



CARE

Common Approach for REFugees
and other migrants' health

EVALUATION REPORT OF THE CARE SYNDROMIC SURVEILLANCE PILOT

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The CARE syndromic surveillance system was developed taking into account the situation in CARE participating countries. The evaluation described in this report follows the indications contained in the CARE project Syndromic Surveillance online Platform and Procedures (available at <https://www.iss.it/site/RMI/SyndromicSurveillance/>).

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Executive Summary

“Syndromic surveillance” indicates surveillance that uses health-related data, usually aggregated, that precede diagnosis and therefore can signal, with a certain probability, a case or an outbreak of disease. By providing information at an earlier stage than laboratory confirmation, syndromic surveillance has the potential to inform timely actions that might reduce the impact of disease in a community.

The WP5 ISS-Italy team of the CARE project produced several tools and training materials in order to develop and piloted/simulated a Syndromic Surveillance System for migrant holding facilities among countries part of the CARE project. The team also performed activities not foreseen initially by the project including the design and implementation of a simulation exercise and the design of some basic analysis functions embedded within the CARE Syndromic Surveillance Platform.

This report describes the evaluation of the CARE Syndromic Surveillance System. This study was conducted at the end of the CARE project among those who piloted or simulated this system.

The general aim of the evaluation was to assess whether participants felt that the CARE syndromic surveillance system can rapidly detecting early signals of potential health emergencies among migrants hosted in reception centres. More specifically, the evaluation aimed to assess:

- the users' level of satisfaction with the outputs of this project activity;
- the syndromic surveillance system's Utility, Simplicity Acceptability, Flexibility attributes,
- the Feasibility of its use in migration centres, and
- whether the CARE syndromic surveillance system can facilitate the detection of infectious disease outbreaks and contribute to the early detection of public health emergencies.

Evidence collected in this evaluation study supports that the CARE project met its objective of developing and piloting/simulating a Syndromic Surveillance System that can facilitate the detection of infectious disease outbreaks and contribute to the early detection of public health emergencies in migrant holding centres.

The tools and materials produced by the CARE project for syndromic surveillance were received with high levels of user satisfaction. The opinion of users on the usefulness, simplicity, acceptability and flexibility attributes of the CARE Syndromic Surveillance System were also very good. In addition, the CARE Syndromic Surveillance System interoperability with the existing Greek surveillance system tested successfully data transfer possibilities. This finding is indicative of the fact that the surveillance protocols are very similar and that the CARE system was sufficiently flexible in terms of the syndrome definitions and denominators.

In conclusion, the CARE syndromic surveillance system was a successful proof of concept that syndromic surveillance in migrant reception/detention facilities can be implemented within an international collaborative framework. Countries, within and beyond the CARE network, could use the CARE Syndromic Surveillance System to set up national systems tailored towards their information needs and to data availability.

From an operational standpoint, further development of this surveillance instrument will depend on the opportunities of the network of promoting its use, also at wider EU/EEA level. From a more technical point of view, users suggested to strengthen the web based platform embedded analysis functions. This suggestion provides a direction for further platform development while, at the same time, pointing that the initial work, conducted by the ISS-Italy team and not initially planned in the CARE project, was appreciated.

Evaluation of the CARE Syndromic Surveillance System

1. Introduction

CARE -Common Approach for REfugees and other migrants' health project (CARE) is a European project that has received funding from the European Union's Health Programme (2014-2020), aiming to promote access to appropriate health care for migrants and refugees.

More specifically, the CARE project is developing an integrated model for migrant and refugee healthcare provision, including targeted tools, protocols and processes, and monitoring of communicable disease spread.

Among other activities, the CARE project developed and piloted/simulated with the participating countries (Italy, Greece, Malta, Croatia, Slovenia) and Portugal a syndromic surveillance system able to ensure rapid detection of disease outbreaks and potential public health emergencies occurring in hotspots or other migrant/refugee hosting facilities.

This pilot/simulation was a **preparedness exercise** to support participating countries who in the future may wish to implement this type of surveillance system in their migrant/refugee hosting facilities. The Italian Institute of Public Health - Istituto Superiore di Sanità (ISS-Italy) developed the CARE syndromic surveillance procedures and tools to guide this pilot/simulation.

1.1. Syndromic surveillance in the context of the CARE project

"Syndromic surveillance" indicates surveillance that uses health-related data, usually aggregated, that precede diagnosis and therefore can signal, with a certain probability, a case or an outbreak of disease. By providing information at an earlier stage than laboratory confirmation, syndromic surveillance has the potential to inform timely actions that might reduce the impact of disease in a community. However, since syndromic surveillance collects clinical symptom aggregations rather than confirmed diagnoses and aggregated data rather than individual data, it cannot replace national statutory notification of infectious diseases.

"The fundamental objective of syndromic surveillance is to identify illness clusters early, before diagnoses are confirmed and reported to public health agencies, and to mobilize a rapid response, thereby reducing morbidity and mortality" [1].

The rationale of implementing syndromic surveillance in migrant reception/detention facilities is that these facilities in Europe are institutional settings that typically host closed/semi-open communities. As in other institutional settings, also migrant holding facilities face specific challenges in preventing and controlling communicable disease transmission. The implementation of syndromic surveillance in migrant reception/detention facilities was recently recommended by ECDC [2].

In the framework of the CARE project, syndromic surveillance was simulated/piloted in the context of migrant reception/detention facilities in countries of Southern Europe according to the following characteristics:

1. **A pre-defined objective:** the objective for the CARE syndromic surveillance system is to enhance the early detection of outbreaks of communicable diseases or single cases of very severe conditions among migrants hosted in dedicated reception centres, which could flag potential public health emergencies.
2. **Aggregated data:** data is entered aggregated by syndrome and age group each day. This means that no personal (sensitive) information on individuals is collected.
3. **Context-adapted syndromes:** the intrinsic flexibility of the syndromic surveillance approach was exploited by designing syndromes and their definitions on the basis of the experience of Italy and Greece in setting up similar systems in migrant holding facilities.
4. **Context-adapted data analysis approaches:** the intrinsic flexibility of the syndromic surveillance approach was exploited by complementing a common data collection format with data series-specific statistical methods for the analysis of data: based on incidence or proportional morbidity. The latter were selected based on the experience of Italy and Greece in setting up similar systems in migrant holding facilities.

1.2. Structure of this report

This report describes the **evaluation of the CARE Syndromic Surveillance System** designed for migrant reception/detention facilities. This study was conducted at the end of the CARE project among those who piloted or simulated this system.

Following a general overview of the activities performed by the CARE project in relation to syndromic surveillance, the evaluation methodology used is described. Following this, the report presents the results of a survey conducted among all participants who used the platform (pilot/simulation) and the demonstrated evidence of interoperability between the CARE and Greek syndromic surveillance systems.

2. Overview of the activities performed by the CARE project in the field of syndromic surveillance

The CARE project aimed to pilot/simulate a syndromic surveillance system applicable to migrant reception/detention facilities in participating countries as a *preparedness* exercise to enable them to set it up if needed.

