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**Title:** Bacterial prevalence and load during COPD exacerbation and recovery

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**Body:** Bacteria are a common aetiological trigger of COPD exacerbations, with prevalence and load increasing from stable state (Garcha et al, Thorax 2011: 66;A11). We investigated prevalence and load of H. influenzae, S. pneumoniae and M. catarrhalis during exacerbation recovery using quantitative PCR (qPCR). We collected sputum from subjects in the London COPD cohort at exacerbation presentation (n=137), day 3 (n=41), 7 (n=53), 14 (n=56) and 35 post-exacerbation (n=35). All exacerbations were treated with  $\geq 7$  days of antibiotics ( $\pm$ oral steroids) and defined by our usual symptomatic criteria (Seemungal et al, AJRCCM, 1998). Characteristics of 102 COPD patients: mean(SD) age 68.7(8.2) years; FEV<sub>1</sub> 1.2(0.5)L, 48.6(24.8)% predicted. Bacterial prevalence was higher at exacerbation than Day 3 (50.4 vs 26.8%; p=0.008), Day 7 (28.3%; p=0.006) and Day 14 (30.4%; p=0.011) (Fig. 1). In recovery samples paired with bacteria-positive exacerbations (different patients at each time point), load [median (IQR) Log<sub>10</sub> CFU/ml] was significantly higher at exacerbation compared with Day 3 (n=15): 10<sup>8.1(5.9-8.7)</sup> vs 10<sup>0(0-4.0)</sup>, p=0.001; Day 7 (n=17): 10<sup>8.2(6.3-8.8)</sup> vs 10<sup>4.2(0-6.6)</sup>, p=0.01; Day 14 (n=14): 10<sup>8.0(6.3-8.7)</sup> vs 10<sup>4.4(0-6.6)</sup>, p=0.022; and Day 35 (n=15): 10<sup>7.7(5.7-9.3)</sup> vs 10<sup>5.9(0-6.74)</sup>, p=0.047. Bacterial prevalence and load detected by qPCR falls within 3 days of antibiotic therapy for COPD exacerbations, with load remaining low for at least 35 days post-onset.