Monitoring & Surveillance of HCAI: an update

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Health Protection Agency
Timely....

Annual report on HCAI

- bloodstream infection surveillance
  • mandatory and routine
  • MRSA
  • GRE

- C. difficile infection

- surgical site infection surveillance (mandatory and voluntary)

Quarterly report: MRSA bacteraemia & C. difficile

National Confidential Study of Deaths following MRSA Infection

http://www.hpa.org.uk/infections/topics_az/hai/default.htm
MRSA bacteraemia
S. aureus bacteraemia
England 1990-2005

Reports of S. aureus bacteraemia
% MRSA (as a proportion of reports with methicillin susceptibility information)
MRSA: voluntary and mandatory surveillance

![Graph showing the number of MRSA bacteraemia reports from 1990 to 2006, with separate lines for voluntary and mandatory surveillance.](Image)
Total numbers of blood cultures taken and total positive blood cultures mandatory surveillance (2002 to 2006)
MRSA bacteraemia rate by Trust type

April 2001 to March 2007
MRSA bacteraemia rate by region (mandatory surveillance)

Provisional data
MRSA bacteraemia: quarterly picture

Number of reports

Quarter

April 2006 – June 2006
July 2006 – September 2006
October 2006 – December 2006
January 2007 – March 2007
April 2007 – June 2007
Staphylococcus aureus bacteraemia reports received under the voluntary and mandatory surveillance schemes in England, calendar year 1990 to 2006.
Age and sex distribution of MRSA bacteraemia, April 2006 – March 2007
Timing of detection of MRSA bacteraemia in relation to presentation of patient to the reporting Trust, April 2006 – March 2007

- 2 or more days: 65%
- On presentation: 6%
- Within 2 days: 27%
- Not categorised: 2%
Patient location prior to admission, April 2006 – March 2007

- MRSA bacteraemia detected 2 or more days after admission (n = 4177):
  - Home: 76%
  - Nursing home: 7%
  - Hospital: 10%
  - PCT hospital: 18%
  - Other location or unknown: 7%

- MRSA bacteraemia detected within 2 days of admission (n = 1696):
  - Home: 66%
  - Nursing home: 18%
  - Hospital: 7%
  - PCT hospital: 7%
  - Other location or unknown: 10%
MRSA bacteraemia rate (per 10,000 bed-days) by specialty*

*Ten most commonly recorded specialties for MRSA bacteraemia detected two or more days after admission.

Source of denominator data: HES
How has this been achieved?
Coupled with…

performance management against the target
Data Sign-Off

The Department of Health requires Chief Executives to sign-off that the data for their trust on this website accords with the trust's local records.

Once signed off the relevant part of the dataset is locked and cannot be changed.

<table>
<thead>
<tr>
<th>Sign-off Year</th>
<th>Sign-off Month</th>
<th>Organism</th>
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<th>Date signed off</th>
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<tr>
<td>2007</td>
<td>August</td>
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<td>01/09/2007</td>
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<tr>
<td>2007</td>
<td>July</td>
<td></td>
<td>SIGNED OFF</td>
<td>01/06/2007</td>
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<td>2007</td>
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<td>01/07/2007</td>
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<td>April</td>
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Lock History

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<th>Lock By</th>
<th>User Locked</th>
<th>Date Lock Set</th>
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Achieving MRSA target

- RSU → SHAs → Trust CEs
- Improvement Teams
- increased frequency of reporting
- closely overseen by PMDU
Be clear about the aims of the surveillance programme!

If going to end up with this

you don’t want to measure it like this
9th June 2005

MANDATORY SURVEILLANCE OF METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS (MRSA) BACTERAEMIAS

Dear Colleague

We are writing to inform you of changes to the mandatory surveillance system for Staphylococcus aureus since our previous communication on 9 June 2003. These changes will provide a better evidence base for national policy and will help you better interpret your local situation so that you can take appropriate targeted action to control these infections.

From the Chief Medical Officer and the Chief Nursing Officer

Sir Liam Donaldson
MSc,MD,FRCS(Ed),FRCP,FFPHM

Professor Christine Beasley CBE RN

Mandatory Enhanced MRSA Bacteraemia Surveillance Scheme – Electronic Reporting

We have asked the Health Protection Agency to develop a new enhanced reporting system for MRSA bacteraemia surveillance, which will allow the capture of more comprehensive data on MRSA. We believe this enhanced system will be helpful in giving Trusts a more accurate picture of their performance and in building up a better evidence base for prevention of infections. 21 Trusts are already using this system on a pilot basis in preparation for rolling out to all acute Trusts by October. A more detailed description of the aims and content of this enhanced reporting scheme for MRSA is given in the Annex.
Renal cases with established RF
Renal unit gets email alert
Further enhancements

MRSA:
- renal developments
- source of the bacteraemia
- *risk factors: bigger focus*
C. difficile associated disease
C. difficile reports in patients aged ≥65 years
1990-2006

