At a Glance

- In 2018, 5.4% of Montana adults reported having ever been diagnosed with COPD
- Among adults never diagnosed with COPD, nearly 13% were classified as being “high-risk” for the development of COPD
- The prevalence of being “high-risk” for COPD was higher among males, older adults, adults with lower educational attainment, adults with lower annual household income, American Indian/Alaska Native adults, veterans, and disabled adults
- Adults at “high-risk” for COPD also reported a higher prevalence of smoking (current and former), ever using an electronic cigarette or other vaping product, frequent mental distress, physical inactivity, and multiple chronic conditions than adults at “low-risk” for COPD

Respiratory Health among Montana Adults, 2018

Introduction

Chronic obstructive pulmonary disease, commonly referred to as COPD, is a collection of diseases that block airflow and result in difficulty breathing and other breathing-related complications.[1] According to the Centers for Disease Control and Prevention (CDC), symptoms of COPD include: (1) frequent coughing or wheezing, (2) excess phlegm, mucus, or sputum production, (3) shortness of breath, and (4) trouble taking a deep breath.[1]

In 2018, chronic lower respiratory disease, which includes COPD, was the fourth leading cause of death in Montana (age-adjusted 47.0 deaths per 100,000 people).[2] COPD is also associated with increased morbidity. The CDC reports that, when compared to adults without COPD, those with COPD are more likely to experience activity limitations, inability to work, increased confusion or memory loss, other chronic conditions, depression or other mental/emotional conditions, fair or poor general health, and more.[1]

Risk factors for COPD include smoking cigarettes, exposure to air pollutants, genetics, and respiratory infections.[1] In 2018, 5.4% of Montana adults reported having ever been diagnosed with COPD.[3] However, many adults may not know that they have COPD. This report describes demographic, health status, and health risk behavior characteristics among Montana adults who have been diagnosed with COPD or who are at a potentially higher risk for COPD.

Methods

This report analyzed data from the 2018 Montana Behavioral Risk Factor Surveillance System (BRFSS). The Montana BRFSS survey is an annual telephone survey conducted among non-institutionalized, Montana adults (aged 18 and older).

Montana Behavioral Risk Factor Surveillance System

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The 2018 Montana BRFSS included the Respiratory Health (COPD Symptoms) optional module developed by the Centers for Disease Control and Prevention (CDC).

The Respiratory Health module included the following five questions:

1. During the past 3 months, did you have a cough on most days?
2. During the past 3 months, did you cough up phlegm or mucus on most days?
3. Do you have shortness of breath, either when hurrying on level ground or when walking up a slight hill or stairs?
4. Have you ever been given a breathing test to diagnose breathing problems?
5. Over your lifetime, how many years have you smoked tobacco products?

For the analysis, respondents were classified into one of three groups:

1. Adults who reported having ever been diagnosed with COPD.
2. High-risk: adults who reported having smoked cigarettes for 10 or more years and who answered “yes” to at least one of the four other module questions but reported no COPD diagnosis.
3. Low-risk: Adults who had not been diagnosed with COPD and did not meet the criteria to be classified as “high-risk.”

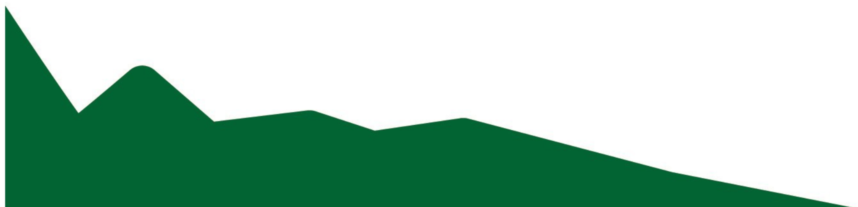
These categorizations were defined according to a review of the available literature.[4]

This analysis is subject to a few limitations. First, the BRFSS is self-reported data. Respondents may underreport some behaviors that may be considered socially unacceptable (e.g., smoking) and may over report behaviors that are desirable (e.g., physical activity). Furthermore, the cross-sectional design of the survey makes casual conclusions impossible. That is, we cannot say that an individual has a given condition or risk behavior because they have COPD or are at “high-risk” for COPD, nor can we say that an individual has COPD or is at “high-risk” for COPD because of a given condition or risk behavior.