Therefore, as mentioned, the objective for the CARE syndromic surveillance system was pre-defined.

The objective for the CARE syndromic surveillance system is to enhance the early detection of large outbreaks of communicable diseases or single cases of very severe conditions among migrants hosted in dedicated reception/detention facilities that could flag potential public health emergencies.

As part of the **preparatory phase** (April to September 2016) of syndromic surveillance, ISS-Italy engaged in decisions and actions necessary to agree with each partner country how to conduct the surveillance and to set up the tools needed. This led to the development of the CARE syndromic surveillance online platform and written operating procedures (hereby Procedures).

Following this, the project entered a **pilot/simulation phase** (October 2016 to March 2017) to explore with participating countries the steps needed to test the procedures and tools developed during the preparatory phase and evaluate the system.

During the CARE WP5 meeting, held in June 2016 in Rome at the ISS-Italy, all CARE country participants part of this work package, decided if they would **pilot** the syndromic surveillance in existing reception/detention facilities in their countries or if they would **simulate** its use. This country-by-country assessment was based on current migration flows, prior risk assessments, data availability and the internal migration management model. In both cases, countries used the CARE syndromic surveillance system (including the web-based platform and the Procedures) developed by ISS-Italy.

- **Pilot: Italy and Greece** participated to the pilot of the surveillance system. Both countries tested the system in a real life situation identifying a surveillance officer in each of the migrant hotspots already involved in other CARE project activities (Kos, Leros, Trapani Milo and Lampedusa). Those officers systematically collected and submitted data, and health authorities at the national level analysed and reported findings. In Italy, this pilot was conducted exclusively on the platform developed by the CARE project. In Greece, the interoperability of the CARE and existing Greek system was tested. **Malta** undertook syndromic surveillance at the chest clinic, which is the place where health screening takes place for all migrants on arrival to Malta who were seeking asylum. In this case, the syndromes' list was used as a checklist by medical students with the help of cultural mediators under the supervision of chest clinic health care professionals.
- **Simulation: Slovenia, Croatia, Malta and Portugal** were unable to pilot the system mainly because migration routes had changed since the beginning of the project leading to the current absence of functioning migrant reception/detention centres hosting migrants and offering in house healthcare services. For this reason, these countries participated in a simulation exercise developed *ad hoc* by the CARE project. During this exercise, the involved experts performed data entry, data analysis and reporting using simulation data on the CARE syndromic surveillance system. Details of the simulation exercise are available in the CARE Syndromic Surveillance Simulation Exercise Report.

2.1. Development of the CARE syndromic Surveillance Procedures and Platform

The **Procedures for syndromic surveillance in migrant reception/detention facilities** were designed to assist CARE project partners working with ISS-Italy in piloting/simulating the CARE project syndromic surveillance system [3].

The procedures provide syndrome definitions and viable statistical analysis approaches, which were tested in the pilot and simulation exercise. Chapter 1 briefly introduces syndromic surveillance. Chapter 2 describes the steps in the phases of the CARE project syndromic surveillance pilot/simulation. Chapter 3 and 4 focus respectively on the syndrome definition design and on possible statistical analysis approaches based on the data available (Figure 1). The Annexes in this document include: the syndrome titles and definitions, the data entry form, the platform user guide and the reporting template.

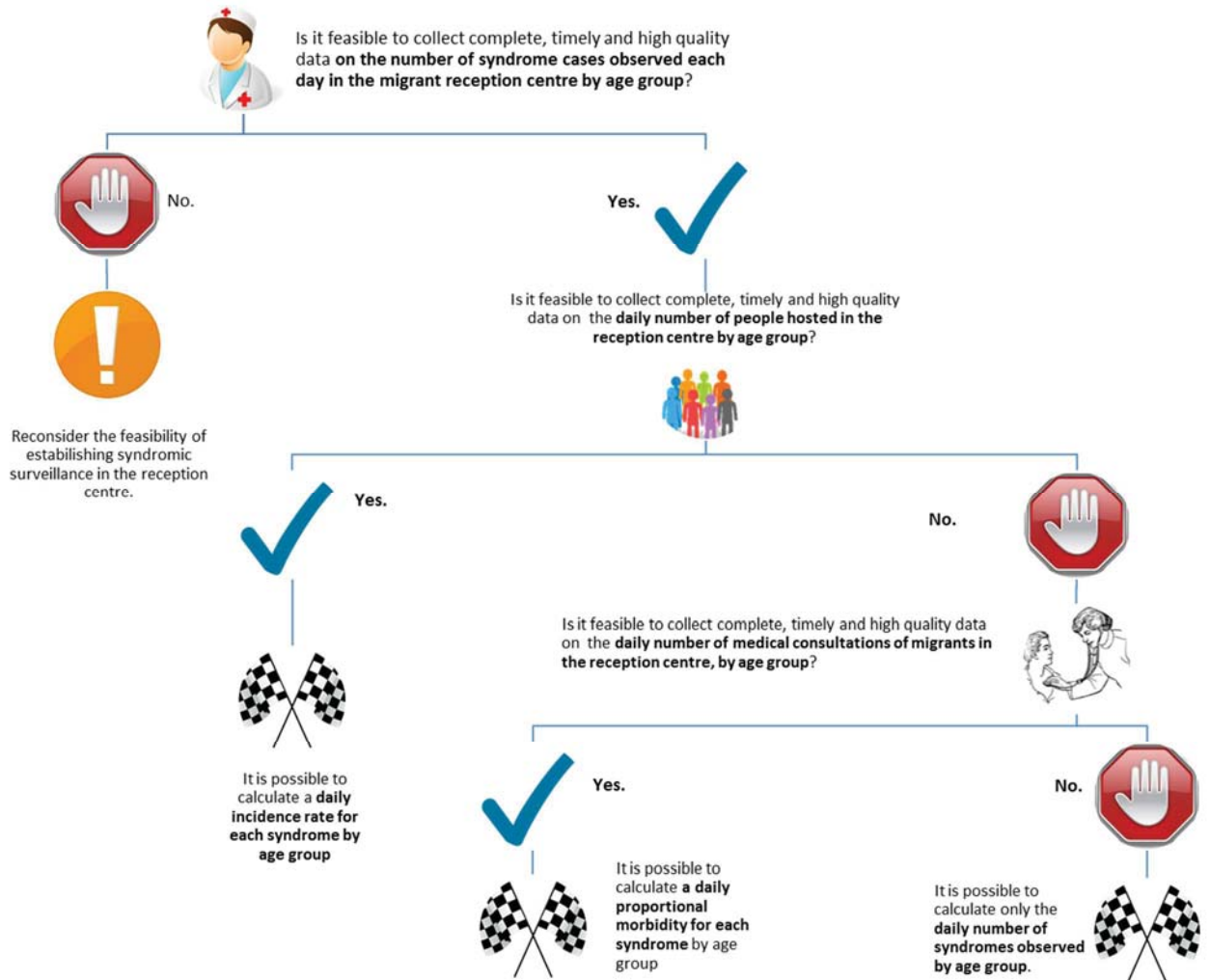


Figure 1 – Flow diagram to facilitate the appraisal of the feasibility to collect complete, timely and high quality data to establish syndromic surveillance in migrant reception/detention facilities

The content of the procedures is based upon a protocol originally developed by ISS-Italy [4-9] and draws from the technical document “Handbook on implementing syndromic surveillance in migrant reception/detention centres and other refugee settings” developed by the same co-authors for the European Centre for Disease Prevention and Control (ECDC) in 2016 [10]. The procedures were then adapted to the CARE context by integrating inputs on syndromes and statistical analysis received from the staff of the Hellenic School of Public Health (ESDY) and the Hellenic Center for Disease Control and Prevention (KEELPNO) during the CARE kick-off pre-meeting held in Athens on the 16 April 2016.

