10 Acute bronchitis or bronchiolitis results (standard output graphs can be found in Appendix A10)

Summary

Type of variation	Consistent across data sources?	Consistent within data sources?	Comments
Age	Partially	N/A	Rates highest at extremes of age in all data sources Mortality rates: age 95+ >> age under 1 HES rates: age under 1 >> age 95+ GPRD rates: age 95+ ≈ age under 1
Sex	Yes	N/A	M>F, except F>M in ages 15-50+ in HES and GPRD
Year on year	Partially	N/A	↓ mortality & GPRD, ↓↑ in HES All sources showed 'dip' in 1992, very marked in HES; GPRD and mortality also showed 'dip' in 1994. Dips were caused by small changes in timing of the winter peaks – financial year may be more appropriate for diseases with marked winter peaks
Week of year	Yes	N/A	↑↑ in December and January
Regional	Partially	N/A	Midlands & North > South, but not consistent by data source or year
Urban-rural	No	N/A	∪-shape rural to urban in GPRD, rural↓ urban↑ gradient in HES, ∩-shape rural to urban in mortality
Geographical correlation	Yes (GPRD + HES)	Yes (GPRD) No (HES)	Too few deaths to allow meaningful geographical correlations.

The following results are considered:

Variations by age and sex
Seasonality
Regional and urban rural distribution
Comparisons across data sources for all ages and by age group
Within database comparisons by age group

Variations by age and sex

All data sources showed peaks at the extremes of age, but there were large differences in the magnitude of these in different data sources. While the larger peak in mortality was in the extreme elderly (Figure 10.1), the larger peak in hospital admissions was in children (Figure 10.2). GP consultations showed fairly similar peaks in children under 1 and the extreme elderly with rates around 3,000 per 10,000 patient years at risk. In children under five years, GP patient consultation rates were approximately 25 times higher than emergency hospital admissions, which were in turn nearly three orders of magnitude higher than death rates. In the extreme elderly (age 85+), GP patient consultation rates were two orders of magnitude higher than emergency hospital admissions which in turn were only three times death rates.

Mortality rates were higher in males than females, while for GP consultations and emergency admissions rates were similar in children (to age 14), then higher in females with a cross-over in later life (age 65 in GP consultations, age 50 in hospital admissions) with higher rates in males thereafter.

Time trends: Mortality rate showed an overall downward trend with a small dip in 1992. GP consultation rates also showed an overall downward trend, but with small dips in 1992 and 1994. Emergency hospital admission rates showed a steep drop in 1992 (to just over half the 1991 rates), then increased in 1993 to the 1991 level and increased slightly again in 1994.

Cohort effect: There was no evidence for cohort effects.

Figure 10.1 Crude mortality rates for acute bronchitis or bronchiolitis by age and sex for 1991-1995