Statistical Analyses

The data were weighted to be representative of the Montana adult population according to methodologies set forth by CDC. In the 2018 dataset, the total sample size (n) was 5,190. Respondents who answered, “Don’t Know,” “Not Sure,” or “Refused,” to any of the questions required to categorize respiratory health status were excluded from the analysis, bringing the total analytical sample size to 4,874. Of these, 403 respondents were categorized as having COPD, 745 respondents were categorized as “high-risk” for COPD, and the remaining 3,753 respondents were categorized as “low-risk” for COPD. Select prevalence estimates were not reported due to low precision, this included estimates with less than 50 respondents, with half-width confidence intervals greater than 10 percent, or with a relative standard error greater than 30 percent.

All prevalence estimates were age-adjusted to the 2000 projected U.S. population, distribution #9, as documented in “Age Adjustment Using the 2000 Projected U.S. Population” of the *Healthy People Statistical Notes*, by Klein and Schoenborn.[5] All statistical analyses were performed using SAS 9.4.



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Results

Demographic Characteristics of Montana Adults Diagnosed with COPD

In 2018, 5.4% of Montanan adults reported having ever been diagnosed with COPD (Table 1). In Montana, the prevalence of COPD was higher among older adults, veterans, and adults who reported the following: lower educational attainment, lower annual household income, and some form of disability (Table 1). Furthermore, American Indian/Alaskan Native adults also reported a higher prevalence of COPD than white, non-Hispanic adults (Table 1).

Table 1. Age-adjusted Prevalence of COPD among Montanan Adults, 2018[1]

	N	Weighted Population Estimate[2]	Weighted Prevalence Estimate (%)	95% CI	p-value
All Adults	403	50,037	5.4	4.7 – 6.1	
Sex					
Male	173	23,251	5.2	4.1 – 6.2	
Female	230	26,786	5.6	4.6 – 6.7	NS[3]
Age					
18-24	5		NSD[4]		
25-34	11		NSD		
35-44	14		NSD		
45-64	145	21,143	8.4	6.7 – 10.1	
65+	222	22,202	12.0	10.0 – 14.1	<0.001
Education					
<High School	46	7,442	11.3	7.3 – 15.4	
High School/GED	145	19,177	7.0	5.4 – 8.5	
Some College	124	16,091	5.2	3.9 – 6.5	
College Degree	87	7,266	2.5	1.8 – 3.2	<0.001
Income					
<$15,000	75	9,860	15.0	10.5 – 19.5	
$15,000-$24,999	87	10,276	8.5	6.1 – 11.0	
$25,000-$49,999	99	12,205	5.9	4.3 – 7.5	
$50,000-$74,999	35	4,518	2.9	1.7 – 4.1	
$75,000+	44	6,318	3.0	1.7 – 4.3	<0.001
Race/Ethnicity					
White, non-Hispanic	301	42,211	5.0	4.2 – 5.7	
AI/AN[5]	72	2,885	8.7	5.8 – 11.6	0.04
Veteran Status					
Veteran	104	13,386	8.2	5.8 – 10.6	
non-Veteran	298	36,482	4.9	4.1 – 5.6	0.006
Disability Status[6]					
Some form of disability	264	32,799	11.3	9.1 – 13.5	
No disability	133	16,283	2.7	2.1 – 3.3	<0.001
Urban-Rural[7]					
Small Metro	93	13,629	5.3	4.0 – 6.5	
Micropolitan	50	11,293	3.9	2.7 – 5.1	
Noncore	260	25,115	6.8	5.4 – 8.2	NS

[1] Data Source: 2018 Montana Behavioral Risk Factor Surveillance System
[2] Total sample size (n) = 4,874
[3] NS = Not significant
[4] Not sufficient data to report reliable estimate
[5] American Indian/Alaskan Native only
[6] Disability is defined as answering "yes" to one or more of the following: (1) are you deaf or do you have serious difficulty hearing, (2) are you blind or do you have serious difficulty seeing, (3) because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions, (4) do you have serious difficulty walking or climbing stairs, (5) do you have difficulty dressing or bathing, (6) because of a physical, mental, or emotional condition, do you have difficulty doing errands alone?
[7]Small Metro = population <250,000; Micropolitan = population 10,000-49,999; Noncore = population <10,000

