

1 **Pneumonia hospitalizations and the subsequent risk of**
2 **incident ischemic cardiovascular disease in Chinese adults**

3 **Online Data Supplement**

4 Yizhen Hu, MD, Canqing Yu, PhD, Yu Guo, MSc, Zheng Bian, MSc, Yuting Han,
5 MD, Ling Yang, PhD, Yiping Chen, DPhil, Huaidong Du, PhD, Yuanjie Pang, DPhil,
6 Dianjianyi Sun, PhD, Jianrong Jin, BA, Jun Zhang, BA, Jingjia Wang, MD, Chunli
7 Shao, PhD, Yi-Da Tang, PhD, Junshi Chen, MD, Zhengming Chen, DPhil, Jun Lv,
8 PhD*, Liming Li, MPH, on behalf of the China Kadoorie Biobank Collaborative
9 Group

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1 **Members of the China Kadoorie Biobank collaborative group**

2 **International Steering Committee:** Junshi Chen, Zhengming Chen (PI), Robert Clarke, Rory

3 Collins, Yu Guo, Liming Li (PI), Jun Lv, Richard Peto, Robin Walters. **International Co-**

4 **ordinating Centre, Oxford:** Daniel Avery, Ruth Boxall, Derrick Bennett, Yumei Chang, Yiping

5 Chen, Zhengming Chen, Robert Clarke, Huaidong Du, Simon Gilbert, Alex Hacker, Mike Hill,

6 Michael Holmes, Andri Iona, Christiana Kartsonaki, Rene Kerosi, Ling Kong, Om Kurmi, Garry

7 Lancaster, Sarah Lewington, Kuang Lin, John McDonnell, Iona Millwood, Qunhua Nie,

8 Jayakrishnan Radhakrishnan, Paul Ryder, Sam Sansome, Dan Schmidt, Paul Sherliker,

9 Rajani Sohoni, Becky Stevens, Iain Turnbull, Robin Walters, Jenny Wang, Lin Wang, Neil

10 Wright, Ling Yang, Xiaoming Yang. **National Co-ordinating Centre, Beijing:** Zheng Bian, Yu

11 Guo, Xiao Han, Can Hou, Jun Lv, Pei Pei, Chao Liu, Canqing Yu. **10 Regional Co-ordinating**

12 **Centres: Qingdao CDC:** Zengchang Pang, Ruqin Gao, Shanpeng Li, Shaojie Wang,

13 Yongmei Liu, Ranran Du, Yajing Zang, Liang Cheng, Xiaocao Tian, Hua Zhang, Yaoming

14 Zhai, Feng Ning, Xiaohui Sun, Feifei Li. **Licang CDC:** Silu Lv, Junzheng Wang, Wei Hou.

15 **Heilongjiang Provincial CDC:** Mingyuan Zeng, Ge Jiang, Xue Zhou. **Nangang CDC:** Liqiu

16 Yang, Hui He, Bo Yu, Yanjie Li, Qinai Xu, Quan Kang, Ziyan Guo. **Hainan Provincial CDC:**

17 Dan Wang, Ximin Hu, Jinyan Chen, Yan Fu, Zhenwang Fu, Xiaohuan Wang. **Meilan CDC:**

18 Min Weng, Zhendong Guo, Shukuan Wu, Yilei Li, Huimei Li, Zhifang Fu. **Jiangsu Provincial**

19 **CDC:** Ming Wu, Yonglin Zhou, Jinyi Zhou, Ran Tao, Jie Yang, Jian Su. **Suzhou CDC:** Fang

20 liu, Jun Zhang, Yihe Hu, Yan Lu, , Liangcai Ma, Aiyu Tang, Shuo Zhang, Jianrong Jin,

21 Jingchao Liu. **Guangxi Provincial CDC:** Zhenzhu Tang, Naying Chen, Ying Huang. **Liuzhou**

22 **CDC:** Mingqiang Li, Jinhuai Meng, Rong Pan, Qilian Jiang, Jian Lan, Yun Liu, Liuping Wei,

23 Liyuan Zhou, Ningyu Chen Ping Wang, Fanwen Meng, Yulu Qin,, Sisi Wang. **Sichuan**

24 **Provincial CDC:** Xianping Wu, Ningmei Zhang, Xiaofang Chen, Weiwei Zhou. **Pengzhou**

25 **CDC:** Guojin Luo, Jianguo Li, Xiaofang Chen, Xunfu Zhong, Jiaqiu Liu, Qiang Sun. **Gansu**

26 **Provincial CDC:** Pengfei Ge, Xiaolan Ren, Caixia Dong. **Maiji CDC:** Hui Zhang, Enke Mao,

