



Software Requirements Specification for the Surveillance Dashboard

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1 INTRODUCTION

1.1 Purpose

The purpose of this document is to serve as a guide to designers, developers and testers who are responsible for the engineering of the Surveillance Dashboard. It should give the engineers all of the information necessary to design, develop and test the software.

1.2 Scope

This document contains a complete description of the functionality of the Surveillance Dashboard. It consists of use cases, functional requirements and non-functional requirements, which, taken together form a complete description of the software.

1.3 Definitions, Acronyms and Abbreviations

Term	Definition
Disease/health topic/subject	A disease, or more general also related health topics such as antimicrobial consumption. For these software requirements, only diseases are considered, but the principle is the same for the more general health topics.
Dataset	A collection of data for one or more Diseases, including raw data, cleaned data, validation data and Result (Indicators and Distributions) data. Datasets are versioned in the Workbench, but for these software requirements each version is to be considered as a separate Dataset. E.g. 'Zoonoses2013.1' would be the name of a Dataset that contains data for all zoonoses, version 1 of the 2013 data extraction (i.e. including data for all years up to 2013).
Subpopulation	A subset (including the full set) of all cases, e.g. 'All cases' or 'All fatal cases'.
Result	One or more value(s) derived from the data for a particular Subpopulation, and for each geographic region / time period combination. It also has additional metadata on how to display the result: map representation to use, graph representation to use, defaults. Can be either an Indicator or a Distribution.
Indicator	A Result that has a single numeric or text value for each geographic region / time period combination, describing the 'person' dimension. It can be displayed both in a (time series) graph and in a map.
Distribution	A Result that has a set of values, potentially ordered, for each geographic region / time period combination, describing the 'person' dimension. As it is a set of values, it is more naturally displayed in a graph. There is a natural link between Indicators and Distributions: the Distribution is normally a further stratification/breakdown of the data that the Indicator summarises into a single value.
Resolution	The geographic and/or time resolution to which Results have been calculated. Geographic resolution is defined by geo level 0 (world), 1 (supranational), 2 (national / NUTS0), 3 (subnational 1 / NUTS1), 4 (subnational 2 / NUTS2) and 5 (subnational 3 / NUTS3). Time resolution is the time unit that is being used: year, quarter, month or week.
Indicator/Distribution Unit	The unit for the (Y-axis) values of the Time Series or the Distribution. E.g. total case, number of cases per 100000, %.

Repository	Database that contains all Result data for all Datasets.
EMMA	ECDC Map and Multilayer Application, based on ArcGIS.
Current Time Period	The time period for which data is being shown in the Dashboard, with the exception of the Time Series, which shows all time periods.
Region	A geographic region with a particular geographic resolution, i.e. geo level 0-5.
Reference Region	A Region whose data is displayed in selected components (all except the Map) in order to be able to compare with other Regions. Normally, the Reference Region is the EU/EEA (geo level 1).
Last Selected Region	The Region last selected on the Map or the Indicator Table.

Table 1: Definitions

1.4 References

1.4.1 Applicable documents

The applicable documents are inputs to the SRS. Any change to an applicable document is likely to impact the SRS.

Ref	Reference	Title	Release
[A1]	Dashboard tender specifications Annex XI — Software architecture and technology	Dashboard back-end interface specifications	N/A
...			

Table 2: Applicable documents

1.4.2 Applicable standards

Ref	Reference	Title	Release
[S1]	https://developers.arcgis.com/en/javascript/jshelp/inside-guidelines.html	ESRI developer guidelines for ArcGIS API for JavaScript	
[S2]	http://www.codeproject.com/Articles/580165/JavaScript-Best-Practices	CodeProject JavaScript Best Practices	
[S3]	http://msdn.microsoft.com/en-us/library/vstudio/f926074.aspx	MSDN C# Coding Conventions	
[S4]	http://msdn.microsoft.com/en-us/library/vstudio/8	MSDN Secure Coding Guidelines	

	a3x2b7f.aspx		
[S5]			

Table 3: Applicable standards

1.4.3 Reference documents

The reference documents are of interest to the reader of the SRS.

Ref	Reference	Title	Release
[R1]		ECDC Surveillance Communication Strategy of 2012.	
...			

Table 4: Reference documents

2 OVERALL DESCRIPTION

This section of the SRS should describe the general factors that affect the software and its requirements. This section does not state specific requirements. Instead, it provides an overview of those requirements, which are defined in detail in Section 3 of the SRS, and makes them easier to understand.

2.1 Product perspective

The figure below gives an overview of the high level data flow between the Dashboard and other component:

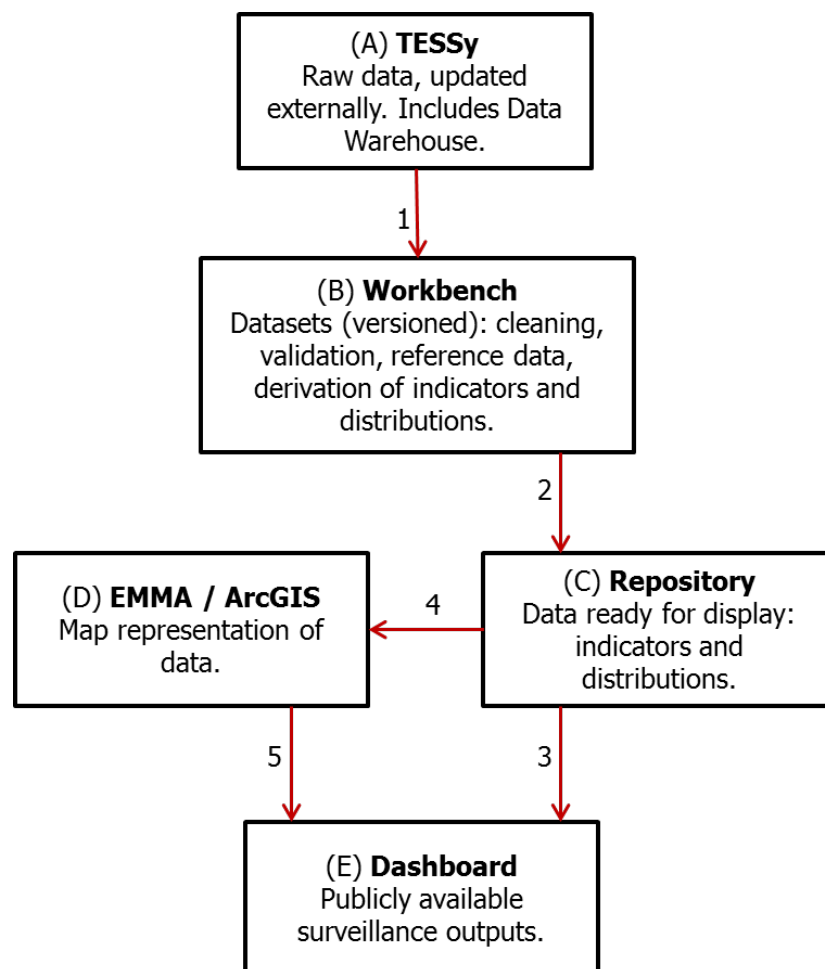


Figure 1: High level component and data flow

ID	Title	Description
A	TESSy	The European Surveillance System (TESSy) system as it exists today, containing the raw data uploaded by countries. More information can be found here: http://ecdc.europa.eu/en/activities/surveillance/TESSy/Pages/TESSy.aspx

