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Others	833 (8.4)	678 (9.0)	104 (10.7)	18 (2.8)	10 (1.6)	23 (12.7)	
Silicosis	4760 (47.8)	3657 (48.4)	447 (46.2)	252 (39.9)	348 (55.9)	56 (30.9)	
CWP	4371 (43.9)	3225 (42.7)	417 (43.1)	362 (57.3)	265 (42.5)	102 (56.4)	
Sex							<0.001
Male	9708 (97.4)	7383 (97.7)	898 (92.8)	628 (99.4)	619 (99.4)	180 (99.4)	
Female	256 (2.6)	177 (2.3)	70 (7.2)	4 (0.6)	4 (0.6)	1 (0.6)	
Birth place							<0.001
Rural areas	8459 (84.9)	6565 (86.8)	633 (65.4)	526 (83.2)	574 (92.1)	161 (89.0)	
Urban areas	1505 (15.1)	995 (13.2)	335 (34.6)	106 (16.8)	49 (7.9)	20 (11.0)	
Marital status							<0.001
Married	9198 (92.3)	7067 (93.5)	795 (82.1)	594 (94)	578 (92.8)	164 (90.6)	
Divorced	187 (1.9)	148 (2.0)	19 (2)	5 (0.8)	10 (1.6)	5 (2.8)	
Widowed	475 (4.8)	262 (3.5)	148 (15.3)	33 (5.2)	22 (3.5)	10 (5.5)	
Unmarried	104 (1.0)	83 (1.1)	6 (0.6)	0 (0)	13 (2.1)	2 (1.1)	
Education level							<0.001
Illiterate or semiilliterate	1041 (10.4)	753 (10.0)	122 (12.6)	91 (14.4)	62 (10.0)	13 (7.2)	
Elementary school	4315 (43.3)	3213 (42.5)	379 (39.2)	306 (48.4)	317 (50.9)	100 (55.2)	
Intermediate school	3537 (35.5)	2713 (35.9)	353 (36.5)	192 (30.4)	217 (34.8)	62 (34.3)	
Senior high school or higher	911 (9.1)	730 (9.7)	109 (11.3)	40 (6.3)	27 (4.3)	5 (2.8)	
Others	160 (1.6)	151 (2.0)	5 (0.5)	3 (0.5)	0 (0)	1 (0.6)	
Employment status							<0.001
Retirement	3940 (39.5)	2564 (33.9)	768 (79.3)	387 (61.2)	186 (29.9)	35 (19.3)	
Unemployment	2763 (27.7)	2181 (28.8)	74 (7.6)	131 (20.7)	313 (50.2)	64 (35.4)	
Temporary employment	1162 (11.7)	995 (13.2)	28 (2.9)	52 (8.2)	60 (9.6)	27 (14.9)	
Long-term employment	1170 (11.7)	1083 (14.3)	44 (4.5)	28 (4.4)	8 (1.3)	7 (3.9)	
Others	929 (9.3)	737 (9.7)	54 (5.6)	34 (5.4)	56 (9.0)	48 (26.5)	
Annual personal income per capita							<0.001
≤1000 Yuan	1483 (14.9)	1175 (15.5)	35 (3.6)	57 (9.0)	164 (26.3)	52 (28.7)	
1001-5000 Yuan	1008 (10.1)	731 (9.7)	46 (4.8)	65 (10.3)	124 (19.9)	42 (23.2)	
5001-30000 Yuan	2988 (30.0)	2420 (32.0)	205 (21.2)	168 (26.6)	164 (26.3)	31 (17.1)	
30001-40000 Yuan	1603 (16.1)	1085 (14.4)	308 (31.8)	145 (22.9)	44 (7.1)	21 (11.6)	
>40000 Yuan	2336 (23.4)	1724 (22.8)	331 (34.2)	178 (28.2)	90 (14.4)	13 (7.2)	
Missing	546 (5.5)	425 (5.6)	43 (4.4)	19 (3.0)	37 (5.9)	22 (12.2)	
Annual family income per capita							<0.001
≤20000 Yuan	2587 (26.0)	2091 (27.7)	83 (8.6)	109 (17.2)	243 (39)	61 (33.7)	
20001-39000 Yuan	2001 (20.1)	1493 (19.7)	179 (18.5)	129 (20.4)	142 (22.8)	58 (32)	
39001-60000 Yuan	2817 (28.3)	2051 (27.1)	359 (37.1)	232 (36.7)	138 (22.2)	37 (20.4)	
>60000 Yuan	1751 (17.6)	1287 (17.0)	271 (28.0)	126 (19.9)	56 (9.0)	11 (6.1)	
Missing	808 (8.1)	638 (8.4)	76 (7.9)	36 (5.7)	44 (7.1)	14 (7.7)	
Season for survey							<0.001
Spring	1598 (16.0)	1081 (14.3)	143 (14.8)	131 (20.7)	158 (25.4)	85 (47)	
Summer	3545 (35.6)	2559 (33.8)	501 (51.8)	253 (40)	216 (34.7)	16 (8.8)	
Autumn	2847 (28.6)	2376 (31.4)	238 (24.6)	104 (16.5)	99 (15.9)	30 (16.6)	
Winter	1974 (19.8)	1544 (20.4)	86 (8.9)	144 (22.8)	150 (24.1)	50 (27.6)	

