



# Infection Control Research and Innovation at CMFT

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# Solving the Problem

- “ Change in practice
  - . Lab methods
  - . Clinical approach
- “ PCR/Rapid testing
- “ IT capability
- “ Environmental cleaning
- “ Air decontamination
- “ But what works?



# Evidence base?

Many infection control interventions lack good evidence, though common sense tells us they will work.

- ” Hand hygiene - Semmelweiss (1847)
- ” Disinfectant vs detergent (268 studies, only complete 4 matched cohort studies)\*

But does common sense cut it when persuading the Trust to pay for something or asking colleagues to comply?

\* Dettenkofer *et al.*, AJIC 2004.



# What can we do?

- “ It may be difficult to establish the evidence base (or at least a good one).
  - . Ethics
  - . Need to get fast results (targets)
  - . Implementing multiple interventions
- “ Think before changing things
- “ Question the evidence behind new interventions - can you generate it?
- “ Look at the data you already have



# What are we doing?

- “ In-situ trial of a novel disinfectant.
- “ Lab trial of a rapid MRSA detection method.
- “ New techniques for *C. difficile* diagnosis.
- “ Other early-stage (research) activities



# Disinfectants

- “ Current guidance recommends the use of 1,000ppm hypochlorite for cleaning areas with MRSA or CDT +ve patients.
- “ Also used in some areas routinely.
- “ But:
  - . degrades the environment
  - . is potentially hazardous.

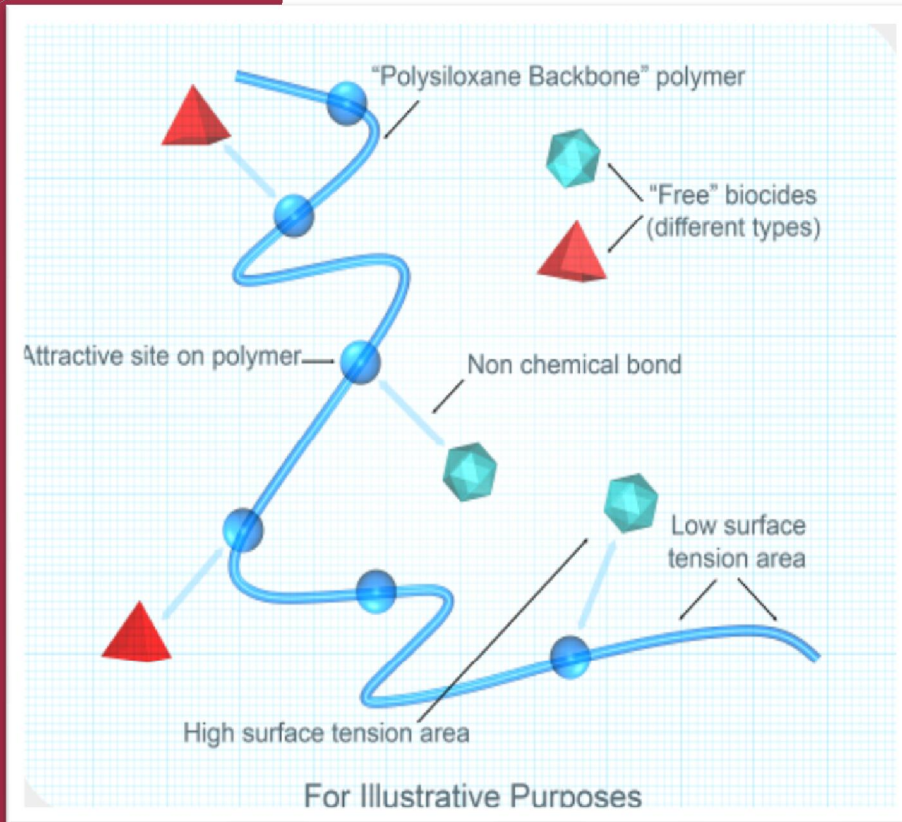


# AzoMaxActivei

- “ New range of disinfectant products containing Byotrolii technology.
- “ Contains disinfectants associated with a polymer.
- “ Polymer adheres to surfaces, thus producing a long lasting effect.
- “ Already used in the food industry and approved as skin sanitizer.



