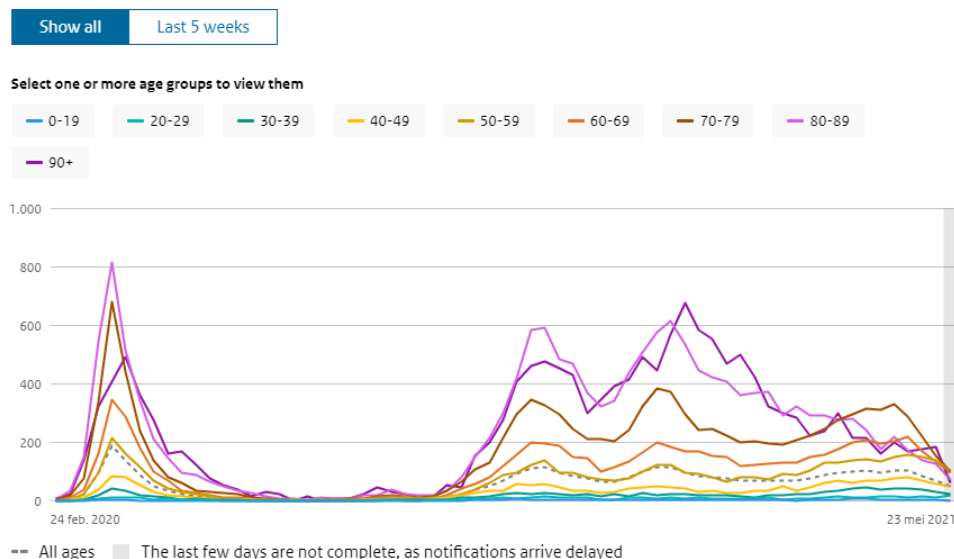
This graph shows hospitalizations (including direct ICU admissions) on the day people are actually admitted, rather than on the day they were reported. This way we can clearly see the development of the coronavirus in the Netherlands. Please note that because hospitalization registrations often happen a few days later, the most recent days are never complete and it may seem as if the number of hospitalizations is decreasing when it is not. The line of average over the last seven days is therefore missing from the last part of the graph. Because the last few days are not complete, the line there does not give a good picture of reality.



Source: NICE via RIVM

### Hospitalizations by age group over time

This graph shows how many people with the coronavirus have been admitted to hospital in a given age group, per 1,000,000 people of that age group. The graph shows the weekly totals of the recordings that took place in that week.



Source: NICE via RIVM

Figure 75. Cases hospitalized over time by age - CovidTracker - France

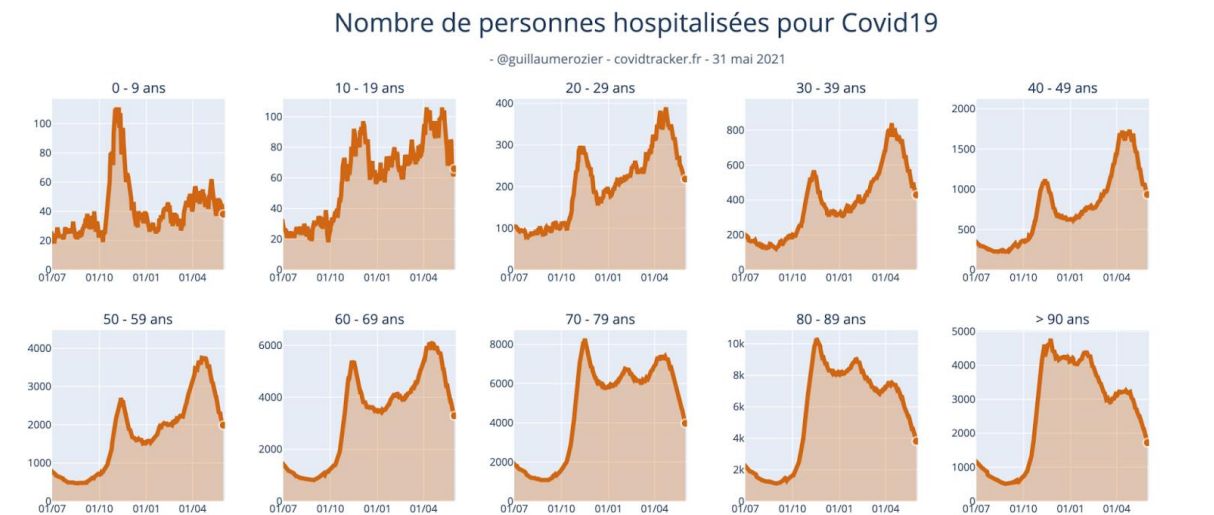


Figure 76. Number of COVID patients in hospital in europe over time -Coronavirus (COVID-19) Hospitalizations - Statistics and Research - Our World in Data

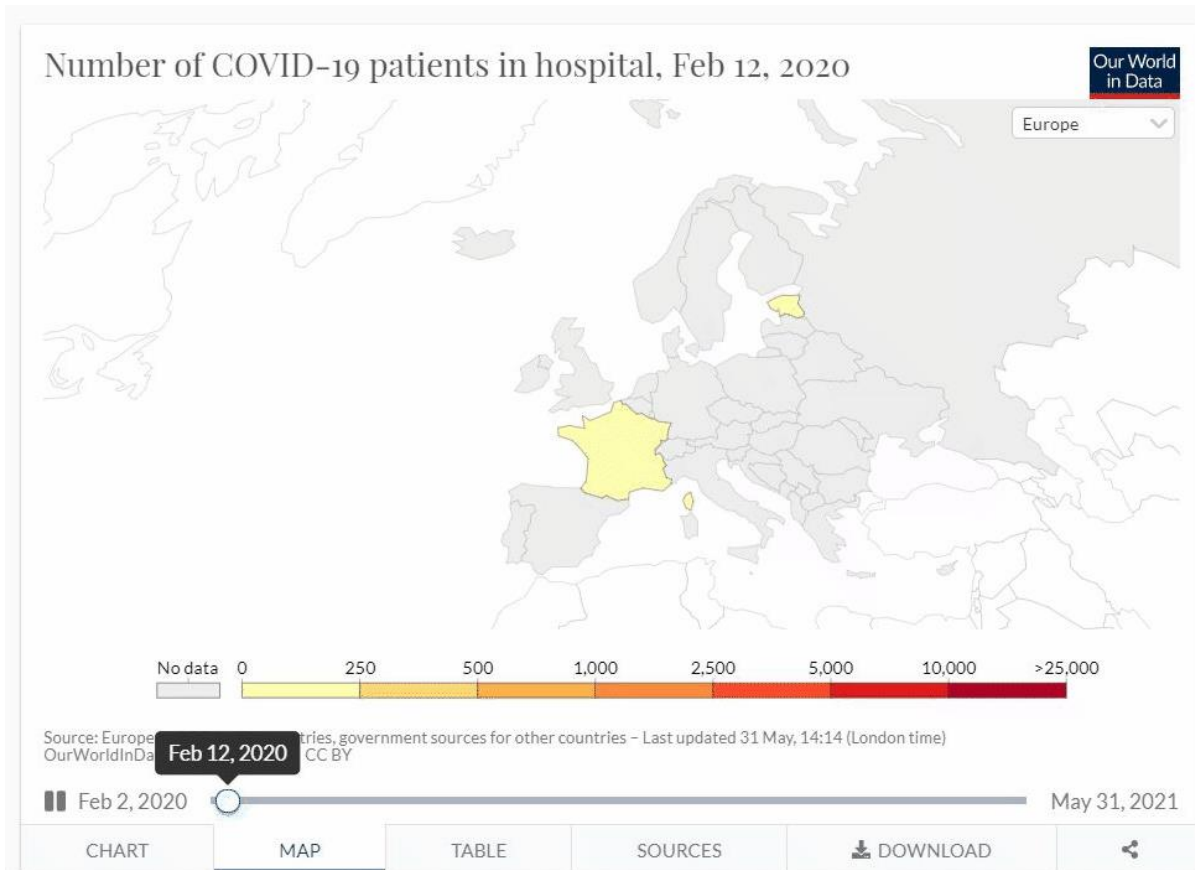




Figure 77. ICU patient per million by Country -Coronavirus (COVID-19) Hospitalizations - Statistics and Research - Our World in Data

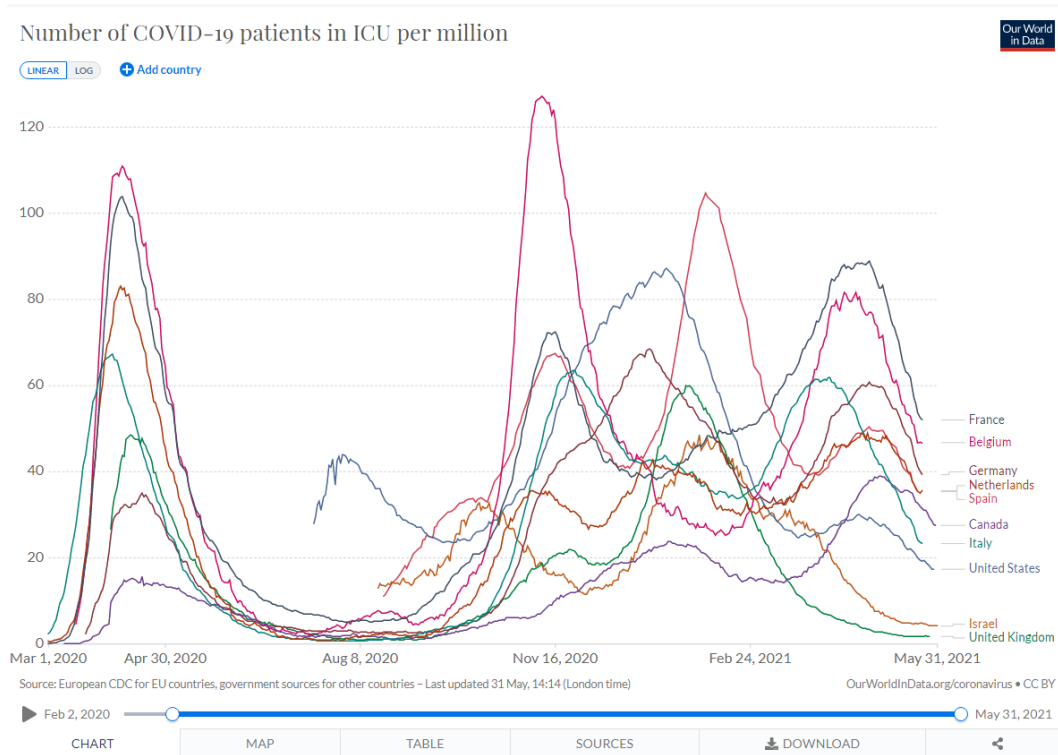
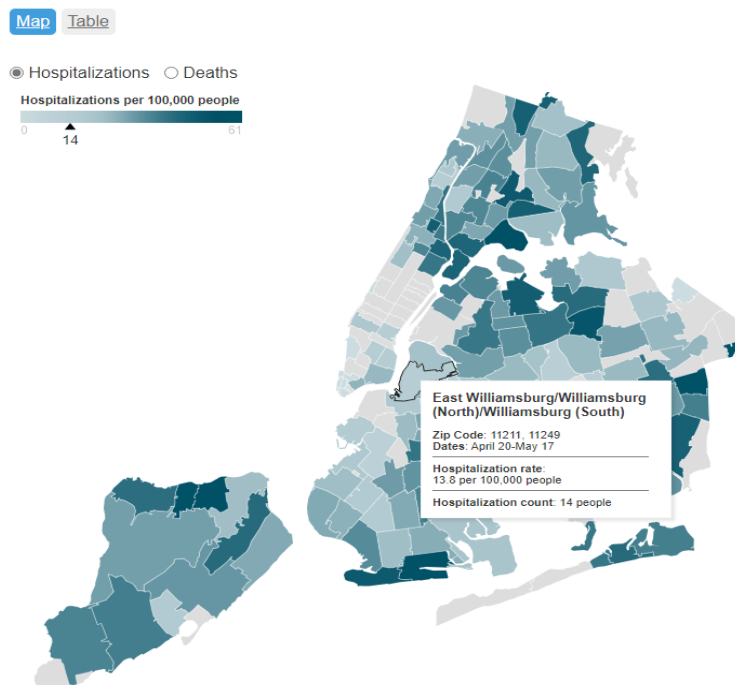


Figure 78. Hospitalize by region - COVID-19: Latest Data - NYC Health

## Hospitalization and Death Rates (28 days)

This map and table show hospitalization rates and death rates over 28 days. To accommodate standard reporting delays for hospitalization and death data, these are published at a 14-day lag.



Rates are not displayed for areas with few hospitalizations. Data are published with a 14-day lag due to standard reporting delays.  
[About the data for this map.](#) [Get the data.](#)



## Hospitalization and Death Rates (28 days)

This map and table show hospitalization rates and death rates over 28 days. To accommodate standard reporting delays for hospitalization and death data, these are published at a 14-day lag.

Map
Table

Search in table
Page 1 of 12

ZIP	Neighborhood	Hospitalizations per 100,000	Deaths per 100,000	Dates
11224	Brighton Beach/Coney Island/Seagate	49.7	38.9	April 20-May 17
11429	Queens Village	53.9	28.8	April 20-May 17
10471	Fieldston/North Riverdale/Riverdale		28.2	April 20-May 17
11235	Brighton Beach/Manhattan Beach/Sheepshead Bay	53.7	28.1	April 20-May 17
11203	East Flatbush (North)/East Flatbush (South)	39.8	24.8	April 20-May 17
11355	Flushing/Murray Hill/Queensboro Hill	52.0	22.8	April 20-May 17
11212	Ocean Hill-Brownsville	52.7	21.8	April 20-May 17
10309	Charleston/Prince's Bay/Woodrow	36.4	21.3	April 20-May 17
10308	Great Kills	16.8	20.1	April 20-May 17
11228	Bath Beach/Dyker Heights	26.7	20.0	April 20-May 17
11416	Ozone Park	45.5	18.9	April 20-May 17
10454	Mott Haven/Port Morris	44.8	18.5	April 20-May 17
11365	Auburndale/Fresh Meadows/Pomonok/Utopia	29.7	18.3	April 20-May 17
11414	Hamilton Beach/Howard Beach/Lindenwood	42.3	17.8	April 20-May 17
10451	Concourse/Melrose	35.9	16.9	April 20-May 17

Rates are not displayed for areas with few hospitalizations or deaths.

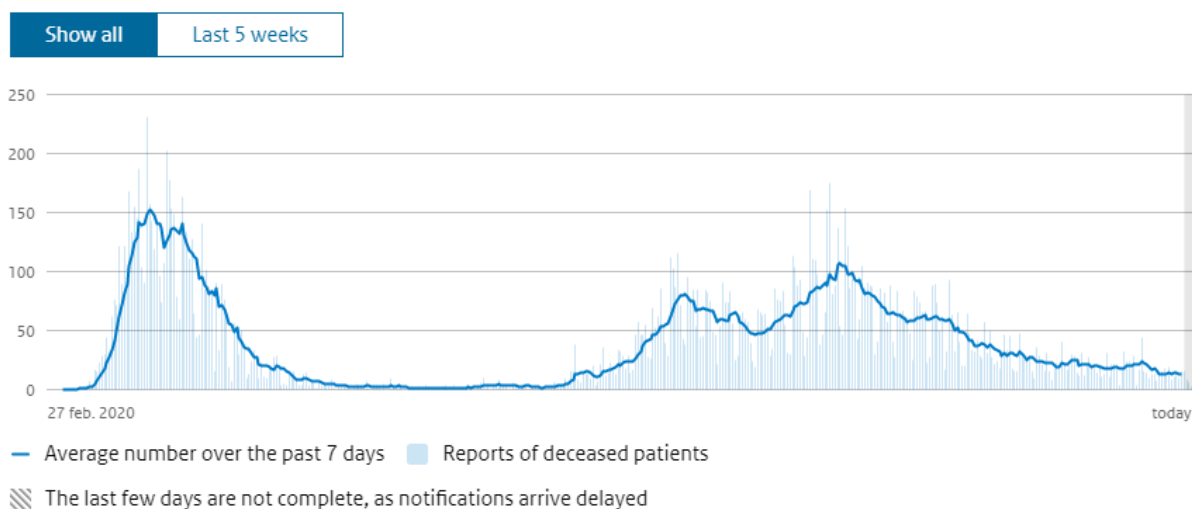
About the data for this chart. Get the data.