Region of China							<0.001
Eastern	3430 (34.4)	2748 (36.3)	345 (35.6)	218 (34.5)	112 (18)	7 (3.9)	
Central	1951 (19.6)	1661 (22.0)	60 (6.2)	58 (9.2)	144 (23.1)	28 (15.5)	
Western	3676 (36.9)	2767 (36.6)	160 (16.5)	285 (45.1)	321 (51.5)	143 (79)	
Northeastern	907 (9.1)	384 (5.1)	403 (41.6)	71 (11.2)	46 (7.4)	3 (1.7)	
Source of cases							<0.001
Screening cases	965 (9.7)	893 (11.8)	17 (1.8)	18 (2.8)	18 (2.9)	19 (10.5)	
Inpatient cases	4408 (44.2)	3046 (40.3)	599 (61.9)	391 (61.9)	305 (49)	67 (37)	
Outpatient cases	2236 (22.4)	1807 (23.9)	229 (23.7)	97 (15.3)	88 (14.1)	15 (8.3)	
Household cases	2355 (23.6)	1814 (24)	123 (12.7)	126 (19.9)	212 (34.0)	80 (44.2)	
Pulmonary tuberculosis							<0.001
No	9221 (92.5)	7023 (92.9)	924 (95.5)	580 (91.8)	530 (85.1)	164 (90.6)	
Yes	743 (7.5)	537 (7.1)	44 (4.5)	52 (8.2)	93 (14.9)	17 (9.4)	
Hypertension							<0.001
No	7953 (79.8)	6172 (81.6)	652 (67.4)	464 (73.4)	520 (83.5)	145 (80.1)	
Yes	2011 (20.2)	1388 (18.4)	316 (32.6)	168 (26.6)	103 (16.5)	36 (19.9)	
Diabetes							<0.001
No	9320 (93.5)	7116 (94.1)	855 (88.3)	583 (92.2)	588 (94.4)	178 (98.3)	
Yes	644 (6.5)	444 (5.9)	113 (11.7)	49 (7.8)	35 (5.6)	3 (1.7)	
Cardiovascular							<0.001
No	8852 (88.8)	6929 (91.7)	714 (73.8)	482 (76.3)	560 (89.9)	167 (92.3)	
Yes	1112 (11.2)	631 (8.3)	254 (26.2)	150 (23.7)	63 (10.1)	14 (7.7)	
Accumulated dust exposure time							<0.001
> 34 years	681 (6.8)	460 (6.1)	138 (14.3)	48 (7.6)	27 (4.3)	8 (4.4)	
30–34 years	1394 (14.0)	966 (12.8)	225 (23.2)	98 (15.5)	76 (12.2)	29 (16.0)	
25–29 years	1208 (12.1)	892 (11.8)	157 (16.2)	73 (11.6)	62 (10.0)	24 (13.3)	
20–24 years	1894 (19.0)	1360 (18)	182 (18.8)	152 (24.1)	156 (25.0)	44 (24.3)	
15–19 years	1365 (13.7)	1054 (13.9)	95 (9.8)	93 (14.7)	97 (15.6)	26 (14.4)	
10–14 years	1619 (16.2)	1300 (17.2)	88 (9.1)	93 (14.7)	106 (17.0)	32 (17.7)	
5–9 years	1231 (12.4)	1060 (14.0)	47 (4.9)	47 (7.4)	64 (10.3)	13 (7.2)	
< 5 years	572 (5.7)	468 (6.2)	36 (3.7)	28 (4.4)	35 (5.6)	5 (2.8)	
History of using immune-enhancing drugs							<0.001
No	8344 (83.7)	6642 (87.9)	707 (73.0)	458 (72.5)	400 (64.2)	137 (75.7)	
Yes	1620 (16.3)	918 (12.1)	261 (27)	174 (27.5)	223 (35.8)	44 (24.3)	
History of hormone therapy for pneumoconiosis							<0.001
No	9266 (93.0)	7203 (95.3)	893 (92.3)	564 (89.2)	460 (73.8)	146 (80.7)	
Yes	698 (7.0)	357 (4.7)	75 (7.7)	68 (10.8)	163 (26.2)	35 (19.3)	

Data are expressed as number(%) and mean±standard deviation; COPD: Chronic obstructive pulmonary disease; BMI: Body mass index; WRII: Work-related injury insurance; SRH: Self-Rated Health; CWP: Coal workers' pneumoconiosis.

Supplementary Table 2. Prevalence and ORs of COPD Associated with Risk Factors and Social Determinants among Pneumoconiosis Patients in 27 Provinces of China, Stratified by Urban and Rural Residence

Items	Prevalence (%) in patients (95%CI)			OR	95%CI	P
	Living in rural areas	Living in urban areas	Total			
Sex						
Male	19.9 (18.9-21.0)	29.3 (27.9-30.7)	23.9 (23.1-24.8)	1.00	Reference	
Female	10.3 (5.1-19.8)	38.3 (31.6-45.4)	30.9 (25.5-36.8)	1.42	1.08-1.86	<0.001
P for difference	0.067	0.010	0.013			
Birth place						
Rural areas	19.9 (18.9-21.0)	27.2 (25.6-28.9)	22.4 (21.5-23.3)	1.00	Reference	
Urban areas	12.2 (5.3-25.5)	34.5 (32.1-37.0)	33.9 (31.5-36.3)	1.78	1.58-2.00	<0.001
P for difference	0.301	<0.001	<0.001			
Alcohol intake						
Non-drinkers	18.3 (16.9-19.7)	32.8 (31.0-34.7)	24.9 (23.8-26.1)	1.00	Reference	
Current drinkers	10.1 (8.5-12.0)	26.8 (24.0-29.8)	17.3 (15.7-19.0)	0.63	0.55-0.72	<0.001
Former drinkers	30.4 (28.1-32.7)	24.5 (21.9-27.3)	28.1 (26.3-29.9)	1.17	1.06-1.31	0.003
P for difference	<0.001	<0.001	<0.001			
Marital status						
Married	19.8 (18.7-20.9)	27.7 (26.3-29.1)	23.2 (22.3-24.0)	1.00	Reference	
Divorced	15.2 (10.0-22.5)	32.3 (22.0-44.6)	20.9 (15.6-27.2)	0.87	0.61-1.25	0.458
Widowed	23.8 (18.1-30.7)	56.8 (51.1-62.2)	44.8 (40.4-49.3)	2.70	2.24-3.25	<0.001
Single	22.1 (14.6-31.9)	11.1 (3.1-32.8)	20.2 (13.6-28.9)	0.84	0.52-1.36	0.475
P for difference	0.294	<0.001	<0.001			
Education level						
Illiterate or semiilliterate	21.4 (18.4-24.7)	37.9 (33.2-42.8)	27.7 (25.0-30.5)	1.00	Reference	
Elementary school	21.8 (20.3-23.3)	32.9 (30.5-35.3)	25.5 (24.3-26.9)	0.90	0.77-1.04	0.160
Intermediate school	18.2 (16.5-20.1)	28.4 (26.3-30.5)	23.3 (21.9-24.7)	0.79	0.68-0.93	0.004
Senior high school or higher	11.2 (7.8-15.7)	23.2 (20.1-26.6)	19.9 (17.4-22.6)	0.65	0.52-0.80	<0.001
Others	4.0 (1.6-9.8)	8.3 (3.6-18.1)	5.6 (3.0-10.3)	0.16	0.08-0.31	<0.001
P for trend	<0.001	<0.001	<0.001			
Employment status						
Retirement	26.5 (23.9-29.2)	38.1 (36.3-39.9)	34.9 (33.5-36.4)	1.00	Reference	
Unemployment	21.5 (20.0-23.2)	17.4 (13.6-21.9)	21.1 (19.6-22.6)	0.50	0.44-0.56	<0.001
Temporary employment	14.7 (12.6-17.0)	12.6 (8.4-18.5)	14.4 (12.5-16.5)	0.31	0.26-0.37	<0.001
Long-term employment	4.7 (3.1-7.0)	9.2 (7.3-11.6)	7.4 (6.1-9.1)	0.15	0.12-0.19	<0.001
Others	21.1 (18.1-24.4)	19.7 (15.6-24.7)	20.7 (18.2-23.4)	0.49	0.41-0.58	<0.001
P for difference	<0.001	<0.001	<0.001			
Annual personal income per capita						
≤1000 Yuan	21.3 (19.2-23.6)	15.9 (10.8-22.7)	20.8 (18.8-22.9)	1.00	Reference	
1001-5000 Yuan	26.7 (23.9-29.7)	33.3 (25.4-42.3)	27.5 (24.8-30.3)	1.45	1.20-1.74	<0.001