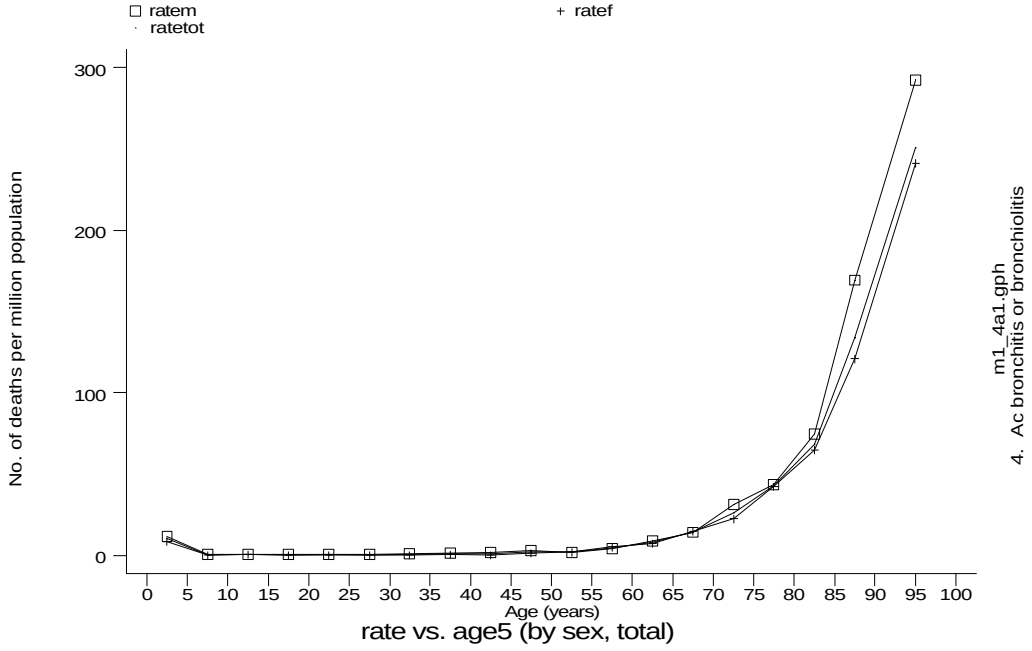
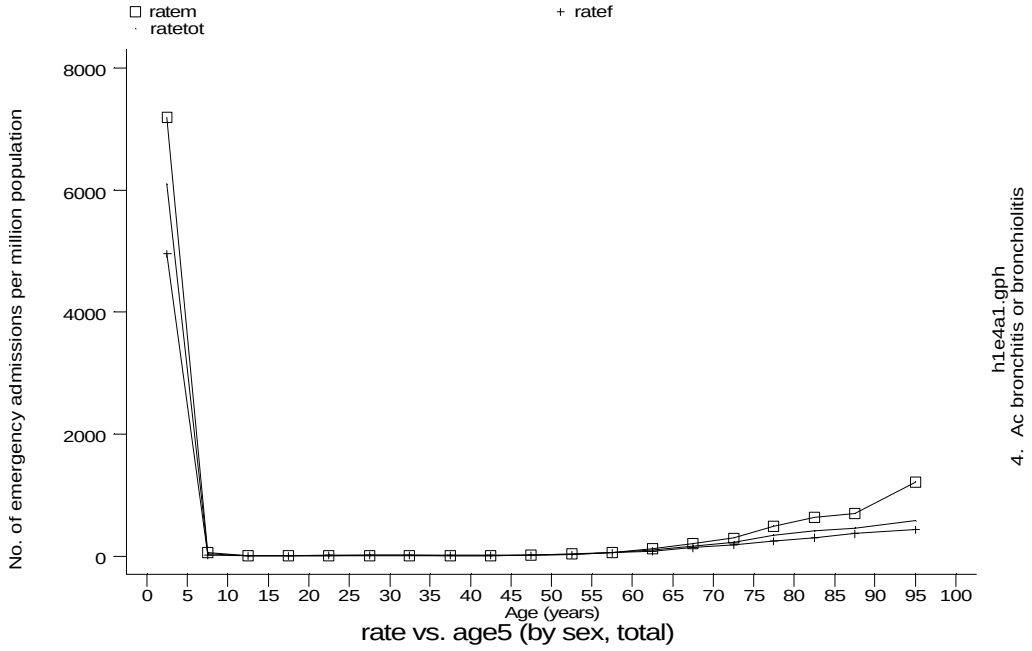


Figure 10.2 Crude emergency hospital admission rates for acute bronchitis or bronchiolitis by age and sex for 1991-1994

