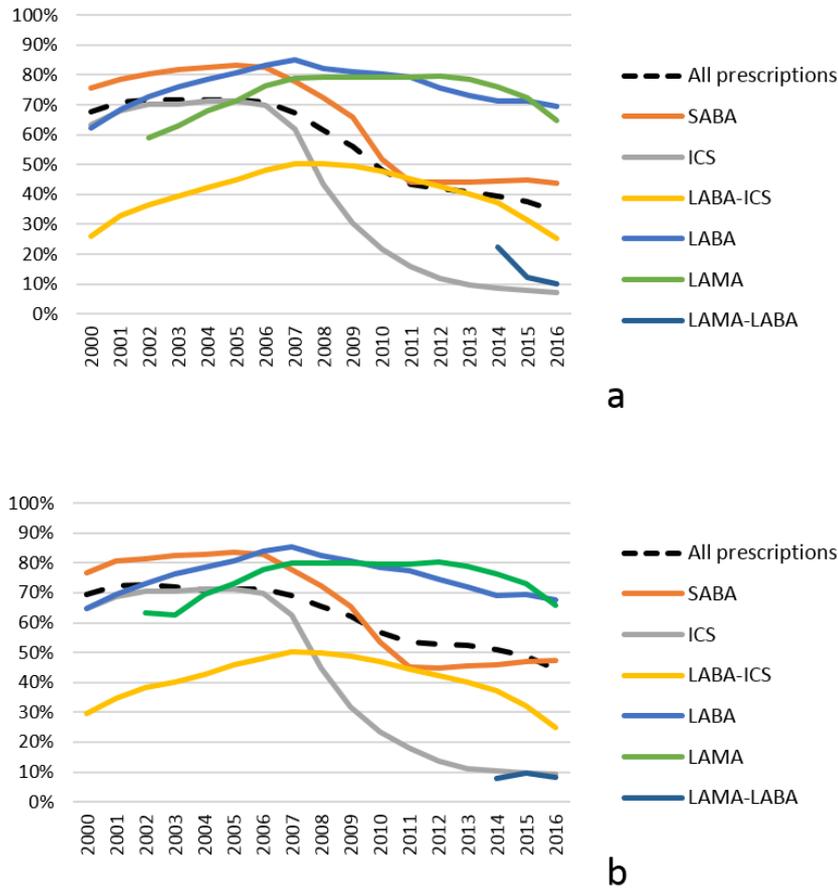
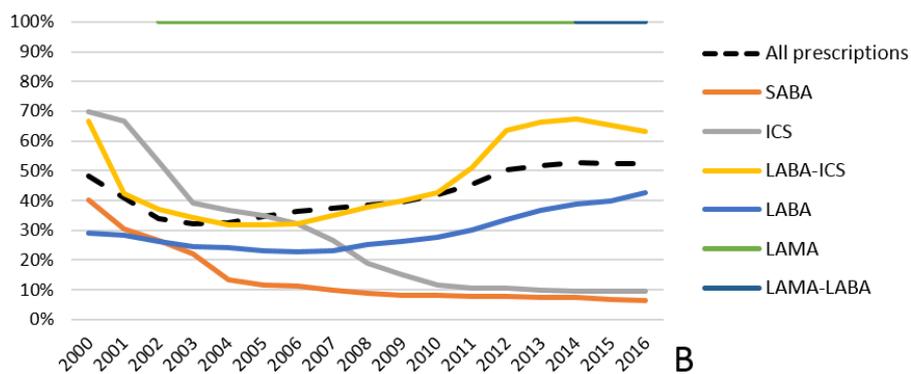
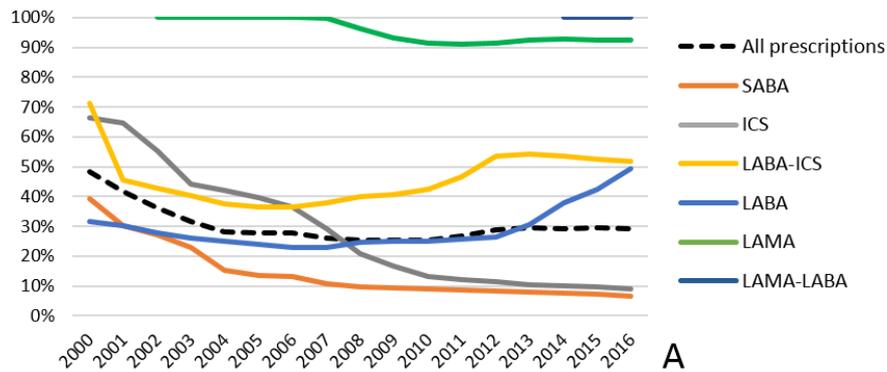