ID	Title	Description
B	Workbench	Raw data for a particular Dataset will be extracted from TESSy at different points in time (data flow 1) to include newly provided or updated data from countries. These will all be stored, cleaned, validated and outputs (indicators, distributions) derived as part of a particular version of the Dataset.
C	Repository	The Repository will store, among others, all versions of each Dataset's outputs (Indicators and Distributions), extracted from the Workbench, to provide rapidly displayable data for the Surveillance Dashboard. The Repository will also expose a few traditional web services to communicate metadata and Distribution data to the frontend.
D	EMMA	The backend of the ECDC Map and Multilayer Application (EMMA) will publish one or more (ArcGIS 10.1) dynamic map service covering the data provided by the Repository (data flow 4), together with its own geographic Reference Data, to be consumed by the front end Dashboard. These maps will in turn be displayed on the Surveillance Dashboard.
E	Dashboard	The dashboard front end in the form of a map viewer implementation, with additional data representation in the form of a table and graphs as well as accompanying text and navigation between different outputs. Selected figures will be rendered directly from the Repository (data flow 3), whereas the table, remaining figures and maps will be queried from the EMMA backend (data flow 5).

Table 5: High level components and data flow

2.2 Product functions

The Surveillance Dashboard will provide a one page overview of the most important aspects of a particular disease that is under surveillance by ECDC, by time, person and place.

2.3 User characteristics

The Surveillance Dashboard will be made available on the ECDC public Portal. The target audience is:

- Public health experts
- Public health policy makers
- The media
- The general public

2.4 Constraints

The dashboard frontend shall be implemented using:

- .Net/C#/ASP.NET/ASPX page using HTML5 and JavaScript technologies. Technologies like Silverlight or Flex / Flash will not be considered.
- The map viewer shall use the ESRI ArcGIS API for JavaScript and be able to interact with the dynamic map service layer introduced in ArcGIS 10.1.
- Custom JavaScript code shall be implemented using either Dojo or JQuery.
- The server side code should be limited to
 - Enabling configuration of the permission level, URLs to the various backend endpoints, etc.

- Providing detailed logging of user interaction from the page (note: asynchronous updates).
- All web service communication for the metadata, map service, Distribution data etc. shall be done directly from the browser using JavaScript.

The frontend will be made available to the end user either as a standalone ASPX page, or through a SharePoint 2010 Page Viewer Web Part in the ECDC web portal, and ECDC will verify the success of both technologies as part of the final testing.

The requirements are grouped into 3 releases, and consequently must be implemented consecutively: release 1.0, 1.1 and 1.2.

2.5 Assumptions and dependencies

[This subsection of the SRS should list each of the assumed factors that affect the requirements stated in the SRS. Dependencies with other projects should also be identified. For example, an assumption may be that a specific operating system will be available on the hardware designated for the software product. If, in fact, the operating system is not available, the SRS would then have to change accordingly.]

3 SOFTWARE REQUIREMENTS

3.1 Software overview

3.1.1 Mockup Health Topics page on the ECDC Portal

The page described in Figure 2 gives an indication of the page into which the Public Dashboard will be embedded, i.e. in the 'Page content' area. At the same time, it may be embedded into other pages as well up to and including a full screen view.

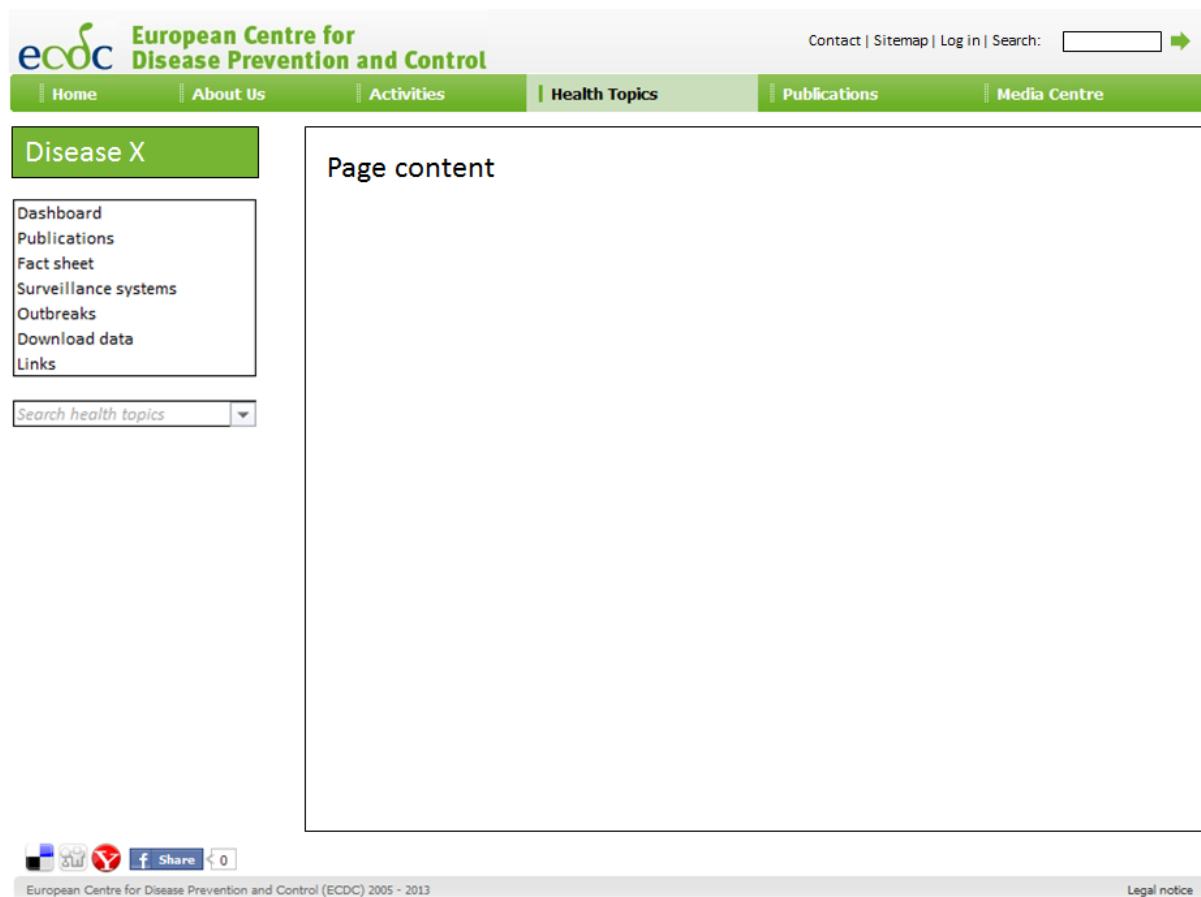


Figure 2: Mockup of the general health topic page.

3.1.2 Mockup Internal Dashboard

A mockup of the Internal Dashboard, which has the widest functionality yet closely resembles the Public Dashboard (except for a Dataset and Disease drop down menu), is given in Figure 3. The following has to be taken into account when interpreting this mockup:

- The actual data shown, and in particular in the Time Series, is not per se correct, only indicative of the functionality.
- A legend for the Map is not shown on the picture, except for a toggle box to show/not show it, but has to be added as well. This is described further in the requirements.

