

Read code	Description	Percent
H26..00	Pneumonia due to unspecified organism	35.8
H25..00	Bronchopneumonia due to unspecified organism	24.1
H062.00	Acute lower respiratory tract infection	18.9
H21..00	Lobar (pneumococcal pneumonia)	7.6
H2z..00	Pneumonia or Influenza NOS	3.7
H2...00	Pneumonia and influenza	1.7
H261.00	Basal pneumonia due to unspecified organism	1.3
H28..00	Atypical pneumonia	1.2
H260.00	Lobar pneumonia due to unspecified organism	0.96
H231.00	Pneumonia due to mycoplasma pneumoniae	0.68
H20..00	Viral pneumonia	0.54
H20z.00	Viral pneumonia NOS	0.46
H22z.00	Bacterial pneumonia NOS	0.46
H540000	Hypostatic pneumonia	0.43
SP13100	Other aspiration pneumonia as a complication of care	0.21
H56y100	Interstitial pneumonia	0.19
H540100	Hypostatic bronchopneumonia	0.15
H22..00	Other bacterial pneumonia	0.14
H23..00	Pneumonia due to other specified organisms	0.12

H470312	Aspiration pneumonia due to vomit	0.12
H223.00	Pneumonia due to streptococcus	0.10
H201.00	Pneumonia due to respiratory syncytial virus	0.09
H2y..00	Other specified pneumonia or influenza	0.09
H22..11	Chest infection- other bacterial pneumonia	0.08
H22y200	Pneumonia-legionella	0.08
H25..11	Chest infection- unspecified bronchopneumonia	0.08
H270000	Influenza with bronchopneumonia	0.08
A3BXA00	Mycoplasma pneumoniae (PPLO) cause/dis classifd/oth	0.05
H224.00	Pneumonia due to staphylococcus	0.05
H270.00	Influenza with pneumonia	0.04
H20..11	Chest infection- viral pneumonia	0.03
H220.00	Pneumonia due to klebsiella pneumoniae	0.03
H23z.00	Pneumonia due to specified organism NOS	0.03
A3BXB00	Klebsiella pneumoniae/cause/disease classifd/oth chapt	0.02
A789300	HIV disease resulting in Pneumocystis carinii pneumonia	0.02
H060A00	Acute bronchitis due to mycoplasma pneumoniae	0.02
H221.00	Pneumonia due to pseudomonas	0.02
H233.00	Chlamydial pneumonia	0.02
H24y200	Pneumonia with pneumocystis carinii	0.02

H262.00	Postoperative pneumonia	0.02
H270.11	Chest infection- influenza with pneumonia	0.02
A116.00	Tuberculous pneumonia	0.01
A380300	Septicaemia due to streptococcus pneumoniae	0.01
AB24.11	Pneumonia- candidal	0.01
H06z112	Acute lower respiratory tract infection	0.01
H20y.00	Viral pneumonia NEC	0.01
H222.00	Pneumonia due to haemophilus influenzae	0.01
H22y000	Pneumonia due to Escherichia coli	0.01
H22yz00	Pneumonia due to bacteria NOS	0.01
H24..00	Pneumonia with infectious disease EC	0.01
H24y700	Pneumonia with varicella	0.01

Codes as per: Myles PR, McKeever TM, Pogson Z, Smith CJ, Hubbard RB. The incidence of pneumonia using data from a computerized general practice database. *Epidemiol Infect* 2009;137:709-716.

Table 1a: Association between benzodiazepine and zopiclone exposure and the incidence of pneumonia (case-control study)

