Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

hpsc

Enhanced EARS-Net Surveillance

2016

Key Points

- **Twenty-one microbiology laboratories provided enhanced data on 2,593 blood-culture isolates, representing 43% of all isolates reported to EARS-Net in Ireland in 2016**
- **There was a decrease in MRSA bloodstream infections (BSI) detected after day five of admission: 38% in 2015 versus 28% in 2016, along with a general decrease in the proportion MRSA BSI categorised as acquired in the reporting hospital**
- **Device-associated BSI were commonly reported for many of the EARS-Net pathogens in 2016, including 30% of VRE BSI**
- **Data quality has improved since 2014 overall. However, data consistency was poorer in 2016 compared to 2015**

In this report

Abbreviations Used Here

BSI – Bloodstream Infections

CVC – Central Venous Catheter

EARS-Net – European Antimicrobial Resistance Surveillance Network

KPN – *Klebsiella pneumoniae*

MRSA – Meticillin Resistant *Staphylococcus aureus*

MSSA – Meticillin Sensitive *Staphylococcus aureus*

PAE – *Pseudomonas aeruginosa*

PICC – peripherally inserted central catheter

PNSP – Penicillin Non-Susceptible *S. pneumoniae*

PSSP – Penicillin Susceptible *S. pneumoniae*

PVC – Peripheral Venous Catheter

VRE – Vancomycin Resistant Enterococci

VSE – Vancomycin Sensitive Enterococci

From the HPSC website click on "**Topics A-Z**", then on "**Enhanced Bacteraemia Surveillance**" for the appropriate page.

Also visit the HPSC website for information on Antibiotic Resistance, and integrated reports on hospital Antibiotic Consumption and Hand Hygiene

August 2017

On behalf of the Irish EARS-Net Steering Group with thanks to all the participating hospital-laboratories

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Introduction

Enhanced data have been collected on European Antimicrobial Resistance Surveillance Network (EARS-Net) isolates since 2004 in Ireland.

The enhanced programme aims to guide local and national preventative strategies for antimicrobial resistant infections. Enhanced data demonstrates trends in the association of infection with specific factors over time: community or healthcare-associated, potentially preventable sources of bloodstream infection (e.g., intravenous catheters and urinary catheters). The ultimate aim is to improve overall patient safety.

In addition to the general analysis, this report includes a breakdown of BSI that were categorised as device-associated.

Results

Data from 21 laboratories were available. Enhanced data records collected for 2016 (n = 2,593) represented 43% of all the isolates of the core EARS-Net dataset for the same time period.

Table 1. EARS-Net pathogen, antimicrobial resistance markers, patient age, gender and timing of BSI onset

		Total for 2016 (% resistant)	Percent female	Mean age in years	Detected <48 hours after admission	Detected >5 days after admission
Staphylococcus aureus	Meticillin Resistant (MRSA)	**95 (15%)**	31%	68.0	64%	28%
	Meticillin Susceptible (MSSA)	**533**	39%	61.7	68%	21%
Streptococcus pneumoniae	Penicillin non-Susceptible	**18 (12%)**	28%	71.3	89%	6%
	Penicillin Susceptible	**129**	51%	62.6	92%	6%
Enterococci	Vancomycin Resistant (VRE)	**307 (25%)**	39%	65.7	4%	84%
	Vancomycin Sensitive (VSE)	**204**	40%	65.6	43%	49%
Escherichia coli	Fluoroquinolone Resistant (FQREC)	**67 (24%)**	47%	73.4	72%	21%
	Fluoroquinolone Susceptible (FQSEC)	**961**	56%	67.5	80%	17%
Klebsiella pneumoniae (KPN)		**168**	38%	67.0	60%	33%
Pseudomonas aeruginosa (PAE)		**111**	36%	68.2	59%	32%

Main findings

Please see Appendix 1 for a complete breakdown for all organisms. See also table 2 for breakdown by device type. See page 1 for abbreviations.

