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Introduction

- Cardiovascular disease (CVD) and chronic obstructive pulmonary disease (COPD) are major contributors to morbidity and premature mortality [1]
- CVD is 2 to 5 times more prevalent among patients with COPD [2]
- COPD exacerbations are known to increase the risk of future CVD events [3]
- CVD risk assessment enables identification and treatment of modifiable risk factors in people with COPD
- CVD risk assessment tools used in Australian primary care have evolved over time to better represent the Australian population (Table 1)

Table 1: CVD risk assessments over time in Australian primary care

Time period	Name of assessment	Target group	Features	Interpretation of risk
Recommended CVD risk assessments in primary care				
2009 to 2012	Framingham-based risk score [4]	45-74 yrs; 35-74yrs (first nations); <60yrs (diabetes)	US equation - adapted for Australian guidelines but included limited risk factors	5-year risk low (<10%) intermediate (10 to <15%) high (≥15%)
2012 to Jul 2023	Absolute CVD risk score (ACVDR) [5]	Inclusion criteria 45-74 yrs; 35-74yrs (first nations); <60yrs (diabetes)	Based on Framingham risk score but with additional risk criteria - recalibrated for Australian population, but missing some key risk factors (e.g., area-level deprivation)	5-year risk low (<10%) intermediate (10 to 15%) high (>15%)
Jul 2023 to present	AusCVDRisk [6]	45-79 yrs; 35-79 yrs (diabetes); 30-79 yrs (first nations)	Based on the New Zealand PREDICT algorithm recalibrated for Australian population. Special consideration for Aboriginal and Torres Strait Islander populations and area-level deprivation	5-year risk low (<5%) intermediate (5 to <10%) high (≥10%)
Other risk scores				
2009 to present	Coronary Artery Calcium (CAC) score [7]	45-84yrs	Identification of plaque in coronary arteries using CT scanners. Reference values based on the Multi-Ethnic Study of Atherosclerosis (MESA) study	Risk (high equates to >20% 10-year risk) low (≤10) mild-moderate (11 – 100) moderate-high (101 – 400) high (>400)

Aims and Objectives

- To investigate the use and results of CVD screening risk tools among patients with and without COPD in the Australian primary care setting

Methods

- We used Australian primary care data from the Optimum Patient Care Research Database Australia between Nov 2009 and Mar 2025
- We conducted a cohort study of adults (aged ≥30 years) grouped according to COPD status, who were defined by the GP as being active patients (at latest data extraction date) up to March 2025
- We searched for any of the CVD risk scores outlined in Table 1. We excluded any risk scores taken when the individual was aged <30 years
- For patients with a 2023 AusCVDRisk score, we compared people with and without COPD for:
 - Absolute scores (medians; 25th, 75th quartiles [Q1, Q3]; Mann Whitney U tests)
 - 5-year risk score categories (low: <5%; intermediate: ≥5 to <10%; high: ≥10%; chi-square tests)
 - Odds of having a higher risk category score by COPD status (univariable ordinal logistic regression – odds ratios [OR] and 95% confidence intervals [CI])

Results

- Of 5,157 patients with COPD, 11.7% (n=601) had at least one CVD risk score recorded
- Of 386,803 patients without COPD, 2.4% (n=9,087) had at least one CVD risk score recorded
- Among patients with a recorded CVD risk score, those with COPD were more likely to be older, female, with significant smoking history and more chronic health conditions than patients without COPD (Table 2)
- Around 35% of patients with COPD and a risk score assessment had experienced an exacerbation in the previous year – a similar rate to the overall COPD population (30–50% [8])
- Recording of CVD risk scores was consistently higher among patients with COPD over time (Figure 1).
- Of 125 patients with COPD and 2,406 without COPD who had at least one AusCVDRisk score, the median (IQR) score was 7% (4,11) for patients with COPD and 4% (2,7) for non-COPD patients (p<0.001).
- Among patients with a recorded AusCVDRisk score, those with COPD were more than twice as likely to be at high risk of CVD compared to those without COPD (34.4% vs 15.9% [p<0.001] Figure 2).
- Compared to those without COPD, patients with COPD and an AusCVDRisk score had odds exceeding three-fold for a higher category risk score (OR=3.20 [95%CI: 2.31,4.44]; p<0.001)

Table 2: Characteristics of study population with a CVD risk score by COPD status