Demographic Characteristics of Montana Adults at "High-Risk" for COPD

In 2018, 12.6% of Montana adults were classified as "high-risk" for COPD (Table 2). In Montana, the prevalence of "high-risk" for COPD was higher among males, older adults, veterans, and adults who reported the following: lower educational attainment, lower annual household income, and some form of disability (Table 2). Furthermore, American Indian/Alaskan Native adults also reported a higher prevalence of "high risk" for COPD than white, non-Hispanic adults (Table 2).

Table 2. Age-adjusted Prevalence of High-Risk for COPD among Montanan Adults, 2018[1]

	N	Weighted Population Estimate[2]	Weighted Prevalence Estimate (%)	95% CI	p-value
All Adults	718	99,381	12.6	11.3 – 13.9	
Sex					
Male	365	55,216	14.0	12.1 – 16.0	
Female	353	44,165	11.2	9.5 – 12.8	0.01
Age					
18-24	2		NSD[3]		
25-34	29	7,637	6.2	3.6 – 8.7	
35-44	103	20,982	18.4	14.3 – 22.4	
45-64	260	37,137	14.7	12.4 – 16.9	
65+	319	31,216	16.9	14.6 – 19.3	<0.001
Education					
<High School	58	10,035	18.7	12.3 – 25.1	
High School/GED	255	36,883	16.6	13.8 – 19.3	
Some College	237	36,279	13.7	11.3 – 16.1	
College Degree	168	16,184	6.5	5.1 – 7.8	<0.001
Income					
<$15,000	93	13,132	23.6	18.1 – 29.0	
$15,000-$24,999	134	16,244	17.5	13.1 – 21.9	
$25,000-$49,999	198	29,597	18.1	14.7 – 21.5	
$50,000-$74,999	83	11,956	8.8	6.2 – 11.4	
$75,000+	105	13,823	6.8	5.1 – 8.5	<0.001
Race/Ethnicity					
White, non-Hispanic	548	84,721	12.0	10.6 – 13.3	
AI/AN[4]	111	6,916	19.4	14.0 – 24.8	0.02
Veteran Status					
Veteran	175	23,346	19.0	14.2 – 23.7	
non-Veteran	541	75,656	11.4	10.1 – 12.7	<0.001
Disability Status[5]					
Some form of disability	360	46,187	21.9	18.3 – 25.4	
No disability	353	52,828	9.7	8.3 – 11.0	<0.001
Urban-Rural[7]					
Small Metro	162	32,904	14.4	11.9 – 16.9	
Micropolitan	99	25,451	11.4	9.0 – 13.9	
Noncore	457	41,026	11.7	9.9 – 13.5	NS