1. ***S. aureus*** **(Appendix 1A)**
   - Of 628 *S. aureus* BSI reported to enhanced EARS-Net surveillance in 2016, 328 (52%) were categorised as healthcare-associated. Of those, 292 (46%) were categorised as likely acquired in the reporting hospital. A higher percentage of healthcare-associated MRSA (54%) than MSSA (45%) BSI were classified as likely acquired in the reporting hospital, The proportion of MRSA BSI detected more than 5 days after hospitalisation decreased from 38% in 2015 to 28% in 2016. This reflects a general downward trend
   - The most common reported primary source for both MRSA (25%) and MSSA (20%) BSI was non-surgical wound (skin and soft tissue infection)

2. **Enterococcal BSI (Appendix 1D)**
   - Of 271 enterococcal BSI reported to enhanced EARS-Net surveillance in 2016 (*E. faecium* = 150, *E. faecalis* = 121), 196 (72%) were categorised as healthcare-associated. Of those, 185 (68%) were categorised as likely acquired in the reporting hospital. A higher percentage of healthcare-associated VRE (91%) than VSE (61%) BSI were classified as likely acquired in the reporting hospital. A higher percentage of VRE (30%) than VSE (18%) BSI were device-associated
3. ***E. coli*** **BSI (Appendix 1C)**
   - Of 1,268 *E. coli* BSI reported to enhanced EARS-Net surveillance in 2016, 471 (37%) were categorised as healthcare-associated. Of those, 372 (29%) were categorised as likely acquired in the reporting hospital. A higher percentage of healthcare-associated fluoroquinolone resistant *E. coli* (36%) than fluoroquinolone susceptible (27%) BSI were classified as likely acquired in the reporting hospital
   - The most common reported primary source for *E. coli* BSI was the urinary tract (48% of FQREC and 44% of FQSEC)

4. ***K. pneumoniae (KPN)*** **BSI**

   - Of 168 K. pneumoniae BSI reported to enhanced EARS-Net surveillance in 2016, 93 (55%) were categorised as healthcare-associated. Of those, 81 (48%) were categorised as likely acquired in the reporting hospital. Devices accounted for 15% of K. pneumoniae BSI (9% CVC/CVC-PICC)

5. ***P. aeruginosa (PAE)*** **BSI *(Appendix 1E)***

6. Of 111 *P. aeruginosa* BSI reported to enhanced EARS-Net surveillance in 2016, 69 (62%) were categorised as healthcare-associated. Of those, 65 (59%) were categorised as likely acquired in the reporting hospital. Devices accounted for 23% of *P. aeruginosa* BSI (13% urinary catheter and 9% CVC/CVC-PICC)

Further information on EARS-Net can be found on the HPSC website:
http://www.hpsc.ie/A-Z/MicrobiologyAntimicrobialResistance/EuropeanAntimicrobialResistanceSurveillanceSystemEARSS/

Device-association

The enhanced EARS-Net surveillance protocol defines device-associated BSI as a case of intra-vascular line and other indwelling medical devices where the isolate is clinically significant AND the device has been present within 48 hours of detection of the organism from blood culture AND where the organism is not related to an infection at another site.

In 2016, 30% of VRE, 18% of VSE, 23% of PAE, 24% of MRSA and 20% of MSSA BSI respectively were reported as device associated. (See page 1 for abbreviations)

Table 2. Breakdown of bloodstream infections that were noted as device-associated with details of device type.

	CVC / CVC-PICC	PVC	Dialysis Catheter	Urinary Catheter	Other	Number of Device-associated	Total Number	Total Device-associated
MRSA	5%	8%	6%	1%	3%	23	95	24%
MSSA	10%	5%	4%	1%	1%	108	533	20%
VRE	24%	0%	1%	3%	1%	20	67	30%
VSE	11%	1%	0%	5%	0%	37	204	18%
FQREC	3%	0%	0%	7%	1%	34	307	11%
FQSEC	2%	0%	0%	3%	0%	63	961	7%
KPN	9%	0%	1%	5%	1%	26	168	15%
PAE	5%	1%	0%	13%	1%	26	111	23%

