

SCOTTISH SURVEILLANCE OF HEALTHCARE ASSOCIATED INFECTION PROGRAMME

QUARTERLY REPORT ON METICILLIN RESISTANT *STAPHYLOCOCCUS AUREUS* BACTERAEMIAS IN SCOTLAND. JANUARY 2003 - MARCH 2006

INTRODUCTION

This report provides data from January 2003 to March 2006 on the rates of MRSA bacteraemias (blood infections) for 18 organisations:

- 15 acute divisions in 12 mainland NHS boards
 - o Glasgow NHS Board has three acute divisions - North, South, and Yorkhill
 - o Lothian NHS Board has two acute divisions - West Lothian, and Lothian Universities
 - o the remaining ten have one each
- three island NHS boards in Scotland.

For convenience, these organisations are referred to from now on as 'acute divisions'.

Previous reports have utilised HPS data from January 2001 and the data from the European Antimicrobial Resistance Surveillance System (EARSS) from January 2003. In order to allow for consistency in reporting, data included cover those periods where both systems were in existence in Scotland.

METHODS

Numbers of identifications of MRSA bacteraemias are obtained from

- the HPS laboratory reporting system and
- referrals of isolates for confirmation and detailed typing to the Scottish MRSA Reference Laboratory, part of HPS's contribution to the European Commission's European Antimicrobial Resistance Surveillance System (EARSS).

The details of these systems are available on the HPS website and the EARSS website respectively (<http://www.hps.scot.nhs.uk/> and www.earss.rivm.nl). One episode of MRSA bacteraemia is counted if it appears in either system alone, or in both.

Rates are calculated by dividing the number of episodes of MRSA bacteraemia in the period by the number of "acute occupied bed days" (AOBDs) for that period. One patient in one bed for one night is one AOBD. Rates are presented per 1000 AOBDs. This rate gives an indication of the number of episodes relative to the size of the population at risk. The data on AOBDs are obtained from the Information and Statistics Division of the NHS in Scotland. They are based on the daily counts of occupied beds that are undertaken in every hospital at midnight. These counts obviously exclude day patients who, by definition, do not occupy a bed at midnight.

Note that the figures published within this report remain provisional until one quarter after the date of publication.

Further information on the methods and notes on interpretation and significance of the data presented here are on the SSHAIP section of the HPS website (<http://www.hps.scot.nhs.uk/>) and the document "MRSA – General information for the public" can be found at <http://www.scotland.gov.uk/Topics/Health/NHS-Scotland/19529/CNOANNEXA>.

NOTES ON INTERPRETATION

The quarterly rates are presented in the form of statistical process control (SPC) charts using each division's average rate over the period of the surveillance (January 2003 to March 2006) as the centre line. This provides a method for monitoring whether a site is performing consistently over time, rather than providing comparison between sites. The control limits are set at three standard deviations from the centre line. If a value falls above the upper control limit this suggests that there is a significant increase in the MRSA bacteraemia rate, similarly if a value falls below the lower control limit this suggest that the MRSA bacteraemia rate has reduced significantly. If all values fall inside the upper and lower control limit this suggests that the process is stable and in a state of "statistical control".

To aid interpretation lines have also been placed on the control charts at one and two standard deviations from the centre line. The lines at two standard deviation from the centre are the upper and lower warning limits and are labelled uwl and lwl on the charts. The lines at one standard deviation from the centre line are termed the upper and lower highlight limits and are labelled uhl and lhl.

Additionally, Health Protection Scotland uses the following eight criteria to assess whether a statistically significant change or unnatural variation in the MRSA bacteraemia rate has occurred :

1. One value either above the upper control limit or below the lower control limit.
2. Eight consecutive values on the same side of the central line (or mean).
3. Any 12 of 14 consecutive values on the same side of the central line (or mean).
4. Three consecutive values in either the top third (above uwl) or bottom third (below lwl) of the expected range.
5. Five consecutive values in the top two-thirds (above uhl) or bottom two-thirds (below lhl) of the expected range.
6. Thirteen consecutive values in the middle thirds of the expected range.
7. Eight consecutive values either increasing or decreasing.
8. Cyclic or periodic behaviour.

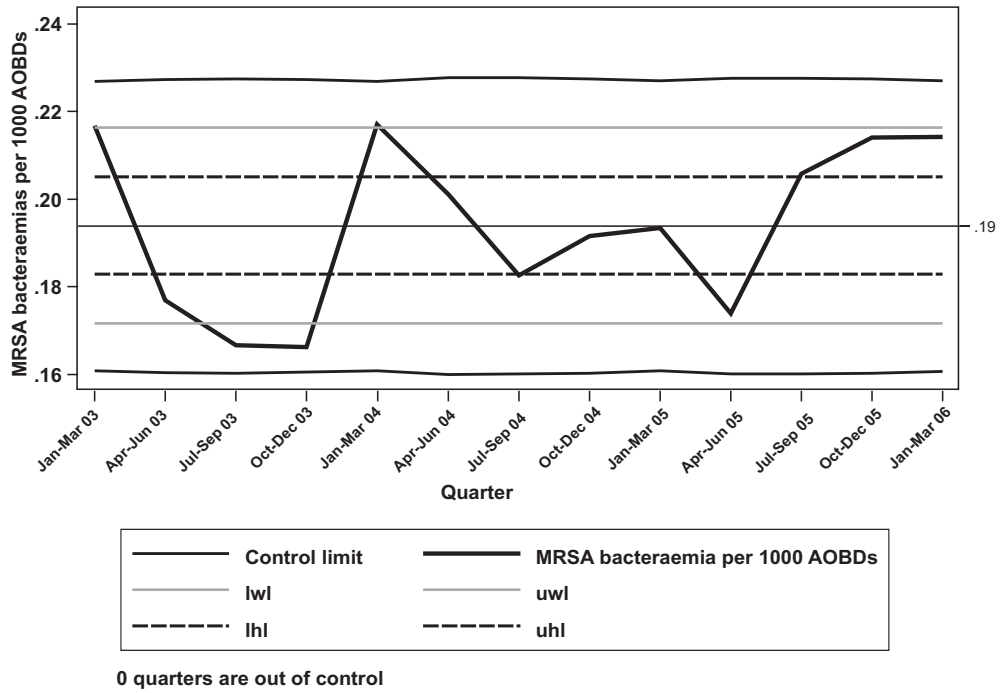
RESULTS

Table 1

Numbers and rates of MRSA bacteraemia per 1000 AOBs identified by laboratory reporting and EARSS combined, by quarter April 2005 to March 2006 in each acute division.