Supplementary Figure 1



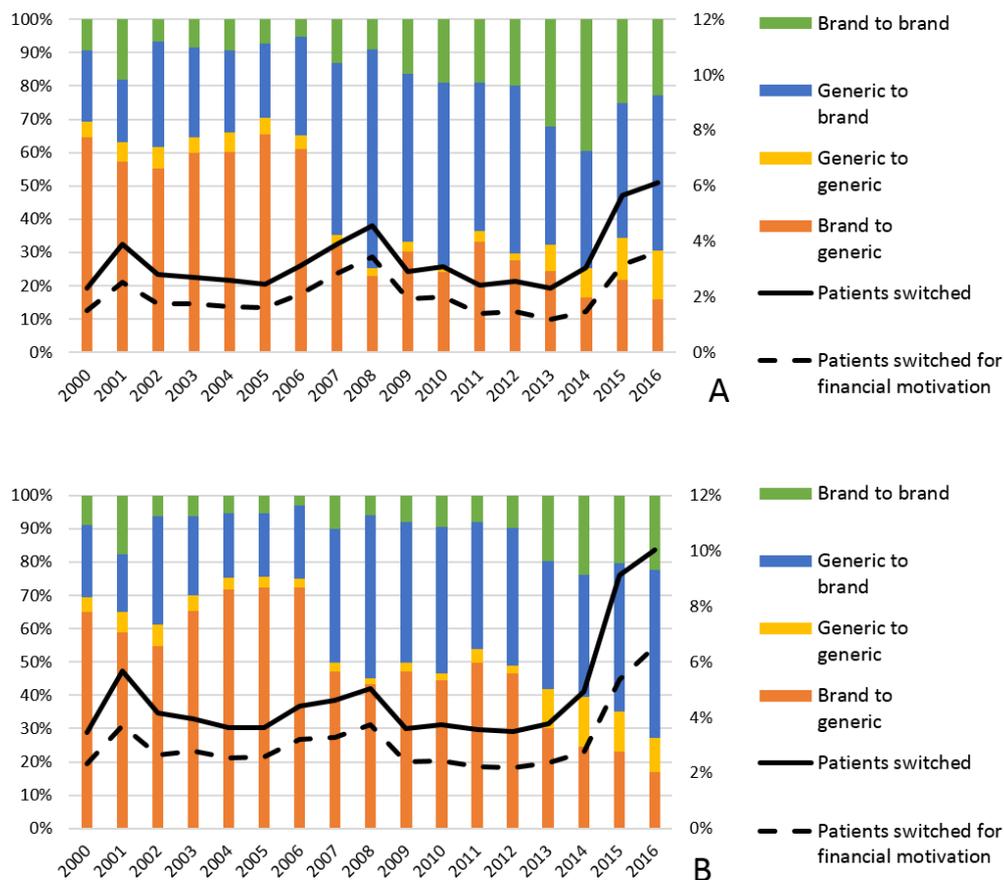
Proportion of generic inhaler prescriptions for asthma (N=649,529) and COPD patients (N=184,710), between 2000 and 2017. A. Patients with asthma. B. Patients with COPD. The dotted line is the proportion of all inhaler prescriptions that were generic; the full lines represents the proportion of generic prescriptions by each inhaler medication class.

Supplementary Figure 2.



Proportion of dry powder inhaler prescriptions for asthma (N=642,567) and COPD patients (N=183,872), between 2000 and 2017. A. Patients with asthma. B. Patients with COPD. The dotted line is the proportion of all prescriptions that were dry powder inhalers; the full lines represents the proportion of dry powder inhaler prescriptions by each inhaled medication class.

Supplementary Figure 3



Proportion of regular inhaler users that were switched, and the type of switch by generic/brand designation, for asthma (N=569,901,) and COPD patients (N=171,321), between 2000 and 2017. A. Regular inhalers users with asthma (excluding patients only prescribed SABA). B. Regular inhalers users with COPD (excluding patients only prescribed SABA). The right axis is the proportion of all regular inhaler users that were switched. The left axis refers to the stacked bars and is the proportion of financially-motivated switches that were switched been generic/branded inhalers

