
Inventory of Syndromic Surveillance Systems in Europe

Deliverable 4, Work Package 4

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1. Introduction

The first main objective of Triple-S has been to describe the current status of syndromic surveillance (SyS) in Europe. This was done by creating an inventory, which consists of a detailed description of all SyS systems, including those focussing on human health and those on animal health. The inventory is crucial to the successful achievement of the second main objective of Triple-S, that is, the development of the guidelines for SyS in Europe. In particular, based on the information included in the inventory, the Triple-S team will create guidelines that aim to cover all possible scenarios in performing SyS.

The inventory was developed by the members of Work Package 4 (WP4, Inventory of syndromic surveillance systems). WP4 is coordinated by the Statistics Office of the *Istituto Superiore di Sanità* (Italy's National Institute of Public Health), which is responsible for conducting the inventory on human SyS systems; the inventory on veterinary SyS systems is being performed by ANSES (French Agency for Food, Environment, and Occupational Health and Safety). Herein we describe how the inventory of human SyS systems was performed and the results obtained to date; the inventory of veterinary SyS systems is described under separate cover.

2. Objectives

The specific objective of WP4 was to describe all SyS systems in Europe, including not only existing systems but also systems that are considered as pilot studies, systems that existed in the past, those that were created for a specific period of time (e.g., for a mass gathering event), and those that are planned for the future.

3. Methodology

The inventory was developed by performing a survey using specifically developed questionnaires sent to contact persons throughout Europe and by conducting a literature search. The survey consisted of two phases, using two different questionnaires.

3.1. *Brief Questionnaire*

The first phase consisted of identifying the SyS systems in each country and obtaining contact information for the persons running these systems. This was done by sending a very brief questionnaire (herein referred to as the "brief questionnaire"; see Attachment 1) to one healthcare professional in each country who was working at a national-level health organisation (e.g., Ministry of Health, the National Institute of Public Health) and who was deemed to be knowledgeable about the existing systems in his/her country. These persons were identified by consulting the entire Triple-S team and by contacting persons with whom this team had developed professional relationships in the past (see Attachment 2 for list of contact persons for the brief questionnaire).

The brief questionnaire was developed by the WP4 members through a series of meetings. The first draft was then sent to the entire Triple-S team for discussion and comments and modified until it was deemed to be satisfactory by all. The final version consisted of the following items: i)

the name of the SyS system; ii) the website address; iii) a brief description of the system; iv) the institution coordinating the system; and v) the name and contact information of the person(s) coordinating the system and an alternate contact person. On the questionnaire, we also asked for information on the status of the SyS, that is, whether it was:

- i) currently active;
- ii) created for an event with a predefined period of time (e.g., the Olympic Games or other mass gathering events);
- iii) existed in the past but was discontinued;
- iv) was in a pilot phase or planned for the future (for the systems created for an event with a predefined period of time and the discontinued systems, we asked for information on systems dating back to the year 2000).

The brief questionnaire was a Word document and was sent together with a letter introducing the Triple-S project (see Attachment 1 for introductory letter). The questionnaires and letters were sent by e-mail, using a specifically created e-mail address. If the deadline for returning them was not met, up to three reminders were sent. If still no response was received, an alternate contact person was identified together with the Triple-S Coordination Team and/or other colleagues.

The following notice has also been noticed on the Triple-S website: “To meet the Triple-S objective of analyzing syndromic surveillance systems throughout Europe, we are conducting an inventory of such systems. If you are aware of a system and wish to provide us with information, you can complete the online questionnaire. If you are not sure whether or not the surveillance system meets our criteria, please see the official Triple-S definition of syndromic surveillance systems on this website. If you have any questions or require clarifications regarding this survey, please do not hesitate to contact us at: triple-s@iss.it.”

3.2. Long questionnaire

The second phase of the survey consisted of collecting detailed information from the persons coordinating the SyS systems identified with the brief questionnaire. To do so, we created a second questionnaire (herein referred to as the “long questionnaire”) (Attachment 3). Like the brief questionnaire, the long questionnaire was developed by the WP4 members and sent to the entire Triple-S team for discussion and comments; in developing the long questionnaire, all attempts were made to strike an acceptable balance between collecting data that was detailed to the greatest extent possible and making the questionnaire brief enough so as not to overload the individual asked to complete the questionnaire with too much work. This process consisted of numerous e-mails and conference calls with the entire Triple-S team. The final version of the long questionnaire consisted of 35 items organized into 4 main sections:

- **Section 1) General:** general characteristics of the SyS system, including its current status and main goals;
- **Section 2) Data:** information on the data providers, the type of data collected, and the data analyses performed);
- **Section 3) Dissemination:** how the data is distributed to its users);
- **Section 4) Uses and evaluation:** who uses the system and the systems strong and weak points).

The questionnaire also included a section in which the respondent could comment freely on the system's strengths and weaknesses.

The long questionnaire was made available on a bespoke website developed in collaboration with the INVS (<https://voozanoo.invs.sante.fr/1956215847/scripts/aindex.php>). To the coordinator of each of the SyS systems identified with the brief questionnaire (see Attachment 4), we first sent an e-mail in which we described the Triple-S Project, the definition of syndromic surveillance developed by the Triple-S project, and the objectives of the inventory; in this e-mail, we asked the coordinator to complete the questionnaire on the website. We began to send these e-mails on June 8, 2011 (i.e., when the questionnaire began to be available online), asking that the questionnaire be completed by June 30, 2011. Once the deadline passed, we sent up to 4 reminders to the coordinators. If they still did not respond, we attempted to identify alternate contact persons.

The process of sending out the brief and long questionnaires was an ongoing process, in that we began to send out requests to complete the long questionnaire as soon as possible after the brief questionnaire that identified the contact person was received (i.e., we did not wait to receive all of the brief questionnaires before beginning with the long questionnaires).

The results collected from the long questionnaires were entered in a database, and a descriptive analysis was performed. For each of the systems we also developed summary sheets with a description of the system's main characteristics (see Attachment 5).

3.3. Literature search

To identify SyS systems in Europe that were potentially missed with the questionnaires, we performed a literature search. The following search terms were first used: syndromic surveillance [TITLE] AND europe (search details: syndromic surveillance[TITLE] AND ("europe"[MeSH Terms] OR "europe" [all fields])). We then also used the terms: syndromic surveillance AND Europe (search details: syndromic [all fields] AND ("epidemiology"[subheading] OR "epidemiology" [all fields] OR "surveillance" [all fields] OR "epidemiology"[MeSH terms] OR "surveillance" [all fields]) AND ("europe" [MeSH Terms] OR "europe"[all fields])).

4. Results

4.1. Brief Questionnaire:

The brief questionnaire was sent to one contact person in each of 28 countries, which included the 27 Member States plus Scotland: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, UK (England), Scotland. In spite of the fact that we sent a number of reminders, we received no responses to the brief questionnaire from Latvia, Luxembourg, Romania, or Spain.

Of the countries that responded, 7 replied that no Sys system exists in their country: Austria, Bulgaria, the Czech Republic, Estonia, Malta, Poland and Slovenia, although the contact person from Malta replied that a feasibility study had been performed. In the remaining 17 countries, a total

of 38 SyS systems were identified by the contact persons for the brief questionnaires, plus the SIDARTHa system (European Emergency Data-based Syndromic Surveillance System), which is being conducted in Spain, and, as a pilot study, in Austria, Denmark, and Germany.

4.2. Long Questionnaire:

The coordinators of these 39 systems were asked to complete the long questionnaire (note: some of the coordinators were in-charge of more than one system, so the total number of persons contacted was lower than 39). Of these 39 systems, we received a completed long questionnaire for 33 of them. The names of the 33 systems are listed in Table 1, along with their status (i.e., currently active, event-specific, discontinued, pilot, or planned).

Table 1 – Names and status of the 33 SyS systems for which detailed information is available, by country

Country	SyS System	Data source	Status
Belgium	UREG	Emergency departments and Ambulance dispatch	Planned
Cyprus	Network for surveillance and control of communicable diseases	General practitioners	Current
Denmark	BioAlarm	Ambulance dispatch	Current
Denmark	Danish medical on-call service ILI surveillance	General practitioners	Current
Finland	AvoHilmo	General practitioners	Pilot
Finland	Health Gate	Health care professionals	Current
France	ASTER	Outpatient facilities	Current
France	Sursaud	Emergency departments	Current
Germany	Intensified surveillance – 2011 Women’s World Cup	Local health departments	Event-specific
Germany	GrippeWeb	General population: volunteer participants	Current
Germany	Epilag Conference	Robert Koch Institute (RKI) and 16 federal-state governmental public health agencies	Current
Greece	Athens 2004 Olympic Games	Emergency departments	Event-specific
Hungary	National Special Medical Information System	Emergency departments Emergency numbers	Planned
Ireland	GP Influenza sentinel Surveillance System	General practitioners Sentinel Surveillance System Sentinel School Surveillance System Sentinel Hospital Surveillance	Current
Ireland	GP sentinel Surveillance System	General practitioners	Current
Ireland	Sentinel Hospital Surveillance	Sentinel hospitals	Current
Ireland	GP Out of hours Syndromic Surveillance System	Out of hours General practitioners	Current
Italy	Syndromic Surveillance of Resp. Inf.	Emergency	Current

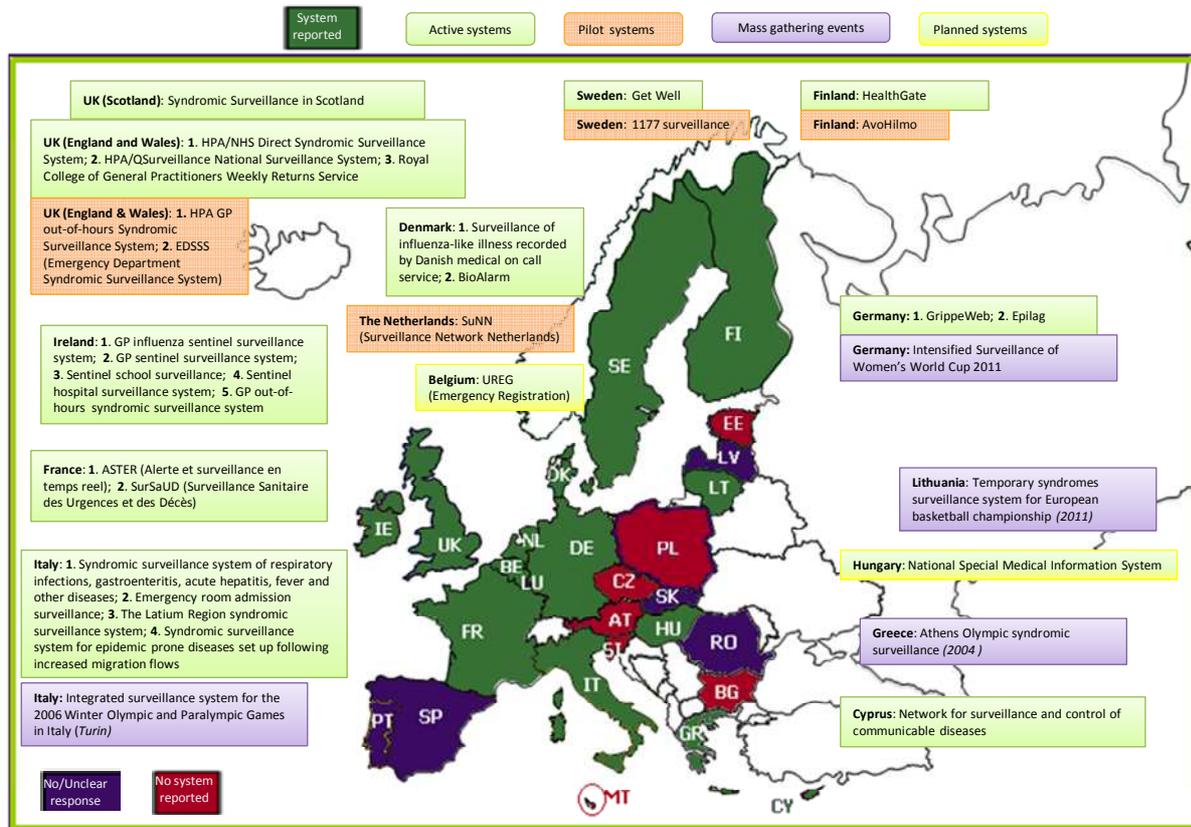
	...(Genoa)	departments	
Italy	ER-based syndromic surveillance system	Emergency departments	Current
Italy	Torino Olympic Watch	Emergency departments	Event-specific
Italy	ASP Lazio	Emergency departments	Current
Italy	Sorveglianza della popolazione immigrata	Immigration centres	Current
Lithuania	Temporary syndromes surveillance system for European basketball championship 2011	Emergency departments	Event-specific
Netherlands	Surveillance Network Netherlands	General practitioners	Pilot
Sweden	GET WELL	Website hits	Current
Sweden	1177	Telephone helplines	Pilot
United Kingdom	HPA/NHS Direct syndrome surveillance system	Telephone helplines	Current
United Kingdom	HPA Q Surveillance national surveillance system	General practitioners	Current
United Kingdom	RCGP	General practitioners	Current
United Kingdom	General Practitioner out of hours...	Out of hours General practitioners	Pilot
United Kingdom	Emergency Dept. Syndromic Surv...	Emergency departments	Pilot
UK Scotland	Syndromic Surveillance in Scotland	General practitioners Providers of drug sales Telephone helplines	Current

Of the 33 systems, most (n=22) are currently active; 5 are pilot systems; 4 existed for mass-gathering events (Olympic Games, football or basket championships), and 2 are planned.

Regarding the general characteristics of the currently active and pilot systems, the year in which they became active ranged from 1967 to 2011, although most systems were created in the year 2000 or later. Twenty three of the systems have access to historical data.

A map of Europe in which the names, locations, and status of the systems are specified is shown in Figure 1. As evident in the figure, most of the systems are located in Western Europe.

Figure 1. Map of Europe showing names and locations of syndromic surveillance systems and their status.



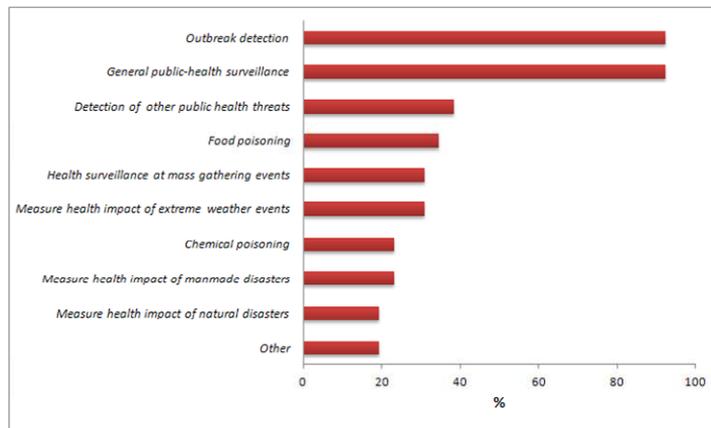
Below we describe the overall situation of SyS in Europe; only the 27 currently active and pilot systems are considered, whereas the 4 systems for mass gathering events, the 2 web-hits systems and the 2 planned systems are discussed separately.

4.2.1. Active and Pilot systems

- **Objectives**

The main functions/objectives of the currently active and pilot systems are shown in Figure 2. As seen in the figure, most systems focus on outbreak detection or general public-health surveillance. The category “Other” included systems capable of response to any emergency, the surveillance of emerging zoonoses; the surveillance of *Escheria coli*, and the surveillance of Haemolytic Uremic Syndrome.

Figure 2. Main functions/objectives of SyS systems



- **Data collection**

Data Providers:

With regard to the data providers (i.e., the source of the data collected by the systems), the most common type of data provider was general practitioners (GP) (12 systems, 2 of which received data from out-of-hours GPs), followed by emergency departments (ED) (n=4), and help lines (n=3); 2 systems each reported outpatient facilities, web hits, or another syndromic surveillance system; 1 system each reported the general population, other health institutions, schools, managers of hospitals, immigration centres, mortality registries, or providers of drug sales. Twenty two systems reported that they had one type of data provider; 1 reported 1 type of provider; 3 had 3 types of providers; and 1 had 4 types of providers.

The frequency with which the data providers actually provide the data to the systems ranged from real time (reported by 3 systems) to weekly (10 systems); the other systems reported (in order of rapidity): every 4 hours (1 system), twice a day (n=1), daily (7 systems), within 2 days (n=1), and variable (n=1). For the two systems based on web hits, data is obviously available immediately.

The means by which data are provided to the systems are: e-mail (n=9), bespoke software (n=8), web portal (n=5), fax (n=2), and post (n=1); as mentioned, there are 2 web-hits systems. Fifteen systems transmit the data automatically; 8 have partially automated data transmission; and 2 have manual transmission. Of the 10 systems that do not have fully automatic transmission, 5 require additional personnel/costs to transmit the data and 2 required that work activities be organized differently. Eighteen systems send individual data alone to the system; 6 send aggregated data; and 1 sends both (information not available for 2 systems).

Data recorded:

With regard to the data sent to the systems (in addition to the medical data being surveyed), the most common demographic variable recorded is gender, followed by geographic place of residence, age/date of birth, and identification number.

