

## **Supplementary Material**

### **A long-term cohort study of patients presenting with hypercapnic respiratory failure**

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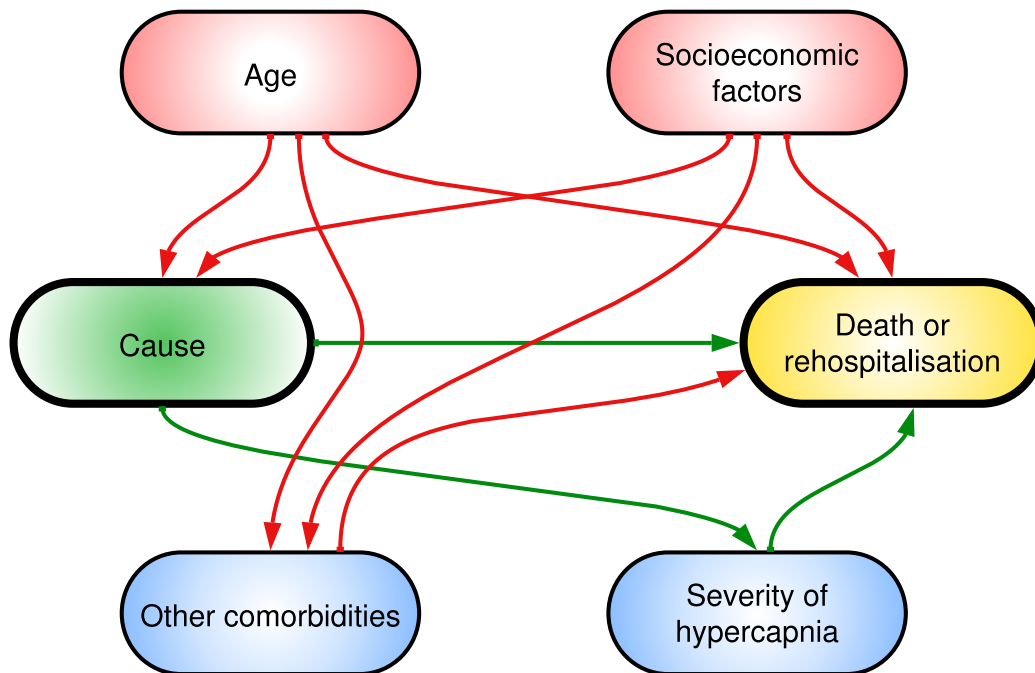
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**Supplementary Table S1.** *Diagnosis codes from the International Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification (ICD-10-AM) used for data abstraction of potential cause for hypercapnic respiratory failure (HRF).*

<b>Potential cause for HRF</b>	<b>ICD Code</b>	<b>Details</b>
Congestive cardiac failure	I09.0	Rheumatic myocarditis
	I11.0	Rheumatic diseases of endocardium, valve unspecified
	I13.0	Hypertensive heart and kidney disease with (congestive) heart failure
	I13.2	Hypertensive heart and kidney disease with both (congestive) heart failure and kidney failure
	I25.5	Ischaemic cardiomyopathy
	I42	Cardiomyopathy
	I43	Cardiomyopathy in diseases classified elsewhere
Neuromuscular disease	I50	Heart failure
	G12	Spinal muscular atrophy and related syndromes (includes motor neuron disease)
	G61	Inflammatory polyneuropathy
	G70	Myasthenia gravis and other myoneural disorders
	G71	Primary disorders of muscles (includes muscular dystrophy, myotonic disorders, congenital myopathies, mitochondrial myopathy)
	G82.3	Flaccid tetraplegia
	G82.4	Spastic tetraplegia
	G82.5	Tetraplegia, unspecified
J98.6	Disorders of diaphragm	
Obstructive lung disease	J43	Emphysema
	J44	Other chronic obstructive pulmonary disease
	J45	Asthma
	J46	Status asthmaticus
	J47	Bronchiectasis

Opioid use	F11	Mental and behavioural disorders due to use of opioids
	T40.0	Poisoning by narcotics (opium)
	T40.1	Poisoning by narcotics (heroin)
	T40.2	Poisoning by narcotics (other opioids)
	T40.3	Poisoning by narcotics (methadone)
	T40.4	Poisoning by narcotics (other synthetic narcotics)
	T40.6	Poisoning by narcotics (other and unspecified)
	Y45.0	Analgesics, antipyretics and anti-inflammatory drugs causing adverse effects in therapeutic use (opioids and related analgesics)
Sleep-disordered breathing	G47.30	Sleep apnoea, unspecified
	G47.32	Obstructive sleep apnoea syndrome
	G47.33	Sleep hypoventilation syndrome
	E66.2	Obesity with alveolar hypoventilation
	E66.20	Obesity with alveolar hypoventilation, body mass index [BMI] not elsewhere classified
	E66.21	Obesity with alveolar hypoventilation, body mass index [BMI] $\geq 30 \text{ kg/m}^2$ to $\leq 34.99 \text{ kg/m}^2$
	E66.22	Obesity with alveolar hypoventilation, body mass index [BMI] $\geq 35 \text{ kg/m}^2$ to $\leq 39.99 \text{ kg/m}^2$
	E66.23	Obesity with alveolar hypoventilation, body mass index [BMI] $\geq 40 \text{ kg/m}^2$



**Supplementary Figure S1.** Directed acyclic graph showing assumed relationships between the underlying cause, other covariates and the outcome of death or rehospitalization among adults with hypercapnic respiratory failure. Green arrows represent causal paths. Red arrows represent biasing paths. Blue variables are ancestors (causes) of the outcome. Red variables are ancestors (causes) of the exposure and outcome.

**Supplementary Table S2.** Number of deaths per person-years at risk among adults surviving a hospital admission with hypercapnic respiratory failure for the period 2013 to 2021.

<b>Age at 2013 (years)</b>	<b>n (%)</b>	<b>Deaths (n)</b>	<b>Person-years of follow-up</b>	<b>Deaths/1,000 person-years</b>
15-24	8 (1.6%)	2	50.8	39.4
25-34	20 (3.9%)	4	130.9	30.6
35-44	32 (6.2%)	6	211.5	28.4
45-54	42 (8.2%)	17	243.3	69.9
55-64	75 (14.6%)	40	374.0	107.0
65-74	140 (27.3%)	100	593.2	168.6
75-84	134 (26.1%)	114	454.0	251.1
85-94	60 (11.7%)	53	132.9	398.8
95+	2 (0.4%)	2	3.25	615.4