SUPPLEMENTARY MATERIAL

(A) Further inclusion criteria and categorisation of ICD-10 diagnostic codes

Pneumonia**:**

A310 Pulmonary mycobacterial infection
A420 Pulmonary actinomycosis
A481 Legionnaires' disease
B012 Varicella pneumonia
B052 Measles complicated by pneumonia
B250 Cytomegaloviral pneumonitis
B59 Pneumocystosis
J100 Influenza with pneumonia, other influenza virus identified
J110 Influenza with pneumonia, virus not identified
J128 Other viral pneumonia
J129 Viral pneumonia, unspecified
J13 Pneumonia due to Streptococcus pneumoniae
J14 Pneumonia due to Haemophilus influenzae
J150 Pneumonia due to Klebsiella pneumoniae
J151 Pneumonia due to Pseudomonas
J152 Pneumonia due to staphylococcus
J153 Pneumonia due to streptococcus, group B
J154 Pneumonia due to other streptococci
J155 Pneumonia due to Escherichia coli
J156 Pneumonia due to other aerobic Gram-negative bacteria
J157 Pneumonia due to Mycoplasma pneumoniae
J158 Other bacterial pneumonia
J159 Bacterial pneumonia, unspecified
J168 Pneumonia due to other specified infectious organisms
J172 Pneumonia in mycoses
J180 Bronchopneumonia, unspecified
J181 Lobar pneumonia, unspecified
J182 Hypostatic pneumonia, unspecified
J188 Other pneumonia, organism unspecified
J189 Pneumonia, unspecified
J690 Pneumonitis due to food and vomit
J850 Gangrene and necrosis of lung
J851 Abscess of lung with pneumonia

Chronic obstructive pulmonary disease:

J40 Bronchitis, not specified as acute or chronic
J410 Simple chronic bronchitis
J42 Unspecified chronic bronchitis
J431 Panlobular emphysema
J432 Centrilobular emphysema
J438 Other emphysema
J439 Emphysema, unspecified
J441 Chronic obstructive pulmonary disease with acute exacerbation, unspecified
J448 Other specified chronic obstructive pulmonary disease
J449 Chronic obstructive pulmonary disease, unspecified

Other lower respiratory tract infections

J200 Acute bronchitis due to Mycoplasma pneumoniae
J208 Acute bronchitis due to other specified organisms
J209 Acute bronchitis, unspecified
J219 Acute bronchiolitis, unspecified
J22 Unspecified acute lower respiratory infection
J852 Abscess of lung without pneumonia

Nonspecific viral infections:

B349 Viral infection, unspecified

Sepsis:
A021 Salmonella sepsis
A392 Acute meningococcaemia
A394 Meningococcaemia, unspecified
A400 Sepsis due to streptococcus, group A
A401 Sepsis due to streptococcus, group B
A402 Sepsis due to streptococcus, group D
A403 Sepsis due to Streptococcus pneumoniae
A408 Other streptococcal sepsis
A409 Streptococcal sepsis, unspecified
A410 Sepsis due to Staphylococcus aureus
A411 Sepsis due to other specified staphylococcus
A412 Sepsis due to unspecified staphylococcus
A414 Sepsis due to anaerobes
A415 Sepsis due to other Gram-negative organisms
A418 Other specified sepsis
A419 Sepsis, unspecified
R572 Septic shock

Skin/soft tissue infections:
L030 Cellulitis of finger and toe
L031 Cellulitis of other parts of limb
L032 Cellulitis of face
L033 Cellulitis of trunk
L038 Cellulitis of other sites
L039 Cellulitis, unspecified
L088 Other specified local infections of skin and subcutaneous tissue
L089 Local infection of skin and subcutaneous tissue, unspecified
M7112 Other infective bursitis, Upper arm
M725 Necrotizing fasciitis
M7250 Necrotizing fasciitis, Multiple sites
M7251 Necrotizing fasciitis, Shoulder region
M7252 Necrotizing fasciitis, Upper arm
M7253 Necrotizing fasciitis, Forearm
M7255 Necrotizing fasciitis, Pelvic region and thigh
M7256 Necrotizing fasciitis, Lower leg
M7257 Necrotizing fasciitis, Ankle and foot
M7258 Necrotizing fasciitis, Other
M7259 Necrotizing fasciitis, Site unspecified
M726 Necrotizing fasciitis
M7263 Necrotizing fasciitis, Forearm
M7266 Necrotizing fasciitis, Lower leg

Upper respiratory infections:
A370 Whooping cough due to Bordetella pertussis
A379 Whooping cough, unspecified
J00 Acute nasopharyngitis [common cold]
J010 Acute maxillary sinusitis
J011 Acute frontal sinusitis
J013 Acute sphenoidal sinusitis
J018 Other acute sinusitis
J019 Acute sinusitis, unspecified
J020 Streptococcal pharyngitis
J028 Acute pharyngitis due to other specified organisms
J029 Acute pharyngitis, unspecified
J030 Streptococcal tonsillitis
J038 Acute tonsillitis due to other specified organisms
J039 Acute tonsillitis, unspecified