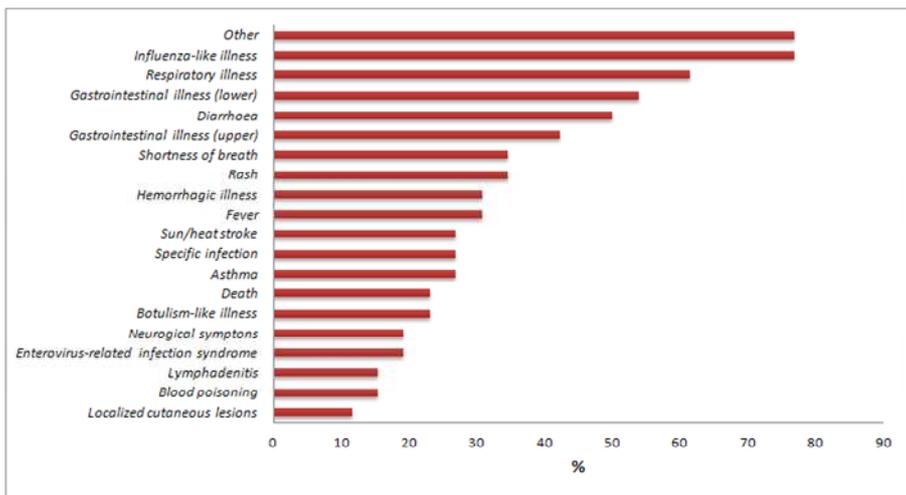
The most commonly recorded medical variables are symptoms/signs, followed by syndromes, medical diagnosis, hospitalization, laboratory testing, and drug therapy.

The codes that the systems use to classify the medical information (symptoms/signs, diagnosis, etc. ...) are as follows: ICD9 CM (2 systems), ICD10 (2 systems), and ICD9 (1 system); 9 systems use another code [i.e., Danish Index; yes/no variable for ILI; SNOMED (Systematized Nomenclature of Medicine); ICPC 1 and 2 (International Classification of Primary Care); bespoke code; and GP coding system (UK)]; for 13 systems, no coding is performed.

Other variables recorded included the date of registration and the place of registration, as well as GP consultation date for ILI, week of work absenteeism and hospitalisation, weekly total hospitalisations, emergency admissions, respiratory admissions, location of hospital, location of patient treatment, hospitalisation ID code, and outcome of triage via help-line.

Based on the medical information collected, a large number of syndromes are built, ensuring public-health surveillance. The syndromes included in the SyS systems are shown in Figure 3. The most common syndrome was influenza-like illness, followed by respiratory illness and gastrointestinal illness. The category “Other” included: measles, mumps, rubella, herpes zoster, chickenpox, hepatitis jaundice; any syndrome with enough related queries (web-hits; every problem reported by diagnosis recorded as “Read Code” (Royal College of GP Weekly Return Service, UK).

Figure 3. Syndromes included in the SyS systems



- ***Data analysis***

The specific method used to analyse the data received by the system depends greatly on the system's objectives, the characteristics of the data (e.g., individual vs. aggregated), the frequency of data collection, and the availability of historical data. The methods reported by the coordinators of the systems were: simple statistical analyses (frequencies, descriptions) (6 systems), modelling for alert (n=4); rates (consultation), incidence (n=3), time series (n=2), and control charts (CUSUM) (n=2).

Regarding the geographic coverage of the data, 20 systems report national coverage; however, the term "national" may only indicate that the data providers are distributed throughout the country but do not necessarily cover the entire population. Two systems each have regional or local coverage; 1 system reported "other", and 2 systems reported "none".

- ***Dissemination***

The main users of the data collected by the SyS systems are: regional authorities (21 systems), Ministry of Health (n=12), the same institution coordinating the system (n=8), GPs (n=5), hospitals (n=3), public-health operators/managers (n=2), epidemiologists, paediatricians, laboratories, general population, journalists, or the data providers themselves (1 system each).

The data are disseminated to the users via e-mail (19 systems), a web site (n=18), and telephone (n=3). The frequency of dissemination is (in order of rapidity): real time (3 systems, information available by web or workstation), weekly (n=16), only when system raises alarm (n=5), weekly during the flu season, fortnightly during the summer (n=2), and monthly (n=1).

- ***Funding***

With respect to funding, most systems (n=22) are funded by the central government, followed by the local government (n=4), research grants (n=2), private funds (n=1), and other (n=1) (the numbers reported in parentheses do not total 27 because some systems have more than one source of funding). Seventeen systems receive perennial or long-term funding, given that they are run as part of institutional activities; annually renewed funding is received by 2 systems; funding renewed every 2-3 years is received by 3 systems; and 1 system receives short-term funding, given that the maintenance of this system is very expensive. One system reported that funding was problematic. Information on the stability of funding was not reported for 3 systems.

- ***Strengths and weaknesses***

Of the strengths of the system reported by the coordinator, which varied greatly depending on the type of data provider and means of collecting data, the most common were: i) the completeness of data and good coverage; ii) the rapidity of data collection; iii) the low cost of the system; and iv) the quality of data. The most commonly reported weaknesses were: i) system only covers predefined diseases and cannot be used for other diseases; ii) very resource intensive; iii) no coding is used (or coding is problematic); and iv) the system is not fully automated.

4.2.2. Web-hits, Mass gathering events and planned systems

As mentioned, the systems based on web hits and those created for mass gathering events are not included in the above description. Two systems that rely on web hits were identified: GETWELL in Sweden and Healthgate in Finland and use selected web portals for either medical professionals or the general public. Regarding the 4 systems created for mass gathering events, all were for sports events: 2 for the Olympic Games (in Athens in 2004 and Turin in 2006); 1 for FIFA Women's World Cup (Germany 2011), and 1 for the European Basketball Championship (Lithuania 2011). The systems were active for duration of event, which ranged from less than 1 month to a couple of months. They were funded by central and local governments, which were also the main users of the systems. Many syndromes were monitored by these systems, including ILI and respiratory diseases, gastrointestinal diseases, diarrhoea, rash, fever, neurological symptoms, hemorrhagic illness, lymphadenitis, localized cutaneous lesions, heat stroke, and death.

Two planned SyS systems were also identified, one in Belgium and the other in Hungary. Both systems plan to use emergency departments as data providers, plus emergency lines in Hungary and ambulance dispatches in Belgium. Both will transmit data daily, via web; individual data will be collected. In Belgium, respiratory and neurological syndromes will be monitored, whereas the system in Hungary will monitor many syndromes (e.g., ILI, neurological, gastrointestinal). For both systems, main demographic data will be collected (gender, age, residence) and the data will be coded using international codes (ICD9, ICD10).

4.3. Literature review:

Regarding the literature search, 70 articles that met the search criteria were identified (see Attachment 6). However, a careful review of these articles reviewed that none of them described systems that we had not already identified with the long questionnaire.

Table 2 – Literature Review: data source groups and respective number of reviewed articles

Data source	No. full text articles
Emergency Department	14
General practitioners	5
Telephone Helpline	11
Web Queries	4
Outpatient facilities	3
Drug Sales/Prescriptions	2
Emergency Medical Dispatch Centres	1
Anti-poison centre	1
Immigration Centre	1
Multiple data sources	15
Other (definitions, methods, ...)	13
Sum	70

5. Discussion

Although the systems differ, many have common characteristics. For example, the most common objectives were general public-health surveillance and outbreak detection. Many of the systems survey a number of syndromes, and most include include ILI/respiratory disease. The data providers are most commonly GPs and EDs. Data are transmitted to the systems in near real-time transmission of data, via electronic means. Individual data are collected, as are demographic and medical data (e.g., signs/symptoms) and historical data. The data are disseminated at least weekly, via electronic means, and the main users are national and regional public-health authorities. The funding of the systems is stable and is usually provided by the central government.

In interpreting the results of our survey, some potential limitations should be taken into consideration. First of all, regarding the brief questionnaire, we cannot be sure that the contact person was aware of all of the SyS systems in his/her country and thus we may have failed to identify some systems. However, we feel that this is unlikely, given that we also relied on individuals participating in the Triple-S Project, most of whom are involved in this type of surveillance, and the literature search revealed no systems that we had not previously identified. A second potential limitation is that we relied on the contact persons to determine whether or not the system they coordinated was indeed a SyS system as defined by the Triple-S Project. In fact, some systems that were initially identified were later deemed to not be true SyS systems. Finally, although the long questionnaire for collecting information on the systems was quite detailed, it is possible that some information that is important to understanding the individual systems may have been missed. However, it must also be considered that many site visits to the systems were performed, which contributed greatly to supplementing and clarifying the information collected with the questionnaires.

Despite these limitations, the information collected by the survey has been fundamental in writing the guidelines that will be produced by Triple-S.

ATTACHMENT 1 – Brief questionnaire, including introductory letter

TRIPLE S PROJECT - INVENTORY OF SYNDROMIC SURVEILLANCE SYSTEM IN EUROPE –

BRIEF QUESTIONNAIRE

COUNTRY

Your name:

Would you be willing to have your name listed on the Project's web site? YES NO

Please, note: if more than one system exists for any of the following categories, please copy and paste the appropriate section.

CURRENTLY ACTIVE SYSTEMS

Name of the system (If the system has no official name, please provide the informal name.)

Website, if available

Brief description of system (i.e., its main functions or objectives and period of activity, including data providers)

Institution coordinating the system

Name and contact information of specific person(s) coordinating the system ("contact person")

Telephone

Fax

E-mail

Alternate contact person (if available): Name

Telephone

Fax

E-mail

SYSTEMS THAT WERE CREATED FOR AN EVENT WITH A PREDEFINED PERIOD OF TIME (E.G., THE OLYMPIC GAMES OR OTHER MASS GATHERING EVENTS)

NOTE: ONLY THOSE ESTABLISHED IN THE YEAR 2000 OR LATER.

Name of the system (If the system has no official name, please provide the informal name.)

Website, if available

Brief description of system (i.e., its main functions or objectives and period of activity)

Institution coordinating the system

Name and contact information of specific person(s) coordinating the system ("contact person")

Telephone

Fax

E-mail

Alternate contact person (if available): Name

Telephone

Fax

E-mail

SYSTEMS THAT HAVE BEEN DISCONTINUED (FOR EXAMPLE, BECAUSE OF LACK OF RESOURCES)

NOTE: ONLY THOSE ESTABLISHED IN THE YEAR 2000 OR LATER.

Name of the system (If the system has no official name, please provide the informal name.)

Website, if available

Brief description of system (i.e., its main functions or objectives)

Reasons of discontinuing

Institution coordinating the system

Name and contact information of specific person(s) coordinating the system ("contact person")

Telephone

Fax

E-mail

Alternate contact person (if available): Name

Telephone

Fax

E-mail

SYSTEM IN A PILOT PHASE OR PLANNED FOR THE FUTURE

Name of the system (If the system has no official name, please provide the informal name.)

Website, if available

Brief description of system (i.e., its main functions or objectives)

Institution coordinating the system

Name and contact information of specific person(s) coordinating the system (“contact person”)

Telephone

Fax

E-mail

Alternate contact person (if available): Name

Telephone

Fax

E-mail

Comments (please provide any comments you may have for any of these systems)

Thank you very much indeed for your collaboration!

INTRODUCTORY LETTER

Dear colleague,

ISS (Italy's National Institute of Public Health) is conducting **an inventory of syndromic surveillance systems in Europe**, as part of the **Triple S Project** [full name: *Triple S-AGE (Syndromic Surveillance Survey, Assessment towards Guidelines for Europe)*].

Triple S is being coordinated by the French Institute for Public Health Surveillance (InVS); it involves 24 organisations in 14 European countries and is co-financed by the Executive Agency for Health and Consumers, as a part of the EU Public Health Action Programme.

The Triple S definition of syndromic surveillance is the following:

Syndromic Surveillance is the real-time (or near real-time) collection, analysis, interpretation and dissemination of health-related data to enable the early identification of the impact (or absence of impact) of potential human or veterinary public-health threats which require effective public health action.

Syndromic surveillance is based not on the laboratory confirmed diagnosis of a disease but on non-specific health indicators including clinical signs, symptoms as well as proxy measures (e.g. absenteeism, drug sales, production collapse in animal health) that constitute a provisional diagnosis (or "syndrome").

The data are usually collected for purposes other than surveillance and, where possible, are automatically generated so as not to impose an additional burden on the data providers. This surveillance tends to be non specific yet sensitive and rapid, and can augment and complement the information provided by traditional test based surveillance systems

The specific objectives of the project are to analyse syndromic surveillance systems throughout Europe - including an in-depth analysis through *site visits* - and to provide guidance for improving existing systems and developing and implementing new ones, including the creation of a handbook on the development of systems.

We believe that you can provide us with information related to the syndromic surveillance systems in your country (characteristics, contact persons for detailed information..): please, could you complete and return us the brief questionnaire attached?

Once we have identified – with your precious help - these systems and the right contact person(s) for each system, we will send her/him detailed questionnaire on how the system works.

For the purposes of the inventory, we wish to have information on the following:

- i) **Currently active** systems;
- ii) Systems that were created for **an event with a predefined period of time** (e.g., the Olympic games or other mass gathering events);
- iii) Systems that have been **discontinued** (for example, because of lack of resources);

Please note, for systems that are not currently active, please include only those that were established in the year 2000 or later;

- iv) Systems in a **pilot phase** or **planned** for the future.

Also, for the purposes of this survey we **are not considering** sentinel networks that provide data for routine influenza surveillance, or mortality monitoring systems, since there are other EU Projects already dealing with these systems such as EISN (European Influenza Surveillance Network) and EuroMOMO (European Monitoring of excess mortality for public health action) respectively.

However, we do **wish to include** sentinel systems for influenza that adopt *novel approaches* to surveying influenza (e.g., website hits).

If you have any doubts as to whether or not a system constitutes a syndromic surveillance system, please do not hesitate to contact us (e-mail: triple-s@iss.it).

Finally, for more information on Triple S, you can consult the website:

www.syndromicsurveillance.eu

We greatly appreciate your collaboration and you will be informed about the results of the inventory as well as of the whole Project, through the above mentioned website.

Sincerely,

Dr. Susanna Conti

Triple S Project WP4 (Inventory of Syndromic Surveillance in Europe) Leader

Mark Kanieff and Grazia Rago, WP4 collaborators

ATTACHMENT 2 – List of contact persons and alternate contact persons for brief questionnaire

Austria – Reinhild Strauss, Hubert Hrabscik

Belgium – Francoise Wuillaume

Bulgaria – Finka Denkova; Mira Kojouharova; Anna Kurchatova

Cyprus – Maria Athanasiadou; Olga Kalakouta

Czech Republic – Jan Kyncl; Jitka Částková

Denmark - Luise Muller

Estonia – Gleb Dennisov; Kuulo Kutsar; Natalia Kerbo

Finland - Pekka Mustonen, Mikko Virtanen

France - Anne Fouillet, Hervé Chaudet

Germany – Andreas Gilsdorf, Tim Eckmanns, Edward Velasco

Greece - Urania Dafni, Dimitris Karlis

Hungary – Anna Paldy

Ireland – Joan O’Donnell

Italy – Paolo Lauriola

Latvia – Irina Lucenko, Antra Bormane

Lithuania - Kotryna Paulauskienė, Vytautas Bakasėnas, Nerija Kupreviciene

Luxembourg – Guy Weber, Pierrette Huberty

Malta – Kathleen England, Tanya Mellilo, Charmaine Gauci

Netherlands – Cees Van den Wijngaard, Liseoltte Van Asten, Mariette Hooiveld

Poland - Bogdan Wojtyniak, Izabela Kucharska, Military Medical Institute Department of Maritime Medicine, Janusz Kocik, Sadkowska-Todys Malgorzata,

Portugal - Mario Carreirira, Orta Gomes, Maria Graca Freitas, Paolo Nogueira, Isabel Natário

Romania – Ioana Pertache, Alexandru Rafila, Elena Lungu

Slovakia – Frantiska Hrubá, Maria Avdicova

Slovenia – Jozica Selb, Irena Klavs, Maja Socan, Maja Praprotnik

Spain – Gloria Carmona Parcerisa, Victor Flores, Karoline de la Hoz

Sweden – Anette Hulth

United Kingdom – Gillian Smith

UK Scotland – Jim McMenamin, Arlene Reynolds

ATTACHMENT 3 - Long questionnaire

QUESTIONNAIRE ON SYNDROMIC SURVEILLANCE

Country:

Your name:

Your organisation:

Your role in the surveillance system:

Would you be willing to have your name and contact information listed on our website?

- i) yes
- ii) no

Name (and role in the surveillance system) of an alternate contact person, if available

Name (and role):

Telephone:

Fax:

E-mail:

Please provide a very brief description of the system (1 or 2 sentences) to be placed on the Project's website (<http://syndromicsurveillance.eu>).

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.....
.....

GENERAL CHARACTERISTICS OF THE SYSTEM

1. What is the complete name of the system? (If no official name exists, please provide the informal name)

- Name in original language:

- Name in English:

- Acronym (if any):

2. Please indicate the system's website address, or if a presentation of the system is available on the web, indicate the web link:

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.....
.....

