



Evaluation of a national observational hand hygiene auditing campaign to improve hand hygiene in Ireland. A retrospective time series analysis, 2009 – 2016.

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Background

Observational hand hygiene auditing (OHHA) is a key component of the World Health Organization multimodal strategy to improve hand hygiene compliance. OHHA was implemented in Ireland in 2011. The aim of this study is to evaluate the impact of OHHA on the national rate of observed hand hygiene compliance, alcohol based hand rub (ABHR) procurement and the incidence of sensitive and resistant *Staphylococcus aureus*, *Enterococcus faecium* (EFM) and Vancomycin Resistant Enterococci (VRE) bloodstream infections (BSI).

Methods

A retrospective interrupted time series analysis from an eight-year period (2009 to 2016), was performed to determine the temporal association between the implementation of OHHA and outcomes.

Results

Observed hand hygiene improved from 74.7% (n=5,610, 73.7, 75.6) in 2011 to 90.8% (n=8,375, 90.1, 91.3) in 2016. ABHR procurement increased from 20.1L / 1,000 bed days used in 2009 to 33.2L / 1,000 bed days used in 2016, Figure 1.

A pre intervention reduction of 2% per quarter in methicillin sensitive *Staphylococcus aureus* (MSSA) BSI stabilised in the time period after the intervention, (p < 0.001), Table 1, Figure 2.

Methicillin resistant *Staphylococcus aureus* (MRSA) BSI was decreasing by 4% per quarter pre intervention, this slowed to 2% per quarter post intervention, (p = 0.09), Table 1, Figure 2.

There was a non-significant increase in sensitive EFM BSI post intervention, (p = 0.21) and no change in the occurrence of VRE BSI (p = 0.80), Table 1, Figure 2.

Table 1. Interrupted Time Series of bacteraemia outcome variables and alcohol hand rub procurement

	Slope Before (quarterly rate of decline in variable before OHHA intervention) with 95% Confidence Interval	Slope After (quarterly rate of decline trend in variable after OHHA intervention) with 95% Confidence Interval	P-value for change in Slope.
Methicillin Sensitive <i>Staphylococcus aureus</i> (MSSA) bacteraemia	0.98 (0.97, 0.98)	1.00 (0.99, 1.00)	p < 0.001
Methicillin Resistant <i>Staphylococcus aureus</i> (MRSA) bacteraemia	0.96 (0.95, 0.98)	0.98 (0.97, 0.99)	p = 0.09
<i>Enterococcus faecium</i> (EFM) bacteraemia	0.99 (0.98, 1.01)	1.01 (1.00, 1.01)	p = 0.21
Vancomycin Resistant Enterococci (VRE) bacteraemia	1.01 (0.98, 1.03)	1.01 (1.00, 1.02)	p = 0.80