27 Xiaoping Wang, Tao Wang, Xi zhang. **Henan Provincial CDC:** Ding Zhang, Gang Zhou,

28 Shixian Feng, Liang Chang, Lei Fan. **Huixian CDC:** Yulian Gao, Tianyou He, Huarong Sun,

29 Pan He, Chen Hu, Xukui Zhang, Huifang Wu, Pan He. **Zhejiang Provincial CDC:** Min Yu,

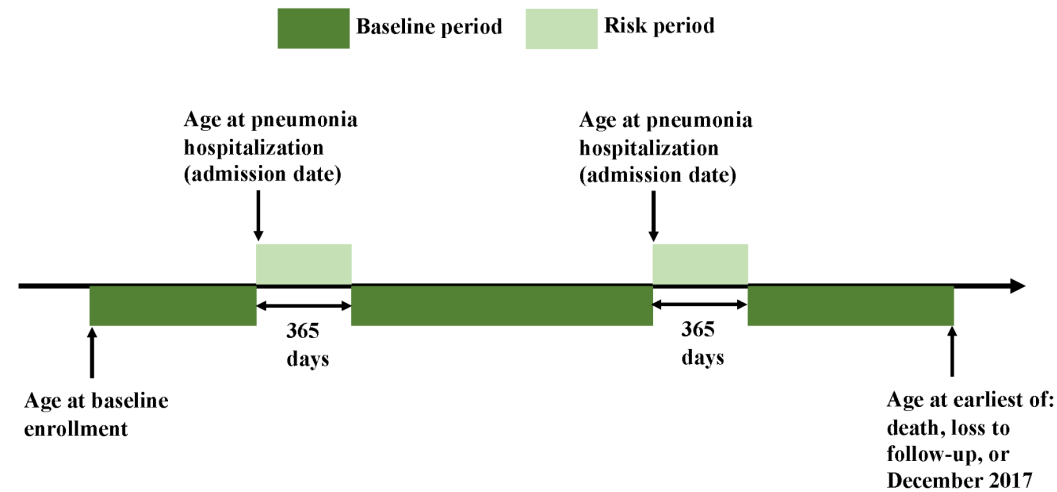
30 Ruying Hu, Hao Wang. **Tongxiang CDC:** Yijian Qian, Chunmei Wang, Kaixu Xie, Lingli Chen,

