Unmasking Obstructive Sleep Apnea: Estimated Prevalence and Impact in the United States

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INTRODUCTION

- OSA is a serious chronic disease, characterized by repeated upper airway obstructions during sleep, leading to episodes of disrupted breathing, sleep fragmentation, and reduced oxygen saturation[1]
- OSA is associated with a range of adverse health outcomes, including cardiovascular diseases,[1,2] metabolic disorders,[3] cognitive impairment,[4] and increased risk of early mortality[5]
- In the U.S., over 54 million (33.2%) adults, ages 30-69 years, were previously estimated to have OSA[6]

OBJECTIVE

To estimate the contemporary prevalence of OSA in U.S. adults in 2024, adjusting for obesity as a major risk factor

METHODS

- A literature-based analysis was conducted to identify studies of adults (≥20 years of age) with OSA using AHI_4 criteria (all apneas plus hypopneas with ≥ 4% oxygen desaturation) derived from PSG or HSAT
- OSA was defined as having an AHI_4 ≥ 5 events/Hr

Table 1. Identified Studies Included for Estimates

Study	Study Location and Period	N (% male)	Age Range	Type of study	OSA Definition	OSA prevalence
Studies Included in Total Prevalence Estimates						
Peppard et al., (2013): Wisconsin Sleep Cohort Study	United States 1988-2011	1,520 (55.1%)	30-60	PSG	AHI≥5 + hypopnea with ≥4% oxygen desaturation/Hr	M: 35% F: 18%
Donovan & Kapur (2016): Sleep Heart Health Study (SHHS)	United States 1995-2006	5,804 (47.6%)	40+	PSG	AHI≥5 + hypopnea with ≥4% oxygen desaturation/Hr	M: 57% F: 38%
Durán et al. (2001)	Spain 1993-1997	555; (58.3%)	30-70	PSG	AHI≥5 + hypopnea with ≥4% oxygen desaturation/Hr	M: 26% F: 28%
Studies Included for OSA Severity Estimates						
Jonassen et al., (2022)	Norway 2011-2016	3,646 (69.7%)	49	PSG	AHI≥5 + hypopnea with ≥4% oxygen desaturation/Hr	Mild: 56% Moderate: 23% Severe: 21%
Donovan & Kapur, (2016): Sleep Heart Health Study (SHHS)	United States 1995-2006	5,804; (47.6%)	40+	PSG	AHI≥5 + hypopnea with ≥4% oxygen desaturation/Hr	Mild: 61% Moderate: 26% Severe: 12%

- For total prevalence, age- and sex-specific rates were estimated based on eligible studies
- The base-year estimation for 2004 was calculated by averaging age-specific total OSA prevalence data from identified studies, to establish a foundational baseline
- The obesity population attributable fraction (PAF) was calculated and applied to base year estimates to project OSA prevalence in year 2024, adjusting for obesity and extrapolated to the U.S. Census population data[7]
- The AHI distribution of Mild (5 – <15), Moderate (15 – <30) and Severe (≥30 events/h) was also estimated

KEY TAKEAWAYS:

- This is one of the first studies to report age- and sex-specific total OSA prevalence estimates in U.S. adults, ≥20 years, adjusting for obesity
- These results indicate that 80.6 million (32.2%) adults in the U.S. were estimated to have OSA in 2024

RESULTS

Table 2. OSA Total Prevalence and US Census Population, 2024

Males		Females		Total	
U.S. Male Population (aged 20+ years)*	OSA Male Prevalence (%)	U.S. Female Population (aged 20+ years)*	OSA Female Prevalence (%)	US Population (aged 20+ years)*	OSA Prevalence (%)
122,168,000	47,623,847 (39%)	127,784,000	32,967,117 (26%)	249,952,000	80,590,964 (32%)

*U.S. census 2023 data.[7]