Appendix 1A. Breakdown for **MRSA** – Meticillin Resistant *Staphylococcus aureus* and **MSSA** – Meticillin Sensitive *Staphylococcus aureus*

		MRSA											MSSA										
		2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Demographic	Gender Female	39%	46%	44%	35%	34%	33%	32%	25%	42%	36%	31%	36%	32%	37%	35%	36%	33%	35%	37%	36%	40%	39%
	Mean age in years	68.2	65.8	68.5	68.5	66.4	67.1	69.0	69.0	71.1	70.0	70.5	54.9	55.5	55.8	60.4	57.6	57.8	58.8	57.7	56.7	58.0	61.7
Length of Stay	Less than or equal to 2 days	27%	31%	35%	45%	36%	51%	54%	59%	58%	53%	64%	51%	48%	51%	56%	59%	56%	66%	66%	62%	68%	68%
	Greater than 5 days	52%	48%	43%	45%	53%	37%	37%	34%	32%	38%	28%	25%	25%	26%	29%	25%	26%	21%	23%	25%	22%	21%
Association	Community	6%	7%	8%	11%	13%	19%	22%	21%	25%	24%	25%	23%	19%	24%	24%	24%	22%	25%	24%	36%	30%	41%
	HCA: not in reporting hospital	16%	20%	24%	25%	15%	20%	19%	22%	13%	14%	11%	12%	23%	19%	20%	20%	17%	17%	17%	5%	5%	5%
	HCA: in reporting hospital	71%	67%	65%	61%	71%	50%	50%	45%	50%	57%	54%	58%	50%	51%	52%	53%	49%	46%	46%	50%	45%	45%
	Unknown	7%	5%	3%	3%	1%	10%	9%	12%	13%	5%	11%	7%	8%	6%	4%	3%	12%	12%	13%	9%	20%	9%
	Device									19%	26%	24%									29%	17%	20%
	Implant									4%	4%	0%									4%	3%	1%
	Procedure									2%	9%	2%									4%	5%	4%
	Device/Implnt/Proc Unkown									12%	25%	33%									10%	28%	31%
	Not Device/Implnt/Proc Assoc.									63%	36%	41%									54%	47%	44%
Primary source	Intra-abdominal / GI tract	2%	5%	1%	2%	1%	2%	0%	0%	0%	0%	0%	1%	3%	1%	1%	2%	1%	1%	1%	1%	0%	1%
	Respiratory tract	12%	13%	8%	11%	9%	9%	10%	10%	11%	8%	8%	5%	6%	5%	5%	3%	3%	4%	4%	7%	6%	4%
	Surgical wound	2%	3%	2%	3%	1%	1%	1%	5%	0%	1%	0%	2%	3%	3%	4%	3%	3%	3%	2%	0%	2%	0%
	Non-surg. wound / Skin tisue	13%	13%	14%	16%	15%	15%	13%	26%	22%	32%	25%	12%	18%	14%	14%	14%	12%	17%	22%	27%	24%	20%
	Urinary tract without catheter	7%	6%	6%	5%	2%	3%	3%	7%	6%	5%	1%	2%	3%	1%	2%	3%	3%	3%	2%	2%	2%	2%
	Other source	33%	33%	33%	30%	44%	30%	32%	29%	18%	13%	6%	39%	31%	31%	35%	40%	33%	33%	35%	19%	19%	14%
	Unknown	32%	26%	37%	34%	28%	41%	41%	23%	44%	40%	59%	39%	36%	44%	40%	36%	46%	39%	34%	45%	47%	59%
Antibiotic Exposure	Yes									27%	32%	19%									25%	22%	18%
	No									7%	2%	0%									6%	2%	0%
	Unknown									66%	66%	81%									69%	76%	82%
Total		**285**	**190**	**180**	**194**	**174**	**108**	**78**	**97**	**101**	**97**	**95**	**347**	**264**	**299**	**469**	**476**	**313**	**260**	**327**	**414**	**465**	**533**

