

Analysis Method Notice

The rate of laboratory confirmed *C.difficile* cases per 100,000 of the HB population

This notice describes an Analysis Method that has been developed for use in the production of published national outcome indicators, performance measures and/or currencies, which are derived directly from NHS Wales data.

The Analysis Method has been reviewed by the Analysis Methodologies Group and its output submitted to the Welsh Information Standards Board (WISB) for potential accreditation.

*It should be noted that, where the data flow on which the analysis is being undertaken has not been reviewed by WISB (see 'Status of WISB Data Standards Assurance' below), accreditation of the analysis method **cannot** be interpreted as an approval of the underlying data standards or the quality of the data used.*

It is recognised that formal review and/or assurance of the data flow may have been undertaken by other bodies, where those data are being formally published; for example, as 'Official Statistics'. In such circumstances, users of this method are advised to contact the relevant organisations should they require further information on the underlying quality of the specified data source.

For further details about the group, including Terms of Reference and membership, please visit the following website:

<http://howis.wales.nhs.uk/sites3/page.cfm?orgid=742&pid=56696>

WISB Reference: ISRN 2018 / 002

Please address enquiries about this Analysis Method the NHS Wales Informatics Service Data Standards Team.

E-mail: data.standards@wales.nhs.uk / Tel: 029 2050 2539

WISB Analysis Method Appraisal Assessment	Accredited This Analysis Method has been appraised by WISB and is felt to: <ul style="list-style-type: none"> • Meet the specified indicator requirement, in that it is suitable for its calculation / derivation; • Is reproducible by organisations, where appropriate.
WISB Analysis Method Appraisal Outcome(s)	

Status of Data Standards Assurance	WISB Reviewed The data used in this Analysis Method are based on data item standards that have been through the Information Standards Assurance Process.
WISB Decision	Approved
Data Standards Assurance Outcome(s)	

Indicator

The rate of laboratory confirmed *C.difficile* cases per 100,000 of the HB population

Target:

2017/18 reduction expectations are HB specific as follows:

Abertawe Bro Morgannwg UHB, Betsi Cadwaladr UHB, Cardiff & Vale UHB and Hywel Dda UHB - a rate of no more than 26 cases per 100,000 of the HB population.

Cwm Taf UHB - a rate of no more than 20 cases per 100,000 of the HB population.

Aneurin Bevan UHB - a rate of no more than 25 cases per 100,000 of the HB population.

Powys Teaching HB and Velindre NHS Trust do not have specific reduction expectations due to the small number of cases per month and Velindre NHS Trust does not have a HB population, but they are both included in the overall Wales numerator data.

Rationale / Context

C.difficile is a spore forming bacterium which is present as one of the 'normal' bacteria in the gut of up to 3% of healthy adults, where it rarely causes problems. It can cause illness when certain antibiotics disturb the balance of 'normal' bacteria in the gut or if cross infection occurs. When *C.difficile* overgrows in the gut it produces toxins, which can cause frequent severe diarrhoea. The spores generated during diarrhoeal episodes of an infected patient can then contaminate care environments. These may then be ingested by other patients and infect them. The most vulnerable to *C.difficile* infection are those who have had recurrent courses of antibiotics, been exposed to infected patients or have underlying disease reducing their immune response.

From the healthcare service point of view, patients will remain in hospital longer due to infection meaning that other patients cannot be treated as quickly. Outbreaks of this infection, impact on hospital and/or community healthcare services. Costs to the health service include diagnosis and treatment, (which may require more expensive diagnostic tests e.g. colonoscopy, MRI to exclude pseudo-membranous colitis), extended length of stay (which often results from toxin positive infection) and the use of more expensive antibiotic therapy to manage relapses. These infections result in increased pressure on Infection Prevention & Control Services, and can impact on bed/ward closures, cancellation of operations/admissions but importantly increased morbidity and patient harm including greater risk of death.

Data Source(s)

DaraStore (via the Welsh Healthcare Associated Infection Programme, Public Health Wales)

ONS Mid-Year Population Estimates

Definitions:**Definitional Guidance:****Data Items:**

n/a

Terms:

n/a

Detailed Specification

Data from each of the laboratory information systems (LIMS) across Wales is automatically copied over once a day into DataStore, a Public Health Wales data warehouse system.

The *C.difficile* test results are extracted from DataStore daily and transferred to a bespoke database for Healthcare Associated Infections data. There is additional manual data entry into the database of samples from locations in Powys Teaching HB processed in microbiology laboratories in England. These are provided by in the infection control team in Powys via a monthly email

C.difficile data is extracted using the following criteria:

- The patient is at least 2 years old (see below as to how the age of the patient is determined).
- The sample was not taken from a patient in a private hospital a privately run dialysis unit or post mortem.
- The sample had a positive glutamate dehydrogenase (GDH) assay combined with a positive *C.difficile* toxin enzyme immunoassay or, if a single test protocol was used, a positive *C.difficile* toxin A and B enzyme immunoassay or a neutralised cell toxicity assay.

The age of the patient is determined as follows:

- Where a date of birth is provided on the specimen form, the age of the patient is based on the date the specimen was received in the laboratory. This is usually the same date of day after the test was taken but occasionally later if a specimen goes astray.
- Where no date of birth is provided on the specimen form, but an age is, the age provided is used.

Duplicate records are flagged within the database (known as ‘de-duplication’) and are excluded from calculations. For *C.difficile* this is carried out on the basis of 28 days i.e. any positive test occurring within 28 days of another positive *C.difficile* test from the same patient is excluded.

HB staff are given the opportunity to audit their data, identifying quality assurance samples, other sample types processed in blood culture bottles, duplicates that have not been identified because they have gone into the laboratory system with 2 different patient identifiers etc. HB staff can either do this on an on-going basis using an online audit system or provide all required changes at the end of the financial year. Because of these differing audit processes all data is marked as provisional until Public Health Wales produce end of financial year figures in May.

The measure is expressed as a rate per 100,000 population as follows:

$$\text{Rate per 100,000 population} = \frac{\text{Numerator}}{\text{Denominator}} \times 100,000$$

Calculation:

Numerator

Cumulative number of *C.difficile* positive samples from patients aged 2 years and over from primary and secondary care NHS locations within Wales (Abertawe Bro Morgannwg UHB, Aneurin Bevan UHB, Betsi Cadwaladr UHB, Cardiff and Vale UHB, Cwm Taf UHB, Hywel Dda UHB, Powys Teaching HB and Velindre NHS Trust) with a specimen date for the current financial year.

Denominator

Mid year population estimates for numbers of persons aged 2 years and over resident in each HB.

N.B The mid year population estimates from the previous year are used until the estimates for the

current year become available.

Reporting Format / Frequency

Reporting Frequency	Monthly
Time Delay of Reported Data?	Approximately 7 calendar days after month end. A reporting scheduled is supplied by PHW each year detailing exact dates reports will be available. DataStore downloads to the HCAI database daily at 7am. The <i>C.difficile</i> report is produced on the data available approximately 3 working days prior to the scheduled report date. All data is provisional until approximately two months after the end of the financial year.

Discussion Points / Areas for Future Development

This section details any areas the Analysis Methodologies Group felt needed further consideration / review by the 'owner' of the method.

Appendix A – Additional Information

n/a

Appendix B – SQL Code (where applicable)

n/a