

Table S1: Participant characteristics relating to AFO, by region and sex

	Rural (%)						Urban (%)					
	Sichuan	Gansu	Henan	Zhejiang	Hunan	Total	Qingdao	Harbin	Haikou	Suzhou	Liuzhou	Total
Men												
Total	21,307	19,314	27,832	24,015	26,369	118,837	15,548	23,245	10,752	22,355	19,320	91,220
Mean age (years)	52.8	51.2	51.7	53.6	53.6	52.6	49.9	53.8	54.2	52.5	55.0	53.1
AFO GOLD Stage I-IV	15.8	3.9	9.2	6.1	6.9	8.4	3.0	2.8	2.5	9.9	3.1	4.5
AFO GOLD Stage II-IV	12.9	3.3	7.0	5.7	6.0	7.0	2.7	2.5	2.1	7.4	2.5	3.6
AFO LLN	18.2	4.1	9.5	5.9	8.1	9.2	2.8	2.5	2.7	11.1	3.3	4.8
Physician diagnosed chronic bronchitis/emphysema	4.2	2.4	1.5	3.9	4.1	3.2	0.7	2.7	2.1	4.9	3.0	2.9
Physician diagnosed CB/E and still on treatment	49.4	43.6	28.8	28.8	26.8	34.8	46.4	17.4	30.9	34.3	27.5	28.4
Physician diagnosed CB/E and												
AFO GOLD Stage I-IV	62.1	15.8	48.1	35.5	33.0	40.5	17.1	21.2	12.5	30.8	17.7	22.8
AFO GOLD stage II-IV	60.7	14.8	46.2	35.1	32.5	39.6	17.1	20.7	12.2	29.0	16.7	21.7
AFO LLN	63.4	15.1	46.5	32.8	32.2	39.5	16.9	19.0	13.4	30.4	17.6	22.0
Under diagnosis	85.3	90.8	92.6	80.7	83.0	86.1	95.9	79.2	89.2	87.4	84.3	86.6
Over diagnosis	36.6	84.9	53.5	67.2	67.8	60.5	83.1	81.0	86.6	69.6	82.4	78.0
Physician diagnosed asthma	0.4	0.2	0.4	0.6	0.4	0.4	1.0	0.6	0.8	0.8	1.0	0.8
Breathlessness†	7.4	8.2	6.7	3.4	4.1	5.8	6.9	2.9	2.1	2.4	3.0	3.4
Chronic cough*	10.7	5.9	5.2	5.8	7.1	6.8	6.8	4.1	1.9	4.9	4.1	4.5
Chronic cough and sputum**	12.0	6.9	6.8	4.5	6.8	7.3	7.4	7.7	2.1	7.7	3.8	6.2
Chronic cough with sputum and												
AFO GOLD stage I-IV	25.5	7.8	18.1	15.0	13.7	17.3	5.9	6.7	5.1	15.6	8.6	9.8
AFO GOLD stage II-IV	23.0	7.0	15.9	14.5	12.8	15.8	5.7	6.2	4.8	13.4	7.0	8.6