Appendix 1B. Breakdown for **PNSP** – Penicillin non-Susceptible *Streptococcus pneumoniae* and **PSSP** – Penicillin Susceptible *Streptococcus pneumoniae*

		PNSP											PSSP										
		2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Demographic	Gender Female	74%	48%	44%	48%	44%	33%	39%	29%	52%	38%	28%	40%	43%	41%	43%	49%	40%	41%	52%	51%	49%	51%
	Mean age in years	48.3	53.7	44.5	61.5	65.6	68.6	57.8	59.3	53.9	61.3	69.3	50.4	54.4	52.3	57.1	58.6	60.1	63.5	61.5	61.2	62.9	64.1
Length of Stay	Less than or equal to 2 days	52%	68%	69%	68%	91%	95%	65%	67%	90%	96%	89%	74%	63%	70%	65%	90%	92%	77%	90%	95%	95%	92%
	Greater than 5 days	10%	4%	8%	8%	6%	0%	26%	19%	5%	4%	6%	9%	11%	4%	12%	7%	5%	8%	4%	2%	5%	6%
Association	Community	42%	48%	56%	32%	56%	29%	32%	43%	48%	42%	50%	56%	45%	46%	45%	58%	55%	50%	48%	67%	60%	67%
	HCA: not in reporting hospital	10%	24%	17%	32%	24%	29%	13%	24%	5%	4%	17%	15%	20%	23%	23%	18%	13%	13%	20%	1%	4%	5%
	HCA: in reporting hospital	10%	4%	11%	8%	6%	5%	32%	19%	19%	4%	22%	12%	14%	7%	13%	8%	7%	11%	10%	5%	5%	9%
	Unknown	39%	24%	17%	28%	15%	38%	23%	14%	29%	50%	11%	17%	21%	23%	20%	16%	25%	27%	21%	28%	31%	19%
	Device									5%	0%	0%									0%	0%	1%
	Implant									0%	0%	0%									0%	0%	1%
	Procedure									0%	0%	0%									1%	0%	0%
	Device/Implnt/Proc Unkown									19%	75%	44%									27%	47%	51%
	Not Device/Implnt/Proc Assoc.									76%	25%	56%									72%	53%	47%
Primary source	Intra-abdominal / GI tract	0%	0%	6%	0%	3%	5%	0%	5%	0%	0%	0%	1%	1%	0%	2%	1%	2%	0%	0%	0%	0%	0%
	Respiratory tract	48%	60%	50%	64%	62%	38%	65%	67%	57%	46%	67%	65%	66%	61%	64%	58%	62%	57%	67%	53%	62%	55%
	Surgical wound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
	Non-surg. wound / Skin tisue	0%	4%	0%	0%	0%	5%	0%	5%	5%	0%	0%	1%	0%	1%	1%	1%	1%	2%	0%	0%	0%	0%
	Urinary tract without catheter	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	1%	0%
	Other source	6%	0%	0%	0%	9%	5%	3%	0%	10%	8%	6%	1%	3%	3%	1%	11%	1%	2%	1%	14%	12%	6%
	Unknown	45%	36%	44%	36%	26%	48%	32%	24%	29%	46%	28%	32%	30%	36%	32%	29%	34%	40%	30%	33%	25%	39%
Antibiotic Exposure	Yes									5%	4%	0%									20%	8%	7%
	No									19%	0%	6%									7%	0%	1%
	Unknown									76%	96%	94%									73%	92%	92%
Total		**31**	**25**	**36**	**25**	**34**	**21**	**31**	**21**	**21**	**24**	**18**	**156**	**115**	**142**	**120**	**134**	**107**	**111**	**89**	**111**	**100**	**129**

Appendix 1C. Breakdown for **FQREC** – Fluoroquinolone Resistant *Escherichia coli* and **FQSEC** – Fluoroquinolone Sensitive *Escherichia coli*

