



INTRODUCTION



Shiga toxin producing *Escherichia coli* (STEC) is a zoonotic gastrointestinal pathogen



Symptoms range from diarrhoea and vomiting to Haemolytic Uraemic Syndrome (HUS), a leading cause of renal failure



Person-to-person spread of STEC in childcare settings is well documented



In England, children ≤5 years with STEC are required to stay away from childcare settings until they have two consecutive negative faecal specimens



The time required away from childcare can be lengthy if carriage is prolonged which disrupts families, causes loss of earnings and impacts the child's education



Epidemiology of detected STEC has changed since the last study reviewing clearance in England¹, with an increase in non-O157 STEC serotypes. Changing dominant serotypes may alter the time required away from childcare under current policies

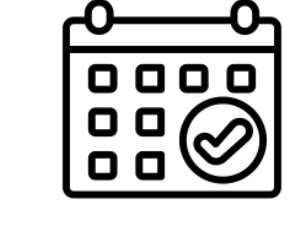
Aim: Review time to clearance by STEC serotype to guide health protection teams in advising parents/carers on potential time required away from childcare setting

METHODS



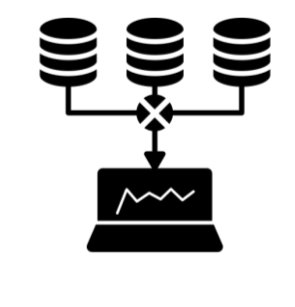
Study population

Laboratory confirmed STEC cases aged ≤5 years, residing in England AND attending childcare facilities