### 7.2.3 Mortality

Figure 79. Deaths over time plus 7-day average - [Sterfte | Coronadashboard | Rijksoverheid.nl](#)

#### Reports of patients who died from COVID-19 over time

This graph shows how many COVID-19 patients have been reported to have died in the selected period. In the graph we also show averages over the past seven days. The last few days are not complete, as notifications arrive delayed. The line of average over the last seven days is therefore missing from the last part of the graph. Because the last few days are not complete, the line there does not give a good picture of reality.



Source: RIVM

Figure 80. Deaths by country -Worldometer (worldometers.info)

MAIN

WEEKLY TRENDS

Now

Yesterday

2 Days Ago

Columns

Search:

All

Europe

North America

Asia

South America

Africa

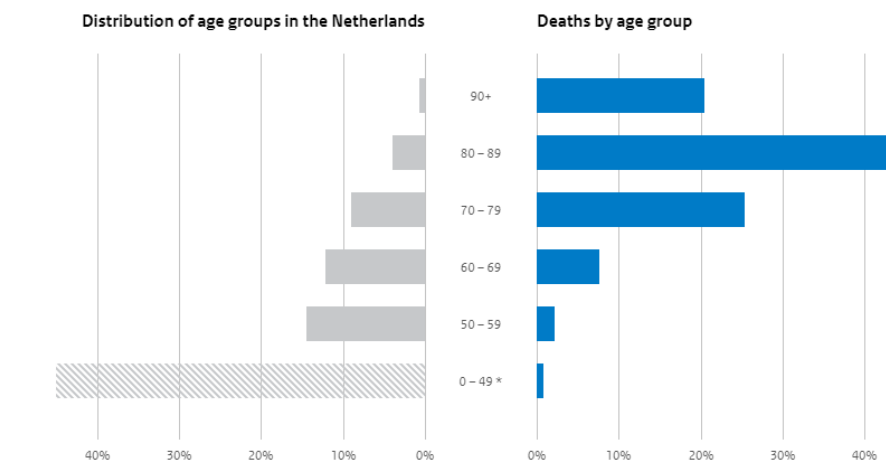
Oceania

#	Country, Other	Total Cases	New Cases	Total Deaths	New Deaths	Total Recovered	Active Cases	Serious, Critical	Tot Cases/ 1M pop	Deaths/ 1M pop	Total Tests	Tests/ 1M pop	Population
	World	171,229,815	+208,889	3,560,939	+4,309	153,663,219	14,005,657	91,738	21,967	456.8			
1	USA	34,043,227	+159	609,551	+7	27,840,884	5,592,792	6,130	102,302	1,832	479,498,588	1,440,930	332,770,250
2	India	28,161,668	+114,711	331,607	+2,480	25,917,521	1,912,540	8,944	20,226	238	344,866,883	247,688	1,392,345,967
3	Brazil	16,515,120		462,092		14,912,744	1,140,284	8,318	77,197	2,160	49,403,998	230,930	213,934,926
4	France	5,666,113		109,402		5,315,150	241,561	2,993	86,631	1,673	84,787,739	1,296,346	65,405,173
5	Turkey	5,242,911		47,405		5,105,042	90,464	1,390	61,562	557	53,919,848	633,127	85,164,357

Figure 81. Mortality stratified by age Sterfte | Coronadashboard | Rijksoverheid.nl

### COVID-19 mortality: breakdown by age

The blue right bars in this graph show the age group to which the deceased persons with COVID-19 belong. The grey left bars show how large each age group is relative to the entire Dutch population. The blue and grey bars together show whether age groups have proportionally more or less people who have died with COVID-19. Suppose that the grey bar shows that 12% of all Dutch people are in their 60s, and the blue bar indicates, for example, that 10% of all people who died with COVID-19 are in their 60s, then this age group has proportionally fewer people who died with COVID-19. The graph is updated daily and deals with deaths since the outbreak of the virus. Please note that everyone under the age of fifty has been placed in one age group by the RIVM, because that data would otherwise be traceable to individuals due to the small numbers.



\* This value is greater than shown in the chart

Value of Monday, May 31 - Source: RIVM

Figure 82. Daily deaths- [Worldometer \(worldometers.info\)](https://www.worldometers.info)

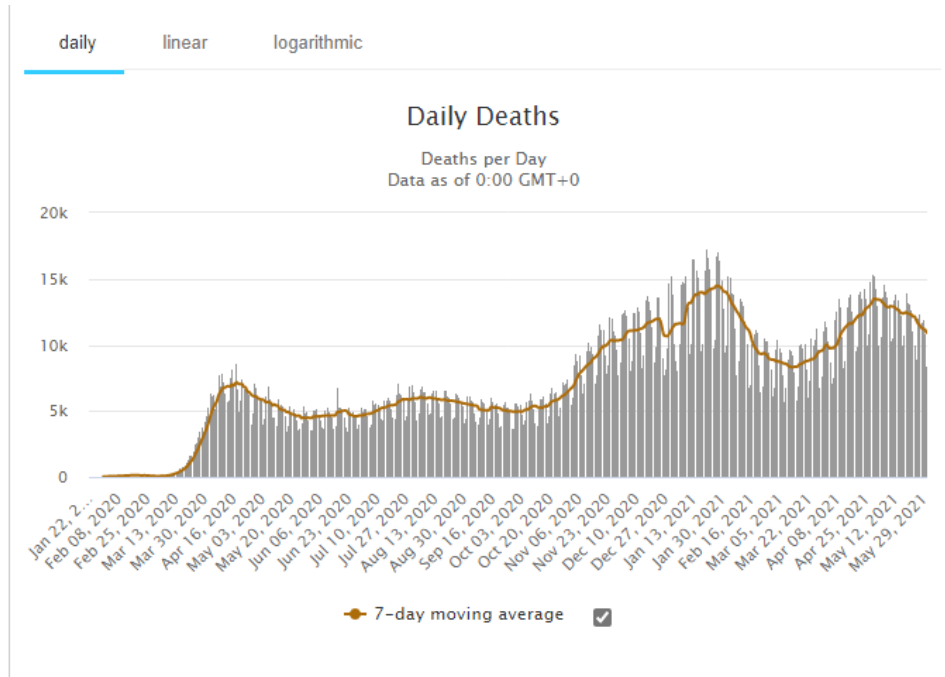


Figure 83. Total deaths logarithmic scale

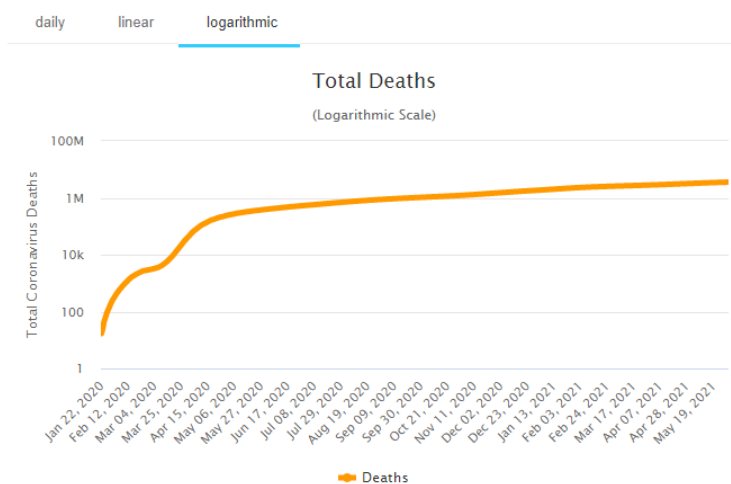


Figure 84. Death overview-[Coronavirus in the UK \(data.gov.uk\)](https://data.gov.uk)



Figure 85. Daily deaths and cumulative deaths by region- [Coronavirus in the UK \(data.gov.uk\)](https://data.gov.uk)

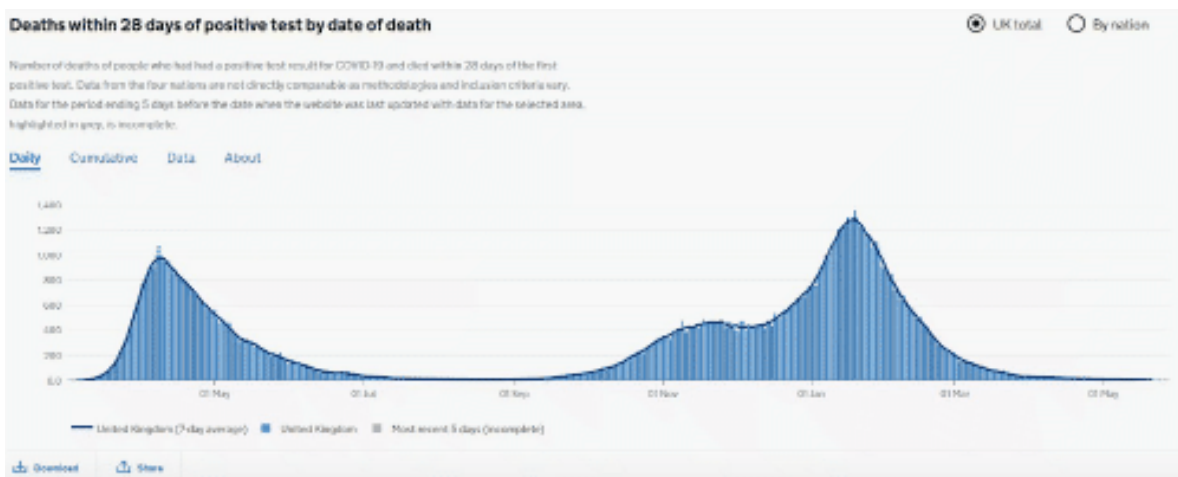


Figure 86. Deaths over time in Nursing home care - [Contaminated nursing homes](#) / [Corona dashboard](#) / [Rijksoverheid.nl](#)

## Number of deceased residents per day

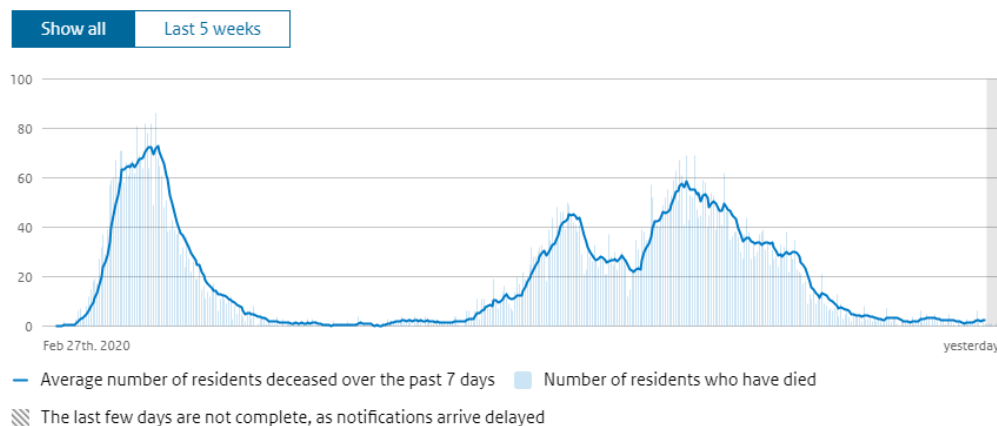
0

This number is an estimate of the number of reported nursing home residents who die in the Netherlands from the consequences of the new coronavirus.

Value of Sunday, May 30 • Source: RIVM

## Number of deceased residents over time

This graph shows how many nursing home residents have been reported to have died from COVID-19 during the selected period. In the graph we also show averages over the past seven days. The last few days are not complete, as notifications arrive delayed. The line of average over the last seven days is therefore missing from the last part of the graph. Because the last few days are not complete, the line there does not give a good picture of reality.



Source: RIVM

Figure 87. Mortality -all causes by year- [CovidTracker - France](#)

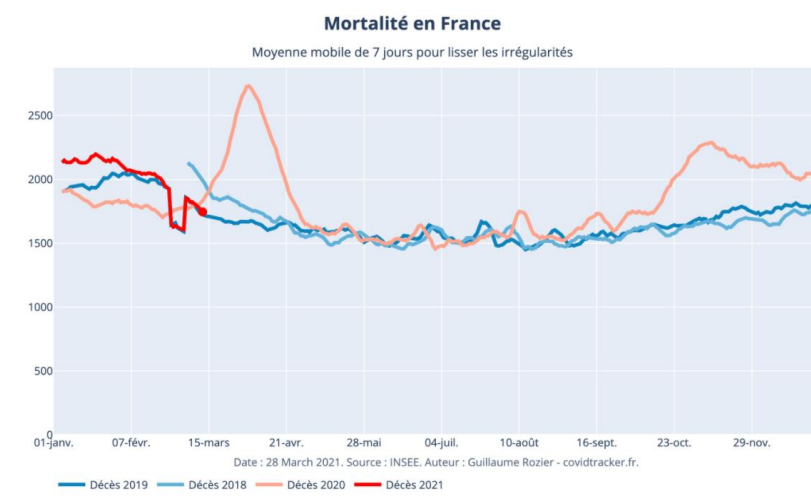


Figure 88. Hospital deaths - CovidTracker - France

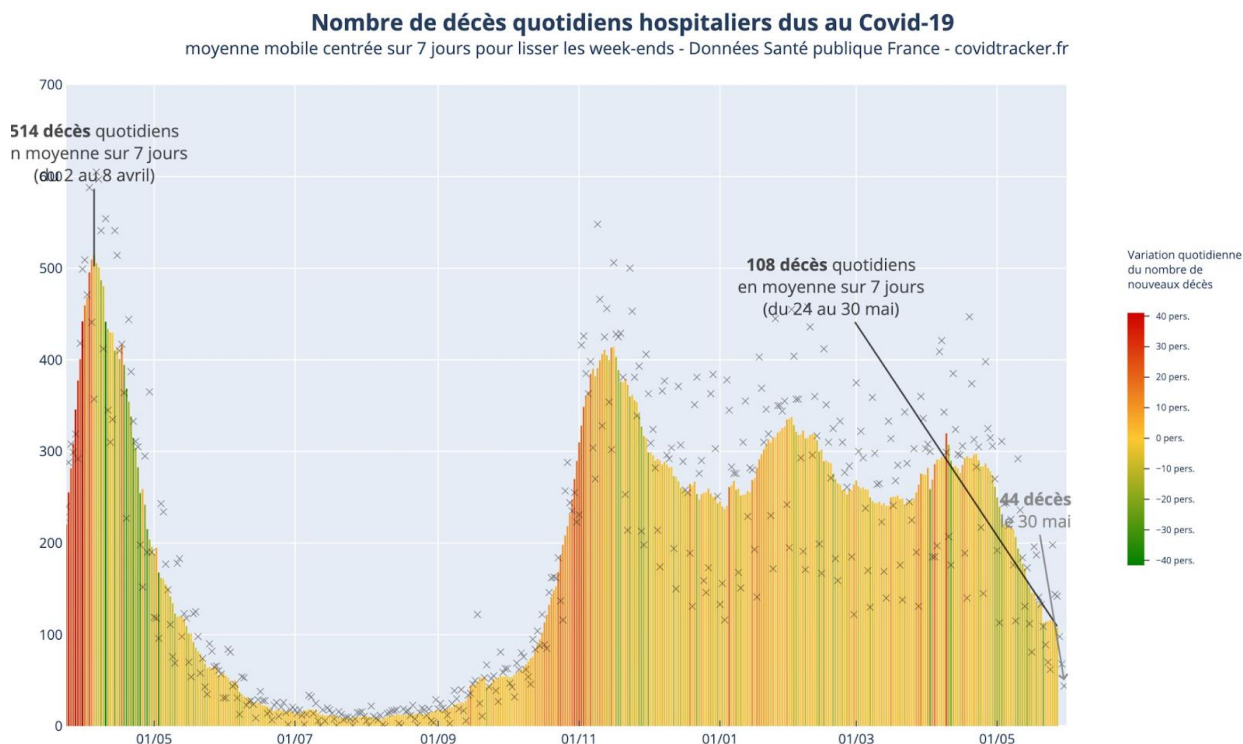


Figure 89. Deaths by area - Coronavirus in the UK (data.gov.uk)

## Deaths with COVID-19 on the death certificate by area

Total number of deaths since the start of the pandemic of people whose death certificate mentioned COVID-19 as one of the causes. The data are published weekly by the ONS, NRS and NISRA and there is a lag in reporting of at least 11 days because the data are based on death registrations. Only data available for the latest reported date are shown.