Exposure variable	Cases (n=4,964)	Controls (n=29,697)	Unadjusted OR (95% CI)	P value	Adjusted OR (95%CI)‡	P value	Adjusted OR (95% CI)†	P value
Benzodiazepines								
No	4,491 (90.47%)	28,288 (95.26%)	1.00		1.00		1.00	
Yes	473 (9.53%)	1,409 (4.74%)	2.24 (1.99-2.51)	<0.001	1.76 (1.56-1.98)	<0.001	1.79 (1.59-2.02)	<0.001
Diazepam								
No	4,812 (96.94%)	29,303 (98.67%)	1.00		1.00		1.00	
Yes	152 (3.06%)	394 (1.33%)	2.39 (1.97-2.89)	<0.001	1.82 (1.49-2.23)	<0.001	1.90 (1.56-2.31)	<0.001
Lorazepam								
No	4,935 (99.42%)	29,613 (99.72%)	1.00		1.00		1.00	
Yes	29 (0.58%)	84 (0.28%)	2.07 (1.35-3.17)	0.001	1.68 (1.07-2.63)	0.025	1.56 (1.00-2.42)	0.050
Chlordiazepoxide								
No	4947 (99.66%)	29,652 (99.85%)	1.00		1.00		1.00	
Yes	17 (0.34%)	45 (0.15%)	2.25 (1.29-3.94)	0.004	1.86 (1.03-3.35)	0.039	1.73 (0.97-3.08)	0.062
Temazepam								
No	4,749 (95.67%)	29,053 (97.83%)	1.00		1.00		1.00	
Yes	215 (4.33%)	644 (2.17%)	2.11 (1.80-2.49)	<0.001	1.68 (1.42-1.99)	<0.001	1.73 (1.46-2.05)	<0.001
Zopiclone								
No	4,939 (99.50%)	29,645 (99.82%)	1.00		1.00		1.00	
Yes	25 (0.50%)	52 (0.18%)	2.83 (1.75-4.57)	<0.001	1.91 (1.14-3.21)	0.014	2.36 (1.43-3.89)	0.001

‡ Adjusted for Charlson's index score, Townsend Score, Depression, myocardial infarction, previous pneumonia, current smoke and lung disease ; Statistically significant results (p<0.05) in bold;

†Adjusted for propensity score

Table 1b: Association between 30-day and long-term mortality following pneumonia and benzodiazepine use, all ages (cohort study; n=4964)

Drug	Numbers dead at 30 days (%) (n=947)	30-day Adjusted Hazard Ratio ¹ (95% CI)	P value	Long-term mortality (%) (n=1547)	Long-term mortality Adjusted Hazard Ratio ¹ (95% CI)	P value
Benzodiazepine No Yes	763 (80.57%) 184 (19.43%)	1.00 1.32 (1.12-1.55)	0.001	1,269 (82.03%) 278 (17.97%)	1.00 1.37 (1.20-1.56)	<0.001
Diazepam No Yes	891 (94.09%) 56 (5.91%)	1.00 1.81 (1.38-2.38)	<0.001	1,471 (95.09%) 76 (4.91%)	1.00 1.73 (1.37-2.18)	<0.001
Chlordiazepoxide No Yes	941 (99.37%) 6 (0.63%)	1.00 1.41 (0.63-3.16)	0.405	1,537 (99.35%) 10 (0.65%)	1.00 1.41 (0.76-2.64)	0.279
Lorazepam No Yes	930 (98.20%) 17 (1.80%)	1.00 1.82 (1.12-2.97)	0.015	1,526 (98.64%) 21 (1.36%)	1.00 1.63 (1.05-2.51)	0.028
Temazepam No Yes	872 (92.08%) 75 (7.92%)	1.00 0.95 (0.75-1.21)	0.704	1,422 (91.92%) 125 (8.08%)	1.00 1.06 (0.88-1.27)	0.558
Zopiclone No Yes	941 (99.37%) 6 (0.63%)	1.00 0.89 (0.40-2.00)	0.786	1,532 (99.03%) 15 (0.97%)	1.00 1.46 (0.87-2.43)	0.149

¹ Adjusted for age, sex, townsend's deprivation score, current smoking, Charlson Comorbidity Index score, alcohol use, depression and psychosis

Note: All comparisons are in reference to 'no use'; percentages shown represent 'row' percentages i.e. the proportion of cases who died within each exposure category.

Table 1c: Mortality analyses adjusted for propensity of treatment

Drug	30-day Adjusted Hazard Ratio ¹ (95% CI)	P value	Long-term mortality Adjusted Hazard Ratio ¹ (95% CI)	P value
Benzodiazepine No Yes	1.00 1.47 (1.24-1.74)	<0.001	1.00 1.49 (1.30-1.71)	<0.001
Diazepam No Yes	1.00 1.52 (1.16-1.99)	0.003	1.00 1.32 (1.04-1.66)	0.020
Chlordiazepoxide No Yes	1.00 0.97 (0.44-2.18)	0.949	1.00 1.05 (0.56-1.95)	0.883
Lorazepam No Yes	1.00 1.98 (1.22-3.21)	0.006	1.00 1.90 (1.23-2.93)	0.004
Temazepam No Yes	1.00 1.17 (0.92-1.49)	0.193	1.00 1.32 (1.09-1.59)	0.004
Zopiclone No Yes	1.00 1.17 (0.53-2.62)	0.699	1.00 1.97 (1.18-3.28)	0.009

¹ Adjusted for propensity scores