5001-30000 Yuan	16.7 (15.1-18.4)	23.6 (21.0-26.3)	19.0 (17.6-20.5)	0.90	0.77-1.05	0.163
30001-40000 Yuan	19.9 (16.5-23.7)	37.5 (34.7-40.4)	32.3 (30.1-34.6)	1.82	1.55-2.14	<0.001
>40000 Yuan	17.1 (14.2-20.5)	29.0 (27.0-31.2)	26.2 (24.5-28.0)	1.35	1.16-1.58	<0.001
Missing	18.7 (15.1-23.0)	29.9 (23.5-37.3)	22.2 (18.9-25.8)	1.09	0.86-1.38	0.496
<i>P</i> for trend	0.001	0.002	<0.001			
Annual family income per capita						
≤20000 Yuan	19.2 (17.7-20.9)	18.8 (14.8-23.6)	19.2 (17.7-20.7)	1.00	Reference	
20001-39000 Yuan	23.9 (21.6-26.4)	27.7 (24.7-31.0)	25.4 (23.5-27.3)	1.43	1.25-1.65	<0.001
39001-60000 Yuan	19.0 (16.8-21.4)	32.5 (30.3-34.8)	27.2 (25.6-28.9)	1.57	1.38-1.79	<0.001
>60000 Yuan	18.2 (15.0-21.9)	29.7 (27.3-32.3)	26.5 (24.5-28.6)	1.52	1.32-1.76	<0.001
Missing	15.9 (12.9-19.3)	29.6 (24.8-35.0)	21.0 (18.4-24.0)	1.12	0.92-1.37	0.244
<i>P</i> for trend	0.007	0.007	<0.001			
Region of China						
Eastern	12.2 (10.8-13.8)	28.4 (26.2-30.6)	19.9 (18.6-21.3)	1.00	Reference	
Central	19.6 (17.3-22.2)	9.7 (8.0-11.8)	14.9 (13.4-16.5)	0.70	0.61-0.82	<0.001
Western	25.3 (23.7-27.0)	23.2 (20.7-25.9)	24.7 (23.4-26.1)	1.32	1.18-1.48	<0.001
Northeastern	15.6 (10.7-22.4)	65.8 (62.3-69.1)	57.7 (54.4-60.8)	5.49	4.69-6.42	<0.001
<i>P</i> for difference	<0.001	<0.001	<0.001			
Season for survey						
Spring	31.1 (28.3-33.9)	34.8 (30.9-38.8)	32.4 (30.1-34.7)	1.00	Reference	
Summer	16.1 (14.5-17.9)	40.7 (38.4-43.0)	27.8 (26.4-29.3)	0.81	0.71-0.92	<0.001
Autumn	10.4 (8.9-12.1)	22.5 (20.4-24.7)	16.5 (15.2-18.0)	0.41	0.36-0.48	<0.001
Winter	26.2 (23.9-28.6)	12.9 (10.6-15.7)	21.8 (20.0-23.7)	0.58	0.50-0.68	<0.001
<i>P</i> for difference	<0.001	<0.001	<0.001			
Source of cases						
Screening cases	9.7 (7.2-12.9)	5.7 (4.1-8.0)	7.5 (6.0-9.3)	1.00	Reference	
Inpatient cases	23.1 (21.3-25.0)	37.2 (35.3-39.1)	30.9 (29.6-32.3)	5.55	4.33-7.11	<0.001
Outpatient cases	13.2 (11.4-15.2)	26.3 (23.7-29.1)	19.2 (17.6-20.9)	2.94	2.27-3.83	<0.001
Household cases	22.8 (21.0-24.7)	23.9 (19.7-28.7)	23.0 (21.3-24.7)	3.70	2.86-4.79	<0.001
<i>P</i> for difference	<0.001	<0.001	<0.001			
Pulmonary tuberculosis						
No	19.6 (18.5-20.7)	29.2 (27.8-30.6)	23.8 (23.0-24.7)	1.00	Reference	
Yes	22.6 (19.2-26.5)	38.3 (32.4-44.5)	27.7 (24.6-31.1)	1.23	1.04-1.45	0.017
<i>P</i> for difference	0.117	0.003	0.019			
Hypertension						
No	19.0 (17.9-20.2)	27.4 (25.9-29.0)	22.4 (21.5-23.3)	1.00	Reference	
Yes	24.4 (21.6-27.4)	35.8 (33.1-38.6)	31.0 (29.0-33.0)	1.56	1.40-1.73	<0.001
<i>P</i> for difference	<0.001	<0.001	<0.001			
Diabetes						
No	19.8 (18.8-20.9)	28.9 (27.5-30.4)	23.6 (22.8-24.5)	1.00	Reference	
Yes	20.5 (15.8-26.2)	36.9 (32.4-41.6)	31.1 (27.6-34.7)	1.45	1.22-1.73	<0.001

<i>P</i> for difference	0.854	0.001	<0.001			
Cardiovascular						
No	19.0 (18.0-20.1)	25.7 (24.3-27.2)	21.7 (20.9-22.6)	1.00	Reference	
Yes	32.5 (27.7-37.7)	47.9 (44.4-51.4)	43.3 (40.4-46.2)	2.75	2.41-3.12	<0.001
<i>P</i> for difference	<0.001	<0.001	<0.001			
Accumulated dust exposure time						
> 34 years	19.5 (14.5-25.7)	37.5 (33.3-41.8)	32.5 (29.0-36.1)	2.16	1.66-2.82	<0.001
30–34 years	25.4 (21.9-29.2)	34.2 (31.1-37.5)	30.7 (28.3-33.2)	1.99	1.57-2.54	<0.001
25–29 years	22.3 (18.9-26.2)	28.8 (25.6-32.3)	26.2 (23.8-28.7)	1.59	1.24-2.04	<0.001
20–24 years	25.5 (23.0-28.1)	32.0 (28.8-35.4)	28.2 (26.2-30.3)	1.77	1.40-2.34	<0.001
15–19 years	19.4 (16.9-22.2)	28.3 (24.6-32.3)	22.8 (20.6-25.1)	1.33	1.04-1.70	0.025
10–14 years	17.3 (15.2-19.7)	25.0 (21.4-29.0)	19.7 (17.8-21.7)	1.10	0.86-1.41	0.428
5–9 years	13.2 (11.1-15.5)	16.0 (12.4-20.5)	13.9 (12.1-15.9)	0.73	0.56-0.95	0.019
< 5 years	16.5 (13.1-20.5)	21.6 (16.3-28.0)	18.2 (15.2-21.6)	1.00	Reference	
<i>P</i> for trend	<0.001	<0.001	<0.001			
History of using immune-enhancing drugs						
No	16.7 (15.6-17.8)	25.4 (24.0-26.8)	20.4 (19.5-21.3)	1.00	Reference	
Yes	37.8 (34.6-41.1)	49.4 (45.9-52.9)	43.3 (40.9-45.8)	2.98	2.67-3.34	<0.001
<i>P</i> for difference	<0.001	<0.001	<0.001			
History of hormone therapy for pneumoconiosis						
No	17.0 (16.0-18.1)	28.7 (27.3-30.1)	22.3 (21.4-23.1)	1.00	Reference	
Yes	47.8 (43.5-52.2)	51.6 (44.5-58.6)	48.9 (45.2-52.6)	3.34	2.85-3.90	<0.001
<i>P</i> for difference	<0.001	<0.001	<0.001			

