

## **National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme: Clinical audit of COPD exacerbations admitted to acute units in England and Wales 2014**

### **Reliability analyses**

Units were asked to re-audit their first 5 cases, using a different auditor: 1105 cases from 189 units.

Reliability (agreement between auditors) is not the same as validity (accuracy of measure). However, establishing good agreement between auditors is an important part of the process of validation, as valid data by definition will have to be reliable.

For categorical data, the kappa statistic was used to measure agreement. Kappa values of 0.41 to 0.60 are said to indicate moderate agreement, values of 0.61 to 0.80 indicate good agreement, while values of over 0.80 are very good. In practice, any value of kappa much below 0.50 will indicate inadequate agreement. Often, the kappa value computed over all relevant cases gives an assessment of agreement that is an amalgamation of separate components. One component is the agreement between auditors as to whether or not they find the required information, and another is agreement in data when both auditors have found relevant information. To separate out these components where relevant, two kappa statistics are given below – one an overall kappa and one a kappa specific to when both auditors found information that was relevant.

The kappa statistic does not measure the nature of any disagreement between auditors, and for this we need to inspect the raw data tables. Any future attempt to improve on the reliability of any audit item (ie when planning a repeat audit) will bear most fruit if it focuses on the more frequent discrepancies in judgement.

For numerical data, the percentage with exact auditor agreement is reported, as is the quantification of the extent of disagreement between auditors.

Summary tables are presented below (pages 2–4) for categorical data, dates and numerical data, with the data items being as closely aligned as possible to the way they are presented in the main report. Below these (pages 5–36) are the main body text of agreement tables and statistics, which provide further detail as to the nature of agreement and disagreement.

In brief: levels of agreement were found to be generally 'good' to 'very good', with about 80% of kappa values over 0.60, more than half over 0.70 and about one-third over 0.80. About 1 in 10 were below 0.50.

There will be a need to exercise caution when performing analyses that correlate one variable with another when one or both variables has less than good inter-auditor reliability – associations between them may dilute as a consequence.

## SUMMARY STATISTICS

### Categorical data

Kappa statistic	Overall as relevant	After excluding unknowns*
K <0.00		
0.00 ≤ K <0.10	<ul style="list-style-type: none"> <li>Where patient managed during admission – not known</li> </ul>	
0.10 ≤ K <0.20		
0.20 ≤ K <0.30	<ul style="list-style-type: none"> <li>Comorbidities: hearing impairment</li> <li>Decision on ceiling of care made within 24 hours – (who) not recorded</li> </ul>	
0.30 ≤ K <0.40	<ul style="list-style-type: none"> <li>Had a chest X-ray</li> <li>Decision on ceiling of care – yes not for NIV</li> <li>Decision on ceiling of care made within 24 hours – (who) not applicable</li> </ul>	
0.40 ≤ K <0.50	<ul style="list-style-type: none"> <li>Decision on ceiling of care – not applicable</li> <li>Decision on ceiling of care made within 24 hours – CT1/CT2</li> <li>Decision on ceiling of care made within 24 hours – FY1/2</li> <li>Decision on ceiling of care made within 24 hours – other healthcare professional</li> <li>Decision on ceiling of care made within 24 hours – patient</li> <li>Under whose care when decision to discharge or transfer to early/supported discharge – others</li> </ul>	
0.50 ≤ K <0.60	<ul style="list-style-type: none"> <li>Case admitted at another unit and transferred to your unit</li> <li>Oral/intravenous (IV) steroid given within 24 hours</li> <li>Smoking cessation advice</li> <li>Comorbidities: locomotor problems</li> <li>Medical Research Council (MRC) dyspnoea score</li> <li>FiO<sub>2</sub> recorded – second arterial blood gas (ABG)</li> <li>No record of decision on ceiling of care</li> <li>Patient intubated/treated with mechanical ventilation</li> <li>Where patient managed during admission – medical assessment unit (MAU)/admissions ward</li> <li>Was suitability for pulmonary rehabilitation considered at the time of discharge?</li> </ul>	
0.60 ≤ K <0.70	<ul style="list-style-type: none"> <li>Ethnicity</li> <li>Under whose care was the patient initially admitted?</li> <li>Seen (Y/N) by any specialty trainee/SpR (ST3+)</li> <li>Seen (Y/N) by any other consultant physician</li> <li>Does the chest X-ray (CXR) demonstrate consolidation?</li> <li>Oxygen prescribed on the medication chart or equivalent</li> <li>Comorbidities: cor pulmonale, left heart failure (LVF), other respiratory disease, other cardiovascular disease</li> <li>Does electrocardiogram (ECG) demonstrate atrial fibrillation (AF)?</li> <li>Body mass index (BMI) recorded in the notes</li> <li>FiO<sub>2</sub> recorded – first ABG</li> <li>Decision on ceiling of care – yes escalation to non-invasive ventilation (NIV) not for intubation</li> <li>Decision on ceiling of care – yes no cardiopulmonary resuscitation</li> <li>Decision on ceiling of care made within 24 hours – other consultant</li> <li>Decision on ceiling of care made within 24 hours – SpR/ST3+</li> <li>Decision on ceiling of care made within 24 hours – family</li> <li>Patient assessed by the intensive therapy unit (ITU) team during admission</li> <li>Where patient managed during admission – surgical/non-medical ward</li> <li>Under whose care when decision to discharge or transfer to early discharge – GP</li> <li>Evidence patient discharged under the care of a COPD team or early/supported discharge service or equivalent</li> <li>Where patient was discharged to</li> </ul>	<ul style="list-style-type: none"> <li>Under whose care was the patient initially admitted?</li> <li>Seen (Y/N) by any other consultant physician</li> <li>Oral/IV steroid given within 24 hours</li> <li>Smoking cessation advice</li> <li>FiO<sub>2</sub> recorded – first ABG</li> <li>FiO<sub>2</sub> recorded – second ABG</li> <li>Evidence patient discharged under the care of a COPD team or early/supported discharge service or equivalent</li> </ul>
0.70 ≤ K <0.80	<ul style="list-style-type: none"> <li>Hours to being seen by any specialty trainee/SpR (ST3+)</li> <li>Hours to being seen by any other consultant physician</li> <li>Seen (Y/N) by a respiratory nurse/COPD respiratory team</li> <li>Hours from arrival to first chest X-ray</li> <li>Antibiotic given within the first 24 hours</li> <li>Oxygen response (target)</li> <li>Smoking status</li> <li>Comorbidities: alcohol, mental health disorder, neurological condition,</li> </ul>	<ul style="list-style-type: none"> <li>Seen (Y/N) by any specialty trainee/SpR (ST3+)</li> <li>Does the chest X-ray demonstrate consolidation?</li> <li>Antibiotic given within the first 24 hours</li> <li>MRC dyspnoea score</li> <li>Does ECG demonstrate AF?</li> </ul>

Kappa statistic	Overall as relevant	After excluding unknowns*
	<p>thromboembolic disease, visual impairment, other gastrointestinal condition, other endocrine disorder</p> <ul style="list-style-type: none"> <li>• Number of significant comorbidity categories</li> <li>• Spirometry recorded in notes/case record in last 5 years</li> <li>• First arterial blood gas taken</li> <li>• Hours to first arterial blood gas taken</li> <li>• Patient treated with NIV</li> <li>• Minutes from arrival to NIV commenced</li> <li>• Decision on ceiling of care – yes full escalation</li> <li>• Decision on ceiling of care made within 24 hours – respiratory consultant</li> <li>• Where patient managed during admission – medical/respiratory high-dependency unit (HDU)</li> <li>• Where patient managed during admission – other medical ward (general/geriatric/non-respiratory)</li> <li>• Under whose care when decision to discharge or transfer to early discharge – acute medicine consultant</li> <li>• Under whose care when decision to discharge or transfer to early discharge – care-of-elderly consultant</li> </ul>	<ul style="list-style-type: none"> <li>• Patient intubated/treated with mechanical ventilation</li> <li>• Where patient was discharged to</li> <li>• Was suitability for pulmonary rehabilitation considered at the time of discharge?</li> </ul>
0.80 ≤ K < 0.90	<ul style="list-style-type: none"> <li>• Time of arrival</li> <li>• Day of week of discharge</li> <li>• Seen (Y/N) by a respiratory consultant</li> <li>• Hours to being seen by a respiratory consultant</li> <li>• Hours to being seen by a respiratory nurse/COPD respiratory team</li> <li>• Known to have COPD prior to this admission</li> <li>• Comorbidities: atrial fibrillation, dementia/confusion, hypertension, ischaemic heart disease (IHD), kidney disease, osteoporosis, stroke, other malignant disease</li> <li>• Eosinophil</li> <li>• First pO<sub>2</sub></li> <li>• Second ABG taken</li> <li>• Minutes between ABGs</li> <li>• Second pH, pO<sub>2</sub></li> <li>• Where patient managed during admission – respiratory ward</li> <li>• Under whose care when decision to discharge or transfer to early discharge – respiratory consultant</li> </ul>	<ul style="list-style-type: none"> <li>• Ethnicity</li> <li>• Seen (Y/N) by a respiratory consultant</li> <li>• Seen (Y/N) by a respiratory nurse/COPD respiratory team</li> <li>• Oxygen response (target)</li> <li>• Smoking status</li> <li>• Patient treated with NIV</li> <li>• Patient assessed by the ITU team during admission</li> </ul>
K ≥ 0.90	<ul style="list-style-type: none"> <li>• Gender</li> <li>• Age group</li> <li>• Month of admission</li> <li>• Day of week of admission</li> <li>• Month of discharge</li> <li>• Length of stay (LOS)</li> <li>• Comorbidities: diabetes, lung cancer</li> <li>• GOLD stage for % predicted FEV<sub>1</sub></li> <li>• Albumin, urea, C-reactive protein (CRP)</li> <li>• First pH, pCO<sub>2</sub>, HCO<sub>3</sub></li> <li>• Second pCO<sub>2</sub>, HCO<sub>3</sub></li> <li>• If assessed by the ITU team, was the patient transferred to care of ITU team?</li> <li>• Any indication of patient dying as inpatient</li> <li>• Index of Multiple Deprivation (IMD) and Welsh IMD quintiles and all domain quintiles</li> </ul>	

\*Variously categorised as 'Not known', 'Not recorded', 'No answer'

## Dates

	Exact agreement	Nature of disagreement
Admission date	94% (1037/1105)	45 (1 day), 6 (2-4 days), 3 (5-9 days), 14 (>10 days)
Discharge date	91% (996/1097)	41 (1 day), 19 (2-4 days), 10 (5-9 days), 31 (>10 days)

