

Original Article**The risk of pneumothorax in pneumoconiosis patients in Taiwan:  
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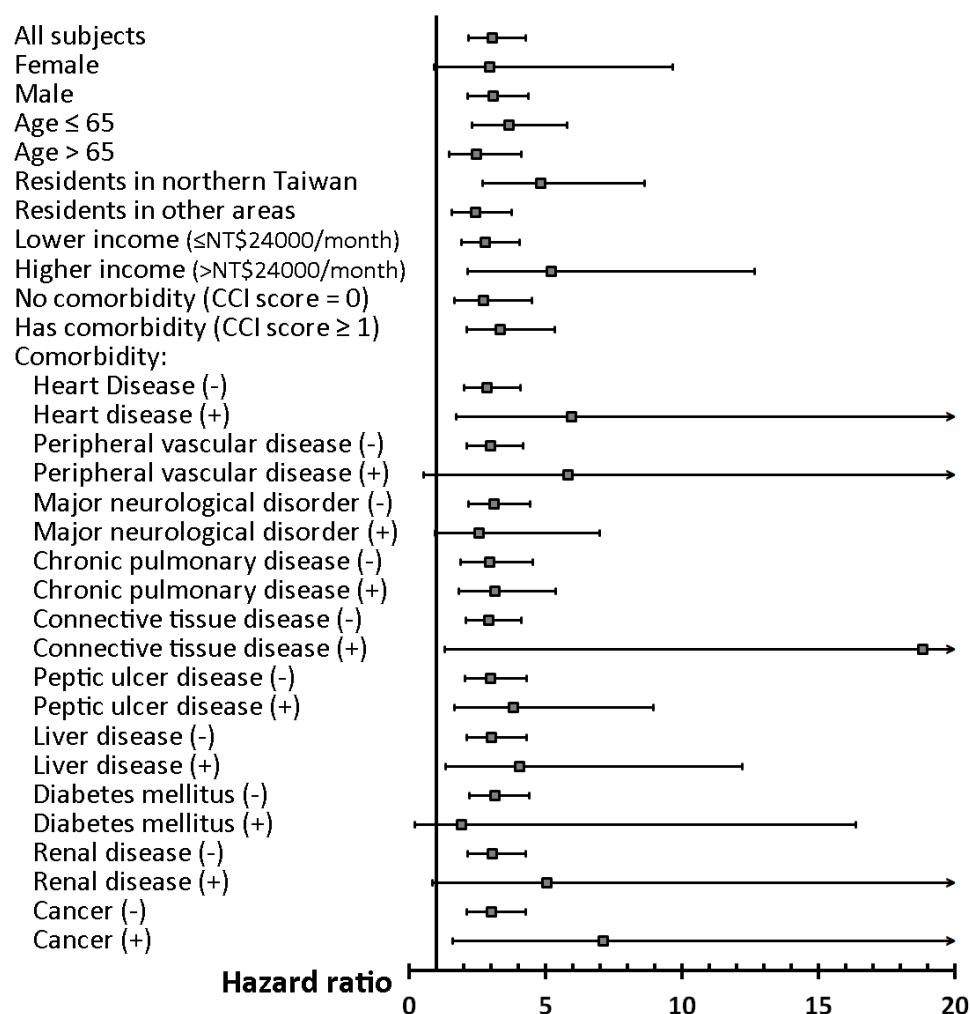
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**Table S1. Multivariable Cox regression analysis of the factors contributing to pneumothorax in the study population.**

Variables	HR [95% CI]	P value
<b>Pneumoconiosis patients vs. Control subjects</b>	3.05 [2.18-4.27]	<0.0001
<b>Male vs. Female</b>	4.46 [2.70-7.37]	<0.0001
<b>Age &gt; 65 vs. ≤65</b>	1.59 [1.17-2.17]	0.0030
<b>Residency (Northern Taiwan vs. Other areas)</b>	0.74 [0.53-1.04]	0.0795
<b>Higher income (&gt;NT\$24000) vs. lower income (≤NT\$24000)</b>	0.61 [0.39-0.96]	0.0324
<b>Presence of underlying diseases:</b>		
Heart disease	1.70 [0.93-3.10]	0.0868
Peripheral vascular disease	3.50 [1.39-8.80]	0.0078
Major neurological disorder	1.78 [1.15-2.75]	0.0098
Chronic pulmonary disease	2.42 [1.73-3.38]	<0.0001
Connective tissue disease	3.25 [1.31-8.07]	0.0111
Peptic ulcer disease	1.00 [0.65-1.55]	0.9876
Liver disease	1.31 [0.80-2.16]	0.2800
Diabetes mellitus	0.58 [0.31-1.10]	0.0931
Renal disease	1.21 [0.57-2.57]	0.6175
Cancer	1.30 [0.68-2.50]	0.4337

Abbreviation: NT\$ = New Taiwan Dollar; HR = hazard ratio; CI = confidence interval.