Supplementary Table 1. CPRD codes used to define a respiratory event

Medcode	Description of mecode's meaning	Symptom (used for sensitivity analysis)	Inhaler technique
76	upper respiratory infection nos		
78	asthma		
81	asthma monitoring		
92	cough	yes	
152	wheezy bronchitis	yes	
173	wheezing	yes	
185	acute exacerbation of asthma		
232	asthma attack		
233	severe asthma attack		
292	chesty cough	yes	
293	respiratory tract infection		
735	[d]breathlessness	yes	
741	[d]shortness of breath		
794	emphysema		
998	chronic obstructive airways disease		
1001	chronic obstructive pulmonary disease		
1025	bronchial cough	yes	
1160	[d]cough	yes	
1234	productive cough nos	yes	
1273	c/o - cough	yes	
1429	breathlessness	yes	
1446	acute exacerbation of chronic obstructive airways disease		
1555	bronchial asthma		
1608	respiratory disease monitoring		
1612	chronic cough	yes	
1692	o/e - bronchospasm		
1813	lung disease nos		
1837	lung function testing abnormal		
2210	[d]wheezing	yes	
2290	allergic asthma		
2395	[d]respiratory abnormalities nos		
2563	[d]respiratory distress		
2575	short of breath on exertion		
2637	upper respiratory tract infection nos		
2891	wheezing symptom	yes	
2909	o/e - breath sounds		
2931	difficulty breathing	yes	
3018	mild asthma		
3068	night cough present	yes	
3366	severe asthma		

3378	bronchodilators used a maximum of once daily	
3458	occasional asthma	
3628	persistent cough	yes
3645	coughing up phlegm	yes
3665	late onset asthma	
3959	[d]respiratory failure	
4070	morning cough	yes
4221	recurrent upper respiratory tract infection	
4342	[d]mouth breather	
4442	asthma unspecified	
4492	other diseases of respiratory system nos	
4606	exercise induced asthma	
4822	shortness of breath	
4836	nocturnal cough / wheeze	yes
4892	status asthmaticus nos	
4931	dry cough	yes
5175	breathlessness symptom	yes
5267	intrinsic asthma	
5349	shortness of breath symptom	
5515	seen in asthma clinic	
5627	hay fever with asthma	
5710	chronic obstructive airways disease nos	
5733	respiratory system diseases	
5798	chronic asthmatic bronchitis	
5818	respiratory symptoms	
5861	o/e - expiratory wheeze	yes
5867	exercise induced asthma	
5909	chronic wheezy bronchitis	yes
5978	acute wheezy bronchitis	yes
6004	o/e - breath sounds nos	
6124	acute lower respiratory tract infection	
6254	inhaler technique shown	yes
6294	acute upper respiratory tract infection	
6326	breathless - moderate exertion	yes
6372	wheeze absent	yes
6391	respiration monitoring	
6421	viral upper respiratory tract infection nos	
6475	[d]respiratory system and chest symptoms	
6563	other diseases of lung	
6671	[d]mouth breathing	yes
6707	extrinsic asthma with asthma attack	
6714	breath symptom	
7058	emergency admission, asthma	
7074	respiratory infection nos	

7092	recurrent wheezy bronchitis	yes
7146	extrinsic (atopic) asthma	
7169	breath holder	
7177	h/o: respiratory disease	
7191	asthma limiting activities	
7378	asthma management plan given	
7416	asthma disturbing sleep	
7534	o/e - respiratory distress	
7683	breathless - lying flat	yes
7706	productive cough -clear sputum	yes
7707	cough symptom nos	yes
7708	productive cough-yellow sputum	yes
7731	pollen asthma	
7773	productive cough -green sputum	yes
7905	[so]lung	
7932	breathless - mild exertion	yes
8025	acute respiratory infections	
8239	[d]cough with haemorrhage	yes
8269	seen by respiratory physician	
8318	lung consolidation	
8335	asthma attack nos	
8355	asthma monitored	
8484	inhaler technique - good	yes
8798	respiratory disease screen	
8968	cough fracture	yes
9018	number of asthma exacerbations in past year	
9042	fh: lung disease	
9496	o/e - breathing description	yes
9520	chronic obstructive pulmonary disease monitoring	
9552	change in asthma management plan	
9653	bronchospasm	
9663	step up change in asthma management plan	
9799	[d]cough syncope	yes
9876	severe chronic obstructive pulmonary disease	
9921	respiratory monitoring	
10043	asthma annual review	
10268	bc - breathing control technique	yes
10403	at risk of chronic obstructive pulmonary disease	
10487	asthma - currently active	
10711	inhaler technique observed	yes
10802	moderate chronic obstructive pulmonary disease	
10863	mild chronic obstructive pulmonary disease	
10874	referral to respiratory physician	
10980	centrilobular emphysema	