## Numerical data

	Exact agreement	Nature of disagreement
Age in years	94% (1032/1097)	(58) 1 year, and (7) more than 1 year (range 2-19)
LOS in days	87% (949/1097)	(81) 1 day, (30) 2-4 days, (11) 5-9 days, and (26) 10 or more days
Hours from arrival to seen by any specialty trainee/SpR (ST3+)	67% (315/472)	(44) within 1 hour, (29) more than 1 hour but within 4 hours, (29) more than 4 hours but within 12 hours, (55) more than 12 hours
Hours from arrival time to time seen by a respiratory consultant	66% (293/442)	(43) within 1 hour, (31) more than 1 hour but within 4 hours, (27) more than 4 hours but within 12 hours, (17) more than 12 hours but within 24 hours, (31) more than 24 hours
Hours from arrival time to time seen by any other consultant physician	67% (348/518)	(44) within 1 hour, (35) more than 1 hour but within 4 hours, (36) more than 4 hours but within 12 hours, (24) more than 12 hours but within 24 hours, (31) more than 24 hours
Hours from arrival to seen by a respiratory nurse/member of the COPD/respiratory team	66% (304/460)	(56) within 1 hour, (31) more than 1 hour but within 4 hours, (16) more than 4 hours but within 12 hours, (22) more than 12 hours but within 24 hours, (31) more than 24 hours
Hours from arrival to first chest X-ray	60% (499/829)	(82) within 1 hour, (149) more than 1 hour but within 4 hours, (59) more than 4 hours but within 12 hours, (17) more than 12 hours but within 24 hours, (23) more than 24 hours
Hours from arrival to first ABG	65% (486/745)	(93) within 1 hour, (70) more than 1 hour but within 4 hours, (41) more than 4 hours but within 12 hours, (24) more than 12 hours but within 24 hours, (31) more than 24 hours
FEV <sub>1</sub>	83% (344/417)	(32) within 0.10, (18) within 0.11-0.20, (23) more than 0.20
FEV <sub>1</sub> predicted	82% (312/383)	(18) within 1.0% predicted, (27) within 1.1-5.0% predicted, (15) within 5.1-10.0% predicted, (11) more than 10.0% predicted
FVC	78% (311/398)	(22) within 0.10, (13) within 0.11-0.20, (18) within 0.21-0.50, (34) more than 0.50
Albumin (g/L)	91% (691/760)	(20) within 1.0, (30) within 1.1-4.0, (19) more than 4.0
Urea (mmol/L)	89% (825/930)	(49) within 1.0, (17) within 1.1-2.0, (14) within 2.1-4.0, (25) more than 4.0
Eosinophil count (10 <sup>9</sup> /L)	88% (721/824)	(55) within 0.10, (21) within 0.11-0.30, (10) within 0.31-0.50, (17) more than 0.50
CRP (mg/L)	86% (759/884)	(38) within 1.0, (28) within 1.1-5.0, (21) within 5.1-20.0, (38) more than 20.0
First ABG – pH	75% (631/841)	(131) within 0.01, (15) within 0.011-0.02, (37) within 0.021-0.05, (27) more than 0.05
First ABG – pCO <sub>2</sub>	86% (717/836)	(85) within 1.0, (17) within 1.1-2.0, (12) within 2.1-4.0, (5) more than 4.0
First ABG – pO <sub>2</sub>	85% (713/835)	(57) within 1.0, (20) within 1.1-2.0, (21) within 2.1-4.0, (24) more than 4.0
First ABG – HCO <sub>3</sub>	78% (623/800)	(89) within 1.0, (63) within 1.1-4.0, (25) more than 4.0
Second ABG – pH	70% (241/345)	(51) within 0.01, (14) within 0.011-0.03, (13) within 0.031-0.05, (26) more than 0.05
Second ABG – pCO <sub>2</sub>	78% (268/345)	(43) within 1.0, (22) within 1.1-2.0, (8) within 2.1-4.0, (4) more than 4.0
Second ABG – pO <sub>2</sub>	75% (258/343)	(39) within 1.0, (17) within 1.1-2.0, (13) within 2.1-4.0, (16) more than 4.0
Second ABG – HCO <sub>3</sub>	72% (233/324)	(40) within 1.0, (34) within 1.1-4.0, (17) more than 4.0

## MAIN BODY TEXT OF AGREEMENT TABLES AND STATISTICS

In the tables that follow, the responses of the original auditor are described on the left vertical side of the table and the responses of the repeat independent auditor are described across the top horizontal. The variable descriptor for the repeat auditor is denoted by an 'R' at the start of the descriptor. The values in the table show the number of cases for how many agreements and disagreements there were between the auditors.

### Gender

		R Gender		Total
		Female	Male	
Gender	Female	559	8	567
	Male	5	533	538
Total		564	541	1105

Kappa, k=0.98

### Age (in years)

		R Age				Total
		<65	65-74	75-84	85+	
Age	<65	288	5	-	-	293
	65-74	2	383	1	-	386
	75-84	-	2	298	1	301
	85+	-	-	2	115	117
Total		290	390	301	116	1097

Kappa, k=0.98

The difference between years was computed and for 94.1% (1032) there was exact agreement, for 5.3% (58) there was disagreement of 1 year, and for 0.6% (7) it was more than 1 year (range 2-19).

### Ethnicity

Ethnicity	R Ethnicity													Total	
	Any other Asian background	Any other black background	Any other ethnic group	Any other mixed background	Any other white background	Bangladeshi	Caribbean	Chinese	Indian	Not stated	Pakistani	White and black Caribbean	White British		White Irish
Any other Asian background	4	-	-	-	-	-	-	-	-	1	-	-	-	-	5
Any other black background	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Any other ethnic group	-	-	2	-	1	-	-	-	1	2	-	-	-	-	6
Any other mixed background	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Any other white background	-	-	-	-	11	-	-	-	-	-	-	-	7	-	18
Bangladeshi	-	-	-	-	-	2	-	-	-	-	-	-	-	-	2
Caribbean	-	-	-	-	-	-	6	-	-	-	-	-	1	-	7
Chinese	-	-	-	-	-	-	-	2	-	-	-	-	-	-	2
Indian	-	-	-	-	-	-	-	-	1	1	-	-	-	-	2
Not stated	-	-	-	-	-	-	-	-	-	88	2	-	36	1	127
Pakistani	-	-	-	-	-	-	-	-	-	-	5	-	1	-	6
White and black Caribbean	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
White British	-	-	-	-	2	-	-	-	-	56	-	2	847	4	911
White Irish	-	-	-	-	-	-	-	-	-	1	-	-	4	11	16
Total	4	1	2	1	14	2	6	2	2	149	7	3	896	16	1105

Kappa, k=0.65

		R White British			Total
		No	Yes	Not known	
White	No	49	13	5	67
British	Yes	8	847	56	911
	Not known	3	36	88	127
Total		60	896	149	1105

Kappa, k=0.65; excluding 'Not known' k=0.81

### Month of admission

		R Month of admission to unit				Total
		Before February	February	March	April	
Month of admission to unit	February	4	740	4	-	748
	March	-	4	237	1	242
	April	-	-	1	114	115
Total		4	744	242	115	1105

Kappa, k=0.97

### Day of week of admission

		R Day of week of admission							Total
		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	
Day of week of admission	Monday	177	2	-	3	1	-	1	184
	Tuesday	5	168	9	1	-	1	-	184
	Wednesday	-	4	167	9	1	-	-	181
	Thursday	1	-	2	132	5	2	-	142
	Friday	-	2	-	1	110	4	-	117
	Saturday	-	-	-	1	5	119	1	126
	Sunday	2	-	1	-	1	3	164	171
Total		185	176	179	147	123	129	166	1105

Kappa, k=0.93

### Time of arrival

Time of arrival (2-hourly categories)	R Time of arrival (2-hourly categories)												Total
	00:00-1:59	2:00-3:59	4:00-5:59	6:00-7:59	8:00-9:59	10:00-11:59	12:00-13:59	14:00-15:59	16:00-17:59	18:00-19:59	20:00-21:59	22:00-23:59	
00:00-1:59	43	3	1	1	-	-	2	-	1	-	2	2	55
2:00-3:59	-	52	1	1	-	-	-	-	-	2	1	3	60
4:00-5:59	2	2	44	1	-	-	2	1	-	-	1	-	53
6:00-7:59	-	2	2	36	4	2	-	-	-	-	1	-	47
8:00-9:59	-	2	-	-	64	5	2	-	1	-	-	1	75
10:00-11:59	-	-	-	5	-	91	7	1	2	2	1	1	110
12:00-13:59	-	-	-	-	3	5	115	4	3	-	-	-	130
14:00-15:59	1	-	-	1	1	1	3	121	6	2	-	1	137
16:00-17:59	1	1	-	2	2	1	1	7	105	3	-	1	124
18:00-19:59	1	1	-	1	-	1	3	2	6	86	2	2	105
20:00-21:59	3	-	-	1	1	1	-	1	1	4	83	4	99
22:00-23:59	2	7	2	-	2	2	-	2	2	2	2	87	110
Total	53	70	50	49	77	109	135	139	127	101	93	102	1105

Kappa, k=0.82

The difference between admission date in days was computed and for 93.8% (1037) there was exact agreement, for 4.1% (45) there was disagreement of 1 day, and for 0.5% (6) it was 2-4 days, for 0.3% (3) it was 5-9 days, and for 1.3% (14) it was 10 or more days.

### Day of week of discharge

		R Day of week of discharge							Total
		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	
Day of week of discharge	Monday	154	3	1	2	-	2	4	166
	Tuesday	4	184	11	-	3	1	-	203
	Wednesday	2	4	158	5	2	-	1	172
	Thursday	3	1	6	173	4	1	-	188
	Friday	5	5	3	1	198	8	-	220
	Saturday	2	1	2	2	3	72	2	84
	Sunday	1	1	1	-	1	1	59	64
Total		171	199	182	183	211	85	66	1097

Kappa, k=0.89

### Month of discharge

		R Month of discharge						Total
		Before February	February	March	April	May	June	
Month of discharge	February	1	653	6	3	1	2	666
	March	-	2	279	4	-	-	285
	April	-	3	6	129	1	-	139
	May	-	-	-	1	7	-	8
Total		1	658	291	137	9	2	1098

Kappa, k=0.95

The difference between discharge date in days was computed and for 90.8% (996) there was exact agreement, for 3.7% (41) there was disagreement of 1 day, and for 1.7% (19) it was 2-4 days, for 0.9% (10) it was 5-9 days, and for 2.8% (31) it was 10 or more days.

