Public Health
England

Protecting and improving the nation's health

Surveillance of Healthcare Associated Infection (HCAI)

Specification

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-leading sscience, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health, and are a distinct delivery organisation with operational autonomy to advise and support government, local authorities and the NHS in a professionally independent manner.

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Data Coordination Board

This information standard (DCB0134) has been approved for publication by the Department of Health under section 250 of the Health and Social Care Act 2012.

Assurance that this information standard meets the requirements of the Act and is appropriate for the use specified in the specification document has been provided by the Data Coordination Board (DCB), a sub-group of the Digital Delivery Board.

This information standard comprises the following documents:

- Specification
- Implementation Guide
- Change Request.

An Information Standards Notice (DCB0134 Amd 18/2017) has been issued as a notification of use and implementation timescales. Please read this alongside the documents for the standard.

The controlled versions of these documents can be found on the NHS Digital website. Any copies held outside of that area, in whatever format (e.g. paper, email attachment), are considered to have passed out of control and should be checked for currency and validity.

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Approvals:

Name	Organisation	Version	Date
Linda Dempster	NHS Improvement	0.4	23/11/2017
Alan Johnson	Public Health England	0.4	23/11/2017

Glossary of Terms:

Term	Acronym	Definition
Public Health England	PHE	Public Health England (PHE) is an executive agency of the Department of Health in the United Kingdom that began operating on 1 April 2013. PHE exists to protect and improve the nation's health and wellbeing and reduce health inequalities. PHE run national surveillance programmes to collect data on Healthcare Associated Infections.
Healthcare Associated Infections	HCAI	**Healthcare associated infections** are infections that are acquired in hospitals or as a result of healthcare interventions.
HCAI Data Capture System	HCAI DCS	*The HCAI Data Capture System is the real time, web enabled surveillance system used for the capture/reporting of mandatory HCAI Surveillance data. It is an* integrated reporting and analysis system for the mandatory surveillance of *Staphylococcus aureus*, *Escherichia coli* bacteraemia, *Klebsiella* bacteraemia, *Pseudomonas aeruginosa* bacteraemia and Clostridium difficile infections.
Meticillin resistant *Staphylococcus aureus/*	MRSA/ MSSA	*Staphylococcus aureus* is a bacterium that is a common coloniser of human skin and mucosa. *Staphylococcus aureus* can cause

Meticillin susceptible *Staphylococcus aureus*		disease, particularly if there is an opportunity for the bacteria to enter the body. Most strains of *S. aureus* are sensitive to the more commonly used antibiotics, and infections can be effectively treated. Some *S. aureus* bacteria are more resistant. Those resistant to the antibiotic meticillin are termed meticillin-resistant *Staphylococcus aureus* (MRSA) and often require different types of antibiotic to treat them. Those that are sensitive to meticillin are termed meticillin-sensitive *Staphylococcus aureus* (MSSA). MRSA and MSSA only differ in their degree of antibiotic resistance: other than that there is no real difference between them.
Data Coordination Board	DCB	The Data Coordination Board is committed to ensuring the quality of standards, to ensure effective implementation, full realisation of benefits and minimal disruption for staff, patients and care users. Assurance Certificates are issued to confirm that a standard has been through assessment and is demonstrated to meet the DCB quality assurance criteria.
Anti-Microbial Resistance	AMR	Antimicrobial resistance describes the ability of a micro-organism to resist the action of antimicrobial drugs**.**
Surgical Site Infection	SSI	A surgical wound infection occurs when micro-organisms from the skin or the environment enter the incision that the surgeon makes through the skin in order to carry out the operation.
Surgical Site Infection Surveillance Scheme	SSISS	A PHE managed service supporting both the mandatory surveillance of SSI in orthopaedics and voluntary surveillance in other categories of surgical procedures.
Clostridium difficile Infection	CDI	*Clostridium difficile* (also known as '*C. difficile*' or '*C. diff*') is a bacterium that can be found in people's intestines. *Clostridium difficile* causes diarrhoea (mild to severe) and, unusually, life-threatening inflammation of the intestines. Other symptoms can include fever, loss of appetite, nausea and abdominal pain or tenderness. A person can become infected with *Clostridium difficile* if he/she ingests the bacterium.