J040 Acute laryngitis
J041 Acute tracheitis
J042 Acute laryngotracheitis
J050 Acute obstructive laryngitis [croup]
J051 Acute epiglottitis
J068 Other acute upper respiratory infections of multiple sites
J069 Acute upper respiratory infection, unspecified
J320 Chronic maxillary sinusitis
J321 Chronic frontal sinusitis
J322 Chronic ethmoidal sinusitis
J323 Chronic sphenoidal sinusitis
J328 Other chronic sinusitis
J329 Chronic sinusitis, unspecified
J36 Peritonsillar abscess
J390 Retropharyngeal and parapharyngeal abscess
J391 Other abscess of pharynx

Lower urinary tract infections:
N300 Acute cystitis
N308 Other cystitis
N309 Cystitis, unspecified
N340 Urethral abscess
N342 Other urethritis
N390 Urinary tract infection, site not specified
O233 Infections of other parts of urinary tract in pregnancy
O234 Unspecified infection of urinary tract in pregnancy
O239 Other and unspecified genitourinary tract infection in pregnancy
O862 Urinary tract infection following delivery

Gastroenteritis:
A010 Typhoid fever
A011 Paratyphoid fever A
A014 Paratyphoid fever, unspecified
A020 Salmonella enteritis
A028 Other specified salmonella infections
A029 Salmonella infection, unspecified
A044 Other intestinal Escherichia coli infections
A045 Campylobacter enteritis
A046 Enteritis due to Yersinia enterocolitica
A048 Other specified bacterial intestinal infections
A049 Bacterial intestinal infection, unspecified
A059 Bacterial foodborne intoxication, unspecified
A081 Acute gastroenteropathy due to Norwalk agent
A083 Other viral enteritis
A084 Viral intestinal infection, unspecified
A085 Other specified intestinal infections
A09 Other gastroenteritis and colitis of infectious and unspecified origin
A099 Gastroenteritis and colitis of unspecified origin

All infections (excluding pneumonia):
Available on request

All non-infections:
Available on request

(B) – Microbiology samples included and organisms cultured from them defined as plausibly causative for pneumonia or excluded

Specimens included[26]: blood for culture, pleural fluid, and bronchoalveolar lavage

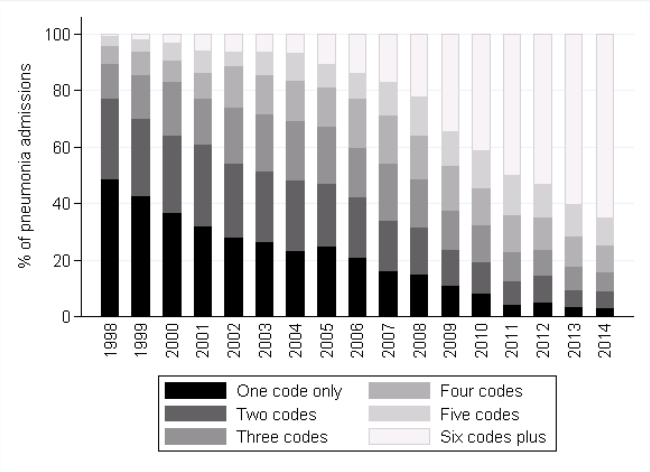
Organisms cultured from these specimens included as plausibly causative for pneumonia, or excluded completely (i.e. test result counted as negative).