	COPD (n=601)	No COPD (n=9,087)	p-value	COPD (n=601)	No COPD (n=9,087)	p-value
Demographics						
Age at most recent assessment (years)						
Mean	67.3	57.8	<0.001	Exacerbations in year prior to CVD risk assessment		
Sex* (%)						
Female	58.7%	54.5%	0.04	Mean	0.4	-
Tobacco use (%)						
Where available*				≥1 exacerbation (%)	34.8%	-
Current smoker	23.8%	5.8%	<0.001	Comorbidities ever prior to CVD risk assessment		
Ex-smoker	26.0%	12.0%	<0.001	Potentially steroid-related comorbidities (%)		
Never smoker	12.8%	29.2%	<0.001	Diabetes type 2	23.7%	14.9%
Number of risk assessments						
AusCVDRisk (%)						
None	79.0%	71.8%	<0.001	Osteoporosis	17.1%	6.3%
1	17.5%	24.6%	<0.001	Hypertension	35.5%	24.7%
2+	3.5%	3.7%	<0.001	Chronic kidney disease	9.6%	3.5%
Other CVD risk assessment (%)						
None	11.3%	19.0%	<0.001	Depression/Anxiety	45.6%	31.0%
1	48.3%	52.6%	<0.001	Obesity	42.0%	40.8%
2+	40.4%	28.4%	<0.001	Other comorbidities (%)		
CAC score (%)						
Any	0%	0.10%	0.74	Asthma	36.2%	15.1%
				Obstructive sleep apnoea	33.2%	17.2%
				GERD	41.5%	22.4%
				Lung cancer	2.0%	0.2%
				Anaemia	23.9%	22.8%

* Missing/indeterminate sex (<1%) removed to preserve confidentiality. Missing tobacco usage (n=226 with COPD; n=4,963 without COPD) excluded