		FQREC											FQSEC										
		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Demographic	Gender Female	48%	39%	44%	48%	50%	41%	43%	46%	45%	46%	47%	58%	60%	58%	58%	58%	59%	58%	56%	57%	59%	56%
	Mean age in years	69.2	69.2	70.0	70.9	70.3	71.8	71.5	72.1	76.2	73.5	74.3	62.2	66.8	64.7	67.1	67.5	66.2	68.6	67.7	68.4	67.1	68.8
Length of Stay	Less than or equal to 2 days	38%	37%	39%	55%	61%	63%	59%	73%	73%	76%	72%	49%	49%	52%	54%	69%	69%	68%	77%	74%	78%	80%
	Greater than 5 days	40%	34%	34%	20%	30%	30%	28%	22%	22%	19%	21%	24%	17%	19%	21%	22%	20%	17%	16%	19%	16%	17%
Association	Community	16%	14%	16%	25%	19%	22%	21%	22%	31%	29%	41%	34%	30%	32%	33%	39%	40%	39%	39%	42%	42%	56%
	HCA: not in reporting hospital	19%	25%	24%	34%	31%	28%	25%	26%	12%	12%	14%	12%	20%	21%	21%	21%	16%	19%	21%	4%	5%	6%
	HCA: in reporting hospital	46%	42%	39%	29%	37%	33%	33%	26%	39%	37%	36%	32%	23%	26%	27%	29%	27%	23%	22%	31%	28%	27%
	Unknown	19%	19%	21%	13%	13%	16%	21%	25%	19%	22%	8%	22%	27%	21%	19%	11%	17%	19%	18%	23%	26%	11%
	Device									16%	11%	11%									6%	6%	7%
	Implant									0%	1%	0%									0%	0%	0%
	Procedure									5%	5%	6%									3%	2%	2%
	Device/Implnt/Proc Unkown									19%	40%	30%									19%	39%	39%
	Not Device/Implnt/Proc Assoc.									60%	43%	53%									71%	53%	52%
Primary source	Intra-abdominal / GI tract	15%	16%	16%	22%	14%	19%	17%	17%	6%	5%	3%	12%	16%	16%	20%	17%	18%	18%	18%	11%	9%	5%
	Respiratory tract	4%	2%	2%	3%	4%	3%	2%	2%	1%	3%	2%	2%	2%	1%	4%	3%	2%	2%	1%	2%	1%	1%
	Surgical wound	1%	0%	1%	1%	1%	0%	3%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%
	Non-surg. wound / Skin tisue	0%	1%	1%	2%	3%	1%	1%	1%	1%	2%	0%	0%	1%	1%	0%	1%	0%	0%	1%	0%	1%	0%
	Urinary tract without catheter	41%	34%	33%	37%	37%	41%	31%	35%	49%	49%	48%	39%	36%	36%	37%	35%	39%	40%	47%	43%	41%	44%
	Other source	8%	11%	7%	3%	11%	2%	2%	3%	10%	11%	11%	8%	6%	5%	5%	14%	3%	3%	2%	12%	13%	13%
	Unknown	31%	36%	41%	31%	30%	33%	44%	42%	32%	30%	36%	38%	40%	40%	34%	29%	37%	37%	30%	32%	35%	36%
Antibiotic Exposure	Yes									27%	12%	16%									21%	6%	7%
	No									4%	3%	0%									6%	3%	1%
	Unknown									69%	85%	84%									72%	91%	92%
Total		**167**	**161**	**179**	**230**	**261**	**203**	**237**	**234**	**272**	**306**	**307**	**519**	**473**	**594**	**651**	**840**	**661**	**662**	**673**	**816**	**952**	**961**

Appendix 1D. Breakdown for **VRE** – Vancomycin Resistant Enterococci and **VSE** – Vancomycin Sensitive Enterococci

