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↘ *Proteus spp, Morganella morganii, and Providencia spp bacteraemia, England, Wales, and Northern Ireland: 2000 to 2005*

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News

Last updated: 18 May 2006 Volume 16, No.20 Next update: 25 May 2006

Going further faster – new DH guidance on reducing MRSA infections

The Department of Health has launched new guidance on reducing methicillin-resistant *Staphylococcus aureus* (MRSA) infections [1]. All NHS acute Trusts in England have been set specific targets for reducing their numbers of MRSA bacteraemias by March 2008. To assist Trusts in assessing the likely financial and operational impact of meeting this target, a simple spreadsheet tool has been developed to estimate the current financial cost and operational cost (in terms of additional bed days incurred) of MRSA bacteraemias and, more widely, all healthcare associated infections. This shows that a Trust with “average” numbers of MRSA bacteraemias (around 44 in 2003/04) could, by meeting the target reduction of 50% by 2008:

- Make savings of over £100,000 and reduce total bed days by 0.2% if all other HCAs remained unchanged
- Realise savings of around £4m and reduced total bed days by 6.1% if all other HCAs are reduced proportionately with MRSA bacteraemias

The guidance includes cases studies sharing outcomes from four Trusts that have implemented changes.

References

1. Department of Health. *Going Further Faster: implementing the Saving Lives delivery programme*. London: Department of Health, 2006. Available at http://www.dh.gov.uk/PublicationsAndStatistics/Publications/PublicationsPolicyAndGuidance/PublicationsPolicyAndGuidanceArticle/fs/en?CONTENT_ID=4134549&chk=B8vQzg.

Bacteraemia

Last updated: 18 May 2006, Next update: 15 June 2006

▣ *Proteus* spp, *Morganella morganii*, and *Providencia* spp bacteraemia, England, Wales, and Northern Ireland: 2000 to 2005

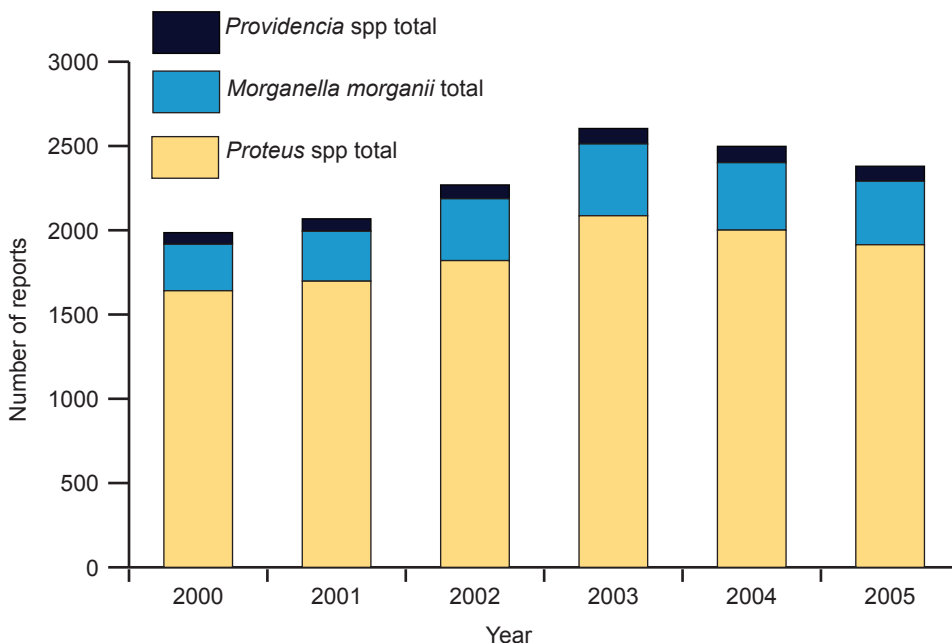
There has been a 4.8% decrease in the number of *Proteus* spp, *Morganella morganii*, and *Providencia* spp bacteraemia reports in 2005 compared to 2004. This apparent decrease in prevalence probably reflects delayed ascertainment reporting for 2005 (table 1 and figure 1). Data for 2005 are provisional as of 26 April 2006 and the number of reports for 2005 is expected to increase. The proportion of reports for each species relative to the total number of reports for all *Proteaeae* (ranging from 80% to 82% for *Proteus* spp, 14% to 16% for *Morganella morganii*; and 3% to 4% for *Providencia* spp.) has not changed from 2000 to 2005.