The mockup in Figure 3 is indicative of the desired user interface, satisfying the described requirements at least up to release 1.1. Proposals to improve the user interface are invited.

To give an idea of the range of possibilities for proposals on improvement, and also given the risk that the user interface may become too crowded especially with respect to the Distribution and the Indicator Table, an alternative mockup is given in Figure 4. It differs at some points from the requirements described below, e.g. Indicator Table only visible as popup, only a single Export and Full screen button (with a submenu), but which can nonetheless also be considered to fit with the requirements.

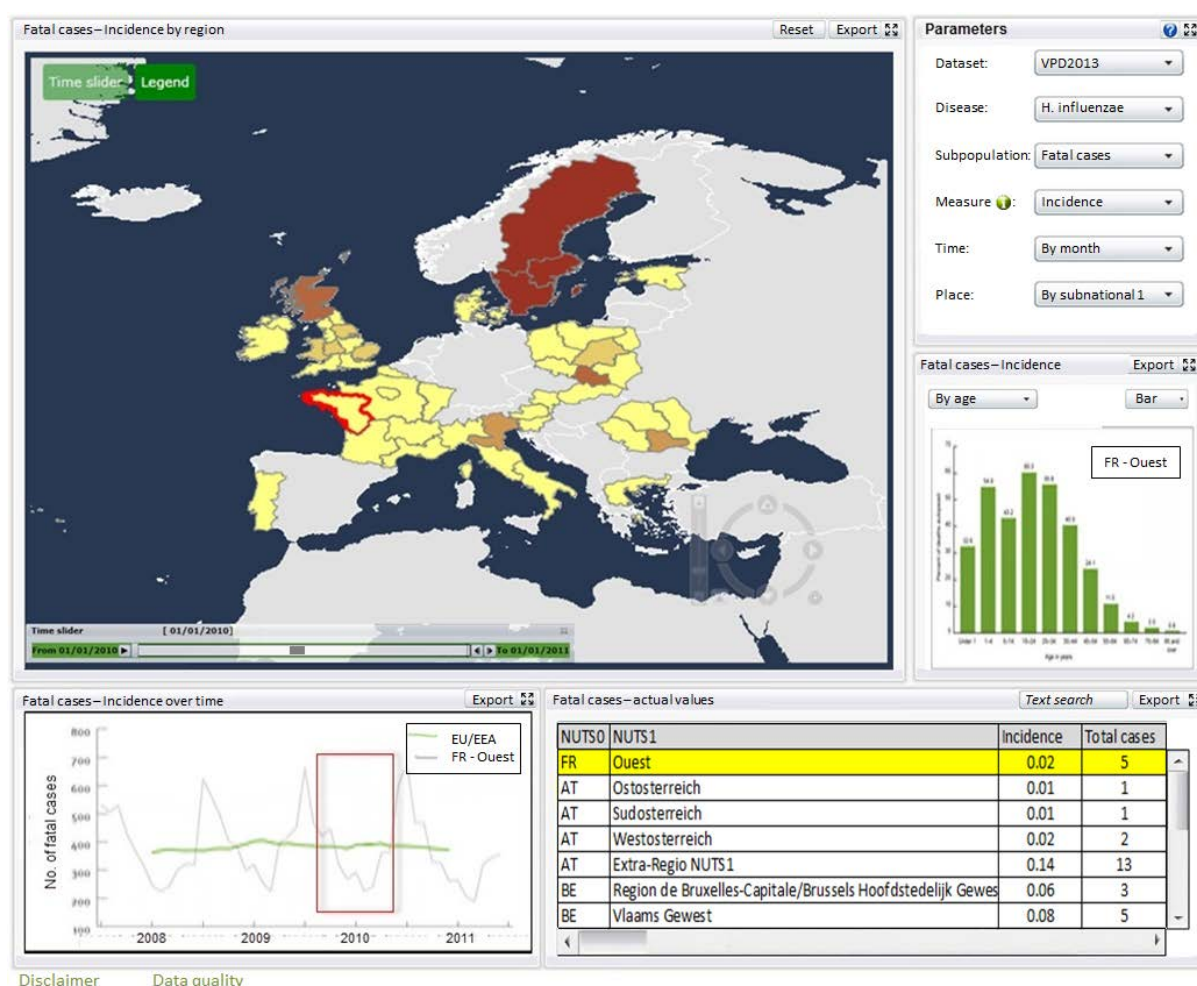


Figure 3: Mock up of the Internal Dashboard.

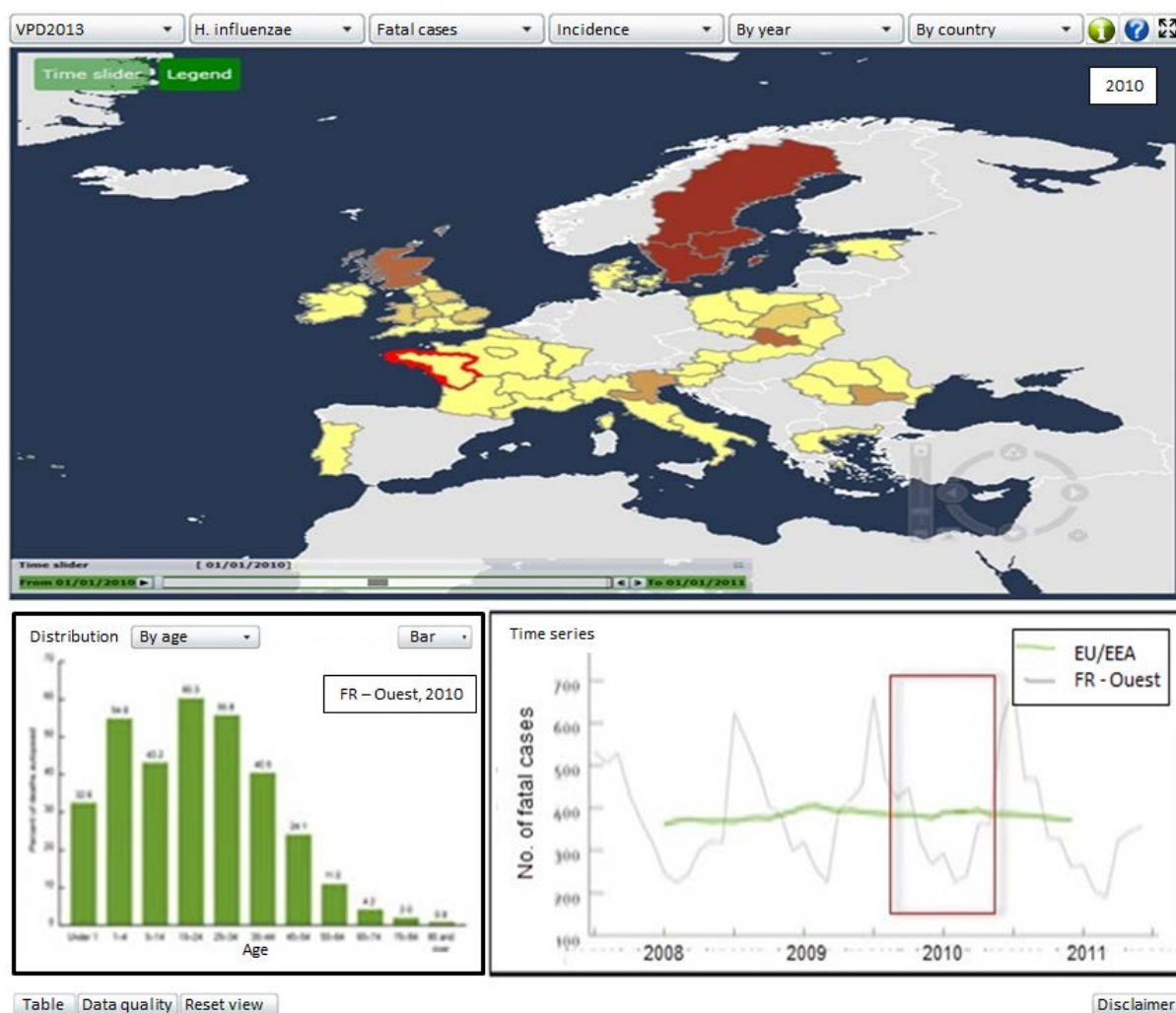


Figure 4: Alternative mockup of the Internal Dashboard.