UK Nation Region Upper tier LA Lower tier LA About

Area ▼	Deaths ▲	Rate per 100,000 population ▲
Yorkshire and The Humber	12,808	232.7
West Midlands	15,215	256.4
South West	8,191	145.6
South East	20,781	226.4
North West	20,225	275.5
North East	6,904	258.6
London	19,162	213.8
East of England	15,151	243

## 7.3 Healthcare Capacity

### 7.3.1 Staff

Public facing dashboards do not contain information regarding staff. Any visual examples will have to be requested from the partners.

### 7.3.2 Beds

#### Insight into Hospital capacity: Beds: Visual Examples

Figure 90. Admissions: <https://coronavirus.data.gov.uk/details/healthcare>

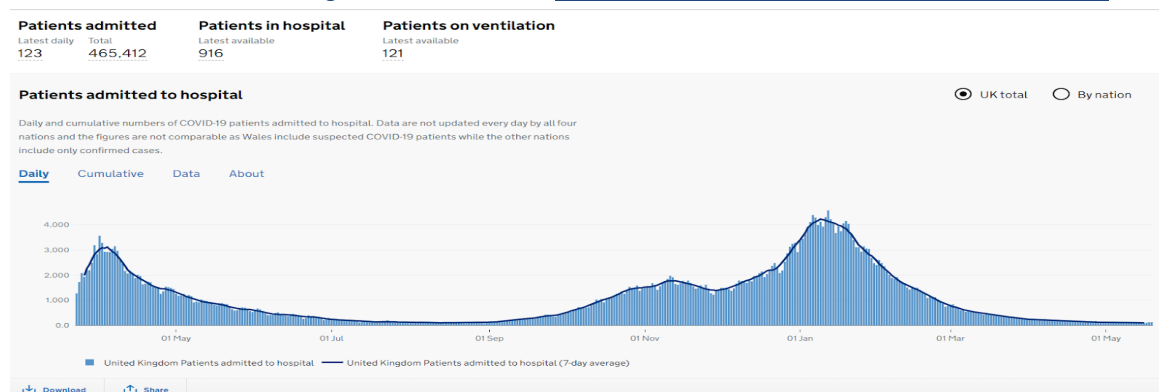
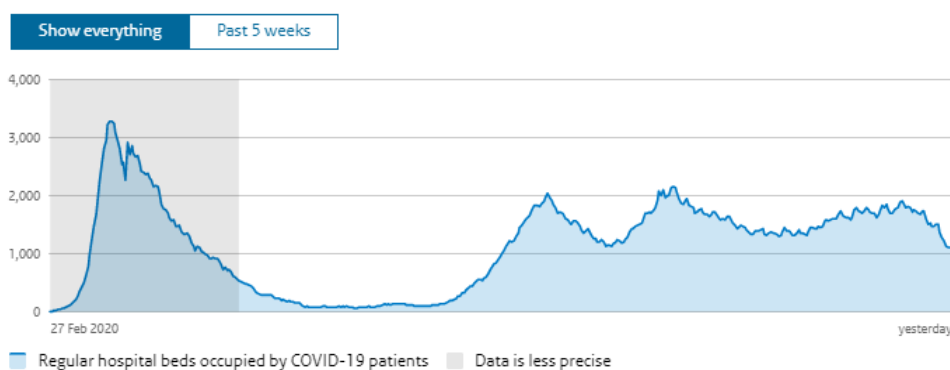


Figure 91. Hospital bed occupancy over time, non ICU - <https://coronadashboard.government.nl/>

#### Hospital bed occupancy over time (non ICU)

This graph shows the number of hospital beds (excluding ICU beds) occupied over time by patients with COVID-19. It represents not just the days on which patients were admitted to hospital but all days on which patients with COVID-19 were in hospital.



Source: LCPS

Figure 92. Occupied mechanically ventilated beds - <https://coronavirus.data.gov.uk/>

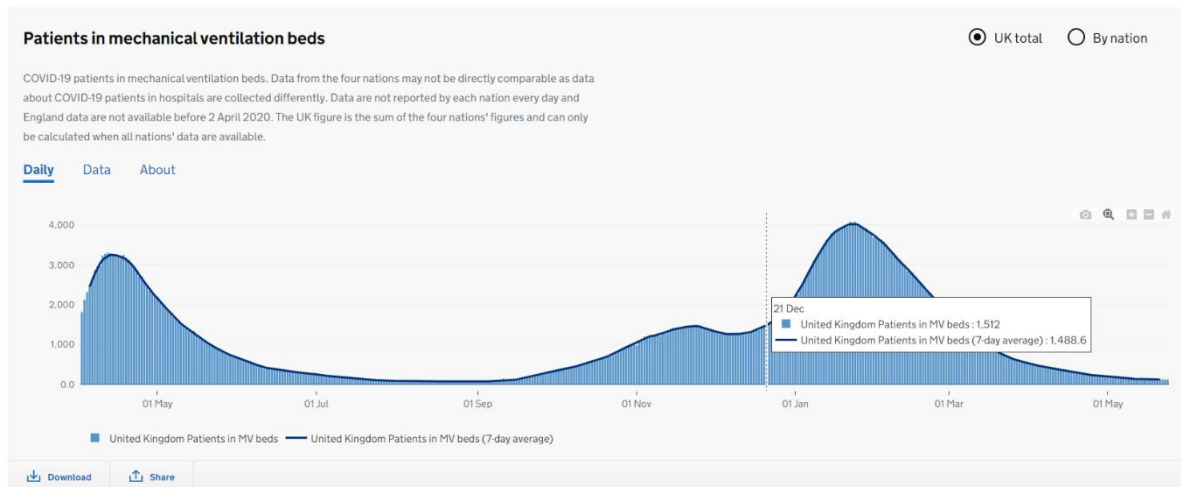


Figure 93. Above: Cases, admissions, discharges - <https://covid19ireland-geohive.hub.arcgis.com/pages/0814b13a2f2b4458a36105502c8e92e8>

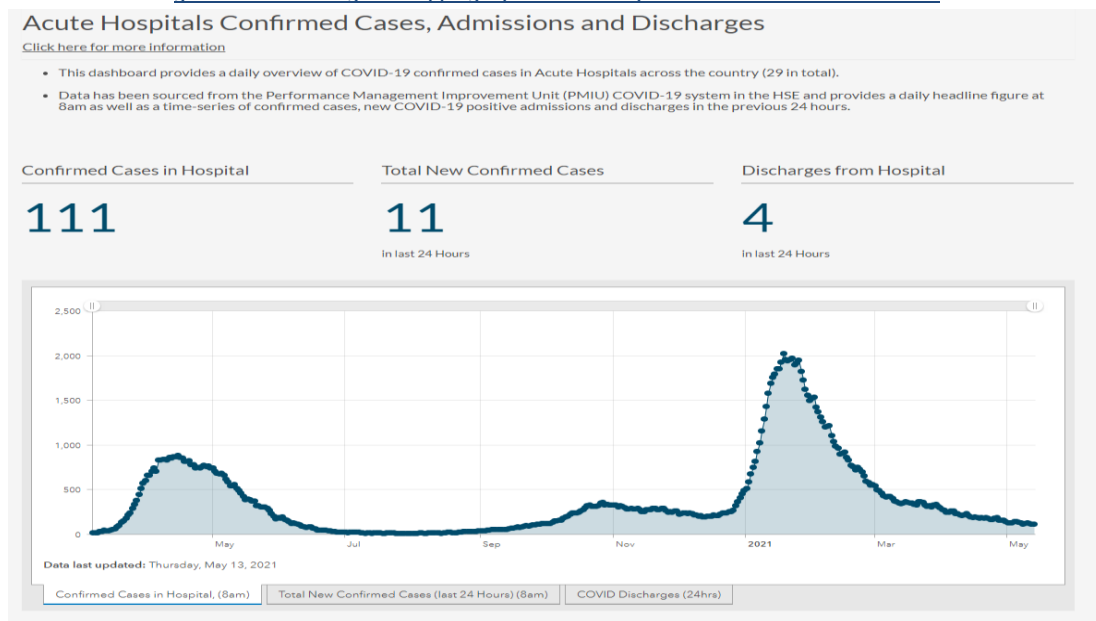




Figure 94. ICU patients by region over time: - <https://covidtracker.fr/>

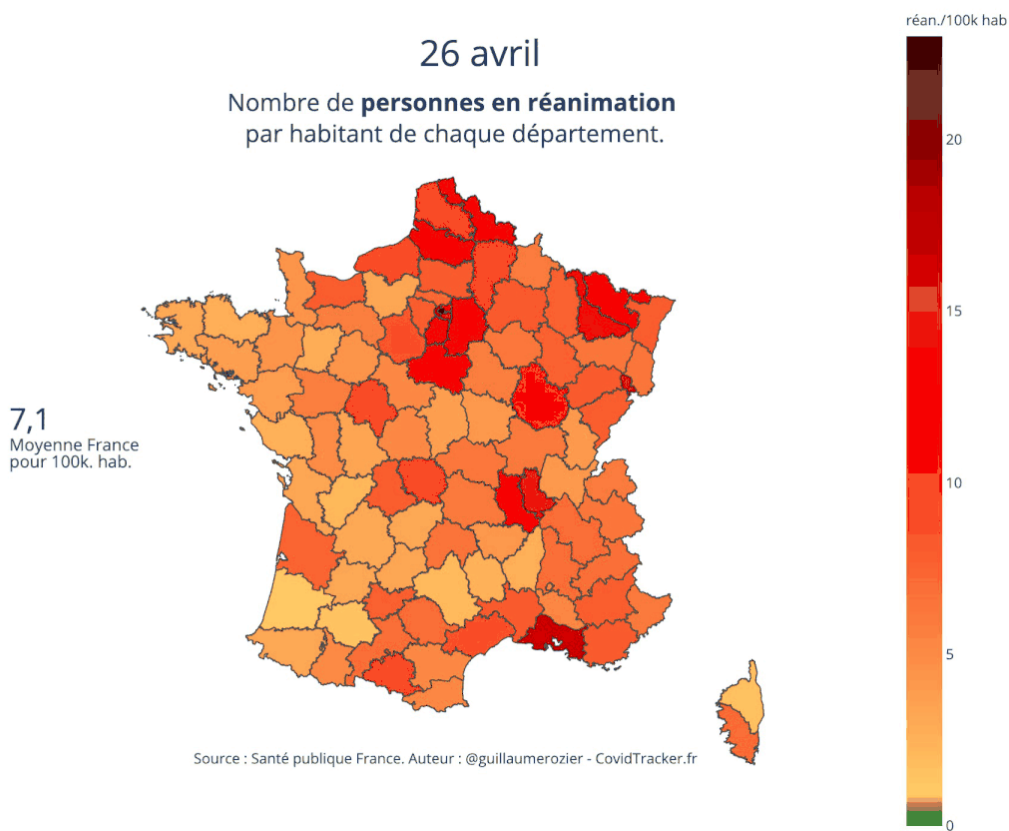


Figure 95. ICU Capacity 7 day trend - <https://coronavirus.jhu.edu/data/hospitalization-7-day-trend/inpatient-capacity>

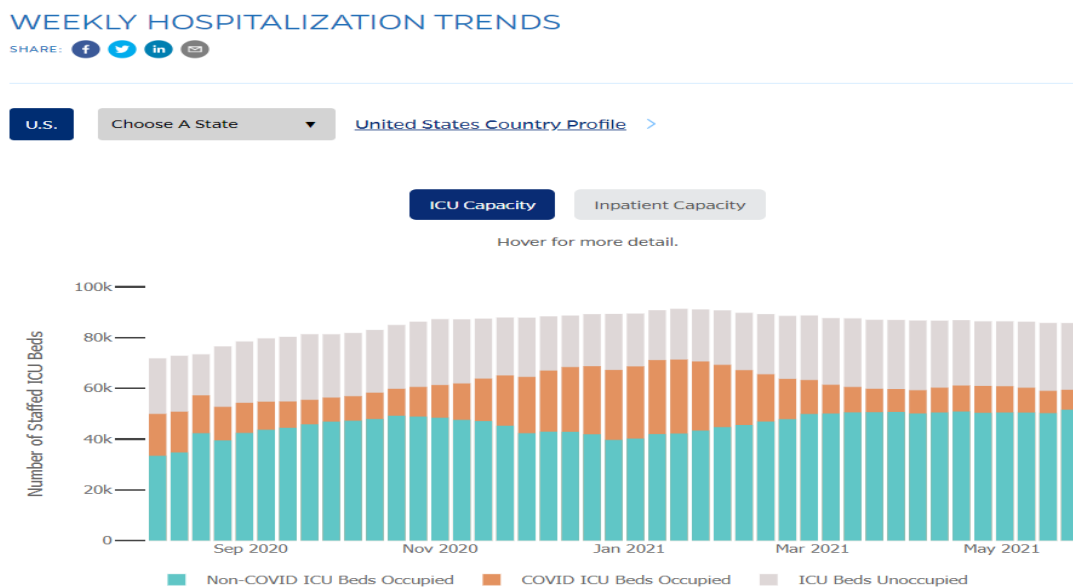


Figure 96. Hospital capacity and surge - <https://mn.gov/covid19/data/response-prep/response-capacity.jsp>