Specifically included as plausibly causing pneumonia (n)	**Specifically excluded (i.e. test counted as negative)**
Streptococcus pneumoniae (480) ***Escherichia coli*** (117) ***Staphylococcus aureus*** (52) ***Methicillin resistant staphylococcus aureus*** (25) ***Haemophilus influenzae*** (40) ***Pseudomonas aeruginosa*** (35) ***Klebsiella* species*:*** *Klebsiella pneumoniae* (40) *Klebsiella oxytoca* (6) *Klebsiella* species (1) **Other *Enterobacteriaceae:*** *Citrobacter braakii* (1) *Citrobacter freundii* (1) *Citrobacter* species (2) Coliforms (23) *Enterobacter aerogenes* (2) *Enterobacter cloacae* (9) *Morganella morganii* (1) Nonfermenting coliform (1) *Proteus mirabilis* (19) *Proteus* species (2) *Proteus vulgaris* (5) *Providencia* species (1) *Salmonella* species (1) *Serratia marcescens* (2) *Yersinia enterocolitica* (1) **Anaerobes/*Streptococcus milleri*:** *Bacteroides fragilis* (2) *Bacteroides intermedius* (1) *Bacteroides uniformis* (1) *Clostridium* species (5) Mixed anaerobes isolated sensitive to metronidazole. (5) *Streptococcus anginosus* (*milleri* group) (2) *Streptococcus constellatus* (*milleri* group) (2) *Streptococcus intermedius* (*milleri* group) (1) *Streptococcus milleri* (7) **Other Gram-positives:** Alpha haemolytic *streptococci* (64) Beta haemolytic *streptococci* (1) Group A *streptococci* (24) *Streptococci* (8) *Streptococci*, beta haemolytic group B (5) *Streptococci*, beta haemolytic group C (5) *Streptococci*, beta haemolytic group G (12) *Streptococcus bovis* (1) *Streptococcus dysgalactiae* (serogroup C/G) (1) *Streptococcus equisimilis* (1) *Streptococcus gallolyticus* (*strep.bovis* biotype I) (1) *Streptococcus mitis* (8) **Other Gram-negatives:** *Capnocytophaga canimorsus* (1) *Eikenella corrodens* (1) *Haemophilus* species (3) *Neisseria meningitidis* (1)	*Acinetobacter baumannii* *Acinetobacter lwoffii* *Acinetobacter radioressistens* *Acinetobacter* species *Actinomyces bovis* Aerobic spore bearer *Aerococcus* species *Aerococcus viridans* *Bacillus* species *Candida* *Candida albicans* *Candida glabrata* *Candida* species *Coagulase negative staphylococcus* Colonies *Corynebacterium afermentans* *Corynebacterium amycolatum* *Corynebacterium jeikeium* *Corynebacterium* species *Corynebacterium striatum* Diphtheroids *Enterococci* *Enterococcus faecalis* group D *Enterococcus faecium* group D *Enterococcus* species *Gemella haemolysans* *Gemella morbillorum* *Lactobacillus casei* *Lactobacillus* species *Listeria monocytogenes* *Micrococci* *Micrococcus luteus* *Micrococcus* species *Moraxella catarrhalis (branhamella catarrhalis)* *Moraxella species* *Neisseria species* Non lactose fermenting Gram negative rods *Pasteurella multocida* *Propionibacterium acnes* *Propionibacterium* species *Pseudomonas luteola* *Pseudomonas* species *Pseudomonas stutzeri* *Rhodococcus* species *Rothia dentocariosa* *Staphylococcus capitis* *Staphylococcus epidermidis*(CONS) *Staphylococcus haemolyticus* *Stenotrophomonas maltophilia*

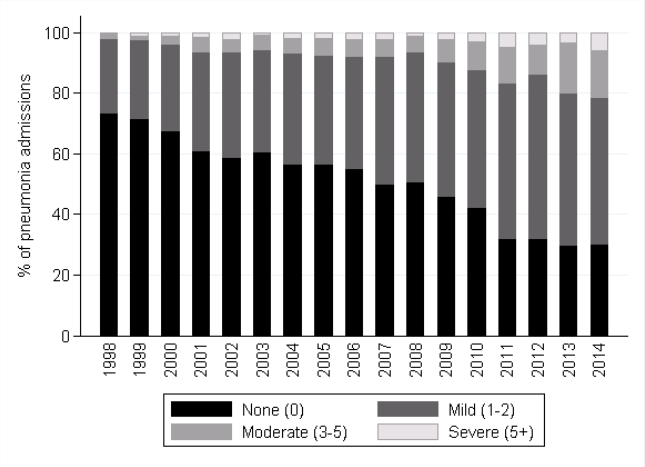
Supplementary Methods

For piecewise linear Poisson regression, data was aggregated by UK financial year (Apr-Mar) and separate models were built for each potential change-point between 2000 and 2012 inclusive, using two linear piecewise linear functions (with the standard Poisson log link). The model which produced the lowest deviance goodness-of-fit statistic was chosen as the best two-piece model (a standard profile likelihood[8] approach). This model was then compared to the model with a single linear trend using a chi-squared test of difference in deviance, and the two-piece model chosen if it was a significantly ($p<0.05$) better fit.

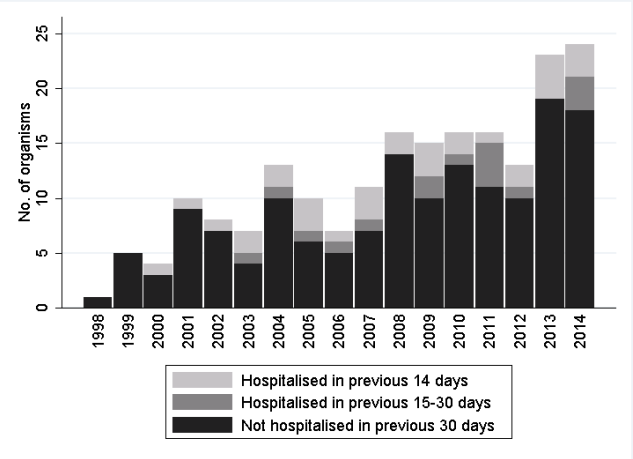
Piecewise linear median regression was conducted similarly, with change-point model selection using the pseudo-R-squared statistic, and the best two-piece model chosen over the single trend model if an F-test of before-and-after trends showed a significant ($p<0.05$) difference.



Supplementary Figure 1. Coding depth – number of diagnostic codes recorded per CAP admission
Note: electronic recording of secondary diagnosis codes was introduced in January 2006.



Supplementary Figure 2. Charlson severity score per CAP admission



Supplementary Figure 3. Prior recent hospitalisation of patients with *Enterobacteriaceae* cultured