3.1.3 Use case overview

An overview of the Use Cases is given in Figure 5. They have to be implemented in the releases as indicated in Table 6.

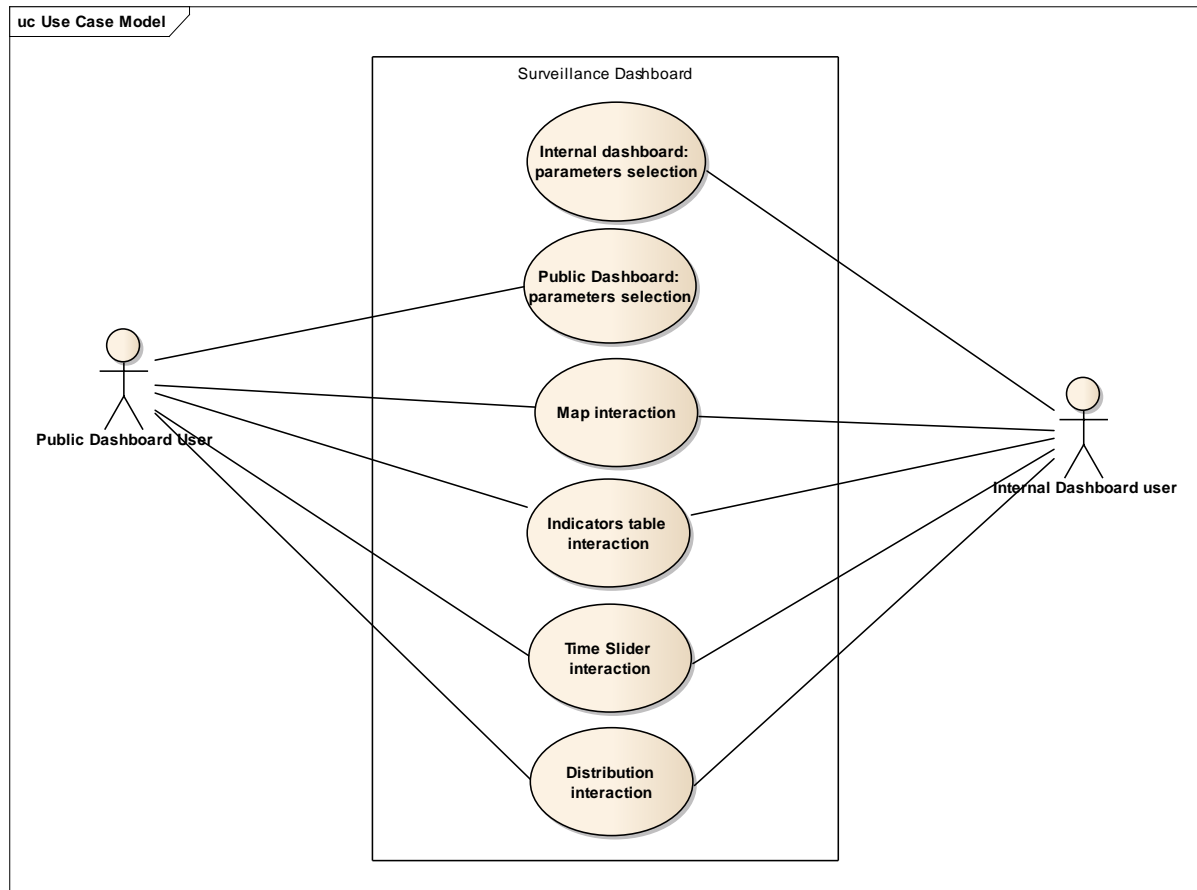


Figure 5: Dashboard Use cases diagram

Use case	Release
UC-1 Internal Dashboard: parameters selection	1.0
UC-2 Public Dashboard: parameters selection	1.0
UC-3 Map interaction	1.0
UC-4 Time Slider interaction	1.0
UC-5 Distribution interaction	1.1
UC-6 Indicator Table interaction	1.1

Table 6: Release management for use cases

3.2 Actors

Actor Details		
Actor ID		ICON
Actor Name	Public Dashboard user	
Brief Description	Member of the general public that access the Public Dashboard via the ECDC Portal	
Category		
Responsibilities	The Public Dashboard user will access the public Surveillance Dashboard to view the cleaned and approved Surveillance data.	
Parent Actors		
Child Actors		

Table 7: Public Dashboard user

Actor Details		
Actor ID		ICON
Actor Name	Internal Dashboard user	
Brief Description	Person in ECDC or in the Member States that can access different data sets, both approval and no approved, via the internal Dashboard	
Category		
Responsibilities	The Internal Dashboard user responsibilities are: <ul style="list-style-type: none">• Approval of a Dataset by ECDC experts.• Approval of Datasets by Member States expert before publication.• Consultation of Datasets which are not available on the Portal.	
Parent Actors		
Child Actors		

Table 8: Internal Dashboard user

3.3 Use cases

3.3.1 Internal dashboard: parameters selection

Use Case Specification		
Use Case ID	UC-1	
Use Case Name	Internal dashboard: parameters selection	
Purpose	The user navigates to the Dashboard and selects the basic parameters required to display the surveillance data.	
Primary Actor(s)	Internal Dashboard user	
Precondition(s)		
Postcondition(s)		
Trigger(s)	User navigates to the URL of the internal dashboard	
Associated Use Case(s)		
Associated Requirements		
Primary Workflow: name of primary workflow		
Step 1	User navigates to the URL of the internal dashboard	
Step 2	<p>System performs the following <u>underlined actions</u>:</p> <ul style="list-style-type: none">Parameters<ul style="list-style-type: none">A. Dataset:<ul style="list-style-type: none"><u>Populates drop-down list</u>: all available Datasets.<u>Sets value</u>: default Dataset.B. Disease:<ul style="list-style-type: none"><u>Populates drop-down list</u>: all Diseases available for the Dataset.<u>Sets value</u>: the default Disease for the selected Dataset.C. Subpopulation:<ul style="list-style-type: none"><u>Populates drop-down list</u>: all available Subpopulations for the selected Disease.<u>Sets value</u>: default Subpopulation for the selected Disease.D. Indicator:<ul style="list-style-type: none"><u>Populates drop-down list</u>: all available Indicators for the selected Disease and Subpopulation.<u>Sets value</u>: default Indicator for the selected Disease and Subpopulation.E. Resolution:<ul style="list-style-type: none"><u>Populates drop-down lists</u>: available geographic and time Resolutions for the selected Indicator.<u>Sets values</u>: default geographic and time Resolution for the selected Indicator. The default geographic Resolution is the geo level 2 (NUTS0). The default time Resolution is the largest available time unit among all available Resolutions (normally Year).F. Current Time Period:<ul style="list-style-type: none"><u>Sets value</u>: the default Current Time Period, which is the latest Time Period available for the Indicator and the Resolution.	