		VRE											VSE										
		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Demographic	Gender Female	22%	43%	49%	34%	44%	51%	40%	45%	41%	36%	39%	42%	45%	42%	44%	43%	38%	38%	40%	46%	41%	40%
	Mean age in years	63.2	59.4	64.8	62.6	59.5	61.7	66.6	66.2	65.6	62.2	63.5	61.6	64.0	63.4	65.4	63.3	66.0	66.3	65.1	66.8	66.3	65.9
Length of Stay	Less than or equal to 2 days	18%	9%	5%	10%	9%	16%	18%	18%	9%	16%	4%	29%	23%	25%	31%	33%	39%	32%	41%	41%	43%	43%
	Greater than 5 days	73%	77%	75%	77%	86%	72%	70%	76%	81%	75%	84%	48%	46%	48%	45%	55%	54%	52%	47%	47%	47%	49%
Association	Community	4%	0%	2%	1%	3%	10%	8%	5%	0%	3%	7%	14%	10%	10%	16%	13%	16%	14%	14%	19%	16%	25%
	HCA: not in reporting hospital	11%	6%	6%	9%	5%	8%	4%	6%	3%	3%	1%	9%	15%	16%	16%	12%	14%	14%	17%	4%	5%	5%
	HCA: in reporting hospital	78%	87%	85%	83%	91%	80%	82%	85%	92%	93%	91%	65%	57%	60%	55%	68%	60%	58%	57%	62%	62%	61%
	Unknown	7%	6%	8%	6%	1%	2%	6%	5%	5%	3%	0%	12%	18%	13%	13%	7%	10%	14%	12%	14%	17%	9%
	Device									38%	24%	30%									18%	13%	18%
	Implant									1%	1%	0%									0%	3%	0%
	Procedure									4%	1%	6%									3%	2%	1%
	Device/Implnt/Proc Unkown									21%	43%	27%									31%	47%	48%
	Not Device/Implnt/Proc Assoc.									36%	31%	37%									48%	35%	33%
Primary source	Intra-abdominal / GI tract	7%	13%	26%	27%	29%	33%	30%	31%	10%	23%	13%	19%	25%	24%	28%	25%	24%	19%	22%	13%	12%	8%
	Respiratory tract	4%	2%	3%	1%	3%	0%	0%	1%	1%	3%	0%	3%	3%	1%	1%	2%	1%	1%	2%	1%	2%	1%
	Surgical wound	0%	0%	0%	0%	1%	0%	1%	1%	0%	1%	0%	2%	1%	1%	0%	1%	1%	0%	1%	0%	0%	0%
	Non-surg. wound / Skin tisue	4%	2%	3%	1%	4%	2%	0%	4%	5%	5%	6%	3%	1%	4%	2%	1%	2%	3%	3%	4%	3%	3%
	Urinary tract without catheter	2%	4%	2%	4%	3%	3%	5%	6%	1%	4%	10%	9%	10%	14%	9%	10%	8%	14%	10%	8%	9%	10%
	Other source	38%	34%	23%	30%	20%	13%	23%	19%	10%	16%	15%	27%	15%	14%	15%	15%	15%	15%	14%	11%	19%	15%
	Unknown	44%	45%	43%	36%	41%	49%	40%	38%	72%	49%	55%	37%	45%	43%	45%	47%	50%	48%	50%	63%	55%	62%
Antibiotic Exposure	Yes									28%	20%	10%									19%	13%	6%
	No									4%	1%	0%									5%	3%	0%
	Unknown									68%	79%	90%									76%	84%	94%
Total		**45**	**47**	**65**	**77**	**80**	**61**	**77**	**84**	**78**	**80**	**67**	**181**	**184**	**225**	**217**	**232**	**197**	**191**	**199**	**226**	**195**	**204**

Appendix 1E. Breakdown for **KPN** – *Klebsiella pneumonia* and **PAE** – *Pseudomonas aeruginosa*