11019	admit copd emergency	
11022	asthma trigger	
11287	chronic obstructive pulmonary disease annual review	
11295	breathing control	yes
11387	refuses asthma monitoring	
11494	other respiratory system diseases	
11523	o/e - breathing depth	yes
11573	other lung disease nec nos	
11614	o/e - bronchial breathing	yes
11695	excepted from asthma quality indicators: informed dissent	
11758	inhaler technique - poor	yes
11768	h/o: * lung	
11820	no cough	yes
11839	asthma resolved	
12166	other specified chronic obstructive airways disease	
12403	other respiratory disease monitoring	
12987	late-onset asthma	
13064	asthma severity	
13065	moderate asthma	
13066	asthma - currently dormant	
13118	inhaler technique - moderate	yes
13135	night cough absent	
13173	asthma not disturbing sleep	
13174	asthma not limiting activities	
13175	asthma disturbs sleep frequently	
13176	asthma follow-up	
13658	refer for lung function test	
14231	peak flow rate before bronchodilation	
14232	peak flow rate after bronchodilation	
14465	o/e - respiratory rate	
14466	o/e - rate of respiration	
14777	extrinsic asthma without status asthmaticus	
14798	emphysematous bronchitis	
14819	[d]painful respiration nos	
15248	hay fever with asthma	
15544	closed injury of lung	
15583	excision of segment of lung	
15628	other upper respiratory infections of multiple sites	
15779	[d]respiratory failure nos	
16070	asthma nos	
16150	respiratory tract operations	
16287	chest infection - unspecified bronchopneumonia	
16410	other emphysema nos	
16468	[d]respiratory system and chest symptoms nos	

16655	asthma monitoring admin.	
16667	asthma control step 2	
16717	smokers' cough	yes
16785	asthma control step 1	
17185	acute bronchiolitis with bronchospasm	
17828	examn. of respiratory system	
17928	respiratory system diseases nos	
17976	noisy breathing	yes
17992	o/e - normal respiration	
18141	asthma monitoring due	
18176	[v]family history of asthma	
18223	step down change in asthma management plan	
18224	asthma control step 3	
18323	intrinsic asthma with asthma attack	
18476	copd follow-up	
18487	other lung anomalies	
18501	copd self-management plan given	
18621	chronic obstructive pulmonary disease follow-up	
18763	referral to asthma clinic	
18792	chronic obstructive pulmonary disease monitoring admin	
18885	seen by respiratory physician	
19003	emergency copd admission since last appointment	
19106	copd accident and emergency attendance since last visit	
19167	asthma monitoring by nurse	
19261	referral to respiratory nurse specialist	
19346	no breathlessness	yes
19373	o/e - smell of breath	
19428	chronic obstructive pulmonary disease excluded by spirometry	
19434	suspected chronic obstructive pulmonary disease	
19470	reflux cough	yes
19519	asthma treatment compliance unsatisfactory	
19520	asthma treatment compliance satisfactory	
19539	asthma monitoring check done	
19567	no family history of chronic obstructive pulmonary disease	
19721	chronic obstructive pulmonary disease leaflet given	
19750	respiratory physiotherapy	
20327	suspected respiratory disease	
20344	o/e - type of respiration	
20422	asthma clinic administration	
20490	painful breathing -pleurodynia	yes
20534	o/e - mouth breathing	yes
20860	asthma control step 5	
20886	asthma control step 4	
21113	acute respiratory infection nos	

21257	occupational lung disease	
21407	o/e - breath sounds normal	
21506	o/e - breath sounds abnormal	
21801	breathlessness nos	yes
22094	short of breath dressing/undressing	
22318	difficulty in coughing up sputum	yes
22649	respiratory monitoring nos	
22718	deep breathing exercises	
22752	occupational asthma	
22847	respiratory disorder excluded	
23002	respiratory system diseases nos	
23640	other specified acute respiratory infections	
23663	respiratory symptom nos	
24479	emergency asthma admission since last appointment	
24517	primary respiratory tb confirm bact and histologically	
24814	chronic respiratory failure	
24848	adult respiratory distress syndrome	
24884	asthma causes daytime symptoms 1 to 2 times per week	
24889	breathless - strenuous exertion	yes
25181	asthma restricts exercise	
25249	respiratory failure	
25258	o/e-rate of respiration normal	
25703	referral to respiratory rapid response team	
25705	asthma monitor 3rd letter	
25706	asthma monitor 2nd letter	
25707	asthma monitor 1st letter	
25791	asthma clinical management plan	
25796	mixed asthma	
25840	respiratory symptoms nos	
26010	other acute upper respiratory infections	
26018	chronic obstructive pulmonary disease monitoring by nurse	
26496	health education - asthma	
26501	asthma never causes daytime symptoms	
26502	bronchodilators used more than once daily	
26503	asthma causes daytime symptoms most days	
26504	asthma never restricts exercise	
26506	asthma severely restricts exercise	
26861	asthma sometimes restricts exercise	
27135	peak expiratory flow rate before bronchodilation	
27136	peak expiratory flow rate after bronchodilation	
27138	lung volume test done	
27141	fev1/fvc ratio before bronchodilator	
27926	extrinsic asthma with status asthmaticus	
28551	o/e - respiratory device	