[1] Data Source: 2018 Montana Behavioral Risk Factor Surveillance System

[2] Total sample size (n) = 4,874

[3] Not Sufficient Data to report reliable estimate

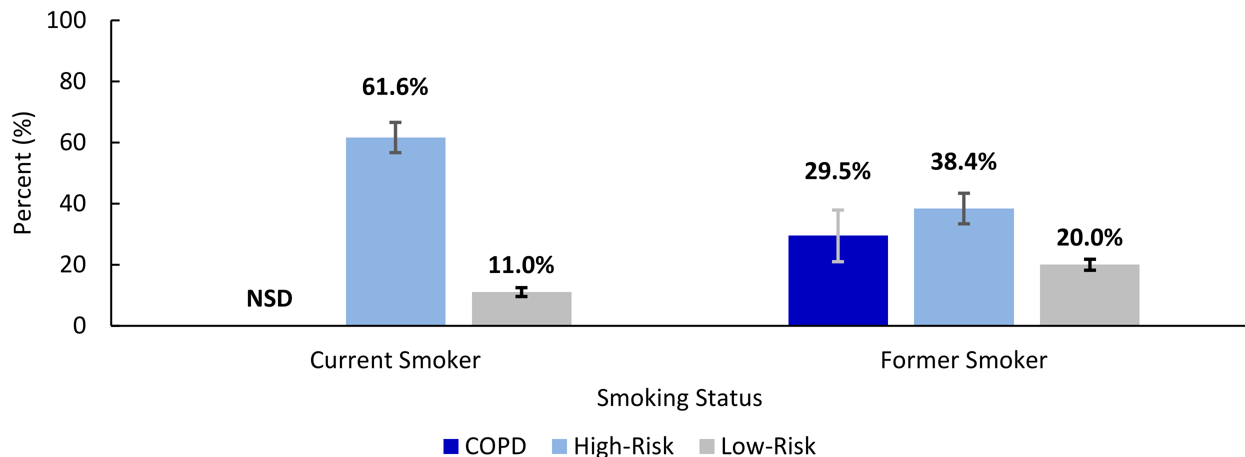
[4] American Indian/Alaskan Native only

[5] Disability is defined as answering "yes" to one or more of the following: (1) are you deaf or do you have serious difficulty hearing, (2) are you blind or do you have serious difficulty seeing, (3) because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions, (4) do you have serious difficulty walking or climbing stairs, (5) do you have difficulty dressing or bathing, (6) because of a physical, mental, or emotional condition, do you have difficulty doing errands alone?

[7] Small Metro = population <250,000; Micropolitan = population 10,000-49,999; Noncore = population <10,000

Current and Former Cigarette Smoking

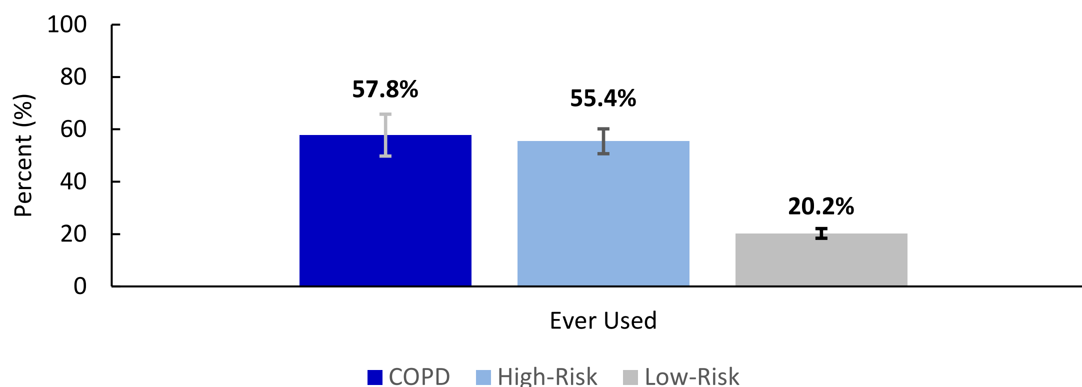
Figure 1: Age-adjusted Prevalence of Current and Former Cigarette Smoking among Montana adults **with COPD** versus **High-Risk for COPD** and **Low-Risk for COPD**, 2018



In 2018, 61.6% of Montana adults categorized as "high-risk" for COPD reported being current cigarette smokers, compared to 11.0% of Montana adults categorized as "low-risk" for COPD. There was not sufficient data (NSD) to report an estimated prevalence of current smoking among adults who reported COPD. Meanwhile, 29.5% of Montana adults with COPD reported being former cigarette smokers, compared to 38.4% of adults categorized as "high-risk" for COPD and 20.0% of adults categorized as "low-risk" for COPD.

