Weekly reporting of Mandatory Surveillance reports of meticillin-resistant *Staphylococcus aureus* bacteraemia and *Clostridium difficile* infection

This commentary discusses the caveats and limitations to the data that users should consider when using the weekly reports on meticillin-resistant *Staphylococcus aureus* (MRSA) bacteraemia and *Clostridium difficile* infections (CDI) based on data reported to the Health Protection Agency (HPA).

Historically, the HPA has undertaken a public reporting function and published data on MRSA bacteraemia and CDI by NHS Acute Trust and Primary Care Organisation (PCO) on a monthly, quarterly, and annual basis. The HPA will continue to publish these statistics, which are produced according to the Code of Practice for the production of Official Statistics.

The weekly data for MRSA bacteraemia and CDI are different from the monthly, quarterly and annual statistics in that analysis is by hospital (as opposed to Acute Trust and PCO-level reporting). It is important to note that these data are not classified as Official Statistics and that their interpretation should be undertaken with caution as explained in the caveats below.

The first "provisional" weekly outputs started on the 2nd June 2010, becoming a formal weekly publication schedule from 5th July 2010. The data for this period are made available through the HPA website and data.gov.uk.

1. Data Definitions

Case definition ("hospital -apportioned" cases)

The weekly publication contains information on cases that are presumed to have been acquired while the patient was admitted during their hospital stay. As such they are considered to be "hospital apportioned" cases and are derived from the data as follows:

MRSA bacteraemia infections are apportioned to a hospital if ALL the following rules are met:

i. The location where the specimen was taken is given as 'acute Trust' or 'PCT Hospital';
ii. Patient is an in-patient, day-patient, or emergency assessment patient;
iii. Patient's specimen date is on, or after, the third day of the admission (or admission date is null), where the day of admission is day 1.

C. difficile **infections are apportioned to a hospital** if ALL the following rules are met:

i. The location where the specimen was taken is given as 'acute Trust' or 'PCT Hospital';
ii. Patient is an in-patient, day-patient, or emergency assessment patient;
iii. Patient's specimen date is on, or after, the fourth day of the admission (or admission date is null), where the day of admission is day 1.

Case definition: Other cases ("non hospital-apportioned" cases)

Any cases reported by an acute trust or Primary Care Trust (PCT) hospital that are identified on admission or within three days of admission (for MRSA bacteraemia) or within four days of admission (for CDI) , where the day of admission is day 1, are not included in this publication. These infections are presumed to have been acquired prior to the specified hospital admission and may be associated, instead, with acquisition from the community or other healthcare facility (e.g. nursing home, hospice; care home; previous hospitalisation ; etc). Data from our most recent Quarterly Epidemiology Commentary suggests that close to 50% of cases of MRSA bacteraemia and CDI are in fact not associated with the patient's current inpatient admission. http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1267551242367

2. Limitations to the data

These data are not an Official Statistic. For a full list of the HPA's Official Statistics related to MRSA bacteraemia and CDI can be found on our website:

http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/StaphylococcusAureus/
http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/ClostridiumDifficile/

Data quality assurance

Data may not have been signed off by Trust CEO, and therefore should NOT be assumed to be quality assured. The trust "sign-off" process, which includes checking that the data are accurate and complete, currently occurs on a monthly basis (not weekly).

Hospital-level data

The mandatory enhanced surveillance scheme was established to monitor counts at an acute Trust- level. There are two limitations for using these data for hospital-level analysis:

a. Data are collected from microbiology laboratories, which are all located within an acute trust. Should one of these laboratories process a patient specimen sent from a non-acute trust hospital (e.g. PCT hospital, mental health hospital trust), the reporting of the hospital name is voluntary and may, subsequently, be incomplete.

b. No definitive hospital list for England exists. The HPA have attempted to maintain a list on the data capture system, but this list may contain out of date (due to hospital mergers), or duplicative (several hospitals trusts or PCTs may commission services at a single hospital) hospital codes. Consequently, the HPA have verified its list with a similar hospital site list (comprising 24,000+ records) maintained by Connecting for Health's (CfH) Organisation Data Service (ODS). The hospital listing used for these tables is based on the best available information from the CfH website and HPA hospital list.