28743	number of copd exacerbations in past year	
28755	chronic obstructive pulmonary disease monitoring 1st letter	
28844	reversibility trial by bronchodilator	
29318	evening cough	yes
29325	intrinsic asthma without status asthmaticus	
29466	upper respiratory tract disease nos	
29645	asthma control step 0	
29693	o/e-hernia-cough impulse shown	
29960	o/e - depth of respiration	
30192	o/e - breathing rate	yes
30308	dna - did not attend asthma clinic	
30382	asthma monitoring admin.nos	
30437	pneumonia with whooping cough	yes
30458	asthma monitoring by doctor	
30552	no respiratory symptoms	
30815	asthma causing night waking	
31135	asthma monitor phone invite	
31143	breathless - at rest	yes
31167	asthma night-time symptoms	
31225	asthma causes daytime symptoms 1 to 2 times per month	
31622	o/e - breathing method	yes
32416	other specified respiratory system anomaly nos	
32622	under care of respiratory physician	
32802	other upper respiratory tract diseases	
32912	no family history of respiratory disease	
33450	emphysema nos	
34202	chronic obstructive pulmonary disease monitoring 2nd letter	
34215	chronic obstructive pulmonary disease monitoring 3rd letter	
35303	dna - did not attend copd clinic	
35324	non-urgent respiratory admission	
35778	breathing exercises	yes
35927	asthma leaflet given	
36330	respiratory procedures nos	
36347	[d]respiratory symptom, unspecified	
36386	respiratory procedures	
37247	chronic obstructive pulmonary disease nos	
37371	chronic obstructive pulmonary disease monitoring due	
37447	acute lower respiratory tract infection	
37943	asthma monitor verbal invite	
37961	acute respiratory failure	
38074	chronic obstructive pulmonary disease monitor phone invite	
38143	asthma never disturbs sleep	
38144	asthma limits walking up hills or stairs	
38145	asthma limits walking on the flat	

38146	asthma disturbs sleep weekly	
38987	other specified diseases of respiratory system	
39570	asthma causes night symptoms 1 to 2 times per month	
39617	lung function testing done	
39667	[d]lung field abnormal nos	
39958	[d]respiratory abnormalities	
40566	number of times bronchodilator used in 24 hours	
40788	other emphysema	
40813	unable to complete a sentence in one breath	
40823	brittle asthma	
41554	asthma monitor offer default	
42287	borg breathlessness score: 6 severe (+)	yes
42313	health education - chronic obstructive pulmonary disease	
42317	increasing exercise wheeze	yes
42725	diagnostic bronchoscopic examination below trachea	
42824	asthma daytime symptoms	
42929	other specified diseases of respiratory system	
42965	other specified excision of lung	
43401	discharge by respiratory physician	
43406	[v]other cardiorespiratory problems	
43795	unexplained cough	yes
43844	relaxed breathing	
44352	number of times bronchodilator used in one week	
44536	o/e - breath smell normal	
45073	intrinsic asthma nos	
45195	h/o: respiratory disease nos	
45286	respiratory monitoring not required	
45770	chronic obstructive pulmonary disease disturbs sleep	
45771	chronic obstructive pulmonary disease does not disturb sleep	
45777	chronic obstructive pulmonary disease clini management plan	
45782	extrinsic asthma nos	
45837	other specified other operation on lung	
45998	chronic obstructive pulmonary disease monitoring by doctor	
46036	multiple copd emergency hospital admissions	
46052	severe acute respiratory syndrome	
46529	attends asthma monitoring	
46549	discharge from respiratory medicine service	
46689	lung function testing not done	
46765	[v]breathing exercises	
47240	[so]respiratory tract and mouth	
47337	asthma accident and emergency attendance since last visit	
47638	[d]other respiratory system and chest symptoms	
47993	does not have asthma management plan	
48252	respiratory complications of care	

48491	o/e - respiratory death	
48855	chronic obstructive pyelonephritis	
50264	[x]other disorders of lung	
50410	o/e - thoracic breathing	
50591	o/e - abdominal breathing	
50902	other specified respiratory tuberculosis	
50991	fusion of lobes of lung	
51031	o/e - bronchophony	
51069	other lung disease nec	
51448	seen by rapid response team - respiratory	
51476	respiratory education	
52098	breath symptom nos	
52834	o/e - type of respiration nos	
54786	h/o: * trachea/lung	
54946	asthma monitoring deleted	
55029	other respiratory support	
55457	[v]family history of other chronic respiratory condition	
55557	other external agent causing respiratory condition	
57193	borg breathlessness score: 3 moderate	yes
57308	other upper respiratory tract diseases nos	
57759	borg breathlessness score: 2 slight	yes
57903	clasp shortness of breath score	
58134	[so]other respiratory tract	
58170	under care of community respiratory team	
58196	intrinsic asthma with status asthmaticus	
58744	o/e - breathing method nos	
58791	lung disease with diseases ec	
59063	[so]respiratory tract nec	
59263	acute interstitial emphysema	
59860	borg breathlessness score: 4 somewhat severe	yes
60096	clasp shortness of breath score	
60101	excision of lung nos	
60188	giant bullous emphysema	
60290	other lung anomaly	
60903	cough aggravates symptom	yes
60905	breathing aggravates symptom	
61024	refer to community respiratory team	
61866	diaphragmatic breathing exercises	
62154	other respiratory procedures	
62913	[v]screening for chronic bronchitis or emphysema	
63183	st george's hospital respiratory questionnaire	
63912	lung disease with diseases ec nos	
64426	respiratory measurements	
64758	other lung anomaly nos	

