

Cardiovascular Disease Rates in Young Adults Have More Than Doubled Since 2010

Team A: Blaine Franklin, PT, DPT; Eric Barkley

Team B: Kersten Bartelt, RN; Joe Deckert, PhD

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Key Findings:

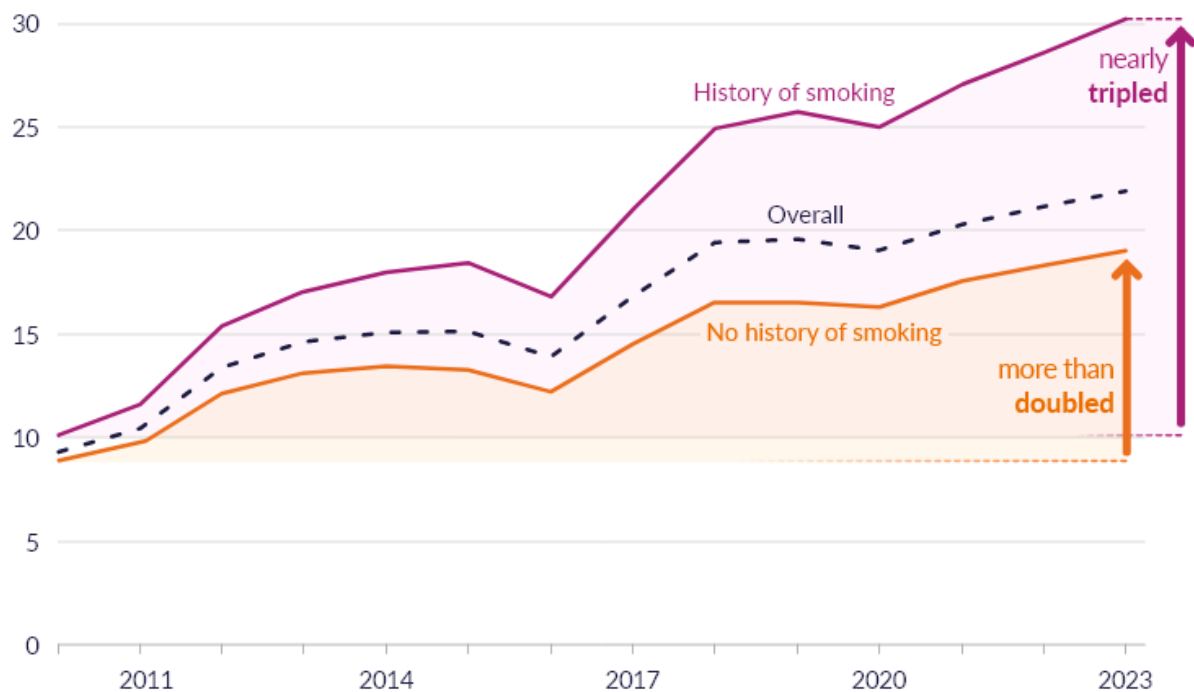
- The incidence of cardiovascular disease (CVD) among adults under 40 has more than doubled since 2010, with rates increasing from 9.4 per 1,000 patients in 2010 to 22.0 per 1,000 patients by 2023.
- Among patients with a history of smoking, the rate of CVD nearly tripled in the same period, rising from 10.2 to 30.2 per 1,000 patients.
- The rate of CVD diagnoses has increased across all BMI groups for nonsmokers.

The prevalence of risk factors for cardiovascular disease (CVD) in young adults has been increasing in recent years.^{1,2} We aimed to gain a deeper understanding of how CVD diagnoses have trended in young adult patients with and without a smoking history and by BMI classification. Smoking has been correlated with a lower BMI and is a known risk factor for cardiovascular disease.³ Obesity has also been correlated with cardiovascular disease.⁴

We studied 25,402,650 patients who had an encounter while they were between 18 and 39 years old from 2010 through 2023 and observed CVD diagnoses, such as angina, ischemic heart disease, pulmonary embolism, valve disease, and atherosclerosis. The rate of CVD for the nonsmoking population more than doubled in that period (8.9 vs. 19.1 per 1,000 patients). For those with a history of smoking, the rate nearly tripled in the same period, rising from 10.2 to 30.2 per 1,000 patients. Ischemic heart disease specifically has been reported to be increasing in young adults.⁵ While we did find a similar growth in the rate of ischemic heart disease in those under 40 since 2017, it makes up only about one tenth of the overall CVD diagnoses in this population.