3. What is the current status of the system?

- i) Currently active
- ii) Completed (i.e., created for an event with a predefined period of time, such as the Olympic games)
- iii) Discontinued (e.g., because of lack of resources, lack of interest by potential users)
- iv) Pilot phase
- v) Planned for the future
- vi) Other (specify)

4. If the system is a currently active system, please provide the start date of the system:

5. If the system is a currently active system, are historical data collected?

Yes

No

6. If the system has been discontinued, please provide the following information:

- Start date :
- End date:
- Reasons for discontinuation:
- Perspectives for the future:

7. If the system is in pilot phase, please provide the start date and the end date:

8. If the system has been planned, please provide the expected start date:

Note, all of the following questions should be answered regardless of the status of the system. More than one answer may be provided.

9. What do you consider the main functions of the system? (Multiple answers possible)

- General public-health surveillance
- Outbreak detection
- Measure health impact of extreme weather events (specify below)
- Measure health impact of natural disasters (specify below)
- Measure health impact of man made disasters (e.g. industrial or nuclear disaster)
- Chemical poisoning
- Food poisoning
- Detection of other public-health threats (specify)
- Health surveillance at mass gathering events (specify below)
- Other (specify)

10. What is the monitored population? (Multiple answers possible)

- General population (specify age range)
- Workers (specify age range)
- Children (specify age range)
- Military population (specify age range)
- Other (specify) (specify age range)

11. What institution/organisation coordinates the system?

.....
.....
.....

12. If other institutions/organisations (excluding data providers) collaborate, please specify the organisation and the activities it performs:

.....
.....
.....

13. Who funds the system? (Multiple answers possible)

- Local government
- Central government
- Privately funded
- Research grants
- Other (specify)

14. Please provide some information on the continuity of funding (e.g; is funding perennial; is it stable, if so for how long; is it short-term, excluding expiration date, etc.):

.....
.....
.....

DATA

Please note: if a flow chart illustrating data collection exists, please send it to triple-s@iss.it.

Data providers

15. Who provides data to the system (referred to as “data providers”)? (Multiple answers possible: For each data provider ticked, a new section of questions will appear):

- A. Emergency departments
- B. Outpatient facilities (other than emergency departments)
- C. General practitioners
- D. Providers of drug sales
- E. Emergency numbers (such as 112)
- F. Other telephone help-lines (specify)
- G. Ambulance dispatch
- H. Schools (for absenteeism)
- I. School clinics
- J. Places of employment (for absenteeism)
- K. Worker clinics or healthcare facilities
- L. Poison control centres
- M. Website hits (specify)
- N. Other surveillance systems or networks (specify)
- O. Other (specify)

15.1. How many data providers provide data to the system?

15.2. How many potential data providers exist in the area(s) covered by the system ? (for example if 150 of the 500 ED in the area provide data to the system, write 500):

15.3. Are the data automatically transmitted from data providers to the system?

- Yes
- No (i.e. manual transmission with someone being responsible for sending the data)
- Partially (please specify)

15.4. If not automated (or if only partially), are there plans to make data transmission fully automated?

- Yes (please specify)
- No

15.5. If data transmission is not fully automated, what is the additional burden for data providers in providing these data to the system? (Multiple answers possible)

- Additional personnel
- Additional costs
- Work organized differently
- Other (specify)

15.6. How do data providers submit data to the system? (Multiple answers possible)

- E-mail
- Web portal
- Fax
- Other (specify)

15.7. How rapidly do the data providers submit data to the system?

- Real time (specify)
- Near real time (specify)
- Daily
- Other (specify)

15.8. Are data provided year-round or only at specific times or for specific occasions(e.g. summertime for monitoring the effects of heat waves, Winter Olympic Games)?

- Year round
- Specific time or occasion

15.9. What type of data are sent by data providers?

- Individual data (e.g. number of patients by age group)
- Aggregated data (e.g. number of patients by age group)

15.10. Is feedback given to the data providers?

- Yes
- No

--- End of Data Provider Section-----

Type of data collected by the system

16. Demographic information:

- i) Age / date of birth
- ii) Gender
- iii) Geographical location of residence (e.g. , postal code)
- iv) Identification number (e.g., ID card, social security)
- v) Name
- vi) Other (specify)

17. Medical information:

- i) medical diagnoses/ clinical signs
- ii) symptoms/signs
- iii) syndromes (i.e. group of symptoms or diagnoses)
- iv) laboratory testing
- v) drug therapy
- vi) hospitalisation
- vii) other (specify)

18. Other information

- i) date of registration of patient / date of call / date of absence
- ii) Place of registration (e.g., emergency departments, school, emergency units (e.g., 112, ambulance, poison control centres)
- iii) other (specify)

19. What “syndromes” are included in surveillance? (Multiple answers are possible):

- Asthma
- Blood poisoning
- Botulism-like illness
- Diarrhoea
- Death
- Enterovirus-related infection syndrome
- Fever
- Gastrointestinal illness (lower)
- Gastrointestinal illness (upper)
- Hemorrhagic Illness

- influenza-like illness (ILI)
- Localized cutaneous lesion
- Lymphadenitis
- Neurological symptoms
- Rash
- Respiratory illness
- Shortness of breath
- Specific Infection
- Sun/heat stroke
- Other (specify)

20. What systems are used to code these syndromes? (Multiple answers possible)

- iv) ICD9
- v) ICD10
- vi) ICD9 CM
- vii) none
- viii) other (please specify),

21. Are the data provided to the system considered to be “personal data” and thus subject to legislation on data privacy?

- no
- yes

22. What is the geographic coverage of the surveillance system?

- i) national,
- ii) regional
- iii) other (specify)

Data analysis

23. At what geographical level are the data analysed? (Multiple answers possible):

- i) at a national level

- ii) at a regional level
- iii) other (please specify)

24.. How often are data analyses performed?

- i) daily
- ii) weekly
- iii) other

25. Do you use statistical methods for outbreak detection?

- yes
- no

26. What data analyses are performed? (Brief description and bibliographic references, if available)

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.....

27. Are the results of the analyses (tables, graphs, reports, etc.) disseminated by website?

- Yes
- No

27.1. If yes to whom?

27.2. How often? (Multiple answers possible)

- i) Real time (specify)
- ii) Near real time (specify)
- iii) Only when the system raises an alarm
- iv) Other (specify)

28. Are the results of the analyses (tables, graphs, reports, etc.) disseminated by e-mail?

- Yes
- No

28.1. If yes to whom?

28.2. How often? (Multiple answers possible)

- i) Real time (specify)
- ii) Near real time (specify)
- iii) Only when the system raises an alarm
- iv) Other (specify)

29. Are the results of the analyses (tables, graphs, reports, etc.) disseminated by fax?

- Yes
- No

29.1. If yes to whom?

29.2. How often? (Multiple answers possible)

- i) Real time (specify)
- ii) Near real time (specify)
- iii) Only when the system raises an alarm
- iv) Other (specify)

30. Are the results of the analyses (tables, graphs, reports, etc.) disseminated by telephone?

- Yes
- No

30.1. If yes to whom?

30.2. How often? (Multiple answers possible)

- i) Real time (specify)
- ii) Near real time (specify)
- iii) Only when the system raises an alarm
- iv) Other (specify)

31. Are the results of the analyses (tables, graphs, reports, etc.) disseminated by other means?

- Yes
- No

31.1. If yes to whom?

31.2. How often? (Multiple answers possible)

- i) Real time (specify)
- ii) Near real time (specify)
- iii) Only when the system raises an alarm
- iv) Other (specify)

USES, EVALUATION, AND PERSPECTIVES OF THE SYSTEM

32. – Who are the main users of the system? (Multiple answers possible):

- i) Ministry
- ii) Regional authorities
- iii) Hospitals
- iv) Other (specify)

33. For what events has the system proven to be useful?

(provide bibliographic references, if available)

34. Has the system been evaluated? (please provide any printed materials that are available)

- Yes
- No

34.1. If so, have the following been evaluated?

- Flexibility
- Timeliness
- Cost
- Quality of data
- Stability of data transmission
- Performance
- Other (specify)

35. Are there plans to expand (or reduce) the system (either geographically or to include additional syndromes or age groups).

- Yes (please specify)
- No

STRENGTHS AND WEAKNESSES

To have an idea of how well the system functions, please describe what you feel are its strong points and weak points.

.....
.....
.....

In addition to the strong and weak points of the system, please use this section to provide any information or clarifications that you feel could not be expressed sufficiently with the answers to this questionnaire.

*If you are aware of any other systems in your country, please name them and provide contact information:

.....
.....
.....

THANK YOU FOR HAVING COMPLETED THE QUESTIONNAIRE!

For more information on Triple S you can consult the Project's website: www.syndromicsurveillance.eu

ATTACHMENT 4 – List of final contact persons for long questionnaire

Country	Contact person
Austria	Reinhild Strauss
Belgium	Petra Van den Eynde
Bulgaria	Anna Kurchatova
Cyprus	Meropi Maria Charalambous Chr. Hadjianastasiou
Czech Republic	Jan Kyncl
Denmark	Niels Ladegaard
Denmark	Kåre Molbak
Estonia	Natalia Kerbo
Finland	Mikko Virtanen
Finland	Pekka Mustonen
France	Hervé Chaudet
France	Céline Caserio-Schnöneman
Germany (1)	Edward Velasco
Germany (2)	Edward Velasco
Germany (3)	Udo Buchholz: (suggested by Velasco)
Germany (5)	Andreas Gilsdorf (suggested by Velasco)
Germany (7)	Tim Eckmanns of RKI (suggested by Gilsdorf)
Greece	Urania Dafni
Hungary	Anna Paldy
Country	Contact
Ireland (5 systems)	Joan O'Donnell
Italy	Filippo Ansaldi
Italy	Carlo Di Pietroantoni
Italy	Flavia Riccardo
Lithuania	Nerija Kupreviciene, Jolita Mackeviciute
Malta	Tanya Mellilo Charmaine Gauci
Netherlands	Mariette Hooiveld (NIVEL)
Portugal	Sergio David Lourenço Gomes
Portugal	Sergio David Lourenço Gomes
Slovakia	Jan Mikas
Slovakia	Jan Mikas
Slovenia	Maja Socan
Sweden	Anette Huth
Sweden	Tom Andersson
United Kingdom (1)	Gillian Smith
United Kingdom (2)	Alex Elliott
United Kingdom (3)	Douglas Fleming
United Kingdom (4)	Alex Elliott
United Kingdom (5)	Alex Elliott

UK Scotland	Jim McMenamin Arlene Reynolds Alexander Malcolm
SIDARTHa	Alexandra Ziemann

ATTACHMENT 5 – Summary sheets describing SyS systems in Europe

Countries with currently active systems

Cyprus (1 system)

Denmark (2 systems)

Finland (1 system)

France (2 system)

Germany (2 systems)

Ireland (4 systems)

Italy (4 systems)

Sweden (1 system)

UK England & Wales (3 systems)

UK Scotland (1 system)

CYPRUS: Network for surveillance and control of communicable diseases	
	ACTIVE since April 2002
WEBSITE	www.moh.gov.cy
COORDINATING INSTITUTION	Unit for Surveillance and Control of Communicable Diseases, Medical and Public Health Services, Ministry of Health
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Stable
REPORTED BRIEF DESCRIPTION	<p>The Surveillance of Communicable Diseases depends on four systems:</p> <p>i) the Mandatory Notified Communicable Diseases, according to relevant legislation (Quarantine Law and Public Health Regulations) based on EU relevant Decisions and EU case definitions (57 diseases);</p> <p>ii) the Sentinel Network, a voluntary System for reporting 11 diseases/syndromes based on clinical diagnosis;</p> <p>iii) Laboratory Network, a voluntary System for reporting isolation of microorganisms/ positive serology results by microbiology laboratories of private/public sector;</p> <p>iv) Sexually Transmitted Diseases Network, a voluntary System for reporting a number of STDs by Gynaecologists and Dermatologists.</p> <p>Sentinel Network concerns weekly syndromic statement based on clinical diagnosis of the following diseases/syndromes: Chickenpox, Viral Gastroenteritis, Bacterial Gastroenteritis, influenza-like illness, Febrile and Rash, Rubella, Hepatitis Jaundice, Measles, Viral Diseases of Upper Respiratory, Mumps syndrome and Pertussis.</p> <p>Data collected for the early detection of diseases clusters or outbreaks for any of the above mentioned diseases/syndromes. Also for the trend of a disease/syndrome through a period of time and as well as compared to the previous years.</p>
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, Outbreak detection, Food poisoning
SYNDROMES	influenza-like illness (ILI), Other: Chickenpox, Viral gastroenteritis, Bacterial gastroenteritis, Febrile and Rush, Measles, Mumps, Rubella, Hepatitis Jaundice, Viral Infections of Upper Respiratory and Pertussis Syndrome
<u>DATA PROVIDERS 1)</u>	General Practitioners (n=66; 30 out of 30 urban and rural health centres, and 36 GPs from the private sector)
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Near real time (weekly)
MEANS OF DATA TRANSMISSION	Manual via Fax, e-mail
INDIVIDUAL/AGGREGATED DATA	Aggregated
<u>DATA PROVIDERS 2)</u>	Outpatient facilities other than emergency departments (5 paediatricians)
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Near real time (weekly)

MEANS OF DATA TRANSMISSION	Manual via Fax, e-mail
INDIVIDUAL/AGGREGATED DATA	Aggregated
VARIABLES	<u>Demographic</u> : Age / date of birth <u>Medical</u> : Syndromes <u>Other</u> : Place of registration
CODING SYSTEM	None
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : the public, <u>BY</u> : website (Ministry of Health), <u>FREQUENCY</u> : every six months <u>TO</u> : health workers of private and public sector, <u>BY</u> : mail, <u>FREQUENCY</u> : every six months
MAIN USERS	Ministry
REPORTED REMARKS AND BIBLIOGRAPHY	Strengths: The voluntary participation of doctors guarantees the completeness of reporting data. Weaknesses: The voluntary participation means limited representative data <i>Information provided by Chrystalla Hadjianastasiou and Meropi Maria Charalambous</i>

DENMARK: Bioalarm	
	<i>ACTIVE since April 2006</i>
WEBSITE	The system is not publicly available
COORDINATING INSTITUTION	Centre for biosecurity and biopreparedness
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Funding is stable and has no defined ending
REPORTED BRIEF DESCRIPTION	Early warning syndromic surveillance; Ambulance dispatches. Outbreak detection; Mathematical algorithms, cluster identification and generation of maps. Full country coverage.
MAIN FUNCTIONS / OBJECTIVES	Outbreak detection, measure health impact of manmade disasters, chemical poisoning, food poisoning, health surveillance at mass gathering events
SYNDROMES	Hemorrhagic Illness, influenza-like illness (ILI), respiratory illness, shortness of breath, specific Infection, botulism-like illness, diarrhoea, fever, gastrointestinal illness (lower), gastrointestinal illness (upper)
DATA PROVIDERS	Ambulance dispatch (5 out of 5 existing)
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Near real-time (every 4 hours)
MEANS OF DATA TRANSMISSION	Automatic via Web portal
INDIVIDUAL/AGGREGATED DATA	Individual data
VARIABLES	<p><u>Demographic</u>: identification number, age/date of birth, gender, geographical location of residence</p> <p><u>Medical</u>: medical diagnoses, symptoms/signs, syndromes, laboratory testing, hospitalisation</p> <p><u>Other</u>: date of registration of patient / date of call / date of absence</p>
CODING SYSTEM	Danish Index
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<p><u>TO</u>: managers of the system, outbreak group members, <u>BY</u>: website, <u>FREQUENCY</u>: near real-time (<i>not specified</i>)</p> <p><u>TO</u>: managers of the system, outbreak group members, <u>BY</u>: e-mail, <u>FREQUENCY</u>: near real-time (<i>not specified</i>)</p>
MAIN USERS	Centre for biosecurity and biopreparedness
REPORTED REMARKS AND BIBLIOGRAPHY	<p><u>Strengths</u>: Full national coverage data at regional levels data with x-y coordinates data with quality information</p> <p><u>Bibliography</u>: Surveillance of ambulance dispatch data as a tool for early warning, Euro Surveill. 2006;11(12): 229-33 Published online December 2006</p>

Information provided by Niels Ladegaard

DENMARK: DMOS (Danish medical on-call service ILI surveillance)	
	<i>ACTIVE since October 2006</i>
WEBSITE	www.ssi.dk http://www.ssi.dk/Aktuelt/Nyhedsbreve/INFLUENZA-NYT.aspx
COORDINATING INSTITUTION	Statens Serum Institut (SSI)
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Funding and system is perennial and considered stable
REPORTED BRIEF DESCRIPTION	A year-round simple electronic reporting system was established in Denmark in collaboration with the Danish medical on-call service (DMOS). Real-time surveillance of influenza-like illness (ILI) was achieved by a simple checkbox for ILI inserted in the electronic health record.
MAIN FUNCTIONS / OBJECTIVES	General public-health, surveillance, outbreak detection, detection of other public-health threats (influenza surveillance)
SYNDROMES	Influenza-like illness (ILI)
DATA PROVIDERS	General practitioners (2,000 out of 2,000)
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily
MEANS OF DATA TRANSMISSION	Automatic via ftp (File Transfer Protocol)
INDIVIDUAL/AGGREGATED DATA	individual data (e.g., information for each patient)
VARIABLES	<u>Demographic</u> : age/date of birth, gender, geographical location of residence <u>Medical</u> : syndromes, hospitalisation <u>Other</u> : date of registration, date of call
CODING SYSTEM	Other (yes/no variable for ILI)
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : professionals and the public; <u>BY</u> : website; <u>FREQUENCY</u> : near real-time (covering the past week) <u>TO</u> : professionals and the public; <u>BY</u> : national epidemiological bulletin <u>FREQUENCY</u> : as a report of the past season
MAIN USERS	Ministry, regional authorities, GPs
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths</u> : Ongoing and close to real time, easy to analyse, low cost, provides possibilities for daily analyses whereas sentinel systems is weekly and has a longer delay. We can also use it to monitor the overall pressure on the DMOS in case of emergencies. <u>Weaknesses</u> : No laboratory diagnosis, no personal identifier, no codes for other diseases or syndromes, the latter would make the system more useful for other diseases as well.