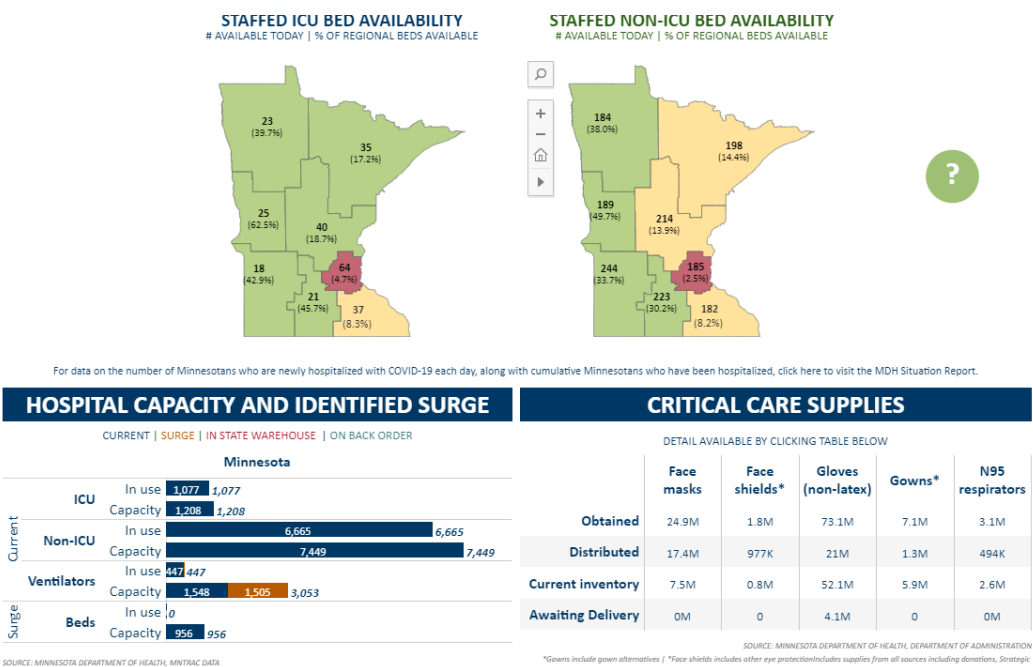
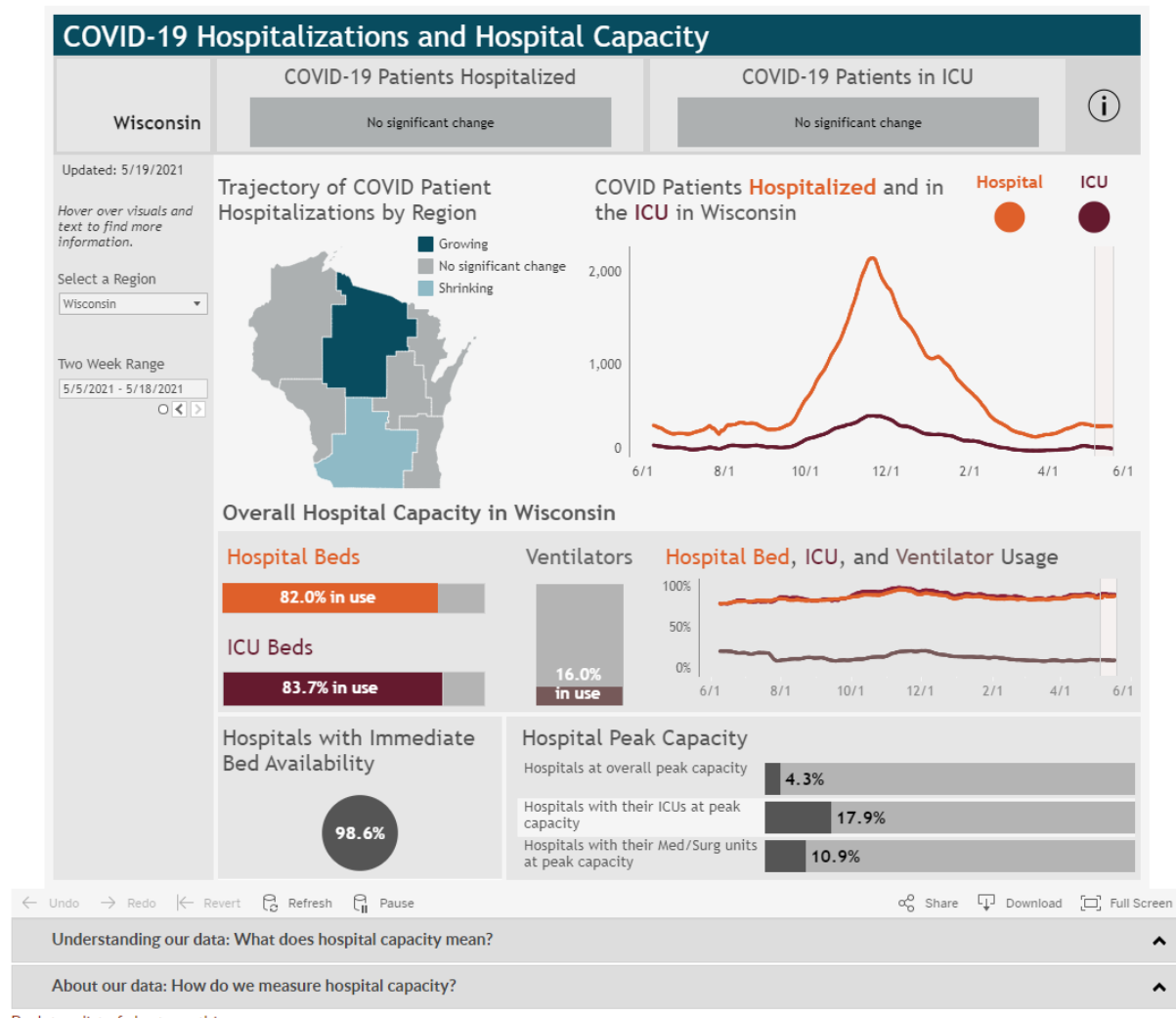


Figure 97. Hospital Capacity Overview - <https://www.dhs.wisconsin.gov/covid-19/hosp-data.htm#capacity>

### 7.3.3 Pre-Hospital and Emergency

This information is not available on public facing dashboards so any visual references will have to be provided by INEM.

### 7.3.4 Resources

#### Insight into Resources: Visual Examples

Figure 98. Stock at COVID-19 usage of PPE by types - <https://www.gov.uk/government/publications/personal-protective-equipment-ppe-strategy-stabilise-and-build-resilience/personal-protective-equipment-ppe-strategy-stabilise-and-build-resilience>

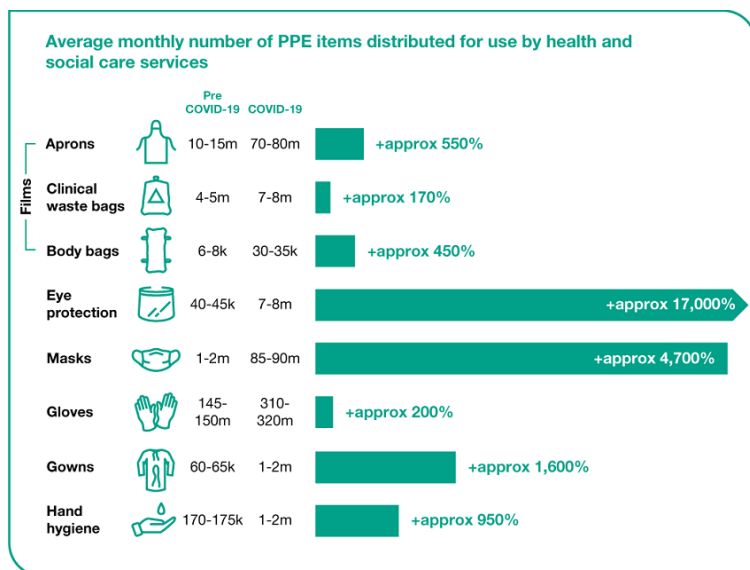


Figure 99. Distribution PPE by source - [Tracking PPE Distribution | Washington State Coronavirus Response \(COVID-19\)](#)

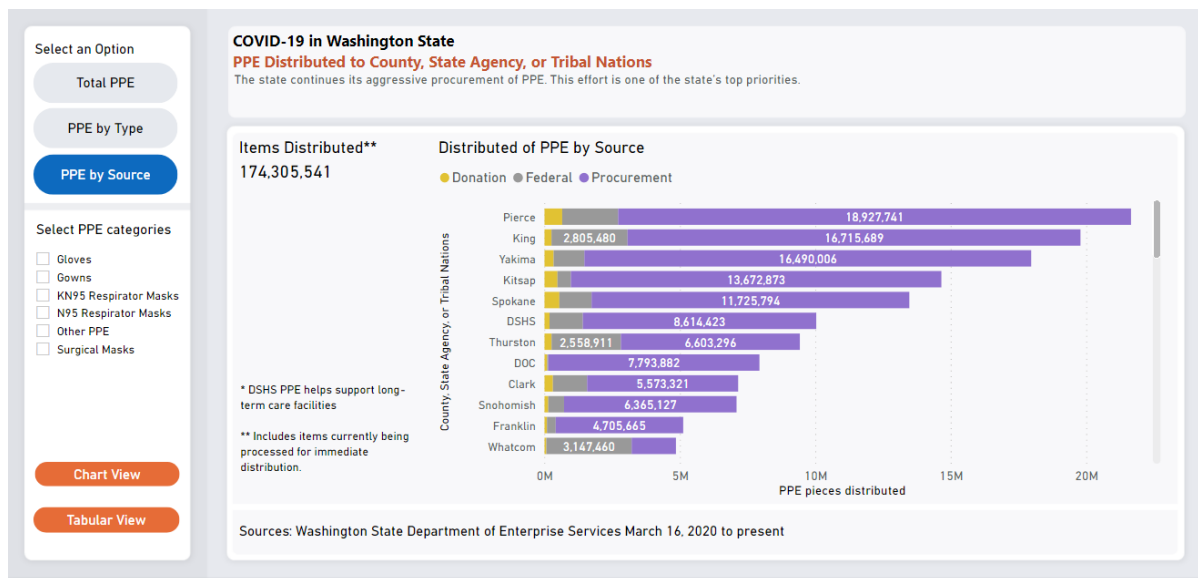


Figure 100. Distribution PPE by area and type - [Tracking PPE Distribution | Washington State Coronavirus Response \(COVID-19\)](#)

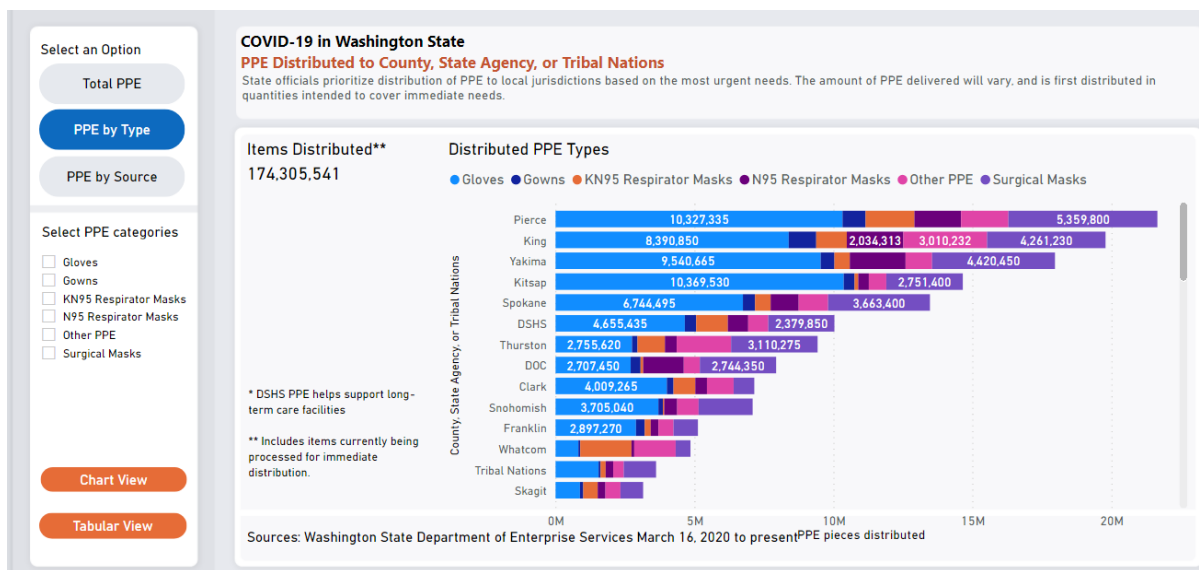
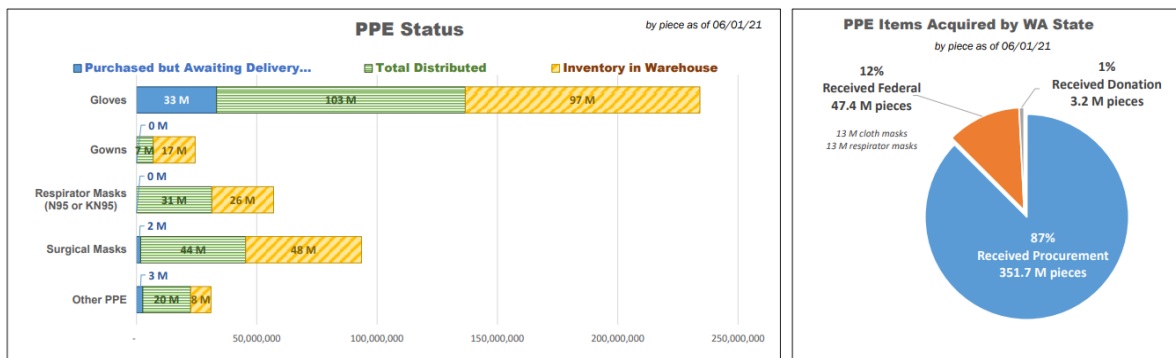


Figure 101. PPE overall status [PPE Distribution | Washington State Coronavirus Response \(COVID-19\)](#)



## 7.3.5 Laboratories

### Insight into Lab: Visual Examples

Figure 102. Laboratory based testing - [Testing in the UK | Coronavirus in the UK \(data.gov.uk\)](#)

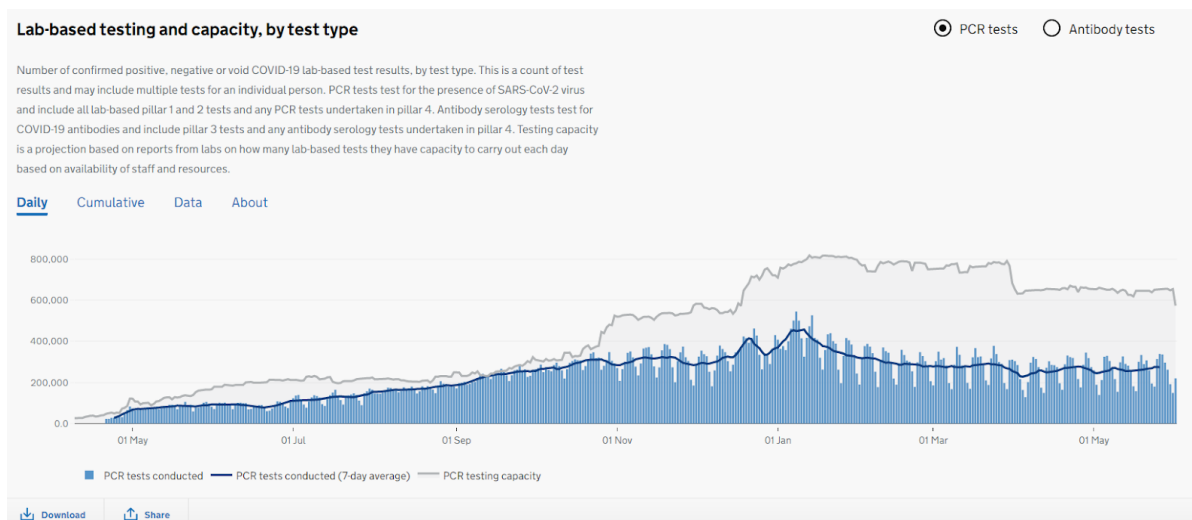
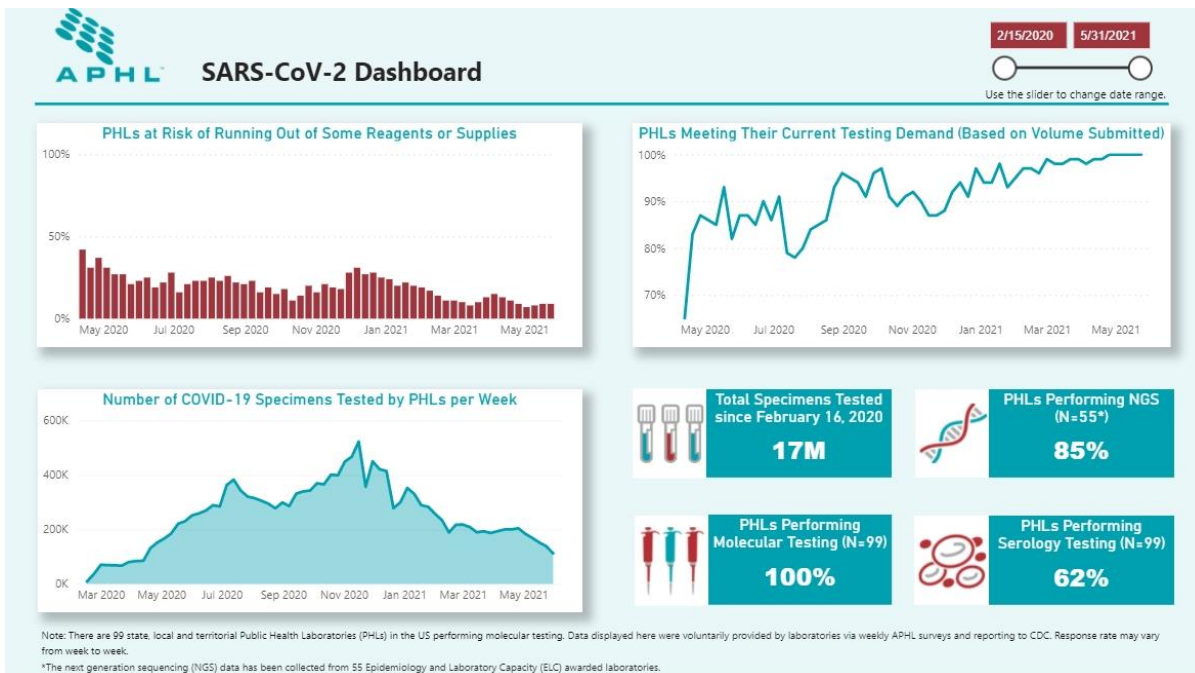


Figure 103. Lab Testing Capacity- ASSOCIATION OF PUBLIC HEALTH LABORATORIES

## 7.4 Contact Tracing

### 7.4.1 Staff

Insight into Testing & Contact Tracing: Staff: Visual Examples

Public facing dashboards do not contain information regarding staff. Any visual examples will have to be requested from the partners.

