**The Emergency Department Syndromic Surveillance System:**

**“Provision and continuation of a software solution for interfacing with emergency department clinical information systems to extract and transmit an anonymised dataset for use in a national syndromic surveillance system”**

# Tender specifications

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# PART 1: TECHNICAL DESCRIPTION

# Context of the procurement

## Introduction

The Emergency Department Syndromic Surveillance System (EDSSS) is a national syndromic surveillance system that has been developed by Public Health England (PHE) and the Royal College of Emergency Medicine (RCEM). It is comprised of a sentinel network of emergency departments (EDs) across England and Northern Ireland that submit, on a daily basis, a small packet of data containing anonymised information on ED attendances.

The information is used by PHE to enhance its syndromic surveillance capacity to monitor the activity and spread of infectious diseases in the community.

### What is syndromic surveillance?

Syndromic surveillance is an established tool for monitoring the activity/spread of infectious diseases in the community in ‘real-time’, and assisting in the management of specific outbreaks or incidents. The PHE Real-time Syndromic Surveillance Team (ReSST) currently co-ordinates two national syndromic surveillance systems: the NHS 111 system, which monitors daily call activity and the underlying presenting symptoms for each call; and two GP surveillance systems including in hours and out of hours GP activity.

The systems are also designed to respond to incidents of potential public health importance e.g. influenza pandemics, air pollution, flooding and heatwaves, when specific reports are produced in ‘real-time’ and distributed to monitor affected areas for diseases/conditions of importance.

### Why is the EDSSS important?

ED syndromic surveillance is based upon the monitoring of patient attendances and presenting symptoms in near real-time. Patients present at EDs with more severe acute illness when compared to other sources of syndromic surveillance data e.g. telephone helpline and GP consultations, providing an opportunity to augment the other community-based surveillance systems for common community-based pathogens e.g. influenza and norovirus, environmental incidents such as heatwaves, and *Escherichia coli* O104 and haemolytic-uremic syndrome (HUS).

One of the main drivers for developing the EDSSS was the London 2012 Olympic and Paralympic Games. The Games required enhanced surveillance to monitor disease outbreaks and the potential public health impact from bioterrorist threats associated with this event. The large influx of participants and spectators to London from a large geographical area (and other sites across England) also increased the likelihood of outbreaks of disease e.g. norovirus, measles, and increased the burden on secondary care health facilities due to other conditions e.g. cardiovascular events. The EDSSS was secured as a public health legacy of the Games.

### What information is analysed by PHE?

Every day a small anonymised dataset is collected from each ED which contains information, including basic patient demographics, on each attendance. Total attendances can be monitored to identify the impact of seasonally circulating infections. Attendances can also be monitored by age group to identify the age-specific impact of pathogens.

The diagnosis code recorded by each emergency medicine clinician is a critical data item that is used to group each attendance into a syndromic clinical indicator. Examples include:

* All respiratory attendances
* Acute respiratory infections
* Gastrointestinal attendances
* Cardiac attendances
* Cold weather effects

Other key data collected include the triage category and presentation fields which can provide some information about the severity of attendance, and discharge status/referral which again can give an indication of the severity of the presenting patients by tracking the proportions of patients discharged to home, admission and intensive care.

### What are the benefits of the EDSSS?

Emergency departments and NHS Trusts participating in the EDSSS will benefit in several areas including:

* standardised data from its ED activity that enables better quality improvement and benchmarking activity;
* updating data collection to be compatible with the incoming Emergency Department Indicators that are replacing the four hour target;
* feedback to the hospital and ED about large-scale disease outbreaks e.g. seasonal flu, enabling the Trust to match acute bed capacity with need;
* the availability of receiving bespoke data reports from PHE if required.

### What is the impact of EDSSS on EDs?

None – the EDSSS is a passive surveillance system. Front line emergency medicine clinicians are not required to undertake any additional requirements in respect of coding etc. The technology used to collect, and securely transmit the small anonymised dataset to PHE each day is automated and requires no intervention

### What is the purpose of this tender?

PHE wish to contract the services of contractors who are able to continue the work involved in maintaining the EDSSS.