Division Name	Number of MRSA bacteraemias				MRSA bacteraemias per 1000 AOBs			
	Apr 05-Jun 05	Jul 05-Sep 05	Oct 05-Dec 05	Jan 06-Mar 06	Apr 05-Jun 05	Jul 05-Sep 05	Oct 05-Dec 05	Jan 06-Mar 06
Argyll & Clyde	7	13	13	11	0.08	0.14	0.14	0.11
Ayrshire & Arran	5	8	14	11	0.06	0.09	0.16	0.12
Borders	3	3	2	2	0.12	0.12	0.09	0.08
Dumfries & Galloway	7	5	5	6	0.24	0.17	0.17	0.21
Fife	15	20	16	20	0.25	0.34	0.27	0.32
Forth Valley	3	11	12	11	0.06	0.21	0.22	0.20
Grampian	13	14	19	28	0.11	0.12	0.16	0.24
Highland	11	3	6	3	0.22	0.06	0.12	0.06
Lanarkshire	27	23	19	35	0.26	0.21	0.17	0.31
Lothian Universities	45	50	60	50	0.28	0.32	0.38	0.30
North Glasgow	41	43	49	55	0.23	0.24	0.28	0.30
Orkney	0	0	1	0	0.00	0.00	0.22	0.00
Shetland	0	0	0	0	0.00	0.00	0.00	0.00
South Glasgow	10	14	5	17	0.09	0.13	0.05	0.16
Tayside	26	31	32	19	0.23	0.29	0.29	0.17
Western Isles	0	0	3	0	0.00	0.00	0.29	0.00
West Lothian	3	5	6	7	0.11	0.19	0.23	0.26
Yorkhill	0	0	1	1	0.00	0.00	0.05	0.05
Scotland	216	243	263	276	0.18	0.20	0.21	0.21

Figure 1: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in Scotland January 2003 to March 2006

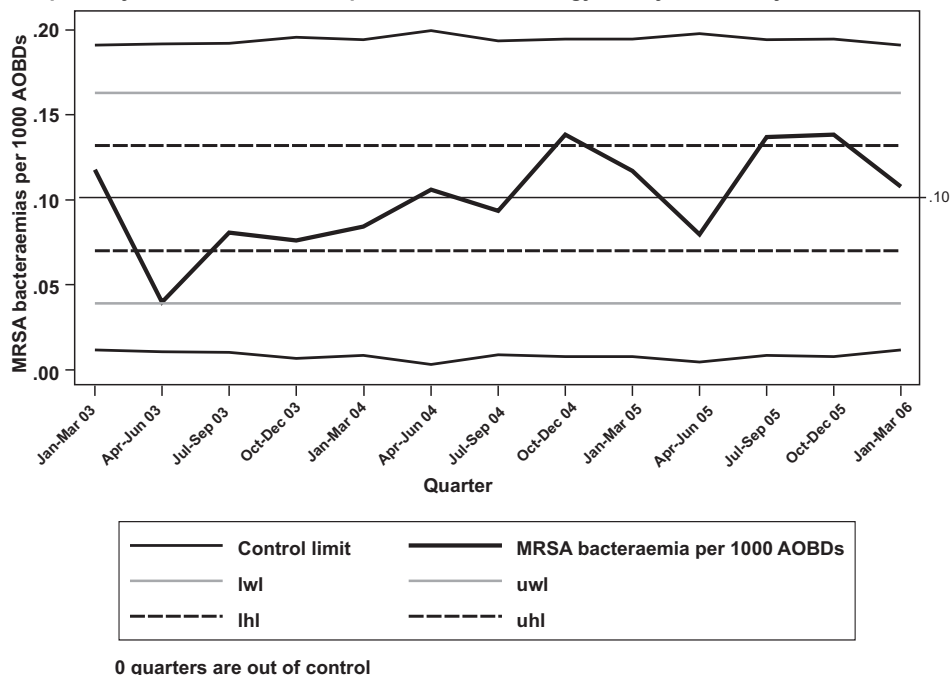


KEY SUMMARY POINT

The MRSA bacteraemia rate for all of Scotland has remained stable during the period January 2003 to March 2006 (figure 1), with no values outside the control limits. The national rate shows only natural variation with no indication of special case variation and the process is considered to be in control.

SPC Charts by division for the period January 2003 to March 2006

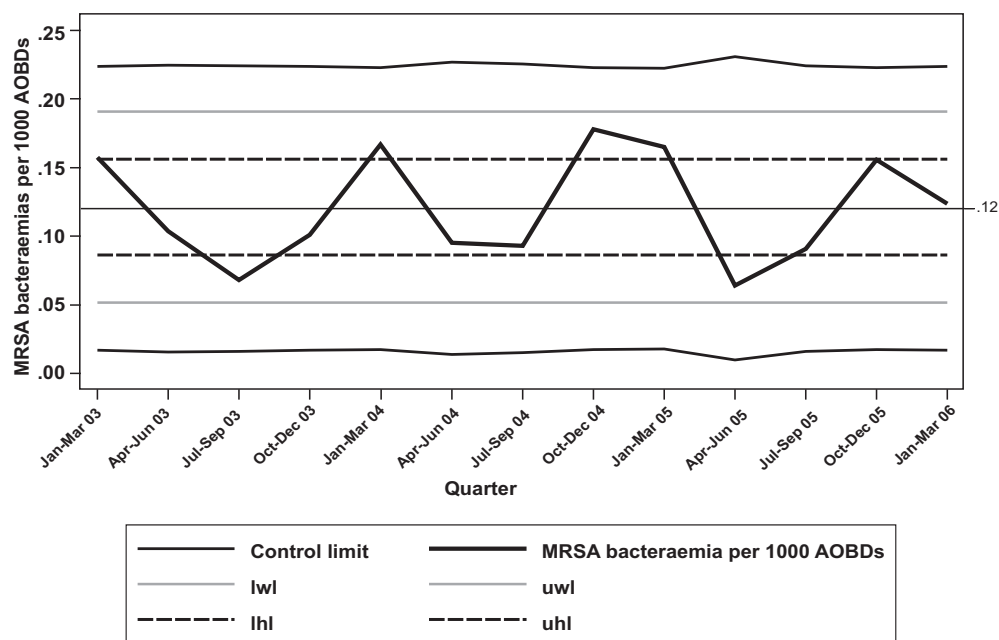
Figure 2: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in Argyll & Clyde. January 2003 to March 2006



0 quarters are out of control

The MRSA bacteraemia rate for Argyll and Clyde acute division has remained stable throughout the period January 2003 to March 2006 (figure 2) with no rates outwith the control limits and none of the eight criteria for interpretation being contravened. This division's rate shows only natural variation with no unnatural variation being identified and is considered to be in control.