These procedures complement and integrate the **Syndromic surveillance web platform** www.iss.it/site/RMI/SyndromicSurveillance/, also developed by ISS-Italy in the framework of the CARE project WP5 activities (careproject@iss.it) in order to simulate and pilot a multi-country collaborative syndromic surveillance system in migrant reception/detention centres. The CARE platform offers functionalities to view, edit, update and analyse data with differential access depending on user profiles (Table 1).

Table 1– CARE Syndromic Surveillance platform User Profiles and User Rights

User Rights				
User Profiles	Visualize	Data Edit / Update	Create a new reception/detention centre reporting unit	Register new Users
Admin	✓		✓	Can create any User Profile
Admin National	✓		✓	Can create National/Sub National/Centre User Profiles
National	✓			
Sub National	✓			
Centre	✓	✓		

In order to support countries, the CARE project platform also hosts a Training and a Simulation section with documents, video presentations and video tutorials, also produced by ISS-Italy, on the surveillance system and on how to operate the different functions of the online platform (Figure 2).

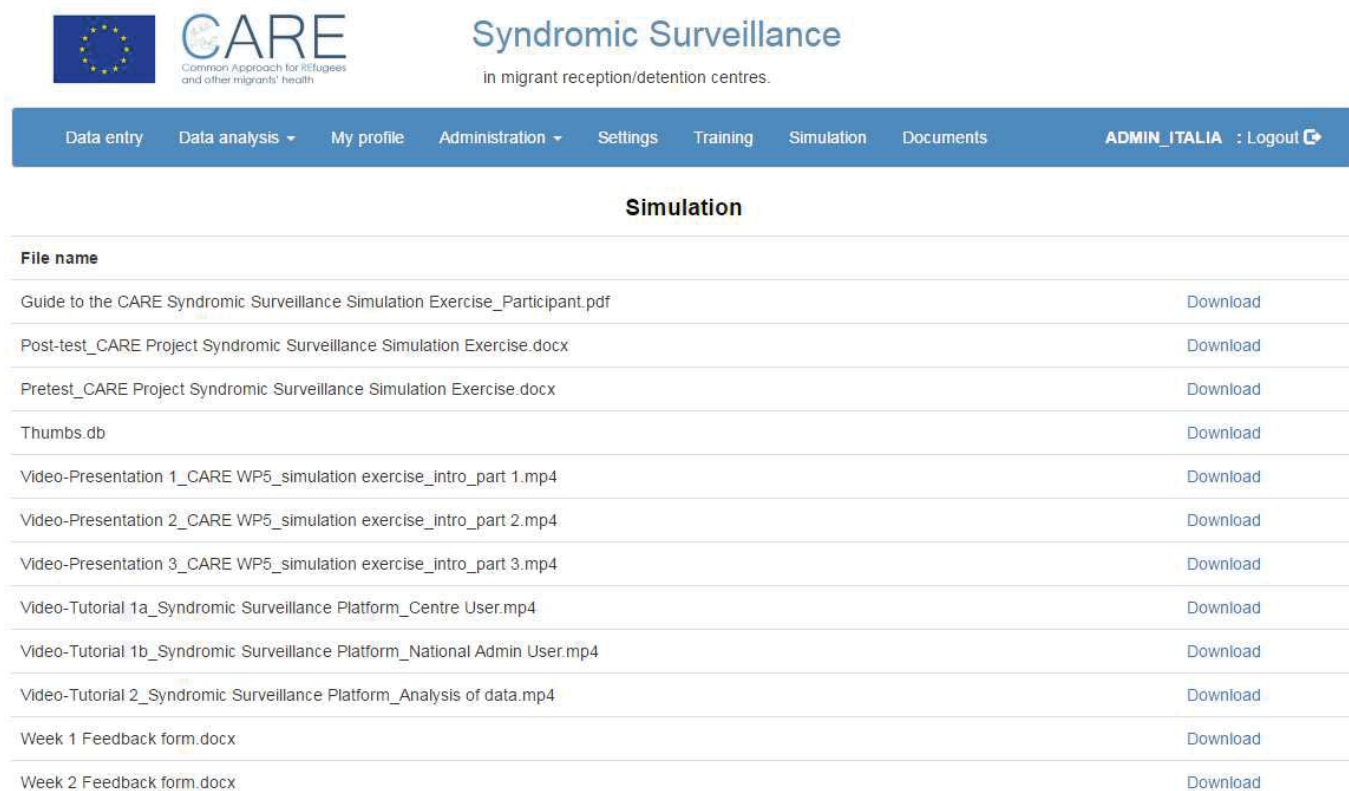


Figure 2 – Simulation section of the CARE Syndromic Surveillance Platform

The Web-based Platform and the Procedures together comprise the **CARE Syndromic Surveillance System**. The system was designed to maximise flexibility in order to favour interoperability with syndromic surveillance procedures and tools already developed in other countries.

For this reason, some syndromes offer alternative definitions that can be selected by country users to better suit their needs and it is possible to add a 14th syndrome of choice. Further, to cater for countries lacking daily data on the total number of migrants present in each reporting centre (hence unable to calculate syndrome incidence), the surveillance procedures and platform are designed to function also using as denominator the total daily number of consultations for all causes (consequently computing proportional morbidity).

2.2. Pilot

The Procedures and a video-tutorial of the platform were presented in the CARE Mid Term Project Meeting held in Ljubljana in September 2016.

Ahead of this meeting, all WP5 participating institutions (in each participating country and Portugal) had received via email the Procedures for syndromic surveillance in migrant reception/detention facilities and the related annexes [3].

On the 1st of October 2016, Italy and Greece were invited to start piloting the CARE Syndromic Surveillance System. Specific user profiles for frontline healthcare workers inserting data at hotspot level and for national admin users viewing and analysing data at central level were created. The piloting took place between October and December 2016.

In Italy, the two involved hotspots (Trapani Milo and Lampedusa) collected data between October and December 2016 inserting it directly in the CARE Syndromic Surveillance online platform. Data was analysed at ISS-Italy and three monthly bulletins were produced and are available in the web platform.

In Greece, due to an existing system for syndromic surveillance for all migrant centres, the pilot consisted in testing the interoperability of the CARE procedures and platform with the Greek surveillance system. Data was collected in the two involved Greek Hotspots (Kos and Leros) between October and December 2016 and then transferred into the CARE platform.