Figure 1. Total OSA Prevalence Stratified by Age and Sex, 2024
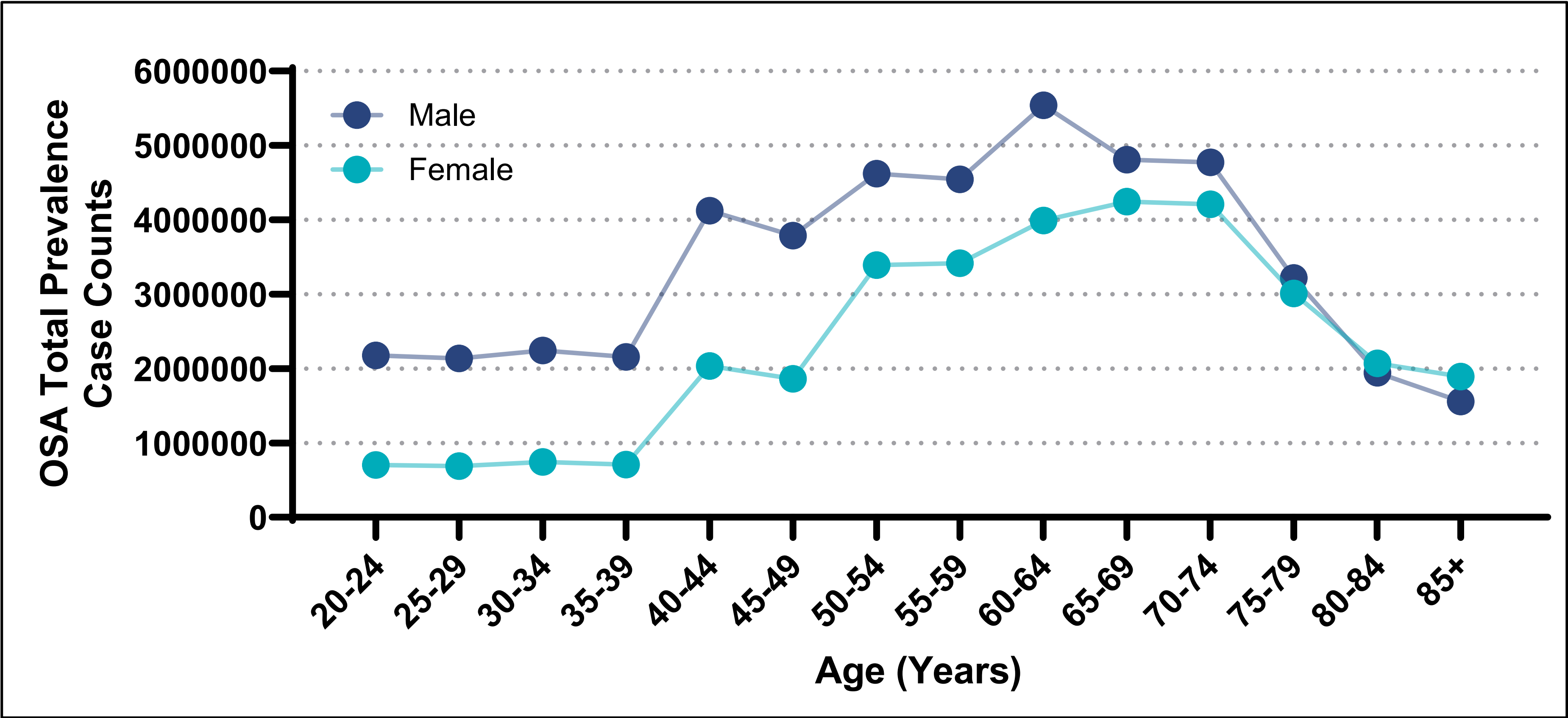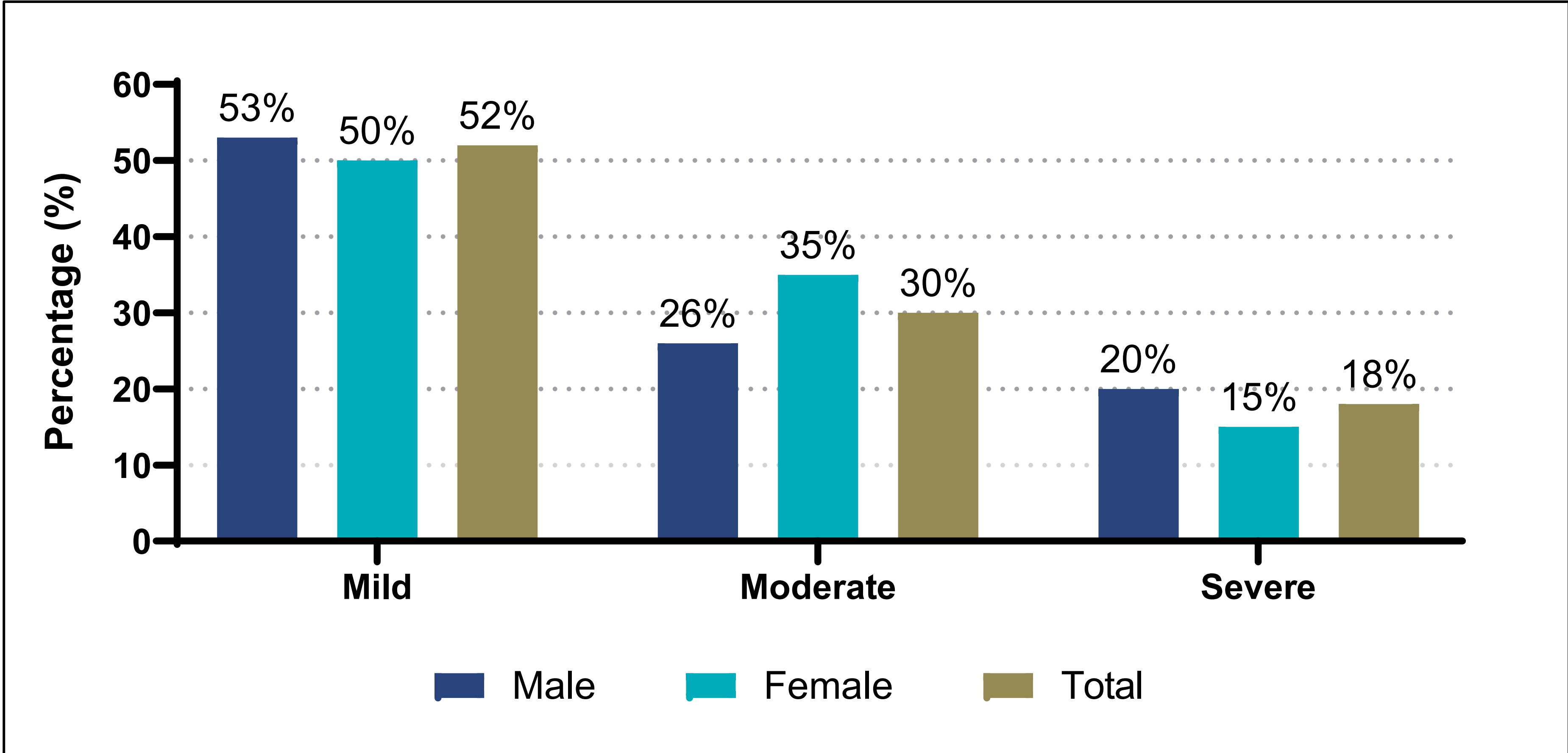