### Length of stay (discharge and death) in days

		R LOS				Total
		0-3	4-7	8-14	15+	
LOS	0-3	511	15	6	5	537
	4-7	8	302	8	4	322
	8-14	1	6	146	5	158
	15+	5	2	4	69	80
Total		525	325	164	83	1097

Kappa, k=0.90

		R LOS 7		Total
		≤7 days	>7 days	
LOS 7	≤7 days	836	23	859
	>7 days	14	224	238
Total		850	247	1097

Kappa, k=0.90

The difference between LOS in days was computed and for 86.5% (949) there was exact agreement, for 7.4% (81) there was disagreement of 1 day, and for 2.7% (30) it was 2-4 days, for 1.0% (11) it was 5-9 days, and for 2.4% (26) it was 10 or more days.

### Initial care

		R Under whose care was the patient initially admitted?						Total
		Acute medicine consultant	Care-of-elderly consultant	Not recorded	Nurse consultant	Other physician	Respiratory consultant	
Under whose care was the patient initially admitted?	Acute medicine consultant	597	18	1	1	32	30	679
	Care-of-elderly consultant	15	60	-	-	3	2	80
	Not recorded	5	-	2	-	1	2	10
	Nurse consultant	-	-	-	-	-	-	0
	Other physician	44	3	-	1	89	9	146
	Respiratory consultant	34	1	1	1	7	146	190
Total		695	82	4	3	132	189	1105

Kappa, k=0.66; excluding 'Not recorded', k=0.67

### Transfer in

		R Was this case admitted at another unit and then transferred to your unit?		Total
		No	Yes	
Was this case admitted at another unit and then transferred to your unit?	No	951	52	1003
	Yes	44	58	102
Total		995	110	1105

Kappa, k=0.50

### Seen by any specialty trainee/SpR (ST3+)

		R Seen by any specialty trainee/SpR (ST3+) within LOS			Total
		Yes	Not seen by	Not recorded	
Seen by any specialty trainee/SpR (ST3+) within LOS	Yes	595	60	9	664
	Not seen by	68	284	21	373
	Not recorded	15	31	22	68
Total		678	375	52	1105

Kappa, k=0.64; excluding 'Not recorded', k=0.72

When both auditors agreed the patient was seen (595), dates and times were given by both for 472. For 66.7% (315) there was exact agreement, for 9.3% (44) there was disagreement within 1 hour, for 6.1% (29) it was more than 1 hour but within 4 hours, for 6.1% (29) it was more than 4 hours but within 12 hours, and for 11.7% (55) it was more than 12 hours.



Hours from arrival time to time seen by any specialty trainee/SpR (ST3+) within LOS	R Hours (H) from arrival time to time seen by any specialty trainee/SpR (ST3+) within LOS																	Total	
	≥12 H but <24 H before arrival	≥6H but <12H before arrival	≥3H but <6H before arrival	≥2H but <3H before arrival	≥1H but <2H before arrival	>0H but <1H before arrival	SAME as arrival time	>0H but ≤1H after arrival	>1H but ≤2H after arrival	>2H but ≤3H after arrival	>3H but ≤4H after arrival	>4H but ≤5H after arrival	>5H but ≤6H after arrival	>6H but ≤12H after arrival	>12 H but ≤18 H after arrival	>18 H but ≤24 H after arrival	>24 H but ≤48 H after arrival		>48 H after arrival
≥12H but <24H before arrival	2	-	-	-	-	-	-	-	-	1	-	-	-	1	1	-	-	-	5
≥6H but <12H before arrival	-	2	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	4
≥3H but <6H before arrival	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
≥2H but <3H before arrival	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
≥1H but <2H before arrival	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
>0H but <1H before arrival	-	-	-	-	1	2	-	1	-	-	-	-	-	-	-	-	-	-	4
SAME as arrival time	-	-	-	-	-	1	16	-	1	1	-	-	-	1	-	-	1	-	21
>0H but ≤1H after arrival	-	1	-	-	-	-	3	25	1	2	-	2	1	-	-	1	-	2	38
>1H but ≤2H after arrival	-	-	-	1	-	-	2	-	29	1	1	-	2	-	1	-	-	3	40
>2H but ≤3H after arrival	2	-	-	-	1	-	2	-	4	32	-	-	1	1	-	-	2	1	46
>3H but ≤4H after arrival	-	-	-	-	-	-	-	-	-	-	25	-	-	-	-	-	-	1	26
>4H but ≤5H after arrival	-	-	-	-	-	-	-	-	-	-	-	18	1	-	1	-	1	1	22
>5H but ≤6H after arrival	-	-	-	-	-	-	1	-	1	-	1	1	16	-	1	-	1	-	22
>6H but ≤12H after arrival	-	-	-	-	-	-	1	1	2	-	-	-	1	49	1	-	2	-	57
>12H but ≤18H after arrival	-	-	-	-	-	-	-	-	-	2	-	-	-	-	13	1	-	1	17
>18H but ≤24H after arrival	-	-	1	-	-	-	-	1	-	1	-	-	-	-	1	19	2	-	25
>24H but ≤48H after arrival	-	-	1	-	-	-	1	3	-	1	-	-	-	4	1	-	51	1	63
>48H after arrival	-	-	-	-	-	-	1	3	1	2	-	1	1	1	-	-	1	69	80
Total	4	4	3	1	3	3	27	35	39	43	27	22	23	57	20	21	61	79	472

Kappa, k=0.76

Seen by any specialty trainee/SpR (ST3+)	R Seen by any specialty trainee/SpR (ST3+)		Total
	Within 4 hours	Later than 4 hours	
Within 4 hours	164	22	186
Later than 4 hours	25	261	286
Total	189	283	472

Kappa, k=0.79

### Seen by a respiratory consultant

		R Seen by a respiratory consultant			Total
		Yes	Not seen by	Not recorded	
Seen by a respiratory consultant	Yes	572	19	2	593
	Not seen by	38	440	5	483
	Not recorded	5	15	9	29
Total		615	474	16	1105

Kappa, k=0.85; excluding 'Not recorded', k=0.89

When both auditors agreed the patient was seen (572), dates and times were given by both for 442. For 66.3% (293) there was exact agreement, for 9.7% (43) there was disagreement within 1 hour, for 7.0% (31) it was more than 1 hour but within 4 hours, for 6.1% (27) it was more than 4 hours but within 12 hours, for 3.9% (17) it was more than 12 hours but within 24 hours, and for 7.0% (31) it was more than 24 hours.

Hours from arrival time to time seen by a respiratory consultant within LOS	R Hours from arrival time to time seen by a respiratory consultant within LOS															Total	
	≥12 H but <24 H before arrival	≥6H but <12 H before arrival	≥3H but <6H before arrival	>0H but <1H before arrival	SAME as arrival time	>0H but ≤1H after arrival	>1H but ≤2H after arrival	>2H but ≤3H after arrival	>3H but ≤4H after arrival	>4H but ≤5H after arrival	>5H but ≤6H after arrival	>6H but ≤12H after arrival	>12 H but ≤18 H after arrival	>18 H but ≤24 H after arrival	>24 H but ≤48 H after arrival		>48 H after arrival
≥12H but <24H before arrival	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
≥6H but <12H before arrival	-	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	3
≥3H but <6H before arrival	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
>0H but <1H before arrival	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
SAME as arrival time	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
>0H but ≤1H after arrival	-	-	-	-	-	2	-	-	1	-	-	-	-	1	-	-	4
>1H but ≤2H after arrival	1	-	-	-	1	-	7	-	2	-	-	1	-	-	1	-	13
>2H but ≤3H after arrival	-	-	-	-	-	-	1	6	-	-	-	-	-	-	-	-	7
>3H but ≤4H after arrival	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	3
>4H but ≤5H after arrival	-	-	-	-	-	-	-	-	1	7	-	-	-	-	-	-	8
>5H but ≤6H after arrival	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	2
>6H but ≤12H after arrival	-	1	-	2	-	1	1	-	1	1	2	46	1	-	1	2	59
>12H but ≤18H after arrival	-	1	-	-	-	-	-	-	-	-	-	6	57	2	1	1	68
>18H but ≤24H after arrival	-	-	-	-	-	-	-	-	-	-	-	-	1	47	3	4	55
>24H but ≤48H after arrival	-	-	-	-	-	-	-	-	1	-	-	2	1	1	79	3	87
>48H after arrival	-	-	-	1	1	-	-	-	-	1	-	2	-	1	11	114	131
Total	1	2	1	3	2	3	11	7	9	9	4	57	61	52	96	124	442

Kappa, k=0.80

Hours from arrival time to time seen by a respiratory consultant within LOS	R Hours from arrival time to time seen by a respiratory consultant within LOS		Total
	Within 24 hours	Later than 24 hours	
Hours from arrival time to time seen by a respiratory consultant within LOS	211	13	224
Total	222	220	442

Kappa, k=0.89

### Seen by any other consultant physician

Seen by any other consultant physician (eg acute, geriatric, gastroenterology) within LOS	R Seen by any other consultant physician (eg acute, geriatric, gastroenterology) within LOS			Total
	Yes	Not seen by	Not recorded	
Yes	678	75	4	757
Not seen by	59	243	13	315
Not recorded	13	11	9	33
Total	750	329	26	1105

Kappa, k=0.65; excluding 'Not recorded', k=0.69

When both auditors agreed the patient was seen (678), dates and times were given by both for 518. For 67.2% (348) there was exact agreement, for 8.5% (44) there was disagreement within 1 hour, for 6.8% (35) it was more than 1 hour but within 4 hours, for 7.0% (36) it was more than 4 hours but within 12 hours, for 4.6% (24) it was more than 12 hours but within 24 hours, and for 6.0% (31) it was more than 24 hours.