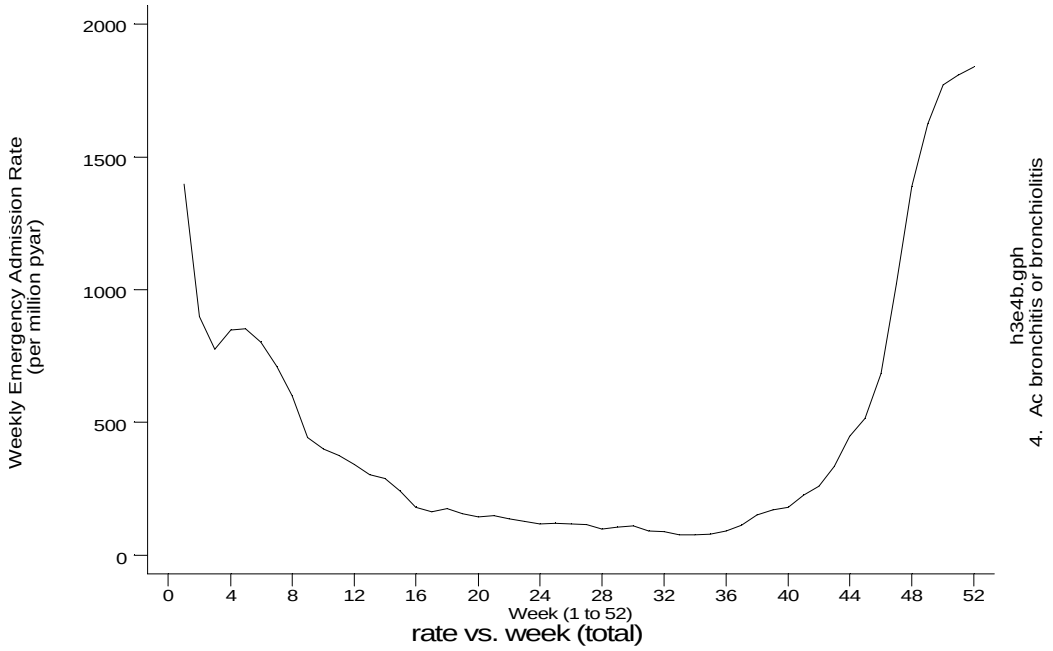


Seasonality

A consistent seasonal pattern was seen with higher rates in the winter months of December and January and lowest rates in the summer (Figure 10.3). The highest rates were seen in January in deaths and patient consultations, while the highest rates of hospital admissions were at the end of December. The highest peak in rates for mortality and GP consultations was in January 1991, but in December 1995 for hospital admissions. The second highest peak was seen in the 1991/2 winter in all data sources. The apparent steep dip in hospital admissions in the 1992 calendar year was due to small changes in the timing of the normal winter peak which led to more admissions in 1991 and 1993 and fewer in 1992 (a combination of an early peak in the 1991/2 winter which was less sustained than in the following years and a later peak in the 1992/3 winter). Additionally 1993 showed a second smaller peak in February.

GP consultations started to rise steeply from week 36 onwards, but the onset of a steep rise was 4 weeks later in hospital admissions and possibly also for mortality, but the exact timing was more difficult to determine because of small number variations, even in combined 1991-1994 data.

Figure 10.3 Weekly pattern in emergency hospital admission rates for acute bronchitis or bronchiolitis, 1991-1994



Regional and urban rural distribution

Southern areas generally experienced lower rates of hospital admissions and GP consultations than average while rates in Northern and Midlands areas were higher (Table 10.1). This was not fully consistent by data source or year – for example, Trent had significantly higher SERs than average for all data sources for all years combined, but not in 1994 (Table 10.1). Regional SMRs were based on relatively small numbers of deaths.

Table 10.1 Numbers of events and SERs in 1994 for acute bronchitis or bronchiolitis ranked (high-low) following order of hospital admission SERs