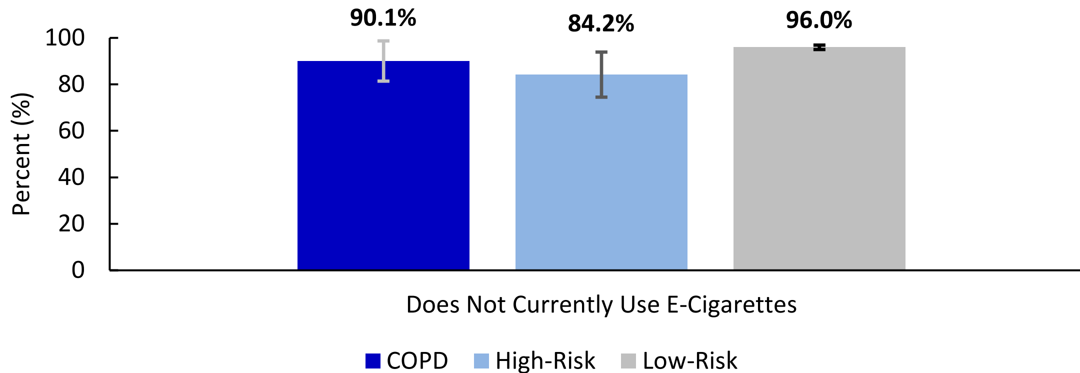
E-Cigarette (Vaping Product) Use

Figure 2: Age-adjusted Prevalence of Having Ever Used an Electronic Cigarette among Montana adults **with COPD** versus **High-Risk for COPD** and **Low-Risk for COPD**, 2018



In 2018, the prevalence of having ever used an electronic cigarette or other vaping product was similar among adults with COPD (57.8%) and adults at "high-risk" for COPD (55.4%), but significantly lower among adults at "low-risk" for COPD (20.2%).

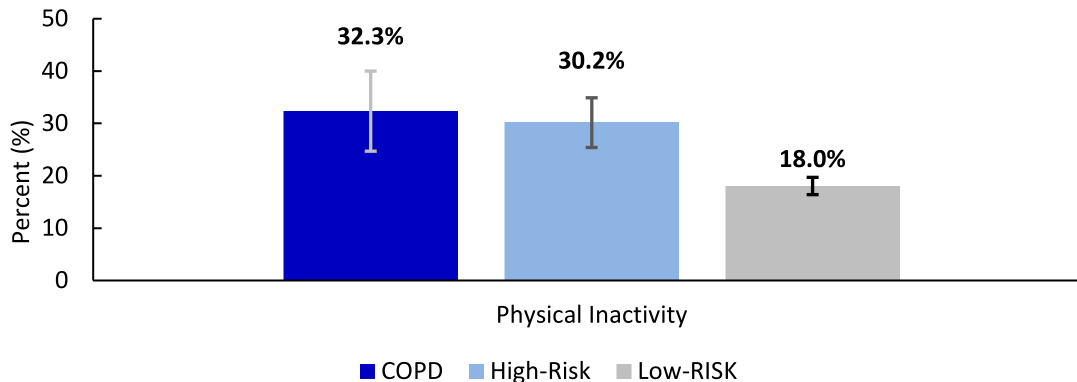
Figure 3: Age-adjusted Prevalence of NOT Currently Using an Electronic Cigarette among Montana adults **with COPD** versus **High-Risk for COPD** and **Low-Risk for COPD**, 2018



In 2018, the prevalence of not currently using electronic cigarettes or other vaping products was significantly higher among adults at “low-risk” for COPD (96.0%) than adults at “high-risk” for COPD (84.2%). The prevalence among adults with COPD (90.1%) was similar to adults at “low-risk” for COPD and at “high-risk” for COPD.

Physical Inactivity

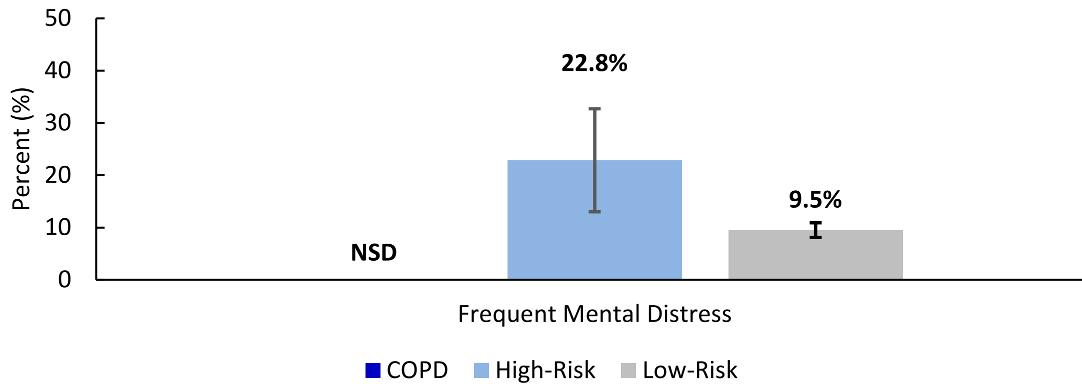
Figure 4: Age-adjusted Prevalence of Physical Inactivity among Montana adults **with COPD** versus **High-Risk for COPD** and **Low-Risk for COPD**, 2018