Table 1 *Proteus* spp, *Morganella morganii*, and *Providencia* spp bacteraemia reports 2000-2005*

	2000	2001	2002	2003	2004	2005
<i>Proteus</i> spp. total	1641	1698	1820	2086	2001	1914
<i>Morganella morganii</i> total	276	296	367	426	400	377
<i>Providencia</i> spp. total	69	74	82	92	97	89
Total	1986	2068	2269	2604	2498	2380

*Data extracted 26 th April 2006.

Figure 1 *Proteus* spp, *Morganella morganii*, and *Providencia* spp bacteraemia reports: 2000 to 2005*



*Data extracted 26th April 2006.

- For *Proteus mirabilis* isolates reported to the HPA, resistance rates to ciprofloxacin (7%) and gentamicin (4%) in 2005 are significantly higher than those reported in 2000. Resistance rates to amoxicillin/ampicillin (29%), cefuroxime (2%), cefotaxime (1%), and ceftazidime (1%) are unchanged from 2000 to 2005.

- For *Morganella morganii* isolates resistance rates increased for ciprofloxacin, cefotaxime, ceftazidime and gentamicin between 2000 and 2005. The apparent decrease in imipenem resistance is statistically insignificant and, in any event, virtually all such 'resistance' in *Proteaeae* is borderline and of doubtful significance.
- There are no statistically significant resistance trends for either *Proteus vulgaris* or *Providencia stuartii* .
- There has been an improvement in the proportion of reports containing susceptibility data in 2004 and 2005 compared to 2003.
- For all species the number of bacteraemia reports was higher in males than in females, and prevalence increased with age – the greatest number of reports related to individuals aged 65 years and over.

The analyses presented are based on data extracted from our voluntary surveillance database on the 26 th April 2006 for the period 2000-2005. The data presented here differ in some instances from data in earlier publications due to the addition of late reports to the database. The complete data report, including data tables and graphs concerning these species, can be viewed on the HPA website and is available on the next page.

[Click here, or scroll to next page for the full report](#)



Proteus spp, Morganella morganii, and Providencia spp

18 May 2006

***Proteus* spp, *Morganella morganii*, and *Providencia* spp**

This webpage contains data on *Proteus* spp, *Morganella morganii*, and *Providencia* spp bacteraemias in England, Wales, and Northern Ireland.

These analyses are based on data extracted from our voluntary surveillance database on the 26 April 2006 for the period between 2000 and 2005. The data presented here differ in some instances from data in earlier publications due to the addition of late reports to the database.

Data tables and graphs

- [Trend in total reports](#)
- [Species-specific data](#)
- [Antibiotic susceptibility data](#)
- [Age and sex distribution by species](#)

Previous publications concerning *Proteus* spp, *Morganella morganii*, and *Providencia* spp