Malta decided, due to the role of the chest clinic which is the place where health screening takes place for all migrants on arrival to Malta who were seeking asylum, to utilize the syndromes' list as a checklist. Medical students with the help of cultural mediators, under the supervision of chest clinic health care professionals, three times a week for 12 weeks period (mid-October 2016 – mid-January 2017) were asking migrants coming to the Chest clinic if they were suffering from 13 different syndromes and entering the data into the platform.

2.3. Simulation Exercise

The CARE project Simulation Exercise on syndromic surveillance was a distance desktop exercise involving four countries (Croatia, Malta, Slovenia and Portugal). The exercise took place during a period of two weeks (**16-27 January 2017**), involving ten public health experts for approximately 30min each working day (Monday to Friday). The simulation exercise took place using emails and the CARE Syndromic Surveillance web platform. In each country, one participant simulated actions from the standpoint of a National Public Health institution and the other simulated actions from the standpoint of a frontline healthcare worker in a migrant/refugee hosting facility (with the exception of Slovenia, where two persons participated as PHI and two as hosting facility).

The **first week** of the exercise was aimed at training participants on the use of the CARE syndromic surveillance system using the project online platform and surveillance procedures. During the **second week**, participants faced an unfolding scenario in their defined roles using the CARE syndromic surveillance system. Before the exercise (**preparation phase**), participants received the materials they would need for the exercise, including the reference documents, user documents and a guide with a description of all the planned activities. At this time, they also submitted a pre-test. At the end of the

exercise (**follow-up phase**), participants submitted a post-test and an evaluation. Please refer to the CARE syndromic Surveillance Simulation Exercise Report [11] for a detailed description of the simulation exercise.

2.4. Monitoring and Evaluation of the Syndromic surveillance system

Monitoring and evaluation activities focussed on the following attributes of surveillance systems [12]:

- timeliness, completeness for the **monitoring**, and
- utility/simplicity/flexibility/acceptability for the **evaluation**.

Monitoring guidance was provided in the Procedures of the CARE Syndromic Surveillance system and piloting countries conducted this activity independently.

Monitoring functions and actions were specifically simulated during the simulation exercise.

Both pilot and simulation participants were then engaged by ISS-Italy in evaluating the system between January and March 2017 (see the following sections if this report).

2.4.1. MONITORING

The ISS-Italy advised to monitor the completeness of reporting weekly: if a reporting unit was not reporting every day, the coordinating team should contact systematically the health provider in this reporting unit and request him/her to insert/to send the missing data as soon as possible.

From the perspective of the system functioning it is important to note if a single reporting unit fails to report for one day. The reason is that this unit will no longer have continuous baseline data upon which the alert thresholds are calculated. A full week of data will be needed to rebuild this threshold automatically.

The ISS-Italy also advised to monitor the timeliness of reporting weekly (number of reports from each reporting unit sent within a predefined target time). If a reporting unit recurrently reported with excessive delay, the coordinating team should contact the health provider in this reporting unit and request him/her to insert/send data daily as required by the syndromic surveillance procedures.

2.4.2. EVALUATION

A systematic evaluation focusing on the utility/simplicity/flexibility/acceptability attributes of surveillance, and in line with the CARE project internal evaluation objectives (according to WP3), was developed by the ISS-Italy WP5 team and is described in detail in chapters 3 and 4 of this report.

2.5. Resources, reference documents and training materials for syndromic surveillance:

The ISS-Italy CARE WP5 team developed the following resources and reference documents:

- CARE project syndromic surveillance web-based platform
<https://www.iss.it/site/RMI/SyndromicSurveillance/>
- CARE project syndromic surveillance procedures
<https://www.iss.it/site/RMI/SyndromicSurveillance/training/training.aspx>
 - Procedures for syndromic surveillance in migrant reception/detention facilities
 - Annex 1- Syndrome titles and definitions

- Annex 2 – Form for centre census
- Annex 3 – CARE platform data collection form
- Annex 4 – CARE platform user guide
- Annex 5 – CARE project dissemination template

The same team also developed the following training materials for the simulation exercise:

<https://www.iss.it/site/RMI/SyndromicSurveillance/simulation/simulation.aspx>

- The Guide to the CARE syndromic surveillance simulation exercise
- Personal user documents for each participant containing the user name and password to access the CARE syndromic surveillance platform
- 10 Daily Task sheets
- 9 ad hoc injects
- 3 video-presentations
- 3 video-tutorials
- 2 weekly feedback forms

During the simulation exercise, an Excel tool for data analysis previously developed by ECDC and compatible with the CARE syndromic surveillance system, was also used by participants [13]

3. Syndromic Surveillance Evaluation Methodology

3.1. Study question

Did the CARE syndromic surveillance system **effectively meet its objective of rapidly detecting early signals of potential health emergencies among migrants hosted in reception centres?**

3.2. Evaluation Objectives

The general aim of the evaluation was **to assess whether participants felt that the CARE syndromic surveillance system can rapidly detect early signals of potential health emergencies among migrants hosted in reception centres.**

3.2.1. SPECIFIC OBJECTIVES

- To assess the users' **level of satisfaction** with the outputs of this project activity.
- To assess the syndromic surveillance system **Utility and Simplicity** attributes.
- To assess the **Acceptability, Flexibility** attributes, and the **Feasibility** of its use in migration centres (in general and specifically in relation to the type of data and reporting timeliness needed).
- To assess whether the CARE syndromic surveillance system, according to the users, **can facilitate the detection of infectious disease outbreaks and contribute to the early detection of public health emergencies.**

3.3. Evaluation survey

The evaluation survey focussed on the following priority surveillance attributes: **Utility, Simplicity, Flexibility and Acceptability**. It also took into account the information needs of the CARE project WP3 in charge of internal evaluation.

The ISS-Italy team developed an online questionnaire (Appendix 1) targeting all users of the CARE Syndromic Surveillance System procedures and platform. The target group included the CARE project participants who engaged in the CARE syndromic surveillance simulation exercise and those participating in the Italian pilot. Greek pilot participants were not invited to compile the online evaluation survey because they did not directly operate on the platform.

The questionnaire was submitted to all the participants of the CARE Syndromic Surveillance Simulation Exercise (10 participants: 5 simulating the role of reporting health care workers in migrant centres and 5 simulating the role of PH officials at national level) on the 27th of January 2017, at the end of the exercise itself.

The online questionnaire was also submitted to the participants of the Italian Pilot (one PH official at national level and one reporting health care worker in each of the two involved hotspots) on the 22nd of February 2017.

Data collection was completed on the 9th of March 2017.

3.4. Evidence of interoperability

Greek participants to the CARE Syndromic Surveillance Pilot together with the ISS-Italy team tested whether the CARE surveillance system could import effectively data from the existing Greek Syndromic Surveillance System operating in all migrant camps in the country.

ISS-Italy provided Greek partners with an excel file to guide the extraction and input of data into the online CARE platform (appendix 2). This file contained 21 data fields: Country, Region/District, Center, Date, Age Group, So1, So2, So3, So4, So5, So6, So7, So8, So9, S10, S11, S12, S13, S14, Number_migrants, No_migrants.