Hours from arrival time to time seen by any other consultant physician (eg acute, geriatric, gastroenterology)	R Hours from arrival time to time seen by any other consultant physician (eg acute, geriatric, gastroenterology)																	Total	
	≥12H but <24H before arrival	≥6H but <12H before arrival	≥3H but <6H before arrival	≥2H but <3H before arrival	≥1H but <2H before arrival	>0H but <1H before arrival	SAME as arrival time	>0H but ≤1H after arrival	>1H but ≤2H after arrival	>2H but ≤3H after arrival	>3H but ≤4H after arrival	>4H but ≤5H after arrival	>5H but ≤6H after arrival	>6H but ≤12H after arrival	>12H but ≤18H after arrival	>18H but ≤24H after arrival	>24H but ≤48H after arrival		>48H after arrival
≥12H but <24H before arrival	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2
≥6H but <12H before arrival	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	2
≥3H but <6H before arrival	-	-	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	3
≥2H but <3H before arrival	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
≥1H but <2H before arrival	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2
>0H but <1H before arrival	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	2	4
SAME as arrival time	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	3
>0H but ≤1H after arrival	-	-	-	-	-	-	1	10	1	1	-	-	-	-	2	-	-	-	15
>1H but ≤2H after arrival	-	-	-	-	-	-	-	1	16	1	1	1	1	-	-	-	-	-	22
>2H but ≤3H after arrival	-	-	-	-	-	-	-	-	1	23	-	-	-	-	-	1	-	1	26
>3H but ≤4H after arrival	1	-	-	-	-	-	1	1	-	-	21	-	-	2	-	1	1	1	29
>4H but ≤5H after arrival	-	-	-	-	-	-	-	1	-	4	1	21	1	-	-	1	-	-	29
>5H but ≤6H after arrival	-	-	1	-	-	-	-	1	-	1	3	-	21	1	1	-	-	1	30
>6H but ≤12H after arrival	-	-	-	-	1	-	-	2	2	3	2	1	4	101	3	1	4	-	124
>12H but ≤18H after arrival	-	2	-	-	-	-	-	-	-	-	-	1	-	3	77	1	6	1	91
>18H but ≤24H after arrival	-	-	-	-	-	-	-	-	-	-	-	1	-	2	2	42	3	1	51
>24H but ≤48H after arrival	-	1	-	-	-	-	-	-	1	1	-	1	-	3	2	2	36	1	48
>48H after arrival	-	-	-	-	-	-	-	1	-	-	1	2	-	3	2	1	1	25	36
Total	1	4	4	1	3	1	4	17	22	34	30	28	27	116	90	50	53	33	518

Kappa, k=0.74

		R Hours from arrival time to time seen by any other consultant physician		Total
		Within 24 hours	Later than 24 hours	
Hours from arrival time to time seen by any other consultant physician	Within 24 hours	411	23	434
	Later than 24 hours	21	63	84
Total		432	86	518

Kappa, k=0.69

**Seen by a respiratory nurse/member of the COPD/respiratory team**

		R Seen by a respiratory nurse/member of the COPD/respiratory team within LOS			Total
		Yes	Not seen by	Not recorded	
Seen by a respiratory nurse/member of the COPD/respiratory team within LOS	Yes	610	37	11	658
	Not seen by	32	345	30	407
	Not recorded	8	17	15	40
Total		650	399	56	1105

Kappa, k=0.76; excluding 'Not recorded', k=0.86

When both auditors agreed the patient was seen (610), dates and times were given by both for 460. For 66.1% (304) there was exact agreement, for 12.2% (56) there was disagreement within 1 hour, for 6.7% (31) it was more than 1 hour but within 4 hours, for 3.5% (16) it was more than 4 hours but within 12 hours, for 4.8% (22) it was more than 12 hours but within 24 hours, and for 6.7% (31) it was more than 24 hours.

Hours from arrival time to time seen by a respiratory nurse/member of the COPD/respiratory team	R Hours from arrival time to time seen by a respiratory nurse/member of the COPD/respiratory team															Total	
	≥6H but <12H before arrival	≥3H but <6H before arrival	≥2H but <3H before arrival	≥1H but <2H before arrival	>0H but <1H before arrival	SAME as arrival time	>1H but ≤2H after arrival	>2H but ≤3H after arrival	>3H but ≤4H after arrival	>4H but ≤5H after arrival	>5H but ≤6H after arrival	>6H but ≤12H after arrival	>12H but ≤18H after arrival	>18H but ≤24H after arrival	>24H but ≤48H after arrival		>48H after arrival
≥6H but <12H before arrival	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	2
≥3H but <6H before arrival	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	3
≥2H but <3H before arrival	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
>1H but <2H before arrival	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
>0H but <1H before arrival	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
SAME as arrival time	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	2
>0H but ≤1H after arrival	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
>1H but ≤2H after arrival	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	3
>2H but ≤3H after arrival	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
>3H but ≤4H after arrival	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	4
>4H but ≤5H after arrival	-	-	-	-	-	-	-	-	-	4	1	-	-	-	-	1	6
>5H but ≤6H after arrival	-	-	-	-	-	-	-	-	-	1	5	1	-	-	-	-	7
>6H but ≤12H after arrival	-	-	-	1	-	-	-	-	-	-	-	40	1	1	1	1	45
>12H but ≤18H after arrival	1	-	-	-	-	-	-	-	-	-	-	3	56	3	1	3	67
>18H but ≤24H after arrival	-	1	-	1	-	-	-	-	-	-	-	-	2	72	6	2	84
>24H but ≤48H after arrival	-	-	-	-	-	1	-	-	-	-	1	2	1	6	91	4	106
>48H after arrival	-	-	1	-	-	-	-	-	-	-	-	-	-	1	6	120	128
<b>Total</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>4</b>	<b>6</b>	<b>7</b>	<b>46</b>	<b>61</b>	<b>83</b>	<b>107</b>	<b>132</b>	<b>460</b>

Kappa, k=0.83

		R Hours from arrival time to time seen by a respiratory nurse/member of the COPD/respiratory team		Total
		Within 24 hours	Later than 24 hours	
Hours from arrival time to time seen by a respiratory nurse/member of the COPD/respiratory team	Within 24 hours	208	18	226
	Later than 24 hours	13	221	234
<b>Total</b>		<b>221</b>	<b>239</b>	<b>460</b>

Kappa, k=0.87

### First chest X-ray

		R First chest X-ray		Total
		Did not have	Yes	
First chest X-ray	Did not have	12	26	38
	Yes	16	1051	1067
<b>Total</b>		<b>28</b>	<b>1077</b>	<b>1105</b>

Kappa, k=0.35

When both auditors agreed the patient had a chest X-ray (1051), dates and times were given by both for 829. For 60.0% (499) there was exact agreement, for 9.9% (82) there was disagreement within 1 hour, for 18.0% (149) it was more than 1 hour but within 4 hours, for 7.1% (59) it was more than 4 hours but within 12 hours, for 2.1% (17) it was more than 12 hours but within 24 hours, and for 2.8% (23) it was more than 24 hours.

Hours from arrival to first chest X-ray	R Hours from arrival to first chest X-ray																	Total	
	≥12 H but <24 H before arrival	≥6H but <12 H before arrival	≥3H but <6H before arrival	≥2H but <3H before arrival	≥1H but <2H before arrival	>0H but <1H before arrival	SAME as arrival time	>0H but ≤1H after arrival	>1H but ≤2H after arrival	>2H but ≤3H after arrival	>3H but ≤4H after arrival	>4H but ≤5H after arrival	>5H but ≤6H after arrival	>6H but ≤12H after arrival	>12 H but ≤18 H after arrival	>18 H but ≤24 H after arrival	>24 H but ≤48 H after arrival		>48 H after arrival
≥12H but <24H before arrival	6	4	-	-	1	-	-	-	1	1	1	1	-	1	-	-	-	-	16
≥6H but <12H before arrival	-	11	-	1	2	-	-	4	-	-	-	-	-	-	1	-	-	-	19
≥3H but <6H before arrival	1	1	22	2	-	-	-	5	2	1	2	1	-	-	-	-	-	-	37
≥2H but <3H before arrival	1	-	3	25	1	-	-	-	1	-	-	1	-	1	-	-	1	-	34
≥1H but <2H before arrival	-	1	2	1	32	1	-	4	1	2	-	-	-	-	-	-	-	-	44
>0H but <1H before arrival	-	1	1	-	-	25	-	3	2	1	2	-	-	-	-	-	-	-	35
SAME as arrival time	-	-	-	-	1	-	1	2	1	-	-	-	-	-	-	-	-	-	5
>0H but ≤1H after arrival	1	-	3	1	6	4	-	164	11	3	2	-	-	-	2	-	2	2	201
>1H but ≤2H after arrival	5	-	2	2	2	1	-	3	140	8	3	2	-	5	-	-	-	1	174
>2H but ≤3H after arrival	-	-	1	4	1	3	-	4	5	85	-	-	-	-	1	-	1	-	105
>3H but ≤4H after arrival	-	-	1	1	-	1	-	-	1	2	48	5	1	1	-	-	1	-	62
>4H but ≤5H after arrival	-	-	1	-	-	-	-	1	1	1	1	15	1	-	-	-	-	-	21
>5H but ≤6H after arrival	-	-	-	-	-	-	-	-	-	-	-	1	7	-	-	-	-	-	8
>6H but ≤12H after arrival	1	-	-	1	-	1	1	-	2	1	-	-	-	20	-	1	-	-	28
>12H but ≤18H after arrival	-	2	1	-	-	-	-	-	-	-	-	1	-	-	9	-	1	-	14
>18H but ≤24H after arrival	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	8	1	-	10
>24H but ≤48H after arrival	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	4	1	8
>48H after arrival	-	1	-	-	-	1	-	2	1	2	-	-	-	-	-	-	-	1	8
Total	15	21	37	38	46	37	2	195	169	107	60	27	9	28	13	9	11	5	829

Kappa, k=0.71

		R Hours from arrival to first chest X-ray		Total
		Within 4 hours	Later than 4 hours	
Hours from arrival to first chest X-ray	Within 4 hours	701	31	732
	Later than 4 hours	26	71	97
Total		727	102	829

Kappa, k=0.68

**If the patient had a chest X-ray, does the chest X-ray demonstrate consolidation?**

		R If the patient had a chest X-ray, does the chest X-ray demonstrate consolidation?			Total
		No	Not known	Yes	
If the patient had a chest X-ray, does the chest X-ray demonstrate consolidation?	No	780	20	39	839
	Not known	20	17	8	45
	Yes	33	3	131	167
Total		833	40	178	1051

Kappa, k=0.66; excluding 'Not known', k=0.74

### Antibiotic given within the first 24 hours

		R Was a first dose of antibiotic given within the first 24 hours?				Total
		Did not have	No – dose given but outside the first 24 hours	Not known	Yes – dose given within 24 hours of admission	
Was a first dose of antibiotic given within the first 24 hours?	Did not have	85	3	2	19	109
	No – dose given but outside the first 24 hours	2	13	1	7	23
	Not known	-	-	4	5	9
	Yes – dose given within 24 hours of admission	10	9	8	937	964
Total		97	25	15	968	1105