65077	other specified operations on lung or mediastinum	
65137	o/e - tubular breathing	
65353	borg breathlessness score: 0 none at all	
65464	late effects of respiratory tuberculosis	
65733	[x]other specified chronic obstructive pulmonary disease	
65742	[x]other and unspecified abnormalities of breathing	yes
66058	[x]other emphysema	
66397	[x]other acute lower respiratory infections	
66460	[x]other specified respiratory disorders	
67040	other specified chronic obstructive pulmonary disease	
67278	[x]chronic lower respiratory diseases	
67566	borg breathlessness score: 9 very, very sev (almost maximal)	yes
67674	acbt - active cycle of breathing technique	yes
68247	o/e - breath sweet - acetone	
68707	borg breathlessness score: 1 very slight	yes
68754	education for self-management of respiratory health	
69289	respiratory tests	
70061	borg breathlessness score: 7 very severe	yes
70571	respiratory complication of care nos	
70630	[x]other diseases of the respiratory system	
70818	borg breathlessness score: 0.5 very, very slight	yes
71923	o/e - rate of respiration nos	
72334	borg breathlessness score: 8 very severe (+)	yes
73719	o/e - depth of respiration nos	
73743	other specified transplantation of lung	
74908	viral wheeze	yes
84402	lung function mixed defect	
85250	simple lung function exercise test	
85504	seen in community respiratory clinic	
86990	reduction of lung volume	
87497	simple lung function exercise testing	
90332	barking cough	yes
90853	control of respiration	
91441	respiratory tests nos	
92109	asthma outreach clinic	
93568	very severe chronic obstructive pulmonary disease	
93736	royal college of physicians asthma assessment	
93838	respiratory measurements nos	
94193	seen in respiratory clinic	
94212	other specified diagnostic imaging of respiratory system	
94914	measurement of static lung volume	
95895	referral to respiratory physician	
96603	other specified other respiratory support	
96931	at risk of chronic obstructive pulmonary diseases exacerbation	

97800	copd - enhanced services administration	
97814	other specified respiratory measurements	
98185	asthma control test	
98851	respiratory quotient normal	
99314	seen by gp with special interest in respiratory disorders	
99762	history of acute lower respiratory tract infection	
99793	patient has a written asthma personal action plan	
100107	health education - asthma self management	
100237	chronic obstructive pulmonary disease assessment test	
100333	cough on exercise	yes
100397	asthma control questionnaire	
100509	under care of asthma specialist nurse	
100600	lower respiratory sample	
100740	health education - structured asthma discussion	
100877	clinical chronic obstructive pulmonary disease questionnaire	
100954	[d]mild wheeze	yes
101037	[d]moderate wheeze	yes
101042	issue of chronic obstructive pulmonary disease rescue pack	
101073	[d]severe wheeze	yes
101421	[d]very severe wheeze	yes
101596	provision of written information on inhaler technique	yes
101734	measurement of respiratory muscle strength	
101792	other specified other respiratory tests	
101842	family history of pulmonary emphysema	
101843	borg breathlessness score: 10 maximal	yes
102146	referral to respiratory outreach team	
102170	asthma review using roy colleg of physicians three questions	
102209	mini asthma quality of life questionnaire	
102301	asthma trigger - seasonal	
102341	asthma trigger - pollen	
102395	asthma causes symptoms most nights	
102400	asthma causes night time symptoms 1 to 2 times per week	
102449	asthma trigger - respiratory infection	
102480	on examination - inspiratory wheeze	yes
102481	auscultation of lower respiratory tract	
102522	post bronchodilator spirometry	
102682	[x]other injuries of lung	
102685	chronic obstructive pulmonary disease 3 monthly review	
102713	asthma limits activities 1 to 2 times per month	
102797	respiratory observations of chest	
102871	asthma trigger - exercise	
102884	active cycle of breathing technique	
102888	asthma limits activities 1 to 2 times per week	
102952	asthma trigger - warm air	