![Graph showing the number of C. difficile reports in patients aged ≥65 years from 1990 to 2006. The y-axis represents the number of records, ranging from 0 to 60,000, and the x-axis represents the years from 1990 to 2006. The graph includes a blue line for voluntary reports and a red line for mandatory reports.]
C. difficile: quarterly picture (≥65 years)
Age and sex distribution of *C. difficile* reports, January to December 2006 (voluntary surveillance)
### C. difficile: no. of cases per 1,000 bed-days

**patients aged 65 years and over: 2004-6**

<table>
<thead>
<tr>
<th>Trust category</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
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<tbody>
<tr>
<td>Large acute</td>
<td>1.90</td>
<td>2.18</td>
<td>2.24</td>
</tr>
<tr>
<td>Medium acute</td>
<td>1.88</td>
<td>2.25</td>
<td>2.38</td>
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<tr>
<td>Small acute</td>
<td>2.07</td>
<td>2.50</td>
<td>2.85</td>
</tr>
<tr>
<td>Acute teaching</td>
<td>1.97</td>
<td>2.21</td>
<td>2.47</td>
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<tr>
<td>Acute specialist</td>
<td>0.90</td>
<td>0.76</td>
<td>0.87</td>
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C. difficile surveillance

Lots of changes underway

- increasing focus
- national target
- changes to the surveillance
  - Jan 2004 to Mar 2007: quarterly aggregate returns
  - April 2007: Enhanced surveillance - real-time web-enabled data capture system
  - wider age range
  - refinements to dataset and definitions
- caveats
GRE bacteraemia
## GRE bacteraemia reports mandatory surveillance 2003-2006

<table>
<thead>
<tr>
<th>Reporting year</th>
<th>No. of GRE bacteraemia reports</th>
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</thead>
<tbody>
<tr>
<td>Oct 2003 – Sept 2004</td>
<td>628</td>
</tr>
<tr>
<td>Oct 2004 – Sept 2005</td>
<td>758</td>
</tr>
<tr>
<td>Oct 2005 – Sept 2006</td>
<td>903</td>
</tr>
</tbody>
</table>
## No. of GRE bacteraemia by Trust

<table>
<thead>
<tr>
<th>Reporting year</th>
<th>Trusts reporting bacteraemia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Oct 2003 – Sept 2004</td>
<td>75</td>
</tr>
<tr>
<td>Oct 2004 – Sept 2005</td>
<td>54</td>
</tr>
<tr>
<td>Oct 2005 – Sept 2006</td>
<td>41</td>
</tr>
</tbody>
</table>
Surgical Site Infection Surveillance
All categories of surgery: 2002-2007
(voluntary and mandatory surveillance)

Hospital participation in broader SSI surveillance increasing

- 261 hospitals
- 260,671 operations
- 5,113 SSIs

Rates of SSI: 0.7 to 8.1 infections per 1000 post-op days

- highest in categories of surgery where the likelihood of microbial contamination at the surgical site is high e.g. small and large bowel surgery
- risk increases as no. of risk factors increases
- for most categories of surgery, there has been a downward trend in the rate of SSI

Mostly superficial infections

S. aureus accounted for 39% of SSI (64% were MRSA)
Focus on orthopaedics

- 3rd year of mandatory surveillance

- rates decreased between 2nd and 3rd year in 3 out of the 4 orthopaedic categories - a continued decrease since the mandatory surveillance began.

- rates very low for planned surgery eg hip and knee prostheses – 0.9 and 0.5%

- comparable with other European countries

- rates highest in hip hemiarthroplasty (3.6%) ~ patients at greater risk of infection + longer post-operative stay

- other points similar
Confidential Study of Deaths following MRSA Infection

- joint study with Office for National Statistics
- funded by DH
- ‘Winning Ways’
- qualitative
- patient and institutional factors in deaths after MRSA infection
- small, stratified random sample
- identify potentially avoidable or amenable factors
What it does not do

• did not compare patients with and without MRSA infection
• small – cannot be extrapolated to Trusts across England as a whole

→ Preliminary work to establish a robust methodology
   + Indicate areas requiring further work
Findings

56 cases in 23 hospitals reviewed by expert panel (pilot and main phases)

- 80% over 70 yrs (only 1 under 50 yrs)
- significant co-morbidities (2 or more in ¾)
- life expectancy < 1 yr in ¾ (< 1 month in >1/3 in main phase)
- several previous admissions
- mention on death certificates: both directions
- source of infection: often invasive devices
- shortcomings identified, but did not affect outcome
- good aspects: microbiologist involvement
Conclusions

• pioneering developments
  - enhanced web-based surveillance
  - performance management
  - different style of public health intervention
• pace relentless
• can be painful
• success with MRSA bacteraemia
• international interest
• *C. difficile?*