Kappa, k=0.74; excluding 'Not known', k=0.78

### Oral/IV steroid given within 24 hours

		R Was a first dose of oral/IV steroid given within 24 hours?				Total
		Did not have	No – dose given but outside the first 24 hours	Not known	Yes – dose given within 24 hours of admission	
Was a first dose of oral/IV steroid given within 24 hours?	Did not have	51	4	1	15	71
	No – dose given but outside the first 24 hours	2	9	1	16	28
	Not known	1	0	9	13	23
	Yes – dose given within 24 hours of admission	20	12	8	943	983
Total		74	25	19	987	1105

Kappa, k=0.58; excluding 'Not known', k=0.62

### Oxygen prescribed on the medication chart or equivalent during admission

		R Was oxygen prescribed on the medication chart or equivalent during this admission?			Total
		No	Not required	Yes	
Was oxygen prescribed on the medication chart or equivalent during this admission?	No	266	33	40	339
	Not required	46	66	15	127
	Yes	47	11	581	639
Total		359	110	636	1105

Kappa, k=0.69

**Oxygen response: both auditors state oxygen used (n=581)**

		R If oxygen was prescribed, please select the correct response:						Total
		No answer	Not recorded	Other target stipulated	Target range not stipulated	Target stipulated 88-92%	Target stipulated 94-98%	
If oxygen was prescribed, please select the correct response:	No answer	-	-	-	-	4	-	4
	Not recorded	-	-	1	-	1	-	2
	Other target stipulated	-	-	13	-	4	-	17
	Target range not stipulated	-	-	1	4	4	-	9
	Target stipulated 88-92%	2	1	2	2	485	6	498
	Target stipulated 94-98%	-	-	1	-	4	46	51
Total		2	1	18	6	502	52	581

Kappa, k=0.77; excluding 'Not known'/'No answer', k=0.82

**Known to have COPD prior to this admission**

		R Was the patient known to have COPD prior to this admission?		Total
		No	Yes	
Was the patient known to have COPD prior to this admission?	No	68	15	83
	Yes	11	1011	1022
Total		79	1026	1105

Kappa, k=0.83

**Smoking status**

		R Smoking status				Total
		Current smoker	Ex-smoker	Never smoked	Not recorded during admission	
Smoking status	Current smoker	348	28	-	12	388
	Ex-smoker	19	537	5	33	594
	Never smoked	-	4	21	-	25
	Not recorded during admission	21	26	-	51	98
Total		388	595	26	96	1105

Kappa, k=0.77; excluding 'Not recorded', k=0.88

**Smoking cessation advice: both auditors state patient was current smoker (n=348)**

		R If a current smoker, was the patient given smoking cessation advice during the admission?				Total
		No	Not applicable	Not recorded/not clear from notes	Yes	
If a current smoker, was the patient given smoking cessation advice during the admission?	No	18	3	7	7	35
	Not applicable	-	6	7	2	15
	Not recorded/not clear from notes	9	3	64	17	93
	Yes	9	-	17	179	205
Total		36	12	95	205	348

Kappa, k=0.59; excluding 'Not recorded', k=0.66

### Significant comorbidity

		R Alcohol-related condition		Total
		No	Yes	
Alcohol-related condition	No	1054	10	1064
	Yes	9	32	41
Total		1063	42	1105

Kappa, k=0.76

		R Atrial fibrillation		Total
		No	Yes	
Atrial fibrillation	No	945	16	961
	Yes	17	127	144
Total		962	143	1105

Kappa, k=0.87

		R Cor pulmonale		Total
		No	Yes	
Cor pulmonale	No	1061	9	1070
	Yes	14	21	35
Total		1075	30	1105

Kappa, k=0.64

		R Dementia/confusion		Total
		No	Yes	
Dementia/confusion	No	1052	10	1062
	Yes	7	36	43
Total		1059	46	1105

Kappa, k=0.80

		R Diabetes		Total
		No	Yes	
Diabetes	No	916	11	927
	Yes	6	172	178
Total		922	183	1105

Kappa, k=0.94

		R Hearing impairment		Total
		No	Yes	
Hearing impairment	No	1086	8	1094
	Yes	8	3	11
Total		1094	11	1105

Kappa, k=0.27

		R Hypertension		Total
		No	Yes	
Hypertension	No	711	50	761
	Yes	30	314	344
Total		741	364	1105

Kappa, k=0.83



		R Ischaemic heart disease		Total
		No	Yes	
Ischaemic heart disease	No	840	39	879
	Yes	28	198	226
Total		868	237	1105

Kappa, k=0.82

		R Kidney disease		Total
		No	Yes	
Kidney disease	No	1029	16	1045
	Yes	8	52	60
Total		1037	68	1105

Kappa, k=0.80

		R Left heart failure (LVF)		Total
		No	Yes	
Left heart failure (LVF)	No	1023	25	1048
	Yes	18	39	57
Total		1041	64	1105

Kappa, k=0.62

		R Locomotor problems		Total
		No	Yes	
Locomotor problems	No	942	51	993
	Yes	42	70	112
Total		984	121	1105

Kappa, k=0.55

		R Lung cancer		Total
		No	Yes	
Lung cancer	No	1079	3	1082
	Yes	1	22	23
Total		1080	25	1105

Kappa, k=0.92

		R Mental health disorder		Total
		No	Yes	
Mental health disorder	No	967	29	996
	Yes	22	87	109
Total		989	116	1105

Kappa, k=0.75

		R Neurological condition		Total
		No	Yes	
Neurological condition	No	1031	16	1047
	Yes	16	42	58
Total		1047	58	1105

Kappa, k=0.71

		R Osteoporosis		Total
		No	Yes	
Osteoporosis	No	1020	12	1032
	Yes	11	62	73
Total		1031	74	1105

Kappa, k=0.83

		R Stroke		Total
		No	Yes	
Stroke	No	1019	15	1034
	Yes	10	61	71
Total		1029	76	1105

Kappa, k=0.82

		R Thromboembolic disease (pulmonary embolism (PE), deep-vein thrombosis (DVT))		Total
		No	Yes	
Thromboembolic disease (PE, DVT)	No	1043	13	1056
	Yes	10	39	49
Total		1053	52	1105

Kappa, k=0.76

		R Visual impairment		Total
		No	Yes	
Visual impairment	No	1079	4	1083
	Yes	7	15	22
Total		1086	19	1105

Kappa, k=0.73

		R Other respiratory disease		Total
		No	Yes	
Other respiratory disease	No	924	41	965
	Yes	44	96	140
Total		968	137	1105

Kappa, k=0.65

		R Other cardiovascular disease		Total
		No	Yes	
Other cardiovascular disease	No	942	38	980
	Yes	36	89	125
Total		978	127	1105

Kappa, k=0.67

		R Other gastrointestinal condition		Total
		No	Yes	
Other gastrointestinal condition	No	969	33	1002
	Yes	19	84	103
Total		988	117	1105

Kappa, k=0.74

		R Other malignant disease		Total
		No	Yes	
Other malignant disease	No	1008	13	1021
	Yes	18	66	84
Total		1026	79	1105

Kappa, k=0.80

		R Other endocrine disorder		Total
		No	Yes	
Other endocrine disorder	No	1006	16	1022
	Yes	19	64	83
Total		1025	80	1105

Kappa, k=0.77

		R Number of significant comorbidity categories					Total
		0	1	2	3	4-8	
Number of significant comorbidity categories	0	118	37	9	3	1	168
	1	21	202	55	13	6	297
	2	10	41	176	38	17	282
	3	-	7	44	115	31	197
	4-8	1	4	8	26	122	161
Total		150	291	292	195	177	1105

Kappa, k=0.57

Kappa with linear weighting 0.74

(NOTE: Unweighted kappa does not take account of the ordinal nature, and regards one kind of discrepancy to be as serious as another. A weighted version of kappa can be calculated that takes account of how far apart any disagreements are. An obvious choice for weights would be 0 for agree, 1 for a disagreement by one category, 2 for a disagreement of two categories etc. These are known as linear weights.)

### MRC dyspnoea score in the weeks prior to admission

What was the estimated MRC dyspnoea score in the weeks prior to this admission with COPD (ie excluding this exacerbation)?	R What was the estimated MRC dyspnoea score in the weeks prior to this admission with COPD (ie excluding this exacerbation)?						Total
	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Not known/Not recorded	
Grade 1 – Not troubled by breathlessness except on strenuous exercise	18	6	-	2	1	18	45
Grade 2 – Short of breath when hurrying or walking up a slight hill	4	37	5	5	4	15	70
Grade 3 – Walks slower than contemporaries on level ground because of breathlessness or has to stop for breath when walking at own pace	1	8	70	14	4	15	112
Grade 4 – Stops for breath after walking about 100 metres (109 yards) or after a few minutes on level ground	1	4	10	146	30	31	222
Grade 5 – Too breathless to leave the house or breathless when dressing or undressing	-	2	8	21	145	30	206
Not known/Not recorded	10	11	17	23	40	349	450
Total	34	68	110	211	224	458	1105

Kappa, k=0.58

Kappa, k=0.67 excluding 'Not known'

Kappa, k=0.74 excluding 'Not known' with linear weighting

(NOTE: Unweighted kappa does not take account of the ordinal nature, and regards one kind of discrepancy as serious as another. A weighted version of kappa can be calculated that takes account of how far apart any disagreements are. An obvious choice for weights would be 0 for agree, 1 for a disagreement by one grade, 2 for a disagreement of two grades etc. These are known as linear weights.)

**Spirometry recorded within the notes/case record during the last 5 years**

		R Has spirometry been recorded within the notes/case record during the last 5 years?		Total
		No	Yes	
Has spirometry been recorded within the notes/case record during the last 5 years?	No	547	68	615
	Yes	55	435	490
Total		602	503	1105

Kappa, k=0.78

		R GOLD stage for % predicted FEV <sub>1</sub>				Total
		≥80%	50-79%	30-49%	<30%	
GOLD stage for % predicted FEV <sub>1</sub>	≥80%	14	1	-	-	15
	50-79%	1	98	3	-	102
	30-49%	2	2	165	4	173
	<30%	-	-	3	90	93
Total		17	101	171	94	383

Kappa, k=0.94

FEV<sub>1</sub>: values from both auditors for 417/435: 82.5% (344) exact agreement, 7.7% (32) disagreement within 0.10, 4.3% (18) disagreement within 0.11-0.20, 5.5% (23) disagreement in excess of 0.20.

FEV<sub>1</sub> predicted: values from both auditors for 383/435: 81.5% (312) exact agreement, 4.7% (18) disagreement within 1.0% predicted, 7.1% (27) disagreement within 1.1-5.0% predicted, 3.9% (15) disagreement within 5.1-10.0% predicted, 2.9% (11) disagreement in excess of 10.0% predicted.

