



# Reducing Population Methicillin Resistant *Staphylococcus aureus* Acquisition Through Hospital-Based Topical Disinfection – An Interrupted Time Series Analysis Approach

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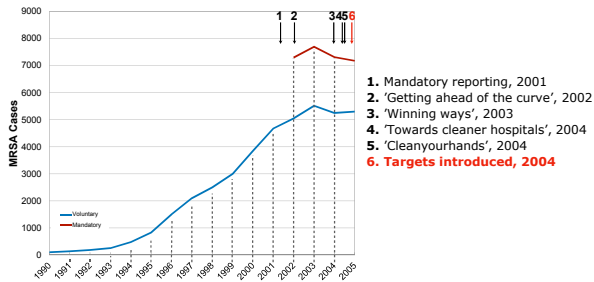
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## Background

### Progression of Methicillin Resistance: *S. aureus* bacteraemia cases 1990-2005 - England



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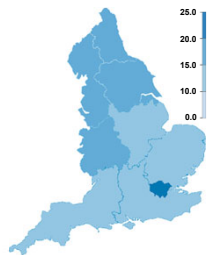
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## MRSA multi-drug challenge

### Key Events in MRSA BSI Control Program in England

Date	Initiative	Comment
November 2004	Introduction of mandatory target to reduce MRSA BSIs	A target to halve the number of MRSA BSIs in hospitals by March 2008



Geographic distribution of MRSA rates per 100,000 population, England 2004

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Population of 1,046,800  
UHL - 1800 beds  
2001 - 161 MRSA BSIs

Geographic distribution of MRSA rates per 100,000 population, England 2004

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### Objectives

- **Highlighting the importance of a hospital-based topical disinfection strategy implementation**
- **Presenting the key step that has been taken to prevent MRSA transmission**

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## Investigation

- **Design:** Retrospective secular trend study
- **Study period:** February 1999 to June 2018
- **Data:** Patient medical records
- **Setting:** Single medical microbiology laboratory for the Leicestershire
- **New MRSA Carriers definition:** First-ever MRSA culture positive from in-patients or community patients
- **Intervention:** April 2007 - topical disinfection with a didecyldimonium chloride body wash (all adult UHL in-patients) and nasal mupirocin (all UHL patients admitted to surgical or intensive care wards, patients with central venous cannulas, known MRSA carriers)

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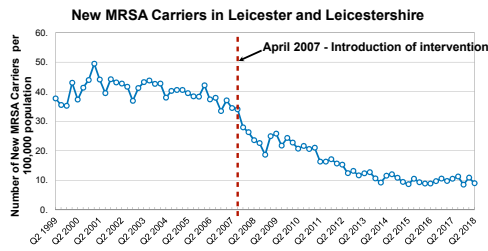
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## Methods

- **Methods:** Interrupted time series analysis using the ARIMA method introduced by Box and Tiao (1975)




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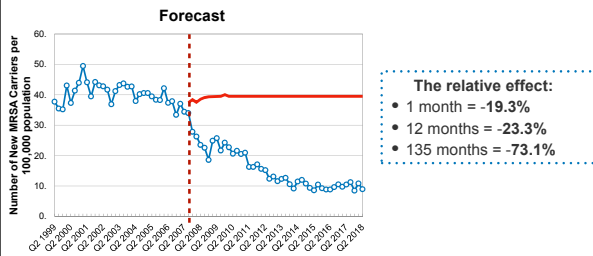
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## Results

- **ARIMAX Intervention Model:** the ARIMA(3,0,0)(0,0,1)[12] (Ljung-Box Q, p=0.83)




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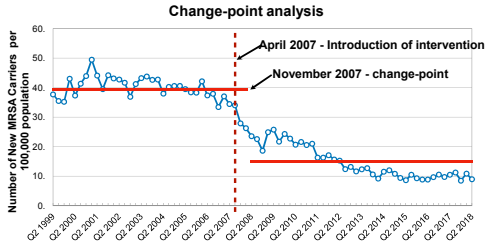
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## Results

- A change-point occurred 7 months after the introduction of TD, resulting in a relative reduction of 21.2% (95% CI 9-31%,  $p < 0.001$ )




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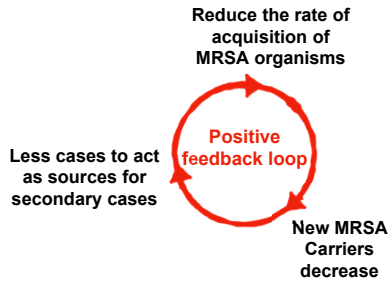
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## Conclusions

- Hospital-wide patient topical disinfection
- Simple and powerful intervention
- Cost effective
- Highly successful




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## Acknowledgements

- Prof. Marco R. Oggioni
- Melisa M. Williams
- Erasmus+
  - UNIVERSITY OF LEICESTER
  - University Hospitals of Leicester NHS Trust
  - Erasmus+
  - PHD STUDENT UNION
  - Gdansk University of Technology
- PhD Student Union, Gdansk University

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