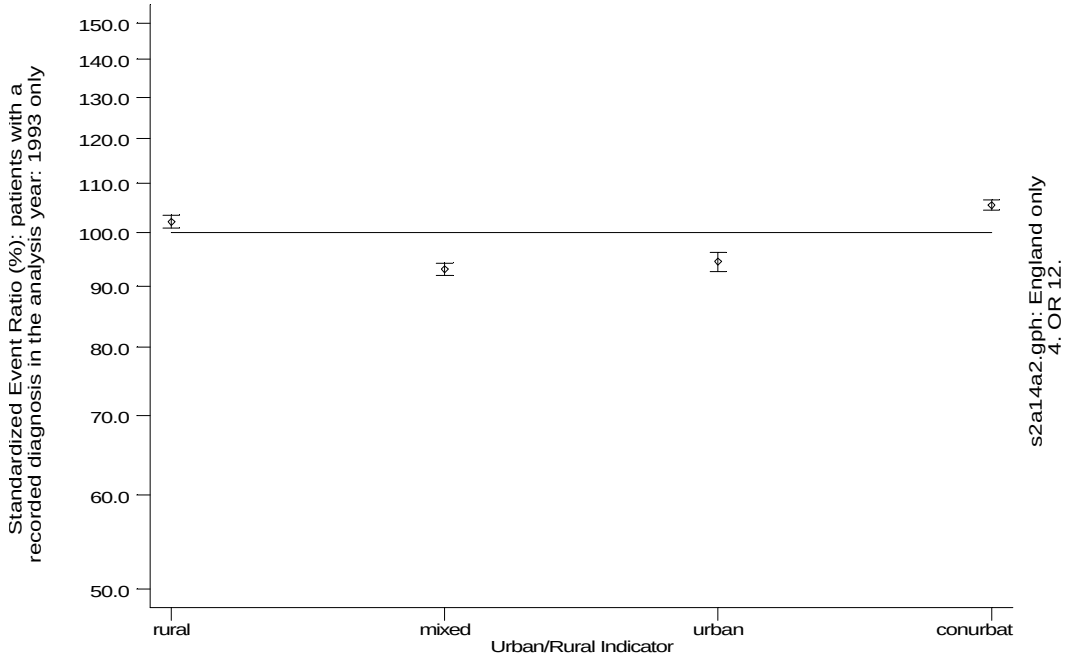
Region	Mortality		HES: emergency admissions		GPRD: patient consultations	
	Number	SMR	Number	SER	Number	SER
N Western	16	63.4	3,169	136.7*	7,357	115.1*
Northern	11	62.5	1,913	126.3*	8,539	127.5*
W Midlands	24	76.1	3,458	120.7*	14,186	99.2
Mersey	14	97.0	1,448	113.2*	5,416	97.8
Yorkshire	25	111.6	2,152	108.2*	3,729	111.5*
NW Thames	4	24.3*	1,527	94.9*	6,094	83.2*
NE Thames	21	96.1	1,955	90.1*	1,631	82.6*
Wessex	25	122.3	1,435	88.9*	5,662	116.7*
S Western	11	48.6*	1,475	88.5*	5,861	93.1*
Trent	55	188.9*	2,217	88.4*	7,903	102.1
SW Thames	12	64.3	1,296	83.6*	6,452	85.5*
E Anglia	13	79.5	1,158	83.2*	6,914	97.3*
Oxford	13	93.7	1,150	80.8*	2,578	91.4*
SE Thames	50	213.8*	1,560	77.4*	1,825	82.4*

* SER significantly different from 100 ($p<0.05$)

Time trends by region: Regional year on year trends were in generally in good accordance with national trends. More variation was seen in mortality with fewer numbers and the expected marked ‘dip’ in hospital admissions in the 1992 calendar year was attenuated in Thames regions, due to lower admissions in 1991.

Urban rural: In GP consultations, a U-shape was seen with higher SERs in rural and conurbation areas (Figure 10.4), while the converse - an inverted U-shape - was seen in mortality. Hospital admissions showed a rural urban gradient (with highest SERs in conurbations).

Figure 10.4 Urban rural pattern for GP patient consultation SERs , 1991-1995



Comparisons across data sources for all ages and by age group

Correlations

Numbers of deaths were too small to allow meaningful geographical correlations with mortality. Geographical correlations between GPRD and HES were moderately good ($r_s \approx 0.6$) for all age groups (Table 10.2).