New CVD Cases Among Young Adults by Smoking Status

35 new cases of CVD per 1,000 patients



N=25,402,650 patients

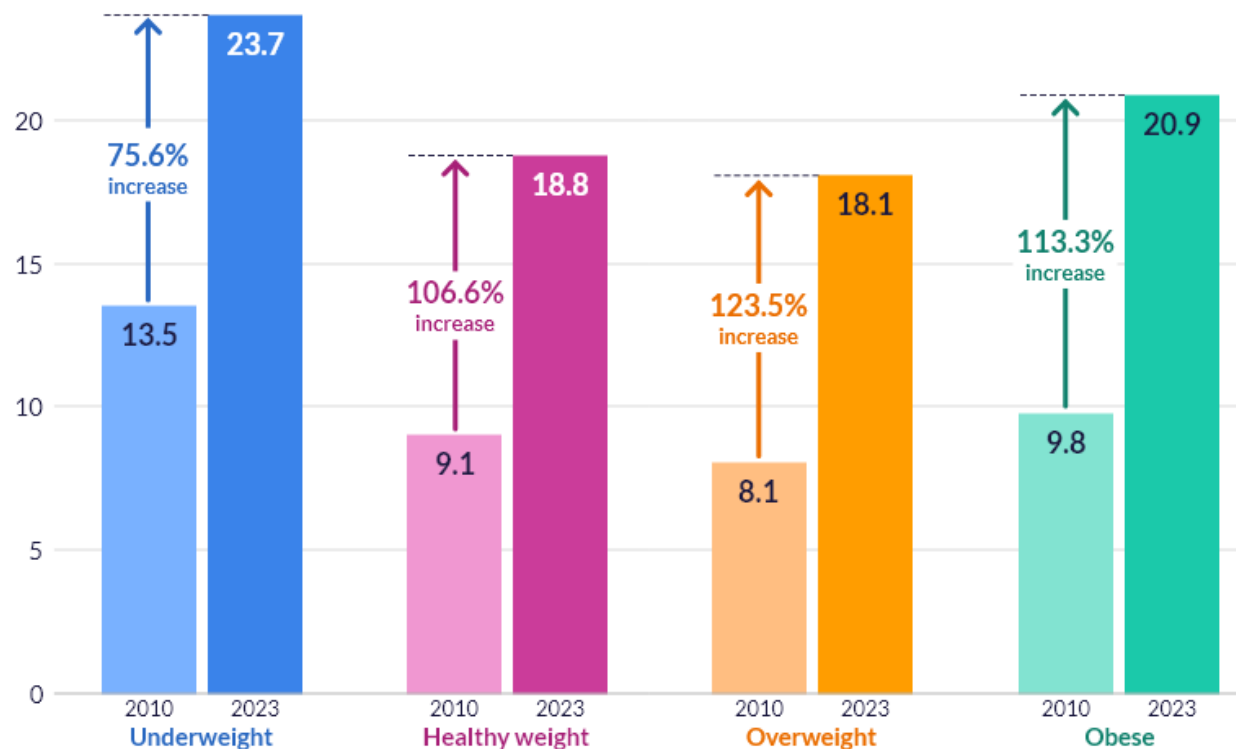
"New CVD Cases Among Young Adults by Smoking Status," 2024. EpicResearch.org

Figure 1. Annual rate of new CVD diagnoses in adults under age 40 by smoking status.

We further stratified the patients with no history of smoking by their BMI classification. We found that patients in the underweight BMI category had the highest rate of CVD diagnoses. From 2010 to 2023, the rates of CVD more than doubled for patients with a BMI in the healthy, overweight, or obese categories, as seen in Figure 2. Rates for patients in the underweight category increased slightly less than the other groups, but still increased by more than 75%.

