

## INTRODUCTION

Ireland has the highest rate of invasive vancomycin-resistant enterococci (VRE) in Europe at 42% (EARS-Net). Policies that include active surveillance screening and patient isolation in Beaumont Hospital, Dublin, aim to limit transmission especially in the intensive care unit (ICU). However, the contribution of the near-patient environment to transmission is poorly understood

## AIMS

- To identify potential reservoirs of VRE in an ICU
- To investigate the clinical and molecular epidemiology of VRE outside of outbreaks in the ICU
- to assess the role of active surveillance of VRE in this setting.

## METHODS

➤ The study setting was the 12-bedded general ICU of Beaumont Hospital Dublin. Beds 1-6 are in an open plan area, beds 7-10 are in isolation rooms and beds 11 and 12 are in negative pressure isolation rooms.

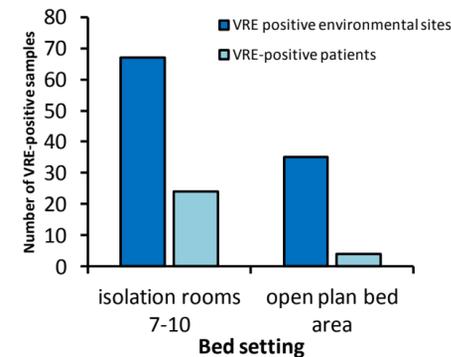
➤ During seven sampling periods, VRE recovery from the near-patient environment and from patients in the ICU was investigated (irrespective of their VRE status).

➤ Swabs (Copan eSwabs) were transferred into 2 ml of brain heart infusion (BHI) broth for enrichment and incubated overnight (16-18h).

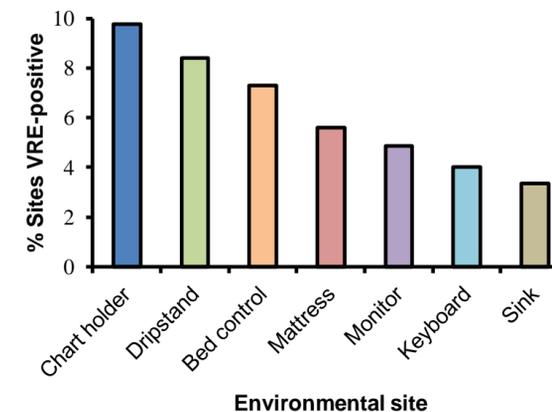
➤ Presumptive identification of enterococci was made using Brilliance UTI clarity agar. VRE was isolated using VRE Select agar (Biorad) and confirmed using MALDI-TOF.

## RESULTS

**Figure 1 VRE recovery in isolation rooms and open plan areas of ICU**



**Figure 2 High-touch environmental sites positive for VRE**



**Table 1. Recovery of VRE from patients and their bed-space environment in the ICU**

Sampling period	Sampling occasions n	VRE (any specimen) n (%)	Patient VRE+ Environmental VRE - n (%)	Patient VRE- Environmental VRE+ n (%)	Patient VRE+ Environmental VRE + n (%)
Oct-Nov 2012	50	18(36.0)	5 (10.0)	9 (18.0)	4 (8.0)
Jan-Feb 2013	47	24 (51.0)	8 (17.0)	10 (21.3)	6 (12.7)
Jun-Jul 2013	37	15 (40.5)	7 (18.9)	4 (10.8)	4 (10.8)
Jan-Feb 2013	57	18 (31.6)	9 (15.7)	5 (8.8)	4 (7.0)
Oct-Nov 2013	29	17 (58.6)	4 (13.7)	2 (6.9)	11 (37.9)
Mar-Apr 2014	38	13 (34.2)	8 (21.1)	4 (10.6)	1 (2.6)
May-Jun 2014	31	09 (29.0)	3 (9.7)	2 (6.5)	4 (12.9)
<b>Total</b>	<b>289</b>	<b>114 (39.4)</b>	<b>44 (15.2)</b>	<b>36 (12.4)</b>	<b>34 (11.7)</b>

➤ Of 157 patients sampled in the ICU, 30 (19 %) were colonised with VRE. Of 1647 swabs taken from the environment of 157 patients in the ICU, 107 sites (6.5%) were positive for VRE.

➤ Significantly more VRE were recovered from the environment in single rooms where the majority of VRE positive patients were located (beds 7-10), compared to the environment of the open plan area (Figure 1)

➤ High touch ICU sites most frequently contaminated with VRE were; the drip stand, bed control panel, and chart holders, together accounting for 61% of contaminated sites (Figure 2).

➤ There was a total of 289 sampling occasions (sampling of a specific bed space on a single day) involving 157 ICU patients. On 114/289 (39.4 %) of sampling occasions, VRE was recovered from the patient bed space, the patient clinical sample, or both (Table 1).

## CONCLUSIONS

The greater proportion of environmental VRE are detected in isolation rooms where VRE-positive patients are most often accommodated.

High touch sites close to patients are a potential reservoir for VRE that may further facilitate its transmission

Even outside of outbreaks, near-patient ICU environmental contamination with VRE is common. Better infection control policies that limit environment transmission of VRE in the ICU are necessary.

## ACKNOWLEDGEMENTS

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