SURVEILLANCE OF BLOODSTREAM INFECTIONS IN BELGIAN HOSPITALS

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INTRODUCTION
Background

National surveillance of bloodstream infections in hospitals

- Case-based - laboratory confirmed
- Mandatory since 2014 (minimum 3 months)
- HA-BSI
  - infection date – admission date ≥2
Objectives of HA-BSI surveillance

Monitor
- Trends
- Causal microorganism (MO) and their resistance profile

Level
- Hospital
- National

Tool for prevention
Results 2016 data
Participation 2016

140 hospitals reported at least one quarter

64% hospitals reported the whole year
Mean incidence HA-BSI Belgium, 2013-2016
Variation HA-BSI incidence between hospitals, Belgium 2016

<table>
<thead>
<tr>
<th>Percentile</th>
<th>HA-BSI/10,000 patient-days</th>
</tr>
</thead>
<tbody>
<tr>
<td>smallest</td>
<td>0.0</td>
</tr>
<tr>
<td>P 25</td>
<td>3.9</td>
</tr>
<tr>
<td>P 50 (median)</td>
<td>6.2</td>
</tr>
<tr>
<td>P 75</td>
<td>9.5</td>
</tr>
<tr>
<td>largest</td>
<td>39.2</td>
</tr>
</tbody>
</table>

P, percentiles  
unit of analysis is reporting quarter
Microorganism specific HA-BSI incidence

[Graph showing incidence of specific microorganisms over years, with labels for E. coli, S. aureus, K. pneumoniae, P. aeruginosa, and E. faecalis.]
Microorganism specific HA-BSI incidence

![Graph showing incidence of HA-BSI for different microorganisms from 2000 to 2016](image-url)
Microorganism specific HA-BSI incidence

![Graph showing incidence trends for different bacterial species](image.png)
Microorganism specific HA-BSI incidence

![Graph showing incidence of HA-BSI per year for different microorganisms.](image-url)
Total 10,106 BSI of which 7,627 HA-BSI

**HA-BSI**

- 21% intensive care unit (ICU)-associated BSI
- 40% HA-BSI associated directly (central line - CL) or indirectly (urinary catheter or endotracheal tube) with invasive devices
Origin of HA-BSI

* Includes ‘confirmed’, ‘probable’ and ‘possible’ CLABSI
Central line-associated BSI (CLABSI)

<table>
<thead>
<tr>
<th>CLABSI</th>
<th>definition</th>
<th>N</th>
<th>Per 10,000 patient-days</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confirmed</td>
<td>clinical suspicion, microbiological confirmation</td>
<td>716</td>
<td>0.7</td>
<td>41</td>
</tr>
<tr>
<td>Probable</td>
<td>clinical suspicion, no microbiological confirmation</td>
<td>597</td>
<td>0.6</td>
<td>34</td>
</tr>
<tr>
<td>Possible</td>
<td>origin unknown, CL present within the two days prior to the BSI</td>
<td>430</td>
<td>0.4</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1,743</td>
<td>1.8</td>
<td>100</td>
</tr>
</tbody>
</table>

CLABSI, 2016
Antimicrobial resistance in *S. aureus* strains isolated from HA-BSI, Belgium 2013-2016

![Graph showing resistance profiles over years](image-url)
Antimicrobial resistance in *E. coli* strains isolated from HA-BSI, Belgium 2013-2016
Antimicrobial resistance in *K. pneumoniae* strains isolated from HA-BSI, Belgium 2013-2016

![Graph showing the percentage of resistant *K. pneumoniae* strains over years 2013 to 2016. The graph compares the resistance to third generation cephalosporins (orange line) and carbapenem (pink line).]
Take-home messages
Take-home messages (1)

HA-BSI

Incidence stable since 2013

High variability between hospitals

Increase in incidence of HA-BSI caused by enterobacteriaceae

Resistance

- MRSA decreased
- For several MO isolated from HA-BSI increase in resistant to third generation cephalosporin and carbapenems
Take-home messages (2)
Priorities for prevention

Devices associated BSI - 40% of all HA-BSI
- 23% CLABSI
- 10% urinary catheter
- 4% endotracheal tube
- 4% peripheral and other catheter

ICU-associated BSI - 21% of all HA-BSI
Future

Transfer to Healthdata – July 2017

Validation study of surveillance data
NSIHweb
http://www.nsih.be/nsih/nsih_nl.asp and

Protocol ‘BSI in hospitals’ (revised January 2016)
http://www.nsih.be/download/SEP_protocol_v4%203_NL.pdf and
http://www.nsih.be/download/SEP_protocol_v4.3_FR.pdf

Healthdata
https://healthdata.wiv-isp.be/
http://www.healthdata.be/dcd
https://support.healthdata.be