Escherichia coli	*E. coli*	*Escherichia coli* (commonly referred to as *E. coli*) is a species of bacteria commonly found in the intestines of humans and animals. There are many different types of *E. coli*, and while some live in the intestine quite harmlessly, others may cause a variety of diseases. The bacterium is found in faeces and can survive in the environment.
Glycopeptide resistant enterococci	GRE	Enterococci are bacteria that are commonly found in the bowel of normal healthy individuals. They can cause a range of illnesses including urinary tract infections, bacteraemia (blood stream infections) and wound infections. The two most common species of enterococci are *E. faecalis* and *E. faecium*. During the mid-1980s enterococci with resistance to glycopeptide antibiotics such as vancomycin and teicoplanin emerged, termed glycopeptide-resistant enterococci (GRE). Most GRE are *E. faecium*.
Klebsiella	*Klebsiella*	*Klebsiella* species belong to the family Enterobacteriaceae. *Klebsiella* species are a type of Gram negative rod shaped-bacteria that are found everywhere in the environment and also in the human intestinal tract (where they do not cause disease). Within the genus *Klebsiella*, 2 common species are associated with the majority of human infections: *Klebsiella* pneumoniae and *Klebsiella* oxytoca Both species are commonly associated with a range of healthcare-associated infections, including pneumonia, bloodstream infections, wound or surgical site infections and meningitis. In healthcare settings, *Klebsiella* infections are seen in vulnerable, immunocompromised and unwell patients who have other co-morbidities and who are receiving treatment for other conditions.
Pseudomonas Aeruginosa	*P. aeruginosa*	*Pseudomonas aeruginosa* is a Gram-negative bacterium often found in soil and ground water. *P. aeruginosa* is an opportunistic pathogen and it rarely affects healthy individuals. It can cause a wide range of infections, particularly in those with a weakened immune system eg cancer

		patients, newborns and people with severe burns, diabetes mellitus or cystic fibrosis. *P. aeruginosa* infections are sometimes associated with contact with contaminated water. In hospitals, the organism can contaminate devices that are left inside the body, such as respiratory equipment and catheters. P. aeruginosa is resistant to many commonly-used antibiotics.
Burden Advice and Assessment Service	ROCR	NHS Digital's Burden Advice and Assessment Service (BAAS) offers advice, guidance and support for the health and social care system (both nationally and locally) on minimising the burden and bureaucracy of data collection, freeing up staff time to care.
Department of Health	DH	The Department of Health (DH) is a department of State responsible for government policy on health, social care and the National Health Service (NHS) in England. The DH carries out some of its work through "arm's length bodies".
NHS Improvement	NHSI	NHS Improvement is responsible for overseeing NHS foundation trusts, NHS trusts and independent providers, helping them give patients consistently safe, high quality, compassionate care within local health systems that are financially sustainable. NHS Improvement works with the Department of Health.
Patient Information Advisory Group	PIAG	The Patient Information Advisory Group (PIAG) was established in the United Kingdom under section 61 of the Health and Social Care Act 2001 and the Patient Information Advisory Group (Establishment) Regulations 2001 to provide advice on issues of national significance involving the use of patient information and to oversee arrangements created under section 60 of the Act. Its membership was drawn from patient groups, health care professionals and regulatory bodies. PIAG is enshrined in law but the duties are now administered by the Confidentiality Advisory Group.
National Information Governance Board	NIGB	The NIGB was established under the Health and Social Care Act 2008 with a range of

		advisory functions on information governance. This included taking over responsibility for the functions under section 251 of the NHS Act 2006. PIAG was superseded by NIGB. NIGB closed in 2013 and was replaced by the National Information Governance Committee (NIGC) managed through the Care Quality Commission.
Health Research Authority	HRA	The Health Research Authority (HRA) was established to promote and protect the interests of patients, streamline regulation and promote transparency in health and social care research. The major aim is to make the UK a great place to do health research, to build confidence and participation and so improve the nation's health. They also provide approvals for the processing of confidential information relating to patients through the Confidentiality Advisory Group (CAG).
Confidentiality Advisory Group	CAG	The Confidentiality Advisory Group provides independent expert advice on the appropriate use of confidential patient information. It advises under two separate legal frameworks: • The Health Service (Control of Patient Information) Regulations 2002 • The Care Act 2014
Coronary Artery Bypass Graft surgery	CABG	CABG surgery is advised for selected groups of patients with significant narrowings and blockages of the heart arteries (coronary artery disease). CABG surgery is an open chest procedure to perform direct revascularization of heart, for example, using a vein graft.
Care Quality Commission	CQC	The CQC is the independent regulator of all health and social care services in England. From 1 April 2013, the NIGB's functions for monitoring and improving information governance practice transferred to the Care Quality Commission that established the National Information Governance Committee (NIGC) to oversee this work. The role of NIGC is to provide advice and assistance to CQC in relation to exercising its

