Introduction:
The NIHR-funded INHALE Programme aims to improve antimicrobial stewardship by using molecular microbiology diagnostics for HAP/VAP in ICUs. The BioFire FilmArray Pneumonia Panel is deployed at point of care in 12 UK ICUs, with patients randomized to FilmArray-guided management or to standard empiric antimicrobials and laboratory microbiology testing. The FilmArray seeks 34 organism and gene targets, with results in 1.5h; we designed and field-tested an algorithm to guide antimicrobial prescribing based on its findings.

Methods:
The algorithm is based on (i) the organism and resistance gene targets detected, (ii) national resistance prevalence data and (iii) the patient’s allergy status. Narrow-spectrum agents are preferred, and good stewardship encouraged. Microbiologists, ICU pharmacists, and ICU clinicians were consulted and local adaptation allowed.

Results:
When single organisms are found, the algorithm favours, e.g. temocillin vs. Enterobacterales, flucloxacillin vs. MSSA and co-amoxiclav vs. H. influenzae; discontinuation is advised if no organism is found and the patient lacks evidence of infection; broader spectrum agents are favoured for combinations of organisms. Among 10 adult sites, 4 adopted the algorithm unaltered and 2 with minor variation. Concerns were: unwillingness to adopt: (i) temocillin for Enterobacterales; (ii) ceftazidime vs. Pseudomonas; or (iii) cephalosporins for patients with mild β-lactam allergy. Greater variation was needed at 2 paediatric ICUs. There was debate about infection control implications of rapid ICU-based tests.

Conclusion:
The algorithm aims to ensure that rapid microbiology translates to optimised therapy. It was not possible to impose a single algorithm at all ICUs, but core elements and principles were retained. An early audit of RCT results indicates most test-arm treatments are being guided by the algorithm, illustrating the approach’s potential.