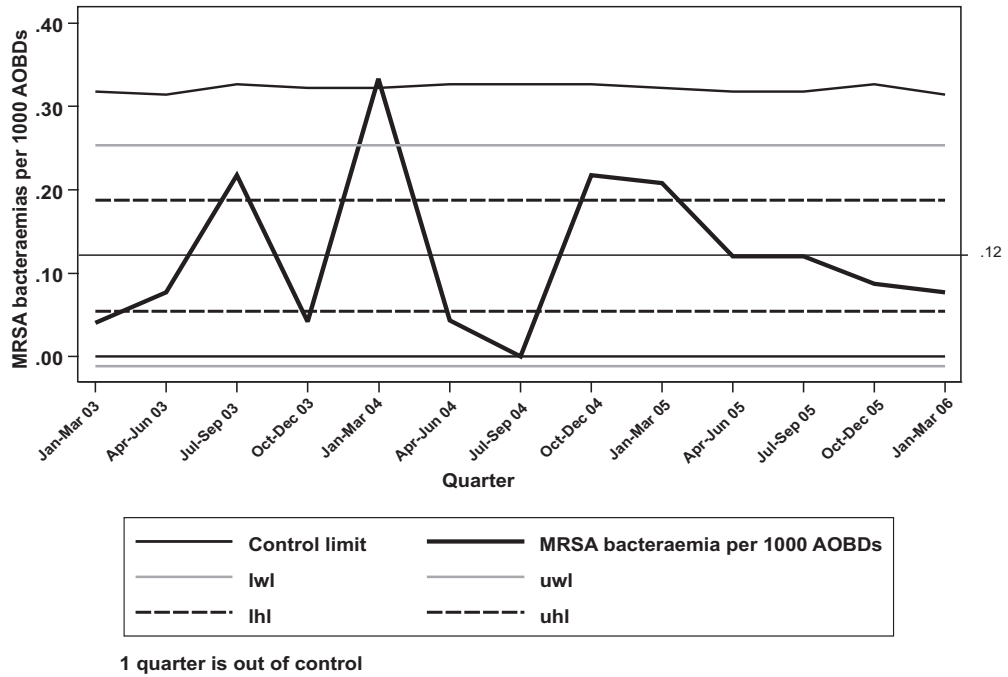
Figure 3: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in Ayrshire & Arran. January 2003 to March 2006



0 quarters are out of control

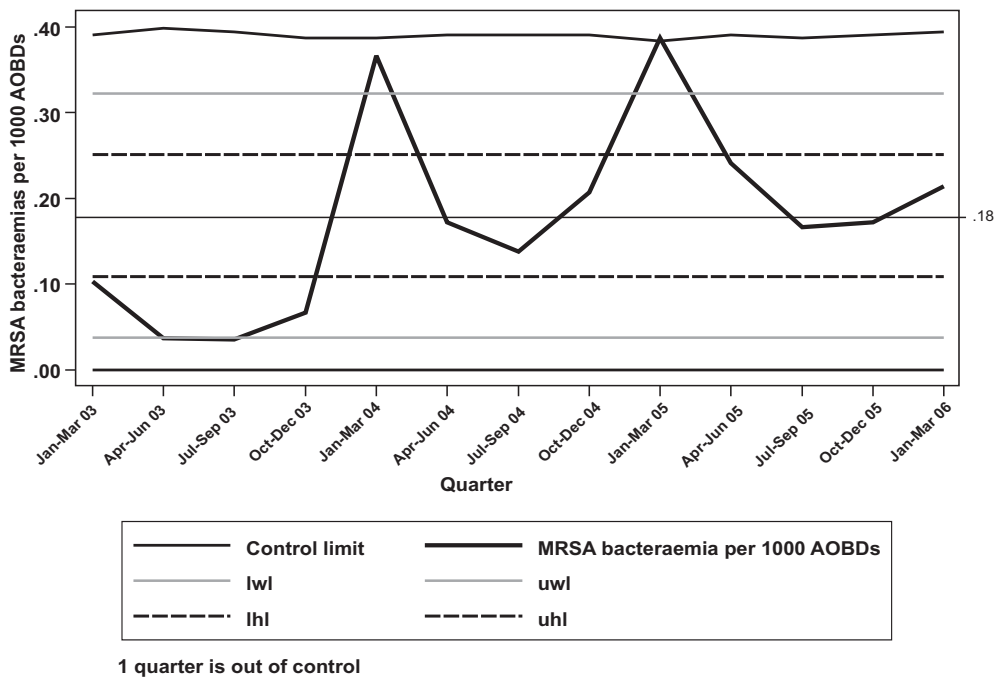
The MRSA bacteraemia rate for Ayrshire and Arran acute division has remained stable throughout the period January 2003 to March 2006 (figure 3) with no rates outwith the control limits and none of the eight rules being contravened. This division's rate demonstrates only natural variation and the process is considered to be in control.

Figure 4: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in Borders. January 2003 to March 2006



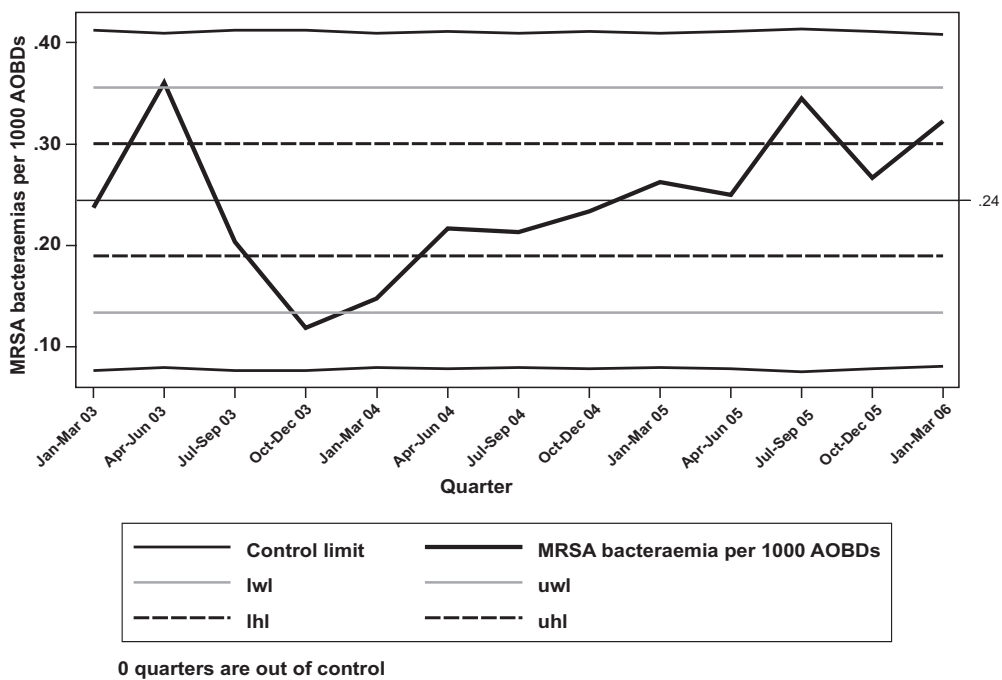
The MRSA bacteraemia rate for Borders acute division rose above its upper control limit during the quarter January to March 2004 indicating a rise in the number of MRSA bacteraemias during this period (figure 4). Following this quarter the rate returned to within the control limits and has remained there for the last eight quarters.