AFO LLN	28.6	7.8	19.3	14.6	15.7	18.9	5.5	6.6	7.0	16.7	9.1	10.1
Women												
Total	34,359	30,666	35,501	33,662	33,539	167,727	19,830	34,291	18,866	30,878	30,846	134,711
Mean age (years)	50.7	48.2	50.3	52.2	50.9	50.5	51.5	53.1	52.5	51.8	53.8	52.6
AFO GOLD Stage I-IV	13.1	3.6	2.8	3.6	4.0	5.5	2.8	1.4	2.6	7.0	2.5	3.3
AFO GOLD Stage II-IV	10.8	3.2	2.3	3.1	3.3	4.6	2.5	1.2	1.9	4.5	1.8	2.4
AFO LLN	18.5	4.6	3.7	4.7	6.2	7.7	3.2	1.5	3.6	11.1	3.7	4.8
Physician diagnosed chronic bronchitis/emphysema	3.6	2.0	1.1	2.0	1.9	2.1	0.5	2.6	1.0	4.5	2.0	2.4
Physician diagnosed CB/E and still on treatment	52.2	38.7	26.0	28.5	26.2	37.8	35.0	16.6	29.5	35.4	23.9	27.4
Physician diagnosed CB/E and												
AFO GOLD Stage I-IV	51.1	9.5	24.7	22.9	23.4	31.5	17.2	11.7	4.6	19.7	10.4	14.3
AFO GOLD stage II-IV	49.4	9.3	23.5	21.2	23.2	30.4	16.0	11.7	4.1	17.2	9.2	12.9
AFO LLN	57.3	10.2	25.9	25.6	30.4	35.6	19.1	11.0	6.0	24.1	11.9	16.7
Under diagnosis	88.9	95.3	92.7	90.4	90.3	90.3	96.6	83.5	98.2	90.3	93.7	91.5
Over diagnosis	42.7	89.8	74.1	74.4	69.6	64.4	80.9	89.0	94.0	75.9	88.1	83.3
Physician diagnosed asthma	0.4	0.1	0.2	0.5	0.4	0.3	1.0	0.6	0.5	0.8	0.9	0.8
Breathlessness†	9.9	17.1	9.7	3.3	4.3	8.5	8.1	6.6	2.4	4.0	2.8	4.7
Chronic cough*	5.7	4.0	2.1	1.7	1.8	3.0	1.9	1.8	0.9	2.3	1.7	1.8
Chronic cough and sputum**	5.7	3.4	1.9	0.9	1.6	2.6	1.6	2.4	0.8	2.5	1.1	1.8
Chronic cough with sputum and												
AFO GOLD stage I-IV	26.7	6.5	7.7	14.9	13.0	17.5	8.0	5.3	5.0	12.7	8.8	8.4
AFO GOLD stage II-IV	24.3	5.8	6.8	13.5	11.6	15.8	7.5	5.1	4.1	10.3	7.4	7.2
AFO LLN	31.6	7.5	8.4	17.1	18.0	20.8	7.6	4.9	7.8	16.2	11.2	10.0