FVC: values from both auditors for 398/435: 78.1% (311) exact agreement, 5.5% (22) disagreement within 0.10, 3.3% (13) disagreement within 0.11-0.20, 4.5% (18) disagreement within 0.21-0.50, 8.5% (34) disagreement in excess of 0.50.

### Albumin (g/L)

		R Albumin (g/L)		Total
		≥34	<34	
Albumin (g/L)	≥34	607	5	612
	<34	5	143	148
Total		612	148	760

Kappa, k=0.96

Exact agreement for 90.9% (691/760), 2.6% (20) disagreement within 1.0, 4.0% (30) disagreement within 1.1-4.0, 2.5% (19) disagreement in excess of 4.0.

### Urea (mmol/L)

		R Urea (mmol/L)		Total
		≤7.1	>7.1	
Urea (mmol/L)	≤7.1	614	18	632
	>7.1	11	287	298
Total		625	305	930

Kappa, k=0.93

Exact agreement for 88.7% (825/930), 5.3% (49) disagreement within 1.0, 1.8% (17) disagreement within 1.1-2.0, 1.5% (14) disagreement within 2.1-4.0, 2.7% (25) disagreement in excess of 4.0.

### Eosinophil count (10<sup>9</sup>/L)

		R Eosinophil count (10 <sup>9</sup> /L)			Total
		Other	>0.45	<0.01 (=zero)	
Eosinophil count (10 <sup>9</sup> /L)	Other	477	7	22	506
	>0.45	7	67	4	78
	<0.01 (=zero)	14	5	221	240
Total		498	79	247	824

Kappa, k=0.87

Exact agreement for 87.5% (721/824), 6.7% (55) disagreement within 0.10, 2.6% (21) disagreement within 0.11-0.30, 1.2% (10) disagreement within 0.31-0.50, 2.1% (17) disagreement in excess of 0.50.

### CRP (mg/L)

		R CRP (mg/L)		Total
		<10.0	≥10.0	
CRP (mg/L)	<10.0	223	13	236
	≥10.0	10	638	648
Total		233	651	884

Kappa, k=0.93

Exact agreement for 85.9% (759/884), 4.3% (38) disagreement within 1.0, 3.2% (28) disagreement within 1.1-5.0, 2.4% (21) disagreement within 5.1-20.0, 4.3% (38) disagreement in excess of 20.0.

**Does the ECG demonstrate AF?**

		R Does the ECG demonstrate AF?				Total
		No	Not recorded	There is no ECG from this admission	Yes	
Does the ECG demonstrate AF?	No	770	20	20	16	826
	Not recorded	30	21	8	5	64
	There is no ECG from this admission	16	12	50	5	83
	Yes	20	2	6	104	132
Total		836	55	84	130	1105

Kappa, k=0.65; excluding 'Not recorded' k=0.76

**BMI recorded in notes**

		R Has the patient's BMI been recorded in the notes?		Total
		No	Yes	
Has the patient's BMI been recorded in the notes?	No	589	87	676
	Yes	77	352	429
Total		666	439	1105

Kappa, k=0.69

**First arterial blood gas taken**

		R Was a first arterial blood gas taken?		Total
		No	Yes	
Was a first arterial blood gas taken?	No	174	41	215
	Yes	36	854	890
Total		210	895	1105

Kappa, k=0.78

When both auditors agreed ABG was taken (854), dates and times were given by both for 745. For 65.2% (486) there was exact agreement, for 12.5% (93) there was disagreement within 1 hour, for 9.4% (70) it was more than 1 hour but within 4 hours, for 5.5% (41) it was more than 4 hours but within 12 hours, for 3.2% (24) it was more than 12 hours but within 24 hours, and for 4.2% (31) it was more than 24 hours.

Hours from arrival to first arterial blood gas	R Hours from arrival to first arterial blood gas																	Total	
	≥12 H but <24 H before arrival	≥6 H but <12 H before arrival	≥3 H but <6H before arrival	≥2 H but <3H before arrival	≥1 H but <2H before arrival	>0H but <1H before arrival	SA ME as arrival time	>0H but ≤1H after arrival	>1H but ≤2H after arrival	>2H but ≤3H after arrival	>3H but ≤4H after arrival	>4H but ≤5H after arrival	>5H but ≤6H after arrival	>6H but ≤12 H after arrival	>12 H but ≤18 H after arrival	>18 H but ≤24 H after arrival	>24 H but ≤48 H after arrival		>48H after arrival
≥12H but <24H before arrival	1	2	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	6
≥6H but <12H before arrival	-	7	-	-	-	-	-	3	1	-	-	1	-	1	-	-	-	-	13
≥3H but <6H before arrival	1	-	21	-	1	1	-	3	1	-	2	-	-	-	1	-	-	-	31
≥2H but <3H before arrival	-	-	1	18	1	1	-	2	-	1	-	-	-	-	-	-	1	1	26
≥1H but <2H before arrival	1	1	-	-	20	1	-	5	1	1	-	-	-	1	-	1	-	-	32
>0H but <1H before arrival	1	-	-	2	2	30	-	6	4	2	2	-	-	-	-	-	-	-	49
SAME as arrival time	-	1	-	1	-	1	6	-	-	-	-	-	-	-	-	-	-	-	9
>0H but ≤1H after arrival	3	-	3	-	7	7	1	177	4	3	3	-	1	2	2	-	1	2	216
>1H but ≤2H after arrival	-	-	3	1	2	2	-	9	113	2	1	-	-	1	-	-	1	2	137
>2H but ≤3H after arrival	-	2	1	1	1	1	-	2	1	63	4	-	-	2	-	-	1	1	80
>3H but ≤4H after arrival	-	-	1	-	-	1	-	1	1	3	25	-	-	-	-	-	-	-	33
>4H but ≤5H after arrival	-	-	1	1	-	-	-	-	3	-	1	13	-	-	-	-	-	-	19
>5H but ≤6H after arrival	-	-	-	-	-	1	-	-	1	2	1	-	8	-	-	-	-	-	13
>6H but ≤12H after arrival	-	1	-	-	-	-	-	1	2	-	-	-	-	19	-	-	-	-	23
>12H but ≤18H after arrival	-	1	-	-	-	-	-	1	-	1	-	-	-	1	7	-	-	-	11
>18H but ≤24H after arrival	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	5
>24H but ≤48H after arrival	-	-	-	-	1	-	-	2	-	-	-	-	1	-	-	-	9	1	14
>48H after arrival	-	1	-	-	-	2	-	-	3	-	-	-	-	-	-	-	-	10	16
Total	7	16	31	24	35	48	7	213	135	78	39	14	10	29	10	7	13	17	733

Kappa, k=0.71

		R pH			Total
		<7.26	7.26-7.34	7.35+	
pH	<7.26	60	5	-	65
	7.26-7.34	4	117	8	129
	7.35+	2	6	639	647
Total		66	128	647	841

Kappa, k=0.92

Exact agreement for 75.0% (631/841), 15.6% (131) disagreement within 0.01, 1.8% (15) disagreement within 0.011-0.02, 4.4% (37) disagreement within 0.021-0.05, 3.2% (27) disagreement in excess of 0.05.

		R pCO <sub>2</sub>		Total
		≤6.0	>6.0	
pCO <sub>2</sub>	≤6.0	460	11	471
	>6.0	10	355	365
Total		470	366	836

Kappa, k=0.95

Exact agreement for 85.8% (717/836), 10.2% (85) disagreement within 1.0, 2.0% (17) disagreement within 1.1-2.0, 1.4% (12) disagreement within 2.1-4.0, 0.6% (5) disagreement in excess of 4.0.

		R pO <sub>2</sub>			Total
		<7.3	7.3-8.0	>8.0	
pO <sub>2</sub>	<7.3	224	9	13	246
	7.3-8.0	6	105	6	117
	>8.0	17	7	448	472
Total		247	121	467	835

Kappa, k=0.88

Exact agreement for 85.4% (713/835), 6.8% (57) disagreement within 1.0, 2.4% (20) disagreement within 1.1-2.0, 2.5% (21) disagreement within 2.1-4.0, 2.9% (24) disagreement in excess of 4.0.

		R HCO <sub>3</sub>			Total
		<23	23-30	>30	
HCO <sub>3</sub>	<23	109	8	3	120
	23-30	9	511	6	526
	>30	-	8	146	154
Total		118	527	155	800

Kappa, k=0.92

Exact agreement for 77.8% (623/800), 11.1% (89) disagreement within 1.0, 7.9% (63) disagreement within 1.1-4.0, 3.1% (25) disagreement in excess of 4.0.

#### Was the FiO<sub>2</sub> recorded? (n=854 if both auditors agreed on ABGs taken)

		R Was the FiO <sub>2</sub> recorded?			Total
		No answer	No	Yes	
Was the FiO <sub>2</sub> recorded?	No answer	4	8	15	27
	No	6	165	61	232
	Yes	7	47	541	595
Total		17	220	617	854

Kappa, k=0.60; excluding 'No answer' k=0.66

#### Second arterial blood gas taken

		R Was a second arterial blood gas taken?		Total
		No	Yes	
Was a second arterial blood gas taken?	No	680	36	716
	Yes	35	354	389
Total		715	390	1105

Kappa, k=0.86

		R Minutes between blood gases							Total
		≤30mins	31-60mins	61-120mins	121-240mins	241-360mins	361-720mins	>720mins	
Minutes Between blood gases	≤30mins	9	1	1	1	-	-	1	13
	31-60mins	-	28	1	2	-	2	1	34
	61-120mins	-	3	55	1	1	1	2	63
	121-240mins	1	1	3	51	1	3	-	60
	241-360mins	-	1	1	-	22	1	-	25
	361-720mins	1	2	1	2	-	17	3	26
	>720mins	1	1	4	1	-	1	71	79
	Total		12	37	66	58	24	25	78

Kappa, k=0.81



		R pH			Total
		<7.26	7.26-7.34	7.35+	
pH	<7.26	43	2	1	46
	7.26-7.34	5	93	5	103
	7.35+	2	7	187	196
Total		50	102	193	345

Kappa, k=0.89

Exact agreement for 69.9% (241/345), 14.8% (51) disagreement within 0.01, 4.1% (14) disagreement within 0.011-0.03, 3.8% (13) disagreement within 0.031-0.05, 7.5% (26) disagreement in excess of 0.05.