Bibliography: www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19767

Information provided by Kåre Mølbak.

FINLAND: Health Gate		<i>ACTIVE since January 2001</i>
WEBSITE	www.terveysportti.fi	
COORDINATING INSTITUTION	Duodecim Medical Publication Ltd in collaboration with THL Finland (National Institute for Health and Welfare)	
FUNDING INSTITUTION	Private funds	
CONTINUITY OF FUNDING	Not specified	
REPORTED BRIEF DESCRIPTION	Health portal for medical professionals; Health portal for general public Correlation between search terms and serologically verified epidemics	
MAIN FUNCTIONS / OBJECTIVES	Outbreak detection	
SYNDROMES	Asthma, hemorrhagic illness, influenza-like illness (ILI), lymphadenitis, neurological symptoms, rash, respiratory illness, shortness of breath, specific infection, sun/heat stroke, blood poisoning, botulism-like illness, diarrhoea, enterovirus-related infection syndrome, fever, gastrointestinal illness (lower), gastrointestinal illness (upper)	
DATA PROVIDERS	Healthcare professionals (50 out of 4 million potential users of public health portal);	
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Real time (<i>no further specification</i>)	
MEANS OF DATA TRANSMISSION	Automatic via web portal	
INDIVIDUAL/AGGREGATED DATA	<u>ONLY WEB HITS</u> regarding syndromes	
VARIABLES	<i>Not applicable</i>	
CODING SYSTEM	ICD 10	
GEOGRAPHIC COVERAGE	National	
DISSEMINATION	<u>TO</u> : anyone interested; <u>BY</u> : as publications and for a service fee, if so desired; <u>FREQUENCY</u> : If asked for	
MAIN USERS	Regional authorities, THL (National Institute for Health and Welfare)	
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths</u> : The system is fast. <u>Weaknesses</u> : vulnerable to hacking	

Information provided by Pekka Mustonen

FRANCE: ASTER (Alerte et surveillance en temps réel)	
	<i>ACTIVE since October 2004</i>
WEBSITE	http://cybertim.timone.univ-mrs.fr/recherche/projets-recherche/ASTER
COORDINATING INSTITUTION	Ministère de la defense – Service de santé des armées, <u>collaborating with</u> Aix-Marseille Université (university / school of medicine – Scientific support); CNES-MEDES (Medical department of the National Center for Space Studies , Technical support); Institut Pasteur de Guyane (Scientific support)
FUNDING INSTITUTION	Research grants, central government
CONTINUITY OF FUNDING	Perennial funding concerning the maintenance in operational condition and the international extension Research fundings of 4-years long periods for the extensions and enhancements Transfer to an industrial society ongoing
REPORTED BRIEF DESCRIPTION	ASTER (Alerte et Surveillance en Temps Réel) is an epidemiological surveillance system for the early warning of natural or aggressive biological threats. It is specifically tailored for a nomadic data collection and allows using various transmission facilities
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, outbreak detection, measure health impact of extreme weather events (extreme temperatures), measure health impact of manmade disasters, chemical poisoning, food poisoning, detection of other public health threats (biological or chemical aggressions)
SYNDROMES	Asthma, hemorrhagic illness, influenza like illness (ILI), localized cutaneous lesion, lymphadenitis, neurological symptoms, rash, respiratory illness, shortness of breath, specific Infection, sun/heat stroke, blood poisoning, botulism-like illness, diarrhoea, death, enterovirus-related infection syndrome, fever, gastrointestinal illness (lower), gastrointestinal illness (upper)
<u>DATA PROVIDERS 1</u> (<u>Outpatient facilities</u> (9 out of a total number not specified)
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Real time (immediate availability on web services)
MEANS OF DATA TRANSMISSION	Automatic via web services opened on local servers
INDIVIDUAL/AGGREGATED DATA	Individual
<u>DATA PROVIDERS 2</u>	<u>General Practitioners</u> (24 out of 24)
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Real time (immediate availability on web services)
MEANS OF DATA TRANSMISSION	Automatic via web services opened on local servers
INDIVIDUAL/AGGREGATED DATA	Individual
<u>DATA PROVIDERS 3</u>	<u>Worker Clinics or Healthcare Facilities</u> (9 out of 9)

FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Real time (immediate availability on web services)
MEANS OF DATA TRANSMISSION	Automatic via web services opened on local servers
INDIVIDUAL/AGGREGATED DATA	Individual
VARIABLES	<u>Demographic</u> : age/date of birth, gender, geographical location of residence, other (case's geographical location) <u>Medical</u> : symptoms/signs, syndromes, laboratory testing, other (specific notifiable disease surveillance systems) <u>Other</u> : Date of registration of patient / date of call
CODING SYSTEM	SNOMED (Systematized Nomenclature of Medicine)
GEOGRAPHIC COVERAGE	Djibouti, French Guyana
DISSEMINATION	<u>TO</u> : all stakeholders, weekly; <u>BY</u> : e-mail; <u>FREQUENCY</u> : only when the systems raises an alarm; <u>TO</u> : epidemiologists; <u>BY</u> : Using specific workstation; <u>FREQUENCY</u> : real time
MAIN USERS	Epidemiologists
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Bibliography</u> : i) Meynard J-B, Chaudet H, Texier G, Dupuy B, Queyriaux B, Pellegrin L, Deparis X, Migliani R, Spiegel A, Boutin J-P. Advantages and limits of real time epidemiological surveillance during military deployments: the experience of the French Armed Forces. <i>Military Medicine</i> 2009;174(10):1068-74. ii) Meynard JB, Chaudet H, Texier G, Ardillon V, Ravachol F, Deparis X, Jefferson H, Dussart P, Morvan J, Boutin JP. Value of syndromic surveillance within the Armed Forces for early warning during a dengue fever outbreak in French Guiana in 2006. <i>BMC Med Inform Decis Mak.</i> 2008 Jul 2;8:29.

Information provided by Hervé Chaudet

FRANCE: SurSaud (Surveillance sanitaire des urgences et des décès)	
<i>ACTIVE since 2004</i>	
WEBSITE	http://www.invs.sante.fr/surveillance/urgences/default.htm
COORDINATING INSTITUTION	Institut de Veille Sanitaire (INVS)
FUNDING INSTITUTION	<p>For the ED network, in July 2004, the initial IT equipment and software development investment needed to set up the system was financed by InVS and totalled €60,000. Since the set-up, InVS does not provide resource allocation to the ED. The recruitment of the ED is based on a voluntary service and the condition to enter the network for ED is to be informatised; The informatization is financed by the Health Ministry.</p> <p>For the associations SOS Médecins, the batch allowing the transmission from the national server SOS to the InVS server was founded by InVS in 2006. Each year, InVS pay an allocation (about €6,000) to the national organisation SOS Médecins for the maintenance of this batch. But InVS does not fund the different associations included in the system.</p> <p>The employees to maintain the system and analyse data are personnel from InVS.</p>
CONTINUITY OF FUNDING	Stable
REPORTED BRIEF DESCRIPTION	The French syndromic surveillance system implemented by the French institute for public health surveillance (Institut de Veille Sanitaire, InVS) since 2004 consists in a network based on different sources of data available in real time from: 1) hospital emergency departments, 2) GP emergency and healthcare network and 3) mortality registry offices. These daily collected data can be used for early detection of abnormal health-related events or to quantify the health impact of major events.
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, outbreak detection, measure health impact of extreme weather events (heat wave, cold spell, storm, flood), measure health impact of natural disasters (earthquake, volcanic eruption), measure health impact of manmade disasters, detection of other public health threats (chemical, biological, radiological, nuclear threats), health surveillance at mass gathering events (G8/G20)
SYNDROMES	Asthma, influenza-like illness (ILI), neurological symptoms, rash, respiratory illness, shortness of breath, specific infection, sun/heat stroke, diarrhoea, death, fever, gastrointestinal illness (lower), gastrointestinal illness (upper)
<u>DATA PROVIDERS 1)</u>	<u>Emergency departments (300 out of 600)</u>
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Twice a day
MEANS OF DATA TRANSMISSION	Automatic extraction

INDIVIDUAL/AGGREGATED DATA	Individual
<u>DATA PROVIDERS 2)</u>	<u>Other Surveillance System: SOS médecins</u>
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Near real time (daily)
MEANS OF DATA TRANSMISSION	Automatic extraction
INDIVIDUAL/AGGREGATED DATA	Individual
<u>DATA PROVIDERS 3)</u>	<u>Mortality registry offices (3,000 out of 36,000)</u>
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily
MEANS OF DATA TRANSMISSION	<i>No answer</i> ; automatic
INDIVIDUAL/AGGREGATED DATA (Individual
VARIABLES	<u>Demographic</u> : age/date of birth, gender, geographical location of residence <u>Medical</u> : medical diagnoses <u>Other</u> : none
CODING SYSTEM	ICD-10
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : general; <u>BY</u> : web; <u>FREQUENCY</u> : weekly <u>TO</u> : scientific committee of the two data sources and data providers; general Direction of InVS; <u>BY</u> : e-mail; <u>FREQUENCY</u> : weekly
MAIN USERS	Regional authorities
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths</u> : Timeliness (daily collection and analysis), with automatic monitoring and transmission of structured data; Individual data with medical diagnosis; National coverage, including the overseas; Without any specific workload for data providers; System with complementary data sources (from GPs and from ED); Very high flexibility and adaptability (both for infectious and environmental events); Close contact and cooperation with professional networks. <u>Weaknesses</u> : Still not exhaustive and not representative (voluntary network) – With data sources from Emergency GP's, mainly urban areas covered by the associations SOS Medecins; Population estimation not known: incidence rate non valuable; Miss of some pathologies with direct admission in ICU or hospitalization unit (heart attack, severity criteria...) or rare pathologies.

Information provided by Céline Caserio

GERMANY: GrippeWeb	
	<i>ACTIVE since March 2011</i>
WEBSITE	www.grippeweb.rki.de
COORDINATING INSTITUTION	Robert Koch Institute (RKI)
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Included in the institute's budget, but no specific funding as such
REPORTED BRIEF DESCRIPTION	Interested participants register on the website www.grippeweb.rki.de , enter some basic data, including their e-mail address then they receive weekly an email if they have had an acute respiratory illness
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance
SYNDROMES	Influenza-like illness (ILI), respiratory illness
DATA PROVIDERS	General population: volunteer participants (1,300)
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Real time
MEANS OF DATA TRANSMISSION	Automatic via web portal
INDIVIDUAL/AGGREGATED DATA	Individual
VARIABLES	<u>Demographic</u> : age/date of birth, gender, geographical location of residence <u>Medical</u> : medical diagnoses, symptoms/signs <u>Other</u> : none
CODING SYSTEM	None
GEOGRAPHIC COVERAGE	National (but a limited number of participants)
DISSEMINATION	Website
MAIN USERS	Public health operators, general population, journalists
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths</u> : Direct link with population; frequent analysis and feedback <u>Weaknesses</u> : data security issues prevent more interesting data and analyses

Information provided by Udo Buchholz

GERMANY: EpiLag (Epidemiological situation telephone conference)	
	<i>ACTIVE since January 2009</i>
WEBSITE	Not available
COORDINATING INSTITUTION	Robert Koch Institute (RKI), collaborating with 16 federal-state governmental public health agencies and the federal armed forces
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Departmental resources, stable
REPORTED BRIEF DESCRIPTION	A weekly epidemiological situation telephone conference (Epidemiologische Lage Konferenz or EpiLag) for information exchange among representatives in the Department for Infectious Disease Epidemiology at the RKI, representatives and infectious disease consultants within each of the 16 federal-state governmental public health agencies, and the federal armed forces. The EpiLag was created as a routine, structured channel to handle event-based information with potential national and regional infectious-disease relevance, rare or special events that are of immediate interest or events that require collaborative discussion and potential action.
MAIN FUNCTIONS / OBJECTIVES	General public-health, surveillance, outbreak detection, food poisoning, information exchange, help with electronic data reporting
SYNDROMES	Hemorrhagic illness, influenza-like illness (ILI), respiratory illness, specific infection, diarrhoea, enterovirus-related infection syndrome, fever, gastrointestinal illness (lower); due to the nature of EpiLag, anything can be anticipated.
DATA PROVIDERS	Robert Koch Institute (RKI) and 16 federal-state governmental public health agencies
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Weekly
MEANS OF DATA TRANSMISSION	Manual via e-mail, telephone
INDIVIDUAL/AGGREGATED DATA	Individual
VARIABLES	<u>Demographic</u> : age/date of birth, gender, geographical location of residence, other (depending on nature of reported event) <u>Medical</u> : medical diagnoses, symptoms/signs, syndromes, laboratory testing, drug therapy, hospitalisation
CODING SYSTEM	None
GEOGRAPHIC COVERAGE	National, state and local level
DISSEMINATION	None
MAIN USERS	Regional authorities
REPORTED REMARKS AND	<u>Strengths and weaknesses</u> : Structured means for states to communicate with each other and the national institute about important infectious disease events. Provides

BIBLIOGRAPHY only regular channel to transmit nationally-distributed information to colleagues at regional, state and local levels. The service is very resource-intensive.

Information provided by Edward Velasco

IRELAND: GP influenza sentinel surveillance system	
	<i>ACTIVE since October 2000</i>
WEBSITE	http://www.hpsc.ie/hpsc/A-Z/Respiratory/Influenza/SeasonalInfluenza/Surveillance/
COORDINATING INSTITUTION	Health Protection Surveillance Centre
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Government funded-perennial
REPORTED BRIEF DESCRIPTION	Influenza surveillance using computerised sentinel general practices in Ireland was established in 2000. This surveillance scheme is a collaboration between the Health Protection Surveillance Centre (HPSC), the Irish College of General Practitioners (ICGP), the National Virus Reference Laboratory (NVRL) and the Departments of Public Health. Sixty sentinel general practices covering 6.2% of the national population participate and undertake clinical surveillance of influenza like illness (ILI) and virological surveillance of influenza on a weekly basis.ILI is defined as per the EU case definition. Weekly reports are produced during the influenza season (Weeks 40 to 20) and fortnightly reports are produced during the summer.
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, outbreak detection, detection of other public health threats (influenza/influenza pandemic)
SYNDROMES	Influenza-like illness (ILI), gastrointestinal illness (lower), other (measles mumps, rubella, varicella and herpes zoster)
DATA PROVIDERS	The data providers of this system are <u>Syndromic Surveillance Systems themselves, described separately in summary sheets:</u> <ol style="list-style-type: none"> 1) GP Sentinel Surveillance System 2) Sentinel School Surveillance System 3) Sentinel Hospital Surveillance
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	weekly
MEANS OF DATA TRANSMISSION	Partially automated via e-mail (automatic transfer from GPs to GP coordinator, who manually collates data into Excel for HPSC)
INDIVIDUAL/AGGREGATED DATA	Aggregated
VARIABLES	<u>Demographic:</u> age/date of birth, gender, geographical location of residence <u>Medical:</u> medical diagnoses, syndromes, laboratory testing, drug therapy <u>Other:</u> date of consultation for ILI and week of absenteeism & week of admission to hospital
CODING SYSTEM	None
GEOGRAPHIC COVERAGE	National

DISSEMINATION	<u>TO</u> : data providers, clinicians, public health, laboratories and health care managers, <u>BY</u> : website and e-mail, <u>FREQUENCY</u> : weekly during flu season and fortnightly during the summer
MAIN USERS	Health Protection Surveillance
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths</u> : The system provides timely information on flu trends in the population including age groups affected, circulating viruses and areas of high flu activity. <u>Weaknesses</u> : Not fully automated. No coding for clinical diagnoses. Resource intensive