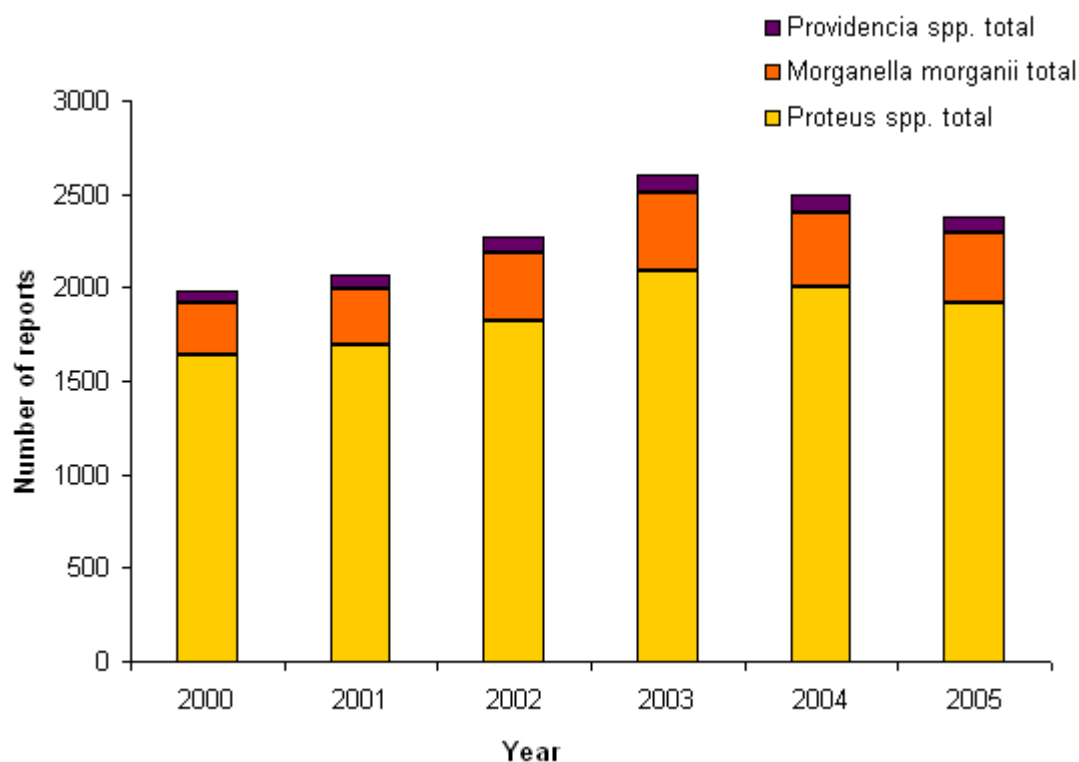
Proteus spp, *Morganella morganii* , and *Providencia* spp bacteraemias, in England, Wales, and Northern Ireland: 2004. *Commun Dis Rep CDR Wkly* [serial online] 2005; **15**(46): Bacteraemia. <http://www.hpa.org.uk/cdr/archives/2005/Bact_4605.pdf>.

Proteus spp, *Morganella morganii* , and *Providencia* spp bacteraemias, in England, Wales, and Northern Ireland: 2003. *Commun Dis Rep CDR Wkly* [serial online] 2004; **14**(8): Bacteraemia. <<http://www.hpa.org.uk/cdr/PDFfiles/2004/cdr0804.pdf>>.

Trends in total reports

There is a 4.8% decrease (Table 1) in the total reports of *Proteus* spp, *Morganella morganii*, and *Providencia* spp bacteraemia reported via the voluntary surveillance scheme in 2005 (2380 reports), compared to 2004 (2498 reports). Reports of bacteraemia for 2005 are higher than those reported in 2000 (prior to the inclusion of laboratory reports from Northern Ireland in 2002), but the number of reports has decreased from a high of 2604 in 2003 (Figure 1).

Figure 1 *Proteus* spp, *Morganella morganii*, and *Providencia* spp bacteraemia reports: 2000 to 2005



This apparent decrease in prevalence probably reflects delayed ascertainment reporting for 2005. The reports for 2005 are provisional as of 26 April 2006 and are expected to increase due to late reporting.

The proportion of reports for each species relative to the total number of reports for all Proteeae (ranging from 80% to 82% for *Proteus* spp.; 14% to 16% for *Morganella morganii*, and 3% to 4% for *Providencia* spp) has not changed between 2000 and 2005.