### 7.4.2 Tests

Insight into Testing & Contact Tracing: Tests: Visual Examples

Figure 104. Test capacity - [Testing in the UK | Coronavirus in the UK \(data.gov.uk\)](#)**Virus tests conducted**

Daily Total  
664,849 180,817,234

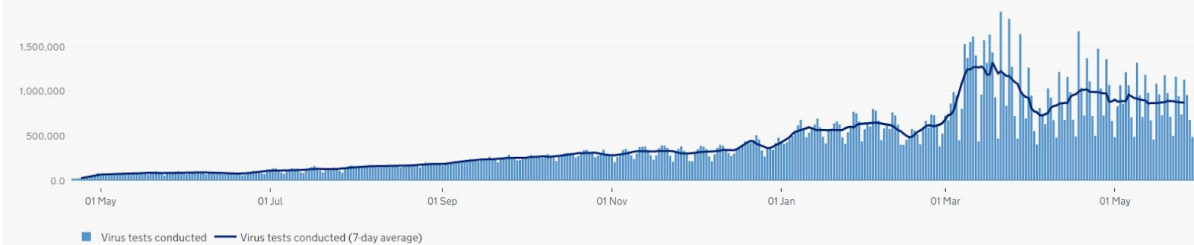
**PCR testing capacity**

573,434

**Virus tests conducted**

Number of confirmed positive, negative or void COVID-19 virus test results. This is a count of test results and may include multiple tests for an individual person. Virus tests test for the presence of SARS-CoV-2 virus and include all pillar 1 and 2 tests and any virus tests undertaken in pillar 4. Virus tests include PCR tests conducted in laboratories and rapid lateral flow tests that give results in less than an hour, without needing to go to a laboratory.

[Daily](#) [Cumulative](#) [Data](#) [About](#)



[Download](#) [Share](#)

Figure 105. review of test capacity by state - [Track Testing Trends - Johns Hopkins \(jhu.edu\)](#)**State Overview**

Filter by region

Show All

How to read this graphic

Map View

Overview

State ↑	New Cases ⓘ ↑		Tests per 100k people ↑		Percent Positive ⓘ ↑	
	New daily cases	Weekly trend	Daily Tests	Weekly trend	Daily % positive	Weekly trend
Alabama ↓	 +640 new	THIS WEEK ↘ LAST WEEK ↘	 33.8 tests per 100k	THIS WEEK ↘ LAST WEEK ↘	 12.9% positive	THIS WEEK ↗ LAST WEEK ↘
Alaska ↓	 +111 new	THIS WEEK ↘ LAST WEEK ↘	 624.2 tests per 100k	THIS WEEK ↘ LAST WEEK ↗	 0.8% positive	THIS WEEK → LAST WEEK →
Arizona ↓	 +4 new	THIS WEEK → LAST WEEK ↘	 257.2 tests per 100k	THIS WEEK ↗ LAST WEEK →	 3.0% positive	THIS WEEK → LAST WEEK →
Arkansas ↓	 +69 new	THIS WEEK ↘ LAST WEEK →	 68.6 tests per 100k	THIS WEEK ↘ LAST WEEK ↘	 6.5% positive	THIS WEEK → LAST WEEK →
California ↓	 +1,404 new	THIS WEEK ↗ LAST WEEK ↘	 417.8 tests per 100k	THIS WEEK ↘ LAST WEEK →	 0.9% positive	THIS WEEK → LAST WEEK →

Figure 106. Positive test – [Corona dashboard | Rijksoverheid.nl](#)**Number of GGD tests per day****36.754**

↑ **5,162.1 higher than** the average for the past 7 days  
(31,591.9)

The tests for which the results are not yet known are not included in this number.

Value of Monday, May 31 · Source: RIVM

**Positively tested persons****7,1%**

↓ **1.6 lower than** the average for the past 7 days (8.7)

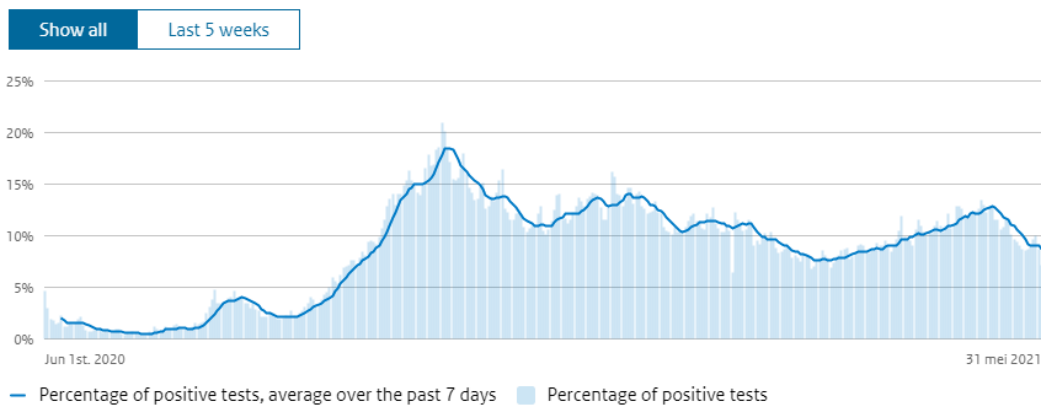
Percentage of positive tests in the GGD test streets, the results of which are known. Only tests whose test results are known shall be taken into account for calculating the percentage.

This is **2,606** of **36,754** tests with a known result.

Value of Monday, May 31 · Source: RIVM

**Percentage of positive tests over time**

This graph shows the daily percentage of GGD tests with a positive result, compared to all GGD tests of that day whose results are known. The data are sorted by the date on which the test took place at the GGD. It takes an average of one to two days for test results to be known.



Source: RIVM

## 7.4.3 Trace Contacts

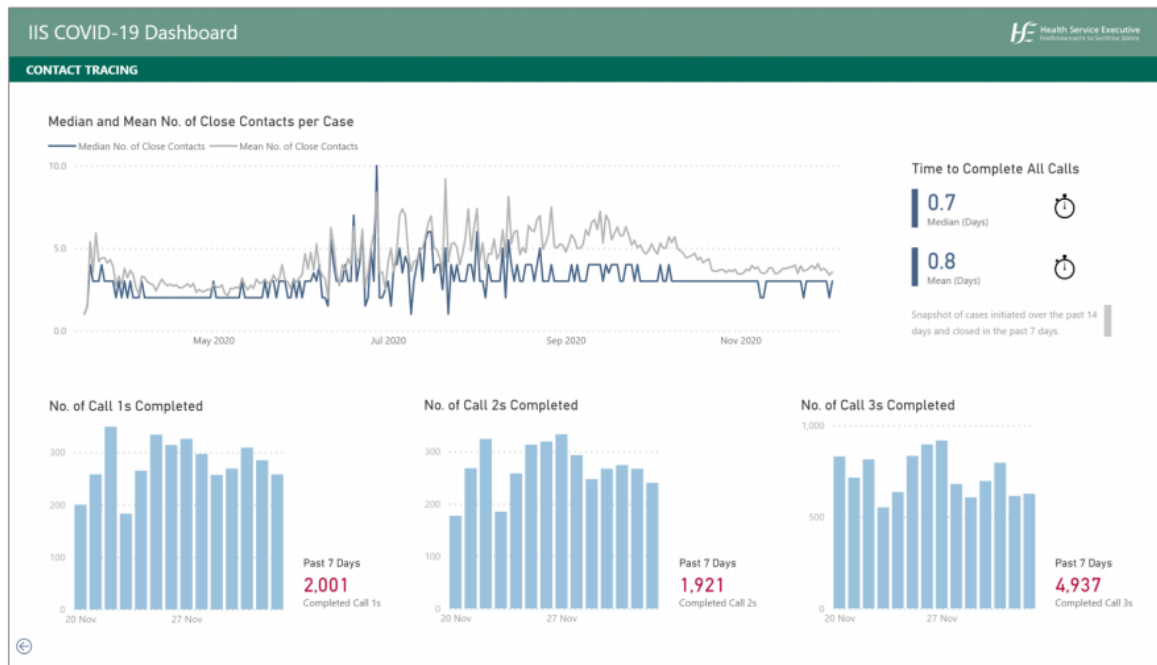
### Insight into Testing & Contact Tracing: Contact Tracing: Visual Examples



Figure 107. Contact tracing - <https://www.hse.ie/eng/services/news/newsfeatures/covid19-updates/covid-19-testing-and-tracing-update-29-october-2020.pdf>

## Contact Tracing

Update 04 December, extract from the dashboard



HSE COVID-19 Situational Report 2

Figure 108. [www.nj.gov/health/cd/topics/covid2019\\_dashboard.shtml](http://www.nj.gov/health/cd/topics/covid2019_dashboard.shtml)

