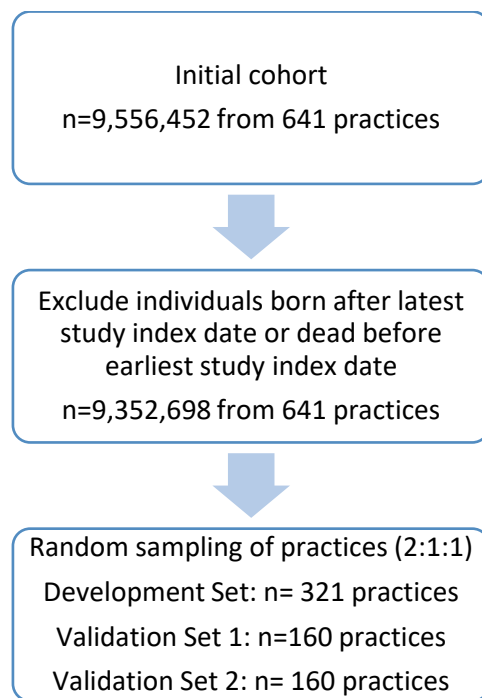
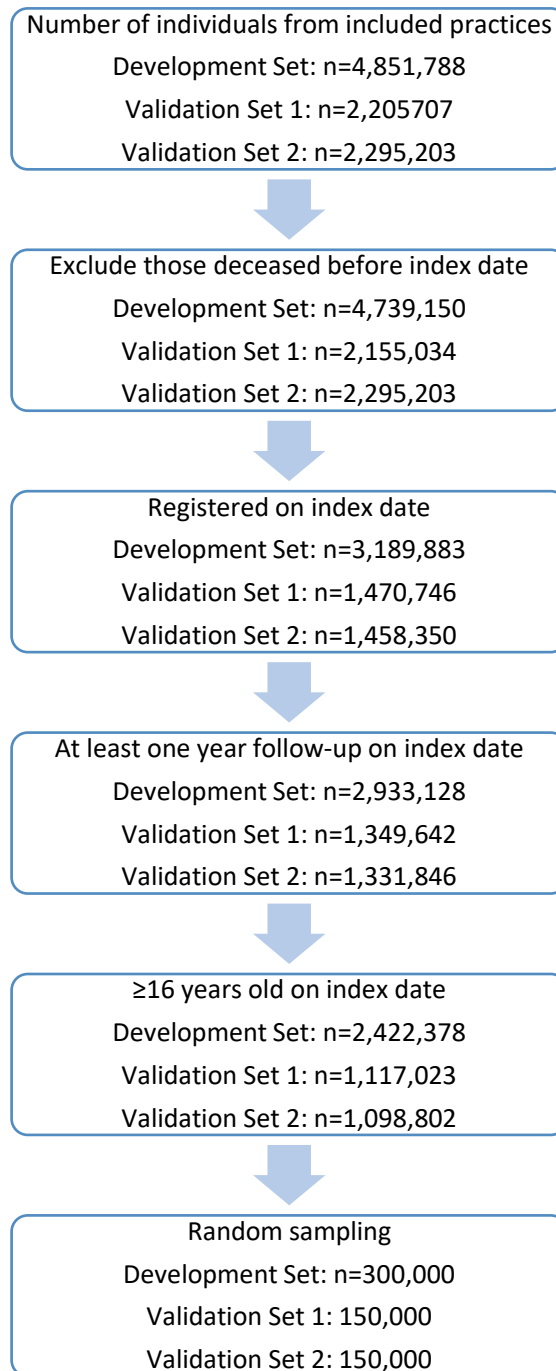


Supplementary Figure S1. Flow diagram for selection of practices.



A measure of mortality not explained by age (standardised) or sex was computed for each practice (i.e. best linear unbiased predictor from a mixed effects logistic regression with a practice random effect), which was sorted into four bins using mean – sd, mean, mean + sd and then block randomised into three datasets.

Supplementary Figure S2. Flow diagram for selection of individuals.



Supplementary Table S1. List of the 37 morbidities included in the baseline model (adapted from Payne et al. (2020)).

Morbidities based on SNOMED CT ever recorded	
Alcohol problems	Heart failure
Anorexia or bulimia	Hypertension
Atrial fibrillation	Inflammatory bowel disease
Blindness and low vision	Learning disability
Bronchiectasis	Multiple sclerosis
Chronic liver disease and viral hepatitis	Parkinsonism
Chronic sinusitis	Peptic ulcer disease
COPD	Peripheral vascular disease
Coronary heart disease	Disorder of prostate
Dementia	Psychoactive substance misuse (not alcohol)
Diabetes	Rheumatoid arthritis
Diverticular disease of intestine	Stroke & transient ischaemic attack
Hearing loss	Thyroid disorders
Morbidities based on prescription in last 12 months	
Constipation (currently treated)	≥4 laxative prescriptions
Migraine	≥4 prescription-only medicine anti-migraine prescriptions
Morbidities based on combination of SNOMED CT ever recorded and/or prescription in last 12 months	
Epilepsy (currently treated)	SNOMED CT AND ≥1 antiepileptic prescription
Asthma (currently treated)	SNOMED CT AND ≥1 asthma prescription
Irritable bowel syndrome	SNOMED CT OR ≥4 antispasmodic prescriptions
Psoriasis or eczema	SNOMED CT AND ≥4 related prescriptions (excluding simple emollients)
Other morbidities	
Anxiety or depression	SNOMED CT (anxiety or depression) in last 12 months OR ≥4 anxiolytic/hypnotic prescriptions in last 12 months OR ≥4 anti-depressant prescriptions (excluding low dose tricyclics) in last 12 months
(New) cancer in last 5 years (excluding non-melanoma skin cancer)	SNOMED CT (first) recorded in last 5 years
Chronic kidney disease	Highest value of last 2 eGFR readings is <60 ml/min
Painful condition	≥4 prescription-only medicine analgesics in last 12 months OR (≥4 specified anti-epileptics in last 12 months AND no epilepsy SNOMED CT ever recorded)
Schizophrenia or bipolar disorder	SNOMED CT ever recorded OR lithium ever prescribed

Supplementary Table S2. Top 20 conditions by prevalence and by effect size in the development dataset.

By prevalence	By absolute effect size
Hypertension	Dementia
Anxiety or depression	Cancer in the last 5 years
Painful condition	Migraine
Hearing loss	Painful condition
Asthma	Chronic kidney disease
Irritable bowel syndrome	COPD
Diabetes	Parkinsonism
Thyroid disorders	Constipation
Coronary heart disease	Atrial fibrillation
Chronic kidney disease	Hypertension
Diverticular disease of intestine	Heart failure
Disorder of prostate	Chronic liver disease and viral hepatitis
Atrial fibrillation	Alcohol problems
Alcohol problems	Inflammatory bowel disease
COPD	Epilepsy
Stroke and transient ischaemic attack	Irritable bowel syndrome
Rheumatoid arthritis	Peripheral vascular disease
Constipation	Hearing loss
Cancer in the last 5 years	Schizophrenia or bipolar disorder
Peptic ulcer disease	Bronchiectasis