For each field the following description was provided:

- **Country:** this is a text field in which to specify your country
- **Region/District:** this is a text field in which you should specify the Region or District where the reporting centre is located
- **Centre:** this is a text field in which you should specify the name of the reporting migrant centre/camp
- **Date:** this is a date field. Please provide dates in the format YYYY-MM-DD. From 1st of October to 31 December 2016 all dates must be included.
 - Each day there should be three records (one for each age category)
 - These records should be present also when no syndrome cases are reported (please put "0" in the syndrome fields and include the denominators by age category)
 - These records should be present also when the camp/centre is not hosting migrants (therefore there is no denominator). In this case please put "yes" in the field "No_migrants".
- **Age Group:** here you should indicate age category related to the data shown. Three categories are possible (00-04; 05-17;18+).
- **So1 - S14:** these are numeric fields for each of the syndromes under surveillance. Please refer to the second worksheet of the excel file "**syndromes**" for the names of the syndromes. As requested we added a 14th syndrome. This is defined at your choice. If you include data on a 14th syndrome, please let us know the name of the syndrome.
- **Number_migrants:** this is a numeric field where you should include the denominator you are using. **Please note** that all centres must report the same type of denominator at all times. This can be:

- the total number of migrants in the centre/camp reporting that day by age group (population), or
- the total number of consultations (any cause) in the centre that day by age group (attendance).
- **No_Migrants:** this is a Yes/No field. Please specify with “Yes” if for any reason on a specific date the centre is not hosting migrants. One line should be filled this way for each age category.

Following these indications, the Greek colleagues provided data collected by the Kos and Leros hotspots between October and December 2016.

4. Syndromic Surveillance Evaluation Results

Ten of the thirteen CARE syndromic surveillance system users (hereby users) answered the online evaluation questionnaire (response rate 78%), 50% had used the syndromic surveillance system as a PH official at national level and 50% as a reporting health care worker in migrant centres. Two users responded from each of the involved countries: Slovenia, Croatia, Malta, Portugal and Italy.

Of the 10 users, 8 were PH officials working at National level who had participated in the CARE syndromic surveillance simulation exercise (4 simulating the role of reporting health care workers in migrant centres and 4 simulating the role of PH officials at national level).

The remaining two users had participated in the real life Italian pilot: one was a PH official at national level and one was a frontline health care worker within an Italian hotspot.

4.1. Level of satisfaction of users

Figure 3 shows the level of reported user satisfaction regarding:

1. The syndromic surveillance tools developed by the CARE project (CARE Syndromic Surveillance Procedures, Annexes and Web-based platform), and
2. The Excel tool developed in 2016 by ECDC and used by the CARE Syndromic Surveillance System users.

All the **tools** developed by the CARE project for syndromic surveillance were well received by users. All users (100%) were very/extremely satisfied with the CARE syndromic surveillance system as a whole (including the CARE web based platform and the procedures) and with the CARE syndromic surveillance procedures and Annex 4- user guide. Nine users (90%) were very/extremely satisfied with the CARE syndromic surveillance platform in terms of its functionalities and user-friendliness, and with the CARE procedures Annex 2 – syndrome titles and definitions.

Four users were very/extremely satisfied with **ECDC excel tool** developed for data analysis, five were sufficiently satisfied and one was not satisfied at all. This respondent explained the answer as follows: *“Unfortunately the ECDC Excel tool didn't work on our Work Laptops which had Excel 2007 installed on them. I believe that it would have been great if this tool was double-checked beforehand or else integrated within the surveillance system as a feature.”*

During the pilot/simulation exercise were you satisfied with the CARE syndromic surveillance:

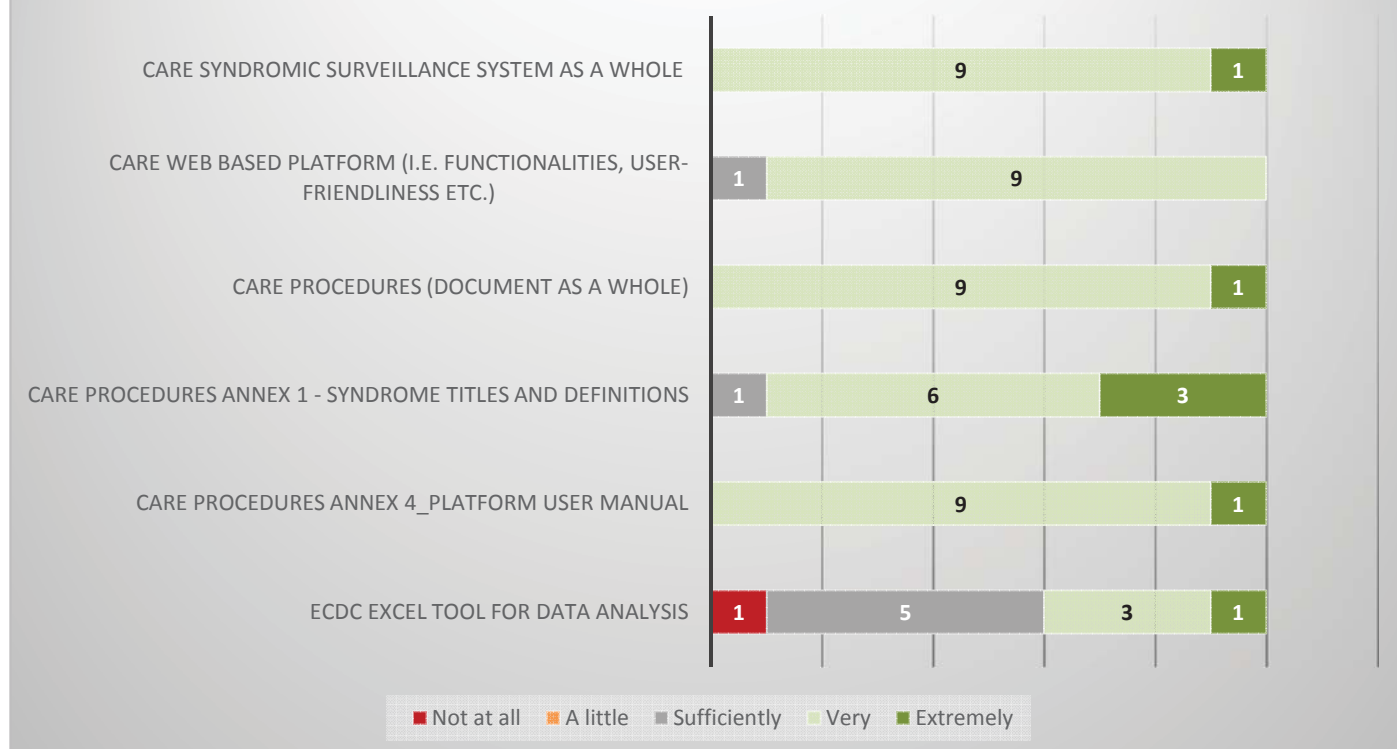


Figure 3 – Level of satisfaction of users with the CARE syndromic surveillance tools and with the ECDC Excel tool for data analysis

Nine users also provided feedback on their level of satisfaction regarding the **support / guidance provided** during the pilot implementation/simulation exercise. Of those, eight (89%) were very/extremely satisfied and one was sufficiently satisfied with the support provided.