# Byotrol<sub>q</sub> technology



- “ Polymer backbone
- “ Associated biocides
- “ No new chemistry
- “ Orientation+amplifies efficacy
- “ Structure increases durability
- “ Structure creates beneficial nano-physical environment



# Residual activity

“ Byotrol can be seen using AFM and other techniques

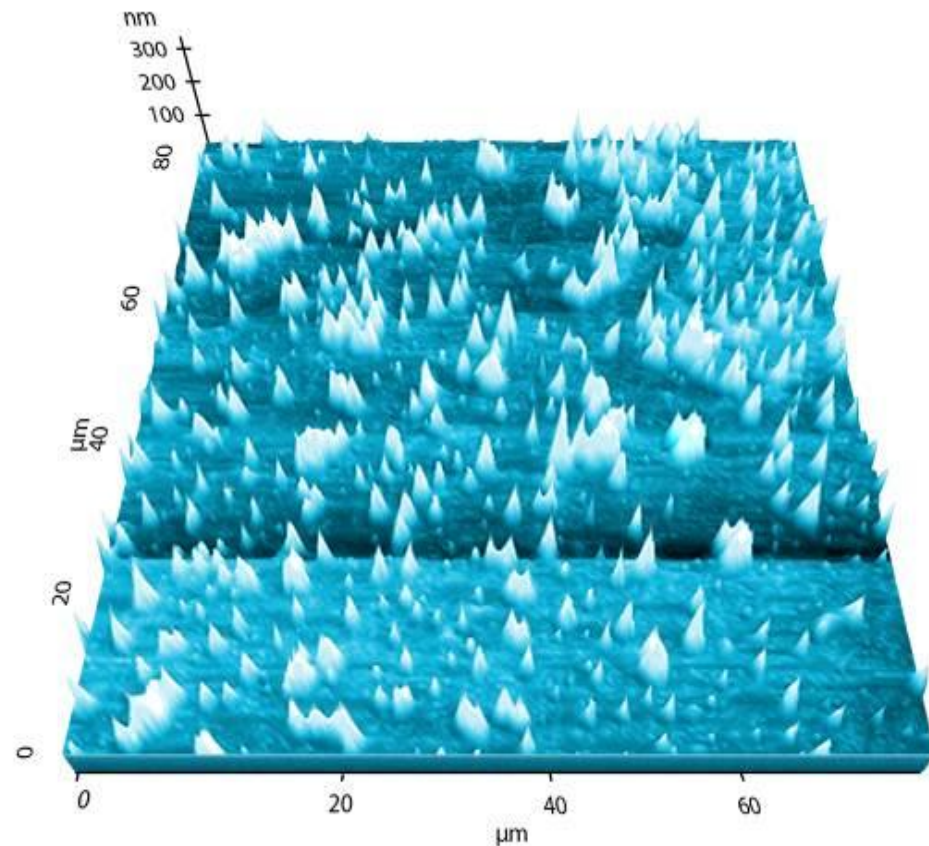


Image taken at OMIC (University of Manchester) on Glass 2006



# Byotrol on fruits

Control after 5 days



Best Current products and Byotrol  
after 7 days

Terminator  
0.8ml/l

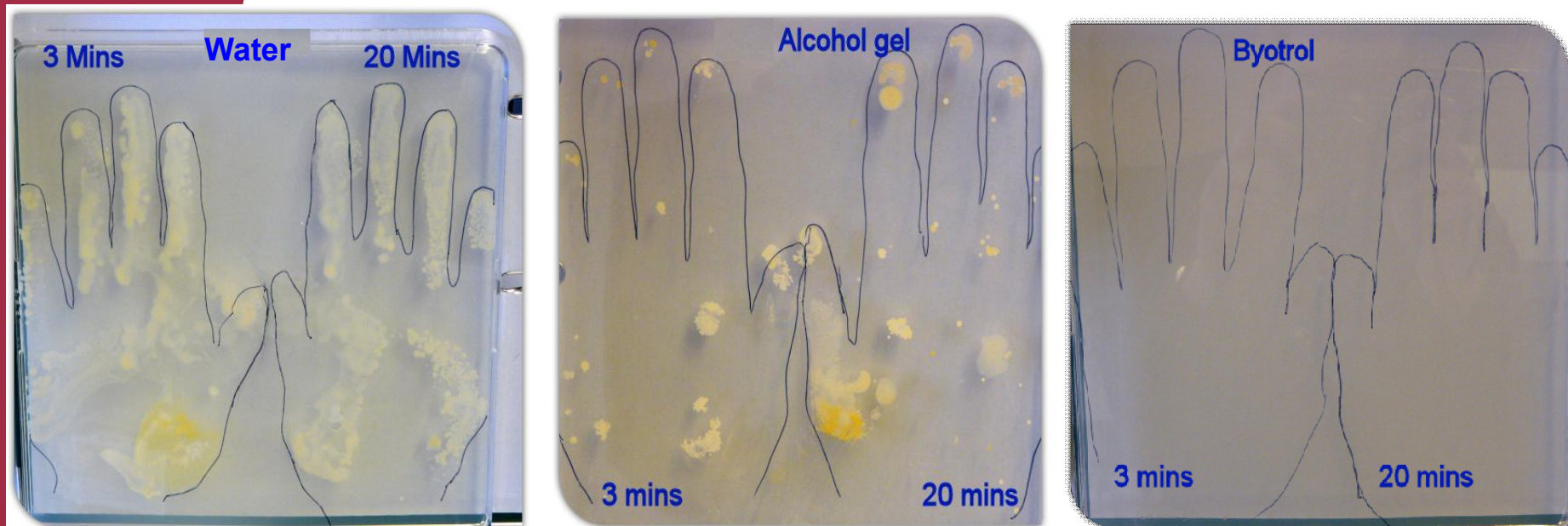