Data are expressed as number(%); COPD: Chronic obstructive pulmonary disease; OR: Odds ratio; CI: Confidence interval.

Supplementary Table 3. Collinearity Statistics

Variables	Tolerance	VIF
Residence	0.545	1.835
BMI	0.930	1.076
Sex	0.891	1.123
Age	0.572	1.747
Smoking index	0.909	1.100
Alcohol intake	0.926	1.080
Region of China	0.860	1.162
Birth place	0.721	1.387
Marital status	0.943	1.061
Education level	0.868	1.153
Employment status	0.713	1.403
Annual personal income per capita	0.613	1.632
Annual family income per capita	0.682	1.467
Season for survey	0.904	1.106
Source of cases	0.802	1.247
WRII	0.717	1.395
SRH	0.889	1.125
Pulmonary bullae or pneumothorax	0.899	1.112
Pulmonary tuberculosis	0.956	1.046
Hypertension	0.849	1.178
Diabetes	0.922	1.084
Cardiovascular	0.843	1.186
Type of pneumoconiosis	0.809	1.236
Accumulated dust exposure time	0.823	1.215
History of using immune-enhancing drugs	0.924	1.082
History of hormone therapy for pneumoconiosis	0.911	1.098

BMI: Body mass index; WRII: Work-related injury insurance; SRH: Self-Rated Health;

VIF: variance inflation factor.

Supplementary Table 4. Multivariable-adjusted odds ratios (ORs) for COPD-related risk factors among pneumoconiosis patients in 27 provinces of China

Items	All pneumoconiosis cases		Living in rural areas		Living in urban areas	
	OR (95%CI)	<i>P</i>	OR (95%CI)	<i>P</i>	OR (95%CI)	<i>P</i>
Source of cases						
Screening cases	1.00 (Reference)		1.00 (Reference)		1.00 (Reference)	
Inpatient cases	3.87 (2.92-5.11)	<0.001	2.23 (1.51-3.30)	<0.001	4.50 (2.92-6.92)	<0.001
Outpatient cases	2.86 (2.13-3.84)	<0.001	1.75 (1.17-2.62)	0.007	3.50 (2.22-5.53)	<0.001
Household cases	2.99 (2.23-4.02)	<0.001	1.97 (1.34-2.91)	0.001	3.21 (1.92-5.38)	<0.001
Season for survey						
Spring	1.00 (Reference)		1.00 (Reference)		1.00 (Reference)	
Summer	0.64 (0.55-0.76)	<0.001	0.68 (0.54-0.86)	0.001	0.91 (0.70-1.17)	0.468
Autumn	0.29 (0.25-0.35)	<0.001	0.31 (0.24-0.41)	<0.001	0.43 (0.33-0.57)	<0.001
Winter	0.58 (0.48-0.70)	<0.001	0.78 (0.61-0.98)	0.035	0.50 (0.35-0.72)	<0.001
Employment status						
Retirement	1.00 (Reference)		1.00 (Reference)		1.00 (Reference)	
Unemployment	0.67 (0.55-0.82)	<0.001	0.63 (0.49-0.80)	<0.001	0.66 (0.42-1.02)	0.061
Temporary employment	0.79 (0.62-1.01)	0.056	0.70 (0.51-0.94)	0.019	1.10 (0.62-1.94)	0.745
Long-term employment	0.34 (0.26-0.45)	<0.001	0.25 (0.15-0.42)	<0.001	0.40 (0.28-0.58)	<0.001
Others	0.61 (0.48-0.77)	<0.001	0.52 (0.38-0.71)	<0.001	0.87 (0.60-1.28)	0.487
Annual personal income per capita						
≤1000 Yuan	1.00 (Reference)		1.00 (Reference)		1.00 (Reference)	
1001-5000 Yuan	1.47 (1.18-1.84)	<0.001	1.38 (1.09-1.75)	0.008	1.46 (0.70-3.04)	0.314
5001-30000 Yuan	0.92 (0.75-1.13)	0.440	1.03 (0.82-1.29)	0.812	0.59 (0.32-1.07)	0.083
30001-40000 Yuan	1.13 (0.88-1.46)	0.334	1.04 (0.72-1.50)	0.852	0.69 (0.37-1.29)	0.251
>40000 Yuan	1.07 (0.82-1.38)	0.633	1.47 (1.01-2.15)	0.050	0.55 (0.29-1.04)	0.066
Missing	1.50 (1.12-2.01)	0.007	1.20 (0.85-1.69)	0.292	1.69 (0.81-3.53)	0.165
Annual family income per capita						
≤20000 Yuan	1.00 (Reference)		1.00 (Reference)		1.00 (Reference)	
20001-39000 Yuan	1.36 (1.13-1.63)	<0.001	1.36 (1.11-1.68)	0.004	1.51 (0.98-2.32)	0.060
39001-60000 Yuan	1.72 (1.42-2.09)	<0.001	1.41 (1.10-1.81)	0.006	2.21 (1.45-3.39)	<0.001
>60000 Yuan	1.88 (1.50-2.35)	<0.001	1.69 (1.19-2.39)	0.003	2.27 (1.45-3.56)	<0.001
Missing	1.05 (0.82-1.36)	0.687	1.02 (0.75-1.40)	0.895	0.97 (0.57-1.67)	0.920
History of using immune-enhancing drugs						
No	1.00 (Reference)		1.00 (Reference)		1.00 (Reference)	
Yes	2.07 (1.81-2.38)	<0.001	1.79 (1.48-2.17)	<0.001	2.28 (1.84-2.82)	<0.001
History of hormone therapy for pneumoconiosis						
No	1.00 (Reference)		1.00 (Reference)		1.00 (Reference)	
Yes	2.17 (1.78-2.63)	<0.001	2.40 (1.90-3.04)	<0.001	1.74 (1.19-2.53)	0.004
Pulmonary tuberculosis	0.69 (0.56-0.85)	<0.001	0.74 (0.57-0.97)	0.027	0.76 (0.53-1.10)	0.144