Figure 5: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in Dumfries & Galloway. January 2003 to March 2006



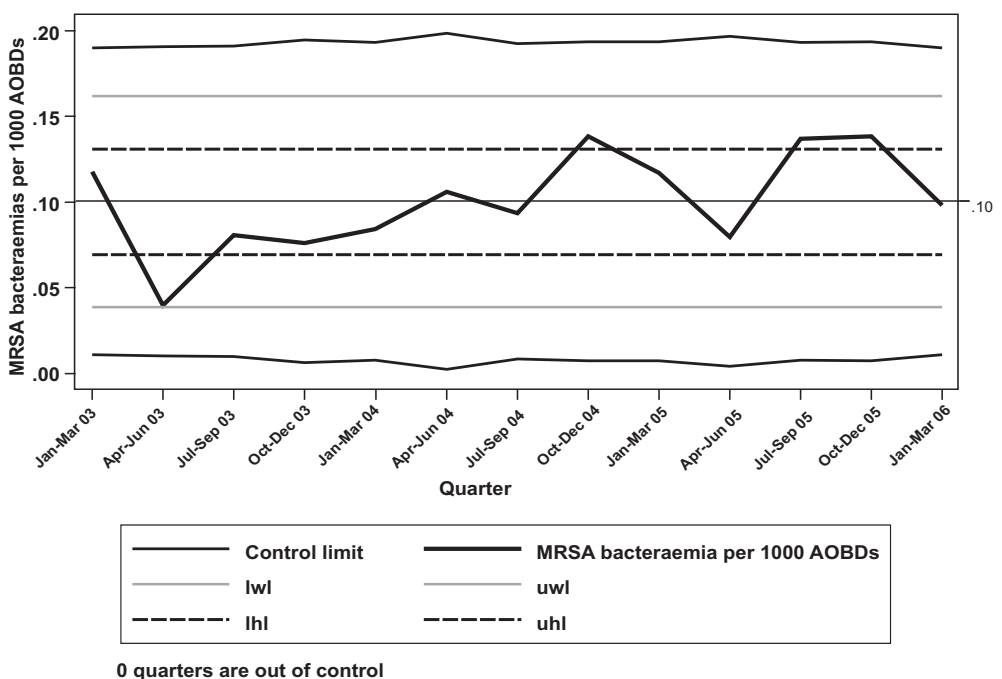
The MRSA bacteraemia rate for Dumfries and Galloway acute division rose above its upper control limit during the quarter January to March 2005 indicating a rise in the number of MRSA bacteraemias during this period (figure 5). Following this quarter the rate returned to within the control limits and has remained there for the last four quarters.

Figure 6: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in Fife. January 2003 to March 2006



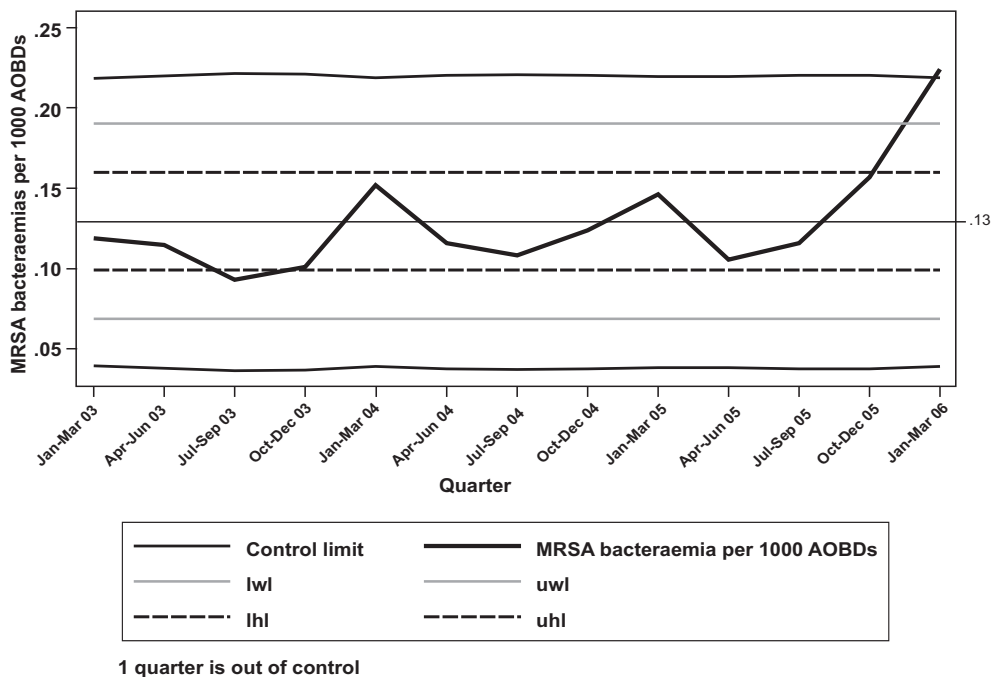
The MRSA bacteraemia rate for Fife acute division has remained stable throughout the period January 2003 to March 2006 (figure 6) with no rates outwith the control limits and none of the eight rules being contravened. This division's rate demonstrates only natural variation and the process is considered to be in control.

Figure 7: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in Forth Valley. January 2003 to March 2006



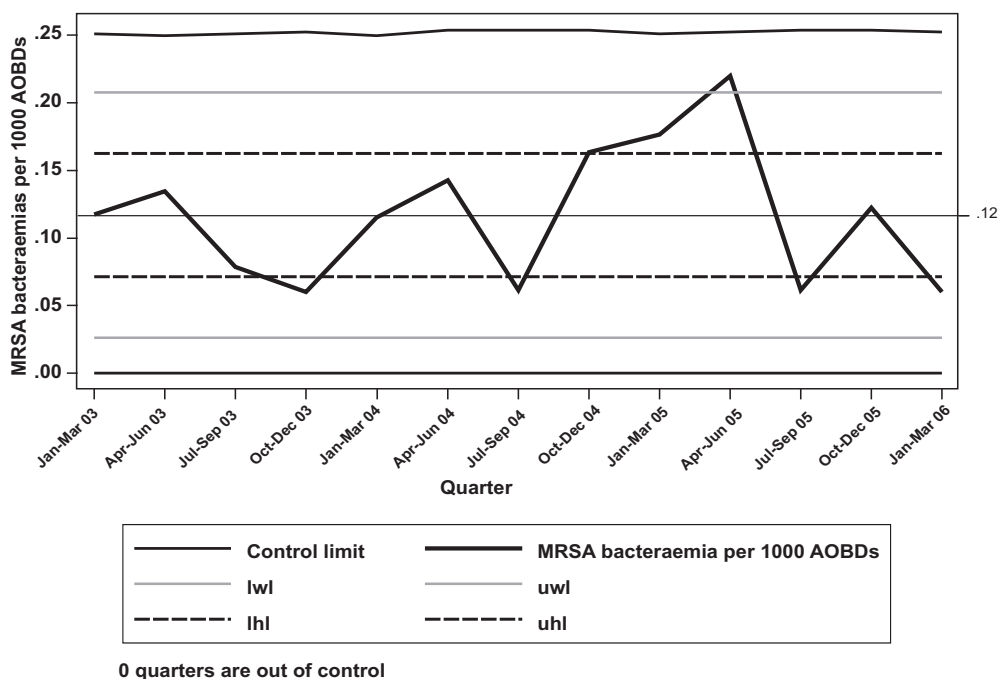
The MRSA bacteraemia rate for Forth Valley acute division has remained stable throughout the period January 2003 to March 2006 (figure 7) with no rates outwith the control limits and none of the eight rules being contravened. This division's rate demonstrates only natural variation and the process is considered to be in control.