Figure 2. OSA Total Prevalence by Disease Severity, 2024

- An estimated total of 80.6 million adults, aged 20 years and older, were projected to have OSA in the US in 2024, of whom 47,623,848 (59%) were males and 32,967,117 (41%) females
- This translates to 32.2% overall prevalence in the US among adults aged 20 years and older, with 39% prevalence among males and 26% prevalence among females, adjusting for obesity

Table 3. Age- and Sex-Specific OSA Severity Proportions

Age Group	Males			Females			Total		
	Mild	Moderate	Severe	Mild	Moderate	Severe	Mild	Moderate	Severe
20 – 24	77%	11%	12%	87%	6%	7%	79%	9%	11%
25 – 29	77%	11%	12%	87%	6%	7%	79%	9%	11%
30 – 34	77%	11%	12%	87%	6%	7%	79%	9%	11%
35 – 39	75%	12%	13%	87%	6%	7%	79%	9%	11%
40 – 44	54%	27%	19%	53%	38%	9%	58%	26%	16%
45 – 49	54%	27%	19%	53%	38%	9%	58%	26%	16%
50 – 54	54%	27%	19%	53%	38%	9%	58%	26%	16%
55 – 59	54%	27%	19%	53%	38%	9%	58%	26%	16%
60 – 64	44%	31%	25%	46%	41%	13%	51%	28%	21%
65 – 69	44%	32%	24%	42%	37%	21%	51%	28%	21%
70 – 74	44%	32%	24%	42%	37%	21%	51%	28%	21%
75 – 79	44%	32%	24%	42%	37%	21%	51%	28%	21%
80 – 84	44%	32%	24%	42%	37%	21%	51%	28%	21%
85+	44%	32%	24%	43%	37%	20%	51%	28%	21%

- Overall OSA severity distribution was 52% Mild, 30% Moderate, and 18% Severe

LIMITATIONS:

- This analysis could not fully eliminate potential publication and selection biases
- For total prevalence estimations, only studies with AHI_4 were included, providing a conservative estimate of OSA prevalence

CONCLUSIONS

- Our findings suggest that OSA is highly prevalent in the U.S., affecting >80 million adults
- Despite its substantial prevalence, OSA remains largely undiagnosed
- These data highlight the urgent need for improved screening and diagnosis as well as greater awareness about the chronic and serious complications of untreated OSA

REFERENCES
1. Drager LF, rt al., *Circulation*. 2017;136(19):1840–50. 2. Javaheri S, et al., *J Am Coll Cardiol*. 2017;69(7):841–58. 3. Lam JC, et al., *Respir Med*. 2006;100(6):980–7. 4. Osorio RS, et al., *Neurology*. 2015;84(19):1964–71. 5. Marin JM, et al., *The Lancet*. 2005;365(9464):1046–53. 6. Benjafield AV, et al., *Lancet Respir Med*. 2019 Aug;7(8):687–98. 7. United States Census Bureau. (accessed Sep 2023). Measuring America's People and Economy. Census.gov | U.S. Census Bureau Homepage

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