Figure 1: CVD risk assessments over time among patients with and without COPD

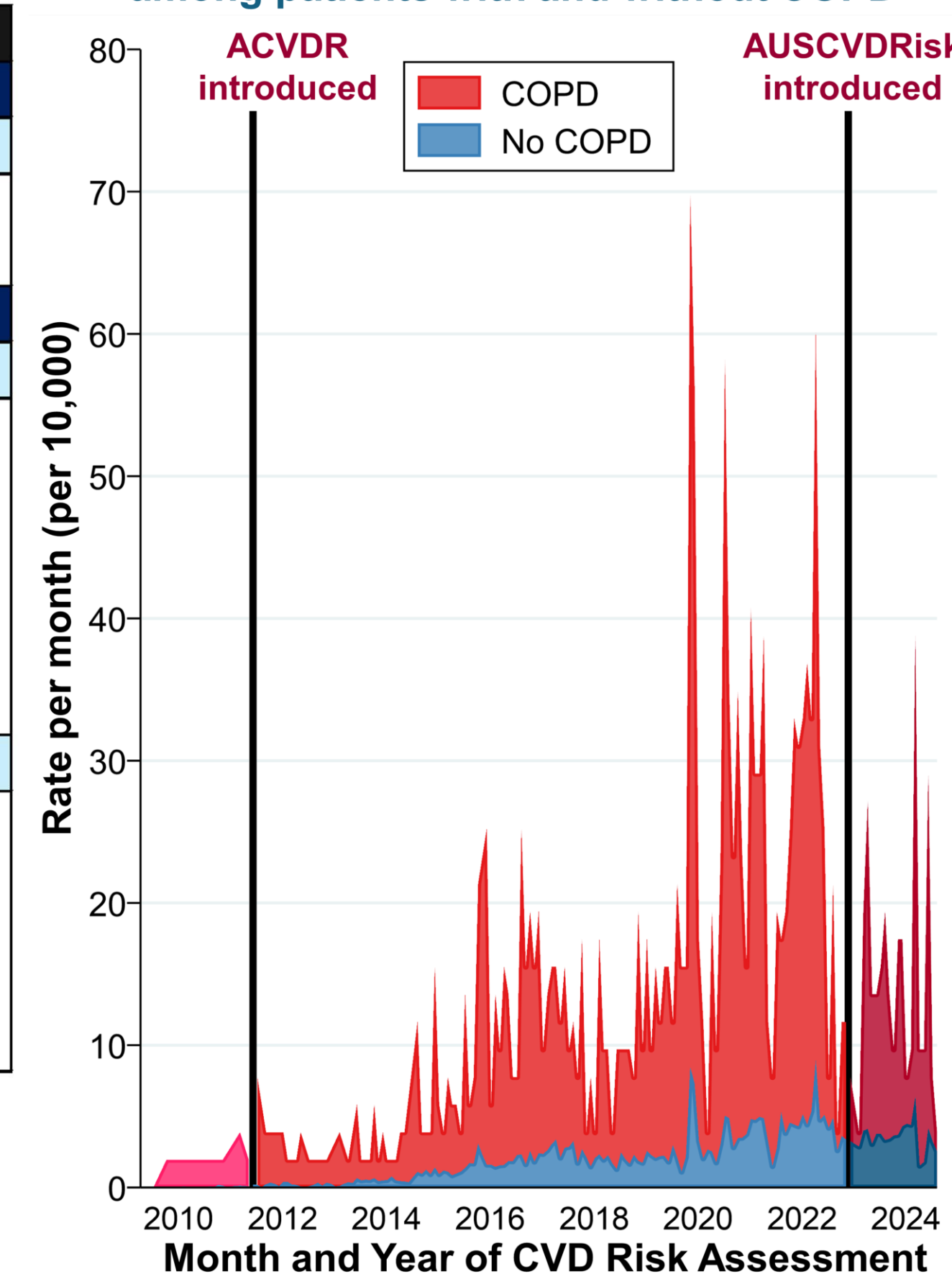
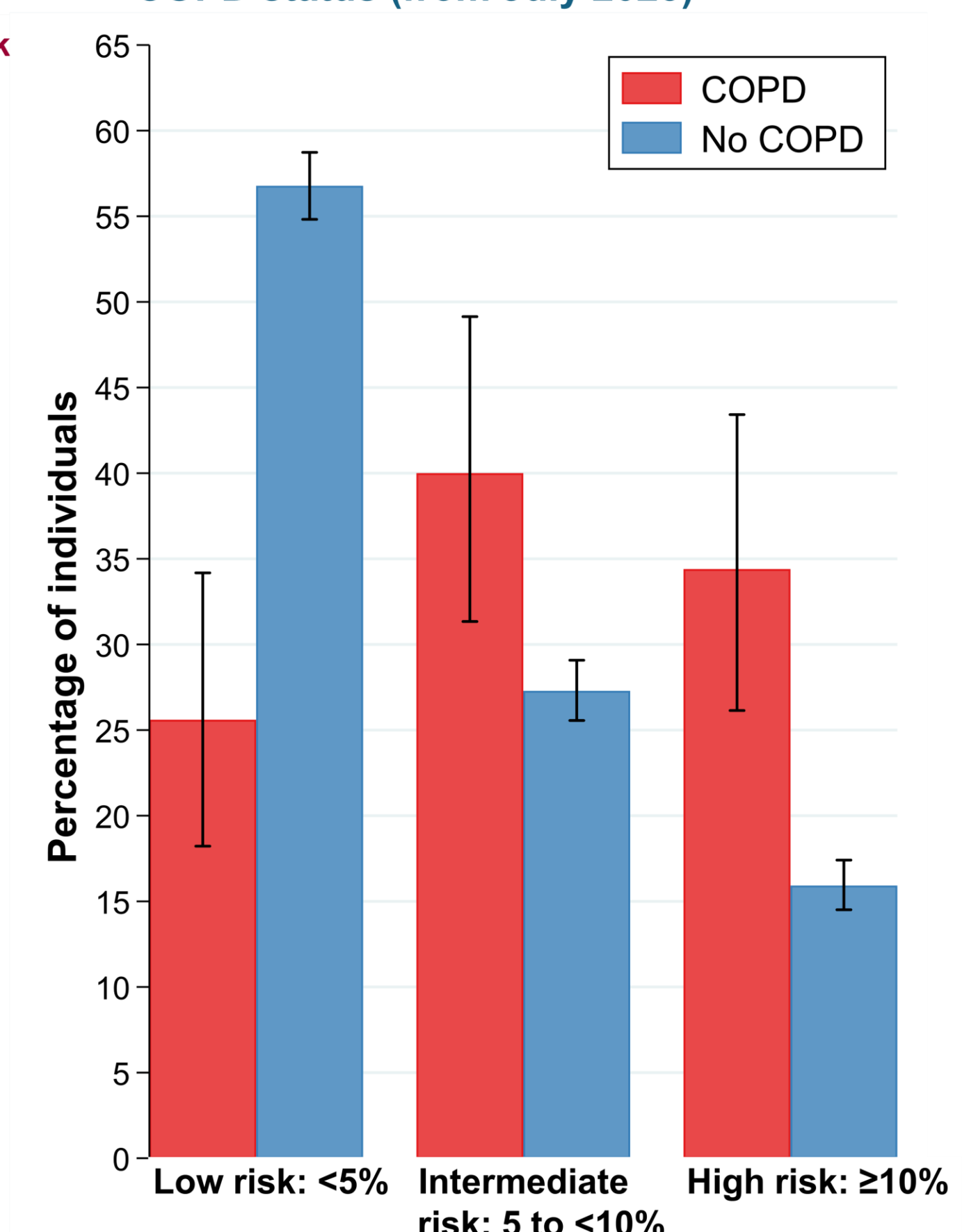


Figure 2: AusCVDRisk assessment risk by COPD status (from July 2023)*



Conclusions

- CVD risk factor screening was undertaken more commonly in patients with COPD compared to those without COPD
- Among those with a CVD risk score, CVD risk was higher in patients with COPD compared to those without COPD
- Greater awareness and screening of CVD risk, particularly in patients with COPD, should be a priority issue for clinicians to guide decision making and preventative treatment approaches

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Abbreviations

Aus: Australia(n); AusCVDRisk: CVD risk score routinely used in Australian primary care since July 2023; CI: confidence interval; COPD: chronic obstructive pulmonary disease; CVD: cardiovascular disease; GERD: Gastroesophageal reflux disease; OR: odds ratio



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