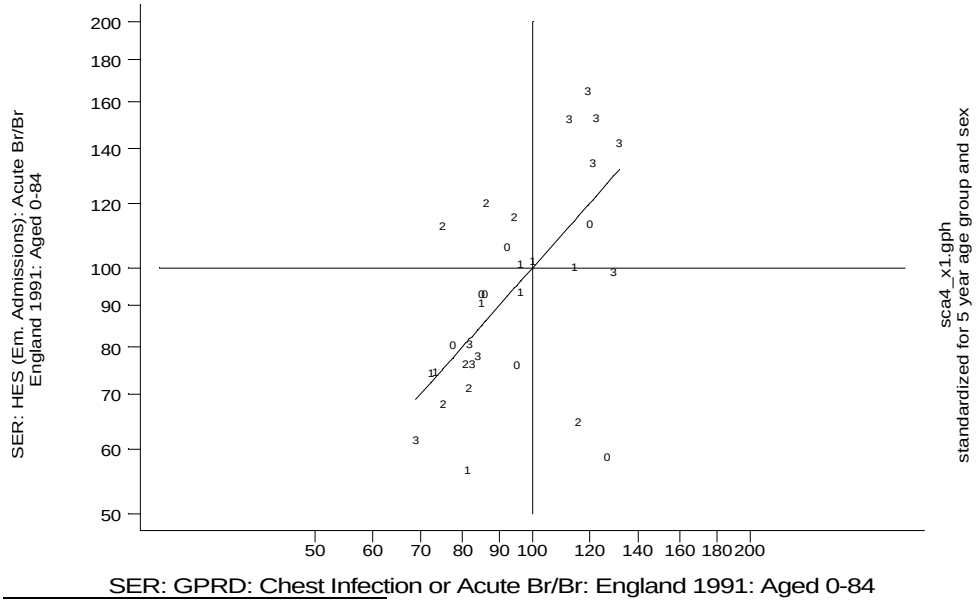
Table 10.2 Spearman rank correlation coefficients for comparison of standardised event ratios for acute bronchitis or bronchiolitis from different data sources for region+urban rural combinations in 1991 and regions in 1994: ages 0-84

	HES: emergency admissions	
	age 0-84	
	1991	**1994**
GPRD: consultations ages 0-84	0.58	0.60

Scatterplots

The scatterplot between emergency hospital admissions and GP consultations (Figure 10.5) showed a nearly five fold difference between the highest and lowest hospital admission SER (range 37-174), but a two fold difference in SERs for GP consultations (range 73-132).

Figure 10.5 SERs for acute bronchitis or bronchiolitis hospital admissions (ages 0-84) compared with SERs for GP patient consultations (ages 0-84) for region and urban rural combinations*



* Footnote: The line added to scatterplot graphs is the line of equivalence.
Key to points: 0 = rural, 1 = mixed, 2 = urban, 3 = conurbations, 9 = indeterminate

Comparisons between data sources by age group

Geographical correlations between GPRD and HES were generally weaker when examining children and adults separately (Table 10.3) than in correlations for all ages combined (Table 10.2). There were too few hospital admissions in adults (age 15-84) to permit more than a regional level correlation in 1991 (as opposed to a regional plus urban rural correlation as for more common diseases).

Table 10.3 Spearman rank correlation coefficients for comparison of standardised event ratios for acute bronchitis or bronchiolitis from different data sources for region+urban rural combinations in 1991 and regions in 1994: ages 0-14 and ages 15-84

	HES: emergency admissions	
	age 0-14	
	1991	**1994**
GPRD: consultations ages 0-14	0.24	0.66
	age 15-84	
	1991	**1994**
GPRD: consultations ages 15-84	0.50†	0.16

† 1991 based on regional comparison only, as number of hospital admissions too small for a region plus urban rural comparison, 1994 based on regional comparison as detailed in methods (Section 4)

Within database comparisons by age group

Patient consultation rates for children correlated well with patient consultation rates for adults in the same areas, but the equivalent correlations with HES were weaker (Table 10.4).

Table 10.4 Spearman rank correlation coefficients for within data source comparison of standardised event ratios for acute bronchitis or bronchiolitis from GPRD and HES for region+urban rural combinations in 1991 and regions in 1994: comparing children ages 0-14 and adults ages 15-84

	GPRD: consultations, ages 15-84			**HES: emergency admissions ages 15-84**	
	1991	**1994**		**1991**	**1994**
GPRD: consultations ages 0-14	0.64	0.82			
HES: emergency admissions ages 0-14				0.40†	0.38

† based on regional comparison only, as number of hospital admissions too small for a region plus urban rural comparison 1994 based on regional comparison as detailed in methods (Section 4)