103007	chronic obstructive pulmonary disease 6 monthly review	
103296	other specified respiratory education	
103318	health education - structured patient focused asthma discuss	
103321	asthma trigger - animals	
103400	referred for copd structured smoking assessment	
103488	referral to respiratory clinic declined	
103494	history of chronic obstructive pulmonary disease	
103558	preferred place of care for next exacerbation of copd	
103593	spirometric lung age	
103612	asthma never causes night symptoms	
103631	royal college physician asthma assessment 3 question score	
103716	seen by respiratory nurse specialist	
103758	referral to copd community nursing team	
103760	copd structured smoking assessment declined	
103785	respiratory bronchiolitis associated interstitial lung dis	
103813	asthma trigger - cold air	
103944	asthma trigger - airborne dust	
103945	asthma trigger - damp	
103952	asthma trigger - emotion	
103955	asthma trigger - tobacco smoke	
103989	[x]primary cough headache	yes
103998	asthma limits activities most days	
104117	copd self-management plan agreed	
104163	[d]episodic dry cough	yes
104169	copd self-management plan review	
104235	[x] adverse reaction to antiasthmatics	
104265	gp ooh service notified of copd care plan	
104384	bronchodilator used infrequently	
104445	buteyko breathing exercises	
104481	has chronic obstructive pulmonary disease care plan	
104487	bronchodilator not used in last month	
104493	bronchodilators used once daily	
104608	end stage chronic obstructive airways disease	
104710	on copd (chr obstruc pulmonary disease) supportv cre pathway	
104915	interstitial lung disease due to connective tissue disease	
104985	on chronic obstructive pulmonary disease supprtv cre pathway	
105386	referr to british lung foundation breathe easy support group	
105420	asthma self-management plan review	
105457	chronic obstructive pulmonary disease care pathway	
105460	discharge from community respiratory team	
105674	asthma self-management plan agreed	
105930	other respiratory support nos	
106637	seen in chronic obstructive pulmonary disease clinic	
106805	chronic asthma with fixed airflow obstruction	

106874	lung function questionnaire	
106945	chronic obstructive pulmonary disease rescue pack declined	
107182	constant wheezing	yes
107318	under care of respiratory physician	
107336	review of inhaler technique using inhaler checking device	yes
107410	anxiety about breathlessness	yes
107483	compensated respiratory acidosis	
107877	chronic obstructive pulmon dis wr self managem plan declined	
108475	asthma management plan declined	
108507	other respiratory disease monitoring - additional	
108599	childhood asthma control test	
108650	breathlessness causing difficulty eating	yes
108912	asthma monitoring invit sms (short message service) txt message	
108965	able to complete sentence in one breath	
109042	wheezing in absence of colds	yes
109076	at risk of asthma	
109207	review of patient at risk of asthma	
109468	asthma monitoring invitation email	
109683	chronic obstructive pulmonary disease resolved	
109774	telehealth chronic obstructive pulmonary disease monitoring	
109958	asthma-chronic obstructive pulmonary disease overlap syndrom	
109996	telehealth asthma monitoring	
110339	asthma monitoring sms text message 1st invitation	
110345	severe asthma exacerbation risk assessment	
110406	at risk of severe asthma exacerbation	
110533	asthma monitoring sms text message 2nd invitation	
111669	asthma monitoring sms text message 3rd invitation	

Supplementary Table 2. CPRD codes used to define an adverse medication event

Medcode	Description
381	drugs and other substances-adverse effects in therapeutic use
1973	allergic drug reaction nos
6006	adverse drug reaction notif
6018	adverse drug reaction nos
6658	drug not taken - side-effects
7509	dr stopped drugs - side effect
7542	yellow card drug react notif
7668	[x]ar-adverse react to drugs/medicines/biolog substances
7883	drug therapy discontinued
8727	drug declined by patient - side effects
9135	[x]adverse reaction to local anti-inflammatory drug
9153	drug discontinued - patient fear/risk
9315	drug rx discontinue-med advice
10030	unspecified adverse effect of drug or medicament
10147	medication stopped - ineffective
10481	medication stopped - interaction
10502	drug-induced headache, not elsewhere classified
10724	medication stopped - side effect
10743	advice about side effects of drug treatment
11000	drug declined by patient
11324	advice to gp to stop patient medication
11484	has shown side effects from medication
11645	medication stopped - contra-indication
13042	adverse reaction to drug nos
15722	allergy drug side effect
18139	drug not taken - dislike form
19268	advice to stop taking medication
19269	advice to stop drug treatment
19351	advice to stop taking a drug
19516	dr stopped drugs - ineffective
20624	dr stop drugs-patient dislikes
20891	[x]drugs/meds/biol subs caus adverse effects in therap use
20981	drug not taken - other reason
21326	drug not taken - pat disbelief
21756	drug discontinued - reason unknown
21968	drug not taken - inconvenient
22616	poor compliance with inhaler
24874	advice about drug side effects
25551	advice about drug treatment
26090	advice about medication side effects
27904	[x] adverse reaction to drug or medicinal substance nos
28039	[x] adverse reaction to other drug or medicine nos