Information provided by Joan O Donnell

IRELAND: GP sentinel surveillance system	
	<i>ACTIVE since October 2000</i>
WEBSITE	www.hpsc.ie/hpsc/A-Z/Respiratory/Influenza/SeasonalInfluenza/Surveillance/
COORDINATING INSTITUTION	<u>Health Protection Surveillance system</u> , (HPSC) <u>collaborating with: Irish College of General Practitioners</u> : collate weekly clinical ILI data from GPs and send collated data to the Health Protection Surveillance Centre for analysis. <u>National Virus Reference Laboratory</u> : Test swabs from sentinel GPs for influenza on a weekly basis. Results of swabs are collated by the NVRL and sent to HPSC on a weekly basis for analysis
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Currently funding is perennial and stable
REPORTED BRIEF DESCRIPTION	The Irish GP sentinel surveillance scheme is a collaboration between the Health Protection Surveillance Centre (HPSC), the Irish College of General Practitioners (ICGP), the National Virus Reference Laboratory (NVRL) and the regional Departments of Public Health. Sixty sentinel general practices covering 5.6% of the national population have been recruited to report on the number of patients with influenza-like illness (ILI) on a weekly basis. The EU ILI case definition is used by sentinel GPs. In addition, sentinel GPs undertake virological surveillance for influenza by sending a combined nasal and throat swab, to the NVRL, on at least one patient per week where a clinical diagnosis of ILI is made during the influenza season
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, outbreak detection
SYNDROMES	influenza-like illness (ILI), gastrointestinal illness (lower), other (clinical measles, mumps, rubella, herpes zoster and chicken pox)
DATA PROVIDERS	60 general practices comprising 135 general practitioners. Nationally there are approximately 2,427 general practitioners of whom 135 provide data. Hence data are provided by approximately 5.6% of GPs. The sentinel scheme covers 6.2% of the national population.
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Weekly (data are submitted to HSPC by ICGP and NVRL on a weekly basis all year round)
MEANS OF DATA TRANSMISSION	Partially automated via e-mail (GPs send data electronically to the co-ordinator who collates the data & sends to HPSC)
INDIVIDUAL/AGGREGATED DATA	Individual
VARIABLES	<u>Demographic</u> : age/date of birth, gender, geographical location of residence <u>Medical</u> : medical diagnoses, symptoms/signs, syndromes, laboratory testing, drug therapy <u>Other</u> : date of registration of patient / date of call
CODING SYSTEM	None

GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : Clinicians, laboratories, public health physicians, surveillance scientist, policy makers, ministry of health, healthcare managers; <u>BY</u> web and e-mail; <u>FREQUENCY</u> : For influenza: weekly during the flu season and fortnightly during the summer. For the other diseases, this report is sent monthly to GP data providers, NVRL and ICGP
MAIN USERS	Ministry, regional authorities, hospitals, laboratories, hospital clinicians, GPs, policy makers (e.g., national immunisation advisory committee)
REPORTED REMARKS AND BIBLIOGRAPHY	<p><u>Strengths</u>: Influenza: The system provides timely and good quality data on influenza activity during the flu season. It monitors ILI activity in all age groups and gives a good indication of the dominant flu virus in circulation. It also gives a good indication of regional flu activity and gives reasonable national representation. In relation to other diseases, it provides valuable data on chickenpox and herpes zoster as varicella is not currently notifiable, this is often the sole data source in this regard.</p> <p><u>Weaknesses</u>: Need to increase virological surveillance of ILI patients. Data transmission is partially computerised. The GPs send ILI returns electronically to the GP co-ordinator who collates them into an Excel sheet and sends them to HPSC. HPSC then enters this into an MS Access database and analyses the data. The NVRL collates the results of sentinel swabs and sends them to the HPSC who then enters this into an MS Access database and analyses the data. Surveillance of measles, mumps, rubella gastroenteritis, chickenpox and shingles is purely clinical surveillance based on clinical diagnoses by GPs.</p>

Information provided by Joan O Donnell

IRELAND: Sentinel school surveillance system	
	<i>ACTIVE since January 2002</i>
WEBSITE	http://www.hpsc.ie/hpsc/A-Z/Respiratory/Influenza/SeasonalInfluenza/Surveillance/
COORDINATING INSTITUTION	Health Protection surveillance centre, collaborating with: Regional departments of public health. These departments liaise with sentinel schools in their regions and receive weekly absenteeism data from the sentinel schools which they collate and forward to HPSC for inclusion in the weekly influenza report.
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Funding is perennial and stable at present. This system does not need specific funding but is undertaken as part of the job description of surveillance scientists in regional departments of public health and so is indirectly funded by central government who pay for their salaries. There is no specific "ring fenced" funding for this scheme
REPORTED BRIEF DESCRIPTION	A sentinel school scheme comprising 46 schools (includes both primary and secondary schools) located in all health authority areas was also established. These schools are located in close proximity to the sentinel GPs and report absenteeism data on a weekly basis during the influenza season (week 40 to week 20). This is a collaborative project between the Health Protection Surveillance centre, regional departments of public health and sentinel schools
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, outbreak detection. Monitors absenteeism so may detect outbreaks of infectious disease or other illness
SYNDROMES	In this case the system is referred to school absenteeism (average number of students 4 to 18 years old absent per week)
DATA PROVIDERS	46 sentinel schools: 27 primary schools out of 3.300 and 19 secondary schools out of 700
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Data providers in general provide weekly absenteeism data to regional departments of public health who forward to HPSC. Not all data providers are timely
MEANS OF DATA TRANSMISSION	Fax, e-mail, post; partially automated (data are manually sent to regional units who collate it electronically and send to HPSC)
INDIVIDUAL/AGGREGATED DATA	Aggregated
VARIABLES	None
CODING SYSTEM	None
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : clinicians, laboratories, public health, ministry of health, policy makers, healthcare managers, schools who provide data; <u>BY</u> : website, e-mail; <u>FREQUENCY</u> : weekly during the influenza season
MAIN USERS	Ministry, regional authorities, Health Protection Surveillance System

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Weaknesses: The timeliness and completeness of data from providers is variable across regions. Schools report on a weekly basis the daily levels of absenteeism and that the departments of public health send the mean absenteeism number to the HPSC weekly. Communications between the departments of public health and the schools can be limited with departments sending either an annual report, an end of year letter of thanks or the HPSC annual report to their sentinel schools. This low level of communications could be having an impact on the enthusiasm of schools to provide complete and timely data to the departments of public health.

Information provided by Joan O Donnell

IRELAND: Sentinel hospital surveillance system	
	<i>ACTIVE since January 2002</i>
WEBSITE	http://www.hpsc.ie/hpsc/A-Z/Respiratory/Influenza/SeasonalInfluenza/Surveillance/
COORDINATING INSTITUTION	Health Protection Surveillance Centre, collaborating with: bed managers/IT managers in the 9 participating sentinel hospitals provided data to the regional departments of public health who collate these data and email them to HPSC who then undertake analysis
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	There is no ring fenced funding for this surveillance scheme. However, data providers from hospitals and scientists in public health departments undertake this surveillance as part of their work and their salaries are supplied by central government. This surveillance is integrated in to the work of these organisations.
REPORTED BRIEF DESCRIPTION	The regional departments of Public Health have established at least one sentinel hospital in each health authority area to report data on total hospital admissions, total emergency admissions and total respiratory admissions by age group on a weekly basis. Currently nine sentinel hospitals including one paediatric hospital participates. The definition of respiratory illness in this instance includes upper respiratory tract infection, lower respiratory tract infection, pneumonia, asthma, chronic bronchitis, and exacerbations of chronic obstructive airways disease. This scheme is a collaboration between sentinel hospital data providers, regional departments of public health and HPSC.
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, outbreak detection, detection of other public-health threats (detect increase in admissions due to any respiratory pathogens including influenza)
SYNDROMES	Respiratory illness, other (respiratory admissions; the definition of respiratory illness in this instance includes upper respiratory tract infection, lower respiratory tract infection, pneumonia, asthma, chronic bronchitis, and exacerbations of chronic obstructive airways disease)
DATA PROVIDERS	Bed managers/HIS managers in sentinel hospitals 9 out of 51 public hospitals
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Weekly, year-round
MEANS OF DATA TRANSMISSION	Partially automated (hospital data faxed/e-mailed to public health who send it electronically to HPSC)
INDIVIDUAL/AGGREGATED DATA	Aggregated (number of patients by age group)
VARIABLES	<u>Demographic</u> : age/date of birth, geographical location of residence, other (geographic location of hospital is provided and some hospitals provide admissions by EISN age groups) <u>Medical</u> : other (total admissions, emergency admissions and respiratory admissions by week. Some hospitals provide admissions by age group.)

CODING SYSTEM	None
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : clinicians, laboratories, public health, healthcare managers, policy makers, hospitals and ministry of health; <u>BY</u> website and mail. <u>FREQUENCY</u> : data are included in the weekly influenza report between weeks 40 and 20 (flu season)
MAIN USERS	Ministry, regional authorities, hospitals, healthcare managers
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths and weaknesses</u> : Data is usually complete but not always timely from some sites. This usually occurs due to lack of holiday cover. Most of the sentinel hospitals are regional hospitals or tertiary referral hospitals which also provide a local service. Therefore the hospitals should be representative of the population both in terms of a rural/urban mix and socioeconomic profile. The level of communications between the departments of public health and the hospitals was mostly via annual reports.

Information provided by Joan O Donnell

IRELAND: GP out-of-hours syndromic surveillance system	
	<i>ACTIVE since May 2009</i>
WEBSITE	http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19632
COORDINATING INSTITUTION	Health Services Executive-Department Public Health HSE Dublin North East and HPSC (Health Protection Surveillance Centre)
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Funding perennial and stable as GP out-of-hour service is a fundamental component of the primary care service in Ireland.
REPORTED BRIEF DESCRIPTION	The GP out of hours syndromic surveillance system is a tele-health system which provides weekly figures on self reported influenza like illness in the community. It covers approximately 70% of the national population with 7 out of 9 GP out of hours services providing data. It is a collaboration between the GP out of hours service, the Health Services Executive and the Health Protection Surveillance Centre.
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, Outbreak detection
SYNDROMES	Influenza-like illness (ILI)
DATA PROVIDERS	7 of 9 GP out-of-hours services nationally covering 70% of the national population
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	weekly
MEANS OF DATA TRANSMISSION	Partially automated (data from the GP out of hours system are collated and emailed to public health)
INDIVIDUAL/AGGREGATED DATA	Aggregated (number of patients by age group)
VARIABLES	<u>Demographic</u> : age/date of birth, gender, geographical location of residence <u>Medical</u> : symptoms/signs, syndromes <u>Other</u> : location where patient treated (i.e., home visit or treatment centre)
CODING SYSTEM	None
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : Clinicians, public health, surveillance scientists, ministry of health, policy makers, GPs, laboratories, healthcare managers and the public; <u>BY</u> website and e-mail; <u>FREQUENCY</u> : Weekly reports during the flu season (weeks 40-20)
MAIN USERS	Ministry, regional authorities, health services managers, policy makers, GPs
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths</u> : The GP OOH covers 70% of the national population and data are entered in real time so can access daily data if required. Also, flexible as can incorporate new reports and new syndromes. <u>Weaknesses</u> : Not clinically coded and depends on self-reported data

Information provided by Joan O Donnell

ITALY: Syndromic surveillance system of respiratory infections, gastroenteritis, acute hepatitis, fever and other diseases	
	ACTIVE since July 2007
WEBSITE	None
COORDINATING INSTITUTION	A.O.U. San Martino, Genoa I.R.C.C.S. G. Gaslini, Genoa Agenzia Regionale Sanitaria, Regione Liguria Dipartimento della salute e servizi sociali, Regione Liguria (Hospital San Martino Genoa, Institute Gaslini, Genoa, Department of health and welfare of Liguria Region)
FUNDING INSTITUTION	Local government
CONTINUITY OF FUNDING	Yearly funding
REPORTED BRIEF DESCRIPTION	In July 2007 a pilot chief complaint Emergency Department Syndrome surveillance system, based on data collected at "San Martino" and "G. Gaslini", regional reference hospital for adults and children in Liguria, began. Five syndromes have been under investigation by the syndromic surveillance system, namely, influenza-like illness, low respiratory tract infections, non-haemorrhagic gastroenteritis, acute hepatitis, fever with rash (maculopapular and vesicular).
MAIN FUNCTIONS / OBJECTIVES	General public-health, surveillance, outbreak detection
SYNDROMES	Influenza-like illness (ILI), rash, respiratory illness, shortness of breath, diarrhoea, enterovirus-related infection syndrome, fever, gastrointestinal illness (lower), gastrointestinal illness (upper)
DATA PROVIDERS	Emergency departments (2 out of 6)
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily
MEANS OF DATA TRANSMISSION	Automatic via e-mail
INDIVIDUAL/AGGREGATED DATA	Individual
VARIABLES	<u>Demographic</u> : age/date of birth, gender, geographical location of residence <u>Medical</u> : medical diagnoses, symptoms/signs, syndromes, laboratory testing, drug therapy, hospitalisation <u>Other</u> : hospitalization identification code
CODING SYSTEM	Based on case definitions, each syndrome was identified by a combination of keywords that must appear in specific fields (anamnesis, case history, objective examination and comments) of the emergency department registration and triage software.
GEOGRAPHIC COVERAGE	Genoa metropolitan area (about 1,000,000 inhabitants)
DISSEMINATION	<u>TO</u> : Ministry of Health, Istituto Superiore di Sanità, health authorities, Regional health agency, hospitals, emergency departments, local health unit officers, GPs, paediatricians, <u>BY</u> : e-mail; <u>FREQUENCY</u> : only when the system raises an alarm, real-time

(periodically according to the syndrome/season/epidemiological picture)

MAIN USERS Regional authorities, hospitals, general practitioners, paediatricians

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BIBLIOGRAPHY** Strengths: Integration with lab-based surveillance for rapid detection and characterization of agents responsible of syndromes - high specificity and sensibility as emerged by on-field evaluation -early detection of outbreaks
Bibliography: Measles outbreak [J Med Virol 2009;81:1807-13; J Prev Med Hyg 2008;49(4):131-5; J Prev Med Hyg 2010;51:67-72 Influenza pandemic [J Prev Med Hyg 2011, in press]

Information provided by Filippo Ansaldi

ITALY: Emergency room admission surveillance		<i>ACTIVE January 2008</i>
WEBSITE	-	
COORDINATING INSTITUTION	Servizio Sovrazonale Epidemiologia ASL AL (Epidemiological Service Alessandria) collaborating with Istituto Superiore di Sanità (Italy's National Institute of Public Health)	
FUNDING INSTITUTION	Local government, central government	
CONTINUITY OF FUNDING	Problematic situation	
REPORTED BRIEF DESCRIPTION	The syndromic surveillance system is based on a network of emergency services from which the system collects a minimum set of information weekly. the aim is to build a system of ongoing monitoring of potential emergency situations that can occur both in large urban areas, both during periods of public health high alert such as, for example, heat waves, periods of influenza, pandemic emergencies, events that attract large numbers of people (mass gathering events). The network currently involves 7 regions, 40 emergency departments.	
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, outbreak detection, measure health impact of extreme weather events (heat waves), health surveillance at mass gathering events	
SYNDROMES	Hemorrhagic illness, influenza-like illness (ILI), localized cutaneous lesion, lymphadenitis, neurological symptoms, rash, respiratory illness, diarrhoea, death, gastrointestinal illness (lower), gastrointestinal illness (upper)	
DATA PROVIDERS	Emergency departments (40 out of 742)	
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Weekly	
MEANS OF DATA TRANSMISSION	Manual via Web portal	
INDIVIDUAL/AGGREGATED DATA	Individual	
VARIABLES	<u>Demographic</u> : identification number, age/date of birth, gender, geographical location of residence <u>Medical</u> : medical diagnoses, hospitalisation <u>Other</u> : date of registration of patient	
CODING SYSTEM	ICD- 9 CM	
GEOGRAPHIC COVERAGE	National (7 Regions out of 21)	
DISSEMINATION	<u>TO</u> : participants, <u>BY</u> : e-mail, website, <u>FREQUENCY</u> : weekly	
MAIN USERS	Ministry of health, Regional authorities	

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None reported

Information provided by Carlo Di Pietrantonj

ITALY: The Latium Region syndromic surveillance system**ACTIVE since March 2006**

WEBSITE	http://www.asplazio.it/asp_online/att_ospedaliera/sorveglianza_sindromica_new/sorveglianza_sindromica.php?menu=s33
COORDINATING INSTITUTION	LAZIOSANITA' - ASP (Latium's Regional Public Health Agency)
FUNDING INSTITUTION	Local government
CONTINUITY OF FUNDING	Perennial
REPORTED BRIEF DESCRIPTION	The Latium Region Syndromic surveillance system is based on the Emergency Informative System, that, since 2000, has recorded all emergency ward admissions in Lazio from all Emergency departments in the Region
MAIN FUNCTIONS / OBJECTIVES	General public-health, surveillance, outbreak detection
SYNDROMES	Influenza-like illness (ILI), respiratory illness
DATA PROVIDERS	Emergency departments (38 out of 54)
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Real time (every 6 min)
MEANS OF DATA TRANSMISSION	Automatic via specific software
INDIVIDUAL/AGGREGATED DATA	Individual
VARIABLES	<u>Demographic</u> : age/date of birth, gender <u>Medical</u> : medical diagnoses, symptoms/signs, syndromes <u>Other</u> : date of registration of patient
CODING SYSTEM	ICD – 9 CM
GEOGRAPHIC COVERAGE	Regional
DISSEMINATION	<u>TO</u> : public-health authorities, <u>BY</u> : e-mail, <u>FREQUENCY</u> : real-time
MAIN USERS	Regional authorities
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths</u> : the timeliness of collecting and processing data, the use of established information systems. <u>Weaknesses</u> : to strengthen the relationship between the surveillance system and the government authorities of public health <u>Bibliography</u> : Borgia P, Genio S, Lori G, Abeni D, Guasticchi G. Il sistema di sorveglianza sindromica per l'epidemia di influenza da A/H1N1: l'esperienza del Lazio. Available: http://www.epicentro.iss.it/focus/h1n1/pdf/sindromica_Lazio.pdf