Increase in New CVD Diagnoses by BMI Category from 2010 to 2023

25 new CVD cases per 1,000 patients



N=20,754,640 patients

"Increase in New CVD Diagnoses by BMI Category from 2010 to 2023," 2024. EpicResearch.org

Figure 2. Rates of new CVD diagnoses per 1,000 patients under age 40 with no smoking history by BMI classification in 2010 and 2023.

These findings suggest that factors other than BMI and tobacco use are contributing to the increase in CVD diagnoses in those under age 40.

We repeated our analysis using ankle sprain diagnoses, which are unlikely to increase over time, as a sensitivity analysis. We found a steady rate of ankle sprain diagnoses, which suggests the observed increase in CVD was not due to changes in the dataset over the study period.

These data come from Cosmos, a dataset created in collaboration with a community of Epic health systems representing more than 243 million patient records from 1,400 hospitals and more than 32,500 clinics from all 50 states and Lebanon. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions. Graphics by Aishwarya Shettigar.

References

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Data Definitions

Term	Definition
Study period	2010-2023
Study population	All patients with an encounter each year while aged 18 to 39 with an outpatient face-to-face encounter prior to that year. Patients with a history of cancer or cardiovascular congenital defects were excluded. Those with a history of the observed outcome condition were excluded from future years.
Cardiovascular disease (CVD)	A diagnosis with ICD-10-CM code I20*-I26*, I30*-I49*, I51*, or I70*-I79*.
Ischemic heart disease	A diagnosis with ICD-10-CM code I20*-I25*.
Cancer	A diagnosis with ICD-10-CM code C* prior to a study year.
Cardiovascular congenital defects	A diagnosis with ICD-10-CM code Q20*-Q28* at any time in a patient's history.
Body Mass Index (BMI)	The nearest BMI documented for a patient cared for in a year classified them as underweight if <18.5, healthy if 18.5-25.0, overweight if 25.0-30.0, and obese if 30+.
Smoking history	Any social determinants of health (SDOH) flowsheet response indicating current or previous smoking tobacco use: • Current • Current every day smoker • Current some day smoker • Every day • Former • Former smoker • Heavy smoker • Heavy tobacco smoker • Light smoker • Light tobacco smoker • Some days • A positive cigarette pack years or packs per day value reported

Table 1. New CVD Cases Among Young Adults by Smoking Status

	Overall	Underweight Nonsmoker	Healthy Weight Nonsmoker	Overweight Nonsmoker	Obese Nonsmoker	Overall - History of Smoking	Overall - No History of Smoking
2010	0.94%	1.35%	0.91%	0.81%	0.98%	1.02%	0.89%
2011	1.04%	1.29%	0.97%	0.90%	1.10%	1.16%	0.98%

2012	1.34%	1.83%	1.19%	1.10%	1.39%	1.54%	1.22%
2013	1.46%	1.97%	1.28%	1.18%	1.53%	1.70%	1.32%
2014	1.51%	1.99%	1.32%	1.19%	1.56%	1.79%	1.35%
2015	1.52%	1.84%	1.27%	1.21%	1.52%	1.85%	1.33%
2016	1.39%	1.69%	1.17%	1.09%	1.40%	1.69%	1.22%
2017	1.69%	1.94%	1.41%	1.32%	1.64%	2.11%	1.45%
2018	1.94%	2.31%	1.58%	1.49%	1.89%	2.50%	1.65%
2019	1.96%	2.18%	1.61%	1.52%	1.85%	2.59%	1.66%
2020	1.91%	2.14%	1.61%	1.51%	1.81%	2.50%	1.63%
2021	2.04%	2.24%	1.76%	1.64%	1.99%	2.72%	1.76%
2022	2.12%	2.40%	1.85%	1.73%	2.00%	2.87%	1.84%
2023	2.20%	2.37%	1.88%	1.81%	2.09%	3.02%	1.91%