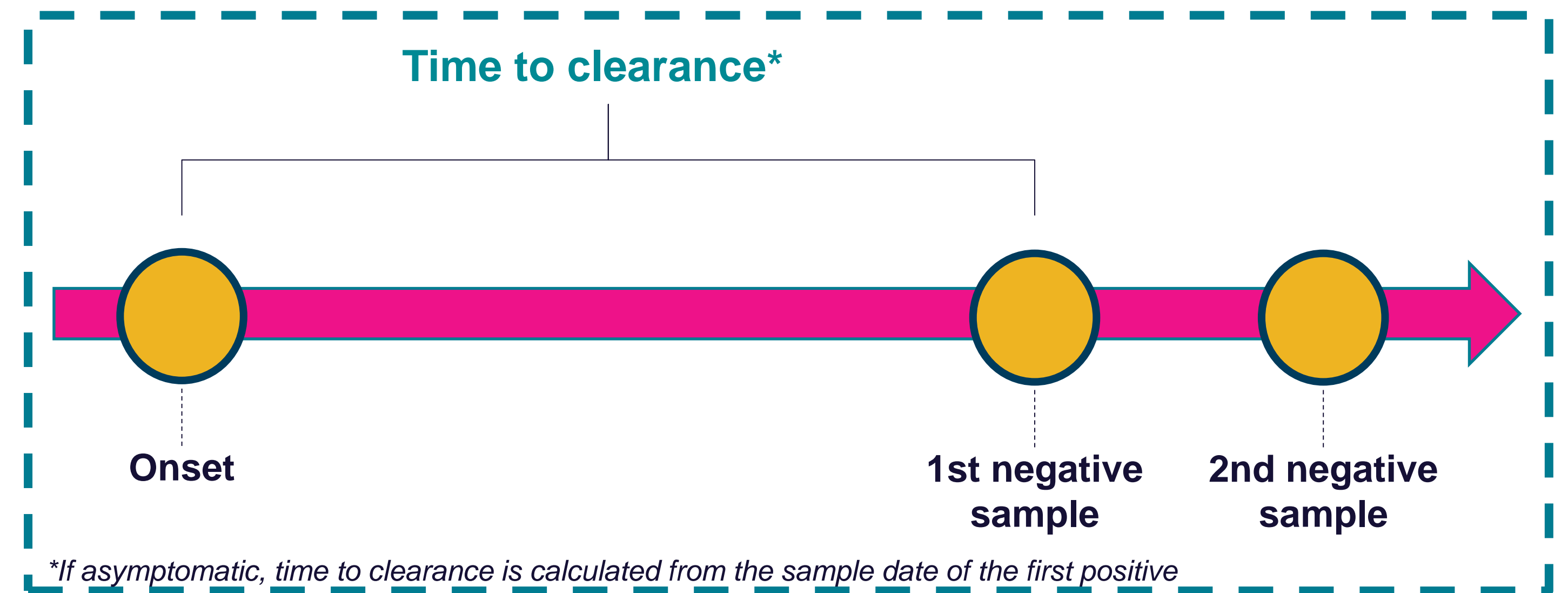
Time period

Onset or sample date between 31/03/18 – 31/03/22



Data sources

- National Enhanced Surveillance System for STEC
- HPZone (public health case management system)



*If asymptomatic, time to clearance is calculated from the sample date of the first positive
Fig 1. Definition of Time to clearance

RESULTS

Study population (n=315)

- Median age: 40 months (interquartile range 26 – 55)
- Females 49% vs Males 51%
- 90% symptomatic at diagnosis; 10% HUS



Fig 2. Percentage of cases by serotype
In the previous study, 98% of cases were STEC O157

Median time to clearance was 32 days (IQR 20-44)