Information provided by Stefano Genio

ITALY: Syndromic surveillance system for epidemic prone diseases set up following increased migration flows	
	<i>ACTIVE since April 2011</i>
WEBSITE	http://www.epicentro.iss.it/focus/sorveglianza/immigrati.asp (in Italian)
COORDINATING INSTITUTION	Ministry of Health and Istituto Superiore di Sanità
FUNDING INSTITUTION	This activity is part of routine public health activities performed at national, regional and local level involving health care providers and public health authorities. No specific fund was therefore earmarked for this activity.
CONTINUITY OF FUNDING	Perennial
REPORTED BRIEF DESCRIPTION	Following the 2011 North Africa Crisis, Italy witnessed an increased influx of migrants and established a syndromic surveillance system to monitor the health status of this immigrant population. A daily notification grid of 13 syndromes was prepared. Cases fitting the case definitions are sent daily to ISS from immigration centres and local/regional health authorities. Thresholds were calculated to detect significant differences between the observed and expected incidence of each syndrome in order to issue statistical alarms to be further investigated. Dissemination of results occurs weekly through a bulletin published online.
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, outbreak detection
SYNDROMES	Hemorrhagic illness, Localized cutaneous lesion, Lymphadenitis, Rash, Respiratory illness, Specific Infection, Blood poisoning, Botulism-like illness, Diarrhoea, Death
DATA PROVIDERS	Immigration centres (100 out of a total number not available)
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	within 2 days on average
MEANS OF DATA TRANSMISSION	Partially automated via e-mail, fax (Some centres send data directly; in some Regions local or regional health authorities send data)
INDIVIDUAL/AGGREGATED DATA	Aggregated by age
VARIABLES	<u>Medical</u> : syndromes <u>Demographic</u> : other (aggregated age groups) <u>Other</u> : place of registration
CODING SYSTEM	None
GEOGRAPHIC COVERAGE	National (13 of 21 Regions)
DISSEMINATION	<u>TO</u> : public, <u>BY</u> : web site, <u>FREQUENCY</u> : weekly <u>TO</u> : the concerned hosting centre in case of a statistical alarm, <u>BY</u> : e-mail
MAIN USERS	Ministry, Regional authorities, Istituto Superiore di Sanità, immigration centres

**REPORTED
REMARKS AND
BIBLIOGRAPHY**

Strengths: Main strong point of the system is that it monitors a vulnerable population in a time of increased migration influx providing timely information and direct feedback to health providers.

Weaknesses: The main weak point is the fact that the population under surveillance is very mobile and changes constantly leading to variations in the denominator. Moreover the total numbers of immigration centres is not known and varies constantly as some open and close in relation to the movement of migrants. This makes the calculation of the system centre representativeness difficult.

Information provided by Flavia Riccardo

SWEDEN: GETWELL (Generating Epidemiological Trends from WEb Logs, Like)	
	<i>ACTIVE since January 2010</i>
WEBSITE	www.biomedcentral.com/1471-2458/11/252
COORDINATING INSTITUTION	Swedish Institute for Communicable Disease Control
FUNDING INSTITUTION	Research grants, central government
CONTINUITY OF FUNDING	Short-term, but maintenance of the system is very cheap. Including tailored analyses for new infections, however, requires some resources.
REPORTED BRIEF DESCRIPTION	GET WELL is a surveillance system that can generate epidemiological trends from anonymous web query logs from a Swedish medical web site. Tailored and fully automatic analyses are in place for influenza and winter vomiting disease.
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance
SYNDROMES	Any syndrome can be included in the surveillance, provided it has enough related queries.
DATA PROVIDERS	Website hits
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Near real-time (every night the log for the previous day is submitted)
MEANS OF DATA TRANSMISSION	Fully automatic transfer using 'curl'
INDIVIDUAL/AGGREGATED DATA	N/A
VARIABLES	N/A
CODING SYSTEM	None
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : public, <u>BY</u> : website, <u>FREQUENCY</u> : weekly <u>TO</u> : those in charge of the surveillance in question, <u>BY</u> : e-mail, <u>FREQUENCY</u> : every Monday morning for the previous week
MAIN USERS	Swedish Institute for Communicable Disease Control
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths</u> : Web queries give a unique access to ill individuals who are not (yet) seeking care; - They are a cheap and labour efficient source; the data are nearly real time; the data reflect a point in time close to onset (provided that the person looking for information is actually ill); a system based on web queries can easily be adapted to various diseases. <u>Weaknesses</u> : No geographical or demographic information provided; unknown level of noise; unknown representativeness of the population. <u>Bibliography</u> : Influenza surveillance: Hulth A, Rydevik G. Web query-based surveillance in Sweden during the influenza A(H1N1)2009 pandemic, April 2009 to February 2010. Euro Surveill. 2011;16(18):pii=19856 The ash cloud in 2010.

Information provided by Anette Hulth

UK England and Wales: HPA/ NHS Direct syndromic surveillance system

ACTIVE since 1999/2000

WEBSITE	www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/RealtimeSyndromicSurveillance/
COORDINATING INSTITUTION	HPA in collaboration with NHS Direct
FUNDING INSTITUTION	NHS Direct provides the data and HPA funds the analysis, etc.
CONTINUITY OF FUNDING	Stable
REPORTED BRIEF DESCRIPTION	The HPA/ NHS Direct syndromic system is a real time syndromic system covering England and Wales which uses information on symptoms reported to a tele-health system
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, Outbreak detection, Measure health impact of extreme weather events (all), Measure health impact of natural disasters (all), Measure health impact of manmade disasters (e.g., industrial or nuclear disasters), Chemical poisoning, Food poisoning, Detection of other public health threats (generic system capable of providing information on generic issues), Health surveillance at mass gathering events (e.g., Olympics)
SYNDROMES	influenza-like illness (ILI), rash, respiratory illness, shortness of breath, sun/heat stroke, botulism-like illness, diarrhoea, fever, gastrointestinal illness (lower), gastrointestinal illness (upper)
DATA PROVIDERS	Other telephone help-lines (NHS Direct, nationally)
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily
MEANS OF DATA TRANSMISSION	Automatic via e-mail
INDIVIDUAL/AGGREGATED DATA	Individual data
VARIABLES	<u>Demographic</u> : age (not date of birth), gender, and geographical location of residence (partial postal code) <u>Medical</u> : symptoms/signs, syndromes <u>Other</u> : outcome of triage via helpline
CODING SYSTEM	None
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : wide health protection audience, including those managing incidents, <u>BY</u> : website, <u>FREQUENCY</u> : weekly other than in incident then daily <u>TO</u> : wide health protection audience, <u>BY</u> : e-mail, <u>FREQUENCY</u> : weekly other than in incident then daily <u>TO</u> : relevant health protection colleagues, <u>BY</u> : telephone, <u>FREQUENCY</u> : only when the system raises an alarm
MAIN USERS	Ministry, regional authorities, hospitals, other (health protection units, national health protection)

**REPORTED REMARKS
AND BIBLIOGRAPHY**

Strengths: automated transfer of routinely collected data; good collaboration with data providers; historical data

Weaknesses : lack of understanding of case definitions for symptoms; lack of specificity for some syndromes; changing patterns of health care provision

Information provided by Gillian Smith

UK England and Wales: HPA/QSurveillance National Surveillance System	
<i>ACTIVE since January 2005</i>	
WEBSITE	www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/RealtimeSyndromicSurveillance/ www.hpa.org.uk/hpr/infections/primarycare.htm
COORDINATING INSTITUTION	HPA and University of Nottingham
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Funding is renewed on a 2-3 yearly basis. this current funding will be up for renewal in March 2013.
REPORTED BRIEF DESCRIPTION	The HPA/QSurveillance National Syndromic Surveillance System is a large UK-based GP surveillance network that reports on GP consultations for a range of clinical and syndromic indicators. The system reports routinely on a weekly basis but can report daily data.
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, Outbreak detection, Measure health impact of extreme weather events (heat waves, cold spells, floods), Measure health impact of natural disasters (volcanic ash clouds), Detection of other public health threats (not specified), Health surveillance at mass gathering events (Olympics)
SYNDROMES	Asthma, influenza-like illness (ILI), respiratory illness, sun/heat stroke, diarrhoea
DATA PROVIDERS	General practitioners (more than 3,400 out of 10,300)
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Near real-time: weekly, but daily in emergencies
MEANS OF DATA TRANSMISSION	Automatic via e-mail
INDIVIDUAL/AGGREGATED DATA	Aggregated data
VARIABLES	<u>Demographic</u> : age/date of birth, gender, geographical location of residence <u>Medical</u> : syndromes
CODING SYSTEM	Read codes (GP coding system)
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : public health/health protection specialists, <u>BY</u> : Website, <u>FREQUENCY</u> : near real-time (weekly) <u>TO</u> : public health/health protection specialists, <u>BY</u> : E-mail, <u>FREQUENCY</u> : near real-time (weekly) <u>TO</u> : Local health protection specialists, <u>BY</u> : Telephone, <u>FREQUENCY</u> : only when the system raises an alarm
MAIN USERS	Regional authorities, other (<i>not specified</i>)
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths</u> : large size of system enabling analysis of data at local level; ability to turn on daily data <u>Weaknesses</u> : contracted outputs and therefore little flexibility in respect of obtaining data outside agreed outputs. <u>Bibliography</u> :i) Influenza pandemic (Harcourt S, Epidemiol Infect. 2011: doi

10.1017/S095026881100046X) (Smith S, Euro Surveill. 2011 Jan 20;16(3). pii:19771.)

ii) Volcanic ash (Elliot A, Euro Surveill. 2010 Jun 10;15(23). pii: 19583)

Cryptosporidium outbreak (Smith S, Euro Surveill. 2010 Aug 19;15(33):19643.)

Information provided by Gillian Smith

UK England and Wales: RCGP WRS (Royal College of General Practitioners Weekly Returns Service) <i>ACTIVE since June 1967</i>	
WEBSITE	None
COORDINATING INSTITUTION	RCGP Research and Surveillance Centre
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Funded continuously since 1967
REPORTED BRIEF DESCRIPTION	Weekly information from nationally representative population covering 1 million persons derived from electronic records of consultations in general practice. Information on age specific morbidity by diagnosis and grouped diagnoses.
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, Outbreak detection, Measure health impact of natural disasters (Earthquake, Volcanic eruption), Measure health impact of manmade disasters, Chemical poisoning, Food poisoning, Health surveillance at mass gathering events, Other (comprehensive system capable of response to any emergency)
SYNDROMES	Information collected on every problem reported by diagnosis recorded as a Read code
DATA PROVIDERS	General practitioners (approximately 500 GPs working in 100 practices); System built around a 2% sampling fraction
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Real-time (twice weekly)
MEANS OF DATA TRANSMISSION	Automated extraction from practice computer systems using bespoke software
INDIVIDUAL/AGGREGATED DATA	Individual data
VARIABLES	<u>Demographic</u> : age/date of birth, gender, geographical location of residence <u>Medical</u> : medical diagnoses, syndromes, other (selected drugs, vaccinations, laboratory results) <u>Other</u> : date of registration of patient / date of call / date of absence
CODING SYSTEM	Read codes mapped to ICD 9 for analysis
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : key persons at Health Protection Agency and Department of Health plus ECDC, <u>BY</u> : website, <u>FREQUENCY</u> : real-time (twice weekly) <u>OTHER</u> : quarterly news letter and annual report website dissemination. Steps to access: i) internet search www.rcgp.org.uk , ii) search for RSC and click on Royal College of General Practitioners RSC, iii) select from Quick links panel on left the field you require (e.g., Weekly data, annual reports)
MAIN USERS	Ministry, regional authorities
REPORTED REMARKS AND	<u>Strengths</u> : integrated clinical and laboratory surveillance. Large population consistently monitored in real time. Sustained program over 40 years. Comprehensive data capture.

BIBLIOGRAPHY

Representative network.

Weaknesses: practical difficulties surrounding case definitions. GPs maintain records for management purposes and not for epidemiological study.

Information provided by D.M. Fleming

UK Scotland: Syndromic Surveillance in Scotland	
	<i>ACTIVE since June 2005</i>
WEBSITE	http://www.hps.scot.nhs.uk/resp/influenzaseason.aspx
COORDINATING INSTITUTION	<p>Health Protection Scotland, collaborating with:</p> <ol style="list-style-type: none"> 1. National Health Service (NHS) - NHS 24; activities include national telephony for triage of out of hours calls to other constituent parts of the NHS in Scotland. 2. General practitioner data is provided by all Scottish general practices and individual level data is provided by sentinel practices participating in the NHS Scotland, National Service Division, Practice Team Information Scheme. Aggregate and individual level data is examined for trends in clinical reporting of clinical conditions - influenza and acute respiratory infections. 3. E-Pharmacy data is provided on behalf of the NHS in Scotland by ATOS-Origin for all Scottish general practitioners. Prescribing trend data is routinely available for a range of medicines that may serve as a proxy for clinical conditions.
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Stable as part of the global sum for surveillance activity within the NHS
REPORTED BRIEF DESCRIPTION	National Health Service (NHS) patient telephony - NHS 24 - for a range of syndromic surveillance topics, General Practitioner Primary Care syndrome analysis for influenza & electronic reporting of NHS general practice pharmacy data
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, Outbreak detection, Measure health impact of extreme weather events (cold weather), Measure health impact of natural disasters (volcanic eruption), Measure health impact of manmade disasters (e.g., industrial or nuclear disasters), Chemical poisoning, Food poisoning, Detection of other public health threats (current use for monitoring botulism-double vision symptoms), Health surveillance at mass gathering events (used for Gleneagle G8 Meeting in 2005)
SYNDROMES	Asthma, hemorrhagic illness, influenza-like illness (ILI), lymphadenitis, neurological symptoms, rash, respiratory illness, shortness of breath, blood poisoning, botulism-like illness, diarrhoea, death, enterovirus-related infection syndrome, fever, gastrointestinal illness (lower), gastrointestinal illness (upper)
<u>DATA PROVIDERS 1)</u>	<u>General Practitioners (all 1002 Scottish General Practices)</u>
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily
MEANS OF DATA TRANSMISSION	Automatic via e-mail
INDIVIDUAL/AGGREGATED DATA	Aggregated
<u>DATA PROVIDERS 2)</u>	<u>Providers of drug sales (all 1002 Scottish General Practices)</u>

FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily
MEANS OF DATA TRANSMISSION	Automatic via e-mail
INDIVIDUAL/AGGREGATED DATA	Individual
<u>DATA PROVIDERS 3)</u>	<u>Other Telephone Help line (Single national data provider covers all 5.162 million Scottish population)</u>
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily
MEANS OF DATA TRANSMISSION	Automatic via e-mail
INDIVIDUAL/AGGREGATED DATA	Individual
<u>DATA PROVIDERS 4)</u>	<u>General Practice Data at individual level (37 general practices, out of 1002 - covering 200,000 population)</u>
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily
MEANS OF DATA TRANSMISSION	Automatic via e-mail
INDIVIDUAL/AGGREGATED DATA	Individual
VARIABLES	<u>Demographic</u> : identification number (e.g., ID card, social security), age/date of birth, gender, geographical location of residence <u>Medical</u> : medical diagnoses, symptoms/signs, syndromes, drug therapy <u>Other</u> : date of registration of patient / date of call / date of absence
CODING SYSTEM	NHS 24 data - free text & algorithm analysis; general practitioner - Read codes; E-Pharmacy - drug name
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : all NHS stakeholders, <u>BY</u> : e-mail, <u>FREQUENCY</u> : routine output weekly, with increased frequency up to daily, if required
MAIN USERS	Ministry, regional authorities, hospitals, general practitioners, NHS 24 and pharmacists
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths</u> : NHS24 - National system & data collected 24 hours per day 7 days per week GP data - highly cost effective collation of aggregate data from all scottish practices by age group GP data - individual level allows continous variables to be examined such as age as need dictates E-Pharmacy - data completeness across all practices <u>Weaknesses</u> : NHS 24 - Signal detections too often - usually spontaneously settle GP data - aggregate data - predetermined age formats limit ability to interpret data GP data - individual level - usual issues re cost & cohort size (200,000)the latter limits data interpretation once substratification of data takes place E-Pharmacy - aggregate data limits ability to drill down within the data <u>Bibliography</u> : G8 Gleneagles meeting 2005 Meyer N, McMenamin J, Robertson C, Donaghy M, Allardice G, Cooper D. A multi-data source surveillance system to detect a bioterrorism attack during the G8 Summit in Scotland Epidemiol Infect. 2008 Jul;136(7):876-85. Epub

2007

Aug 3. Icelandic volcanic eruptions Elliot AJ, Singh N, Loveridge P, Harcourt S, Smith S, Pnaiser R, Kavanagh K, Robertson C, Ramsay CN, McMEnamin J, Kibble A, Murray V, Ibbotson S, Catchpole M, McCloskey B, Smith GE. Syndromic surveillance to assess the potential public health impact of the Icelandic volcanic ash plume across the United Kingdom, April 2010. *Euro Surveill.* 2010;15(23):pii=19583. C Botulinum outbreak Scotland November 2011