Cardiovascular	1.30 (1.10-1.53)	0.002	1.55 (1.16-2.06)	0.003	1.04 (0.84-1.29)	0.718
Accumulated dust exposure time						
< 5 years	1.00 (Reference)		1.00 (Reference)		1.00 (Reference)	
5–9 years	0.86 (0.63-1.16)	0.324	0.79 (0.54-1.15)	0.216	0.89 (0.51-1.55)	0.685
10–14 years	1.16 (0.87-1.54)	0.305	1.07 (0.75-1.52)	0.724	1.26 (0.77-2.08)	0.356
15–19 years	1.13 (0.85-1.51)	0.401	1.05 (0.73-1.52)	0.788	1.08 (0.66-1.77)	0.749
20–24 years	1.34 (1.02-1.77)	0.034	1.29 (0.91-1.83)	0.149	1.15 (0.72-1.84)	0.555
25–29 years	1.02 (0.76-1.37)	0.893	1.06 (0.71-1.58)	0.767	0.91 (0.56-1.47)	0.705
30–34 years	1.09 (0.82-1.45)	0.537	1.07 (0.72-1.57)	0.744	0.96 (0.60-1.53)	0.860
> 34 years	0.81 (0.59-1.11)	0.194	0.63 (0.37-1.05)	0.075	0.79 (0.48-1.29)	0.349

Data are expressed as number(%); COPD: Chronic obstructive pulmonary disease; OR: Odds ratio; CI: Confidence interval.

Supplementary Table 5. Baseline characteristics before and after 1:1 propensity score matching

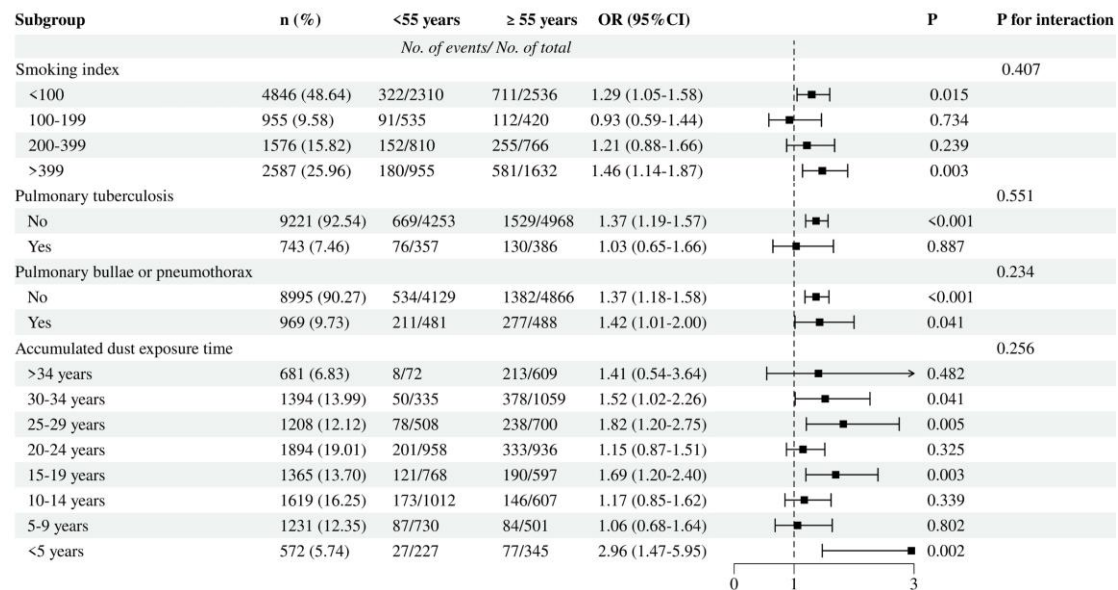
Covariates	Before Matching			After Matching		
	No COPD	COPD	SMD	No COPD	COPD	SMD
n	7560	2404		2267	2267	
Residence						
Rural areas	4504 (59.6)	1114 (46.3)	-0.265	1134 (50.0)	1090 (48.1)	-0.039
Urban areas	3056 (40.4)	1290 (53.7)	0.265	1133 (50.0)	1177 (51.9)	0.039
Smoking index						
<100	3813 (50.4)	1033 (43.0)	-0.151	923 (40.7)	960 (42.4)	0.033
100–199	752 (10.0)	203 (8.4)	-0.054	210 (9.3)	198 (8.7)	-0.019
200–399	1169 (15.5)	407 (16.9)	0.039	403 (17.8)	384 (16.9)	-0.022
>399	61.02 (9.1)	761 (31.7)	0.161	731 (32.3)	725 (32.0)	-0.006
BMI						
<18.5	4093 (54.1)	1242 (51.7)	-0.050	1190 (52.5)	1178 (52.0)	-0.011
18.5-23.9	468 (6.2)	273 (11.4)	0.163	242 (10.7)	254 (11.2)	0.017
24.0-27.9	2412 (31.9)	728 (30.3)	-0.035	676 (29.8)	682 (30.1)	0.006
≥28.0	587 (7.8)	161 (6.7)	-0.043	159 (7.0)	153 (6.8)	-0.011
Stages of pneumoconiosis						
Stage I	3493 (46.2)	968 (40.3)	-0.121	825 (36.4)	899 (39.7)	0.067
Stage II	1846 (24.4)	632 (26.3)	0.043	636 (28.1)	604 (26.6)	-0.032
Stage III	1482 (19.6)	623 (25.9)	0.144	627 (27.7)	586 (25.9)	-0.041
Clinical cases	739 (9.8)	181 (7.5)	-0.085	179 (7.9)	178 (7.9)	-0.002
Region of China						
Eastern	2748 (36.4)	682 (28.4)	-0.177	699 (30.9)	666 (29.4)	-0.032
Central	1661 (22.0)	290 (12.1)	-0.304	235 (10.4)	288 (12.7)	0.070
Western	2767 (36.6)	909 (37.8)	0.025	968 (42.7)	879 (38.8)	-0.081
Northeastern	384 (5.1)	523 (21.8)	0.404	365 (16.1)	434 (19.1)	0.077
Alcohol intake						