		R pCO <sub>2</sub>		Total
		≤6.0	>6.0	
pCO <sub>2</sub>	≤6.0	106	5	111
	>6.0	4	230	234
Total		110	235	345

Kappa, k=0.94

Exact agreement for 77.7% (268/345), 12.5% (43) disagreement within 1.0, 6.4% (22) disagreement within 1.1-2.0, 2.3% (8) disagreement within 2.1-4.0, 1.2% (4) disagreement in excess of 4.0.

		R pO <sub>2</sub>			Total
		<7.3	7.3-8.0	>8.0	
pO <sub>2</sub>	<7.3	90	4	8	102
	7.3-8.0	6	52	3	61
	>8.0	7	6	167	180
Total		103	62	178	343

Kappa, k=0.84

Exact agreement for 75.2% (258/343), 11.4% (39) disagreement within 1.0, 5.0% (17) disagreement within 1.1-2.0, 3.8% (13) disagreement within 2.1-4.0, 4.7% (16) disagreement in excess of 4.0.

		R HCO <sub>3</sub>			Total
		<23	23-30	>30	
HCO <sub>3</sub>	<23	37	3	1	41
	23-30	2	172	8	182
	>30	-	5	96	101
Total		39	180	105	324

Kappa, k=0.90

Exact agreement for 71.9% (233/324), 12.4% (40) disagreement within 1.0, 10.5% (34) disagreement within 1.1-4.0, 5.3% (17) disagreement in excess of 4.0.

**Was the FiO<sub>2</sub> recorded?** (n=354 if both auditors agreed on ABGs taken)

		R Was the FiO <sub>2</sub> recorded?			Total
		No answer	No	Yes	
Was the FiO <sub>2</sub> recorded?	No answer	1	2	5	8
	No	5	49	26	80
	Yes	8	18	240	266
Total		14	69	271	354

Kappa, k=0.52; excluding 'No answer' k=0.61

**Patient treated with NIV**

Was the patient treated with NIV?	R Was the patient treated with NIV?							Total
	Yes	No – not clinically indicated	No – patient declined	No – NIV not available	No – reason unclear	Patient intubated directly	Not known	
Yes	130	8	-	-	4	1	-	143
No – not clinically indicated	3	885	2	5	6	-	3	904
No – patient declined	3	1	5	-	2	-	-	11
No – NIV not available	-	1	-	-	-	-	-	1
No – reason unclear	1	19	-	-	12	-	-	32
Patient intubated directly	-	-	-	-	-	2	-	2
Not known	1	10	-	-	-	-	1	12
<b>Total</b>	<b>138</b>	<b>924</b>	<b>7</b>	<b>5</b>	<b>24</b>	<b>3</b>	<b>4</b>	<b>1105</b>

Kappa, k=0.79; excluding 'Not known' k=0.82

Minutes from arrival to NIV commenced	R Minutes from arrival to NIV commenced							Total
	≥12H but <24H before arrival	Up to 12H before arrival	<30mins after arrival	30-59mins after arrival	60-179mins after arrival	3-24H after arrival	>24H after arrival	
≥12H but <24H before arrival	1	-	-	-	-	-	-	1
Up to 12H before arrival	-	5	-	-	-	-	-	5
<30mins after arrival	-	-	3	-	-	-	-	3
30-59mins after arrival	-	-	1	9	2	1	-	13
60-179mins after arrival	1	-	1	1	17	2	-	22
3-24H after arrival	1	3	-	1	-	24	-	29
>24H after arrival	-	1	-	-	-	2	16	19
<b>Total</b>	<b>3</b>	<b>9</b>	<b>5</b>	<b>11</b>	<b>19</b>	<b>29</b>	<b>16</b>	<b>92</b>

Kappa, k=0.77

**Decision on ceiling of care (including CPR) documented in notes within 24 hours of admission**

		R Yes full escalation		Total
		No	Yes	
Yes full escalation	No	946	28	974
	Yes	31	100	131
<b>Total</b>		<b>977</b>	<b>128</b>	<b>1105</b>

Kappa, k=0.74

		R Yes escalation to NIV not for intubation		Total
		No	Yes	
Yes escalation to NIV not for intubation	No	979	29	1008
	Yes	26	71	97
<b>Total</b>		<b>1005</b>	<b>100</b>	<b>1105</b>

Kappa, k=0.69

		R Yes no cardiopulmonary resuscitation		Total
		No	Yes	
Yes no cardiopulmonary resuscitation	No	967	27	994
	Yes	35	76	111
<b>Total</b>		<b>1002</b>	<b>103</b>	<b>1105</b>

Kappa, k=0.68

		R Yes not for NIV		Total
		No	Yes	
Yes not for NIV	No	1086	7	1093
	Yes	8	4	12
Total		1094	11	1105

Kappa, k=0.34

		R No record of decision on ceiling of care		Total
		No	Yes	
No record of decision on ceiling of care	No	384	127	511
	Yes	112	482	594
Total		496	609	1105

Kappa, k=0.56

		R Not applicable		Total
		No	Yes	
Not applicable	No	883	72	955
	Yes	70	80	150
Total		953	152	1105

Kappa, k=0.46

#### Decision on ceiling of care made within 24 hours – individuals involved

		R Respiratory consultant		Total
		No	Yes	
Respiratory consultant	No	1013	21	1034
	Yes	16	55	71
Total		1029	76	1105

Kappa, k=0.73

		R Other consultant		Total
		No	Yes	
Other consultant	No	904	44	948
	Yes	51	106	157
Total		955	150	1105

Kappa, k=0.64

		R SpR/ST3+		Total
		No	Yes	
SpR/ST3+	No	986	32	1018
	Yes	27	60	87
Total		1013	92	1105

Kappa, k=0.64

		R CT1/CT2		Total
		No	Yes	
CT1/CT2	No	1069	14	1083
	Yes	12	10	22
Total		1081	24	1105

Kappa, k=0.42

		R FY1/2		Total
		No	Yes	
FY1/2	No	1091	6	1097
	Yes	4	4	8
Total		1095	10	1105

Kappa, k=0.44

		R Other healthcare professional		Total
		No	Yes	
Other healthcare professional	No	1086	12	1098
	Yes	2	5	7
Total		1088	17	1105

Kappa, k=0.41

		R Patient		Total
		No	Yes	
Patient	No	1056	13	1069
	Yes	20	16	36
Total		1076	29	1105

Kappa, k=0.48

		R Family		Total
		No	Yes	
Family	No	1062	11	1073
	Yes	12	20	32
Total		1074	31	1105

Kappa, k=0.62

		R Not recorded		Total
		No	Yes	
Not recorded	No	1041	27	1068
	Yes	29	8	37
Total		1070	35	1105

Kappa, k=0.20

		R Not applicable		Total
		No	Yes	
Not applicable	No	819	100	919
	Yes	96	90	186
Total		915	190	1105

Kappa, k=0.37

**Was the patient assessed by the ITU team during admission?**

		R Was the patient assessed by the ITU team during admission?			Total
		Not assessed by ITU team	Not known	Yes	
Was the patient assessed by the ITU team during admission?	Not assessed by ITU team	991	10	12	1013
	Not known	16	5	-	21
	Yes	13	1	57	71
Total		1020	16	69	1105

Kappa, k=0.69; excluding 'Not known' k=0.81

		R If assessed by the ITU team, was the patient transferred to care of the ITU team?		Total
		Assessed but ITU team deemed inappropriate to transfer care	Yes	
If assessed by the ITU team, was the patient transferred to care of the ITU team?	Assessed but ITU team deemed inappropriate to transfer care	36	-	36
	Yes	1	20	21
Total		37	20	57

Kappa, k=0.96

#### Patient intubated/treated with mechanical ventilation

		R Was the patient intubated/treated with mechanical ventilation?			Total
		No	Not known	Yes – intubated and mechanically ventilated	
Was the patient intubated/treated with mechanical ventilation?	No	1057	12	4	1073
	Not known	14	10	-	24
	Yes – intubated and mechanically ventilated	1	1	6	8
Total		1072	23	10	1105

Kappa, k=0.50 excluding 'Not known' k=0.70

#### On what ward(s) was the patient managed during the admission?

		R Medical assessment unit (MAU)/admissions ward		Total
		No	Yes	
Medical assessment unit (MAU)/admissions ward	No	147	82	229
	Yes	67	809	876
Total		214	891	1105

Kappa, k=0.58

		R Respiratory ward		Total
		No	Yes	
Respiratory ward	No	591	51	642
	Yes	49	414	463
Total		640	465	1105

Kappa, k=0.81

		R Surgical/non-medical ward		Total
		No	Yes	
Surgical/non-medical ward	No	1063	10	1073
	Yes	10	22	32
Total		1073	32	1105

Kappa, k=0.68

		R Medical/respiratory HDU		Total
		No	Yes	
Medical/respiratory HDU	No	1050	16	1066
	Yes	8	31	39
Total		1058	47	1105

Kappa, k=0.71

		R Other medical ward (general/geriatric/non-respiratory)		Total
		No	Yes	
Other medical ward (general/geriatric/non respiratory)	No	830	46	876
	Yes	54	175	229
Total		884	221	1105

Kappa, k=0.72

		R Not known		Total
		No	Yes	
Not known	No	1081	10	1091
	Yes	13	1	14
Total		1094	11	1105

Kappa, k=0.07

#### Any indication of patient dying as inpatient in current LOS

		R Any indication of patient dying as inpatient – to exclude dying in a readmission		Total
		No	Yes	
Any indication of patient dying as inpatient – to exclude dying in a readmission	No	1064	4	1068
	Yes	3	34	37
Total		1067	38	1105

Kappa, k=0.90

#### Under whose care when decision to discharge or transfer to early/supported discharge scheme (n=1064 where both auditors agreed patient was discharged alive)

		R Acute medicine consultant		Total
		No	Yes	
Acute medicine consultant	No	647	62	709
	Yes	52	303	355
Total		699	365	1064

Kappa, k=0.76

		R Respiratory consultant		Total
		No	Yes	
Respiratory consultant	No	492	35	527
	Yes	39	498	537
Total		531	533	1064

Kappa, k=0.86

		R Care-of-elderly consultant		Total
		No	Yes	
Care-of-elderly consultant	No	954	16	970
	Yes	20	74	94
Total		974	90	1064

Kappa, k=0.79

		R GP		Total
		No	Yes	
GP	No	1057	3	1060
	Yes	1	3	4
Total		1058	6	1064

Kappa, k=0.60

		R Others		Total
		No	Yes	
Others	No	992	26	1018
	Yes	24	22	46
Total		1016	48	1064