Information provided by Jim McMEnamin

UK Northern Ireland: GP flu sentinel surveillance scheme	
	<i>ACTIVE since October 2000</i>
WEBSITE	http://www.fluawareni.info/sites/default/files/news/Flu%20Bulletin%20Wk47-48%20final_0.pdf
COORDINATING INSTITUTION	Public Health Agency
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Included as part of funding for core Public Health Agency business
REPORTED BRIEF DESCRIPTION	Surveillance of flu/Fli using a GP sentinel practice network covering 11% of the population
MAIN FUNCTIONS / OBJECTIVES	Outbreak detection, influenza/flu like illness surveillance.
SYNDROMES	Influenza-Like Illness (ILI)
<u>DATA PROVIDERS</u>	<u>General Practitioners (37 out of 350)</u>
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Weekly
MEANS OF DATA TRANSMISSION	manual transmission with someone being responsible for sending the data via e-mail (<i>Plans for: Development being piloted to capture this from sentinel and all GPs in Northern Ireland</i>)
INDIVIDUAL/AGGREGATED DATA	Aggregated
VARIABLES	<u>Demographic</u> : age/date of birth, Gender <u>Medical</u> : syndromes (i.e., group of symptoms or diagnoses) <u>Other</u> : date of registration of patient / date of call / date of absence
CODING SYSTEM	ICD10
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : Dept Health, hospitals, GPs media, <u>BY</u> : website, <u>FREQUENCY</u> : weekly
MAIN USERS	Ministry, Regional authorities, Hospitals, General Practitioners, media
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths</u> : Has worked well since 2000 and was robust during the pandemic. Also includes GPs swabbing a sample of patients presenting with DFlu/Fli. Good cooperation from data providers despite manual reporting. <u>Weaknesses</u> : Weak point is that it is limited to weekly reporting but pilot underway for automated data extraction not just from the 37 sentinel GPs but all GPs which will permit daily analysis and by locality. Currently limited to flu/Fli. <i>33. For what events has the system proven to be useful? (provide bibliographic reference if available)</i> : During SARS, 2009 pandemic and monitoring the occurrence and extent of seasonal influenza

Information provided by Brian Smyth

UK Northern Ireland: OOH Flu surveillance	
	<i>ACTIVE since (no date reported)</i>
WEBSITE	http://www.fluawareni.info/sites/default/files/news/Flu%20Bulletin%20Wk47-48%20final_0.pdf
COORDINATING INSTITUTION	Public Health Agency
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Core part of funding to the Public Health Agency and OOH providers from central government
REPORTED BRIEF DESCRIPTION	Surveillance of Flu/Fli of contacts to Out of Hours (OOH) services
MAIN FUNCTIONS / OBJECTIVES	Outbreak detection
SYNDROMES	Influenza-Like Illness (ILI)
<u>DATA PROVIDERS</u>	<u>GP OOH providers (5 out of 5)</u>
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	near real time: daily download
MEANS OF DATA TRANSMISSION	Automatic: autoextracted from OOH clinical systems
INDIVIDUAL/AGGREGATED DATA	Aggregated
VARIABLES	<u>Demographic</u> : age/date of birth <u>Medical</u> : syndromes (i.e., group of symptoms or diagnoses), Hospitalisation <u>Other</u> : date of registration of patient / date of call / date of absence
CODING SYSTEM	READ codes
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : Dept Health, hospitals, GPs, OOH providers and media, <u>BY</u> : website, <u>FREQUENCY</u> : weekly
MAIN USERS	Ministry, Regional authorities, Hospitals, OOH providers
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths</u> : Has worked well and operationally robust during pandemic. Can also provide data on outcomes - if referred to hospital or required home visit. Limited at present to flu/fli <u>Weaknesses</u> : Limited at present to flu/fli <i>33. For what events has the system proven to be useful? (provide bibliographic reference if available):</i> during 2009 pandemic and over bank holiday weekends when GP practices are closed

Information provided by Brian Smyth

UK Wales: GP surveillance in Wales	
	<i>ACTIVE since 1 January 1987</i>
WEBSITE	http://www.wales.nhs.uk/sites3/page.cfm?orgid=457&pid=27918
COORDINATING INSTITUTION	Public Health Wales
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Fixed term funding of Audit+
REPORTED BRIEF DESCRIPTION	Surveillance of GP consultations for common infectious and non-infectious diseases through Audit+. Routine weekly sentinel surveillance with capability for extension to daily total population, or targeted, surveillance.
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance
SYNDROMES	Asthma, influenza-like illness (ILI), Specific Infection, Sun/heat stroke, Diarrhoea, Gastrointestinal illness (lower), Gastrointestinal illness (upper)
<u>DATA PROVIDERS</u>	<u>General Practitioners (450 out of 450)</u>
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	daily
MEANS OF DATA TRANSMISSION	Automatic: Electronic transfer
INDIVIDUAL/AGGREGATED DATA	Aggregated
VARIABLES	<u>Demographic</u> : age/date of birth, Gender <u>Medical</u> : medical diagnoses) <u>Other</u> : Place of registration (e.g., emergency departments, school, emergency units (e.g., 112, ambulance, poison control centres)
CODING SYSTEM	READ codes
GEOGRAPHIC COVERAGE	National and regional. If required, specific cohorts of GPs
DISSEMINATION	<u>TO</u> : Public Health Wales, <u>BY</u> : website, <u>FREQUENCY</u> : Weekly or daily if required <u>TO</u> : Participating GPs, <u>BY</u> : e-mail, <u>FREQUENCY</u> : Weekly
MAIN USERS	Ministry, Regional authorities, Public Health Wales
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths</u> : Completeness Flexibility Surveillance is not main function of Audit+ <u>Weaknesses</u> : Governance arrangements of Audit+ Complexity Sustainability 33. <i>For what events has the system proven to be useful? (provide bibliographic reference if available)</i> : Recent examples: Influenza epidemics, including pandemic Pertussis outbreaks Chemical fire Water quality incidents

Information provided by Daniel Thomas

UK Wales: Surveillance in OOH services in Wales		<i>ACTIVE since 1 January 2010</i>
WEBSITE		
COORDINATING INSTITUTION	Public Health Wales and Welsh Government Clinical management system suppliers	
FUNDING INSTITUTION	Central government	
CONTINUITY OF FUNDING	Perennial	
REPORTED BRIEF DESCRIPTION	Surveillance of common infectious and non-infectious diseases seen in out-of-hours services in Wales	
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance	
SYNDROMES	Respiratory illness	
<u>DATA PROVIDERS</u>	<u>General Practitioners (5 out of 5)</u>	
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	daily	
MEANS OF DATA TRANSMISSION	Automatic via email	
INDIVIDUAL/AGGREGATED DATA	individual	
VARIABLES	<u>Demographic</u> : age/date of birth, Gender <u>Medical</u> : medical diagnoses <u>Other</u> : Place of registration (e.g., emergency departments, school, emergency units (e.g., 112, ambulance, poison control centres))	
CODING SYSTEM	READ codes	
GEOGRAPHIC COVERAGE	National and regional.	
DISSEMINATION	TO: Welsh Government - Unscheduled care dashboard, BY: website, FREQUENCY: daily	
MAIN USERS	Ministry, Regional authorities	
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths</u> : Automated Complete coverage <u>Weaknesses</u> : Currently limited to one condition 33. For what events has the system proven to be useful? (provide bibliographic reference if available): Planning health services	

Information provided by Daniel Thomas

UK Scotland: NHS 24 syndromic surveillance		<i>ACTIVE since 1 May 2004</i>
WEBSITE		
COORDINATING INSTITUTION	NHS 24 in partnership with Health Protection Scotland (HPS is the National body charged with public health surveillance)	
FUNDING INSTITUTION	Central government	
CONTINUITY OF FUNDING	Funding is taken from the allocation given to NHS24 and HPS from central government. So long as both bodies deem it a priority then funding will remain in place. There are no intentions to reduce funding at present.	
REPORTED BRIEF DESCRIPTION	Systematic analysis of call presentations to 24 hour national telehealth triage service. This produces regular weekly reports on the trends of key indicator conditions such as colds and flu for Scotland	
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, Outbreak detection, Food poisoning, Health surveillance at mass gathering events: Data can be analysed to detect local outbreaks via key symptom presentations	
SYNDROMES	Asthma, influenza-like illness (ILI), Lymphadenitis, Rash, Respiratory illness, Shortness of breath, Diarrhoea	
<u>DATA PROVIDERS</u>	<u>National Health Board responsible for Telehealth Triage</u> (<i>NHS 24 is a single Health board providing all triage to Scotland for primary care presentations out of hours (18:00- 08:00hrs daily and all weekend). Data is generated internally and then processed</i>)	
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Real time: As each call is completed data is input to the national system	
MEANS OF DATA TRANSMISSION	Automatic: Data is input to the national system by clinicians taking the calls real time	
INDIVIDUAL/AGGREGATED DATA	individual	
VARIABLES	<u>Demographic</u> : Name, Identification number, Age / date of birth, Gender, Geographical location of residence, location of caller at time of call <u>Medical</u> : Symptoms/signs, Drug therapy, Past medical history is partially captured	
CODING SYSTEM	None	
GEOGRAPHIC COVERAGE	National and regional, <i>Can also be analysed at locality level.</i>	
DISSEMINATION	<u>TO</u> : Health Protection Scotland <u>BY</u> : e-mail <u>FREQUENCY</u> : Weekly trend reports are produced	
MAIN USERS	Regional authorities	
REPORTED REMARKS AND	Strengths are in its flexibility and it's national coverage. National data on symptom profiles can be generated quickly and tracked through time. In addition to standard	

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reports detailed condition specific reports can be developed if required. Data transfer to analysts is automated and standard queries run. 33. *For what events has the system proven to be useful? (provide bibliographic reference if available):* Best use of the data is for winter illness surveillance.

Information provided by Malcolm Alexander

Countries with systems active for specific events

Germany (Women' World Cup 2011)

Greece (Olympics 2004)

Italy (Winter Olympics 2006)

Lithuania (EU basketball champ 2011)

GERMANY: Intensified Surveillance of Women's World Cup 2011	
	<i>ACTIVE from June 27 to July 15 2011</i>
WEBSITE	None
COORDINATING INSTITUTION	Robert Koch Institute (RKI) collaborating with local health departments located in the cities in which World Cup games take place
FUNDING INSTITUTION	Local government, Central government
REPORTED BRIEF DESCRIPTION	Surveillance for mass gatherings of prior unknown scale – A strategy to tailor an adequate enhanced surveillance for the FIFA Women's World Cup in Germany 2011. Project serves as a model for future enhanced surveillance at similar mass gathering events.
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, outbreak detection, measure health impact of extreme weather events, food poisoning, health surveillance at mass gathering events
SYNDROMES	Varies depending on the specific infectious disease
DATA PROVIDERS	Local health department out of a total number not available
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Near real time (as soon as possible)
MEANS OF DATA TRANSMISSION	Automatic via SurvNet: RKI's secure electronic reporting system
INDIVIDUAL/AGGREGATED DATA	Individual
VARIABLES	<u>Demographic</u> : age/date of birth, gender, geographical location of residence <u>Medical</u> : medical diagnoses, symptoms/signs, syndromes, laboratory testing, hospitalisation
CODING SYSTEM	None
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : a person in RKI collaborating with the System, <u>BY</u> : e-mail, <u>FREQUENCY</u> : twice a week
MAIN USERS	Regional authorities
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths</u> : involvement of all stakeholders in concept development; utilization of wider-reaching RKI-surveillance system; Activities are tailored to match size and scope of this particular mass-gathering event <u>Weaknesses</u> : difficult to know beforehand how effective the system will be at detecting events, Event detection may be slow given the reporting structure (event from local health departments are first reported back after internal review for this project's bi-weekly report)

Information provided by Edward Velasco

GREECE: Athens Olympic syndromic surveillance	
<i>ACTIVE from August 1 to October 30 2004</i>	
WEBSITE	http://www.keelpno.gr
COORDINATING INSTITUTION	KEELPNO (Hellenic Centre for Infectious Diseases Control)
FUNDING INSTITUTION	Local government
REPORTED BRIEF DESCRIPTION	The 2004 Olympics Syndromic Surveillance System used data from emergency departments of major hospitals (including paediatric hospitals) in Athens and other major Olympic cities. Surveillance was conducted for 10 syndromes: 1) respiratory infection with fever; 2) bloody diarrhoea; 3) gastroenteritis (diarrhoea, vomit) without blood; 4) febrile illness with rash; 5) meningitis, encephalitis, or unexplained acute encephalopathy/delirium; 6) suspected acute viral hepatitis; 7) botulism-like syndrome; 8) lymphadenitis with fever; 9) sepsis or unexplained shock; and 10) unexplained death with history of fever.
MAIN FUNCTIONS / OBJECTIVES	Outbreak detection, health surveillance at mass gathering events
SYNDROMES	Hemorrhagic illness, influenza-like illness (ILI), lymphadenitis, neurological symptoms, rash, respiratory illness, sun/heat stroke, botulism-like illness, diarrhoea, death, enterovirus-related infection syndrome, fever, gastrointestinal illness (lower), gastrointestinal illness (upper)
<u>DATA PROVIDERS 1)</u>	<u>Emergency departments (30 out of 100)</u>
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	By noon every day
MEANS OF DATA TRANSMISSION	Manual via fax, e-mail
INDIVIDUAL/AGGREGATED DATA	Individual
<u>DATA PROVIDERS 2)</u>	<u>Ambulance dispatch (2 centres - Athens & Thessaloniki - out of 5)</u>
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	every day (by noon)
MEANS OF DATA TRANSMISSION	Manual via e-mail
INDIVIDUAL/AGGREGATED DATA	individual
VARIABLES	<u>Demographic</u> : identification number, age/date of birth, gender, geographical location of residence <u>Medical</u> : symptoms/signs, syndromes, hospitalisation <u>Other</u> : Date of registration of patient
CODING SYSTEM	None

GEOGRAPHIC COVERAGE	Places involved in the Olympic Games
DISSEMINATION	<u>TO</u> : presented and discussed with epidemiologic surveillance team, Olympic committee, Ministry of Health, <u>BY</u> : meetings, <u>FREQUENCY</u> : every day at 2 pm
MAIN USERS	Ministry, regional authorities
REPORTED REMARKS AND BIBLIOGRAPHY	<p><u>Strengths</u>: real time answers, sensitivity, feasibility of international collaboration for its development/implementation, provider of safety net in media worries (bioterrorism-epidemics)</p> <p><u>Weaknesses</u>: cost, many false statistical alarms (but system was prepared to handle them), resilience/reaction of classical local epidemiology community</p> <p><u>Bibliography</u>:</p> <p>i) http://www.cdc.gov/mmwr/preview/mmwrhtml/su5301a19 .htm</p> <p>ii) Chapter 5: book: Mass gatherings and public health: the experience of the Athens 2004 Olympic Games / edited by Agis D. Tsouros and Panos A. Efstathiou; http://catalogue.nla.gov.au/Record/4367661</p>

Information provided by Urania Dafni

ITALY: Integrated surveillance system for the 2006 Winter Olympic and Paralympic Games in Italy <i>ACTIVE from February 1 to March 31 2006</i>	
WEBSITE	None
COORDINATING INSTITUTION	Servizio Sovrazonale Epidemiologia ASL Alessandria (Epidemiological Service Alessandria) collaborating with Istituto Superiore di Sanità
FUNDING INSTITUTION	Local and central government
REPORTED BRIEF DESCRIPTION	An integrated epidemiological surveillance and response system was set up for the 2006 Olympic Winter Games in Torino between 1 February - 31 March. The system was a cooperation between the regional and national health authorities, and its aims were early detection of any adverse health events (particularly clusters of communicable diseases), and prompt and effective response. The data sources and results are summarized below: Statutory notifications of infectious diseases, based on physician's notifications. Laboratory-based surveillance of invasive diseases. Sentinel surveillance of influenza-like illness. Syndromic surveillance was set up specifically for the Olympic Games. seven accident and emergency departments of local hospitals. 19 on-call medical services. Toxic exposure surveillance.
MAIN FUNCTIONS / OBJECTIVES	Health surveillance at Winter Olympic Games
SYNDROMES	Hemorrhagic illness, influenza-like illness (ILI), localized cutaneous lesion, lymphadenitis, neurological symptoms, rash, respiratory illness, blood poisoning, diarrhoea, death, gastrointestinal illness (lower), gastrointestinal illness (upper)
DATA PROVIDERS 1)	Emergency departments (7 out of 7)
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily
MEANS OF DATA TRANSMISSION	Manual via e-mail
INDIVIDUAL/AGGREGATED DATA	<i>Not reported</i>
DATA PROVIDERS 2)	General Practitioners: 21, covering a population of 28,080, which is 2% of the 1.4 million people living in the area affected by the Olympic Games
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily
MEANS OF DATA TRANSMISSION	Manual via e-mail
INDIVIDUAL/AGGREGATED DATA	Aggregated
DATA PROVIDERS 3)	Poison Control Centres: the three poison control centres in the Lombardia Region referred consultation requests from the Piemonte Region about exposure to toxic agents to SeREMI (Epidemiological Health Service) on a daily basis.

FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily
MEANS OF DATA TRANSMISSION	Manual via e-mail
INDIVIDUAL/AGGREGATED DATA	Aggregated
VARIABLES	<u>Demographic</u> : identification number, age/date of birth, gender, geographical location of residence <u>Medical</u> : medical diagnoses, syndromes, laboratory testing, hospitalisation <u>Other</u> : date of registration of patient / date of call
CODING SYSTEM	ICD-9 CM
GEOGRAPHIC COVERAGE	Regional
DISSEMINATION	<u>TO</u> : general Public, <u>BY</u> : website, <u>FREQUENCY</u> : daily
MAIN USERS	Ministry of Health, Regional authorities
REPORTED REMARKS AND BIBLIOGRAPHY	<i>None reported</i>

Information provided by Vittorio Demicheli

LITHUANIA: Temporary syndromes surveillance system for European basketball championship <i>ACTIVE from August 25 to September 25 2011</i>	
WEBSITE	None
COORDINATING INSTITUTION	State public-health service
FUNDING INSTITUTION	Central government
REPORTED BRIEF DESCRIPTION	Temporary syndrome surveillance system for European basketball championship
MAIN FUNCTIONS / OBJECTIVES	Outbreak detection
SYNDROMES	Hemorrhagic illness, neurological symptoms, rash, respiratory illness, shortness of breath, botulism-like illness, diarrhoea, death, enterovirus-related infection syndrome, fever, gastrointestinal illness (lower), gastrointestinal illness (upper)
<u>DATA PROVIDERS 1)</u>	<u>Emergency departments</u>
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily
MEANS OF DATA TRANSMISSION	Manual via fax, e-mail
INDIVIDUAL/AGGREGATED DATA	Aggregated
<u>DATA PROVIDERS 2)</u>	<u>Ambulance dispatch (10 out of a total number not specified)</u>
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily
MEANS OF DATA TRANSMISSION	Manual via fax, e-mail
INDIVIDUAL/AGGREGATED DATA	Aggregated (e.g., number of patients by age group)
VARIABLES	<u>Demographic:</u> age <u>Medical information:</u> syndromes <u>Other:</u> date of registration of patient / date of call
CODING SYSTEM	None
GEOGRAPHIC COVERAGE	Regional
DISSEMINATION	None
MAIN USERS	Regional authorities
REPORTED REMARKS AND BIBLIOGRAPHY	<i>None reported</i>

Information provided by Nerija Kupreviciene

Countries with systems in pilot phase

Finland (1 system)

The Netherlands (1 system)

Sweden (1 system)

UK England & Wales (2 systems)

FINLAND: AvoHilmo		<i>PILOT PHASE since January 2008</i>
WEBSITE	http://www.thl.fi/fi_FI/web/fi/tutkimus/hankkeet/avo_hilmo	
COORDINATING INSTITUTION	THL (National Institute for Health and Welfare in Finland)	
FUNDING INSTITUTION	Local government, Central government	
CONTINUITY OF FUNDING	Funding is stable for the central government. For local government, there are mostly upfront costs.	
REPORTED BRIEF DESCRIPTION	AvoHilmo is an on-line data collection to the national health care service register at THL from primary health care centres	
MAIN FUNCTIONS / OBJECTIVES	General public-health, surveillance, outbreak detection, measure health impact of extreme weather events (heat, cold, slippery conditions), food poisoning	
SYNDROMES	Influenza-like illness (ILI)	
DATA PROVIDERS	General practitioners (currently 21 out of 350, but increasing steadily)	
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Mostly daily, some weekly or monthly	
MEANS OF DATA TRANSMISSION	Automatic via web portal	
INDIVIDUAL/AGGREGATED DATA	Individual	
VARIABLES	<u>Demographic</u> : identification number, age/date of birth, gender, geographical location of residence <u>Medical</u> : medical diagnoses, drug therapy <u>Other</u> : place of registration	
CODING SYSTEM	ICPC2 (ICPC The International Classification of Primary Care)	
GEOGRAPHIC COVERAGE	Regional	
DISSEMINATION	<u>To</u> : data providers and general public; <u>BY</u> : website; <u>FREQUENCY</u> : near real-time	
MAIN USERS	Regional authorities, THL (National Institute for Health and Welfare in Finland)	
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths and weaknesses</u> : Value not currently known, lots of potential + individual level, includes diagnoses and medications, all types of visits – poor coverage, slow recruitment of new practices, several software providers, potential data quality issues (completeness, coding differences)	

Information provided by Mikko Virtanen

THE NETHERLANDS: Surveillance Network Netherlands	
<i>PILOT PHASE from May 1 2011 to May 1 2012</i>	
WEBSITE	www.nivel.eu/surveillance
COORDINATING INSTITUTION	Netherlands Institute for Health Services Research (NIVEL)
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Funding by the Dutch Ministry of Health, Welfare and Sport is foreseen until 2017.
REPORTED BRIEF DESCRIPTION	The Surveillance Network Netherlands monitors, analyses and reports weekly rates of morbidity and mortality based on symptoms, complaints and diagnoses as registered in electronic medical records of all patients enlisted with the participating general practitioners.
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, other (surveillance of emerging zoonoses), outbreak detection, measure health impact of manmade disasters
SYNDROMES	Asthma, influenza-like illness (ILI), neurological symptoms, rash, respiratory illness, shortness of breath, specific infection, diarrhoea, death, fever
DATA PROVIDERS	General practitioners (200 - 300 general practices out of 4000 general practices)
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Near real-time (weekly)
MEANS OF DATA TRANSMISSION	Automatic via web portal
INDIVIDUAL/AGGREGATED DATA	Individual data
VARIABLES	<u>Demographic</u> : age/date of birth, gender, geographical location of residence <u>Medical</u> : medical diagnoses, symptoms/signs, syndromes, drug therapy <u>Other</u> : date of registration of patient / date of call / date of absence
CODING SYSTEM	ICPC-1
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : public domain, <u>BY</u> : website, <u>FREQUENCY</u> : near real-time (weekly) <u>TO</u> : public-health authorities, researchers, <u>BY</u> : e-mail, <u>FREQUENCY</u> : near real-time (weekly)
MAIN USERS	Ministry, regional authorities
REPORTED REMARKS AND BIBLIOGRAPHY	<u>Strengths</u> : based on all ICPC-coded complaints, symptoms and diagnoses as registered by GPs - data collection does not interfere with daily practice - known epidemiological denominator: fixed patient list - GPs are the first accessible medical professionals in the Dutch health-care system - Dutch GPs are the gatekeepers to specialized medical care <u>Weaknesses</u> : limited to ICPC-codes symptoms/diagnoses (no free text) - limitations of

the ICPC coding system (eg. no code for ILI) -no virology, eg. to distinguish RS virus from influenza

Information provided by Mariette Hoolvel

SWEDEN: Gastroenteritis Surveillance (1177)	
PILOT PHASE from January 2010 to December 31 2011	
WEBSITE	
COORDINATING INSTITUTION	National Food Administration
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Funded by Swedish Civil Contingencies Agency on a yearly basis
REPORTED BRIEF DESCRIPTION	In cooperation with the Swedish Health Care Direct 1177 (Sjukvårdsrådgivningen), a 24 hours health care advice service, the National Food Administration is carrying out a pilot program of daily national surveillance of gastroenteritis. The data consists of daily frequencies of contact causes (symptoms), with spatial resolution at the level of parishes. When the system is fully implemented (2012-2013), regional and local authorities will have online access to daily monitoring of outbreak signals, as well as spatial and temporal statistics on endemic gastroenteritis.
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, outbreak detection, food poisoning
SYNDROMES	gastrointestinal illness (lower), gastrointestinal illness (upper)
DATA PROVIDERS	Other telephone help-lines. There are 21 independent regional health care authorities that manage their own health care call services. Today, 18 of these regions (16 last year) collect data on health care calls according to a common standard.
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily
MEANS OF DATA TRANSMISSION	Partially automatic via e-mail (routines for automatic transmission being developed)
INDIVIDUAL/AGGREGATED DATA	Individual data
VARIABLES	<u>Demographic</u> : age/date of birth, gender, geographical location of residence <u>Medical</u> : symptoms/signs <u>Other information</u> : date of registration of patient / date of call / date of absence
CODING SYSTEM	None
GEOGRAPHIC COVERAGE	National
DISSEMINATION	<u>TO</u> : Project Manager, <u>BY</u> : E-mail, <u>FREQUENCY</u> : Only when the system raises an alarm and other (to discuss results)
MAIN USERS	Ministry, regional authorities
REPORTED REMARKS AND	<u>Strengths</u> : symptom-based, good spatial and temporal resolution, simplicity <u>Weaknesses</u> : limited resources

BIBLIOGRAPHY

Information provided by Tom Andersson

UK England and Wales: GP Out of Hours		<i>PILOT PHASE since April 2010</i>
WEBSITE	-	
COORDINATING INSTITUTION	Health Protection Agency	
FUNDING INSTITUTION	Central government	
CONTINUITY OF FUNDING	Funding has to be renewed every 2-3 years	
REPORTED BRIEF DESCRIPTION	The HPA GP out of hours surveillance system monitors community morbidity through out of hours GP activity. This daily system provides the ability to monitor GP activity during evening, night and public holidays, thus complementing the in hours GP systems in existence.	
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, outbreak detection, measure health impact of extreme weather events (heatwaves, cold spells, floods), measure health impact of natural disasters (volcanic ash), chemical poisoning, food poisoning, detection of other public health threats (<i>E. coli</i> haemolytic uremic syndrome), health surveillance at mass gathering events (Olympics)	
SYNDROMES	Asthma, influenza-like illness (ILI), respiratory illness, shortness of breath, sun/heat stroke, diarrhoea, gastrointestinal illness (lower), gastrointestinal illness (upper)	
DATA PROVIDERS	Out-of-hours GPs	
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily	
MEANS OF DATA TRANSMISSION	Automatic via e-mail	
INDIVIDUAL/AGGREGATED DATA	Individual data	
VARIABLES	<u>Demographic</u> : Age / date of birth, Gender, Geographical location of residence <u>Medical</u> : Medical diagnoses, Symptoms / signs, Syndromes <u>Other</u> : Date of registration of patient / date of call / date of absence	
CODING SYSTEM	GP Read codes	
GEOGRAPHIC COVERAGE	National	
DISSEMINATION	<u>TO</u> : public-health specialists, <u>BY</u> : e-mail, <u>FREQUENCY</u> : near real-time (currently 2 weekly but will be weekly once system live) <u>TO</u> : relevant local/national public-health representative, <u>BY</u> : telephone, <u>FREQUENCY</u> : only when the system raises an alarm	
MAIN USERS	Regional authorities	
REPORTED REMARKS AND	<u>Strengths</u> : able to monitor evenings, nights and public holidays. Focused more on acute GP activity (in hours predominantly chronic disease management). Provision of daily	

BIBLIOGRAPHY

data.

Weaknesses: diagnostic coding not good with certain providers limiting the potential to report on syndromic indicators.

Information provided by Alex Elliot

UK England and Wales: EDSSS (Emergency Department Syndromic Surveillance System)	
PILOT PHASE since January 2010	
WEBSITE	-
COORDINATING INSTITUTION	HPA
FUNDING INSTITUTION	Central government
CONTINUITY OF FUNDING	Short term funding that will require renewal every 3-4 years
REPORTED BRIEF DESCRIPTION	The Emergency Department Syndromic Surveillance System (EDSSS) is a sentinel emergency department surveillance system that monitors daily attendance data from a small network of sites across England.
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance, outbreak detection, measure health impact of extreme weather events (heat waves, colds spells), measure health impact of natural disasters (volcanic ash), chemical poisoning, detection of other public health threats (<i>E. coli</i> haemolytic uremic syndrome; melamine poisoning), health surveillance at mass gathering events (Olympics)
SYNDROMES	Asthma, hemorrhagic illness, influenza like illness (ILI), rash, respiratory illness, shortness of breath, sun/heat stroke, other (symptoms of cold), diarrhoea, death, gastrointestinal illness (lower), gastrointestinal illness (upper)
DATA PROVIDERS	Emergency departments
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily
MEANS OF DATA TRANSMISSION	Automatic via ftp (File Transfer Protocol)
INDIVIDUAL/AGGREGATED DATA	Individual data
VARIABLES	<u>Demographic</u> : age/date of birth, gender, geographical location of residence <u>Medical</u> : medical diagnoses, symptoms/signs, syndromes <u>Other</u> : place of registration
CODING SYSTEM	ICD 10, other (SNOMED – systematized nomenclature of medicine)
GEOGRAPHIC COVERAGE	National/sentinel
DISSEMINATION	<u>TO</u> : surveillance reports will be available on the HPA website once the system is live, <u>BY</u> : website, <u>FREQUENCY</u> : near real time (weekly) <u>TO</u> : currently limited contacts during pilot phase including emergency department clinicians, public health specialist, <u>BY</u> : e-mail, <u>FREQUENCY</u> : near real-time (currently twice weekly but will be weekly once system is live)
MAIN USERS	Regional authorities

**REPORTED
REMARKS AND
BIBLIOGRAPHY**

Strengths: Ability to detect severe presentation of disease in the community.

Weaknesses: will only be a sentinel system and therefore will not cover certain local incidents where there is no coverage. coding is not consistent and does not allow very specific analysis of certain conditions.

Information provided by Alex Elliot

Countries with systems planned for the future

Belgium (1 system)

Hungary (1 system)

BELGIUM: UREG (Emergency Registration)		<i>PLANNED for January 2012</i>
WEBSITE	-	
COORDINATING INSTITUTION	FOD VVL (Institute of Public Health)	
FUNDING INSTITUTION	Central Government	
CONTINUITY OF FUNDING	Stable	
REPORTED BRIEF DESCRIPTION	The system would like to gain a profound insight into the functioning of the emergency services and should prove useful in crisis situations	
MAIN FUNCTIONS / OBJECTIVES	General public-health surveillance	
SYNDROMES	Asthma, influenza-like illness (ILI), neurological symptoms, respiratory illness	
<u>DATA PROVIDERS 1)</u>	<u>Ambulance dispatch</u> (via Hospitals, 2 out of 140 existing during the pilot phase)	
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily	
MEANS OF DATA TRANSMISSION	Automatic via Web Portal	
INDIVIDUAL/AGGREGATED DATA	individual	
<u>DATA PROVIDERS 2)</u>	<u>Emergency Departments</u> (2 out of 140 existing during the pilot phase)	
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Daily	
MEANS OF DATA TRANSMISSION	Automatic via web Portal	
INDIVIDUAL/AGGREGATED DATA	Individual	
VARIABLES	<u>Demographic</u> : identification number, gender, geographical location of residence <u>Medical</u> : medical diagnoses, syndromes <u>Other</u> : place of registration	
CODING SYSTEM	ICD9, ICD10	
GEOGRAPHIC COVERAGE	National	
DISSEMINATION		
MAIN USERS	Ministry, Hospitals	
REPORTED REMARKS AND BIBLIOGRAPHY		

Information provided by Petra Van den Eynde

HUNGARY: National Special Medical Information System		<i>PLANNED for January 2012</i>
WEBSITE		
COORDINATING INSTITUTION	National Institute of Environmental Health	
FUNDING INSTITUTION		
CONTINUITY OF FUNDING		
REPORTED BRIEF DESCRIPTION		
MAIN FUNCTIONS / OBJECTIVES		
SYNDROMES	Asthma, hemorrhagic illness, influenza like illness (ILI), localized cutaneous lesion, lymphadenitis, neurological symptoms, rash, respiratory illness, shortness of breath, specific infection, sun/heat stroke, blood poisoning, botulism-like illness, diarrhoea, death, enterovirus-related infection syndrome, fever, gastrointestinal illness (lower), gastrointestinal illness (upper)	
DATA PROVIDERS 1)	<u>Emergency Departments</u> (65 out of 65)	
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Near real-time (Every day)	
MEANS OF DATA TRANSMISSION	Web portal, e-mail,	
INDIVIDUAL/AGGREGATED DATA	Individual	
DATA PROVIDERS 2)	<u>Emergency Numbers</u> (20 out of 20)	
FREQUENCY OF DATA TRANSMISSION TO SYSTEM	Near real-time (every day)	
MEANS OF DATA TRANSMISSION	Web portal, e-mail,	
INDIVIDUAL/AGGREGATED DATA	Individual	
VARIABLES	<u>Demographic</u> : name, identification number, age /date of birth, gender, geographical location of residence <u>Medical</u> : medical diagnoses, syndromes, hospitalisation, other (triage category) <u>Other</u> : place of registration	
CODING SYSTEM	ICD – 10	
GEOGRAPHIC COVERAGE	National	
DISSEMINATION	Not yet defined	

MAIN USERS	Ministry, regional authorities, hospitals, National Public-Health Service
REPORTED REMARKS AND BIBLIOGRAPHY	

Information provided by Anna Paldy

ATTACHMENT 6 – Articles identified through literature search

The first 49 articles found through PubMed from October 2010 to June 2011

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