		functions to monitor and seek to improve registered providers' IG practices.
Clinical Commissioning Group	CCG	A CCG is part of the National Health Service in England. CCGs are clinically-led statutory NHS bodies responsible for the planning and commissioning of health care services for their local area.

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1. Overview

1.1 Summary

Standard	
Standard Number	DCB0134
Standard Title	Surveillance of Healthcare Associated Infections (HCAI).
Description	The importance of Healthcare Associated Infections as a cause of preventable illness and death has been recognised increasingly in recent years, and the prevention and control of these infections continues to be a priority. Surveillance or monitoring of these infections is key to their control: we need to be able to measure them if we are to assess whether any impact has been made on controlling infection. Many hospitals in the country have participated in voluntary surveillance of key infections for many years and as part of the increased focus on control of HCAI, surveillance of some infections was made mandatory. Public Health England run national surveillance programmes to collect data on Healthcare Associated Infections (HCAI). This includes both mandatory and voluntary data collections. The data collections include reporting to PHE by NHS and Independent Sector hospitals on a range of HCAI's including but not limited to: - Mandatory surveillance of: o MRSA bacteraemia. o MSSA bacteraemia. o *E. coli* bacteraemia. o *Clostridium difficile* infection. o *Klebsiella* bacteraemia. o *Pseudomonas aeruginosa* bacteraemia. o Surgical Site Infection for orthopaedic surgical categories. - Voluntary surveillance of: o Surgical Site Infection for 13 other surgical categories, including but not limited to cardiac surgery, gastric surgery, spinal surgery. Data are reported to PHE via the HCAI Data Capture System and the Surgical Site Infection Surveillance Scheme. Data are then available to participants either through reports generated by those systems and also via PHE publication of regular reports. The data collections covered by this Information Standard is a disaggregate, patient level data set. An exemption under section 251 of the NHS Act 2006 (previously section 60 of the Health and Social Care Act 2001) allows PHE to receive patient-identifiable

<table>
<tr><td></td><td>data from other organisations for the active control and prevention of infection.

This standard is used to:
• Identify trends in the prevalence of HCAI i.e. the identification of unexpected levels/ trends in outbreaks and cases, and to provide information which can be used as a catalyst for improvement to reduce the incidence of infections.
• Provide regular infection rates to stakeholders.
• Inform national policy and strategy provided by PHE, NHSI and DH.
• Provide information to the public to support the patient choice agenda.

Additionally, NHS acute trusts report quarterly aggregated totals of various laboratory results to PHE, referred to as Quarterly Laboratory Reporting (QLR).

The data set covers all relevant individuals tested for the above in all NHS settings (as stipulated under the Mandatory HCAI surveillance schemes) and also within Independent Sector healthcare providers participating in the PHE HCAI surveillance schemes.</td></tr>
<tr><td>Applies to</td><td>This Information Standard applies to NHS and Independent Sector healthcare providers participating within the PHE HCAI Surveillance schemes including the Surgical Site Infection Surveillance Scheme.

All users of the associated surveillance systems including the HCAI Data Capture System and SSI Surveillance Scheme need to conform to this Information Standard.</td></tr>
<tr><td colspan="2">Release</td></tr>
<tr><td>Release Number</td><td>Amd 18/2017</td></tr>
<tr><td>Release Title</td><td>Version 3.0</td></tr>
<tr><td>Description</td><td>This Information Standard has been extended to encompass new data collections or changes to existing data collections, as outlined below:
<u>New categories of reporting to existing HCAI surveillance Data Capture Systems</u>
Mandatory reporting at record level of Klebsiella and Pseudomonas aeruginosa bacteraemia from 1 April 2017.