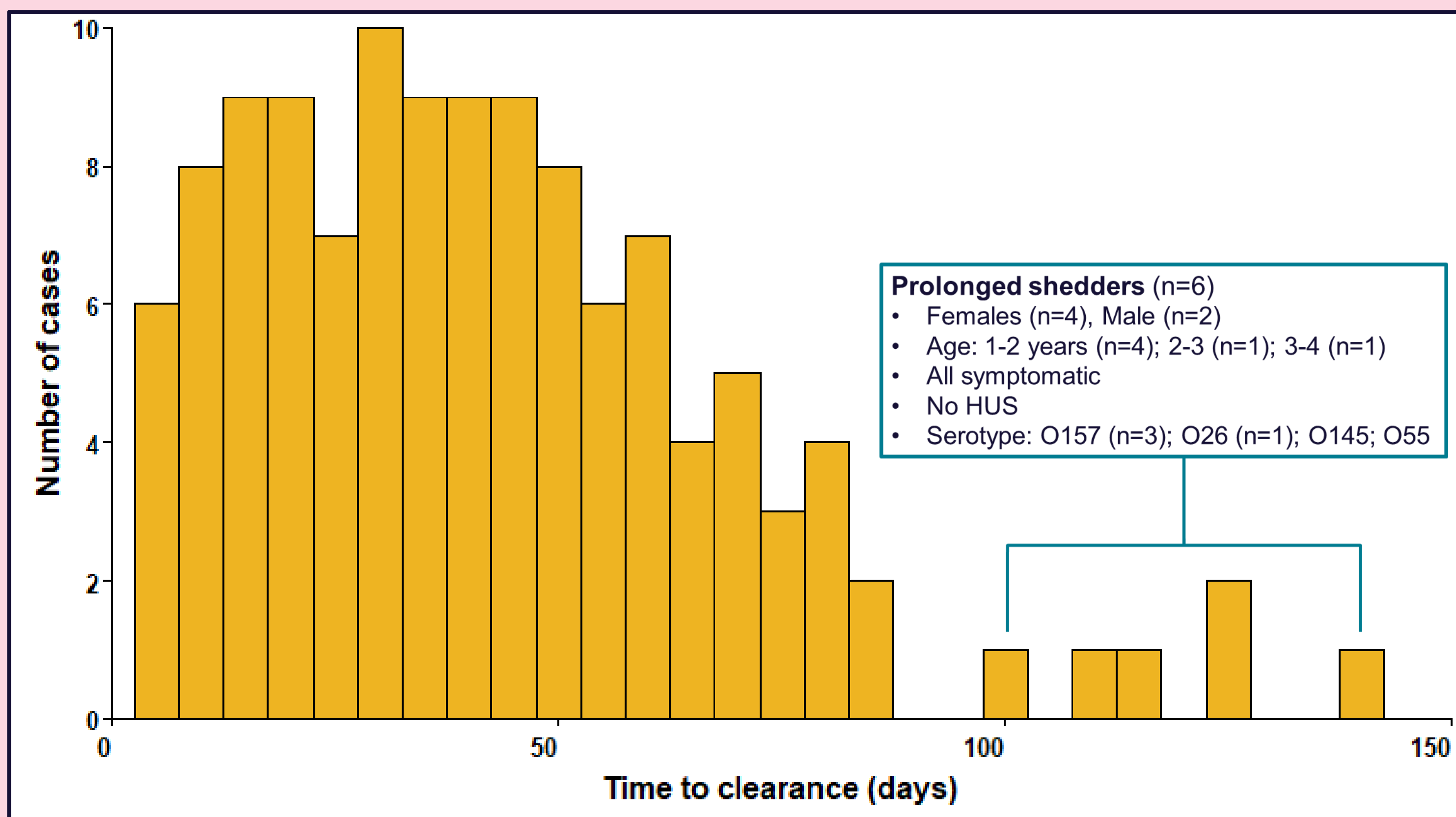


Fig 3. Number of cases by time to clearance in days

- Younger children take longer to clear, 9% drop in time to clearance per year of age
- No significant difference in time to clearance between O157 vs O26 vs Non-O157 & Non-O26
- No significant difference in time to clearance between sex, HUS, antibiotics or anti-diarrhoeals, eae gene or stx profile
- Asymptomatic children cleared infection in a shorter time after first positive (median 18, IQR 8-30) than symptomatic children (median 32, IQR 21 – 47)
- Cases who reported blood in stool had a 17% (95% CI 4-29) decrease in time to clearance, after adjusting for age