† Out of breath when walking when walking on level ground; * Frequent cough for more than 3 months; ** Frequent morning cough with sputum for more than 3 months;

Table S2: Age and region standardised prevalence of AFO based on GOLD stage I-IV, by patient characteristics

Characteristics	Men				Women			
	Rural		Urban		Rural		Urban	
	N	%	N	%	N	%	N	%
Overall	118837	8.4	91220	4.5	167727	5.5	134711	3.3
Age group (%)								
30-39	17204	2.4	12361	1.0	30478	2.6	17695	1.7
40-49	32932	3.4	26230	1.9	52743	2.8	40707	2.0
50-59	37100	7.6	26571	3.9	52371	5.0	41400	2.9
60-69	23544	14.9	17766	8.5	25137	9.8	25269	5.8
70-79	8057	23.5	8292	13.7	6998	17.7	9640	9.5
Test for trend, p-value	<0.0001		<0.0001		<0.0001		<0.0001	
BMI group (%)								
<18.5	6821	16.7	2599	10.6	8680	10.1	4259	6.0
18.5 to 24	85013	8.5	50482	5.2	107832	5.3	78023	3.8
≥ 25	27002	5.3	38139	3.2	51214	4.0	52429	2.8
Test for trend, p-value	<0.0001		<0.0001		<0.0001		<0.0001	
Smoking category (%)								
Never smoker	13486	7.1	16796	3.2	158401	5.0	128716	3.4
Occasional smoker	13123	6.7	10487	3.1	3389	5.9	2133	2.8
Ex-regular smoker	13980	9.1	13913	5.3	1561	5.7	1083	6.3
Current regular smoker	78248	8.6	50024	5.2	4376	7.5	2779	5.5
Ever regular	92228	8.7	63937	5.2	5937	7.3	3862	5.4
Heterogeneity test, p-value	<0.0001		<0.0001		<0.0001		<0.0001	
Passive smoking^a								
No	3546	8.5	6211	3.7	19783	6.2	21643	3.4
Yes	9940	6.7	10585	3.0	138618	4.9	107073	3.3
Heterogeneity test	0.0001		0.0371		<0.0001		0.3282	
Pack years^b								
<10 pack year	18211	7.5	12322	3.8	2831	7.9	1998	5.2
10-19 pack year	21324	7.8	16786	4.7	1574	7.9	968	5.4
>20 pack year	52693	9.5	34829	5.9	1532	11.8	896	9.0
Test for trend, p-value	<0.0001		<0.0001		0.1717		0.1453	
Age started smoking (years)								
<20	32031	9.6	21159	6.3	2083	11.5	846	10.3
20-24	35021	8.8	23375	5.2	1268	11.7	643	5.0
25-29	11572	8.5	10097	5.0	724	8.0	477	5.0
≥30	13604	7.7	9306	4.6	1862	7.2	1896	5.0
Test for trend, p-value	<0.0001		<0.0001		<0.0001		<0.0001	
Number of cigarettes smoked daily (or equivalent)								
1-4	6605	8.8	2992	4.2	1726	7.4	961	5.8
5-14	25376	8.4	19681	5.0	2805	9.0	1982	4.4
15-24	41631	8.8	30558	5.4	1212	8.9	801	6.8
≥25	18616	9.1	10706	5.6	194	7.6	118	5.7
Test for trend, p-value	0.0396		0.0076		0.5021		0.1296	
Reason for stopping among ex-smokers								
Physical illness	7442	13.7	6386	9.8	1001	29.0	442	9.2
Other reason	6538	9.1	7527	5.0	560	19.3	641	5.5
Heterogeneity test, p-value	<0.0001		<0.0001		<0.0001		0.0201	
Highest education completed								
No formal education	15043	10.1	3606	7.9	53238	7.0	23254	3.8
Primary	52103	8.9	17983	5.6	67726	5.0	27309	3.4
Middle School /High School	49621	6.8	55167	4.1	45690	4.1	71772	3.0
College/University	2070	6.0	14464	3.8	1073	3.2	12376	2.6
Test for trend, p-value	<0.0001		<0.0001		<0.0001		<0.0001	
Household income (yuan)								
2500-4,999	17022	11.1	2413	7.9	25256	7.4	5461	4.4
5000-9,999	27939	9.4	7319	6.0	43775	5.8	15521	4.0
10,000 - 19,999	34326	8.3	25184	5.0	48506	4.8	40887	3.6
≥20,000	39550	6.1	56304	4.2	50190	4.1	72842	3.1
Test for trend, p-value	<0.0001		<0.0001		<0.0001		<0.0001	
Currently cooks with coal/wood								
No	85965	7.9	86428	4.6	31872	5.38	122950	3.4
Yes	32872	9.0	4792	6.0	135855	5.26	11761	4.3
Heterogeneity test, p-value	<0.0001		0.0003		0.0043		0.1582	
Ever cooked with coal/wood								
No	80005	7.8	60591	4.5	12381	5.42	52523	3.2
Yes	38832	9.0	30629	4.9	155346	5.22	82188	3.6
Heterogeneity test, p-value	<0.0001		0.0265		0.0008		0.0335	
Currently cooks with gas/electricity								
No	110423	8.3	39656	4.9	146891	5.3	22095	3.9
Yes	8414	7.0	51564	4.5	20836	4.8	112616	3.4
Heterogeneity test, p-value	<0.0001		0.0028		0.0002		0.0001	

^a Among never smokers, exposed to others' tobacco smoke regularly at home or work

^b Restricted to ever regular smokers

Table S3: Age and region standardised prevalence of AFO based on GOLD stage II-IV, by patient characteristics