G. Distribution:

- Populates drop-down list: available Distributions for the selected Indicator.
- Sets value: default Distribution for the selected Indicator.

H. Distribution Graph Type:

- Populates drop-down list: available Distribution Graph Types for the selected Distribution.
- Sets value: default Distribution Graph Type for the selected Distribution.

- Displays:

A. Map

- Base map layer rendered.
- Map layer rendered for all available Regions of the geographic Resolution for the Indicator and Current Time Period, using the rendering parameters for that Indicator.
- Legend rendered with Indicator unit and classes.
- Title added: '*Subpopulation – Indicator by region*'.

B. Distribution

- Only if available for the selected Indicator and Resolution, otherwise displays text "Distribution not available".
- Distribution rendered for the Reference Region (normally 'EU/EEA') according to Distribution Graph Type.
- Distribution Unit set.
- Title added: '*Subpopulation – Indicator*'.

C. Time Series

- Line plotted for the Reference Region for all Time Periods of the Time Slider's extent.
- Legend added for all plotted lines.
- Indicator, and Indicator Unit for Y-Axis Label set according to parameters for that Indicator.
- Y-Axis Extent set. There is a fixed min and/or max value defined per Indicator. If not defined, the min and max values of all series to be shown are used.
- Current Time Period indicated by a transparent rectangle covering the entire Y-Axis range and the corresponding Time Period on the X-Axis.
- Title added: '*Subpopulation – Indicator over time*'.

D. Time Slider

- Extent of the slider set from the Start Time Period to the End Time Period.
- Intervals of the slider from to all time periods between and including the Start and End Time Periods.
- Slider position set to the Current Time Period.

E. Indicator Table

- All Available Regions as rows.
- All Indicators for the Subpopulation as columns.

	<ul style="list-style-type: none"> ▪ Values for the Current Time Period. ▪ Title added: '<i>Subpopulation</i>'.
Step 3	User selects a different Dataset.
Step 4	<p>System repeats step 2 for the selected:</p> <ul style="list-style-type: none"> • Dataset <p>Difference with step 2: All the dependent parameters selections remain the same if they are available also for the newly selected Dataset. If not, the corresponding parameters default values are selected.</p>
Step 5	User selects a different Disease.
Step 6	<p>System repeats step 2 for the selected:</p> <ul style="list-style-type: none"> • Dataset • Disease <p>Difference with step 2: All the dependent parameters selections remain the same if they are available also for the newly selected Disease. If not, the corresponding parameters default values are selected.</p>
Step 7	User selects a different Subpopulation
Step 8	<p>System repeats step 2 for the selected:</p> <ul style="list-style-type: none"> • Dataset • Disease • Subpopulation <p>Difference with step 2: All the dependent parameters selections remain the same if they are available also for the newly selected Subpopulation. If not, the corresponding parameters default values are selected.</p>
Step 9	User selects a different Indicator
Step 10	<p>System repeats step 2 for the selected:</p> <ul style="list-style-type: none"> • Dataset • Disease • Subpopulation • Indicator <p>Difference with step 2: All the dependent parameters selections remain the same if they are available also for the newly selected Indicator. If not, the corresponding parameters default values are selected.</p>
Step 11	User selects a different geographic Resolution.
Step 12	<p>System repeats step 2 for the selected:</p> <ul style="list-style-type: none"> • Dataset • Disease • Subpopulation • Indicator • Distribution • Geographic Resolution. <p>Difference with step 2: All the dependent parameters selections remain the same if they are available also for the geographic Resolution. If not, the corresponding parameters default values are selected.</p>
Step 13	User selects a different time Resolution.
Step 14	<p>System repeats step 2 for the selected:</p> <ul style="list-style-type: none"> • Dataset • Disease • Subpopulation • Indicator

	<ul style="list-style-type: none"> • Distribution • Time Resolution.
--	--

Table 9: UC-1 Internal Dashboard: parameters selection

3.3.2 Public dashboard: parameters selection

Use Case Specification	
Use Case ID	UC-2
Use Case Name	Public dashboard: parameters selection
Purpose	The user navigates to the Dashboard on the ECDC Portal and selects the basic parameters required to display the surveillance data.
Primary Actor(s)	Public dashboard user
Precondition(s)	
Postcondition(s)	
Trigger(s)	The user navigates on the ECDC Portal to the Health Topic page of a given disease.
Associated Use Case(s)	
Associated Requirements	
Primary Workflow: name of primary workflow	
Step 1	User navigates on the ECDC Portal to the Health Topic page of a given disease.
Step 2	System performs the same actions as step 2 of UC-1, except for: <ul style="list-style-type: none"> • Parameters <ul style="list-style-type: none"> A. Dataset: <ul style="list-style-type: none"> ▪ <u>Sets value:</u> default Dataset. ▪ <i>Note: the Dataset parameter is not displayed</i> B. Disease: <ul style="list-style-type: none"> ▪ <u>Sets value:</u> the Disease selected at step 1. ▪ <i>Note: Disease parameter is not displayed</i>
Step 3	User selects a different Subpopulation
Step 4	System performs the same actions as step 8 of UC-1.
Step 5	User selects a different Indicator
Step 6	System performs the same actions as step 10 of UC-1.
Step 7	User selects a different geographic Resolution.
Step 8	System performs the same actions as step 12 of UC-1.
Step 7	User selects a different time Resolution.
Step 8	System performs the same actions as step 14 of UC-1.

Table 10: UC-2 Public Dashboard: parameters selection

3.3.3 Map interaction

Use Case Specification	
Use Case ID	UC-3
Use Case Name	Map interaction
Primary Actor(s)	Public dashboard user, Internal Dashboard user

Purpose	The user interacts with the dashboard map
Precondition(s)	The dashboard is displayed (UC-1 or UC-2)
Postcondition(s)	
Trigger(s)	
Associated Use Case(s)	
Associated Requirements	
Primary Workflow	
Step 1	User hovers over Regions in the map with the mouse.
Step 2	System shows a small window with the name of the Region and the values of all its available Indicators.
Step 3	User left clicks on a Region.
Step 4	<p>System:</p> <ul style="list-style-type: none"> Highlights the border of the Region. Updates: <ul style="list-style-type: none"> Indicator Table: highlights the selected Region and sort the rows according to the sorting algorithm defined in [R-035]. Time Series Graph: plots an additional line for the selected Region. Distribution: rendered for the current Last Selected Region, i.e. the one just clicked, only.
Step 5	User left clicks the Region again to either unselect it (in case it is the only selected Region) or make it the only selected Region (in case there were already other selected Regions)
Step 6	<p>System, in case the Region was the only selected Region:</p> <ul style="list-style-type: none"> Un-highlights the border of the unselected Region. Updates: <ul style="list-style-type: none"> Indicator Table: unhighlights the selected Region and sort the rows according to the sorting algorithm defined in [R-035]. Time Series Graph: removes the additional line for the unselected Region. Distribution: rendered for the previous Last Selected Region or if none, the Reference Region <p>System, in case there were already other selected Regions:</p> <ul style="list-style-type: none"> Repeat actions above for unselecting each selected Region. Select the clicked on Region by performing the same actions as in Step 4.
Step 7	<p>User shift-left clicks on up to 5 different not selected Regions in sequence to select them.</p> <p>At most 5 Regions can be selected. If the 6th Region is clicked on, a warning is displayed that another Region has to be unselected first.</p>
Step 8	<p>System repeats step 6 for each selected Region.</p> <ul style="list-style-type: none"> Indicator Table: highlights the selected Regions and sort the rows according to the sorting algorithm defined in [R-035]. Time Series Graph: plots additional lines for the selected Regions. Distribution: Only the last selected Region is rendered in the Distribution.