In 2018, the prevalence of physical inactivity was significantly higher among Montana adults with COPD (32.3%) and Montana adults classified as “high-risk” for COPD (30.2%) than among those classified as “low-risk” for COPD (18.0%). Physical inactivity was defined as reporting no leisure time physical activity within the past 30 days.

Frequent Mental Distress

Figure 5: Age-adjusted Prevalence of Frequent Mental Distress among Montana adults **with COPD** versus **High-Risk for COPD** and **Low-Risk for COPD**, 2018



In 2018, the prevalence of frequent mental distress was higher among Montana adults at "high-risk" for COPD (22.8%) than among Montana adults at "low-risk" for COPD (9.5%). There was not sufficient data (NSD) to report a prevalence estimate for Montana adults with COPD. Frequent mental distress is defined as a respondent reporting that their mental health was "not good" on 14 or more of the past 30 days.

Access to Care

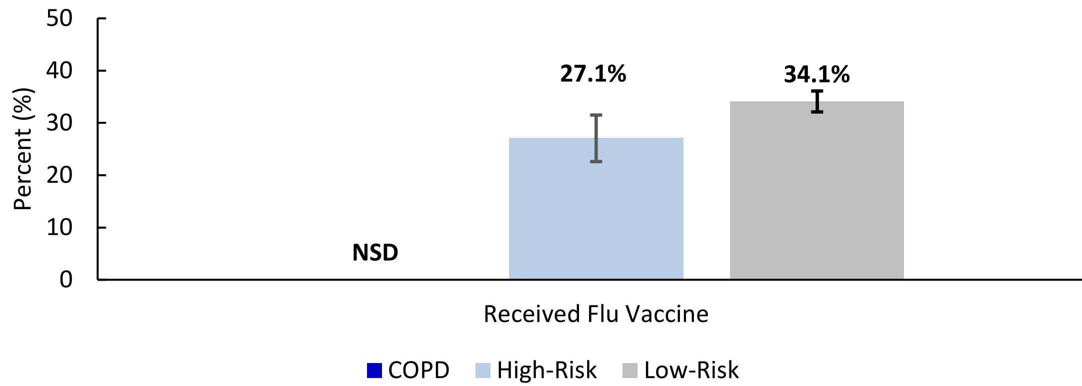
Table 3. Age-adjusted Prevalence of Select Access to Care Indicators, by Respiratory Health Status, among Montana Adults, 2018

Access to Care Indicator	Respiratory Health Status		
	COPD % (95% CI)	High-Risk % (95% CI)	Low-Risk % (95% CI)
No Health Care Coverage	NSD	12.4% (8.0-16.8)	10.9% (9.4-12.4)
No Primary Care Provider	22.1% (12.7-31.6)	NSD	28.8% (26.7-30.8)
No Past Year Routine Check Up	NSD	73.4% (68.2-78.6)	70.5% (68.4-72.7)

In 2018, the prevalence of having no form of health care coverage was similar among Montana adults at "high-risk" for COPD (12.4%) and "low-risk" for COPD (10.9%). There was not sufficient data (NSD) to report a prevalence estimate for health care coverage among Montana adults with COPD. The prevalence of having no primary care provider was similar among Montana adults with COPD (22.1%) and adults at "low-risk" for COPD (28.8%). There was NSD to report a prevalence estimate for adults at "high-risk" for COPD. Lastly, the prevalence of having no routine medical check-up in the past year was similar among Montana adults at "high-risk" for COPD (73.4%) and "low-risk" for COPD (70.5%). There was NSD to report a prevalence estimate for Montana adults with COPD.