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Admission date

The algorithm used for apportioning cases to hospitals is based on the number of days elapsed between the admission date and the specimen date. As the current system only requires acute Trusts to complete patient level data, there may be cases where there is insufficient information provided by the PCT hospital to correctly apportion the case to the non-acute trust hospital. .

Timeliness of reporting

Currently, reporting through the surveillance system is not necessarily 'real time'. The current system is based on a monthly reporting cycle whereby the Trust CEO signs-off the data on the 15th of the following month. Under the current reporting cycle Trusts have up to six weeks to enter the cases onto the system.

- Only specimens confirmed by laboratory testing positive as MRSA or *C. difficile* should be reported to the HPA. Inherent to the testing process is a time delay, in the case of MRSA bacteraemia it can take **2-4** days to reach a definitive result; *C. difficile* rapid toxin tests usually takes at least **1** day.

- The assignment of a case to a specific week is based on the date the specimen was taken and not when the case was entered onto the HPA's data capture system. This can lead to a time delay in reporting e.g. because it can take 2-4 days to receive laboratory confirmation of a diagnosis, which is required before a case can be entered onto the surveillance system. Thus not all cases pertaining to the specific week will be included in the most recent weeks' data. These data will be updated in subsequent weekly publications, and will reflect the best available data at the time of publication.

- This can impact on the timeliness of reporting in two ways:

    a. *For the current weeks' data:* Depending on which day of the week a specimen is collected will affect the likelihood that it will be processed and reported in the same week and shown in the tables for the current week. A specimen collected last Monday morning has a better chance of being reported in this table, than one collected on the Friday or Saturday of the same week.

    b. *For the current months' data:* The monthly reporting cycle currently in use only requires cases to be added in advance of the CEO monthly sign off. There is likely to be wide variation between acute Trusts in the reporting lag due to local differences in data entry policies. A trust's weekly count will depend on the pattern of that data entry.

- Users of these data should also exercise caution when comparing data between different weeks. Fluctuations may not necessarily indicate a true variation in risks of acquisition of infection in hospital, but may be due to a range of other factors, such as organisational changes, variations in the patient populations being treated and seasonal changes in

hospital admissions. Consideration of the numbers without the context cannot indicate the reasons or the significance of the fluctuations.

3. **What the data tables show:**

- Data are presented as counts per week based on the date the specimen was taken.

- Counts of MRSA bacteraemia and CDI are given for the last 12 weeks up to the most recent full week running from Monday to Sunday. The assignment of cases to specific weeks is based on the date the specimen was taken and not when the case was entered onto the HPA's data capture system.

- We present two data tables; one for MRSA bacteraemia and one for CDI. Data are presented at the hospital level and include both acute and PCT hospitals.

4. What these data do not provide:

- A basis for accurately determining the number of cases of MRSA bacteraemia or CDI in the last few weeks. Microbiological testing introduces an inherent delay into the reporting of cases which means the counts for the most recent weeks' data are lower than the number of infections that have likely occurred. The data will be updated weekly.

- A basis for decisions on the clinical effectiveness of infection control interventions in individual Trusts: further investigations considering potential confounders would need to be undertaken before this could be done.

- A basis for comparisons between hospitals. The counts of infections have not been adjusted for hospital size, patient demographics or case mix which would be required to give a standardised rate.

- Cases reported by the following are NOT included in these tables: GPs, private sector hospitals, hospices, or from NHS-commissioned patients in private sector hospitals. They do not relate to an NHS hospital admission.

- A basis for comparing the current weekly reporting with the other HPA publications on MRSA bacteraemia and CDI. The routine HPA publications are based on reporting at acute Trust and Primary Care Organisation levels

5. Confidentiality

Some of these figures will report on very low numbers of cases. More than half of Trusts now report fewer than six cases of MRSA a year, so weekly figures in those hospitals will typically show zero or one case. We recognise that it is important to balance the benefits of providing this new information to the public, with the potential risk to confidentiality for individuals, through inadvertent identification despite the use of completely anonymised aggregate data. For the existing monthly data, the scale of activity in NHS hospitals means that the risk of identifying an

individual is slight. That risk is not greatly increased by the move to weekly data, which provides more relevant and up to date information.