Step 9	User shift-left clicks on an already selected Region to unselect it.
Step 10	System: performs the same actions as in Step 6 for unselecting the Region.
Alternative Scenario through Indicator table	
Step A3	User left clicks on a row of the Indicator Table. Same actions as Step 3.
Step A5	User left clicks a selected row of Indicator Table to either unselect it (in case it is the only selected Region) or make it the only selected Region (in case there were already other selected Regions). Same actions as Step 5.
Step A7	User shift-left clicks on up to 5 different not selected rows of the Indicator Table in sequence to select them. Same actions as Step 7.
Step A9	User shift-left clicks on an already selected row of the Indicator Table to unselect it. Same actions as Step 9.

Table 11: UC-3 Map interaction

3.3.4 Time Slider interaction

Use Case Specification		
Use Case ID	UC-4	
Use Case Name	Time Slider interaction	
Primary Actor(s)	Public dashboard user, Internal Dashboard user	
Purpose	The user interacts with the Time Slider of the Map	
Precondition(s)	The dashboard is displayed (UC-1 or UC-2)	
Postcondition(s)		
Trigger(s)	User starts to use the Time Slider	
Associated Use Case(s)		
Associated Requirements		
Primary Workflow: name of primary workflow		
Step 1	User hovers over a time period in the Time Slider with the mouse.	
Step 2	System displays the ISO 8601 partial date of the time period.	
Step 3	User selects a different time period on the Time Slider	
Step 4	System updates all the components with the data for the new Current Time Period (Map, Time Series, Distribution, Indicator Table). <ul style="list-style-type: none">Time Series: The rectangle of the Current Time Period moves along the X axis. The X axis extent remains unchanged with the change of Current Time Period.	
Step 7	User goes through multiple time periods via 2 options: <ol style="list-style-type: none">A slider, orA play/pause functionality from the Current Time Period until latest time period, with an interval of 1.5 seconds.	
Step 8	For each time period, the system updates all the components with the data for the new time period (Map, Time Series, Distribution, Indicator Table). If a new period is selected faster than the data for it can be rendered by all components, then <ol style="list-style-type: none">If this is during usage of the play functionality: complete the	

	rendering for each 'frame'. In effect, the 1.5 seconds then becomes the minimum time between frames.
	2. If this is during manual sliding of the time slider: stop the rendering for a meanwhile no longer selected time period as soon as possible and proceed to rendering the newly selected Current Time Period.

Table 12: UC-4 Time Slider interaction

3.3.5 Distribution interaction

Use Case Specification		
Use Case ID	UC-5	
Use Case Name	Distribution interaction	
Primary Actor(s)	Public dashboard user, Internal Dashboard user	
Purpose	The user interacts with the Distribution component	
Precondition(s)	The dashboard is displayed (UC-1 or UC-2)	
Postcondition(s)		
Trigger(s)	User starts to use the Distribution	
Associated Use Case(s)		
Associated Requirements		
Primary Workflow: name of primary workflow		
Step 1	User selects a different Distribution	
Step 2	System: <ul style="list-style-type: none">Populates the drop-down list of available Distribution Graph Types for the selected Distribution.Sets the default value for the Distribution Graph Type of the selected Distribution.Set the Distribution Unit.Renders the distribution for the Last Selected Region or if none the Reference Region according to Distribution Graph Type. Only if available for the selected Indicator and Resolution, otherwise displays text "Distribution not available".	
Step 3	User selects a different Distribution Graph Type	
Step 4	Systems: <ul style="list-style-type: none">Set the Distribution Unit.Renders the distribution for the Last Selected Region or if none the Reference Region according to Distribution Graph Type. Only done if a Distribution is available for the selected Indicator and geographic and time Resolution, otherwise displays text "Distribution not available".	

Table 13: UC-5 Distribution interaction

3.3.6 Indicator Table interaction

Use Case Specification		
Use Case ID	UC-6	
Use Case Name	Indicator Table interaction	
Primary Actor(s)	Public dashboard user, Internal Dashboard user	

Purpose	The user interacts with the Indicator Table
Precondition(s)	The dashboard is displayed (UC-1 or UC-2)
Postcondition(s)	
Trigger(s)	User starts to use the Indicator Table
Associated Use Case(s)	
Associated Requirements	
Primary Workflow: name of primary workflow	
Step 1	User enters the name of a Region in a box for autocompleted text search to quickly locate it.
Step 2	System <ul style="list-style-type: none"> Performs the search on both the region name and code (e.g. NUTS code). When a single match is found, the visible regular rows in the table are adjusted to show the corresponding row. If no or more than 1 match is found, a corresponding warning message is shown.
Step 3	User left clicks on a row of the Indicator Table. Same actions as Step 3 of Map interaction.
Step 4	User left clicks a selected row of Indicator Table to either unselect it (in case it is the only selected Region) or make it the only selected Region (in case there were already other selected Regions). Same actions as Step 5 of Map interaction.
Step 5	User shift-left clicks on up to 5 different not selected rows of the Indicator Table in sequence to select them. Same actions as Step 7 of Map interaction.
Step 6	User shift-left clicks on an already selected row of the Indicator Table to unselect it. Same actions as Step 9 of Map interaction.

Table 14: UC-5 Indicator Table interaction

3.4 Supplementary requirements

3.4.1 Functional requirements

3.4.1.1.1 General

Table 15: Functional requirements – General.

ID	Requirement	Release
R-001	Map: EU/EEA and acceding countries use the NUTS classification, other countries use another applicable classification.	1.0
R-002	The Dashboard must be displayable by calling it through an URL (including parameters). The user should be able to easily generate the URL.	1.1
R-003	A reset button should be available that shows the map for the selected Indicator but using all the defaults for the rest and no selected regions.	1.1
R-004	It must be possible to export the data from the Dashboard: <ul style="list-style-type: none"> Map: bitmap image. Select format, image resolution. 	1.1