# Objectives of the work

## Specific objectives

The specific objectives of this work are:

1. **To maintain an IT infrastructure that supports the transmission of daily extracts of data to PHE from EDs participating in the EDSSS.** For example, the contractor should be able to support the existing EDSSS infrastructure within the existing Trusts to enable the daily collection and transfer from the network of participating EDs. Currently, the network consists of 35 EDs located across England and Northern Ireland.
2. **To upgrade the existing IT infrastructure that supports the transmission of daily extracts of data to PHE from EDs participating in the EDSSS thus improving resilience of the system.** For example, the contractor should be able to upgrade the existing EDSSS infrastructure within the existing Trusts to enable more resilient daily collection and transfer from the network of participating EDs. Currently, the network consists of 35 EDs located across England and Northern Ireland.
3. **To maintain data transmission at existing EDs that have been recruited to the EDSSS.** For example, the contractor should be able to resolve technical issues at each existing participating ED including problems where data transmission has failed, and thus must have established contacts within each relevant Trust.
4. **To maintain a programme of data validity checking within the NHS trust before data are transmitted to PHE.** The contractor should develop and maintain a means of validating extracted data against the defined data structure of the RCEM Emergency Care Minimum Dataset. Issues with the data quality should be resolved prior to the transmission of data to PHE, which may require liaison with Trust IT and or other IT partners supporting the local ED software.
5. **Where possible to recruit a number of new EDs, utilising a variety of clinical information systems to the EDSSS.** For example, the contractor should be able to identify approach and recruit a number of new EDs that use different clinical information systems to that already implement in the EDSSS.

## Methodology/Approach

1. **Maintaining and developing the existing EDSSS IT infrastructure**

In order to carry out the work the future contractor will have to demonstrate that they can deploy the existing EDSSS IT infrastructure to ensure immediate continuation of the surveillance system without a break in service or quality.

The existing IT infrastructure consists of a virtual server that is housed and maintained within each relevant Trust. The virtual server collects data on a daily basis from the clinical information system via a database view or replication. A process on the virtual server validates and processes the data to ensure that any patient identifiable data is removed before transfer across the N3 network to PHE.

1. **Upgrade the existing IT infrastructure**

The contractor will also have to demonstrate that they can upgrade the existing infrastructure and scale up the existing framework to take the EDSSS forward into the future as it develops and increases in size. In particular, the future contractor will have to undertake several steps at each existing site to ensure maintenance including:

* maintain transfer software on virtual servers within the hospitals to provide data via N3 to PHE
* at all times observe governance and security procedures as required by N3 and the agreed governance protocols
* assist PHE with data collection via their N3 connection – design and implementation of processes and procedures required to implement direct Trust to PHE data transfer over the N3 network, in addition to the existing IT infrastructure detailed above
* develop minor software as necessary to improve robustness of data transfer process.

1. **Maintenance of data transfer from existing EDSSS sites**

In order to carry out the work of maintaining the existing EDSSS EDs (at time of writing, 35 EDs), the future contractor will have to demonstrate that they can perform the technical maintenance involved in ensuring the continued data transfer from the existing EDSSS EDs. This is crucial in that the surveillance system must not be interrupted. In particular, the future contractor will have to undertake several steps at each site to achieve this including:

* *working with PHE and other external contractors,* to identify and where appropriate correct, any current or potential future problems with the transfer of data from the NHS Trust systems to PHE.
* *working with Trust IT employees*, and in particular local managers of the clinical information systems, and senior Heads of IT, to ensure that access rights and user permissions required to the EDSSS dataset are maintained, in addition to providing assurance that any required changes to existing EDSSS data extraction routines will not impact on the local live systems.

1. **Maintenance of a programme of data validity checking within the NHS trust before data are transmitted to PHE**

The contractor should develop and maintain a means of validating extracted data against the defined data structure of the RCEM Emergency Care Minimum Dataset.

* Ensuring that the correct fields are made available in the correct format (alpha/ numeric, limited use of special characters)
* Ensuring that patient identifiable information, in the form of the patient’s full home postcode, is not transmitted. This field must be truncated to the postcode district level before extraction from the Trust server

1. **Recruitment and integration of new sites to the EDSSS**

In order to carry out the work, the future contractor will have to demonstrate that they can perform the technical development involved in implementing new EDs into the EDSSS. It will be required that these new sites will use a number of different clinical information systems. In particular, the future contractor will have to undertake several steps at each site to achieve this including:

* *Contribute to the negotiation with participating hospitals,* following the clinical decision within the hospital to participate in the EDSSS, Information Governance consent must be sought (resulting in the signing of the standard EDSSS Information Sharing Agreement), and assistance from the hospital IT department must be enlisted. Gaining the approval and support from the Trust IT management and Information Governance is critical to the success of the subsequent IT development. The contractor must assist PHE to undertake this work and therefore must have the necessary skills, knowledge and experience of the issues involved in working within the secondary care environment, producing results in short time scales.
* *site surveys,* undertaking an assessment of the existing clinical information system to assess its suitability to implementation including: the current version of the system; the IT setup within the NHS Trust; the IT infrastructure within the Trust with specific reference to the local distribution of databases and servers; identification, and proposed solutions for avoiding, potential problems with the capacity of the Trust IT system with particular regard to the clinical information live database.
* *working within existing hospital systems,* working with the NHS Trust to install and maintain transfer software on virtual servers in the hospitals to provide data via N3 to PHE. The contractor may also be required to work with the emergency medicine software providers to iron out any data issues, acting as a link between software providers and PHE to ensure the successful design and construction of all routines and data mapping to allow ED data to be forwarded to PHE in the correct format and to established data mapping standards.
* *facilitate permission to access NHS Trust firewalls,* working with hospital IT teams to arrange for permissions required to access the virtual server. The contractor will also be required to gain access to the other part of the firewall maintained and controlled by BT. The contractor will therefore be required to perform administrative tasks for BT to make appropriate permission changes on a hospital by hospital basis.
* *interface with the clinical information system to collect a view of the dataset,* extracting data from the emergency medicine software used in each ED (which may be from any commercial software provider or as built and maintained by the Trust IT team), collect a view from the live emergency medicine clinical software system and encrypt, anonymise and transfer it securely to the virtual server provided by the Trust for the EDSSS work.
* *develop, facilitate and establish N3 to N3 transmission direct from Trust to PHE,* developing the software, NHS approved structure and appropriate permission access levels (including through Trust and BT firewalls) to enable transmission of data direct from Trust to a dedicated PHE N3 server
* *provide a secure mechanism of transfer from the hospital to PHE,* matching the current data transfer mechanism, providing a means of transferring the data extract from the hospital environment to PHE across the N3 network whilst maintaining the strict NHS security controls and providing rigid reassurance to Information Governance regarding the mechanisms of transfer at all times. This data transmission route is to be maintained as a backup once a direct N3 to N3 route from the Trust to PHE has been established

In order to undertake the steps outlined above, it is anticipated that the future contractor must have experience in multiple NHS trust hospitals, of developing, installing and maintaining very similar systems to that required by PHE.

**Security/data protection/NHS standards**

The future contractor should have all relevant credentials required for working with databases containing patient identifiable information. The contractor should also be able to demonstrate:

* that they are fully N3 compliant with a dedicated N3 feed;
* experience of working with BT in gaining access to and working within the N3 network;
* that they have excellent existing relationships with hospitals;
* have an excellent working knowledge of the NHS Governance process and be fully compliant and hold the required accreditation for working in this environment;
* experience in interfacing with NHS databases;
* that they comply with all NHS/Connecting for Health data security and protection laws.

# Duration

The duration of the contract, which includes delivery of all works described in these specifications, shall be 12 months, with the possibility of extending for a further period of 12 months following the agreement of all parties. All deliverables described in paragraph 4 below are required to be completed within this 12 month period, but it is important that the existing daily data flow from existing EDSSS EDs continues to flow without interruption.

# Deliverables, meetings and timetable

## Deliverables

The future contractor shall present the following deliverables:

1. **Data/data transfer:** the contractor will provide an automated daily transfer of attendance data, accessed from the database view provided by either Trust IT or other external contractors, from each existing and future new ED participating in the EDSSS, to PHE as described in paragraph 2.2a.

In ensuring the delivery of the daily data, the contractor will undertake required maintenance of the existing EDSSS IT infrastructure, resolving all problems in a timely and efficient manner, where appropriate working with PHE and other external contractors to overcome problems as described in paragraph 2.2c.

1. **New EDs:** where possible, new EDs, using a range of different clinical information systems, should be implemented into the EDSSS.

Each successfully implemented ED shall be defined as “the receipt of daily data, containing the fields specified in the ‘PHE Anonymised Dataset’ of the RCEM Emergency Care Minimum Dataset, transmitted to PHE. PHE will confirm with the contractor, in writing, that the data received from each new ED are to the required structure of the RCEM Emergency Care Minimum Dataset, that there are no errors in the data, and that there are no further amendments required.

All deliverables are to be produced in English.

## Meetings

**Work update meetings**

The contractor will be required to be represented at an update meeting including representatives from PHE and any other external contractors involved in the work. PHE will be responsible for determining the frequency of these meetings.

# Terms of approval of reports

After reception of each report, PHE will have 20 working days in which:

* To approve it, with or without comments or reservations;
* To reject it and request a new report.

If PHE does not react within this period, the report shall be deemed to have been approved.

Where PHE requests a new report because the one previously submitted has been rejected, this shall be submitted within 20 working days. The new report shall likewise be subject to the above provision.