<u>Reports/outputs - changes & additions to reporting schedules</u>
• Publication of monthly reporting of Klebsiella and Pseudomonas aeruginosa bacteraemia (October 2017).
Note: All mandatory surveillance of MRSA bacteraemia, MSSA bacteraemia, CDI, E. coli bacteraemia and Klebsiella and</td></tr>
</table>

	Pseudomonas aeruginosa bacteraemia reports are published according to an agreed publication schedule available on GOV.UK* (*All mandatory surveillance outputs are National Statistics. The mandatory surveillance data is managed by PHE on behalf of the Department of Health. PHE retains responsibility for publishing the data).
Implementation Completion Date	Changes were fully effective from October 2017 and providers must ensure full conformance with this standard by 31 March 2018.

1.2 Supporting Documents

Ref #	Reference	Title
1	HCAI.1	Mandatory enhanced MRSA, MSSA and Gram-negative bacteraemia, and *Clostridium difficile* infection surveillance v4.1
2	HCAI.2	Announcement of government intentions to reduce Gram-negative bacteraemia by 50% by 2020/21
3	HCAI.3	Gram-negative bacteraemia mandatory surveillance reporting aid
4	HCAI.4	Mandatory Health Care Associated Infection Surveillance: Data Quality Statement
5	HCAI.5	Overview of Roles and Permissions User Manual
6	HCAI.6	HCAI Data Capture System User Manual
7	HCAI.7	Data Upload Wizard User Manual
8	HCAI.8	PHE Data Dictionary July 2017
9	HCAI.9	Surgical Site Infection (SSI) Surveillance Protocol (NB This includes Data Collection sheets)
10	HCAI. 10	Operating Procedure Codes (OPCS) Codes
11	HCAI. 11	SSI Web Link User Manual

2. Health and Care Organisations

2.1 Requirements

#	Requirement [1]
1	Healthcare providers, including NHS Hospitals and Independent Sector providers, participating in HCAI Mandatory Surveillance schemes MUST implement this standard for the relevant surveillance.
2	For additional guidance, all participating healthcare providers SHOULD review the requisite User Guidance indicated in Appendix A, which provides further clarity for the data items covered by this Information Standard. This includes data items that are Mandatory/Compulsory or Required, mandatory items MUST be submitted with each submission. The data set

[1] The key words MUST, SHOULD and MAY are defined in RFC-2119.

	specification and guidance regarding all surveillance covered by this Information Standard supports those undertaking surveillance within the healthcare setting and are best reviewed by those tasked with undertaking and reporting surveillance locally. Roles responsible for this surveillance may vary between providers.
3	Healthcare providers undertaking Surgical Site Infection Surveillance MUST be familiar with the OPCS codes and Protocol for required case finding and definitions upon which SSI data sets are defined and collected.
4	All Public Health England, NHS Improvement and Department of Health staff working with data covered by this Information Standard MUST adhere to the requirements of the Standard.
5	As part of the conditions of approval under section 251 of the NHS Act 2006 which have been provided to cover this activity, healthcare providers MUST inform patients that their data may be used for secondary uses such as statistical reporting. PHE makes available the "PHE: what we do, how we use personal information, and your options" available to the public via the website.
6	The Information Standard does not stipulate how data should be collected locally; however, submission of data MUST be via established, secure web-enabled data capture systems. (See section 3.3: Technical Architecture for further details).
7	To support the implementation of this Information Standard, all participating healthcare providers, Public Health England, NHS Improvement, NHS England, Clinical Commissioning Groups and Department of Health staff working with the data sets covered by this Standard SHOULD highlight any issues hindering the implementation of this Information Standard. This feedback mechanism provides appropriate information to the Standard developers to improve the implementation and data collection processes. Contact details are provided in Appendix A.