Table 1 *Proteus* spp, *Morganella morganii*, and *Providencia* spp bacteraemia reports: 2000 to 2005

	2000	2001	2002	2003	2004	2005
<i>Proteus</i> spp total	1641	1698	1820	2086	2001	1914
<i>Morganella morganii</i> total	276	296	367	426	400	377
<i>Providencia</i> spp total	69	74	82	92	97	89
Total	1986	2068	2269	2604	2498	2380

Species-specific data

Table 2 gives a breakdown of numbers of reports by species in 2005:

- The majority of bacteraemias due to *Proteus* spp were attributed to *P. mirabilis* (82%), and *P. vulgaris* (5%); 13% were not identified to species level.
- The majority of bacteraemias due to *Providencia* spp. were attributed to *P. stuartii* (20%) and *P. rettgeri* (20%); 12% were not identified to species level.

Table 2 Laboratory bacteraemia reports of *Proteus* spp, *Morganella morganii*, and *Providencia* spp, England, Wales, and Northern Ireland: 2000-2005

Bacteraemia	2000	2001	2002	2003	2004	2005
<i>Proteus mirabilis</i>	1257	1351	1446	1672	1612	1565
<i>Proteus vulgaris</i>	75	62	81	95	90	92
<i>Proteus penneri</i>	1	1	6	3	11	3
<i>Proteus</i> spp	295	277	284	309	281	250
<i>Proteus</i> spp., other named	13	7	3	7	7	4
<i>Proteus</i> spp total	1641	1698	1820	2086	2001	1914
<i>Morganella morganii</i>	276	296	367	426	400	377
<i>Providencia stuartii</i>	53	45	56	57	64	59
<i>Providencia rettgeri</i>	8	16	12	17	18	18
<i>Providencia alcalifaciens</i>	2	2	1	2	1	0
<i>Providencia rustigianii</i>	0	0	0	1	2	1
<i>Providencia</i> spp	6	11	13	14	10	11
<i>Providencia</i> spp, other named	0	0	0	1	2	0
<i>Providencia</i> spp total	69	74	82	92	97	89
Total number of reports	1986	2068	2269	2604	2498	2380

*Data extracted 26th April 2006.

Antibiotic susceptibility data

Tables 3 to 6 present antibiotic susceptibility data for each of the four main species: *Proteus mirabilis*, *Proteus vulgaris*, *Morganella morganii*, and *Providencia stuartii*. Trend analysis was performed using chi-square test for trend in Stata (v8.2).

- For *Proteus mirabilis*, there has been an increase in ciprofloxacin and gentamicin resistance from 2000 to 2005; no increased rates of resistances were observed for amoxicillin/ampicillin, cefuroxime, cefotaxime, or ceftazidime from 2000 to 2005.
- For *Morganella morganii*, there has been increased resistance reported for ciprofloxacin, cefotaxime, ceftazidime, and gentamicin from 2000 to 2005. The apparent decrease in imipenem resistance from 2000 to 2005 is misleading as it is statistically insignificant. Virtually all imipenem resistance in Proteeae, however, is borderline and is of dubious significance.
- There are no statistically significant resistance trends for either *Proteus vulgaris* or *Providencia stuartii*, which is partially due to the small number of reported isolates.

In 2005, for the four main species:

- Ciprofloxacin and gentamicin susceptibility information was provided in more than 70% of all reports.
- Ceftazidime susceptibility information was approximately half of all reports.
- Carbapenem (imipenem or meropenem) susceptibility information was provided in approximately half of all reports.

With the exception of *Providencia stuartii*, the proportion of reported isolates with susceptibility testing has increased from 2000 to 2005.