Figure 8: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in Grampian. January 2003 to March 2006



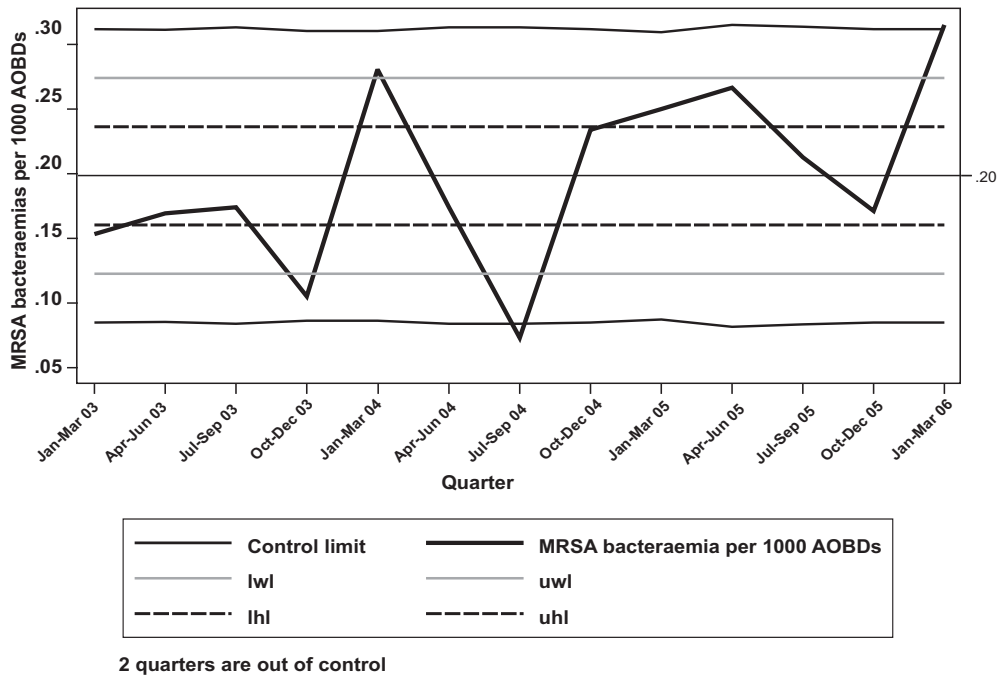
The MRSA bacteraemia rate for Grampian acute division has risen above the upper control limit for the first time in the most recent quarter, January to March 2006 (figure 8).

Figure 9: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in Highland. January 2003 to March 2006



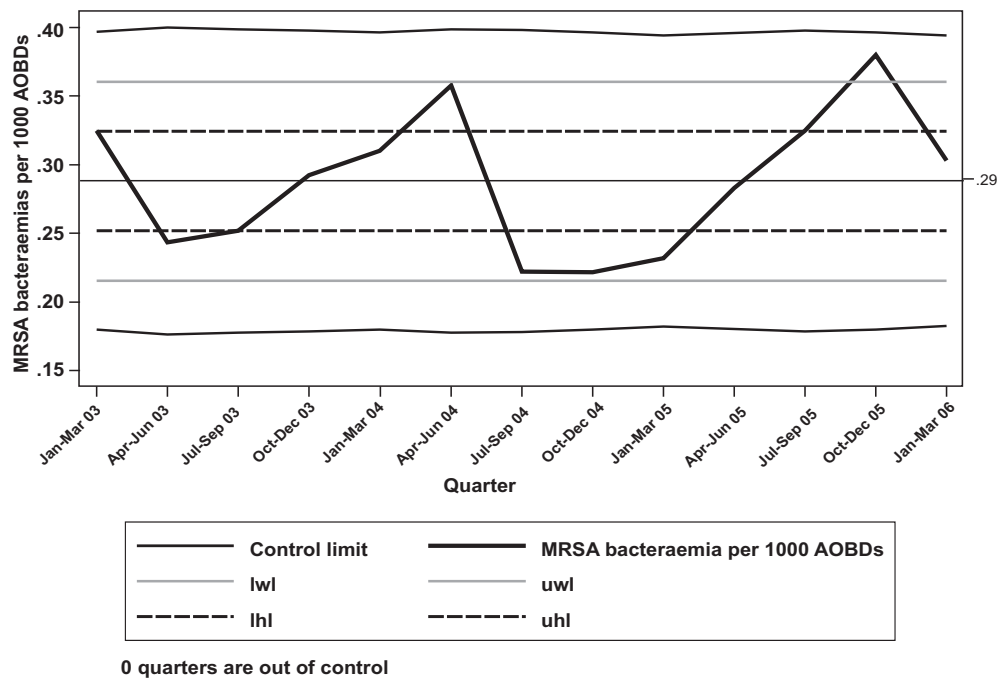
The MRSA bacteraemia rate for Highland acute division has remained stable throughout the period January 2003 to March 2006 (figure 9) with no rates outwith the control limits and none of the eight rules being contravened. This division's rate demonstrates only natural variation and the process is considered to be in control.