		KPN											PAE										
		2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Demographic	Gender Female	37%	37%	39%	41%	47%	39%	47%	37%	44%	37%	38%	47%	46%	30%	40%	37%	36%	47%	44%	44%	41%	36%
	Mean age in years	58.3	65.8	63.1	63.9	62.1	64.0	64.1	65.8	66.0	68.1	64.7	66.2	66.8	68.3	66.2	67.7	70.4	68.9	67.5	69.0	69.4	72.2
Length of Stay	Less than or equal to 2 days	28%	39%	35%	49%	45%	42%	42%	49%	51%	60%	60%	32%	25%	34%	34%	49%	55%	53%	54%	68%	60%	59%
	Greater than 5 days	48%	35%	44%	34%	42%	44%	43%	41%	36%	33%	33%	40%	42%	43%	41%	43%	33%	33%	34%	23%	35%	32%
Association	Community	16%	12%	18%	25%	19%	16%	19%	18%	23%	25%	35%	9%	14%	10%	9%	17%	19%	21%	23%	34%	13%	23%
	HCA: not in reporting hospital	13%	28%	19%	16%	17%	13%	17%	21%	6%	5%	7%	19%	17%	28%	24%	25%	18%	21%	17%	4%	6%	4%
	HCA: in reporting hospital	57%	45%	51%	44%	51%	53%	49%	50%	54%	52%	48%	51%	45%	47%	51%	53%	40%	42%	45%	39%	61%	59%
	Unknown	14%	15%	11%	14%	12%	18%	15%	11%	17%	18%	10%	21%	23%	15%	16%	6%	22%	16%	15%	23%	20%	15%
	Device									19%	15%	15%									13%	22%	23%
	Implant									1%	1%	1%									0%	0%	1%
	Procedure									1%	4%	2%									4%	4%	2%
	Device/Implnt/Proc Unkown									15%	36%	40%									21%	41%	38%
	Not Device/Implnt/Proc Assoc.									65%	44%	42%									62%	32%	36%
Primary source	Intra-abdominal / GI tract	18%	24%	26%	29%	21%	24%	21%	26%	15%	12%	2%	4%	7%	11%	17%	8%	12%	5%	10%	13%	4%	5%
	Respiratory tract	11%	10%	9%	10%	5%	7%	6%	6%	6%	8%	8%	11%	10%	13%	11%	9%	4%	18%	6%	11%	9%	14%
	Surgical wound	5%	0%	1%	1%	2%	0%	1%	0%	0%	1%	0%	0%	3%	3%	1%	0%	4%	0%	0%	0%	0%	0%
	Non-surg. wound / Skin tisue	0%	4%	0%	1%	2%	1%	0%	0%	1%	2%	1%	13%	4%	3%	3%	7%	7%	4%	6%	6%	2%	9%
	Urinary tract without catheter	11%	13%	18%	14%	16%	21%	20%	24%	26%	22%	24%	13%	17%	22%	11%	24%	15%	11%	20%	27%	19%	18%
	Other source	16%	14%	14%	17%	11%	9%	15%	10%	18%	17%	18%	11%	10%	8%	16%	16%	4%	14%	8%	4%	7%	3%
	Unknown	40%	35%	32%	29%	43%	39%	38%	34%	35%	38%	47%	49%	48%	42%	40%	37%	52%	48%	51%	39%	59%	51%
Antibiotic Exposure	Yes									14%	6%	8%									23%	10%	8%
	No									4%	2%	0%									4%	0%	0%
	Unknown									82%	92%	92%									73%	90%	92%
Total		**83**	**93**	**114**	**140**	**146**	**135**	**130**	**118**	**142**	**179**	**168**	**47**	**69**	**79**	**99**	**89**	**67**	**73**	**71**	**71**	**94**	**111**

Appendix 2. Data Quality Analysis

2016 Full Year

Participation

Participation metric	Value	2015 data
Number of laboratories	21	22
Proportion of total EARS-Net	42.8%	45.2%

Consistency

Proportion of records in the core dataset with enhanced data from participants

Proportion of matched records	Number of participants	2015 data
100%-95%	13	15
95%-90%	2	2
<90%	6	5

Data Completion

Availability of data (usually Y or N, or dates) for key fields

Field name	% records completed	2015 data
Date of admission	99%	99%
Probable contaminant	68%	84%
Healthcare-association	89%	72%
Device-related	67%	77%
Implant-related	65%	71%
Procedure-related	65%	64%
Source organ site	76%	76%
ICU-acquired	47%	63%
Outcome	96%	82%
Antibiotic exposure	12%	15%