**Figure S1. Stratified analyses of multivariable Cox regression analyses assessing the effect of pneumoconiosis on incident pneumothorax.**

The results are presented with adjusted HRs (95% CI) of pneumoconiosis, which are adjusted for sex, age, residency, income level, and the presence of various comorbidities (except for the variable used for stratification).

\*Abbreviations: CCI = Charlson Comorbidity Index; HR = hazard ratio; CI = confidence interval.

**Table S2. Baseline characteristics of the propensity score (PS)-matched cohorts.**

	All subjects	Pneumoconiosis	Control	P value
<b>N</b>	9675	1935	7740	
<b>Sex, n (%)</b>				
Female	2800 (29%)	560 (29%)	2240 (29%)	
Male	6875 (71%)	1375 (71%)	5500 (71%)	
<b>Age (year), mean <math>\pm</math> SD</b>	56.7 $\pm$ 15.6	56.7 $\pm$ 15.6	56.7 $\pm$ 15.6	
<b>Age (year), n (%)</b>				
$\leq 65$	6622 (68%)	1323 (68%)	5299 (68%)	
$> 65$	3053 (32%)	612 (32%)	2441 (32%)	
<b>Residency, n (%)</b>				$>0.99$
Northern Taiwan	4315 (45%)	863 (45%)	3452 (45%)	
Other areas	5360 (55%)	1072 (55%)	4288 (55%)	
<b>Monthly income (NT\$), median (IQR)</b>	19200 (0-21900)	19200 (0-21900)	19200 (0-21900)	0.5137
<b>Monthly income (NT\$), n (%)</b>				0.3931
$\leq 24000$	7596 (79%)	1533 (79%)	6063 (78%)	
$> 24000$	2079 (21%)	402 (21%)	1677 (22%)	
<b>CCI score, mean <math>\pm</math> SD</b>	0.5 $\pm$ 1	0.5 $\pm$ 1.1	0.5 $\pm$ 1	0.3092
<b>CCI score, n (%)</b>				0.5506
= 0	7038 (73%)	1389 (72%)	5649 (73%)	
= 1	1423 (15%)	292 (15%)	1131 (15%)	
$\geq 2$	1214 (13%)	254 (13%)	960 (12%)	
<b>Underlying diseases, n (%)</b>				
Heart disease	176 (2%)	42 (2%)	134 (2%)	0.1959
Myocardial infarction	49 (1%)	11 (1%)	38 (0%)	0.6674
Congestive heart failure	137 (1%)	31 (2%)	106 (1%)	0.4387
Peripheral vascular disease	42 (0%)	10 (1%)	32 (0%)	0.5362
Major neurological disorder	491 (5%)	96 (5%)	395 (5%)	0.7989
Cerebral Vascular disease	477 (5%)	96 (5%)	381 (5%)	0.9438
Dementia	24 (0%)	4 (0%)	20 (0%)	0.6827
Hemiplegia	41 (0%)	8 (0%)	33 (0%)	0.9376
Chronic pulmonary disease	1532 (16%)	306 (16%)	1226 (16%)	0.9778
Connective tissue disease	43 (0%)	7 (0%)	36 (0%)	0.5410
Peptic ulcer disease	874 (9%)	190 (10%)	684 (9%)	0.1778
Liver disease	512 (5%)	108 (6%)	404 (5%)	0.5249
Diabetes mellitus	458 (5%)	89 (5%)	369 (5%)	0.7557
Renal disease	120 (1%)	28 (1%)	92 (1%)	0.3583
Cancer	139 (1%)	31 (2%)	108 (1%)	0.4943

Abbreviation: NT\$ = New Taiwan Dollar; CCI = Charlson Comorbidity Index;  
SD = standard deviation; IQR = interquartile range.