- [Table 3 Antibiotic susceptibility data for *Proteus mirabilis* bacteraemia reports, England, Wales, and Northern Ireland: 2000 to 2005](#)
- [Table 4 Antibiotic susceptibility data for *Proteus vulgaris* bacteraemia reports, England, Wales, and Northern Ireland: 2000 to 2005](#)
- [Table 5 Antibiotic susceptibility data for *Morganella morganii* bacteraemia reports, England, Wales, and Northern Ireland: 2000 to 2005](#)
- [Table 6 Antibiotic susceptibility data for *Providencia stuartii* bacteraemia reports, England, Wales, and Northern Ireland: 2000 to 2005](#)

Table 3 Antibiotic susceptibility data for *Proteus mirabilis* bacteraemia reports, England, Wales, and Northern Ireland: 2000 to 2005*

	<i>Proteus mirabilis</i>	2000	2001	2002	2003	2004	2005
Amoxicillin/ Ampicillin	Reports with susceptibility data	769	834	984	1145	1145	1123
	Resistant (%)	223 (29%)	258 (31%)	276 (28%)	330 (29%)	333 (29%)	323 (29%)
	Reports with no information	39%	38%	32%	32%	29%	28%
Cefuroxime	Reports with susceptibility data	650	757	938	1098	1054	1052
	Resistant (%)	15 (2%)	12 (2%)	16 (2%)	22 (2%)	20 (2%)	17 (2%)
	Reports with no information	48%	44%	35%	34%	35%	33%
Cefotaxime	Reports with susceptibility data	423	388	365	494	559	582
	Resistant (%)	1 (0%)	5 (1%)	3 (1%)	11 (2%)	7 (1%)	6 (1%)
	Reports with no information	66%	71%	75%	70%	65%	63%
Ceftazidime	Reports with susceptibility data	517	542	646	750	796	768
	Resistant (%)	2 (0%)	4 (1%)	8 (1%)	10 (1%)	9 (1%)	8 (1%)
	Reports with no information	59%	60%	55%	55%	51%	51%
Ciprofloxacin	Reports with susceptibility data	720	804	924	1088	1140	1129
	Resistant† (%)	19 (3%)	24 (3%)	49 (5%)	53 (5%)	63 (6%)	78 (7%)
	Reports with no information	43%	40%	36%	35%	29%	28%
Gentamicin	Reports with susceptibility data	776	866	1030	1199	1219	1199
	Resistant† (%)	12 (2%)	16 (2%)	40 (4%)	48 (4%)	42 (3%)	46 (4%)
	Reports with no information	38%	36%	29%	28%	24%	23%

* Data extracted 26 th April 2006.

† p<0.05 for chi-square test for trend .

Table 4 Antibiotic susceptibility data for *Proteus vulgaris* bacteraemia reports, England, Wales, and Northern Ireland: 2000 to 2005*

	<i>Proteus vulgaris</i>	2000	2001	2002	2003	2004	2005
Ciprofloxacin	Reports with susceptibility data	42	41	51	62	68	71
	Resistant (%)	0 (0%)	0 (0%)	1 (2%)	2 (3%)	0 (0%)	3 (4%)
	No information	44%	34%	37%	35%	24%	23%
Cefotaxime	Reports with susceptibility data	26	24	18	32	32	36
	Resistant (%)	2 (8%)	0 (0%)	0(0%)	1 (3%)	1 (3%)	0 (0%)
	No information	65%	61%	78%	66%	64%	61%
Ceftazidime	Reports with susceptibility data	32	28	43	45	48	47
	Resistant (%)	1 (3%)	0 (0%)	0 (0%)	0(0%)	2 (4%)	2 (4%)
	No information	57%	55%	47%	53%	47%	49%
Gentamicin	Reports with susceptibility data	44	41	57	66	68	79
	Resistant (%)	0 (0%)	0 (0%)	0 (0%)	1 (2%)	1 (1%)	1 (1%)
	No information	41%	34%	30%	31%	24%	14%
Imipenem	Reports with susceptibility data	19	17	22	22	16	19
	Resistant (%)	0 (0%)	0 (0%)	0 (0%)	1 (5%)	1 (6%)	0 (0%)
	No information	75%	73%	73%	77%	82%	79%

* Data extracted 26 th April 2006.

† p<0.05 for chi-square test for trend .