Flu Vaccination

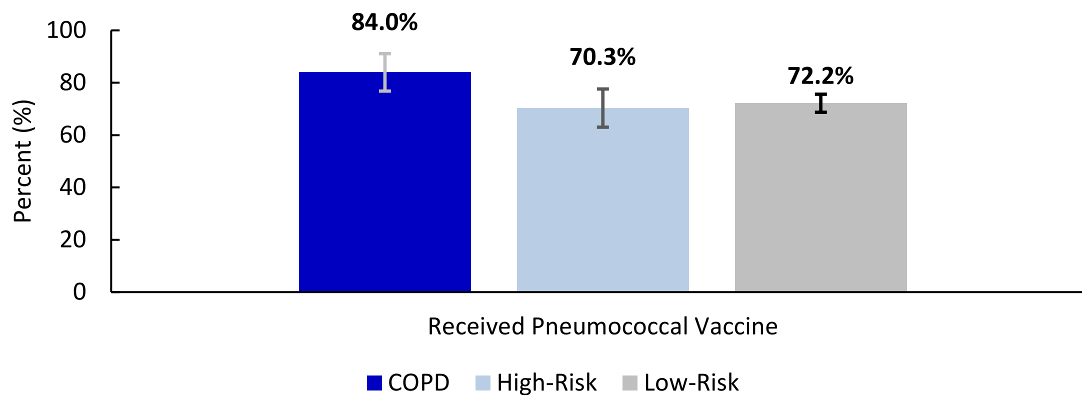
Figure 6: Age-adjusted Prevalence of Having Received a Flu Vaccine within the Past 12 Months among Montanan adults **with COPD** versus **High-Risk for COPD** and **Low-Risk for COPD**, 2018



In 2018, the prevalence of having received a flu vaccine within the past 12 months was significantly higher among Montana adults at "low-risk" for COPD (34.1%) than at "high-risk" for COPD (27.1%). There was not sufficient data to report a prevalence estimate for adults with COPD.

Pneumococcal Vaccination

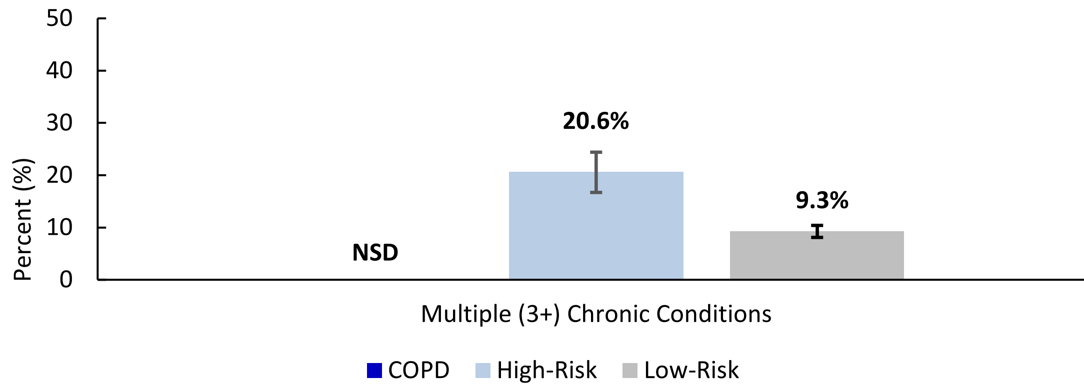
Figure 7: Prevalence of Having Ever Received a Pneumococcal Vaccine among Montanan adults **aged 65+ with COPD** versus **High-Risk for COPD** and **Low-Risk for COPD**, 2018



In 2018, among Montana adults aged 65 years and older, the prevalence of having ever received a pneumococcal vaccine was significantly higher among those with COPD (84.0%) than among those at "high-risk" for COPD (70.3%) and at "low-risk" for COPD (72.2%).