Characteristics	Men				Women			
	Rural		Urban		Rural		Urban	
	N	%	N	%	N	%	N	%
Overall	118837	7.0	91220	3.6	167727	4.6	134711	2.4
Age group (%)								
30-39	17204	1.8	12361	0.7	30478	2.1	17695	1.2
40-49	32932	2.6	26230	1.3	52743	2.3	40707	1.4
50-59	37100	6.3	26571	3.0	52371	4.1	41400	2.0
60-69	23544	12.7	17766	6.9	25137	8.4	25269	4.4
70-79	8057	20.5	8292	11.7	6998	15.8	9640	7.7
Test for trend, p-value	<0.0001		<0.0001		<0.0001		<0.0001	
BMI group (%)								
<18.5	6821	15.3	2599	9.8	8680	9.3	4259	4.8
18.5 to 24	85013	6.9	50482	4.1	107832	4.4	78023	2.8
≥ 25	27002	4.7	38139	2.7	51214	3.4	52429	2.0
Test for trend, p-value	<0.0001		<0.0001		<0.0001		<0.0001	
Smoking category (%)								
Never smoker	13486	6.0	16796	2.5	158401	4.1	128716	2.4
Occasional smoker	13123	5.6	10487	2.4	3389	4.9	2133	2.0
Ex-regular smoker	13980	8.2	13913	4.5	1561	4.3	1083	2.5
Current regular smoker	78248	7.0	50024	4.1	4376	6.3	2779	4.9
Ever regular	92228	7.2	63937	4.2	5937	6.1	3862	4.6
Heterogeneity test, p-value	<0.0001		<0.0001		<0.0001		<0.0001	
Passive smoking^a								
No	3546	7.2	6211	3.2	19783	5.1	21643	2.5
Yes	9940	5.7	10585	2.2	138618	4.0	107073	2.4
Heterogeneity test	0.0008		0.0186		<0.0001		0.3964	
Pack years^b								
<10 pack year	18211	6.1	12322	2.9	2831	6.3	1998	4.0
10-19 pack year	21324	6.5	16786	3.8	1574	6.4	968	5.0
>20 pack year	52693	7.9	34829	4.8	1532	10.9	896	8.8
Test for trend, p-value	<0.0001		<0.0001		0.0407		0.1041	
Age started smoking (years)								
<20	32031	8.1	21159	5.3	2083	8.0	846	10.0
20-24	35021	7.4	23375	4.3	1268	8.7	643	4.6
25-29	11572	6.9	10097	4.0	724	7.2	477	2.9
≥30	13604	6.3	9306	3.6	1862	6.1	1896	4.2
Test for trend, p-value	<0.0001		<0.0001		<0.0001		<0.0001	
Number of cigarettes smoked daily (or equivalent)								
1-4	6605	7.3	2992	3.3	1726	5.0	961	4.7
5-14	25376	7.0	19681	4.0	2805	7.8	1982	4.0
15-24	41631	7.4	30558	4.4	1212	8.2	801	5.2
≥25	18616	7.6	10706	4.7	194	6.5	118	5.1
Test for trend, p-value	0.0131		0.0020		0.1700		0.1705	
Reason for stopping among ex-smokers								
Physical illness	7442	12.7	6386	8.8	1001	26.7	442	9.2
Other reason	6538	8.0	7527	4.0	560	16.7	641	4.9
Heterogeneity test, p-value	<0.0001		<0.0001		<0.0001		0.0062	
Highest education completed								
No formal education	15043	8.4	3606	7.0	53238	6.0	23254	2.8
Primary	52103	7.4	17983	4.6	67726	4.1	27309	2.5
Middle School /High School	49621	5.5	55167	3.2	45690	3.4	71772	2.2
College/University	2070	4.2	14464	2.9	1073	1.8	12376	1.8
Test for trend, p-value	<0.0001		<0.0001		<0.0001		<0.0001	
Household income (yuan)								
2500-4,999	17022	9.6	2413	6.9	25256	6.1	5461	3.6
5000-9,999	27939	7.7	7319	5.2	43775	4.9	15521	3.0
10,000 - 19,999	34326	6.8	25184	3.9	48506	3.9	40887	2.7
≥20,000	39550	5.1	56304	3.3	50190	3.4	72842	2.2
Test for trend, p-value	<0.0001		<0.0001		<0.0001		<0.0001	
Currently cooks with coal/wood								
No	85965	6.5	86428	3.6	31872	4.43	122950	2.5
Yes	32872	7.6	4792	5.0	135855	4.40	11761	3.2
Heterogeneity test, p-value	<0.0001		<0.0001		0.0008		0.1775	
Ever cooked with coal/wood								
No	80005	6.5	60591	3.6	12381	4.47	52523	2.4
Yes	38832	7.6	30629	4.0	155346	4.36	82188	2.6
Heterogeneity test, p-value	<0.0001		0.0129		0.0001		0.1343	
Currently cooks with gas/electricity								
No	110423	6.9	39656	4.0	146891	4.4	22095	3.0
Yes	8414	5.9	51564	3.5	20836	3.8	112616	2.4
Heterogeneity test, p-value	0.0003		0.0002		<0.0001		<0.0001	