Covariates	Before Matching			After Matching		
	No COPD	COPD	SMD	No COPD	COPD	SMD
Non-drinkers	4049 (53.6)	1345 (56.0)	0.048	1240 (54.7)	1253 (55.3)	0.012
Current drinkers	1711 (22.6)	357 (14.9)	-0.219	347 (15.3)	345 (15.2)	-0.002
Former drinkers	1800 (23.8)	702 (29.2)	0.119	680 (30.0)	669 (29.5)	-0.011
Pulmonary tuberculosis						
No	7023 (92.9)	2198 (91.4)	-0.052	2079 (91.7)	2072 (91.4)	-0.011
Yes	537 (7.1)	206 (8.6)	0.052	188 (8.3)	195 (8.6)	0.011
Pulmonary bullae or pneumothorax						
No	7079 (93.6)	1916 (79.7)	-0.346	1907 (84.1)	1845 (81.4)	-0.070
Yes	481 (6.4)	488 (20.3)	0.346	360 (15.9)	422 (18.6)	0.070
Type of pneumoconiosis						
Others	678 (9.0)	155 (6.5)	-0.103	137 (6.0)	150 (6.6)	0.023
Silicosis	3657 (48.4)	1103 (45.9)	-0.050	1040 (45.9)	1022 (45.1)	-0.016
CWP	3225 (42.7)	1146 (47.7)	0.100	1090 (48.1)	1095 (48.3)	0.004
WRH						
No	4150 (54.9)	872 (36.3)	-0.387	888 (39.2)	863 (38.1)	-0.023
Yes	3410 (45.1)	1532 (63.7)	0.387	1379 (60.8)	1404 (61.9)	0.023
Accumulated dust exposure time						
> 34 years	468 (6.2)	104 (4.3)	-0.092	108 (4.8)	100 (4.4)	-0.017
30–34 years	1060 (14.0)	171 (7.1)	-0.269	157 (6.9)	170 (7.5)	0.022
25–29 years	1300 (17.2)	319 (13.3)	-0.116	326 (14.4)	308 (13.6)	-0.023
20–24 years	1054 (13.9)	311 (12.9)	-0.030	330 (14.6)	303 (13.4)	-0.035
15–19 years	1360 (18.0)	534 (22.2)	0.102	515 (22.7)	506 (22.3)	-0.010
10–14 years	892 (11.8)	316 (13.1)	0.040	271 (12.0)	299 (13.2)	0.037
5–9 years	966 (12.8)	428 (17.8)	0.131	376 (16.6)	392 (17.3)	0.019

Covariates	Before Matching			After Matching		
	No COPD	COPD	SMD	No COPD	COPD	SMD
< 5 years	460 (6.1)	221 (9.2)	0.108	184 (8.1)	189 (8.3)	0.008

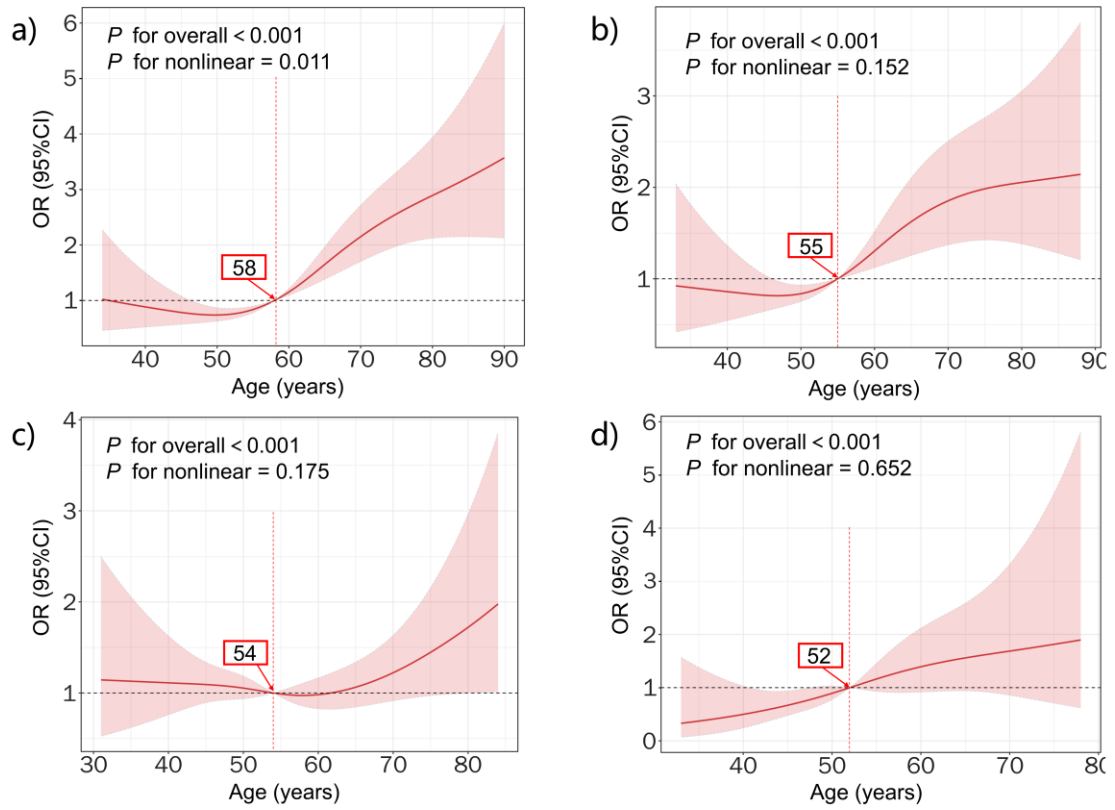
Data are expressed as number(%); COPD: Chronic obstructive pulmonary disease; BMI: Body mass index; WRII: Work-related injury insurance; CWP: Coal workers' pneumoconiosis; SMD, standardized mean difference.