2.2 Conformance Criteria

#	Conformance Criteria
1	100% of providers participating in HCAI Mandatory Surveillance schemes have submitted these data in the required format.
2	All participants submitting data to the system have ensured their data quality before submission.
3	All organisms under mandatory surveillance have been signed off by NHS acute trust Chief Executive Officers (CEOs).
4	All submissions contain all mandatory fields and contain all required fields.
5	Surgical Site Infection Surveillance uses the latest version of OPCS coding and follows the protocol for case finding and definitions.
6	PHE adherence to this standard has been audited annually (particularly with regard to Information Governance).
7	All new participants in SSI collections have attended SSI Training Days.
8	Monitoring surgical wounds for infection: Information for patients Leaflets on this data have been made available to all patients where they are subject to Post Discharge Questionnaires (PDQ)
9	Patients have been informed that their data may be used for secondary purposes via the PHE Personal Information Charter.
10	The submission of data via established, secure web-enabled data capture systems has been checked frequently by PHE at the periodic closure of data submission periods as outlined in 3.1.
11	PHE has used the surveillance captured under this Information Standard to enable National Benchmarking for Surgical Site Infection Surveillance.
12	All sites have an up-to-date Information Security Policy.
13	Weekday support for users of both the SSI Surveillance Scheme and HCAI Data Capture System has been provided by PHE.

Note also the following points relevant to the above conformance criteria:

a. As the new data collections are already in effect PHE can already evidence compliance with the standard via received data. For example, participants submitting data to the system MUST ensure their data quality. By definition local NHS CEO's provide an assurance of their data quality by being responsible for the signing off of monthly data submissions regarding organisms subject to mandatory surveillance.

b. Healthcare providers undertaking Surgical Site Infection Surveillance will demonstrate that they are familiar with the new OPCS 4 codes required in the changes to the data standard by their submission of the operational codes consistent with the categories under surveillance to the SSI Data Capture System. The continuous SSI data validation process will demonstrate any users not using the codes correctly, highlighting these users for additional assistance or training from the PHE SSI Team.

c. The adherence to this Information Standard by Public Health England and Department of Health staff working with these data will be checked annually via Information Governance audit and/or Training Records audit. Such audits will highlight potential Information Governance breaches or any staff that have not undertaken the necessary training required in order to support delivery of this Information Standard, e.g. PHE Information Governance training.

d. PHE will also therefore enable the provision of regular publications of national and sub-national rates for HCAI via GOV.UK.

e. Lack of support may be reported, and therefore measurable, via the PHE Complaints system. The HCAI & AMR Department's Management Group undertakes an annual review of Complaints received.

3. Implementation and Use

3.1 Guidance

User guidelines and supporting documentation are indicated in 1.2. Further information on implementation can be found in the Implementation Guidance document. These User Guidelines provide details of the regularity of reporting by Healthcare Providers to PHE and regularity of PHE reports based upon these data submissions. The User Guidelines set will support data entry by providing instruction on data items and permissible values and ensure that data is collected in a consistent manner. It will therefore be possible to compare data collected across services. National processing and reporting will help to improve data quality and make data more transparent and accessible to patients.

The expanded data sets have continued to collect the same level of patient-identifiable information as existing data sets. Data collected at patient-identifiable level are tightly controlled within PHE and granted only to those with the necessary security approvals and is used in accordance with Caldicott principles and PHE Information Governance policies including Record Retention.

Data flow using existing systems/methodologies are outlined in detail in the HCAI Data Capture System User Manual. This document outlines the data entry process and provides detail on the required data items for reporting a case. Information on those data items that can be reported on an optional/voluntary basis is also included. NB: it is only the required core data fields that are covered by the Data Standard. Please see supporting document HCAI.8 (PHE Data Dictionary, July 2017, tab 1) for further information.

Although it remains possible to enter data using existing systems and methodologies the method of data collection has been expanded to allow for the batch upload of cases if desired. Such an expansion serves to improve/enhance data collection capacity while the ongoing ability to submit data as per the existing Information Standard ensures minimal impact on NHS and Independent Healthcare providers. Further information on the batch upload process is available in the 'Data Upload Wizard User Manual'.

These data collections give valuable information about rates of Healthcare Associated Infection across the country.

Data will be collected to meet the following needs:

- To provide national and sub-national data on rates of HCAI. Healthcare providers participating in SSI will be able to benchmark their performance against the national average.
- To allow PHE to calculate and monitor national and sub-national trends in HCAI and use the information collected for action. This includes assisting NHSI monitor progress against the government ambition to halve Gram-negative bacteraemia by FY 2020/21.

Mandatory Surveillance of MRSA bacteraemia, MSSA bacteraemia, *E. coli* bacteraemia, *Klebsiella* bacteraemia and *Pseudomonas aeruginosa* bacteraemia and CDI

Within the NHS the surveillance of all of the above are mandated by the Department of Health through NHS Improvement and the results are used to measure progress.