**Table S3. Incidence rate of pneumothorax (PTX) after the index date in each propensity score (PS)-matched cohort.**

	Pneumoconiosis				Control				IRR [95% CI]
	N	PTX	PY	IR	N	PTX	PY	IR	
<b>All PS-matched subjects</b>	1935	36	24639.4	1.5	7740	48	101849.3	0.5	3.1 [2.7-3.6]***
<b>Stratified analyses</b>									
<b>Sex</b>									
Female	560	1	8115.7	0.1	2240	5	32460.7	0.2	0.8 [0.5-1.2]
Male	1375	35	16523.7	2.1	5500	43	69388.6	0.6	3.4 [2.9-4.0]***
<b>Age</b>									
≤ 50	1323	22	18000.0	1.2	5299	25	74282.3	0.3	3.6 [3.1-4.3]***
> 50	612	14	6639.4	2.1	2441	23	27567.0	0.8	2.5 [2.0-3.2]***
<b>Residents in</b>									
Northern Taiwan	863	12	11836.9	1.0	3452	11	48460.0	0.2	4.5 [3.6-5.6]***
Other areas	1072	24	12802.5	1.9	4288	37	53389.2	0.7	2.7 [2.2-3.3]***
<b>Monthly income</b>									
≤ NT\$24000	1533	29	19155.5	1.5	6063	45	78417.2	0.6	2.6 [2.3-3.1]***
> NT\$24000	402	7	5483.9	1.3	1677	3	23432.0	0.1	10.0 [6.9-14.4]***
<b>Comorbidity</b>									
No (CCI score = 0)	1389	19	19330.8	1.0	5649	27	80127.9	0.3	2.9 [2.5-3.5]***
Yes (CCI score ≥ 1)	546	17	5308.6	3.2	2091	21	21721.4	1.0	3.3 [2.6-4.3]***

\*\*\* $p < 0.0001$ 

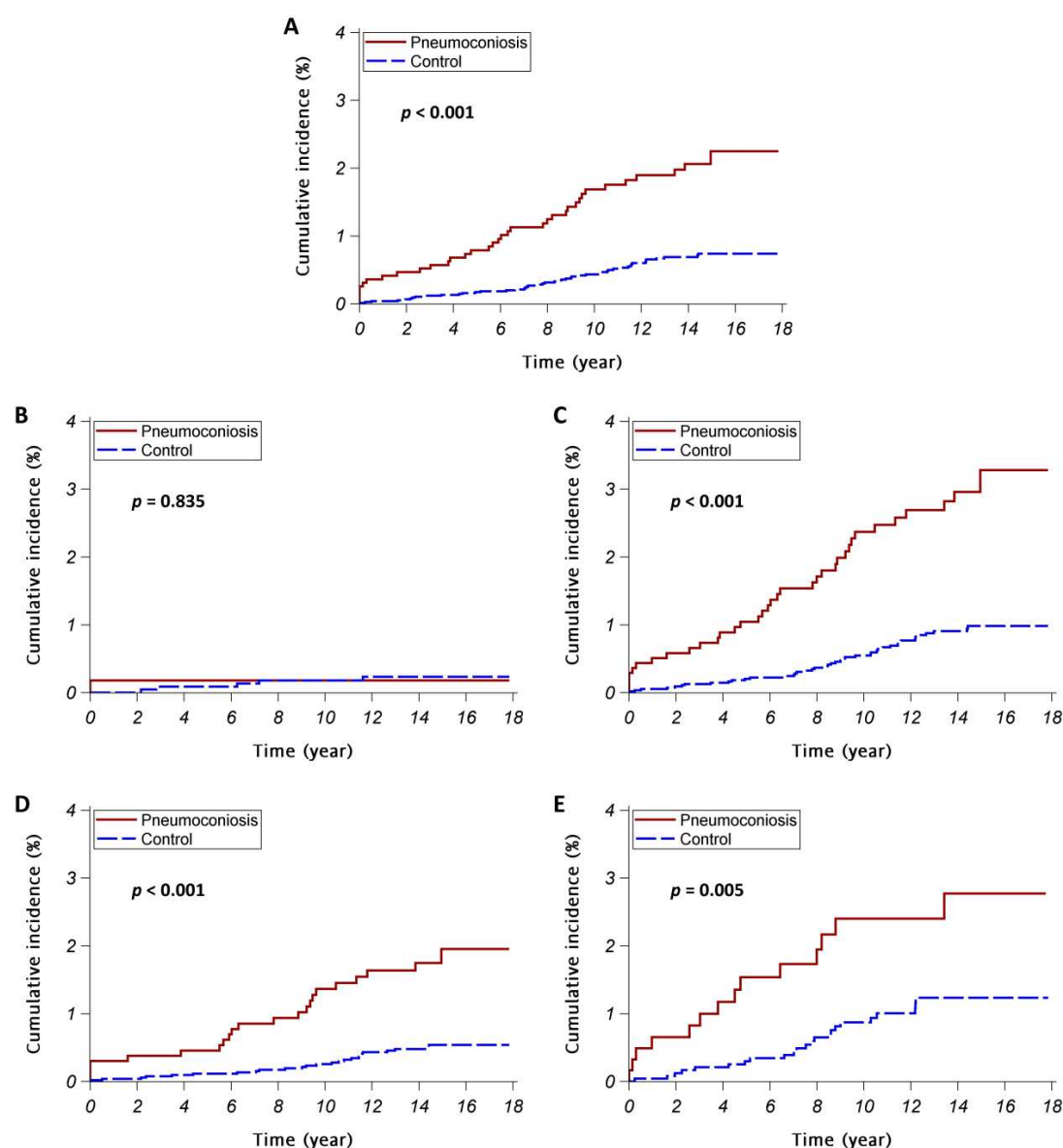
Abbreviation: NT\$ = New Taiwan Dollar; CCI = Charlson Comorbidity Index;