	<ul style="list-style-type: none"> Time Series and Distribution: bitmap image. Select format, image resolution. Distribution: CSV and Excel format. Indicator Table: CSV and Excel format. <p>Any media exports such as figures, slides and videos, must have the ECDC logo embedded into them.</p>	
R-005	<p>It must be possible to export the data from the Dashboard:</p> <ul style="list-style-type: none"> Map: vector image. Select format, image resolution. Time Series and Distribution: vector image. Select format, image resolution. Map. Select specific adjustments such as show invisible countries. Map. Video of the Map over time. Select format, video resolution, speed, start and end time period. Distribution and Indicator Table. Select time periods, from all available ones, to export the data for, instead of only the current one. An additional column with the time period must then be added. <p>Any media exports such as figures, slides and videos, must have the ECDC logo embedded into them.</p>	1.2
R-006	The Dashboard must show in a separate page or popup, through a 'More information' icon/link, a text description of each Indicator and Distribution, retrieved dynamically from the back end.	1.1
R-007	<p>The Dashboard must make available a link to a page, changed dynamically depending on the Disease, that contains the description of the surveillance systems as well as quality indicators for that Disease in all countries.</p> <p>The content of this page is out of scope.</p>	1.1
R-008	It must be possible to have a full screen view of the Dashboard as a whole, and of the Map, Time Series, Distribution and Indicator Table separately as well. The interaction between the components must remain the same in such full screen view.	1.1
R-009	<p>The Dashboard must make available a link to a page that contains a disclaimer for the use of the system, including:</p> <ul style="list-style-type: none"> ECDC liability and on the quality and reliability of the data. Publication of the data by users. <p>The content of this page is out of scope.</p>	1.1
R-010	The Dashboard must be able to itself generate and show a page with a table description of the surveillance systems and quality indicators, generated from data retrieved from the back end. This is in replacement of R-006 where there is simply a link to a separate page outside of the application.	1.2
R-011	It must be possible to have hierarchical drop down menus, e.g. for the choice of Indicator, with the description of the hierarchy provided by metadata retrieved from the back end.	1.2
R-012	It must be possible to relocate drop down menus to any other sub component (e.g. Map, Time Series...) in order to accommodate e.g. additional 'look and feels' (see R-054) or improvements in usability.	1.2

3.4.1.1.2 Map

Table 16: Functional requirements – Map.

ID	Requirement	Release
R-016	The Map must be able to display both quantitative (numeric) and qualitative (text label with a corresponding number, e.g. Low/Medium/High and 1/2/3) Indicator data, and both polygon and symbol geometries.	1.0
R-017	The map can be zoomed in and out through a zoom control, data can be panned in the map by dragging the display in any direction with the mouse or using the pan	1.0

	tool.	
R-018	The map should be able to show some regions in lower geographic Resolution than the chosen geographic Resolution, in order to be able to still display useful, but lower resolution data. E.g. the chosen geographic Resolution is geo level 3 (NUTS1), whereas for Austria only geo level 2 (NUTS0) data is available. In this case, Austria as a whole is shown. The back end can be expected to provide the correct geometry data for such cases.	1.2
R-019	The map should be able to show, in addition to Indicators, also a specific category of a Distribution (e.g. Age 0-5). The data for this is to be retrieved from the back end similarly to the Indicator data. See also R-010: the user would select this view from a hierarchical drop down menu.	1.2

3.4.1.1.3 Time Slider

Table 17: Functional requirements – Time Slider.

ID	Requirement	Release
R-021	The earliest, latest and Current Time Period are indicated.	1.0
R-022	It should be possible to move the time slider in different components, e.g. the Map or the Time Series Graph.	1.1
R-023	The slider range can be adjusted by choosing the start and end time period within the earliest and latest available limits.	1.2

3.4.1.1.4 Indicator Table

Table 18: Functional requirements – Indicator Table.

ID	Requirement	Release
R-031	<p>The columns of the table are, in order:</p> <ol style="list-style-type: none"> The description of the Region, in up to 4 columns depending on the geographic Resolution: <ol style="list-style-type: none"> The ISO 2-letter code of the country (geo level 2 / NUTS0¹). If geo level > 2, the geo level 3 (NUTS1) label of the Region. If geo level > 3, the geo level 4 (NUTS2) label of the Region. If geo level > 4, the geo level 5 (NUTS3) label of the Region. All the Indicators available for the Disease and Subpopulation, with their sort order stored per Disease and Subpopulation. 	1.1
R-032	<p>Rows are sorted hierarchically:</p> <ol style="list-style-type: none"> Selection order, descending: selected Regions are sorted first; by descending order of selection. Not selected regions are not sorted further by this column (but are by the next one). Alphabetical order by code of the Region. 	1.1
R-033	Possibility to sort by any column selected by the user (ascending and descending). If sorted on a numerical column, empty values are sorted at the bottom. The sort must be a stable sort maintaining the same order as before sorting for rows that have the	1.1

¹ NUTS only applicable for EU/EEA regions. The general classification is ECDC Geo Level: 0 (World), 1 (supra-national eg EU/EEA), 2 (country /NUTS0 eg Germany), 3 subnational1 (NUTS1 eg Bavaria), 4 subnational2 (NUTS2 eg xxx), 5 subnational3 (NUTS3 eg xxx).

	same value to sort on, and hierarchical first on selection order descending so that selected rows remain on top (see R-032 point 1).	
R-034	Rows can be scrolled by a vertical scroll bar. The table header must remain frozen.	1.1
R-035	Columns can be scrolled by a horizontal scroll bar but with the first column(s) for the Region description remaining frozen.	1.1
R-036	A mixture of different geographic Resolutions can be shown in the table, e.g. if geo level 4 (NUTS2) is the selection geographic Resolution, then level 3 (NUTS1) and level 2 (NUTS0) rows are also shown in the table and sorted just above their subregions. These additional rows also have their data retrieved from the back end.	1.2

3.4.1.1.5 Distribution

Table 19: Functional requirements – Distribution.

ID	Requirement	Release
R-041	The system must support the following Distribution graph types: horizontal bar, vertical bar, stacked bar, line, pie chart.	1.1
R-042	Further customization of the graph must be possible, including colour schemes, markers, legend and grouping of bars (e.g. when displaying more than 1 data series). It should be possible to catch click events on the graph that allow to access the X and Y value if the click occurred in the graph area. Optionally, for line graphs, it should be possible to define a coloured area between 2 lines (e.g. between a minimum and a maximum line).	1.2

3.4.1.1.6 Time Series

Table 20: Functional requirements – Time Series.

ID	Requirement	Release
R-046	Further customization of the graph must be possible, including colour schemes, markers and legend. It should be possible to catch click events on the graph that allow to access the X and Y value if the click occurred in the graph area.	1.2
R-047	It must be possible to toggle between displaying the time series Indicator (Reference Region and Selected Regions), and the time series for the Distribution (Reference Region only, a line for each category e.g. 'Age 0-4', 'Age 5-14' ...).	1.2

3.4.2 Non-functional requirements

3.4.2.1 General

Table 21: Non functional requirements – General.