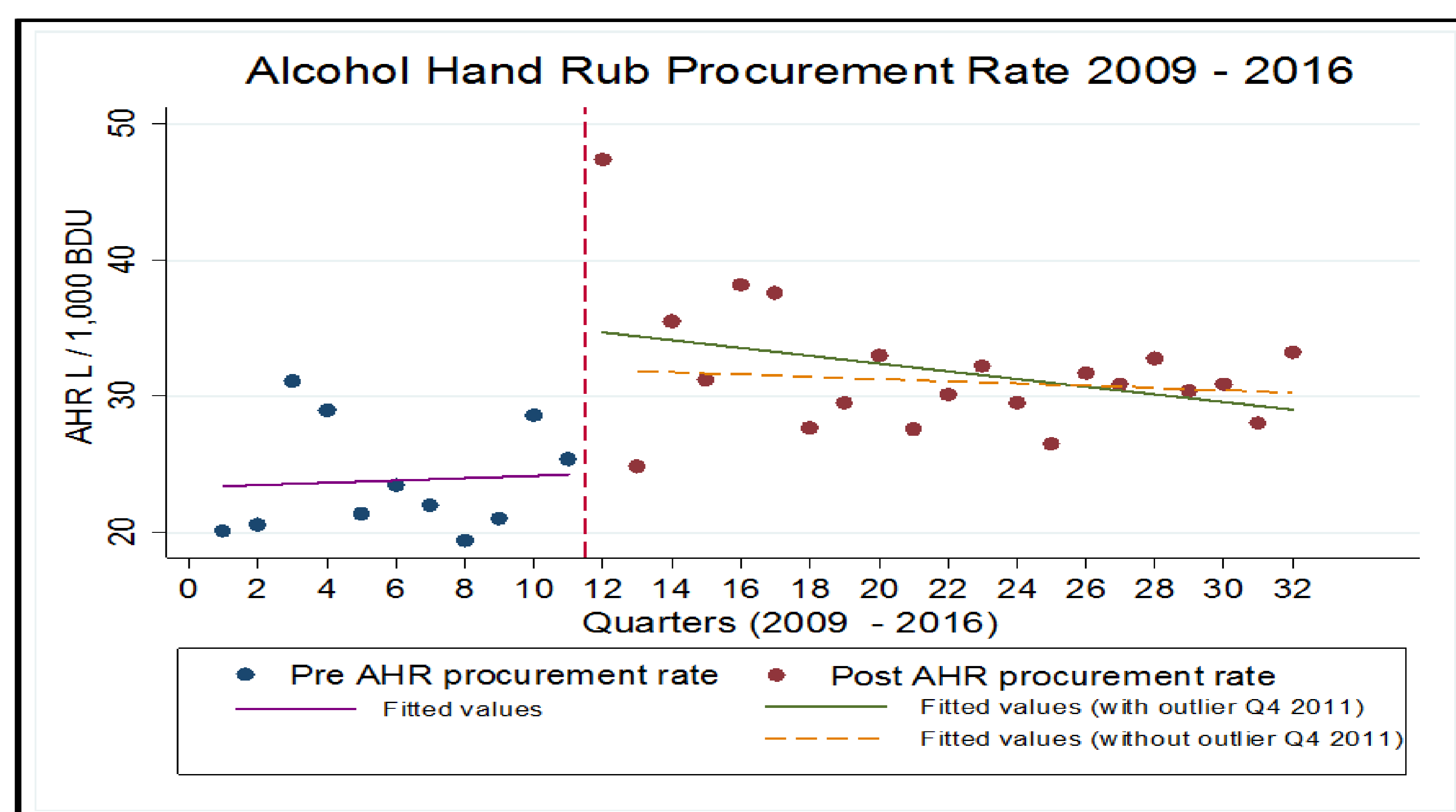


Figure 1. Alcohol Hand Rub Procurement Rates Pre and Post OHHA intervention.

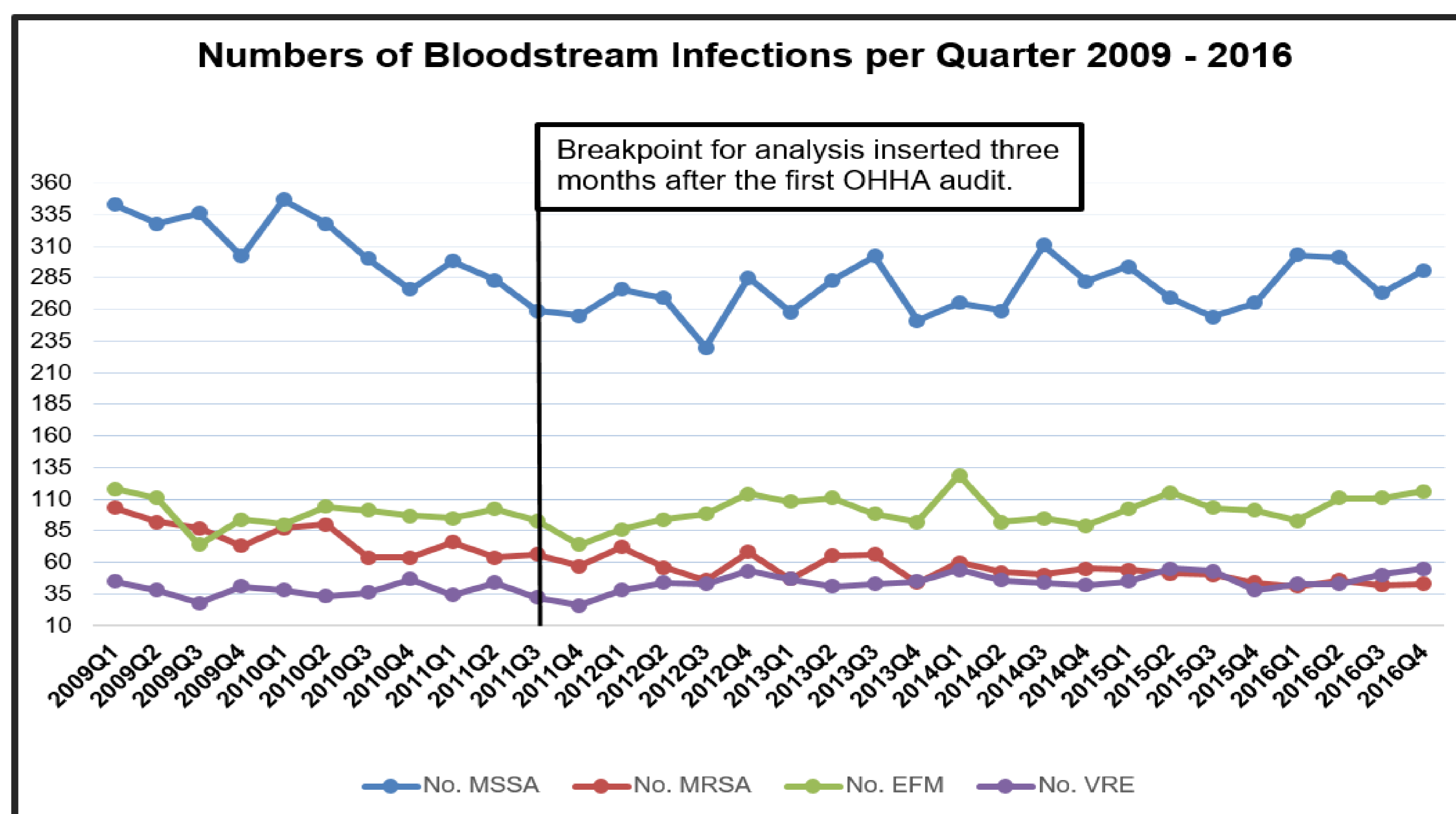


Figure 2. Numbers of Bacteraemia per Quarter 2009 – 2016

Discussion

Overall there was no association between a reduction in any of the BSI outcome variables and the OHHA intervention. However, MRSA BSI continued to fall and while not significant, OHHA may have been a contributing factor. The lack of an association may be due to the complexity of factors that influence acquisition of BSI of which, hand hygiene is just one element. The strengths of this study include the use of nationally reported datasets where data have been reported consistently over time and the addition of ABHR procurement data as an additional proxy measure for hand hygiene. Limitations include the lack of more observed hand hygiene data points as the data were reported biannually and the possible effect of other infection prevention and control measures that occurred during the study period.

Conclusions

Implementation of national OHHA has resulted a significant maintained improvement in observed hand hygiene compliance and ABHR procurement. OHHA positively influences hand hygiene behaviours however, this alone does not translate to improvement in BSI outcomes.