31 Yidan Zhang, Dongxia Pan, Qijun Gu. **Hunan Provincial CDC:** Yuelong Huang, Biyun Chen,

32 Li Yin, Huilin Liu, Zhongxi Fu, Qiaohua Xu. **Liuyang CDC:** Xin Xu, Hao Zhang, Huajun Long,

33 Xianzhi Li, Libo Zhang, Zhe Qiu.

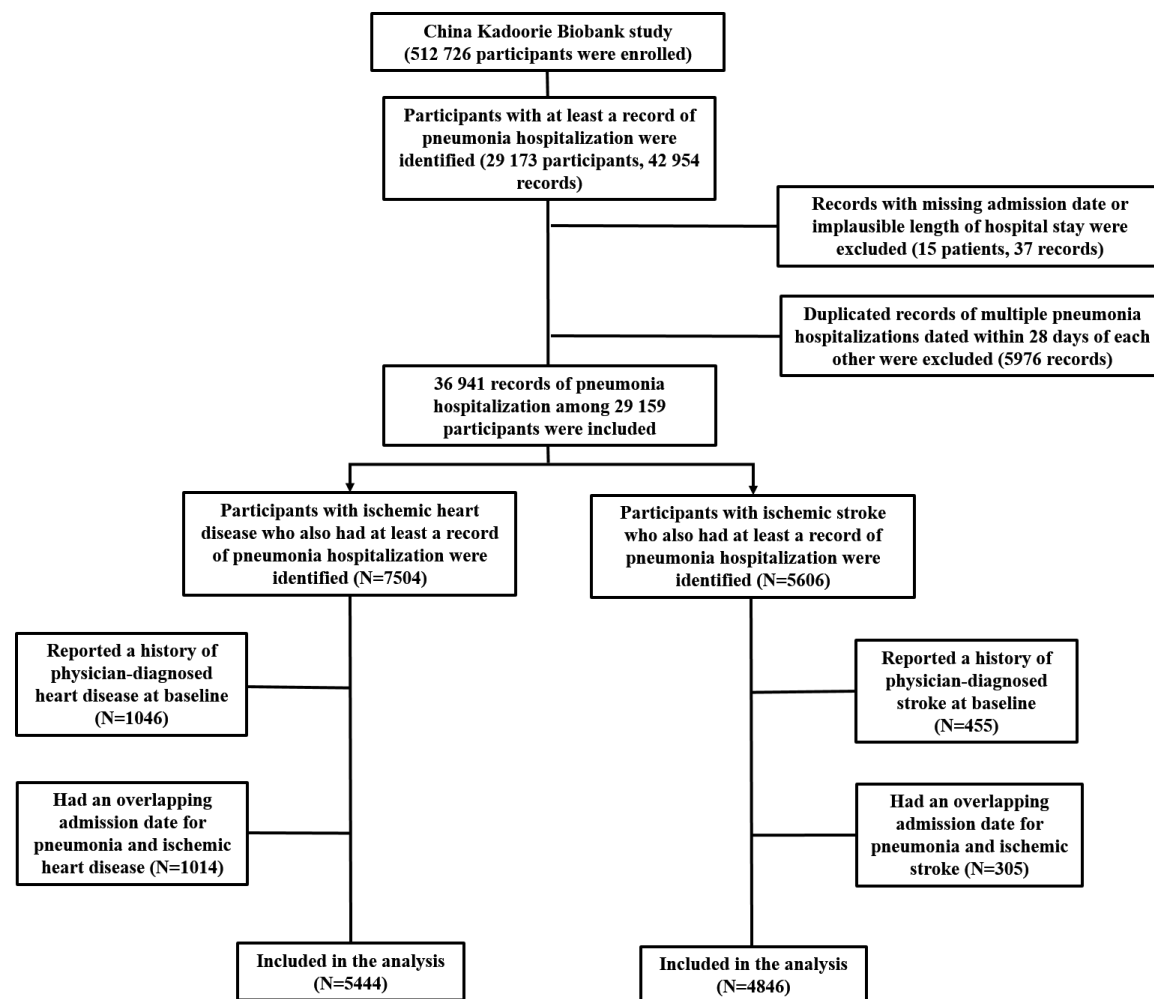
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Supplementary Figure S1 Schematic of the self-controlled case series design

5 This timeline is based on age. The risk period (light-shaded areas) was divided into 1-3, 4-7, 8-28, 29-91, and 92-365 days (not drawn to scale) after
6 pneumonia hospitalization. We included CKB participants who had both records of new-onset ischemic cardiovascular disease and hospitalization for
7 pneumonia during the observation period in the analysis. The incidence ratio for new-onset ischemic cardiovascular disease occurring within each risk period
8 compared with the baseline period (dark-shaded areas) was calculated for each participant.



Supplementary Figure S2 Flowchart illustrating the number of participants included in our study

1 **Supplementary Table S1 Sensitivity analyses for association of pneumonia hospitalization with new-onset ischemic**
2 **cardiovascular disease**

	Cases included in analyses, n	RIs (95% CIs)				
		1-3 days	4-7 days	8-28 days	29-91 days	92-365 days
Analyses of IHD risk						
Primary analysis	5444	4.24 (2.92, 6.15)	3.66 (2.59, 5.19)	3.08 (2.59, 3.65)	1.74 (1.52, 2.00)	1.23 (1.12, 1.35)
Sensitivity analysis						
Adjusting for age in 1-year age bands	5444	4.09 (2.82, 5.93)	3.54 (2.50, 5.01)	2.97 (2.50, 3.53)	1.68 (1.47, 1.93)	1.18 (1.08, 1.30)
Adjusting for calendar month	5444	4.22 (2.91, 6.13)	3.65 (2.58, 5.18)	3.07 (2.59, 3.64)	1.74 (1.52, 2.00)	1.23 (1.12, 1.35)
Excluding cases who have died within 30 days of the IHD event	5 082	2.63 (1.61, 4.30)	2.61 (1.70, 4.01)	2.26 (1.84, 2.78)	1.47 (1.26, 1.72)	1.12 (1.01, 1.23)
Including cases who were not hospitalized for pneumonia in the observation period	46 677	4.07 (2.80, 5.90)	3.52 (2.48, 4.99)	2.96 (2.50, 3.51)	1.68 (1.47, 1.93)	1.18 (1.08, 1.29)
Different lengths of pre-exposure period ^a						
2-week before exposure	5444	4.34 (2.99, 6.30)	3.75 (2.65, 5.32)	3.17 (2.67, 3.76)	1.79 (1.56, 2.06)	1.24 (1.13, 1.36)
1-month before exposure	5444	4.41 (3.04, 6.40)	3.83 (2.70, 5.42)	3.16 (2.65, 3.75)	1.80 (1.57, 2.07)	1.24 (1.13, 1.37)
Analyses of IS risk						
Primary analysis	4846	1.85 (1.02, 3.35)	3.44 (2.36, 5.03)	1.59 (1.24, 2.04)	1.25 (1.05, 1.48)	1.04 (0.94, 1.15)
Sensitivity analysis						
Adjusting for age in 1-year age bands	4846	1.78 (0.98, 3.22)	3.31 (2.27, 4.84)	1.53 (1.19, 1.96)	1.20 (1.01, 1.42)	1.00 (0.90, 1.11)
Adjusting for calendar month	4846	1.85 (1.02, 3.34)	3.44 (2.35, 5.02)	1.59 (1.24, 2.04)	1.25 (1.05, 1.48)	1.04 (0.94, 1.15)
Excluding cases who have died within 30 days of the IS event	4727	1.74 (0.94, 3.24)	2.38 (1.49, 3.78)	1.38 (1.06, 1.81)	1.16 (0.97, 1.39)	1.00 (0.90, 1.12)
Including cases who were not hospitalized for pneumonia in the observation period	46 985	1.79 (0.99, 3.24)	3.33 (2.28, 4.87)	1.54 (1.20, 1.97)	1.21 (1.02, 1.43)	1.01 (0.91, 1.12)