Agribac  
1%

Byotrol  
0.5%



# Byotrol on Skin

In testing Byotrol significantly outperforms conventional hand sanitising products which make 99.9% claims.



*Hands seeded with E.coli then cleaned with water, current technology and Byotrol Mousse after 3 minutes and 20 minutes.*



# The Trial

“ 4 wards used  
AzoMaxActive  
or Hypochlorite  
for 30 + 17  
weeks.

“ 40 swabs per  
ward per week.

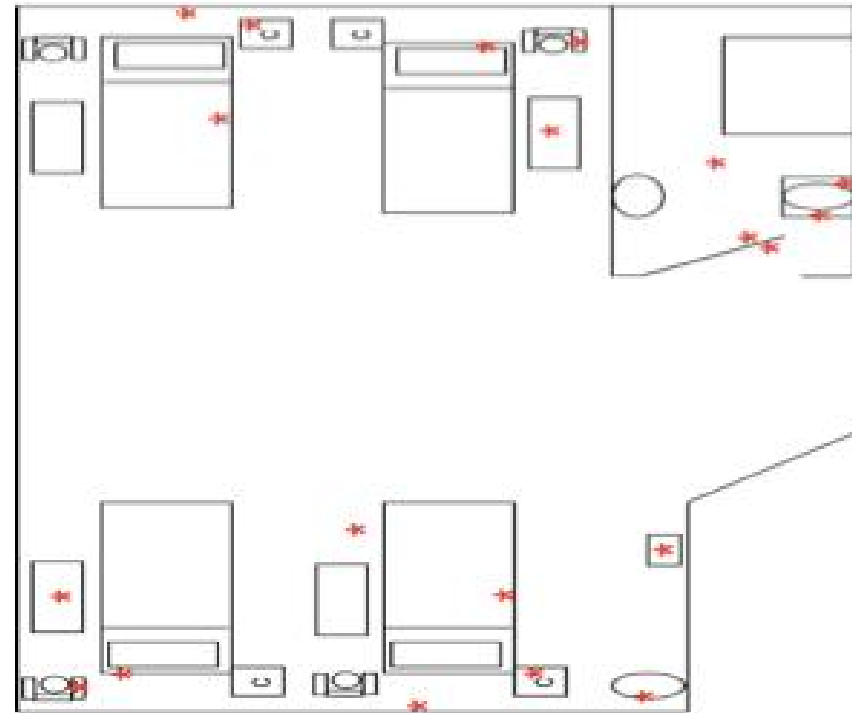


Figure 1. Schematic representation of 4-bedded bay sampled in study. Asterisks mark sites sampled