28356	advice about drug side effects
28557	advice about when to take medication
29037	drug declined by patient - reason unknown
29533	adverse reaction to drug or medicinal substance nos
29942	[x]sequel adver effec caus by drug med/bio subst in therap use
29983	drug declined by patient - patient beliefs
30062	drug rx stopped-med advice nos
31169	drug not taken - dislike taste
35009	advice about medication side effects
35179	[x] adverse reaction to other drugs and medicines
35257	adverse reaction to other drug or medicine nos
35262	drug declined by patient - dislikes taste
35934	rep.presc. drug side effect
37024	[x] adverse reaction to drug nos
39154	adverse reaction to other drugs and medicines
42622	drug side effect - acceptable to patient
42658	resp. drug side effects
50700	adverse reaction smooth/skeletal+respiratory system drug nos
52748	drug-induced tremor
53117	adverse reaction to other drugs and medicines
54019	[x]unspecif drug/medic caus adverse effects in therap use
54997	patient does not understand why taking all medication
58850	[x] adverse react smooth/skeletal muscle & respiratory drugs
59450	adverse reaction to other respiratory system drugs
63839	[x]oth drugs/medicaments caus adverse effects in therap use
65923	yellow card drug react notif
65982	offering encouragement to take drug
101511	[x]unspecified adverse effect of drug or medicament
102307	adverse reaction to drug
102317	advice about side effects of drug treatment
103415	[x] adverse reaction to other respiratory system drugs
109651	drug allergy
109674	allergic reaction to drug
12192	advice to gp to change patient medication

Supplementary Table 3. Characteristics of the population of regular inhaler users

	Total Regular Inhaler Population	
	N	%
Total	665,105	100.0
Respiratory condition		
Asthma	569,901	85.7
COPD	95,204	14.3
Gender		
Male	289,843	43.6
Female	375,254	56.4
Age at switch, years (median, IQR)	46.2 (30-63)	
Socioeconomic status		
1 (least deprived)	66,929	15.1
2	84,834	19.1
3	84,506	19.0
4	96,137	21.6
5	111,661	25.1
Smoking		
Never	214,185	32.2
Ex-smoker	224,658	33.8
Current	226,262	34.0

Supplementary Table 4. Age-adjusted incidence rate ratios for each month during the 3-month risk period following a brand-to-generic inhaler switch, compared to stable periods.

	Patients (N)	Risk period	Exacerbations in risk period	Exacerbations in control period	IRR	95% CI
Monthly risk periods	1,719	1st month	55	1483	0.71	0.54-0.92
	1,179	2nd month	51	1483	0.68	0.51-0.90
	1,719	3rd month	62	1483	0.83	0.64-1.08

Supplementary Table 5. Age-adjusted incidence rate ratios for each month during the 3-month risk period following an inhaler switch (brand-to-brand, generic-to-generic or generic-to-brand), compared to a stable period.

	Patients (N)	Risk period	Exacerbations in risk period	Exacerbations in control period	IRR	95% CI
Monthly risk periods	3,523	1st month	130	2980	0.82	0.69-0.98
	3,523	2nd month	119	2980	0.78	0.65-0.94
	3,523	3rd month	113	2980	0.76	0.63-0.92

Supplementary Table 6. Age-adjusted incidence rate ratios of GP consultations, adverse-medication events, non-specific respiratory events, for each month during the 3-month risk period following an inhaler switch, compared to stable periods.

Event	Number of patients	Risk period	Number of events in 3-month risk period	Number of events in control period	IRR	95% CI
GP consultation	50289	1st month	49846	926991	1.01	1.00-1.02
	50289	2nd month	47014	926991	1.00	0.99-1.02
	50289	3rd month	46742	926991	0.99	0.98-1.01
Non-specific respiratory	51659	1st month	9620	187618	0.96	0.94-0.98
	51659	2nd month	9023	187618	0.94	0.92-0.96
	51659	3rd month	9129	187618	0.97	0.95-0.99
Adverse-medication	3258	1-31 days	204	3520	1.09	0.95-1.26
	3258	32-60 days	189	3520	1.06	0.91-1.22
	3258	61-91 days	180	3520	1.02	0.88-1.19

Switches could be between brand-to-generic, brand-to-brand, generic-to-generic or generic-to-brand.