Once data are submitted by participants, the Chief Executive of that organisation is required to review and sign-off their data as being accurate. This process in turn locks the data set. To ensure stability for reporting purposes, once data sets are locked changes cannot be made by the end user. If further changes are required then an application has to be made by the Chief Executive of the organisation to the PHE Colindale to have the data set unlocked for a short period.

For MRSA, MSSA, *E. coli*, *Klebsiella* and *Pseudomonas aeruginosa* bacteraemia and CDI data sets, Chief Executives have until the 15th of the following month to sign-off their data.

PHE publishes data on a monthly and annual basis, with epidemiological commentaries produced quarterly.

For bloodstream infections and *Clostridium difficile* Infection (CDI), clinical specimens are analysed in Microbiology laboratories and positive results recorded in the hospital's laboratory information management system, triggering the completion by infection control and microbiology teams of the requisite HCAI data entry before submission to the HCAI Data Capture System (DCS).

For Surgical Site Infection (SSI), there are triggers for recording HCAI data. Firstly, the hospital will select the period and category they wish to participate in the surveillance and then collect and submit demographic data and surgical data on all patients undergoing surgery in that category based on a list of predefined OPCS codes using the PHE SSI web-based data capture system. NHS hospitals are mandated to report one quarter per financial year for Orthopaedic Surgical Site Infection Surveillance, they can choose in which quarter to participate, all other surgical categories available within the scheme are voluntary. These patients are followed up to see if they develop SSI according to PHE definitions (based on clinical and microbiological criteria). If the patient develops an SSI, this acts as the second trigger for recording details of the infection using the PHE web-based data capture system, Surgical Site Infection Surveillance Scheme (SSISS). All data on the patients are then submitted on to SSISS database.

PHE runs quarterly SSI Training days which are designed for healthcare staff participating in the PHE surgical site infection (SSI) surveillance scheme. The course is designed for staff involved in data collection, administration of the surveillance or dissemination and feedback of the results. It covers surveillance principles, definitions, methodology and how to interpret and apply the data locally.

SSI closing dates

Closing dates for submission of data, shown in the table below, are the very latest dates that records can be submitted. However, timely data submission ensures timely report production and feedback of results to participating hospitals and it is strongly recommended that all records are submitted as soon as possible after the end of the 30 day follow up time for the period.

Surveillance period	**Closing date for data submission**
January to March	30 June
April to June	30 September
July to September	31 December
October to December	31 March

3.2 Governance

This section provides information on national and local data governances issues related to the data collections covered by this Information Standard. The governance structure includes NHS Improvement, PHE, Department of Health and Independent Sector Healthcare providers.

National Data Governance

In terms of information governance, there are no additional issues arising from the changes to the Information Standard. PHE has permission to handle Patient Identifiable Information (PII) under section 251 of the NHS Act 2006 (previously section 60 of the Health and Social Care Act 2001). This may also be referred to as permission to process confidential patient information for the specified purposes within Regulation 3, Communicable disease and other risks to public health" of the Health Service (Control of Patient Information) Regulations 2002. The original approval for the then Public Health Laboratory Service, now PHE, was PIAG 03 (a) 2001 "Communicable Disease Surveillance and Control". A link to the original approval is available via the NIGB website PIAG Register, 2001-2008 applications. As part of PHE processes and as required by CAG, all PHE Information Assets, that includes the HCAI data collections, are subject to annual internal reviews to ensure compliance with Section 7 of the Health Service (Control of Patient Information) Regulations 2002.

Extension to the Mandatory HCAI Surveillance Data Capture System: PHE runs a Mandatory Healthcare Associated Infection Surveillance programme on behalf of the Department of Health. *Klebsiella* and *Pseudomonas aeruginosa* reporting has now been added by the Department of Health through NHS Improvement to the Mandatory HCAI Surveillance programme, and PHE's surveillance system extended as a result.

Mandatory HCAI surveillance data are used to monitor progress on controlling key infections and to provide epidemiological evidence to inform action to reduce them. It also enables benchmarking and performance management. As stated above, an exemption

under Section 251 of the NHS Act 2006 (previously Section 60 of the Health and Social Care Act 2001) and the Health Service (Control of Patient Information) Regulations 2002 – regulation 3 - allows PHE to receive patient-identifiable data, without the requirement for patient consent, from other organisations for the active control and prevention of infection. HCAI national surveillance schemes sit within this remit.