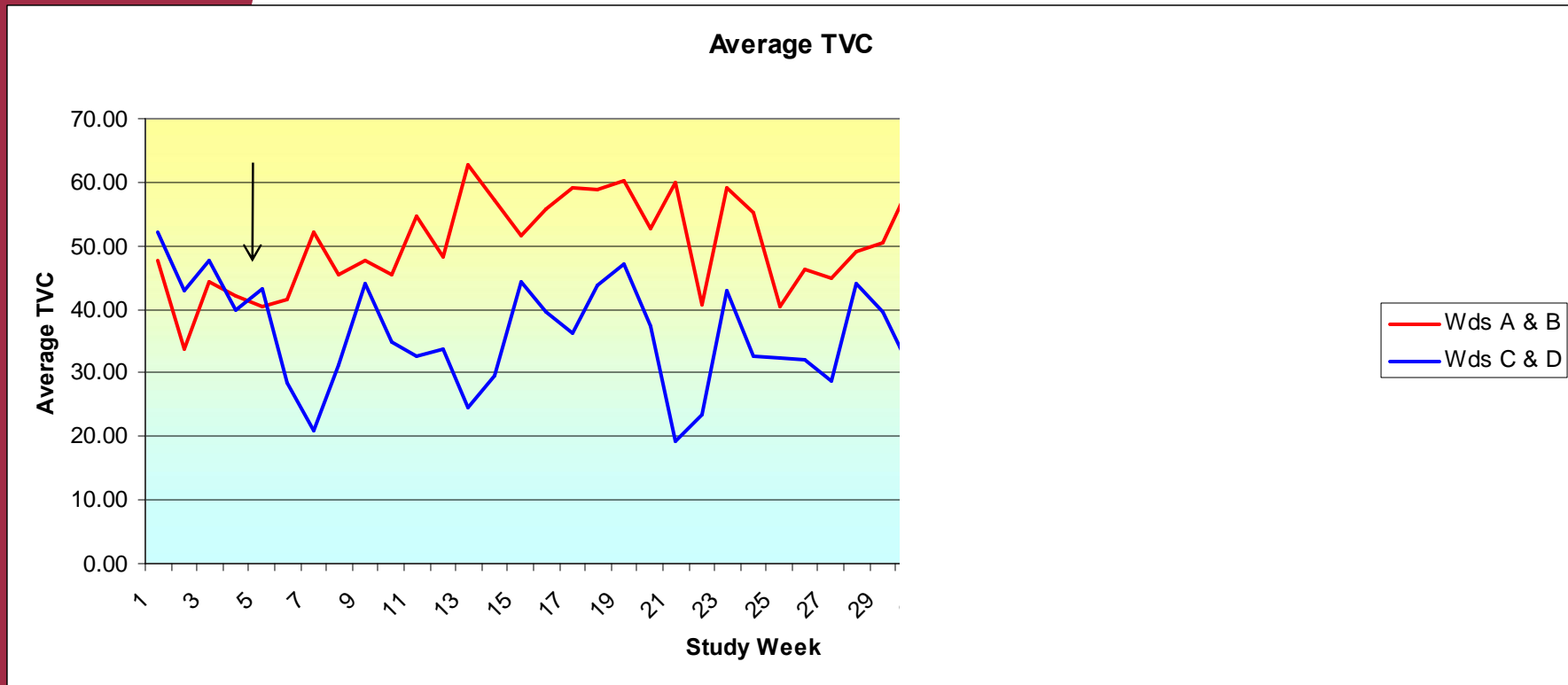


# The Trial

- “ Tested for:
  - “ Bacteria (total viable count, TVC)
  - “ MRSA
  - “ *C. difficile*
- “ Numbers of MRSA positive and CDT positive patients recorded.

