NOVEL APPROACHES TO UNLABEL VRE-SUSPECTED PATIENTS

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Introduction

During a large vancomycin resistant *Enterococcus faecium* (VRE) outbreak in The Netherlands thousands of patients with possible exposure were labelled with a **VRE-suspected** flag. This flag can be removed – *unlabelling* – after cultures appear negative. However, culturing many patients is not cost-effective.

We investigated two additional, non-culture based approaches to remove VRE-suspected flags:

1. Is there a typical duration of VRE carriage, and can we use that to unlabel patients after a certain time?
2. Can a low contemporary VRE incidence on wards be used to unlabel patients as they experienced minimal exposure – based on culturing information of contemporary residents?

Material and Methods

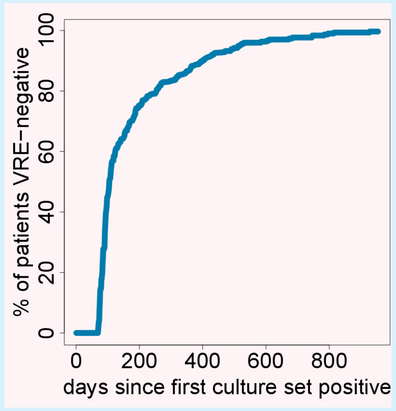
VRE testing: Rectal swabs, obtained during the outbreak and follow-up period, were cultured using an enrichment broth with 16mg/l amoxicillin. Then, a chromogenic agar was incubated for 48 hours and suspect colonies were inoculated on a blood agar plate, and characterised with MALDI-TOF and a vancomycin Etest if *Enterococcus faecium* was detected.

VRE status: A patient was considered **VRE-positive** if VRE was detected in at least one culture. A patient was considered **VRE-negative** if a set of at least five cultures within a period of 10 days were all negative, and there were no future samples available or tested positive.

Carriage duration for unlabelling

To estimate the duration of carriage, we selected **VRE-positive** patients without presumed ongoing exposure. We then established their VRE status based on available culturing results at various time points. Using a survival-type analysis of the obtained 432 data points, we see that:

- After 1 year, 12% of patients were still positive.
- After 2 years, 2.3% of patients were still positive.



Especially the early part of the survival analysis curve depends on our current follow-up scheme and may change when the (early) follow-up frequency is increased.

Exposure risk based unlabelling

To assess the likelihood that individuals labelled as **VRE-suspected** were indeed **VRE-positive**, we used VRE test results from contemporary exposed patients in the same ward.

For every at-risk ward in which *patient X* stayed, we identify contemporary patients in the same ward in the period from 7 days before until 7 days after the stay of *patient X*.

The label of a *patient X* was removed if, for each ward *patient X* stayed in:

- At least 25 contemporary patients were tested, and
- If ≥ 25 patients were tested, ≤2% was **VRE-positive**.

With this strategy, we were able to unlabel 4% of labelled patients. Other criteria are possible, for example a minimum of 10 tested patients and ≤5% VRE positive tests would unlabel 13% of individuals.

UNLABEL?	% OF PATIENTS VRE-POSITIVE					NUMBER OF PATIENTS TESTED				
	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5
keep label	14,20	10,71	13,11			169	28	61		
keep label	6,52	0,00	0,00	0,00		46	15	23	15	
keep label	3,70	3,45	4,23		4,41	54	29	71	0	68
unlabel	0,00					29				
keep label	6,25	1,59	0,00	0,00	0,00	16	63	51	22	42
keep label	0,00	1,89	2,04			24	53	49		
unlabel	0,00	1,79	1,85			49	56	54		
keep label	21,82	16,94	16,83			55	124	101		
keep label	2,44	0,00				41	56			
keep label	15,00	8,00	4,55	3,64		20	25	66	55	
keep label	2,56					39				
keep label	0,00	22,22	9,23	22,22	16,15	7	72	65	18	161

Example: assessing the label of 12 individuals. *Left)* The percentage of contemporary individuals tested VRE-positive. *Right)* The number of contemporary individuals tested.

Conclusions

→ The duration of carriage is over a year for 12% of **VRE-positive** individuals without ongoing exposure. Thus, unlabelling patients solely because a certain time passed may require an unacceptably long period.

→ We can use the VRE incidence on a ward to assess the risk of VRE exposure, and unlabel patients.

→ Thresholds for minimum allowed incidence can be adjusted, based on preferred definitions of low-risk.

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