Kappa, k=0.44

**Evidence patient discharged under the care of a COPD team or early/supported discharge service or equivalent (n=1064 where both auditors agreed patient was discharged alive)**

Evidence patient discharged under the care of a COPD team or early/supported discharge service or equivalent	R Evidence patient discharged under the care of a COPD team or early/supported discharge service or equivalent				Yes	Total
	Not available	Not recorded	Not suitable for referral to early discharge scheme	Reviewed by early discharge scheme but not accepted		
Not available	101	35	3	4	21	164
Not recorded	22	207	24	3	21	277
Not suitable for referral to early discharge scheme	3	15	41	7	14	80
Reviewed by early discharge scheme but not accepted	2	3	8	43	26	82
Yes	12	40	17	16	376	461
Total	140	300	93	73	458	1064

Kappa, k=0.61; excluding 'Not recorded' k=0.66

**Where patient was discharged to (n=1064 where both auditors agreed patient was discharged alive)**

Where patient was discharged to	R Where patient was discharged to								Total
	Community hospital/rehab ward or equivalent	Residential placement	Sheltered accommodation	House/flat alone	House/flat with another person	Not recorded	Other	No answer	
Community hospital/rehab ward or equivalent	13	1	-	1	1	-	-	-	16
Residential placement	1	33	1	1	4	1	2	1	44
Sheltered accommodation	-	1	10	1	2	-	-	1	15
House/flat alone	2	-	3	244	48	13	1	11	322
House/flat with another person	-	1	1	53	463	18	3	21	560
Not recorded	1	2	1	12	9	21	1	1	48
Other	-	-	-	4	2	-	10	1	17
No answer	-	3	-	7	14	8	-	10	42
<b>Total</b>	<b>17</b>	<b>41</b>	<b>16</b>	<b>323</b>	<b>543</b>	<b>61</b>	<b>17</b>	<b>46</b>	<b>1064</b>

Kappa, k=0.61; excluding 'Not recorded'/'No answer' k=0.74

**Was suitability for pulmonary rehabilitation considered at the time of discharge? (n=1064 where both auditors agreed patient was discharged alive)**

Was suitability for pulmonary rehabilitation considered at the time of discharge?	R Was suitability for pulmonary rehabilitation considered at the time of discharge?						Total
	No assessment made	Not known	Other	Yes – assessed and referred	Yes – assessed but not suitable for referral	Yes – assessed but referral declined	
No assessment made	354	67	7	20	25	4	477
Not known	53	71	1	11	9	4	149
Other	5	5	11	3	-	-	24
Yes – assessed and referred	16	8	1	132	3	2	162
Yes – assessed but not suitable for referral	27	8	4	8	102	6	155
Yes – assessed but referral declined	4	4	1	7	9	72	97
<b>Total</b>	<b>459</b>	<b>163</b>	<b>25</b>	<b>181</b>	<b>148</b>	<b>88</b>	<b>1064</b>

Kappa, k=0.59; excluding 'Not known' k=0.73

**IMD national quintiles**

Rank of IMD score (where 1 is most deprived)	R Rank of IMD score (where 1 is most deprived)					Total
	1-6496	6497-12993	12994-19489	19490-25985	25986-32482	
1-6496	286	2	5	1	-	294
6497-12993	6	232	3	1	2	244
12994-19489	1	4	174	1	3	183
19490-25985	2	1	1	155	1	160
25986-32482	-	1	2	3	89	95
<b>Total</b>	<b>295</b>	<b>240</b>	<b>185</b>	<b>161</b>	<b>95</b>	<b>976</b>

Kappa, k=0.95



		R Rank of income score (where 1 is most deprived)					Total
		1-6496	6497-12993	12994-19489	19490-25985	25986-32482	
Rank of income score	1-6496	294	4	2	2	1	303
	6497-12993	7	235	4	2	1	249
	12994-19489	4	4	171	-	2	181
	19490-25985	-	2	1	154	1	158
	25986-32482	1	1	1	2	80	85
Total		306	246	179	160	85	976

Kappa, k=0.94

		R Rank of employment score (where 1 is most deprived)					Total
		1-6496	6497-12993	12994-19489	19490-25985	25986-32482	
Rank of employment score	1-6496	305	-	3	4	-	312
	6497-12993	7	222	4	3	1	237
	12994-19489	-	5	180	2	1	188
	19490-25985	2	2	3	132	3	142
	25986-32482	1	-	2	2	92	97
Total		315	229	192	143	97	976

Kappa, k=0.94

		R Rank of health deprivation and disability score (where 1 is most deprived)					Total
		1-6496	6497-12993	12994-19489	19490-25985	25986-32482	
Rank of health deprivation and disability score	1-6496	293	1	4	1	-	299
	6497-12993	3	220	5	2	1	231
	12994-19489	3	6	185	4	-	198
	19490-25985	-	2	-	141	2	145
	25986-32482	-	-	4	1	98	103
Total		299	229	198	149	101	976

Kappa, k=0.95

		R Rank of education and skills training score (where 1 is most deprived)					Total
		1-6496	6497-12993	12994-19489	19490-25985	25986-32482	
Rank of education and skills training score	1-6496	308	3	2	-	2	315
	6497-12993	7	228	-	2	1	238
	12994-19489	2	3	156	2	1	164
	19490-25985	2	3	3	156	3	167
	25986-32482	1	1	-	2	88	92
Total		320	238	161	162	95	976

Kappa, k=0.95

		R Rank of barriers to housing and services score (where 1 is most deprived)					Total
		1-6496	6497-12993	12994-19489	19490-25985	25986-32482	
Rank of barriers to housing and services score	1-6496	156	-	1	-	2	159
	6497-12993	3	187	2	3	2	197
	12994-19489	2	2	175	2	1	182
	19490-25985	-	1	5	204	1	211
	25986-32482	1	1	2	2	221	227
Total		162	191	185	211	227	976

Kappa, k=0.96

		R Rank of crime score (where 1 is most deprived)					Total
		1-6496	6497-12993	12994-19489	19490-25985	25986-32482	
Rank of crime score	1-6496	247	6	2	2	1	258
	6497-12993	1	233	2	3	1	240
	12994-19489	3	3	159	1	1	167
	19490-25985	1	3	2	168	3	177
	25986-32482	1	1	2	1	129	134
Total		253	246	167	175	135	976

Kappa, k=0.95

		R Rank of living environment score (where 1 is most deprived)					Total
		1-6496	6497-12993	12994-19489	19490-25985	25986-32482	
Rank of living environment score	1-6496	195	5	2	2	-	204
	6497-12993	4	193	2	1	-	200
	12994-19489	1	2	206	-	1	210
	19490-25985	2	2	2	215	2	223
	25986-32482	-	-	1	3	135	139
Total		202	202	213	221	138	976

Kappa, k=0.96

		R Welsh WIMD quintiles rank					Total
		1-379	380-758	759-1138	1139-1517	1518-1896	
Welsh WIMD quintiles rank	1-379	25	-	-	-	-	25
	380-758	-	17	-	-	-	17
	759-1138	-	-	12	-	-	12
	1139-1517	-	1	1	13	-	15
	1518-1896	-	-	-	-	6	6
Total		25	18	13	13	6	75

Kappa, k=0.97

		R Welsh income quintiles rank					Total
		1-379	380-758	759-1138	1139-1517	1518-1896	
Welsh income quintiles rank	1-379	21	-	-	-	-	21
	380-758	-	22	-	-	-	22
	759-1138	-	-	14	-	-	14
	1139-1517	-	-	-	13	-	13
	1518-1896	-	-	1	-	4	5
Total		21	22	15	13	4	75

Kappa, k=0.98

		R Welsh employment quintiles rank					Total
		1-379	380-758	759-1138	1139-1517	1518-1896	
Welsh employment quintiles rank	1-379	25	-	-	-	-	25
	380-758	-	19	-	-	-	19
	759-1138	-	-	14	-	-	14
	1139-1517	-	1	-	13	-	14
	1518-1896	-	-	-	-	3	3
Total		25	20	14	13	3	75

Kappa, k=0.98

		R Welsh health quintiles rank					Total
		1-379	380-758	759-1138	1139-1517	1518-1896	
Welsh health quintiles rank	1-379	24	-	-	-	-	24
	380-758	-	16	-	-	-	16
	759-1138	-	-	9	-	-	9
	1139-1517	-	-	-	16	-	16
	1518-1896	-	-	1	-	9	10
Total		24	16	10	16	9	75

Kappa, k=0.98

		R Welsh education quintiles rank					Total
		1-379	380-758	759-1138	1139-1517	1518-1896	
Welsh education quintiles rank	1-379	18	-	-	-	-	18
	380-758	-	19	-	-	-	19
	759-1138	-	-	17	-	-	17
	1139-1517	-	-	1	11	-	12
	1518-1896	-	-	1	-	8	9
Total		18	19	19	11	8	75

Kappa, k=0.97

		R Welsh housing quintiles rank					Total
		1-379	380-758	759-1138	1139-1517	1518-1896	
Welsh housing quintiles rank	1-379	19	-	-	-	-	19
	380-758	-	13	-	-	-	13
	759-1138	-	-	20	-	-	20
	1139-1517	-	-	-	14	-	14
	1518-1896	-	-	-	-	9	9
Total		19	13	20	14	9	75

Kappa, k=0.1.00

		R Welsh environment quintiles rank					Total
		1-379	380-758	759-1138	1139-1517	1518-1896	
Welsh environment quintiles rank	1-379	15	-	-	-	-	15
	380-758	-	17	-	-	-	17
	759-1138	-	-	14	-	-	14
	1139-1517	-	-	-	14	-	14
	1518-1896	-	-	-	-	15	15
Total		15	17	14	14	15	75

Kappa, k=0.1.00

		R Welsh access to services quintiles rank					Total
		1-379	380-758	759-1138	1139-1517	1518-1896	
Welsh access to services quintiles rank	1-379	19	-	-	-	-	19
	380-758	-	9	-	-	-	9
	759-1138	-	-	12	-	-	12
	1139-1517	-	-	-	14	-	14
	1518-1896	-	-	1	-	20	21
Total		19	9	13	14	20	75

Kappa, k=0.98

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		R Welsh community safety quintiles rank					Total
		1-379	380-758	759-1138	1139-1517	1518-1896	
Welsh community safety quintiles rank	1-379	19	-	-	-	-	19
	380-758	-	18	-	-	-	18
	759-1138	-	1	13	-	-	14
	1139-1517	-	-	-	15	-	15
	1518-1896	-	-	-	1	8	9
Total		19	19	13	16	8	75

Kappa, k=0.97