Table 5 Antibiotic susceptibility data for *Morganella morganii* bacteraemia reports, England, Wales, and Northern Ireland: 2000 to 2005*

	<i>Morganella morganii</i>	2000	2001	2002	2003	2004	2005
Ciprofloxacin	Reports with susceptibility data	159	175	235	288	281	276
	Resistant† (%)	9 (6%)	6 (3%)	12 (5%)	19 (7%)	32 (11%)	23 (8%)
	No information	42%	41%	36%	32%	30%	27%
Cefotaxime	Reports with susceptibility data	90	97	90	145	126	137
	Resistant† (%)	10 (11%)	9 (9%)	14 (16%)	20 (14%)	26 (21%)	25 (18%)
	No information	67%	67%	75%	66%	69%	64%
Ceftazidime	Reports with susceptibility data	114	128	159	211	203	182
	Resistant† (%)	18 (16%)	9 (7%)	17 (11%)	23 (11%)	46 (23%)	40 (22%)
	No information	59%	57%	57%	50%	49%	52%
Gentamicin	Reports with susceptibility data	163	186	250	298	304	286
	Resistant† (%)	8 (5%)	8 (4%)	12 (5%)	24 (8%)	23 (8%)	23 (8%)
	No information	41%	37%	32%	30%	24%	24%
Imipenem	Reports with susceptibility data	75	83	96	115	100	94
	Resistant† (%)	7 (9%)	6 (7%)	4 (4%)	13 (11%)	6 (6%)	2 (2%)
	No information	73%	72%	74%	73%	75%	75%

* Data extracted 26 th April 2006.

† $p < 0.05$ for chi-square test for trend .

Table 6 Antibiotic susceptibility data for *Providencia stuartii* bacteraemia reports, England, Wales and Northern Ireland: 2000-2005

	Providencia stuartii	2000	2001	2002	2003	2004	2005
Amikacin	Reports with susceptibility data	5	1	4	10	9	13
	Resistant (%)	1 (20%)	0(0)	0 (0)	0 (0)	0 (0)	0 (0)
	No information	91%	98%	93%	82%	86%	78%
Ciprofloxacin	Reports with susceptibility data	41	28	38	38	44	43
	Resistant (%)	4 (10%)	4 (14%)	4 (11%)	3 (8%)	1 (2%)	4 (9%)
	No information	23%	38%	32%	33%	31%	27%
Cefotaxime	Reports with susceptibility data	27	17	12	22	17	26
	Resistant (%)	0 (0)	2 (12%)	0 (0)	2 (9%)	1 (6%)	1 (4%)
	No information	49%	62%	79%	61%	73%	56%
Ceftazidime	Reports with susceptibility data	31	19	27	28	27	27
	Resistant (%)	2 (6%)	2 (11%)	0 (0)	0 (0)	0 (0)	2 (7%)
	No information	42%	58%	52%	51%	58%	54%
Imipenem	Reports with susceptibility data	16	10	16	11	12	13
	Resistant (%)	0 (0)	0(0)	0 (0)	0 (0)	0 (0)	1 (8%)
	No information	70%	78%	71%	81%	81%	78%

* Data extracted 26 th April 2006.

† p<0.05 for chi-square test for trend .

Age and sex distribution by species

Figures 2 to 4 show the age and sex distribution of bacteraemia reports for *Proteus* spp, *Morganella morganii*, and *Providencia* spp. In all species, the number of reports was higher in males than in females, and prevalence increased with age – the greatest number of reports related to individuals aged 65 years and over.