4.2. Utility, Simplicity, Acceptability, Flexibility of the syndromic surveillance system and Feasibility of use

Ninety percent of users assessed the system as very/extremely **useful and simple** to use (Figure 4).

In terms of **acceptability**, 70% of respondents stated that they found the time required to set the system/insert data (depending on their assigned User Profile), download and analyse the data acceptable for a surveillance system targeting health centres catering for migrants in their country. The three respondents who did not consider this time acceptable, were all simulation exercise participants and motivated their response as follows:

- *"I hope it is, doctor is available only for 2 hours several times a week"*
- *While the platform is very simple and quite easy to use, to analyse the data by each individual syndrome is unnecessarily time consuming.*

The latter comment refers primarily to the use of the **ECDC excel tool** for data analysis that required users to analyse data by syndrome.

The CARE Syndromic Surveillance System was also assessed as very/extremely **flexible** by 80% of respondents (Figure 4). One user from Malta scored “a little” to flexibility but did not provide a motivation for the answer.

Regarding **feasibility** of using the CARE Syndromic Surveillance System in migrant holding settings, 80% of participants stated that they found the system to be very/sufficiently feasible to use. One participant from Portugal commented as follows: “I answered as if we had migrant centres. Our model of receiving/hosting migrants is based on resettling them around the country.” Motivations for scoring “a little” for feasibility were provided by both respondents from Slovenia: “because of the current migrants situation in Slovenia, there is no need for such a surveillance system”.

Ninety percent of participants also reported that it would be **feasible** for health centres catering for migrants in their country to collect the type of data used in the CARE syndromic surveillance system and insert it within 24 hours. One participant did not agree motivating the response as follows: “I am not sure, it depend will the doctor be available every day”.

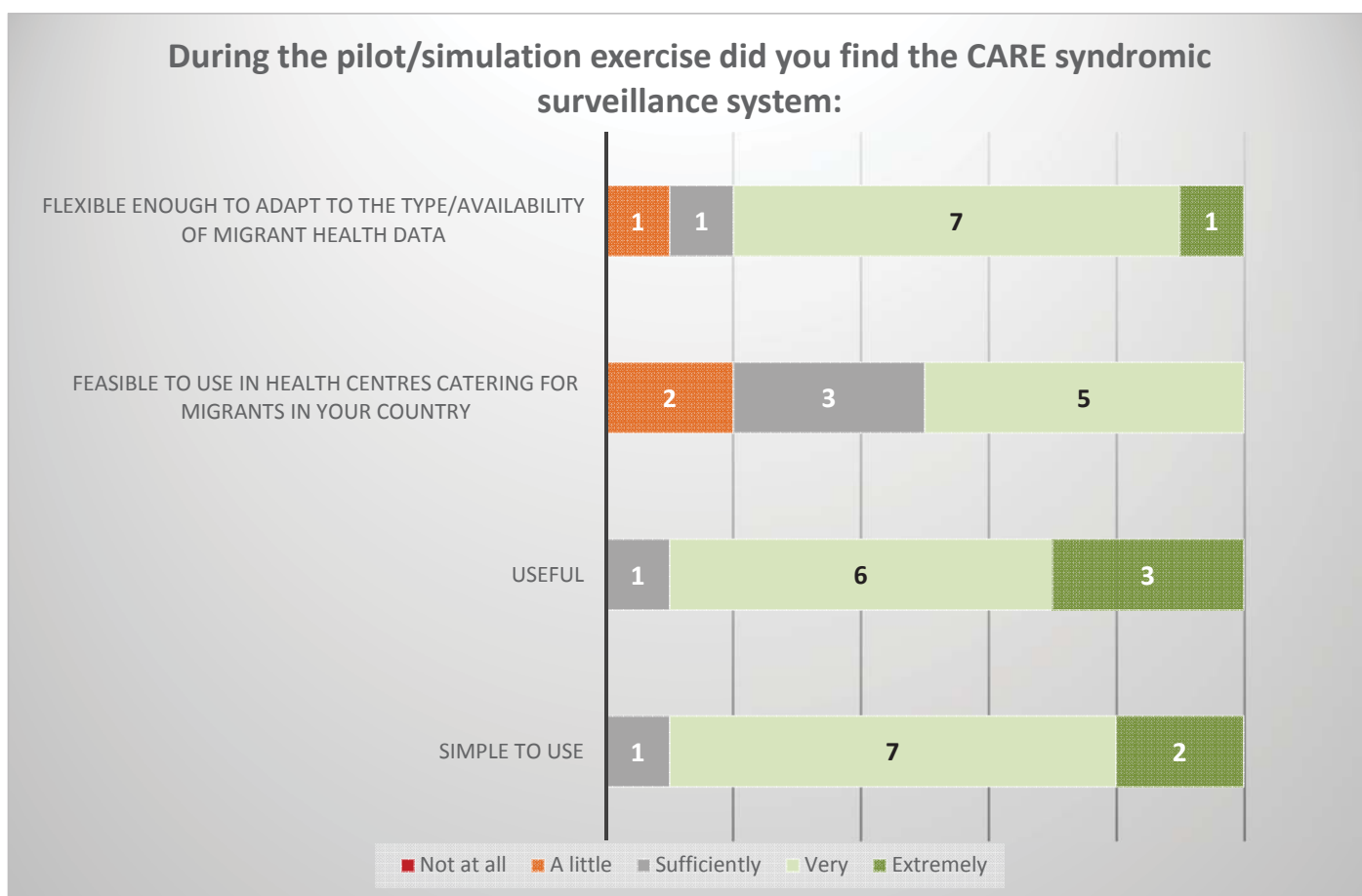


Figure 4 – Results of evaluation questions exploring the usefulness, simplicity, flexibility of, and feasibility of using, the CARE Syndromic Surveillance System.

4.3. Overall added value

All participants (100%) were very satisfied with the potential of the model proposed by the CARE Syndromic Surveillance System to detect public health emergencies.

More specifically, eight users agreed that the CARE syndromic surveillance system could improve the **timeliness** of reporting and analysing health data collected in health centres catering for migrants in their country. The two

respondents from Slovenia disagreed because “the current migrant situation and monitoring of health data do not require syndromic surveillance in Slovenia”.