Supplementary Figures



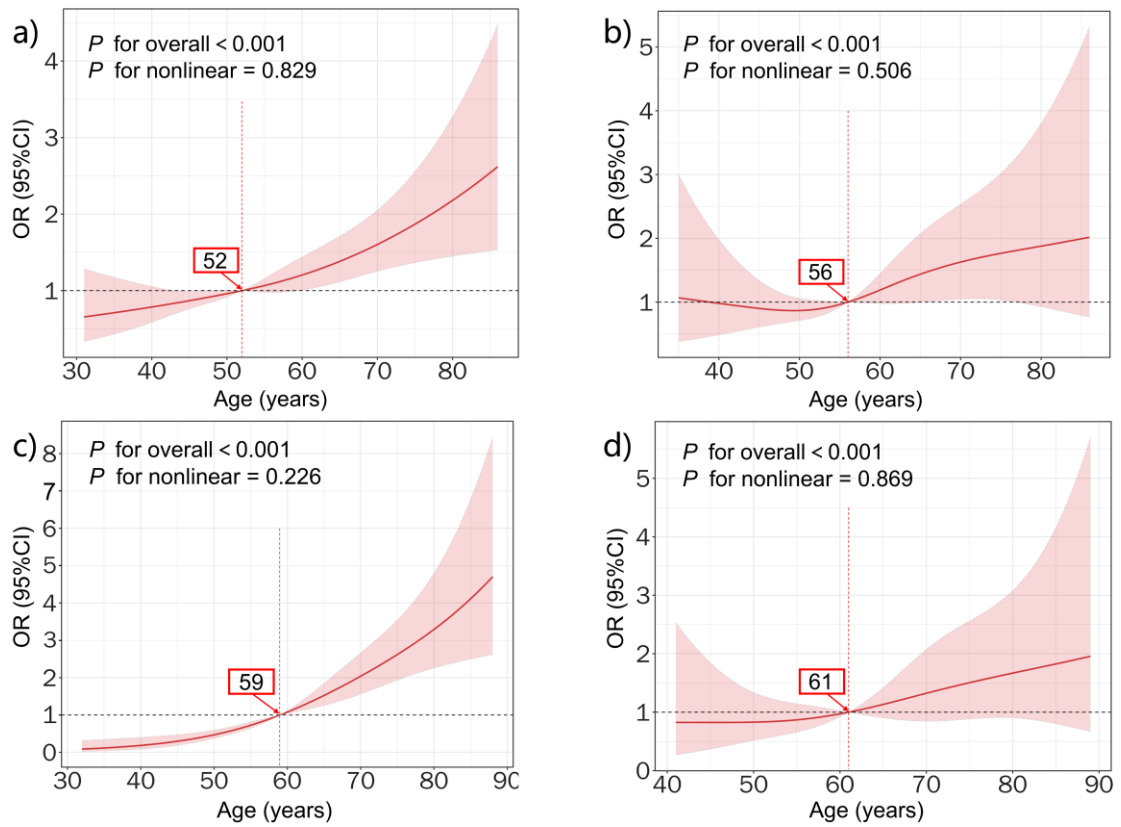
Supplementary Figure 1. Subgroup and interaction analyses of the association between age (≥ 55 vs < 55 years) and COPD risk in patients with pneumoconiosis (adjusted for other covariates).

BMI: Body mass index; WRII: Work-related injury insurance; SRH: Self-Rated Health; OR, odds ratio; CI, confidence interval.



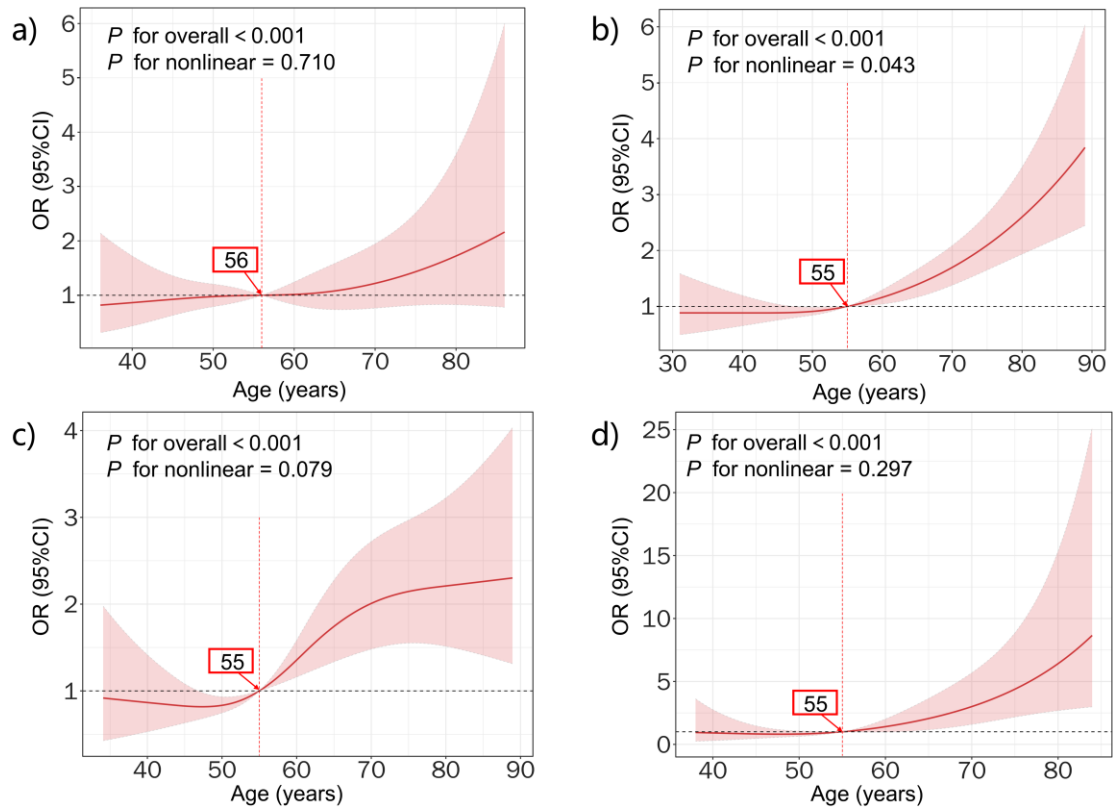
Supplementary Figure 2. Stratified analysis of age-related COPD risk by pneumoconiosis stage in patients with pneumoconiosis (fully adjusted model).

Stage I (a), Stage II (b), Stage III (c) and clinical cases (d).



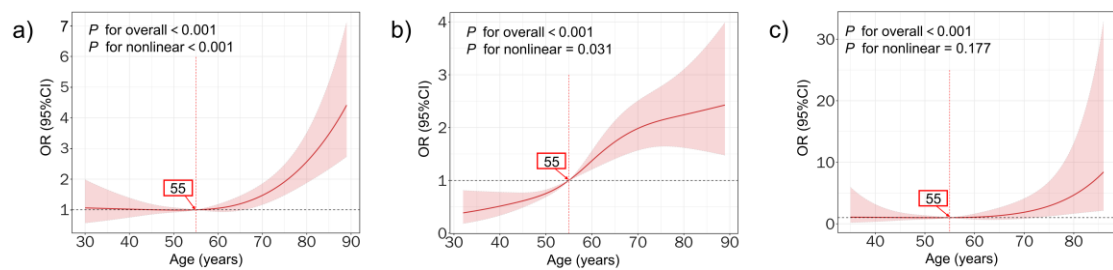
Supplementary Figure 3. Stratified analysis of age-related COPD risk by geographic region in patients with pneumoconiosis (fully adjusted model).

Western (a), central (b), eastern (c) and northeastern (d).



