

Clinical and Economic Impact of Point of Care Testing for Influenza in the Emergency Department

INTRODUCTION

- Influenza can cause a wide range of clinical presentations, and contributes to excess winter mortality
- Previous point of care (PoC) tests for influenza lacked sufficient sensitivity or specificity to be clinically effective
- Early and reliable diagnostic testing of influenza has potential to decrease antibiotic use
- Clinical- and cost effectiveness are essential factors in introducing new tests into clinical practice

METHODS

During the 2017/18 winter influenza season, a PoC influenza PCR assay (Cobas Liat influenza A and B; Roche Diagnostics) was introduced in the emergency department (ED). A retrospective cohort study was undertaken to assess the clinical and economic impact of ED influenza POCT

STANDARD CARE (SC)

- Flu swab collected on ward, sent to laboratory for processing
- Cepheid Xpert Xpress Flu/RSV PCR
- 58% of results available same day

1198 Laboratory tests for influenza sent from in-patients Oct 2017 – April 2018

264 positive tests in laboratory (22%)

50 positive cases randomly selected

INTERVENTION (POCT)

- Influenza PoCT performed by ED staff
- Roche Cobas Liat Influenza PCR
- Results available within ~20mins

563 influenza POCTs in the ED Dec 2017 – Feb 2018

192 positive tests at PoC (34%)

50 positive cases randomly selected

Exclusion criteria: aged under 18, admitted for any time to Intensive care unit, paper records not traceable, discharged directly from ED

ED INFLUENZA POC TESTING CRITERIA

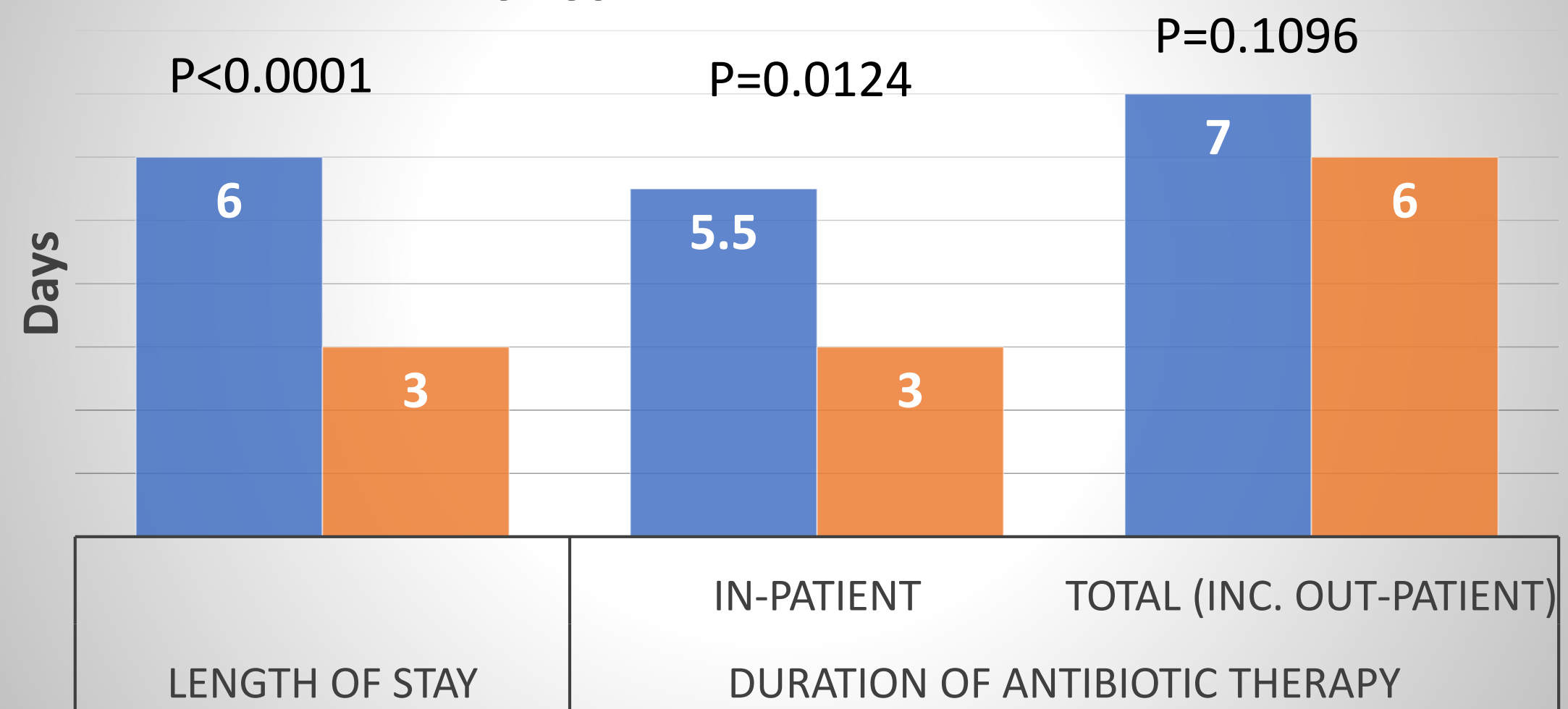
- 1 Any patient with ≥ 2 clinical symptoms and signs of influenza
OR
Any patient with illness compatible with complication of flu
- 2 Patient is likely to be admitted
- 3 Approved by an ED Consultant