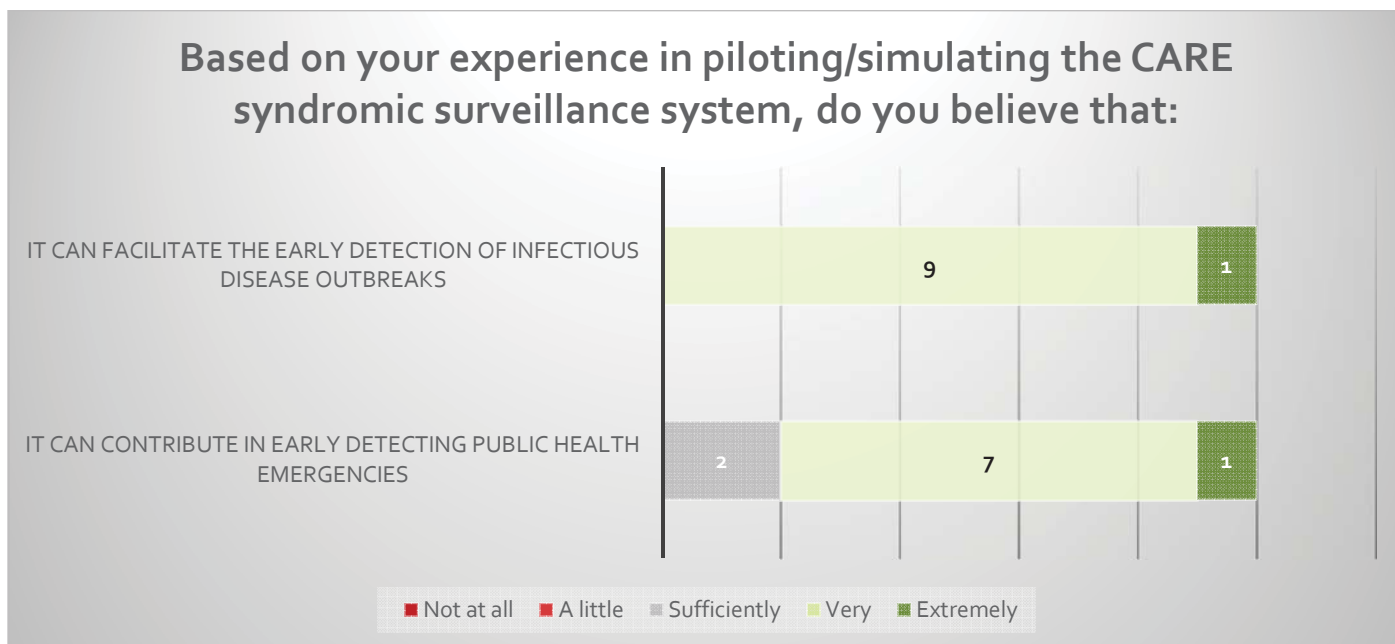


Figure 5 – Opinion of users on whether the CARE syndromic surveillance system met its objective

All users reported believing, based on their experience in piloting/simulating the CARE Syndromic Surveillance System, that this system **can facilitate the detection of infectious disease outbreaks**. Eight users (80%) also believe that it can **contribute to the early detection of public health emergencies**.

When asked how they would improve the CARE project syndromic surveillance system (procedures and platform), five users provided the following inputs:

- *A useful next step would be to develop a companion mobile-app and have the User Interface enhanced for Mobile Devices.*
- *The analysis would perhaps be quicker, if there was an option to see the data with syndromes combined (instead of each syndrome separately).*
- *A filter for dates in the graph-building tool would improve visualization.*
- *Would be useful if the platform could produce automated reports in real time based on the uploaded data*

4.4. Evidence of interoperability between the Greek and CARE Syndromic Surveillance Systems

Data of the two Greek Hotspots involved in the CARE project for the period of the pilot (October-December 2016) was sent by Greek partners to ISS-Italy.

Only minor normalization was needed (due to different numbers being assigned to similar syndromes in the two systems). Data was successfully transferred in the CARE Syndromic Surveillance platform. Therefore, this data can now be viewed, downloaded and analysed by Greek partners also using this tool.

Concluding remarks

The WP5 ISS-Italy team of the CARE project produced several tools and training materials in order to develop and piloted/simulated a Syndromic Surveillance System for migrant holding facilities among countries part of the CARE project. The team also performed activities not foreseen initially by the project including the design and implementation of a simulation exercise and the design of some basic analysis functions embedded within the CARE Syndromic Surveillance Platform.

The results of the evaluation conducted with users who piloted/simulated the system, confirm that the tools and materials were well received with generally high levels of satisfaction. Some users reported lower levels of satisfaction with the Excel **Tool developed by ECDC** and tested by the CARE project, probably because of technical difficulties in operating it and to the fact that the tool only allows to analyse data one syndrome at a time.

The findings of this evaluation indicate that the CARE project met its objective of developing and piloting/simulating a Syndromic Surveillance System that **can facilitate the detection of infectious disease outbreaks** and **contribute to the early detection of public health emergencies** in migrant holding centres.

The opinion of users on the usefulness, simplicity and flexibility attributes of the CARE Syndromic Surveillance were very high. Most users also stated that they found the system to be very/sufficiently feasible to use in migrant holding centres. Considering the very difficult working conditions within migrant holding centres this is a very promising result.

Some less positive responses were explained recurrently by users as due to the migrant situation and monitoring of health data in their country that does not require syndromic surveillance. Therefore, they were not directed to the CARE Syndromic Surveillance System specifically. In particular, this was due to the lack of functioning migrant centres due to changes in the migration flow along the Balkan Migration route and/or to the fact that migrants in some participating countries do not access dedicated medical services (i.e. access the same services as the general population making the collection of stratified numerators and denominators very difficult).

Continuity of medical presence in the centres (medical services accessible each day) was raised by users as a possible issue in the feasibility of implementing the CARE Syndromic Surveillance System in their countries. As explained in more detail the "Procedures of the CARE Syndromic Surveillance System", this system defines alert thresholds on the basis of the confidence interval of expected cases of a syndrome. Historical data on residents in migrant reception/detention facilities is typically not available. In order to calculate the number of **expected cases** of any syndrome/day without relying on historical data, the CARE project syndromic surveillance system uses the **moving average** of the previous seven days. For this reason, if continuity of daily data is not available (e.g. in the case of migrant centres not offering health assistance every day), the system is unable to calculate alert thresholds.

The CARE Syndromic Surveillance System interoperability with the existing Greek surveillance system tested successfully data transfer possibilities. This finding is indicative of the fact that the surveillance protocols are very similar and that the CARE system was sufficiently flexible in terms of the syndrome definitions and denominators. Concerning syndromes, the CARE syndromic Surveillance System provides several alternative options for more sensitive/more specific definitions of individual syndromes as well as the possibility of including an extra syndrome of choice if needed. Concerning denominators, the CARE system is able to function indifferently with daily population data (generating incidence trends) and with the daily number of consultations (generating proportional morbidity trends).

The CARE project Syndromic Surveillance system was a successful proof of concept that syndromic surveillance in migrant reception/detention facilities can be implemented within an international collaborative framework. Countries, within and beyond the CARE network, could use the CARE Syndromic Surveillance System to set up national surveillance systems tailored towards their information needs and to data availability.

From an operational standpoint, further development of this surveillance instrument will depend on the opportunities of the network of promoting its use also at a wider EU/EEA level. From a more technical point of view, users suggested to strengthen the web-based platform embedded analysis functions and explore the use of mobile devices. This suggestion

provides a direction for further platform development while, at the same time, pointing that the initial developments in this direction, conducted by the ISS-Italy team and not initially planned in the CARE project, were appreciated.