Figure 10: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in Lanarkshire. January 2003 to March 2006



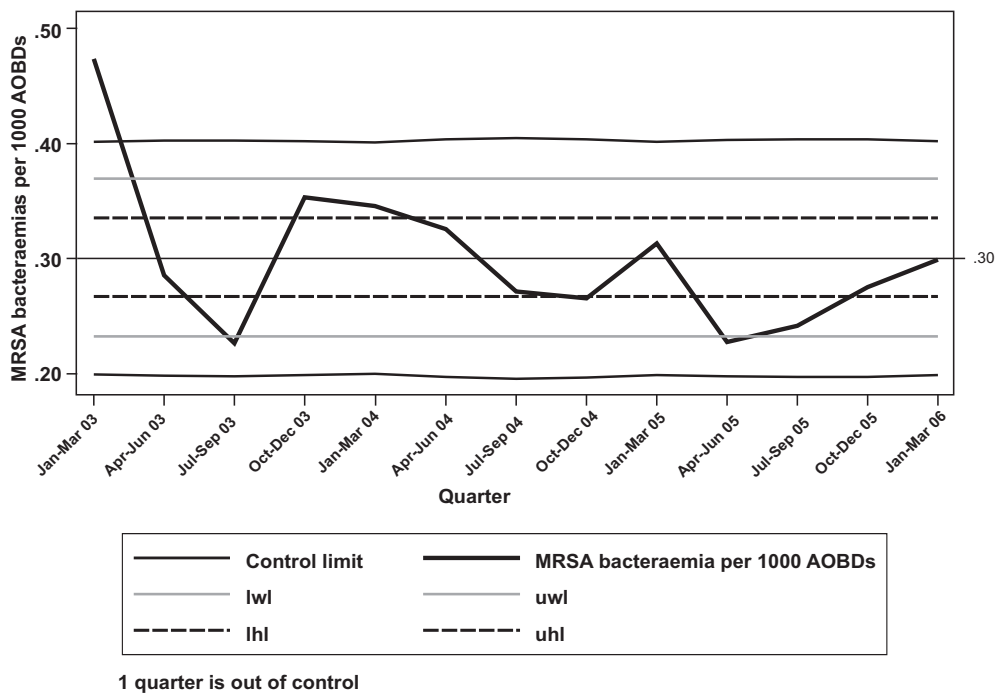
The MRSA bacteraemia rate for Lanarkshire acute division fell below the lower control limit in the quarter July to September 2004, suggesting a reduction in the rate during this period (figure 10). The rate then returned to within the control limits, however in the most recent quarter the rate rose above the upper control limit, suggesting an increase in the number of MRSA bacteraemia cases during this period.

Figure 11: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in Lothian. January 2003 to March 2006



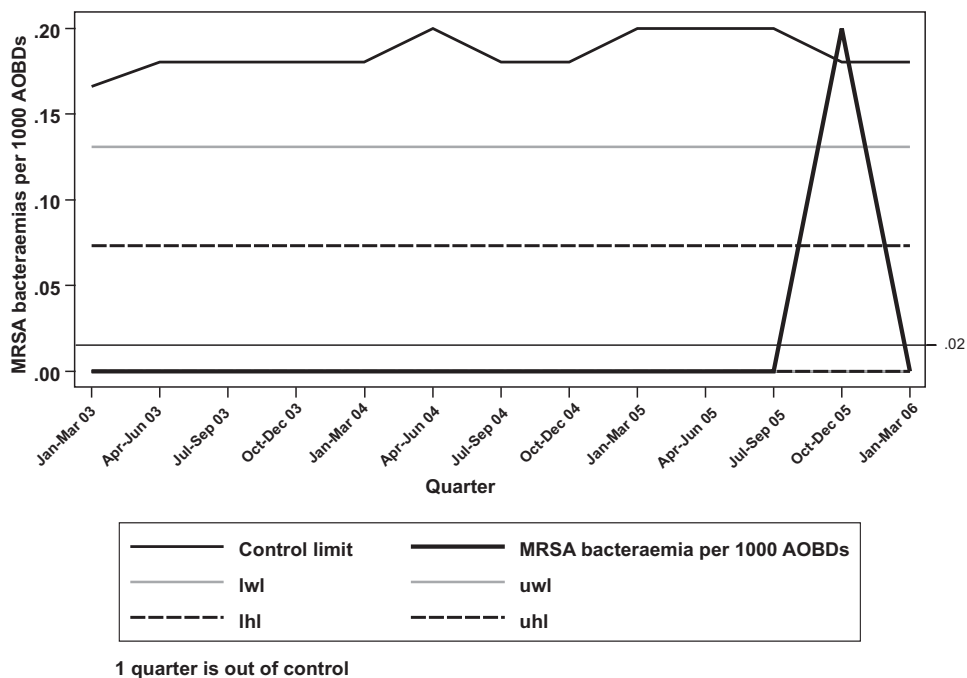
The MRSA bacteraemia rate for Lothian acute division has remained stable throughout the period January 2003 to March 2006 (figure 11) with no rates outwith the control limits and none of the eight rules being contravened. This division's rate demonstrates only natural variation and the process is considered to be in control.

Figure 12: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in North Glasgow. January 2003 to March 2006



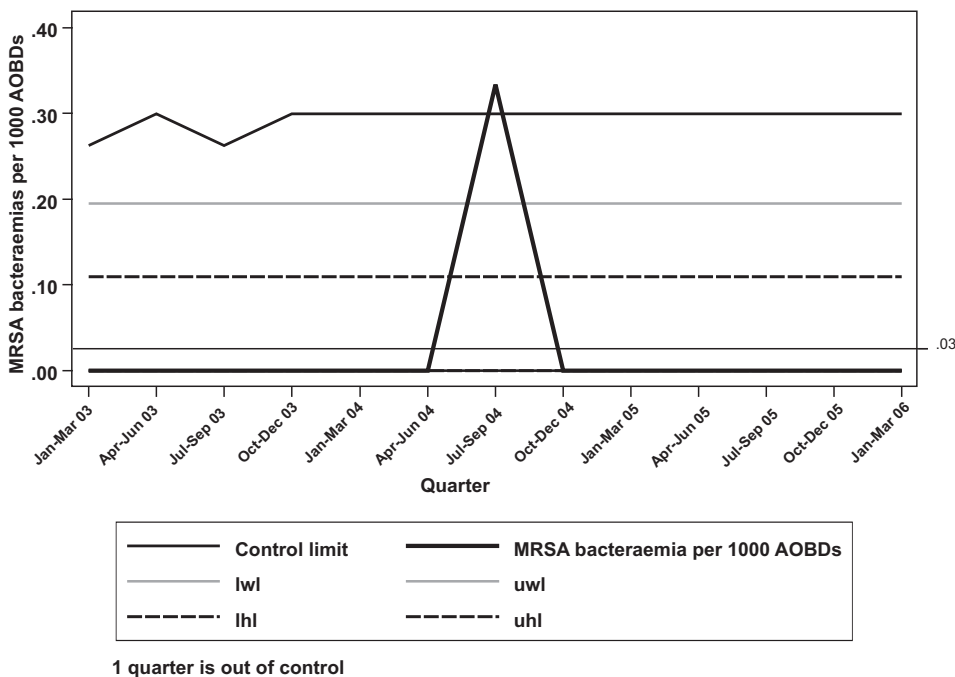
The MRSA bacteraemia rate for North Glasgow acute division was above the upper control limit during the quarter January to March 2003, after this period the rate returned to within the control limits and has remained there for the last twelve quarters (figure 12).