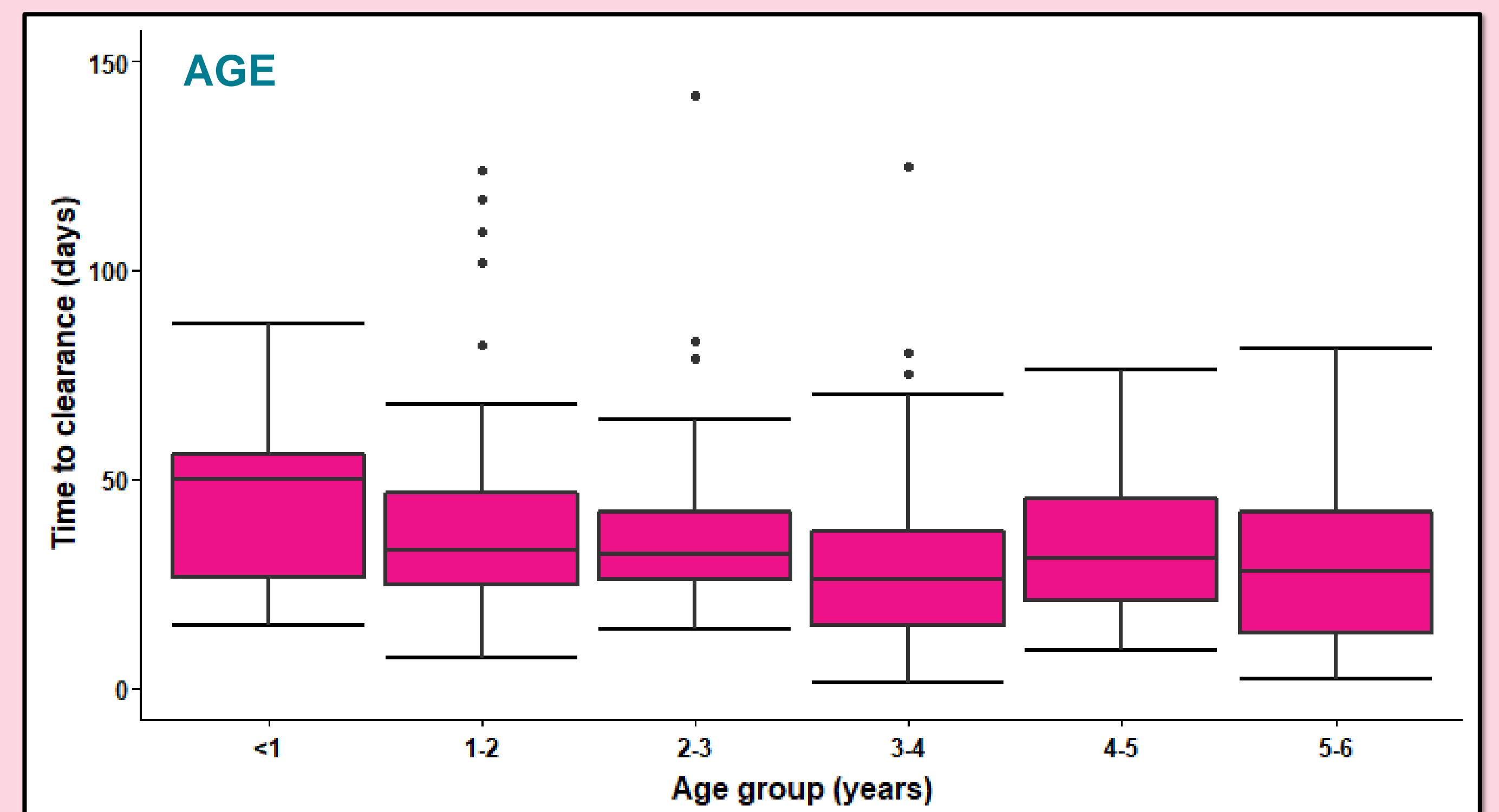


Fig 4. Time to clearance in days by age group

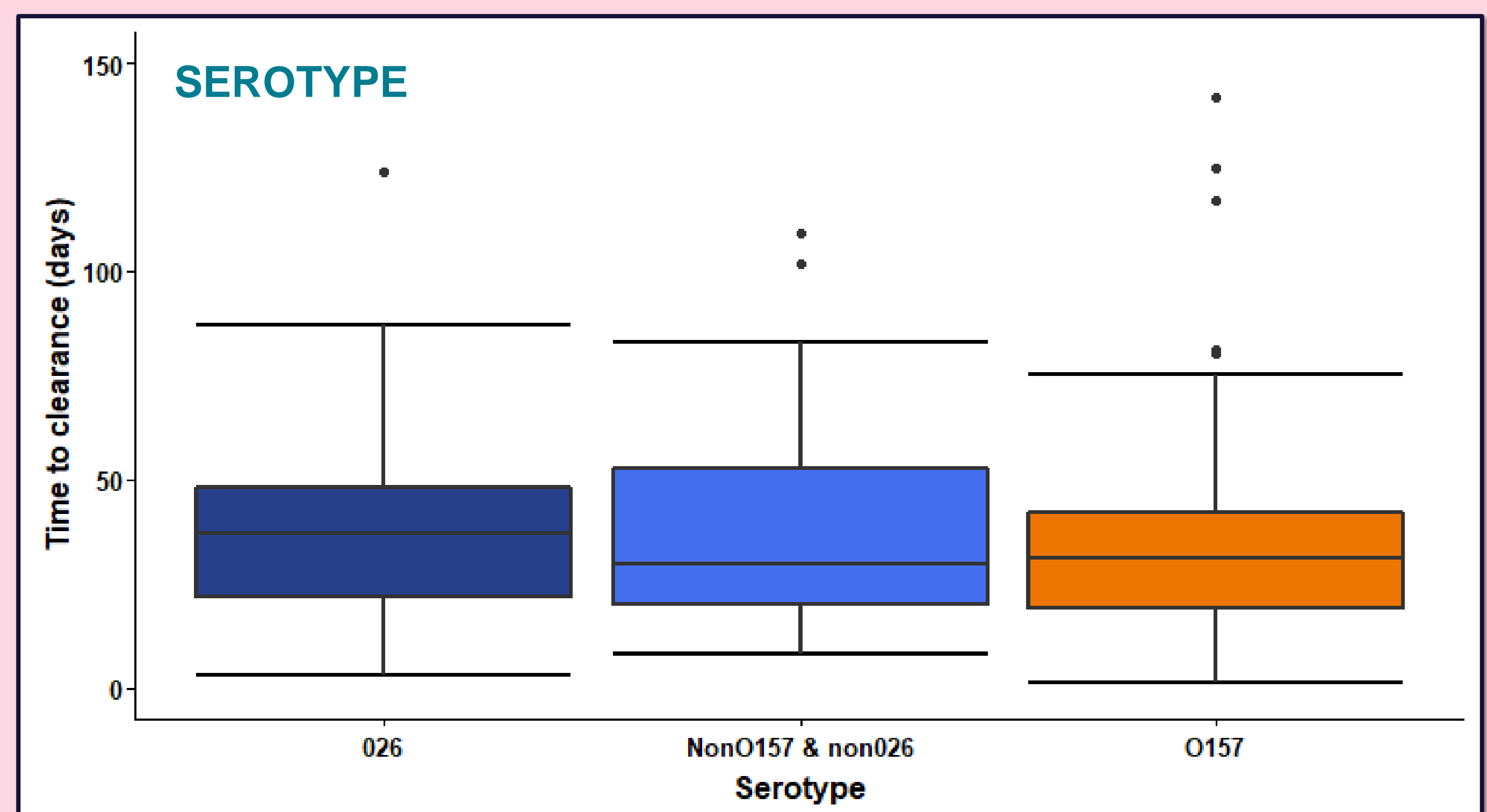


Fig 5. Time to clearance in days by serotype

[Bars: interquartile range (IQR); horizontal line within bar: median; whiskers: 1.5 IQR beyond 25th and 75th percentiles; outliers: >1.5 IQR beyond 25th and 75th percentiles].

LIMITATIONS

- Children with shorter duration and less severe symptoms are less likely to be tested and therefore less likely to be included in our study population, which could impact our time to clearance estimates. This study is thus not an accurate description of the biology of clearance but does allow to predict duration following diagnosis in practice which is important for parents and carers
- The estimates reported depend on frequency of testing which we were unable to capture, as cases may in fact be free of carriage between their last positive and first negative sample

ACKNOWLEDGEMENTS

We would like to acknowledge the following people: Vrinda Lobo (Gastro and Food Safety (One Health) Division), Michael Harte (Gastro and Food Safety (One Health) Division) and the HPTs and EHOs involved in the management of these cases. This study is funded by the National Institute for Health and Care Research (NIHR) Health Protection Research Unit in Gastrointestinal Infections, a partnership between the UK Health Security Agency, the University of Liverpool and the University of Warwick. The views expressed are those of the author(s) and not necessarily those of the NIHR, the UK Health Security Agency or the Department of Health and Social Care.

Reference
1. Dabke, G., et al., Duration of shedding of Verocytotoxin-producing *Escherichia coli* in children and risk of transmission in childcare facilities in England. 2014. 142(2): p. 327-334.

CONCLUSIONS

- Our study provides up to date estimates of STEC clearance time in young children
- The median time to clearance was 32 days, similar to the previous study in England which included cases from 2010-2011 (31 days, IQR 17-41)¹
- It appears serotypes have no impact on time to clearance
- Those who reported blood in stool clear faster than those that didn't, this finding needs to be further explored

These estimates can be used by HPTs to more accurately advise parents/carers on likely time to achieve STEC microbiological clearance, which can help assist in formulating management plans.

NEXT STEPS

Assess how Health Protection Teams deal with cases of prolonged carriage to identify

- Difficulties in implementing exclusion
- How these difficulties are being currently managed
- Factors taken into account when cases are allowed to return to setting prior to clearance