

Real-time surveillance of Carbapenem-resistant Enterobacteriaceae (CRE) using live microbiology culture data in a North - West London Hospital Trust, 2014 - 2015

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1. Introduction

- CRE is an emerging issue worldwide¹.
- CRE outbreaks are on the rise across England, with the North West and London identified as high-risk areas.
- Real-time surveillance using microbiology culture data is useful to assist with timely flagging of potential clusters of carbapenemase producing isolates.
- Sentinel surveillance of CRE in real-time could be useful for identifying and tracking outbreaks.

2. Methods

- We began detailed surveillance of CRE using live microbiology culture data in May 2014.
- All cases of CRE were collected in a centralised database, accessible to Trust microbiologists, infection control doctors, nurses and pharmacists.
- Information on the type of isolate, molecular mechanism underpinning carbapenemase activity and culture collection date were among key variables collected.

Figure 1: CRE carbapenemase breakdown

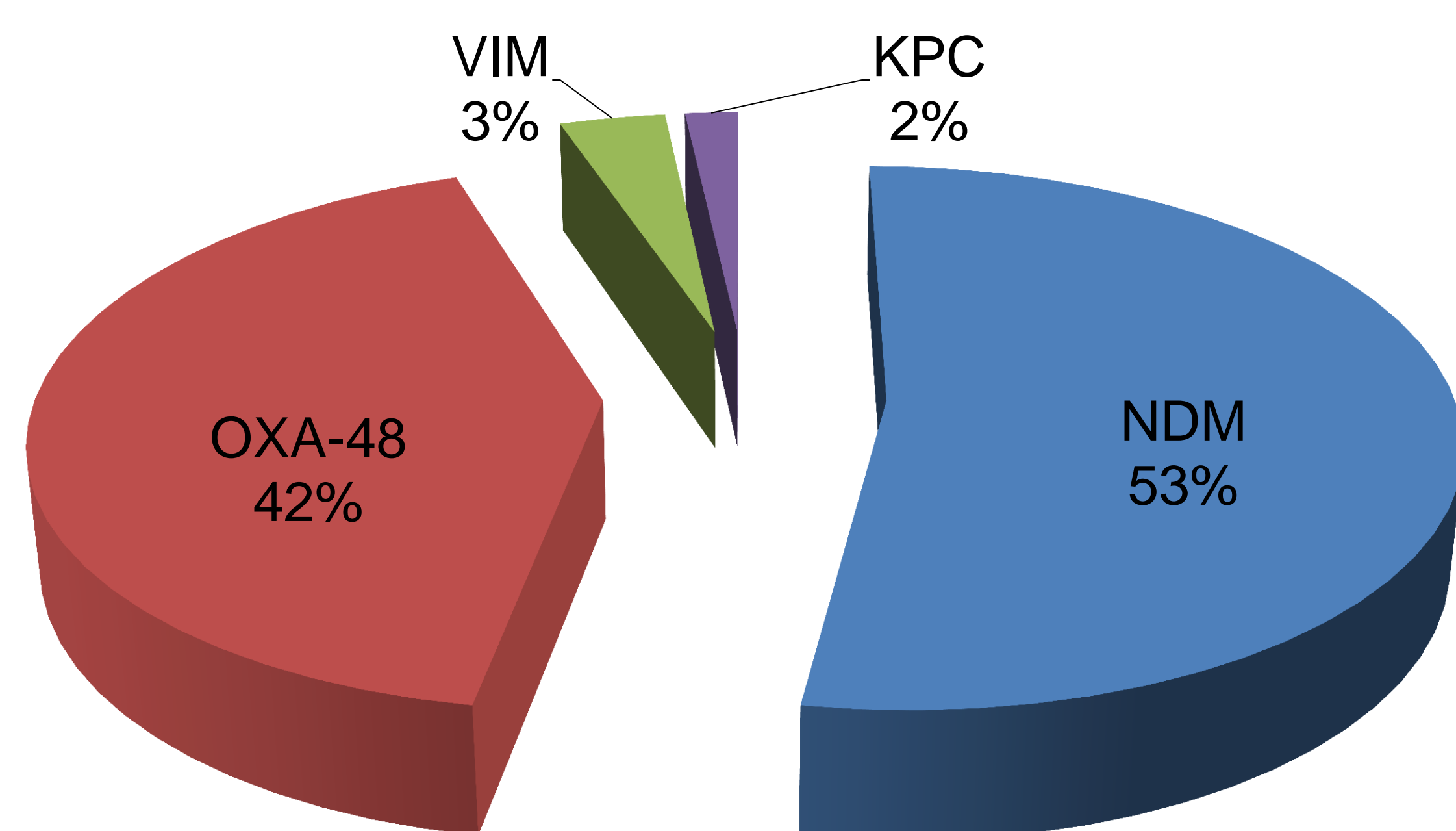


Figure 2: CRE organism breakdown

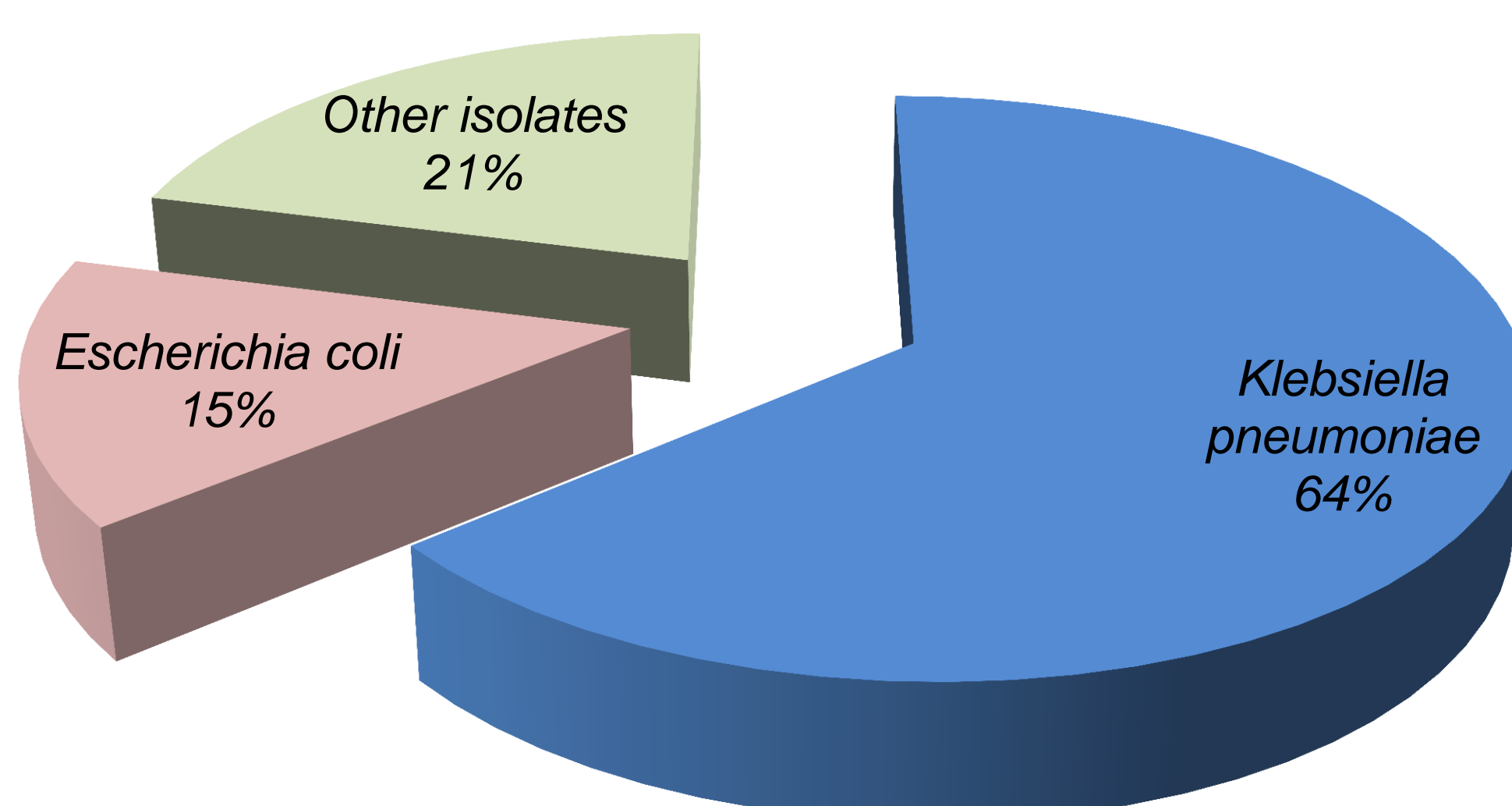
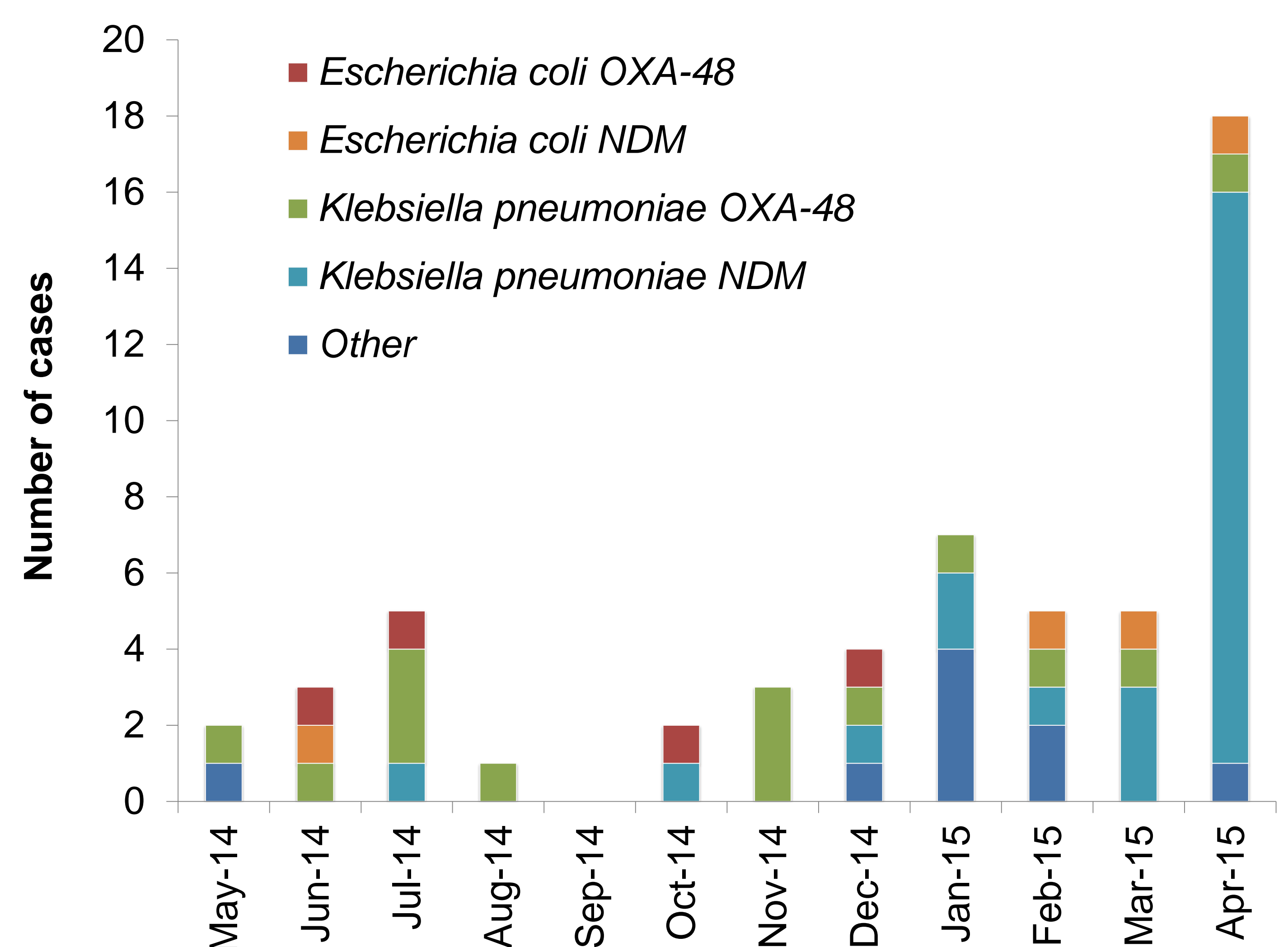


Figure 3: CRE epidemiology curve



3. Results

- We identified 55 CRE from 35 patients from May '14 to Apr '15.
- Cases were characterised by diversity in terms of organism: 64% *Klebsiella pneumoniae*, 15% *Escherichia coli* (Figure 1); carbapenemase gene, 53% NDM, 42% OXA-48, 3% VIM and 2% KPC (Figure 2); and sample type, 36% from screening samples, 60% from clinical samples.
- A cluster of 29 NDM producing *Klebsiella pneumoniae* isolates was identified in the latter months of the study, in early 2015 (Figure 3).

4. Discussion

- Real-time surveillance of CRE using microbiology culture data enabled the timely identification of a common clone, NDM *Klebsiella pneumoniae*, among a background of clonal and carbapenemase diversity.
- The emergence of a predominant local clone matches the epidemiology of *K. pneumoniae* CRE in the North-West of England, albeit a different carbapenemase (NDM vs. KPC).
- As a result, the Trust has implemented risk factor based admission screening Trust wide.

References

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2. Walsh TR. Emerging carbapenemases: a global perspective. Int J Antimicrob Agents 2010; 36 Suppl 3: S8-14.