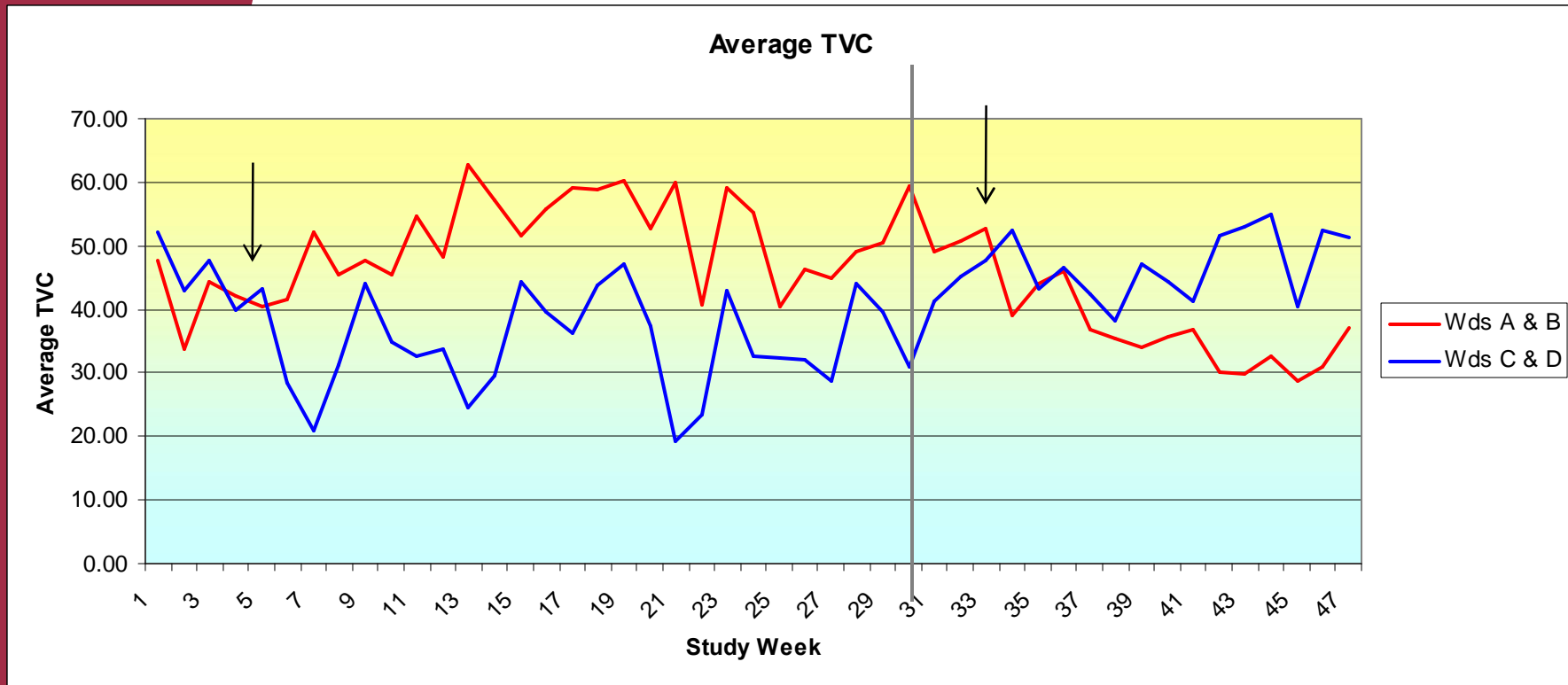


# Pre-cross over



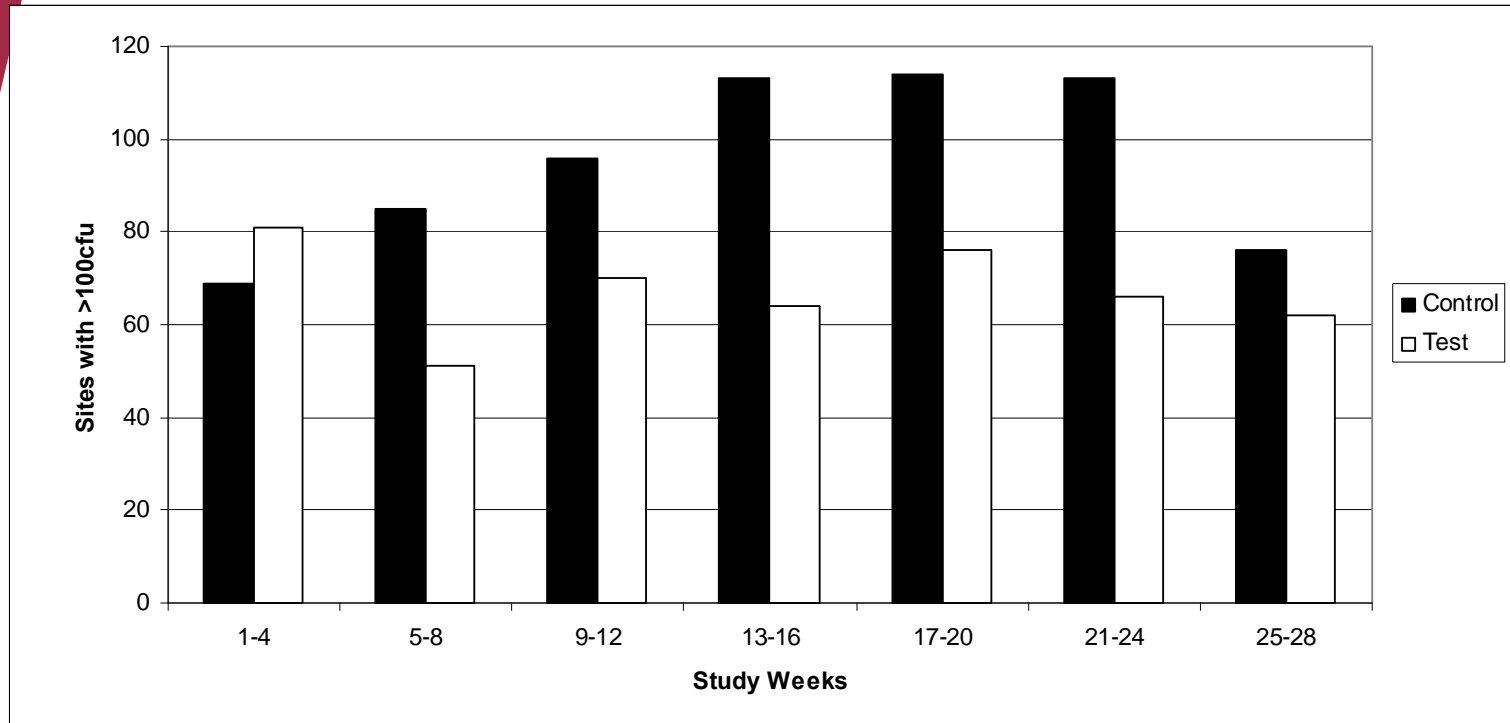


# Post-cross over





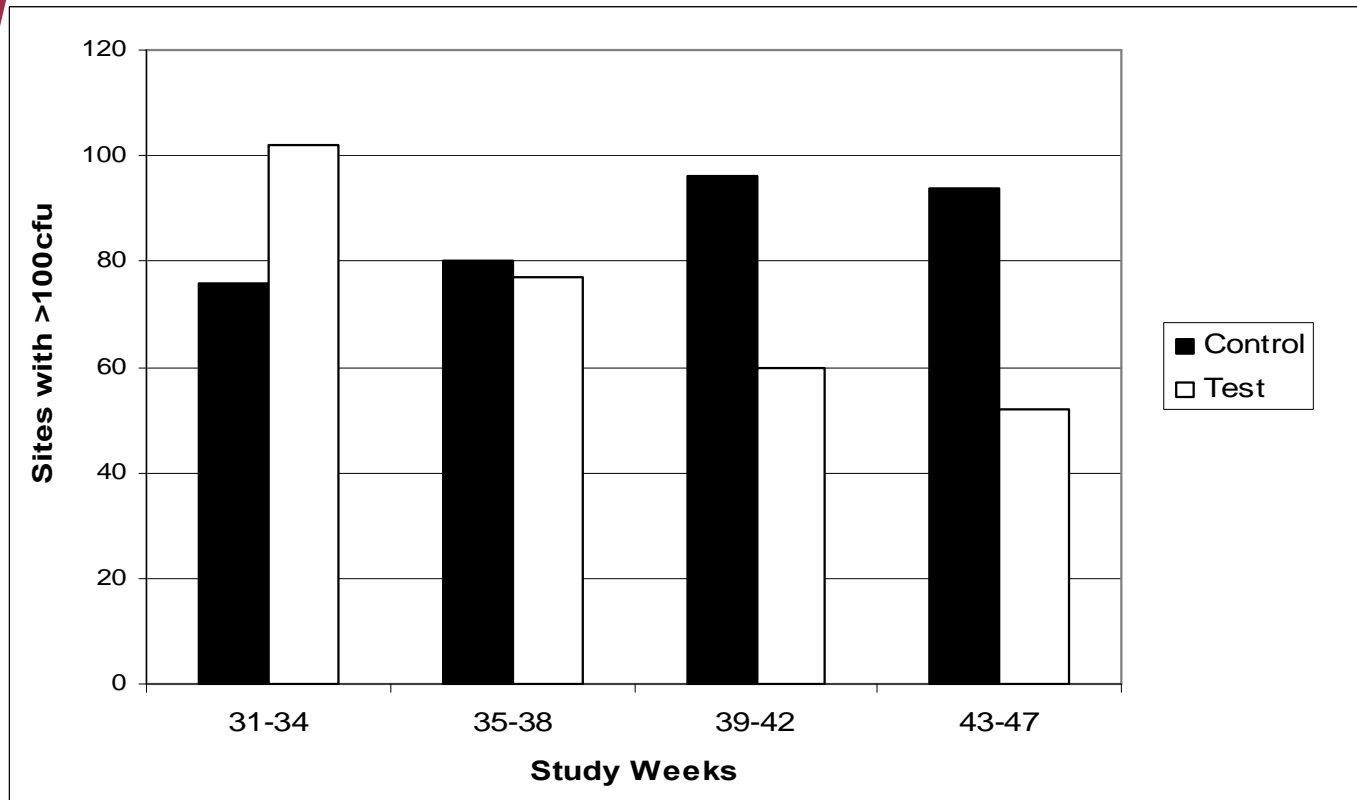
# TVC counts ( $>100$ cfu)



Pre-cross over



# TVC counts (>100 cfu)



Post-cross over



# Overall efficacy

<b>Sites &gt;10 cfu</b>	<b>Total for weeks</b>		
	<b>1 to 30</b>	<b>31 to 47</b>	<b>1 to 47</b>
<b>Test</b>	1396	805	2201
<b>Control</b>	1823	980	2803

<b>Sites &gt;100 cfu</b>	<b>Total for weeks</b>		
	<b>1 to 30</b>	<b>31 to 47*</b>	<b>1 to 47</b>
<b>Test</b>	503	311	814
<b>Control</b>	731	378	1109