Only aggregate data are published by PHE with data being published according to pre-agreed monthly, quarterly, six-monthly and annual schedules via GOV.UK.

Data collection and use by PHE is strictly defined, and information management at the PHE is carried out according to Caldicott principles of data protection and confidentiality.

The PHE Personal Information Charter details the standards the general public can expect of PHE within our remit of holding personal information. Further information regarding safeguarding confidentiality of patient information is listed on the PHE Personal Information Charter page or if required can be obtained from PHE's Caldicott Guardian, Dr. Paul Cosford (Paul.Cosford@phe.gov.uk).

Additionally, Patient Information Leaflets are provided to hospitals covering "Monitoring Surgical Wounds for Infection" and "MRSA Information for Patients.

PHE has System Level Security Policies and Risk Assessments in place for both systems, HCAI and SSI. System Level Security Policies include details for physical security measures such as secure hosting, secure office environment to measures to control access.

Access to all HCAI surveillance data held within either the HCAI DCS or SSISS, including identifiable and non-identifiable fields, is managed using password protection. PHE collect information at patient level to enable validation, de-duplication and data linkage work.

Data are retained on PHE Data Capture Systems in accordance with PHE Records Retention Schedule; the Data Capture System has permission to extend data retention time beyond 8 years. Data are also retained in accordance with the request of the Independent Inquiry into Child Sexual Abuse.

Local Data Governance

User of the system should read the "NHS Confidentiality Code of Practice" and "Caldicott Report" for guidance and technical support related to data and information sharing at both operational and secondary use levels.

Note regarding the NHS Data Dictionary and SNOMED CT

Following review by the NHS Digital Terminologies service and the NHS Data Model and Dictionary service, PHE recognise and accept the need to align the Data Capture System with the NHS Data Model and Dictionary and SNOMED CT. Organisationally the Department of HCAI & Antimicrobial Resistance (AMR) within PHE have confirmed they are committed to migration to SNOMED CT. The HCAI & AMR Department within PHE confirm their intention to align with the data dictionary for future releases. It is recognised this must take place in readiness for adoption of SNOMED CT in acute care by April 2020. The NHS Data Model and Dictionary service have issued a statement in support of this approach.

3.3 Technical Architecture

Public Health England has built the secure web-enabled Data Collection Systems for the upload, storage and reporting of HCAI.

HCAI DCS - require participating healthcare providers to submit data via secure N3 and/or internet.

SSISS - access is via a secure web portal.

Access to the HCAI DCS is controlled through the use of individual level passwords/usernames. The HCAI DCS System supports a range of organisations and user types or roles, each of which has associated permissions and levels of access to the system. Within each organisation it is possible for the same user to have a range of different roles and for different users to have different roles. A user's organisation type, its place in the hierarchy and the user's role affect whether the user is able to enter or sign off data. It also impacts on what data they are able to view.

All roles allow users to view data entered on the system at a summary level via a range of reports. For example, all users are able to view a count or rate of reported MRSA bacteraemia by NHS Trust.

- Access to patient level data, with or without PII, is restricted based on the organisational hierarchy (see Overview of Roles and Permissions User Manual). National users have access to patient level data for all cases entered on the system. Sub-national users have patient level access for cases mapped to their organisation in one of several ways. Organisation units only have patient level access to records entered by themselves.

For SSI logins and passwords are provided to participating healthcare providers and data submission for both systems is initiated and controlled by a designated staff member at the submitting organisation.

Data quality will be checked at different stages in the system:

- SSI data
    - Once an SSI category is selected the system automatically only makes available data field options relevant for that category.
    - Users submitting data may receive a message advising them to check their data entry:
        - Error - a required variable is missing or data are entered inaccurately.
        - Warning, - the system questions the value entered. E.g. the value is outside parameters or two incompatible variables have been entered.
    - The user must correct entries to clear all such messages before a record can be submitted. They have the option to override warning message/s by addressing the problem in the comments field.

- Data are then validated by PHE staff upon submission. This is via a system check for warnings that a hospital has received during the submission process. These are then checked again for actions taken to correct the warning.