ID	Requirement	Release
R-051	Supported browsers: Internet Explorer 9 or later, Firefox 4 or later, Chrome 20 or later, Safari 5 or later.	1.0
R-052	Supported Device:	1.0

	<ul style="list-style-type: none"> PC Tablet 	
R-053	Responsive web design (RWD) has to be used. E.g., the view has to auto-scale and/or adjust the layout of the components depending on the resolution of the screen.	1.2
R-054	<p>The same implementation must be used for the different 'look and feel' of the dashboard. The difference must be managed by configuration:</p> <ol style="list-style-type: none"> Public Dashboard for embedding: Map, Time Series Graph, Distribution Graph and Indicator Table are shown. Disease and Dataset are not selectable. Public Dashboard for full screen: Map, Time Series Graph, Distribution Graph and Indicator Table are shown. Dataset is not selectable. Internal Dashboard: Map, Time Series Graph, Distribution Graph, and Indicator Table are shown. All parameters can be chosen. <p>UI elements corresponding to fixed parameters are not shown.</p>	1.1
R-055	<p>The same implementation must be used for the different 'look and feel' of the dashboard. The difference must be managed by configuration:</p> <ol style="list-style-type: none"> Report Interactive Figure type 1: Map and Time Series only are shown. Indicator, Subpopulation, Disease and Dataset are not selectable. Report Interactive Figure type 2: Map and Indicator Table only are shown. Disease and Dataset are not selectable. Report Interactive Figure type 3: Map and Time Series only are shown. Indicator, Subpopulation, Disease and Dataset are not selectable. The years of the Time Series are superimposed and selection of a region does not affect the Time Series such that only the standard Reference Region value is shown. <p>UI elements corresponding to fixed parameters are not shown.</p>	1.2
R-056	The design should take into account the possibility to show more than 1 Indicator on the Map using another representation (chloropleth, symbol, striping, border thickness) of choice.	1.0
R-057	When returning to a new session in the Dashboard, the user should see the same view as the last view from the previous session.	1.2

3.4.2.2 Usability requirements

3.4.2.3 Performance requirements

Table 22: Non functional requirements – Performance.

ID	Requirement			Release
R-061	Average response time is to be measured with 1 concurrent user, and maximum response time with 100 concurrent users.			1.1
	Action	Average response time (s)	Maximum response time (s)	
	Initial load of the component	3	10	
	Change of space unit	2.5	10	
	Change of time unit	1	3	
	Change of Indicator	1	3	

	Change of Distribution	1	3	
	Select region	1	3	
Prefetching/caching of data can be implemented. The data to be prefetched/cached can be expected to remain unchanged on the server for the duration of the session.				

3.4.2.4 Security requirements

Table 23: Non functional requirements – Security.

ID	Requirement	Release
R-071	<p>The system must log the following information:</p> <ul style="list-style-type: none"> The time spent by an individual user looking at a particular combination of Dataset, Disease, Subpopulation, Indicator, Distribution and Resolution. The country of origin of a user. The browser used. 	1.2

4 APPENDIXES

4.1 Logical data model

The logical data model upon which the back end will rely is given in Figure 6 and further described in Table 24. The most relevant tables and fields are shown.

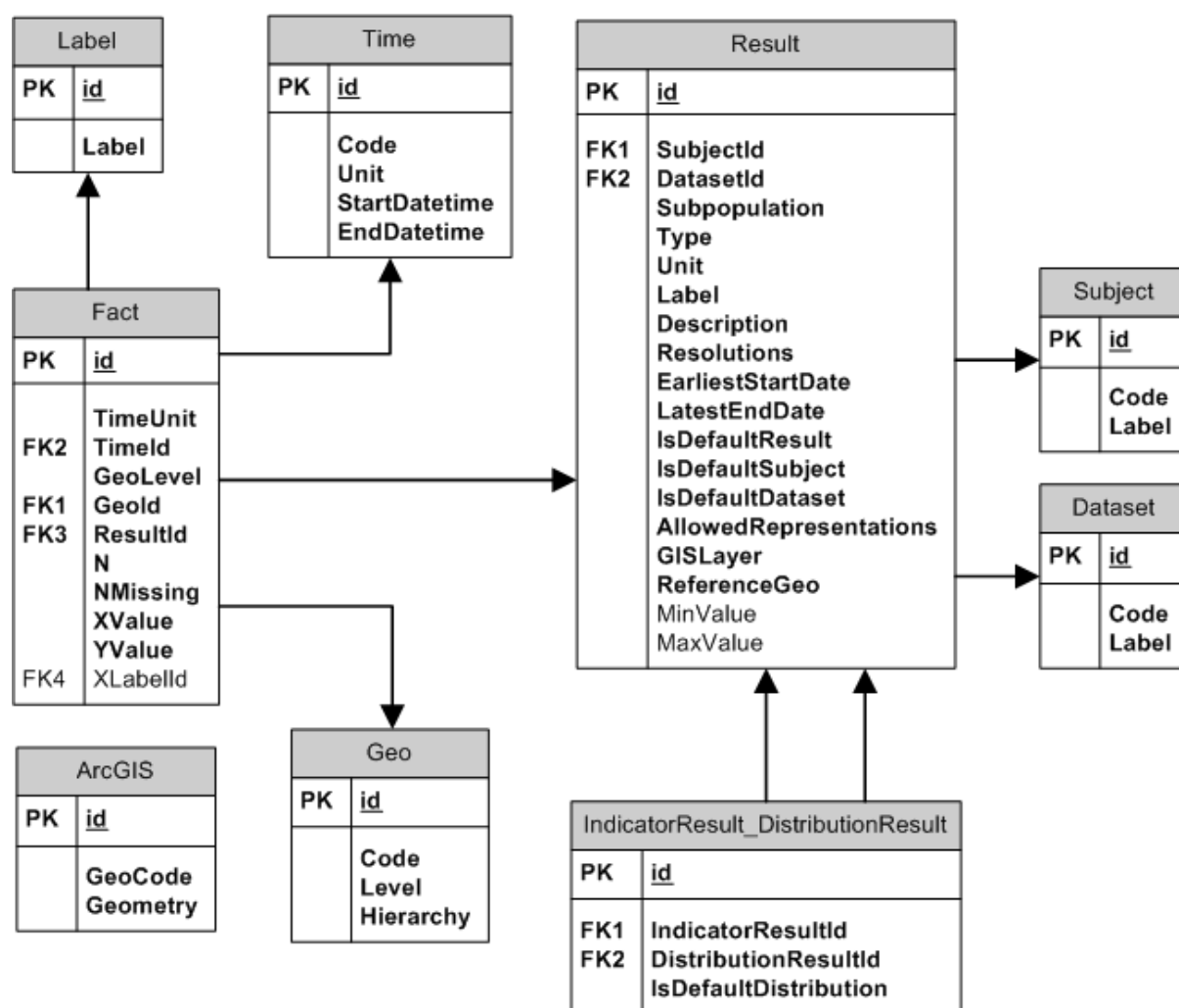


Figure 6: Logical data model.

Table 24: Description of logical data model.

Table name	Description
Time	Time periods in all relevant time Resolutions, for the period 1900-2050.
Geo	All geographic regions in all relevant geographic Resolutions, including names and hierarchy but not geometry.
Subject	Subjects. Equal to Disease in most cases.

Dataset	Datasets.
Result	Results, i.e. a particular indicator or distribution for a particular Dataset and Disease, including all information required to represent the data linked to it in a map or graph.
ResultIndicator_ResultDistribution	Link between indicator results and distribution results, defining which distributions are linked to an indicator.
Fact	<p>Individual values for each relevant combination of Time, Geo and Result:</p> <ul style="list-style-type: none"> - Numeric indicator: XValue = 1, XLabelId is NULL and YValue = actual value (e.g. 50, with % as the unit defined by the Result table). - Distribution: XValue = X-axis / order value (e.g. 1), XLabelId is foreign key to Label table containing the X-axis label (e.g. 'Male'), YValue = Y-axis value (e.g. 50, with % as the unit defined by the Result table). - Qualitative indicator: XValue = 1, XLabel = is foreign key to Label table containing the qualitative value (e.g. 'LOW', 'MEDIUM' or 'HIGH'), YValue = numeric value corresponding to XLabel (e.g. 1, 2 or 3).
Label	A collection of text labels.
ArcGISGeometry	ArcGIS geometry data.