All  $p < 0.001$ , except \* $p < 0.01$



# MRSA & *C. difficile*

<b>Total MRSA</b>	<b>Total for weeks</b>		
	<b>1 to 30</b>	<b>31 to 47*</b>	<b>1 to 47**</b>
<b>Test</b>	46	24	70
<b>Control</b>	61	43	104

\* $p < 0.05$ , \*\* $p < 0.01$

<b><i>C. difficile</i></b>	<b>Total for weeks</b>		
	<b>1 to 30</b>	<b>31 to 47</b>	<b>1 to 47</b>
<b>Test</b>	12	1	13
<b>Control</b>	8	5	13



# Clinical Data

	Weeks 1-30		Weeks 31-44	
	Test	Control	Test	Control
MRSA	10	11	3	3
MRSA Acc	1	2	1	0
CDT +ve	9	10	2	5

All not significant




# AzoMaxActive<sup>®</sup>

- “ In use trial demonstrated a significant reduction in TVC.
- “ AzoMaxActive out-performed chlorine releasing agents.
- “ Residual activity lasted approx. four weeks.
- “ Reductions in MRSA and CDT positive patients were not significant (limit of study size?)



# Research and Innovation

- “ The success in reducing HCAI at CMFT has enabled us to position ourselves as a place for testing new technologies.
- “ Can new technologies make things even better?
- “ Most of our success to date is a result of the hard work of our staff



Thanks to everyone  
who has made these  
trials possible by  
their hard work and  
enthusiasm!