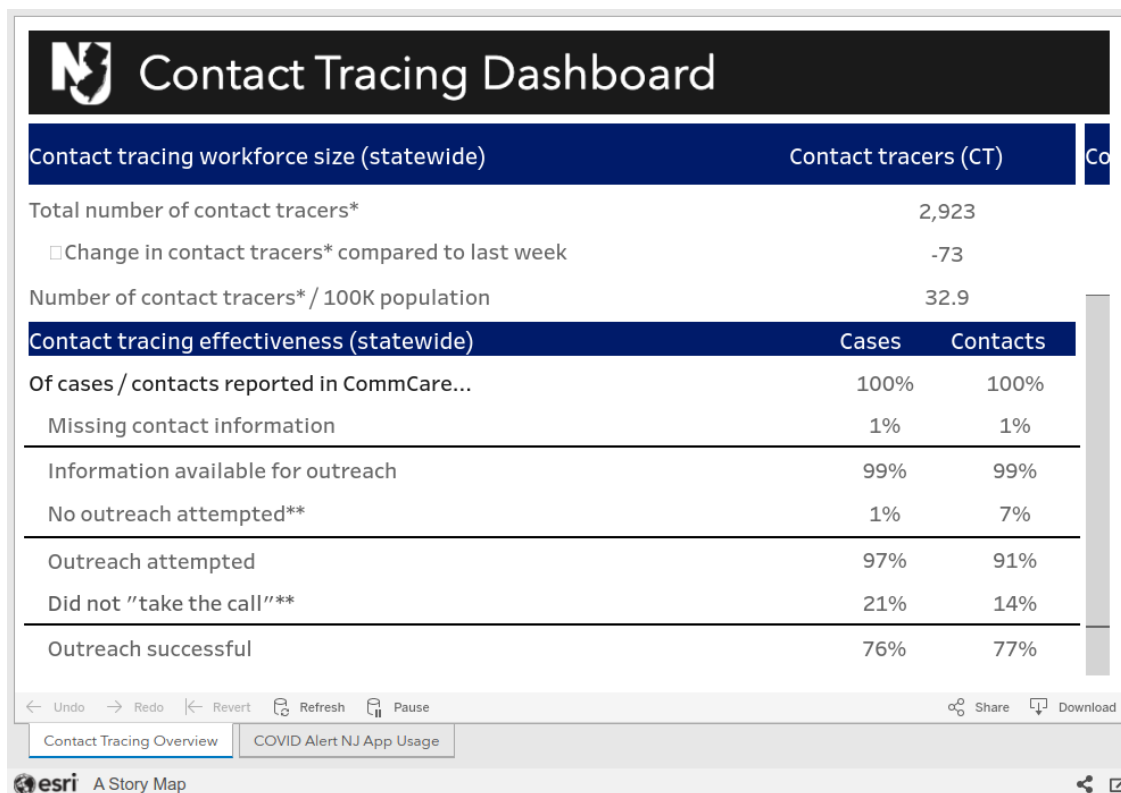


Figure 109. <https://coronavirus.maryland.gov/pages/contact-tracing>

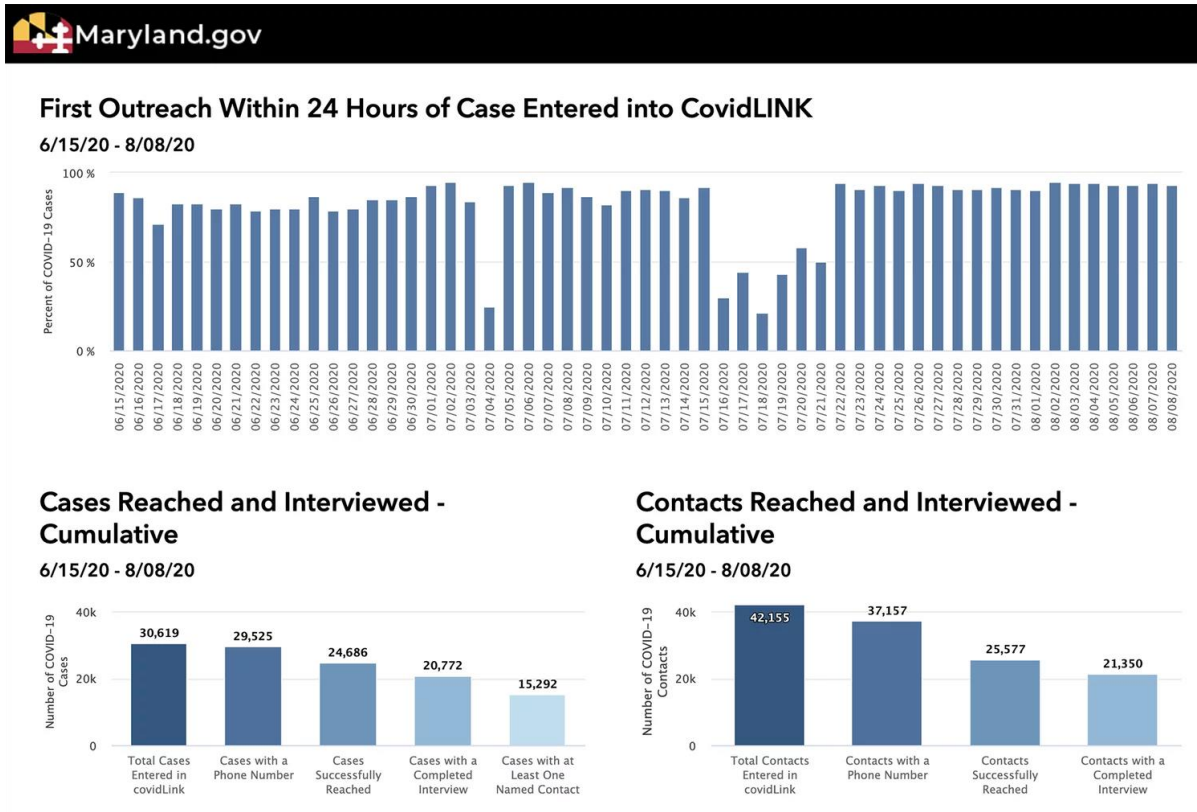
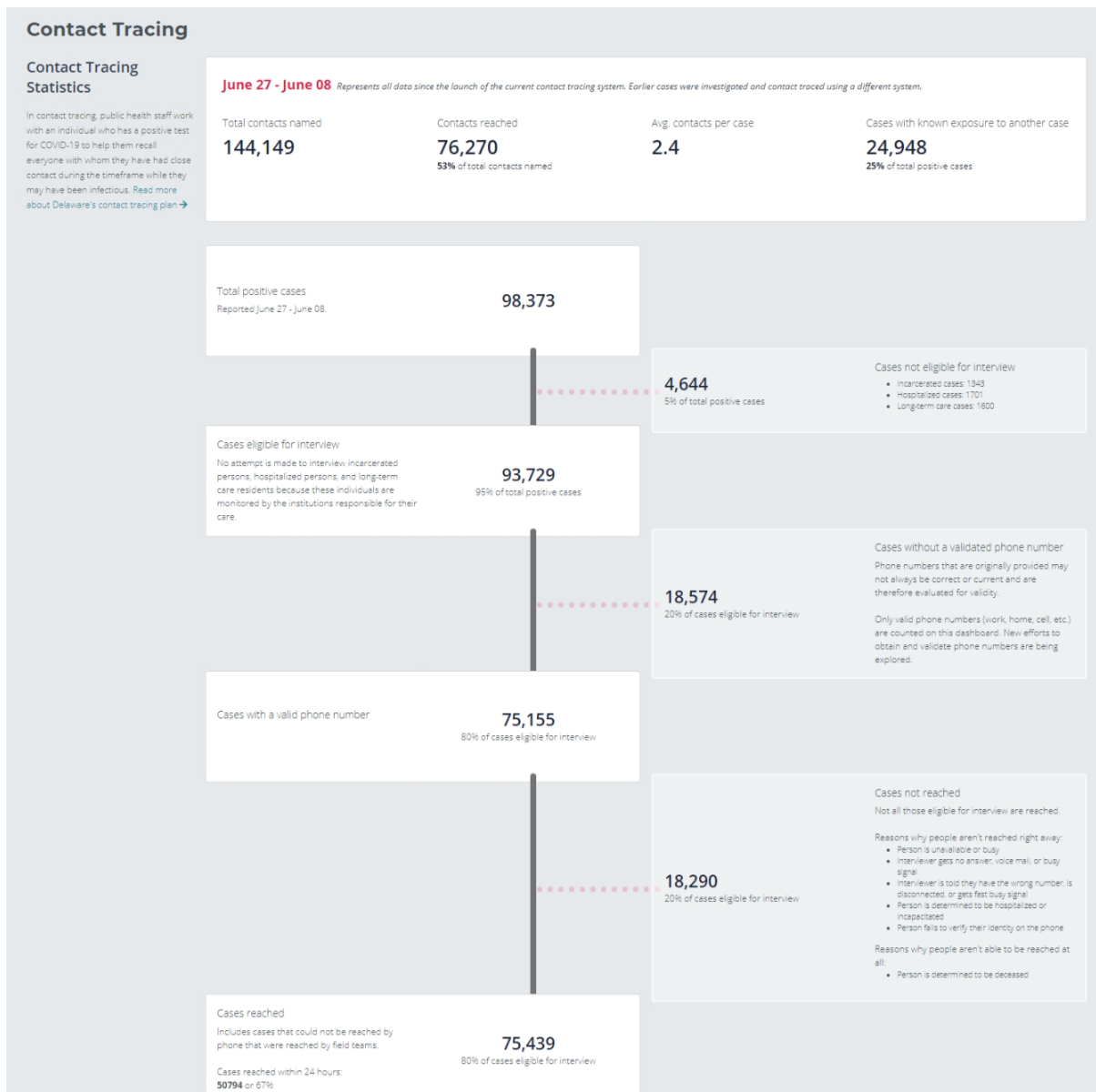
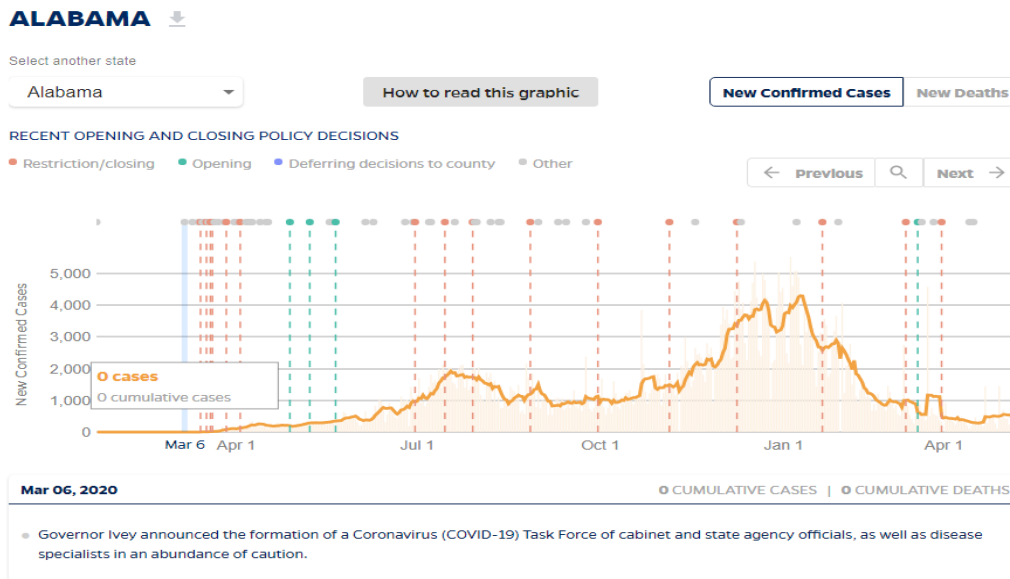


Figure 110. contact tracing process- State of Delaware – My Healthy Community

## 7.5 Interventions

### Insight into Interventions: Visual Examples

Figure 111. Impact of decisions by state - Johns Hopkins (jhu.edu)



**Data Sources:** Cases and deaths data from JHU CSSE. As of August 1, 2020, policy events are drawn from various state-specific sources. Prior to that, the data source for policy events was the National Governor's Association.

Figure 112. Decision over time on Hong Kong (Paper)- [https://www.journalofinfection.com/article/S0163-4453\(20\)30235-8/fulltext](https://www.journalofinfection.com/article/S0163-4453(20)30235-8/fulltext)

### Evolving epidemic of coronavirus disease 2019 (COVID-19) in Hong Kong (from day 1 to 100)

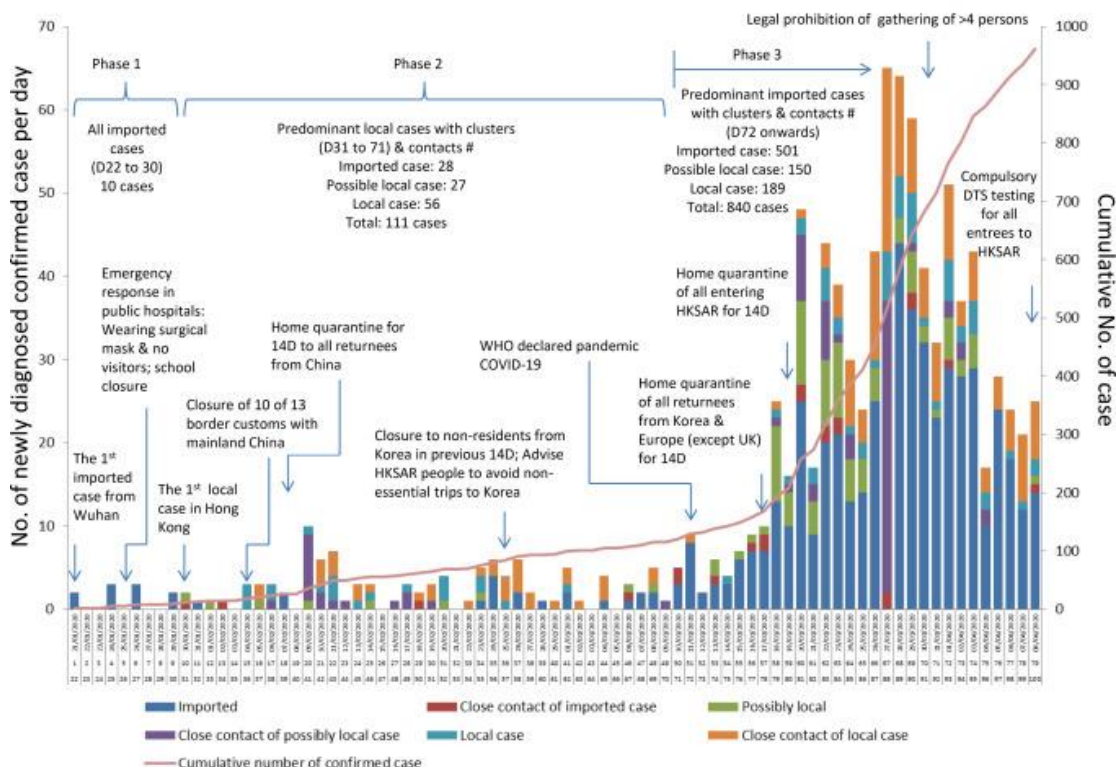
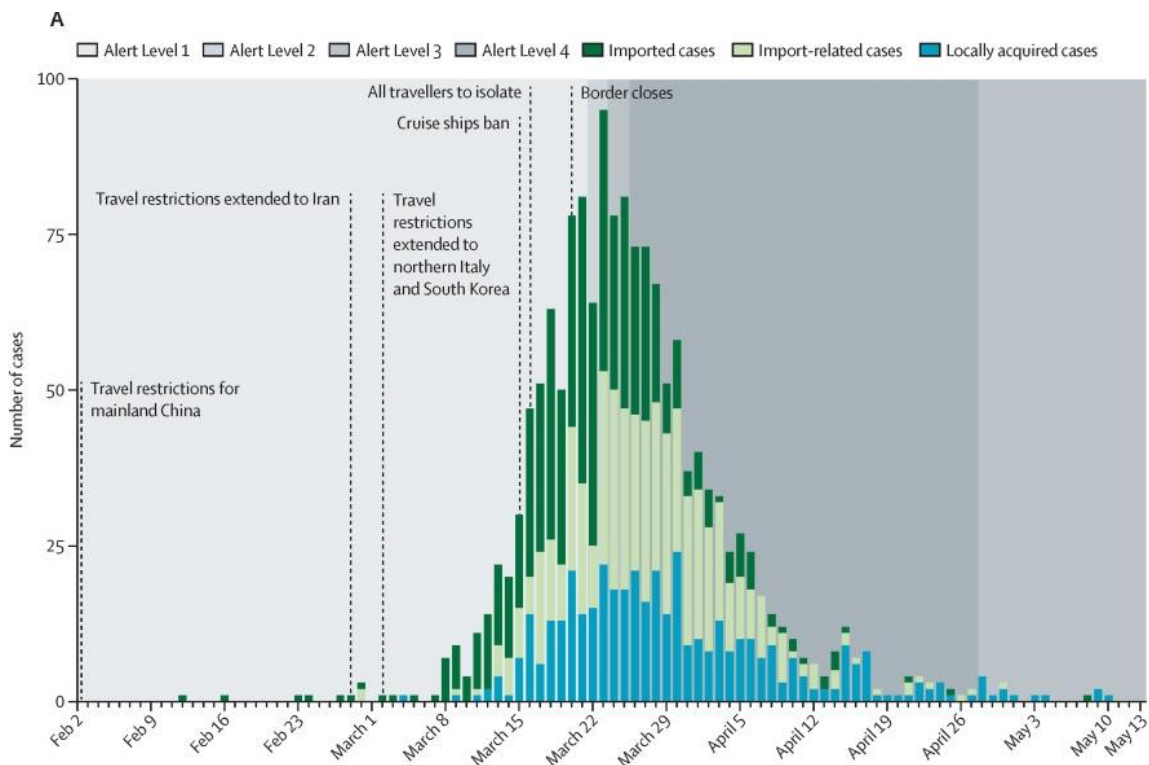


Figure 113. New Zealand COVID-19 epidemic and response timeline- *The lancet*

## 7.6 Disease Profile

### Insight into Virus profile

Figure 114. Epidemiological parameter (paper)- [http://www.math.ualberta.ca/ami/CAMQ/pdf\\_files/vol\\_19/19\\_4/19\\_4c.pdf](http://www.math.ualberta.ca/ami/CAMQ/pdf_files/vol_19/19_4/19_4c.pdf)

Parameter	Meaning	Italy	Spain	Germany	France
$b$	Transmission rate of ascertained cases	$b$	$b$	$b$	$b$
$r$	Ascertainment rate	$r$	$r$	$r$	$r$
$\alpha$	Ratio of transmission rate between unascertained and ascertained cases	1	1	1	1
$D_e$	Latent period	5.2	5.2	5.2	5.2
$D_i$	Infectious period	2.3	2.3	2.3	2.3
$D_q$	Duration from illness onset to hospitalization	10	10	10	10
$D_h$	Hospitalized period	30	30	30	30
$N$	Population size	60,431,283	46,749,202	82,927,922	65,228,495
$n$	Daily inbound and outbound size	250,000	360,000	380,000	260,000

<https://doi.org/10.1371/journal.pone.0241743.t002>

Figure 115. The reproduction number shows how fast the virus spreads - CovidTracker

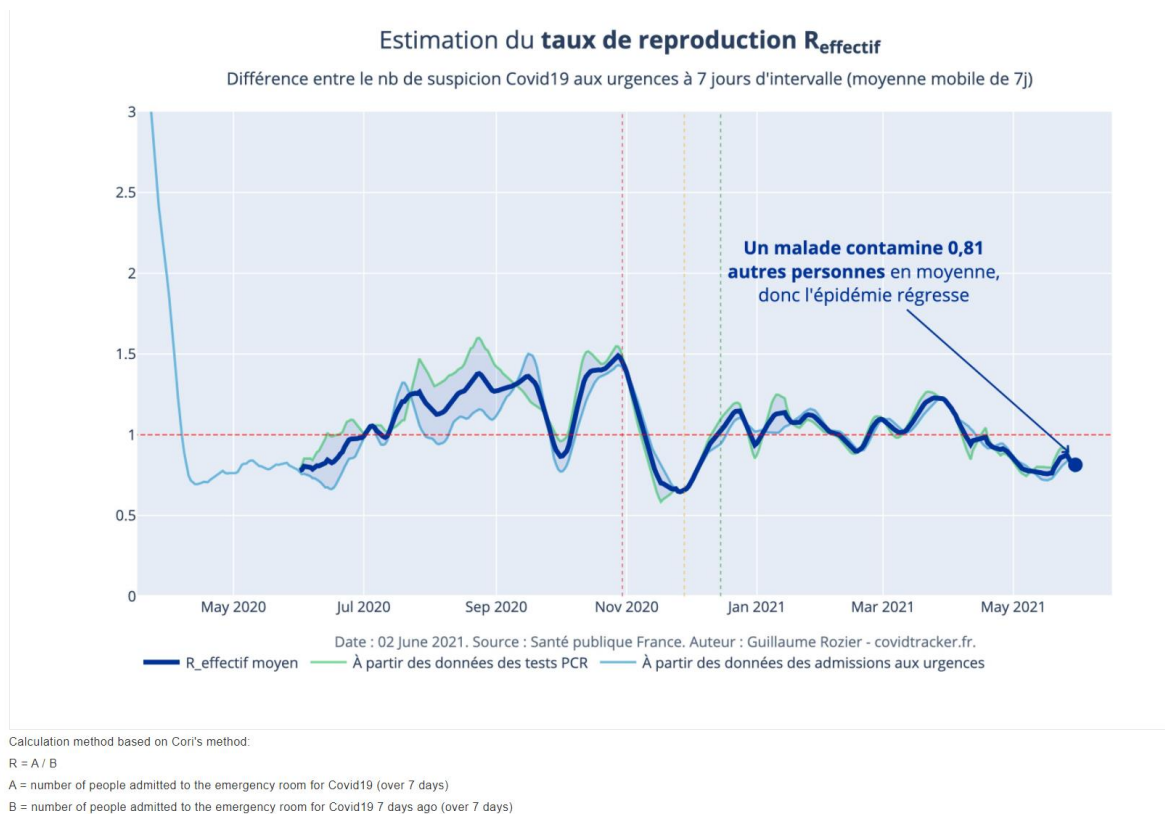
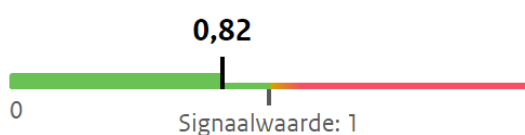


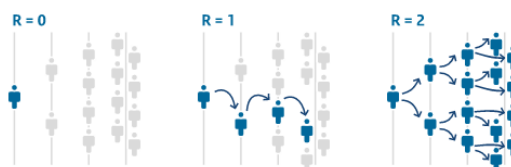
Figure 116. Reproduction number - [Reproductiegetal](#) | [Coronadashboard](#) | [Rijksoverheid.nl](#)

## Reproduction number



↓ **0.03 less** than the previous value

Number of people infected by one infectious person. This is always the reproduction number of two weeks ago because the reliability of more recent calculations is not large enough.