^a Among never smokers, exposed to others' tobacco smoke regularly at home or work

^b Restricted to ever regular smokers

Table S4: ORs for under- and over-diagnosis of AFO by baseline characteristics

Characteristics	* OR (95% CI) for under-diagnosed AFO	†OR (95% CI) for over-diagnosed AFO
Gender		
Male	Ref.	Ref.
Female	1.39 (1.23-1.55)	0.87 (0.76-0.98)
Age (years)		
30-39	Ref.	Ref.
40-49	0.71 (0.59-0.87)	1.18 (0.95-1.46)
50-59	0.42 (0.35-0.50)	0.94 (0.77-1.15)
60-69	0.28 (0.23-0.34)	0.79 (0.64-0.96)
70-79	0.30 (0.25-0.37)	0.81 (0.65-1.01)
BMI (kg/m²)		
18.5 - <25.0	Ref.	Ref.
<18.5	0.57 (0.51-0.63)	0.66 (0.59-0.75)
≥25.0	1.23 (1.12-1.35)	1.83 (1.66-2.02)
Smoking status		
Never smoker	Ref.	Ref.
Occasional smoker	1.11 (0.93-1.33)	0.91 (0.74-1.10)
Ex-regular smoker	0.50 (0.44-0.57)	0.48 (0.42-0.56)
Current regular smoker	1.51 (1.34-1.71)	0.67 (0.59-0.77)
Region		
Urban	Ref.	Ref.
Rural	1.09 (1.00-1.19)	0.67 (0.61-0.74)
Highest education completed		
College/University	Ref.	Ref.
Middle/High School	1.18 (0.94-1.50)	0.90 (0.72-1.13)
Primary School	0.91 (0.72-1.15)	0.60 (0.48-0.76)
No formal education	1.12 (0.87-1.40)	0.66 (0.52-0.83)
Household income (Yuan)		
≥20,000	Ref.	Ref.
10,000 - 19,999	1.31 (1.18-1.45)	0.86 (0.77-0.95)
5,000 - 9,999	1.41 (1.26-1.57)	0.86 (0.77-0.97)
≤5,000	1.31 (1.17-1.46)	0.56 (0.50-0.63)
Respiratory symptoms		
No	Ref.	Ref.
Breathlessness or chronic cough	0.15 (0.14-0.16)	0.43 (0.39-0.47)
Breathlessness & chronic cough	0.26 (0.23-0.29)	0.78 (0.68-0.89)

*Under-diagnosed AFO: no self reported physician diagnosis of CB/E but presence of AFO by spirometry criteria vs. those with physician diagnosed and spirometry confirmed air flow obstruction;

†Over-diagnosed AFO: self reported physician diagnosis of CB/E but not presence of AFO by spirometry criteria vs. those with physician diagnosed Emphysema/Chronic Bronchitis;

Table S5: Prevalence of restrictive abnormality by sex and region

FEV1/FVC≥LLN and FVC<LLN	Men			Women		
	Rural	Urban	Total	Rural	Urban	Total
Age group (%)						
30-39	26.3	38.7	26.3	26.7	30.6	26.7
40-49	26.7	42.0	26.7	26.6	33.0	26.6
50-59	30.2	42.6	30.2	26.1	30.4	26.1
60-69	33.5	41.1	33.5	25.6	28.1	25.6
70-79	37.1	43.5	37.1	28.7	29.9	28.7
Smoking category (%)						
Never smoker	30.8	41.3	30.8	26.6	30.7	26.6
Occasional smoker	29.6	40.6	29.6	23.7	27.4	23.7
Current regular smoker	31.4	42.8	31.4	36.7	34.8	36.7
Ex regular	29.5	42.4	29.5	25.1	31.3	25.1
Ever regular	29.8	42.4	29.8	26.1	31.1	26.1