Chronic Conditions

Figure 8: Age-adjusted Prevalence of Multiple (2+) Chronic Conditions among Montanan adults **with COPD** versus **High-Risk for COPD** and **Low-Risk for COPD**, 2018



In 2018, the prevalence of reporting multiple (three or more) chronic conditions was significantly higher among Montana adults at “high-risk” for COPD than at “low-risk” for COPD (9.3%). There was not sufficient data to report a prevalence estimate of multiple chronic conditions for Montana adults with COPD.

Multiple chronic conditions were defined as having been diagnosed with or classified as having three or more of the following: stroke, myocardial infarction (heart attack), coronary heart disease (CHD), diabetes, chronic obstructive pulmonary disease (COPD), kidney disease, asthma (current), cancer (other than skin cancer), arthritis, depressive disorder, obesity (body mass index ≥ 30.0).

Table 4. Age-adjusted Prevalence of Select Chronic Conditions, by Respiratory Health Status, among Montana adults, 2018

	Respiratory Health Status		
Chronic Condition	COPD % (95% CI)	High-Risk % (95% CI)	Low-Risk % (95% CI)
Asthma (Current)	NSD	21.1% (11.2-31.1)	7.5% (6.3-8.7)
Arthritis	NSD	32.6% (28.6-36.5)	21.6% (20.0-23.1)
Cancer (excluding skin cancer)	11.2% (7.9-14.5)	6.7% (4.8-8.6)	6.1% (5.2-6.9)
Cardiovascular Disease (CVD)	27.0% (17.7-36.3)	11.1% (8.6-13.6)	5.4% (4.5-6.2)
Depression	NSD	50.1% (44.8-55.5)	18.5% (16.7-20.3)
Diabetes	13.8% (9.4-18.2)	11.2 (8.5-14.0)	7.0% (6.0-8.0)
Kidney Disease	6.2% (3.2-9.3)	2.7% (1.4-4.0)	1.1% (0.7-1.5)
Obesity	NSD	26.2% (21.4-30.9)	26.2% (24.2-28.1)

In 2018, the prevalence of cardiovascular disease (CVD) was higher among Montana adults with COPD (27.0%) than among adults at “high-risk” for COPD (11.1%) and “low-risk” for COPD (5.4%). Furthermore, the prevalence of current asthma, arthritis, depression, and diabetes was higher among Montana adults at “high-risk” for COPD than adults at “low-risk” for COPD (Table 4).

Recommended Public Health Actions to Promote Respiratory Health

The **Montana Tobacco Quit Line** is a free resource to help Montanans quit using all commercial tobacco products, including cigarettes, smokeless tobacco, and electronic cigarettes. The Montana Tobacco Quit line provides the following: a free personalized quit plan, five free proactive cessation coaching sessions, eight weeks of free nicotine replacement therapy, and reduced cost cessation medication. Individuals interested in starting with the Quit Line may call 1-800-784-8669 or visit the website at https://montana.quitlogix.org/en-US/. Answers to frequently asked questions about the Montana Tobacco Quit Line can also be accessed at https://dphhs.mt.gov/Portals/85/publichealth/documents/Tobacco/QuitLine/MontanaTobaccoQuitLineFrequentlyAskedQuestions.pdf.

Additionally, **Montana: Living Life Well** is a Chronic Disease Self-Management Program developed by Stanford University and adopted by the Montana Department of Public Health and Human Services. Participants of Montana: Living Life Well learn techniques that assist in the day-to-day management of their condition(s), including lung disease, and that maintain or improve their ability to perform activities of daily living. More information on Montana: Living Life Well and additional resources for chronic disease self-management can be found at https://dphhs.mt.gov/publichealth/arthritis/selfmanagementprograms.

Providers should also discuss **annual flu shots and the pneumonia vaccine** with patients with COPD and at "high-risk" for COPD to prevent these infections. Viral and bacterial infections are major contributors to complications such as exacerbations, hospitalization, and disease progression, as well as death, among individuals with COPD.[6]

Lastly, the National Institutes of Health has developed a **COPD National Action Plan**, which contains five strategic goals. To learn more about this and other components of the COPD National Action Plan, visit https://www.nhlbi.nih.gov/sites/default/files/media/docs/National%20Action%20Plan_508c_8%2018%2017.pdf

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