N = number of patients; PTX = pneumothorax (number of patients);

PY = total patient-years;

IR = incident rate, as expressed as PTX incidence per 1000 patient-years;

IRR = incidence rate ratio; CI = confidence interval.



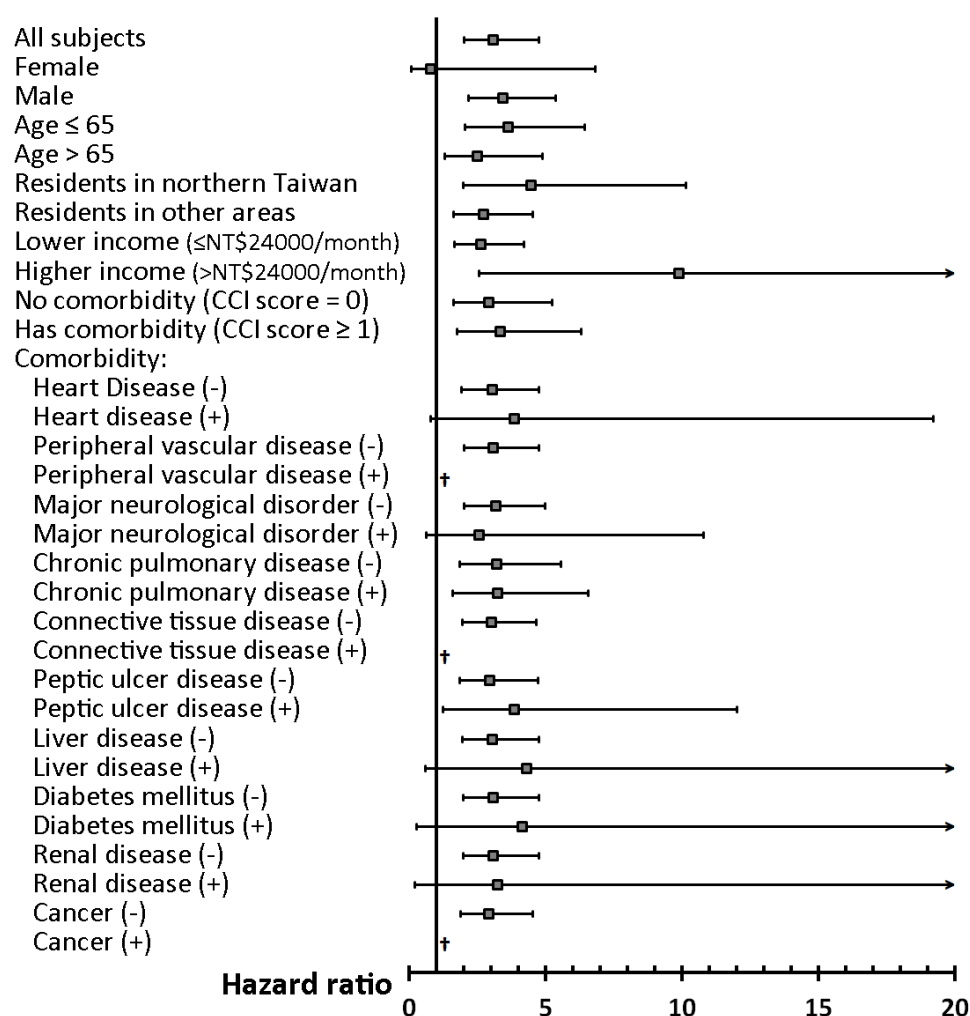
**Figure S2. The cumulative incidences of pneumothorax in the propensity score (PS)-matched cohorts.**

The red continuous lines and blue dashed lines show the cumulative incidence of pneumothorax for the pneumoconiosis patients and the control subjects respectively.

(a) all study subjects;

(b) female subjects; (c) male subjects;

(d) subjects aged  $\leq 65$  years; (e) subjects aged  $> 65$  years.