Figure 13: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in Orkney. January 2003 to March 2006



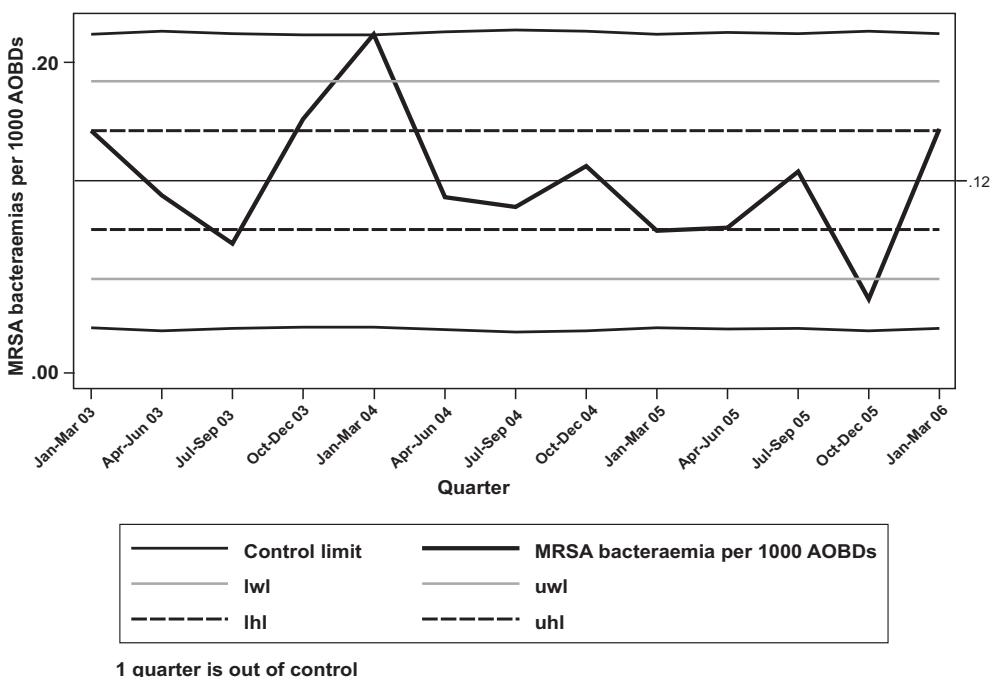
Orkney acute division has reported only one MRSA bacteraemia during the period January 2003 to March 2006, due to the rarity of these reports this one case caused the rate to fall above the upper control limit (figure 13), thus these data should be interpreted with due caution. Since this quarter the rate has returned to zero.

Figure 14: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in Shetland. January 2003 to March 2006



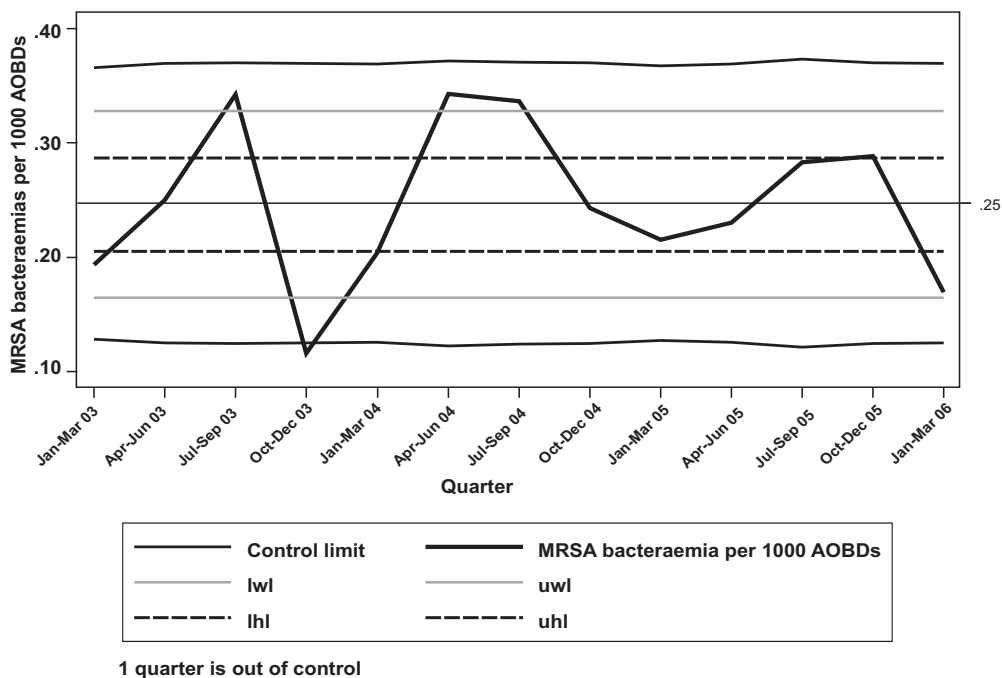
Shetland acute division has reported only one MRSA bacteraemia during the period January 2003 to March 2006, due to the rarity of these reports this one case caused the rate to fall above the upper control limit (figure 14), thus these data should be interpreted with due caution. Since this quarter the rate has returned to zero for the last six quarters.

Figure 15: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in South Glasgow. January 2003 to March 2006



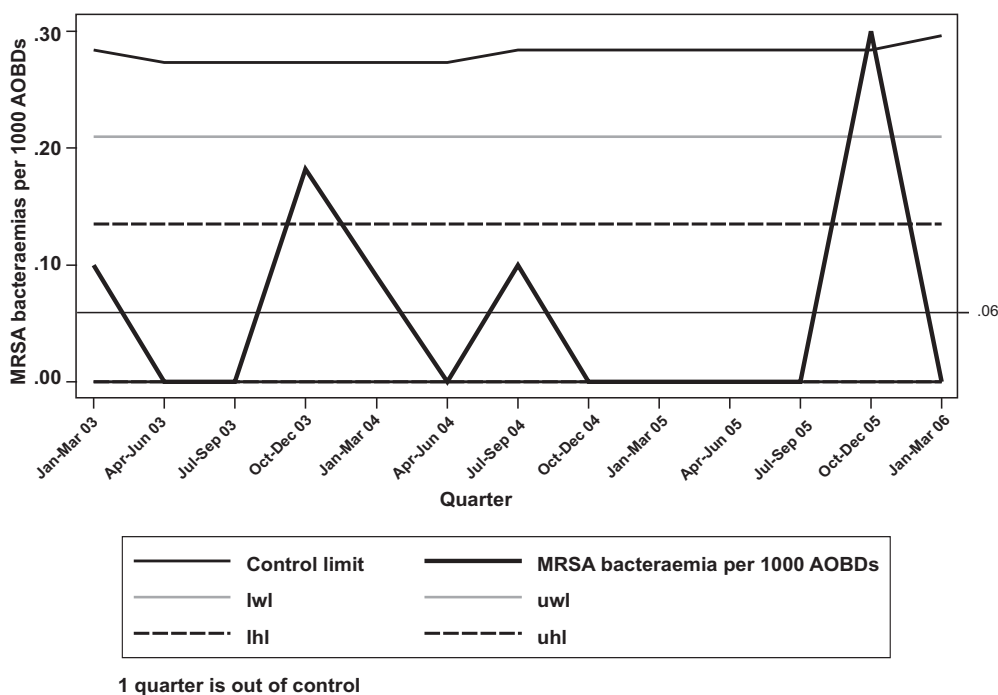
The MRSA bacteraemia rate for South Glasgow acute division rose above the upper control limit during the quarter January to March 2004 (figure 15), suggesting a rise in the number of MRSA bacteraemia episodes during this period, the rate then returned to within the control limits and has remained there for the last eight quarters.