		Cases included in analyses, n	RIs (95% CIs)				
			1-3 days	4-7 days	8-28 days	29-91 days	92-365 days
Different lengths of pre-exposure period ^a							
	2-week before exposure	4846	1.88 (1.04, 3.39)	3.49 (2.39, 5.10)	1.62 (1.26, 2.08)	1.28 (1.07, 1.51)	1.06 (0.95, 1.18)
	1-month before exposure	4846	1.92 (1.06, 3.46)	3.57 (2.45, 5.22)	1.64 (1.28, 2.11)	1.29 (1.09, 1.53)	1.07 (0.97, 1.19)

1 Abbreviations: RI, relative incidence; CI, confidence interval; IHD, ischemic heart disease; IS, ischemic stroke.

2 ^aA pre-exposure period is a portion of the observation time immediately preceding the index date that was excluded from the baseline period.

1 **Supplementary Table S2 More subgroup analyses for association**
2 **between pneumonia hospitalization and ischemic heart disease**

Subgroup	RIs (95% CIs)			Baseline (n=4479)	P value for interaction ^a
	1-28 (n=198)	29-91 (n=218)	92-365 (n=549)		
Overall	3.29 (2.85, 3.80)	1.74 (1.52, 2.00)	1.23 (1.12, 1.35)	1.00	
Sex					0.005
Male	4.07 (3.34, 4.96)	2.03 (1.67, 2.47)	1.18 (1.02, 1.36)	1.00	
Female	2.68 (2.17, 3.31)	1.52 (1.25, 1.85)	1.26 (1.12, 1.42)	1.00	
Region					0.001
Rural	3.77 (3.14, 4.52)	1.78 (1.48, 2.14)	1.40 (1.25, 1.57)	1.00	
Urban	2.70 (2.13, 3.42)	1.70 (1.38, 2.10)	1.00 (0.86, 1.17)	1.00	
Educational attainment					0.007
No formal / primary school	3.63 (3.06, 4.31)	1.63 (1.37, 1.95)	1.33 (1.19, 1.48)	1.00	
Middle school or higher	2.65 (2.02, 3.48)	1.96 (1.57, 2.45)	1.03 (0.87, 1.22)	1.00	
Tobacco smoking					0.015
Nonsmoker	2.78 (2.29, 3.38)	1.64 (1.38, 1.96)	1.26 (1.13, 1.41)	1.00	
Current smoker ^b	4.24 (3.41, 5.27)	1.94 (1.55, 2.43)	1.15 (0.98, 1.36)	1.00	
Alcohol drinking					0.067
Non-weekly drinker	3.22 (2.75, 3.77)	1.70 (1.46, 1.98)	1.28 (1.16, 1.41)	1.00	
Weekly drinker	3.73 (2.60, 5.35)	1.98 (1.41, 2.80)	0.91 (0.69, 1.20)	1.00	
BMI					0.207
18.5-24.9 kg/m ²	3.46 (2.87, 4.18)	1.96 (1.64, 2.33)	1.26 (1.12, 1.42)	1.00	
<18.5 kg/m ² or ≥25.0 kg/m ²	3.07 (2.46, 3.84)	1.48 (1.18, 1.85)	1.18 (1.03, 1.36)	1.00	
Waist circumference					0.120
Male<85 cm, female<80 cm	3.57 (2.94, 4.35)	1.93 (1.60, 2.33)	1.33 (1.17, 1.51)	1.00	
Male≥85 cm, female≥80 cm	3.01 (2.44, 3.72)	1.56 (1.27, 1.92)	1.13 (0.99, 1.29)	1.00	
Family history of CVD^c					0.210
No	3.54 (3.02, 4.14)	1.79 (1.53, 2.08)	1.24 (1.11, 1.37)	1.00	
Yes	2.37 (1.65, 3.42)	1.58 (1.16, 2.16)	1.19 (0.98, 1.45)	1.00	