**Figure S3. Stratified analyses of univariate Cox regression analyses assessing the effect of pneumoconiosis on incident pneumothorax in the propensity score (PS)-matched cohorts.**

The results are presented with HRs (95% CI) of pneumoconiosis.

\*Abbreviations: CCI = Charlson Comorbidity Index; HR = hazard ratio; CI = confidence interval.

†: Due to small sample size, hazard ratio cannot be estimated.

**Table S4. Pneumoconiosis cases with pneumothorax reported from different countries and industries, available with patients' data.**

Country	Author (year)	Occupation	Case number	Age	sex	Exposure		Smoking
						dust	duration	
Indonesia	Amanda G (2016) <sup>1</sup>	builder	1	39	M	silica	18	Y
India	Natarajan AS (1992) <sup>2</sup>	silica flour mill worker	1	28	M	silica	7	N
	Gupta KB (2006) <sup>3</sup>	stone cutting	1	26	M	silica	3	Y
	Fotedar S (2010) <sup>4</sup>	stone cutting	1	24	M	silica	4	N
	Bairagya T (2012) <sup>5</sup>	stone cutting	1	21	M	silica	4	Y
	Srivastava GN (2014) <sup>6</sup>	stone crusher	1	28	M	silica	1	N
	Mishra P (2014) <sup>7</sup>	well driller	1	33	M	silica	10	N
	Dixit R (2015) <sup>8</sup>	stone crusher	1	35	M	silica	2	N
	Sharma RK (2017) <sup>9</sup>	Stone mining	20 (50)	—	M(45), F(5)*	silica	10 (5-15)*	Y(30)*
	Bairwa MK (2019) <sup>10</sup>	stone crusher & cutting	20	38.6 (26-65)	M	silica	13.7 (5-24)	Y(15)
	Meena MK (2020) <sup>11</sup>	stone mining	22 (50)	38.70 (10.17) *	—	silica	13.8 (4.8)*	Y(38)*
Iran	Mohebbi I (2007) <sup>12</sup>	stone grinding	7 (21)	26.43 (5.85)	M*	silica	2.14 (1)	N*
Japan	Hasejima N (1995) <sup>13</sup>	beryllium-copper wire drawing	1	24	M	beryllium	—	—
	Handa T (2009) <sup>14</sup>	—	2 (10)	33 (24-40) *	M(4), F(6)*	beryllium	5.84 (1-10.4)*	—
	Kobashi Y (2003) <sup>15</sup>	—	1	46	M	silica	13	—
	Kurihara T (2014) <sup>16</sup>	—	1	71	M	asbestos	—	—
Brazil	Moreira MA (2010) <sup>17</sup>	saws and knives sharpener	1	27	M	Hard metal	8	Y
Turkey	Fidan F (2005) <sup>18</sup>	welding	1	23	M	Hard metal	8	Y
	Sahbaz S (2007) <sup>19</sup>	denim, sandblasting	2	Case 1: 23 Case 2: 25	M	silica	Case 1: 3 Case 2: 1.5	Case 1: Y Case 2: —
	Aydin Y (2010) <sup>20</sup>	—	2 (5)	18.6 (16-22)*	M*	silica	—	Y *
Belgium	Demoulin AS (2009) <sup>21</sup>	metal sandblasting	1	26	M	silica	5	Y
South Africa	Oni T (2015) <sup>22</sup>	gold miner	1	59	M	silica	16.5	Y
Korea	Yang HS (2014) <sup>23</sup>	glass blending	1	57	M	silica	20	Y
Morocco	Elidrissi AM (2016) <sup>24</sup>	well-digger	2 (54)	50 (34-82)*	M	silica	12.9*	Y(36)*
China	Zhang DH (2003) <sup>25</sup>	gem worker	5 (47)	—	—	silica	4.67(1.17)*	—
	Wu N (2020) <sup>26</sup>	Artificial Stone Natural stone	3 (18) 1 (63)	36.1 (9.6)* 52.8 (8.6)*	M* M(52), F(11)*	silica	6.4 (2.9)* 29.3 (11.7)*	Y(12)* Y(43)*
USA	Suratt PM (1977) <sup>27</sup>	tombstone sandblaster	4	36 (23-47)	M	silica	2.9 (1.6-5.3)	Y(4)
	Mindy J. (2002) <sup>28</sup>	Aluminum welder	1 (2)	43	M	Aluminum fume	24	Y

Cases are presented as pneumoconiosis with pneumothorax (total observation cases).

Age is presented as mean (SD or range); duration of exposure is presented in mean years (SD or range).

—, information not available or not stated; \* data for all observed cases; Y( ), yes(case number); N, not used.



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