RESULTS

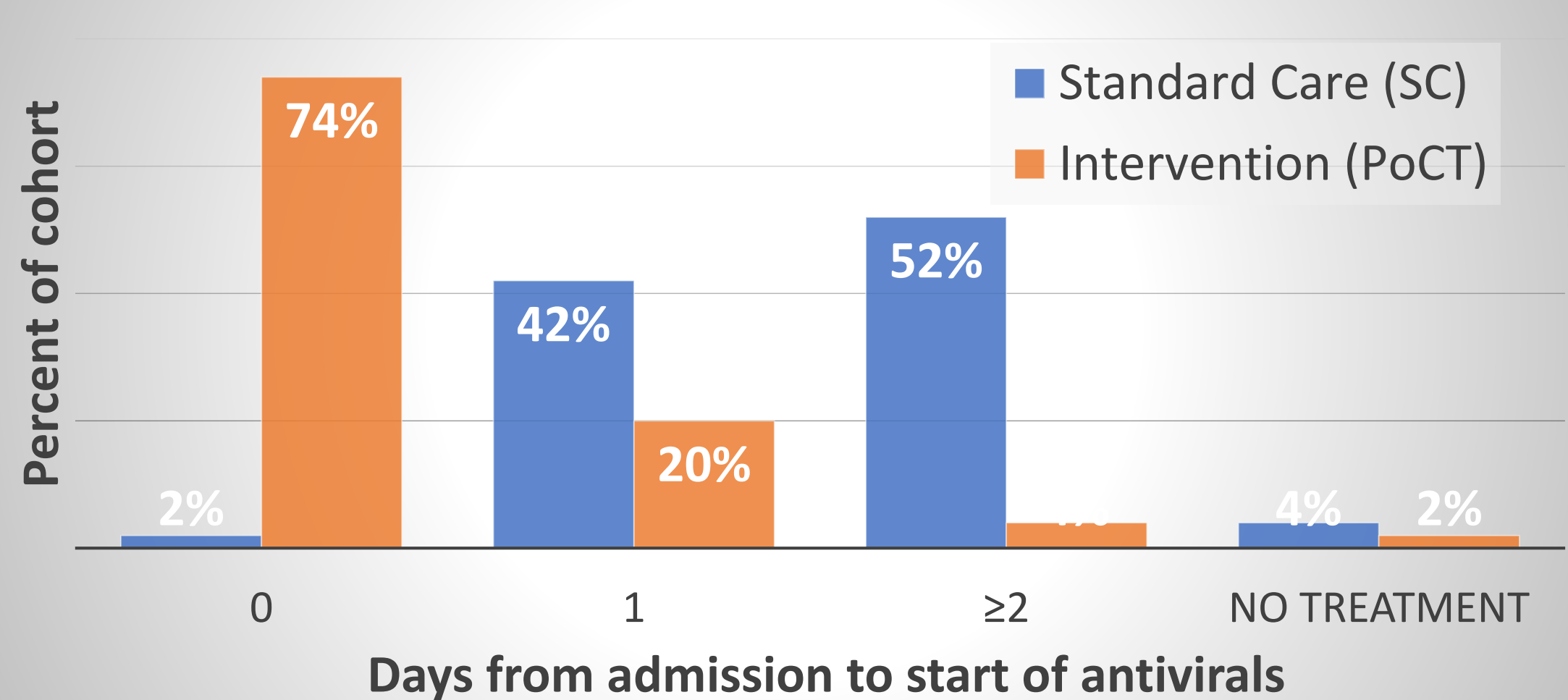
Data from the SC and PoCT groups was pooled and analysed. Medians are reported as the data is not normally distributed and exhibits a positive skew. Mann Whitney U Test was used to measure significance.

- **50% reduction in hospital length of stay: 6d (SC) vs. 3d (PoCT)**
- 86% of patients in both SC and PoCT cohorts received antibiotics however,
 - **Duration of antibiotic therapy: 7d (SC) vs. 6d (PoCT)**
 - **54% of patients in (SC) had ≥ 3 antibiotics prescribed vs. 30% (PoCT)**
- **Significant reduction in median time (from admission) to administration of time-critical antiviral treatment:**
 - **44% (SC) vs. 94% (POCT) received antiviral within 0-1d**
- **Saving of £200 per patient tested, in a health economics model comparing cohorts of 1000 and 20% positivity rate**

Median length of stay and antibiotic therapy by type of influenza test



Admission to antiviral treatment



CONCLUSIONS

PoC diagnosis of influenza in ED was associated with:

- Statistically significant shorter length of stay
- Earlier anti-viral treatment
- Reduction in antibiotic use, including number of agents used
- Significant cost savings

ED influenza PoCT has clinical and economic benefits.

1 – Foundation Doctors, rotating through Emergency Department, Royal Berkshire Hospital, and Public Health Services for Berkshire; primary data collection and analysis

2 – Consultant in Public Health, Public Health Services for Berkshire; contributed to study design

3 – Academic Health Sciences Network Oxford, enabled intervention and performed health economics evaluation

4 – Consultant Microbiologist, Royal Berkshire Hospital; clinical lead for intervention and for study