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Appendixes

Appendix 1: CARE syndromic Surveillance evaluation questionnaire

Appendix 2: Excel file to guide the extraction and input of data



The project "717317/CARE" has received funding from the European Union's Health Programme (2014-2020)

Questionnaire for the evaluation of the CARE syndromic surveillance system

Welcome to the CARE Syndromic Surveillance evaluation.

You received the invitation to compile this short questionnaire because you participated either in the pilot or in the simulation exercise of the CARE syndromic surveillance system.

The CARE - Common Approach for REFugees and other migrants' health - (CARE) project, funded by the European Union's Health Programme (2014-2020), aims to promote access to appropriate health care for migrants and refugees, through an integrated model for their healthcare provision.

Among other activities, the project developed and piloted/simulated– among the participating countries (Italy, Greece, Malta, Croatia, Slovenia) and Portugal – a syndromic surveillance system able to ensure rapid detection of disease outbreaks and potential public health emergencies occurring in hotspots or migrants'/refugees' centers and preventing them from becoming cross border health threats.

Please help us to assess the CARE syndromic surveillance system by answering these few questions by the 28th February 2017.

Many thanks

The CARE WP5 team



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Questionnaire for the evaluation of the CARE syndromic surveillance system

About you

* 1. Name/Surname

* 2. Country

* 3. I work in a:

4. Email address

* 5. I participated to the CARE Syndromic Surveillance:

* 6. I used the CARE syndromic surveillance system with the user role of:



Questionnaire for the evaluation of the CARE syndromic surveillance system

About the CARE syndromic surveillance system

* 7. Do you think syndromic surveillance can improve the timeliness of reporting and analysing health data collected in health centres catering for migrants in your country (in holding centres or in other settings)?

- Yes
- No (please specify)

* 8. During the pilot/simulation exercise did you find the CARE syndromic surveillance system:

	Not at all	A little	Sufficiently	Very	Extremely
<u>Simple to use</u>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Useful</u>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Feasible to use in health centres catering for migrants in your country</u> (in holding centres or in other settings)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Flexible enough to adapt to the type/availability of migrant health data</u> (collected in health centres catering for migrants in your country - in holding centres or in other settings)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. ...If an answer is "Not at all" to any please specify why:

* 10. Did you find the time required to set the system/insert data(*depending on your assigned User Profile*), download and analyse the data **acceptable** for a surveillance system targeting health centres catering for migrants in your country (*in holding centres or in other settings*)?

- Yes
 No (please specify)

* 11. Do you think it is feasible for health centres catering for migrants in your country (*in holding centres or in other settings*) to collect the type of data used in the CARE syndromic surveillance system and insert it **within 24 hours** (*i.e. the following day*)?

- Yes
 No (please specify)

* 12. During the pilot/simulation exercise were you satisfied with the CARE syndromic surveillance:

	Not at all	A little	Sufficiently	Very	Extremely
System as a whole (procedures and platform)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Web Based platform (i.e. functionalities, user-friendliness etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Procedures (document as a whole)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Procedures Annex 1 - Syndrome Titles and Definitions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Procedures Annex 4_Platform User Manual	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ECDC Excel tool for data analysis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In terms of the support / guidance provided during the pilot implementation/simulation exercise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In terms of the syndromic surveillance's model potential to detect public health emergencies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. ...If an answer is "Not at all" to any please specify why:

* 14. Based on your experience in piloting/simulating the CARE syndromic surveillance system, do you believe that:

	Not at all	A little	Sufficiently	Very	Extremely
It can contribute in early detecting public health emergencies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It can facilitate the early detection of infectious disease outbreaks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. ...If an answer is "Not at all" to any please specify why:

16. How would you improve the CARE project syndromic surveillance system (procedures and platform)?



CARE
Common Approach for REFugees
and other migrants' health

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Questionnaire for the evaluation of the CARE syndromic surveillance system

Thank you very much!

Appendix 2: Excel file to guide the extraction and input of data

Country	Region/District	Center	Date	AgeGroup	Syndromes														Attendance or Migrant Population					
					S01	S02	S03	S04	S05	S06	S07	S08	S09	S10	S11	S12	S13	S14	Number_migrants	No_migrants				
Greece	Region 1	Center 1	2017-01-19	00-04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	123	no
Greece	Region 1	Center 1	2017-01-19	05-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	123	no
Greece	Region 1	Center 1	2017-01-19	18+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	123	no
Greece	Region 1	Center 1	2017-01-20	00-04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	123	no
Greece	Region 1	Center 1	2017-01-20	05-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	123	no
Greece	Region 1	Center 1	2017-01-20	18+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	123	no
Greece	Region 1	Center 1	2017-01-21	00-04																				yes
Greece	Region 1	Center 1	2017-01-21	05-17																				yes
Greece	Region 1	Center 1	2017-01-21	18+																				yes
Greece	Region 1	Center 1	2017-01-22	00-04																				yes
Greece	Region 1	Center 1	2017-01-22	05-17																				yes
Greece	Region 1	Center 1	2017-01-22	18+																				yes
Greece	Region 1	Center 1	2017-01-23	00-04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	123	no
Greece	Region 1	Center 1	2017-01-23	05-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	123	no

Greece	Region 1	Center 1	2017-01-23	18+		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	123	no
Greece	Region 1	Center 2	2017-01-19	00-04		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	no	
Greece	Region 1	Center 2	2017-01-19	05-17		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	no	
Greece	Region 1	Center 2	2017-01-19	18+		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	no	
Greece	Region 1	Center 2	2017-01-20	00-04		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	no	
Greece	Region 1	Center 2	2017-01-20	05-17		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	no	
Greece	Region 1	Center 2	2017-01-20	18+		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	no	
Greece	Region 1	Center 2	2017-01-21	00-04																					yes	
Greece	Region 1	Center 2	2017-01-21	05-17																					yes	
Greece	Region 1	Center 2	2017-01-21	18+																					yes	
Greece	Region 1	Center 2	2017-01-22	00-04																					yes	
Greece	Region 1	Center 2	2017-01-22	05-17																					yes	
Greece	Region 1	Center 2	2017-01-22	18+																					yes	
Greece	Region 1	Center 2	2017-01-23	00-04		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	no	
Greece	Region 1	Center 2	2017-01-23	05-17		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	no	
Greece	Region 1	Center 2	2017-01-23	18+		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	no	

NOTE: No data are included in this file. Numbers are added only as examples for compilation

- [S01] Acute respiratory infection with fever
- [S02] Suspected pulmonary tuberculosis
- [S03] Bloody diarrhoea
- [S04] Gastroenteritis without blood in the stool
- [S05] Rash and fever
- [S06] Meningitis, encephalitis
- [S07] Lymphadenitis with fever
- [S08] Acute paralysis
- [S09] Sepsis or unexplained shock
- [S10] Fever and bleeding
- [S11] Acute jaundice
- [S12] Ectoparasite infestations
- [S13] Unexplained deaths
- [S14] Other, specify