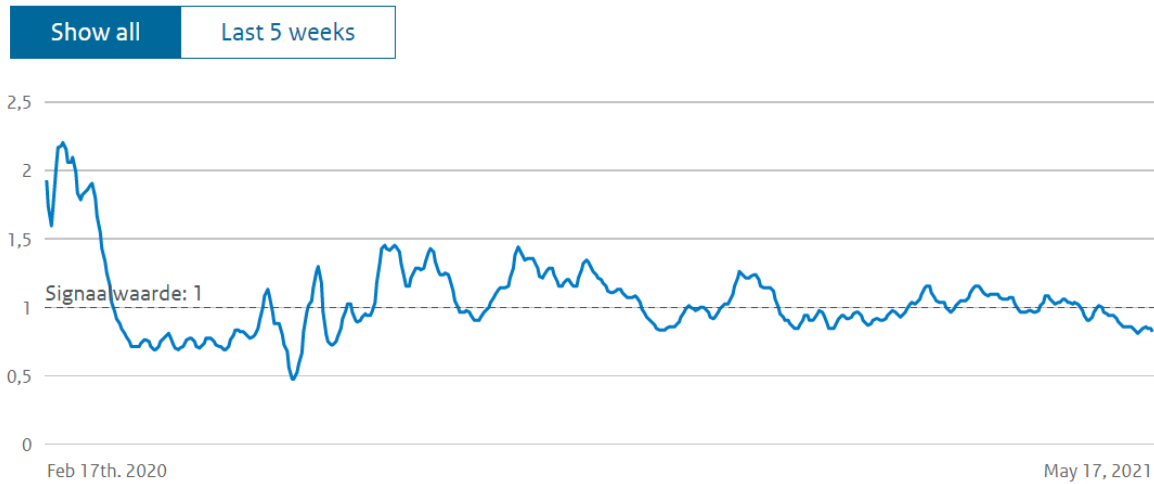


The reproduction number shows how fast the virus spreads. This number indicates how many people are infected on average by someone infected with the coronavirus. With a reproduction number of around 1, the number of infections remains approximately the same. If the reproduction number is less than 1, the number of infections decreases. With a number higher than 1, the number of infections increases.

Value of Monday 17 May obtained on Tuesday 1 June · Source: RIVM

## The reproduction number over time

The effective R is an estimate. For recent R estimates, the reliability is not great, therefore the R-line does not continue in the last two weeks.



Value of Tuesday, June 1 • Source: RIVM

## 7.7 Vaccinations

### 7.7.1 Vaccine Delivery

#### Insight into Vaccine: Delivery Visual Examples

Figure 117. Vaccinations: by cohort, vs target, 7 day moving average: <https://covid-19.hscni.net/ni-covid-19-vaccinations-dashboard/>

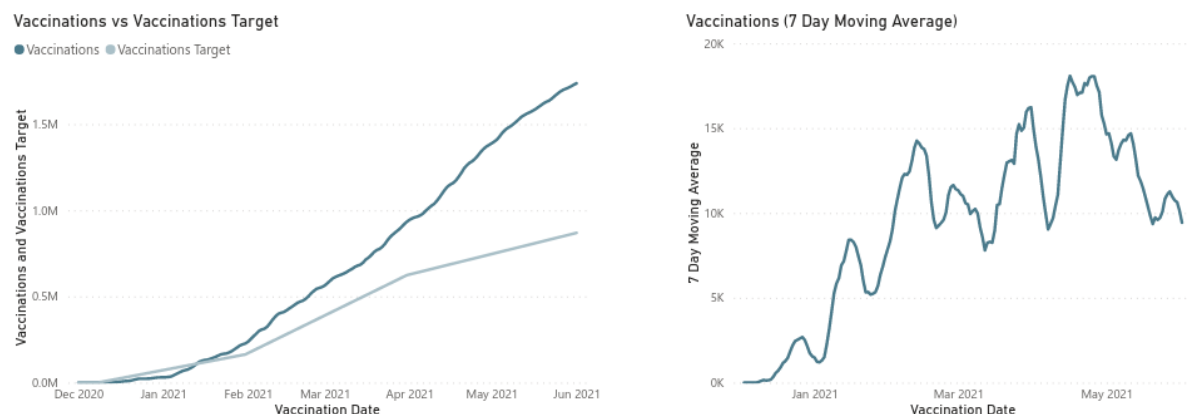
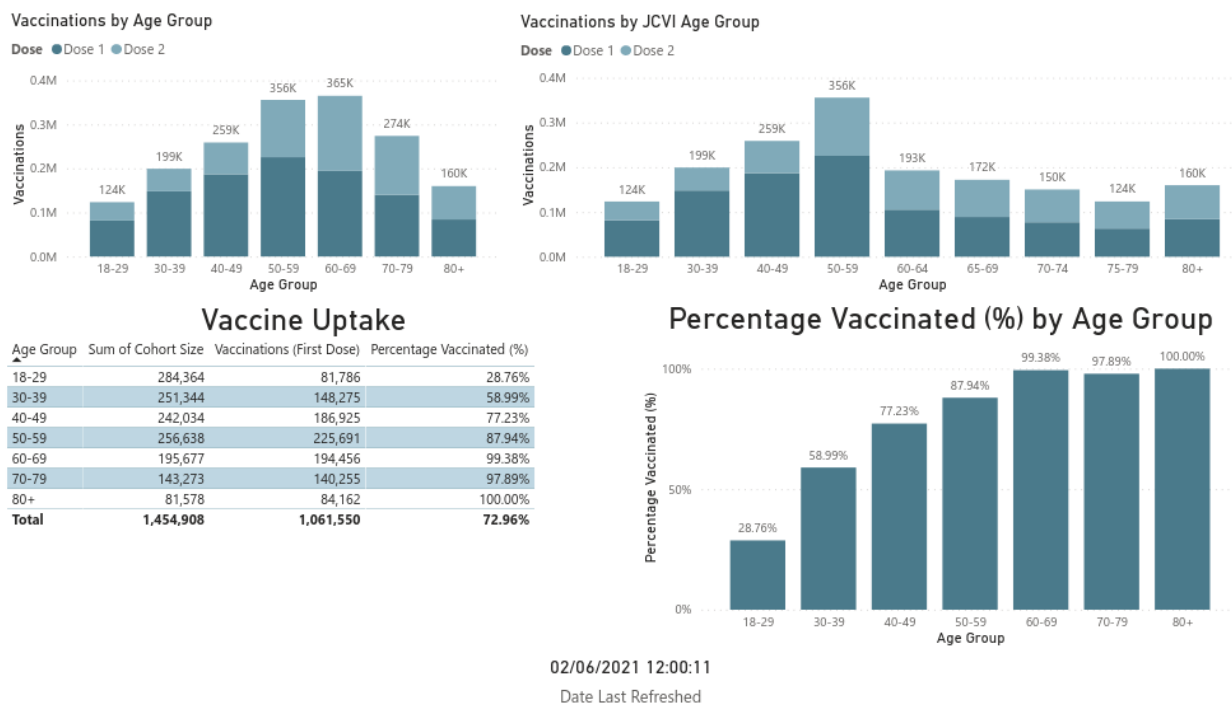




Figure 118. Vaccinations total number and type: <https://covid19ireland-geohive.hub.arcgis.com/pages/6830eb851e3e4ae9861c916db88fb4be>

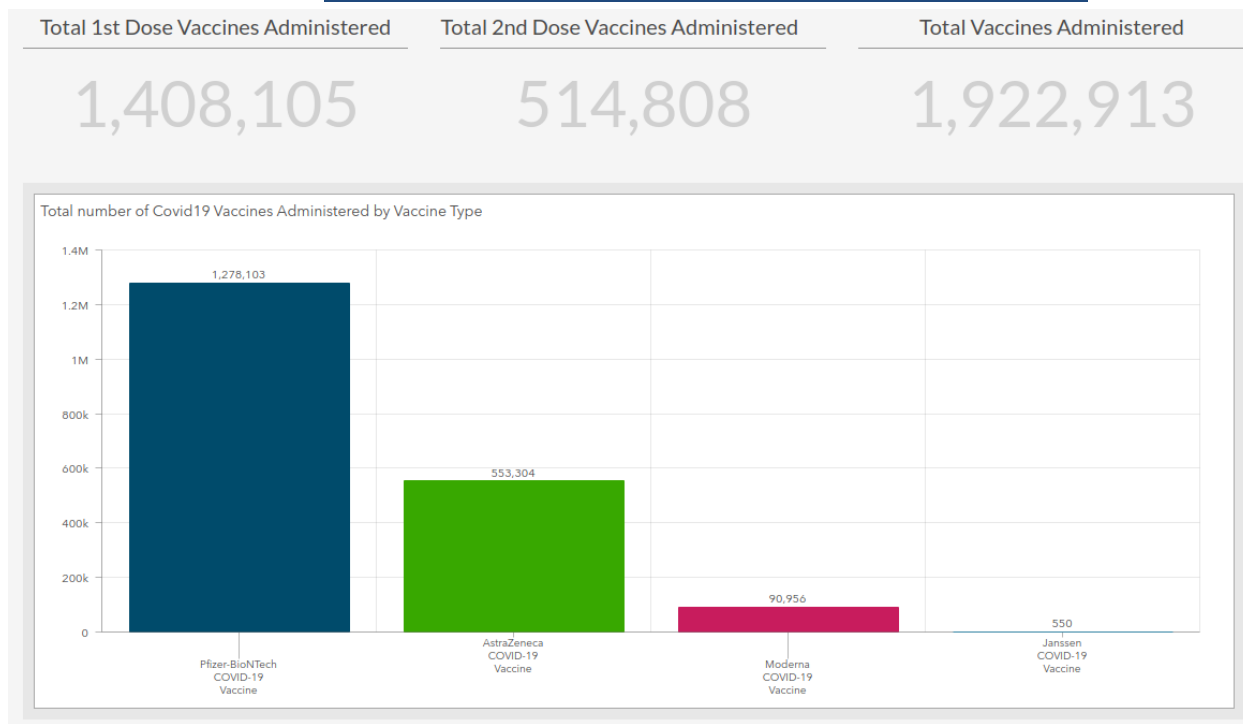


Figure 119. Delivery and Expected: <https://coronadashboard.government.nl/landelijk/vaccinaties>



Figure 120. Delivered and Administered doses by type: <https://coronadashboard.government.nl/landelijk/vaccinaties>

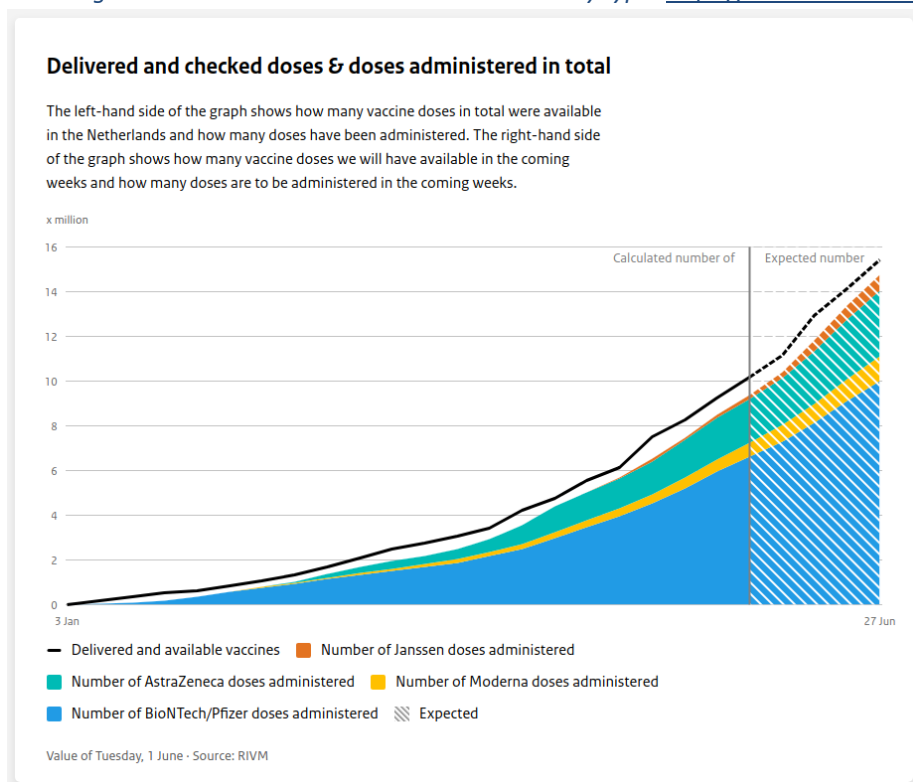


Figure 121. Total number of vaccinations: <https://coronadashboard.government.nl/landelijk/vaccinaties>

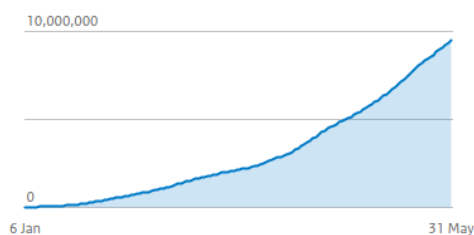


## COVID-19 vaccinations

So far approximately **9.4 million** vaccine doses have been administered.

### Total vaccine doses administered

This graph shows the total number of doses administered according to calculations.



### Planned doses this week

**1,039,113**

Number of doses the Netherlands expects to administer from 31 May to 6 June. The actual number may differ, for example due to people cancelling their appointments or problems with vaccine deliveries.



Every minute **188** people receive a vaccine dose.

This is an estimate. The estimated figure is based on an average of **135,399** doses per day between 08.00 and 20.00 over the past seven days.