Figure 16: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in Tayside. January 2003 to March 2006



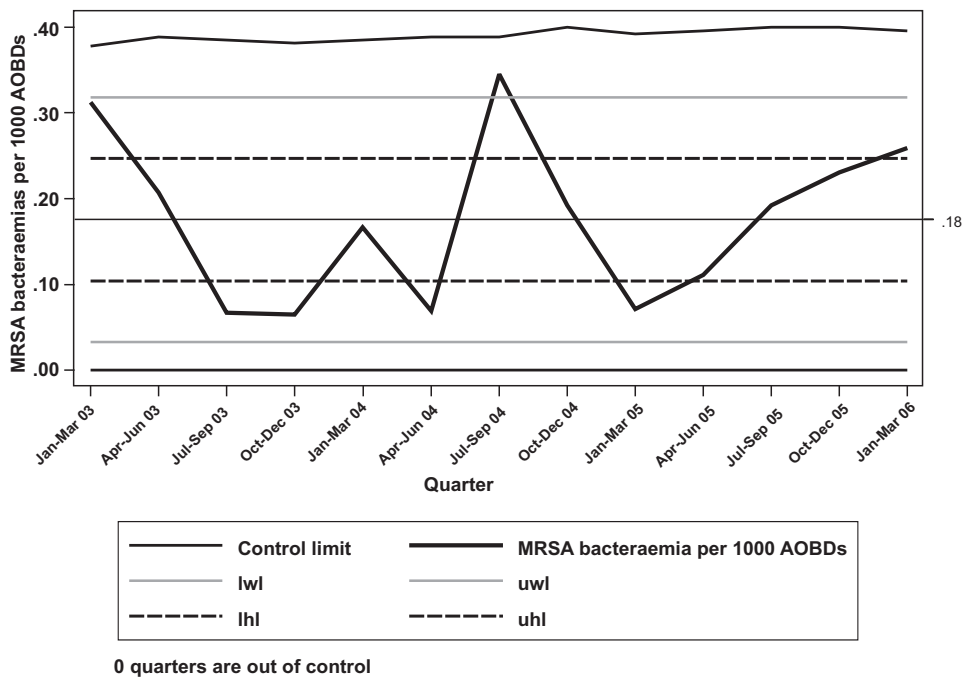
The MRSA bacteraemia rate for Tayside acute division fell below the lower control limit in the quarter October to December 2003, suggesting a decrease in the number of MRSA bacteraemia in this period (figure 16). Since this quarter the rate has remained within its control limits for nine quarters.

Figure 17: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in Western Isles. January 2003 to March 2006



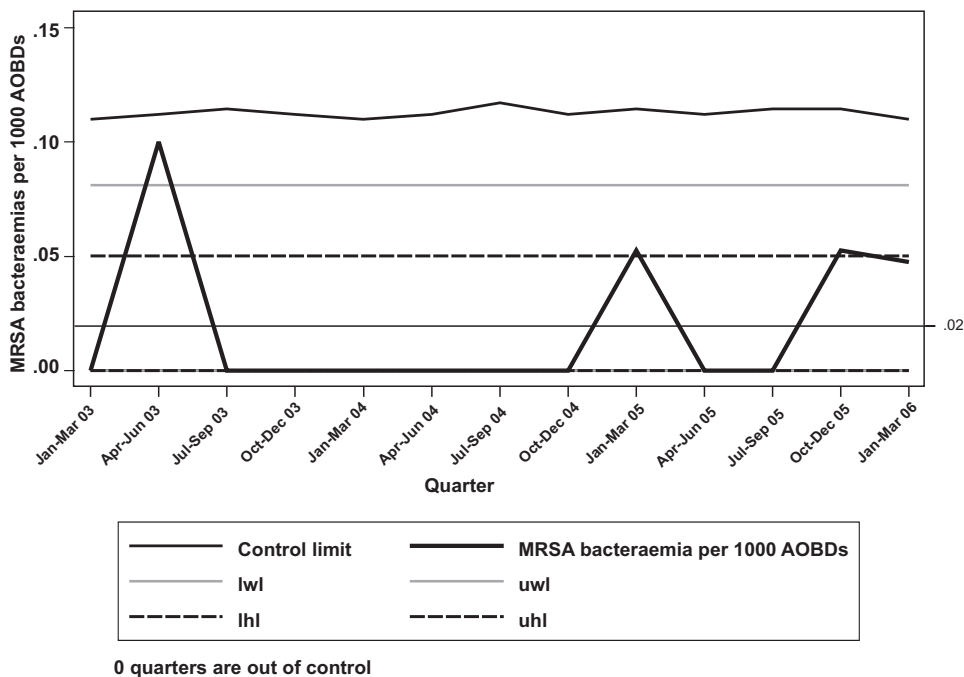
The MRSA bacteraemia rate for Western Isles acute division rose above the control limit during the quarter October to December 2005, indicating a rise in the number of episodes of MRSA bacteraemia during this period (figure 17), however the small number of reports mean that these data should be interpreted with due caution. The rate returned to a low level in the most recent quarter.

Figure 18: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in West Lothian. January 2003 to March 2006



The MRSA bacteraemia rate for West Lothian acute division has remained stable throughout the period January 2003 to March 2006 (figure 18) with no rates outwith the control limits and none of the eight rules being contravened. This division's rate demonstrates only natural variation and the process is considered to be in control.

Figure 19: SPC chart of quarterly MRSA bacteraemias per 1000 AOBs in Yorkhill. January 2003 to March 2006



The MRSA bacteraemia rate for Yorkhill acute division has remained stable throughout the period January 2003 to March 2006 (figure 19) with no rates outwith the control limits and none of the eight rules being contravened. This division's rate demonstrates only natural variation and the process is considered to be in control.

SUMMARY

During the period January 2003 to March 2006 eight acute divisions have remained consistently within their control limits, nine divisions have reported a rate above the upper control limit or below the lower control limit during one quarter and one division has reported rates from two quarters above and below the control limit.

The MRSA bacteraemia rate for all of Scotland has remained stable during the period January 2003 to March 2006 and has demonstrated only natural variation with none of the eight criteria for interpretation being contravened. This rate shows only natural variation with no unnatural variation being identified and is considered to be in control.

Within individual divisions, two reported rates above their control limit during the most recent quarter, January to March 2006. HPS is liaising with these divisions to examine the reasons for this in order to address this variation.

Acknowledgements

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