Figure 2 *Proteus* spp bacteraemia reports in 2005 by age and sex

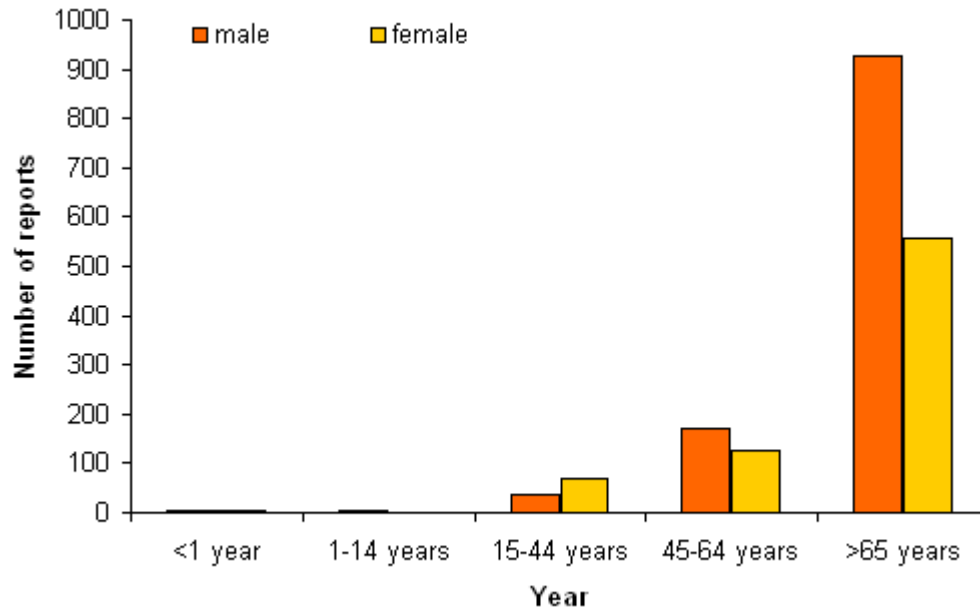


Figure 3 *Morganella morganii* bacteraemia reports in 2005 by age and sex

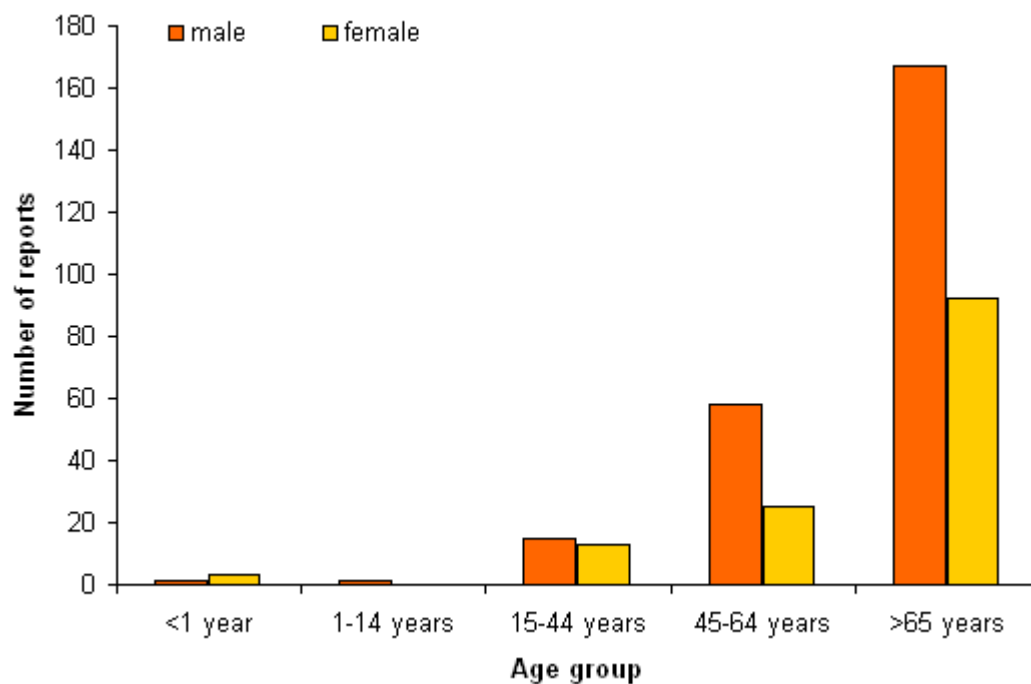


Figure 4 *Providencia* spp bacteraemia reports in 2005 by age and sex