## 7.7.2 Vaccine Staff

### Insight into Vaccine: Staff visual Examples

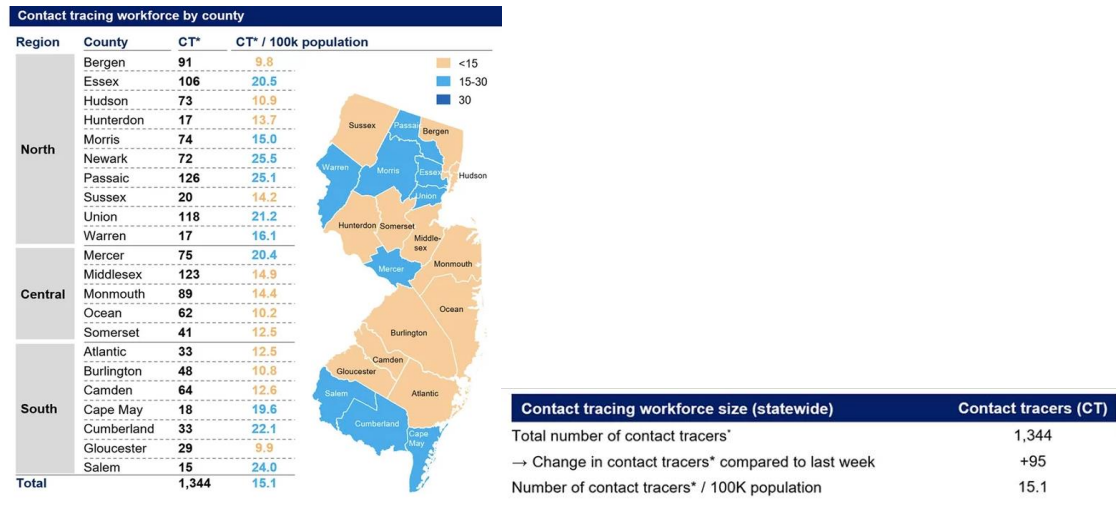
Figure 122. Contact tracing staff - [Contact Tracing Dashboard | North Carolina \(ncdhhs.gov\)](#)

Who has been hired through the Carolina Community Tracing Collaborative?

Demographics of Contact Tracers Hired	Total Hired	Hired Percentage
Black or African American	171	26%
Hispanic or Latino	203	31%
American Indian or Alaska Native	11	2%
Asian or Pacific Islander	12	2%
White	203	31%
Two or more races	17	3%
No Response	46	7%
Sum	663	100%

Language(s) Spoken by Contact Tracers	Total	Percent
English Only	422	64%
Bilingual	241	36%

Figure 123. [https://www.nj.gov/health/cd/topics/covid2019\\_dashboard.shtml](https://www.nj.gov/health/cd/topics/covid2019_dashboard.shtml)

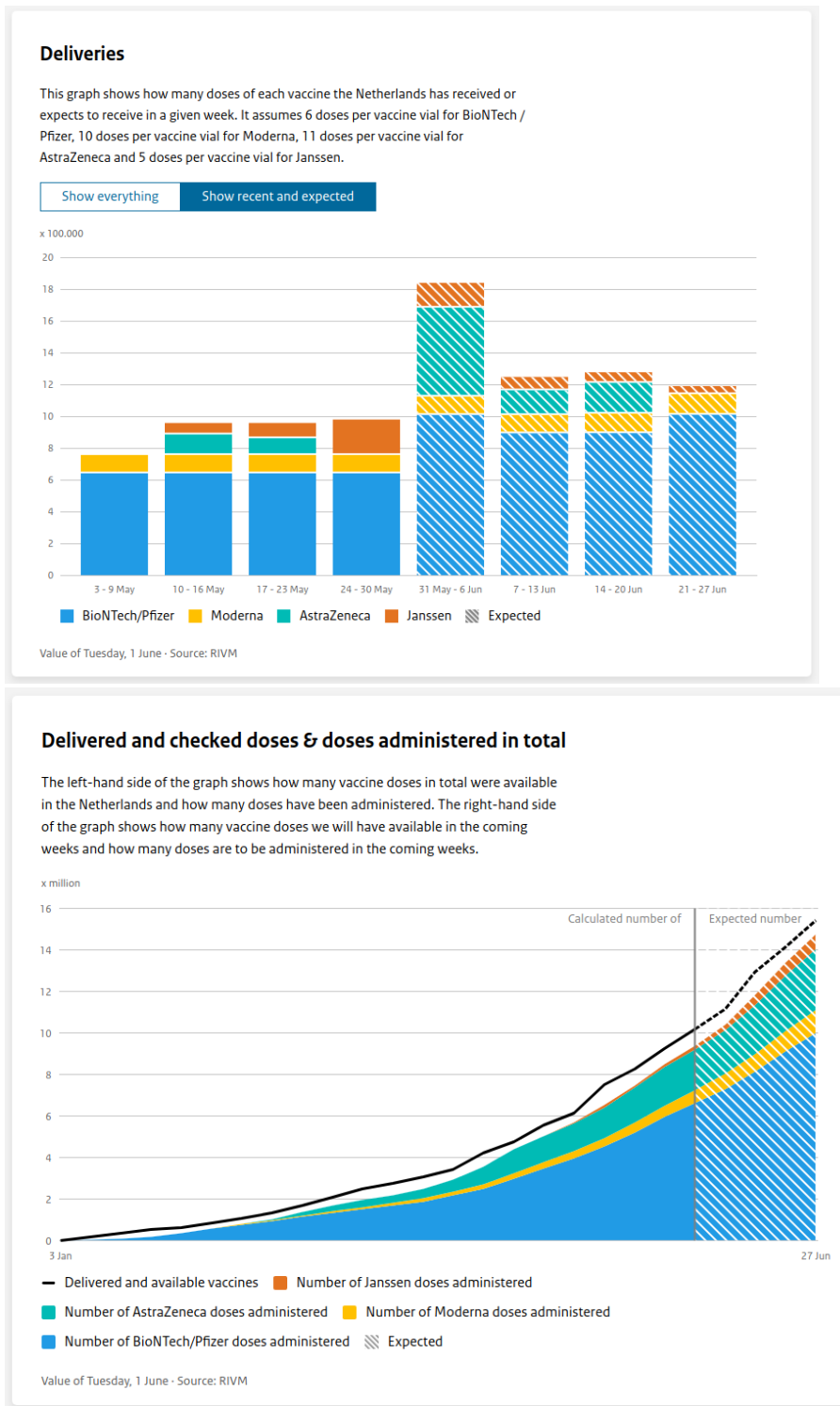


### 7.7.3 Vaccine Scenarios

#### Insight into Vaccine: Scenarios Visual Examples

Staffing visualisations are not available to the public. Any visual examples would need to be requested from the partners.

Figure 124. Deliveries and checked doses



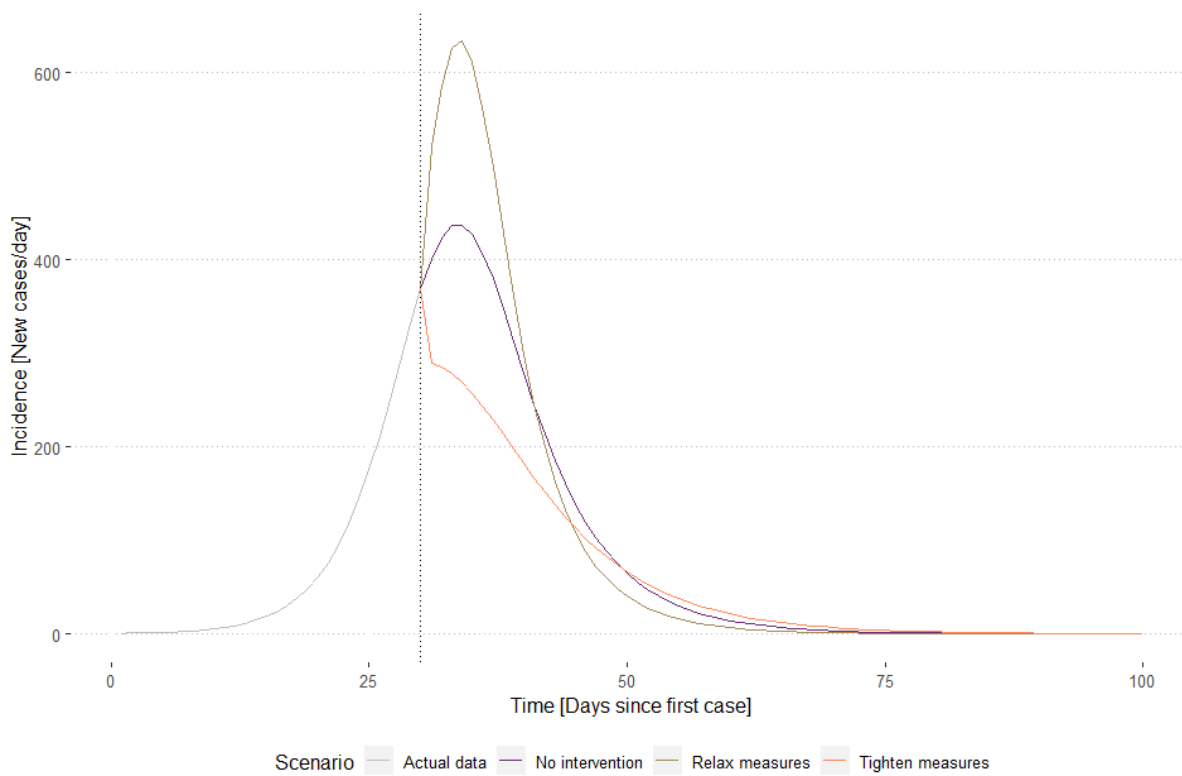
## 7.8 Scenarios

### 7.8.1 Epi Cases

Insight into Cases (Scenarios): Visual Examples

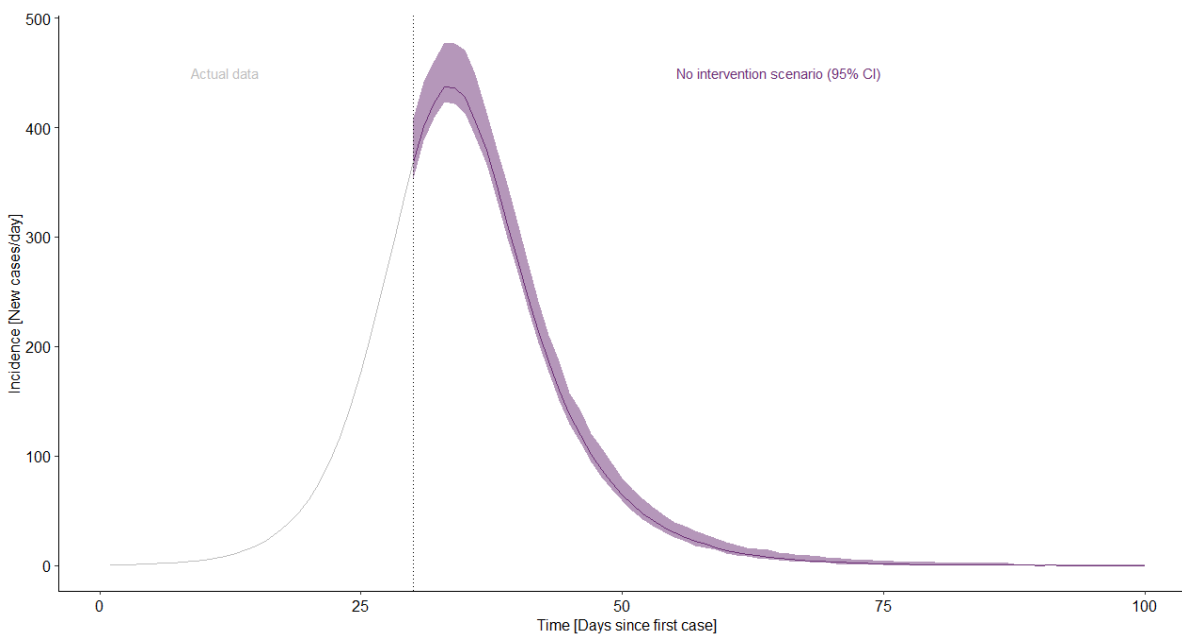
1. Scenarios (mean trajectory)

Figure 125.Scenarios (mean trajectory)



## 2. Scenarios with uncertainty

Figure 126. Scenarios with uncertainty



## 3. Scenarios

Figure 127. Daily infections and testing - <https://covid19.healthdata.org/germany?view=infections-testing&tab=trend&test=infections>



## 7.8.2 Hospital Cases

### Insight into Hospital capacity: Forecast: Visual Examples

Figure 128. Hospital Impact Model for Epidemic - <https://penn-chime.phl.io/>

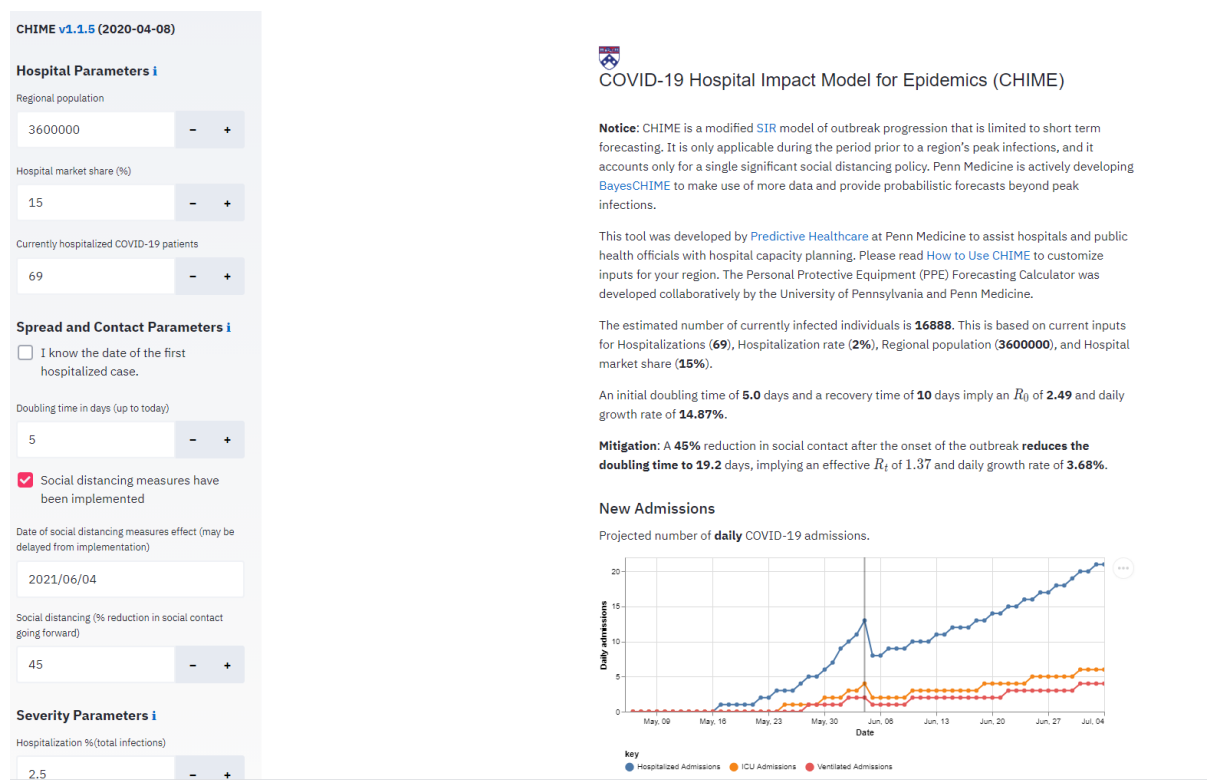


Figure 129. Interactive Model for Hospitals - [Interactive model \(hmpi.org\)](http://Interactive%20model%20(hmpi.org))