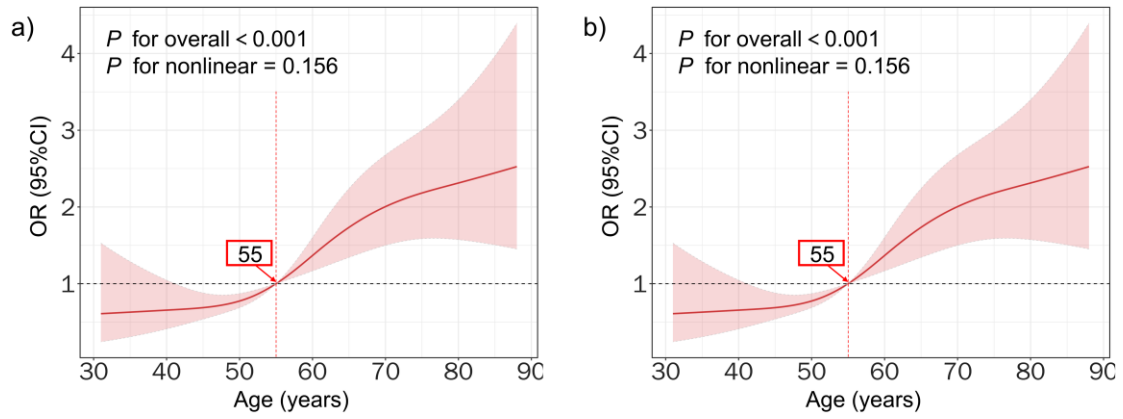
Supplementary Figure 4. Stratified analysis of age-related COPD risk by BMI categories in patients with pneumoconiosis (fully adjusted model).

<18.5 kg/m² (a), 18.5-23.9 kg/m² (b), 24.0-27.9 kg/m² (c) and ≥28.0 kg/m² (d).



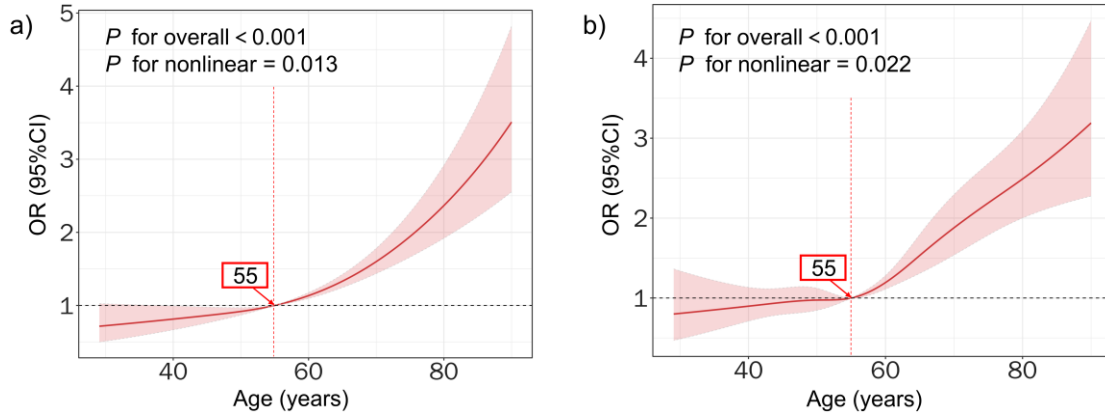
Supplementary Figure 5. Stratified analysis of age-related COPD risk by pneumoconiosis subtype in patients with pneumoconiosis (fully adjusted model).

Silicosis (a), coal workers' pneumoconiosis (b) and others (c).



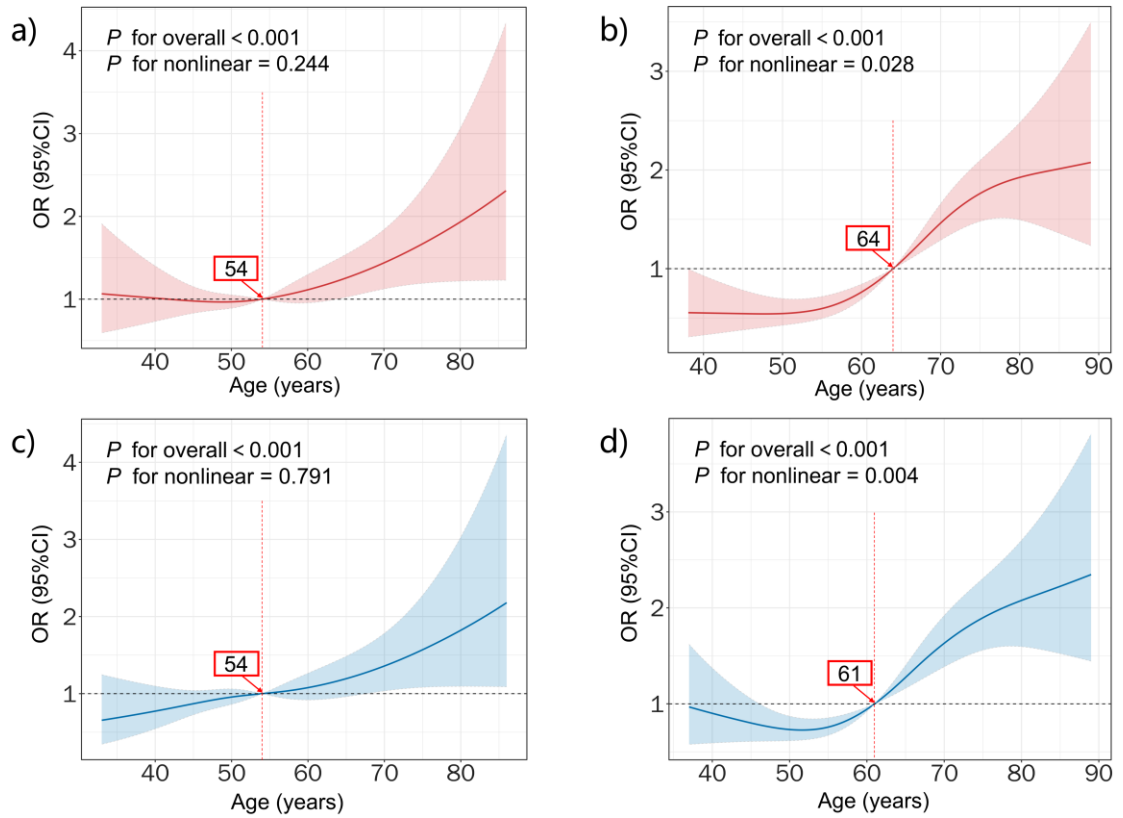
Supplementary Figure 6. Stratified analysis of age-related COPD risk by self-rated health (SRH) score in patients with pneumoconiosis (fully adjusted model).

SRH \leq 60 (a), SRH > 60 (b).



Supplementary Figure 7. Sensitivity analysis of age-related COPD risk using restricted cubic spline (RCS) models with different knot settings in patients with pneumoconiosis (fully adjusted model).

RCS model with 3 knots (a), RCS model with 5 knots (b).



Supplementary Figure 8. Stratified analysis of age-related COPD risk by residence and work-related injury insurance(WRII) status in patients with pneumoconiosis after propensity score matching (adjusted for other covariates).

Rural residence (a), urban residence (b), without WRII (c) and with WRII (d). OR, odds ratio; CI, confidence interval.