- HCAI DCS
  - Data are systematically checked against voluntary data collection systems (e.g. PHE's Second Generation Surveillance System SGSS) to verify that all cases are being reported.
  - The system includes data quality/sense checking facilities, for example it is not possible to enter a specimen date earlier than the patient's Date of Birth.
  - Monthly CEO sign off provides confirmation that all specimens that have tested positive within a given month have been added to the HCAI DCS.

Further information on how data quality is assured on the HCAI DCS can be found the annual 'Mandatory Health Care Associated Infection Surveillance: Data Quality Statement' [HCAI.4].

Submitting data to SSISS

Data can be submitted via the web link by one of two methods

Method	How it works	Instructions
SSI web link	SSI data are entered into boxes that correspond with those on the surveillance sheet, e.g. SSI symptoms, and submitted via a web link.	Records can be entered and saved on the web link as 'in progress' these can be edited as required. Once complete a record can be submitted after which no changes can be made. It is possible to search for any record and view the data. Automated error checks identify errors in the data which must be corrected before a record can be submitted. This facilitates better quality of data and quicker report production.
CSV[2] Electronic transfer of data held on a local database.	Hospitals with their own system for processing data, who prefer to collect and store SSI data on a local database can upload their data electronically via a CSV file.	The data has to be re-formatted locally so that it corresponds to the rules specified within the PHE Data Dictionary March or SSI; this is available for registered users via contacting SSI.Data@phe.gov.uk. This can be time consuming and requires IT skill. Data are then imported into the web link in CSV file format and are held as 'in progress' records. Once erroneous records are cleared each individual record is submitted separately.

XML will be considered for future releases whilst noting the recent archiving of the e-Government Interoperatility Framework (eGIF) Standards that set out the government's

[2] Comma separated values

technical policies and specifications for achieving interoperability and ICT systems coherence across the public sector.

HCAI Data Capture System

Data will be submitted to PHE via the web-enabled HCAI Data Capture System (DCS). HCAI DCS - require participating Healthcare providers to submit data via secure N3 and/or internet.

Access is further controlled by individual level usernames and passwords. Data submitted by e-mail is sent to the secure PHE e-mail account, Mandatory.Surveillance@PHE.gov.uk

Healthcare providers can either manually enter their data onto the System or upload data using the Data Upload wizard. The HCAI DCS includes the facility for users to upload data using Excel, CSV, or delimited text formats [HCAI.5].

User reports

SSI

National aggregate NHS data are published in the SSI annual report, accompanied by tables of trust level orthopaedic data.

Healthcare providers are able to access different reports for their data submissions. These may be summary reports for their SSI or more detailed choices from a number of options. These reports are available once participants have completed their quarterly data submission.

Mandatory surveillance

PHE provides regular publication of HCAI data via GOV.UK, as outlined below. Additionally, participants may undertake local analysis of their data to compare against published aggregate national rates.

Monthly rates for MRSA, MSSA, *E. coli* and CDI infection rates for Acute Trust and CCGs. NB: *Klebsiella* and *Pseudomonas aeruginosa* bacteraemia outputs will be included later in 2017.

Quarterly Epidemiological Commentary: Aggregated over all English NHS acute Trusts, the commentaries contain a description of the trends in MRSA, MSSA, *E. coli* and CDI over a number of quarters. NB: *Klebsiella* and *Pseudomonas aeruginosa* bacteraemia will be included later in 2017.

6-monthly: Surveillance of MRSA, MSSA, *E. coli* and CDI for Independent Sector Healthcare Organisations.

Annually: Annual (financial year) MRSA, MSSA, *E. coli* and CDI data tables by acute Trust and CCG (counts/rates). NB: *Klebsiella* and *Pseudomonas aeruginosa* bacteraemia outputs will be included from 2018.

Outputs are also available via the 'AMR Local Indicators' National Public Health Profile on PHE Fingertips.

Appendix A: Contact details for HCAI & AMR Department in PHE Colindale.

For more information on this document please contact:

HCAI & AMR Department, Public Health England Colindale
Email: HCAI.AMRDepartment@phe.gov.uk

Please state “HCAI Information Standard” in the subject.

T: 020 8327 6054

Email:mandatory.surveillance@phe.gov.uk