3 Abbreviations: RI, relative incidence; CI, confidence interval; BMI, body mass index; CVD,
4 cardiovascular disease.

5 ^a We tested multiplicative interaction by using a likelihood ratio test comparing models with
6 and without a cross-product term.

7 ^b Participant who quit smoking because of illness was classified as a current smoker.

8 ^cA family history of CVD was defined as having at least one first-degree relative (biological
9 father, mother, and siblings) with heart disease or stroke

1 **Supplementary Table S3 More subgroup analyses for association**
2 **between pneumonia hospitalization and ischemic stroke**

Subgroup	RIs (95% CIs)			Baseline (n=4193)	P value for interaction ^a
	1-28 (n=102)	29-91 (n=139)	92-365 (n=412)		
Overall	1.89 (1.55, 2.30)	1.25 (1.05, 1.48)	1.04 (0.94, 1.15)	1.00	
Sex					0.702
Male	1.86 (1.39, 2.47)	1.17 (0.90, 1.51)	0.98 (0.84, 1.15)	1.00	
Female	1.92 (1.46, 2.52)	1.32 (1.05, 1.65)	1.09 (0.95, 1.25)	1.00	
Region					0.195
Rural	2.27 (1.72, 3.01)	1.42 (1.11, 1.82)	1.07 (0.92, 1.25)	1.00	
Urban	1.61 (1.22, 2.13)	1.12 (0.88, 1.42)	1.01 (0.88, 1.17)	1.00	
Educational attainment					0.209
No formal / primary school	2.09 (1.63, 2.67)	1.31 (1.05, 1.62)	1.12 (0.98, 1.28)	1.00	
Middle school or higher	1.61 (1.15, 2.24)	1.16 (0.88, 1.53)	0.93 (0.78, 1.10)	1.00	
Tobacco smoking					0.833
Non-smoker	1.76 (1.36, 2.27)	1.24 (1.00, 1.53)	1.04 (0.92, 1.18)	1.00	
Current smoker ^b	2.13 (1.55, 2.92)	1.26 (0.94, 1.69)	1.03 (0.87, 1.24)	1.00	
Alcohol drinking					0.899
Non-weekly drinker	1.89 (1.53, 2.35)	1.27 (1.06, 1.53)	1.03 (0.92, 1.15)	1.00	
Weekly drinker	1.86 (1.11, 3.12)	1.09 (0.68, 1.74)	1.09 (0.84, 1.42)	1.00	
BMI					0.674
18.5-24.9 kg/m ²	1.86 (1.43, 2.43)	1.27 (1.01, 1.59)	1.10 (0.96, 1.26)	1.00	
<18.5 kg/m ² or ≥25.0 kg/m ²	1.92 (1.43, 2.59)	1.21 (0.93, 1.58)	0.96 (0.82, 1.13)	1.00	
Waist circumference					0.578
Male<85 cm, female<80 cm	1.80 (1.36, 2.40)	1.38 (1.09, 1.73)	1.07 (0.93, 1.24)	1.00	
Male≥85 cm, female≥80 cm	1.98 (1.50, 2.60)	1.11 (0.86, 1.44)	1.01 (0.87, 1.17)	1.00	
Family history of CVD^c					0.120
No	1.99 (1.59, 2.49)	1.30 (1.07, 1.58)	1.11 (0.98, 1.25)	1.00	
Yes	1.58 (1.02, 2.44)	1.08 (0.75, 1.56)	0.84 (0.67, 1.06)	1.00	

3 Abbreviations: RI, relative incidence; CI, confidence interval; BMI, body mass index; CVD,
4 cardiovascular disease.

5 ^a We tested multiplicative interaction by using a likelihood ratio test comparing models with
6 and without a cross-product term.

7 ^b Participant who quit smoking because of illness was classified as a current smoker.

8 ^c A family history of CVD was defined as having at least one first-degree relative (biological
9 father, mother, and siblings) with heart disease or stroke.