

## Chronic Obstructive Pulmonary Disease (COPD) and Comorbidities — North Carolina 2009

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### Background

Chronic Obstructive Pulmonary Disease (COPD) is a lung disease characterized by chronic inflammation of the airways. The primary risk factor for COPD is cigarette smoking; other risk factors include long-term exposure to environmental lung irritants and certain genetic conditions.<sup>1</sup> COPD is also found to be associated with significant comorbidities, including heart disease, kidney disease, asthma, and arthritis, as well as various types of cancer.<sup>2</sup> A large-scale study, using electronic primary care records of more than 1.2 million patients, found that COPD was associated with significantly higher odds of cardiovascular disease, stroke, and diabetes mellitus.<sup>3</sup> There is growing evidence to suggest that systemic inflammation is potentially a common pathway for multiple chronic conditions found among adults with COPD.<sup>4</sup>

COPD can adversely affect one's quality of life (QoL). Depression has often been associated with COPD. In an observational study of 35,722 patients with COPD, the incidence rate of new-onset diagnoses of depression was significantly higher in the COPD group, compared to the COPD-free group.<sup>5</sup> Sleeping difficulties and physical inactivity are also common among those with COPD.<sup>6,7</sup>

The aim of this report is to enumerate the prevalence and risk of secondary chronic diseases, and poor quality of life, among North Carolina adults with COPD.

### Methods

The study results were derived from the 2009 BRFSS (Behavioral Risk Factor Surveillance System) telephone survey of North

**Table 1.**  
**Weighted Prevalence and Age-adjusted Relative Risk of Poor Quality of Life Among Adults With and Without COPD: 2009 NC BRFSS Survey (N=12,337)**

Poor Quality of Life	Prevalence		Relative Risk	
	COPD %	No COPD %	aRR	95% C.I.
Number of days in past 30 when mental health not good				
14 to 30 days	24.0	10.8	2.44*	1.90–3.12
Number of days in past 30 when poor health <sup>1</sup> restricted activities				
14 to 30 days	31.3	12.8	2.10*	1.67–2.65
Number of days in past 30 with not enough rest or sleep				
14 to 30 days	40.5	27.8	1.66*	1.41–1.95
Participate in any exercise activities in past month				
None	42.4	25.2	1.57*	1.36–1.80

Abbreviations: COPD – chronic obstructive pulmonary disease; aRR – age-adjusted relative risk.  
\*Statistically significant  $p < 0.05$   
<sup>1</sup>Poor health includes poor mental or physical health.

Carolina adults, ages 18 and older. An affirmative response to the COPD screener question: “Have you ever been told by a doctor or health professional that you have COPD, emphysema, or chronic bronchitis?” defined the COPD study population. The comparison group consisted of all those who responded “no” to the screener question. There were 993 respondents who met the definition for COPD and 11,344 respondents who did not have COPD.

Poor quality of life was assessed from three questions, based on the number of self-reported days out of the past 30 days when (1) mental health was not good, (2) daily activity was restricted due to poor health, and (3) self-reported days of not having enough rest

or sleep. For each question, the report of 14 or more days defined poor QoL. Lack of exercise in the past month was also examined as a QoL measure (Table 1). Seven chronic diseases were delineated from the For each indicator of poor QoL and chronic disease, we computed the weighted prevalence and corresponding age-adjusted relative risk for those with COPD versus those without COPD.

## Results

The results in Table 1 show that about 1 in 4 respondents with COPD, compared to about 1 in 10 without the disease, reported having 14 or more days of recent poor mental health. When asked about poor mental or physical health restricting usual activities, such as work, about 31 percent of those with COPD reported having 14 or more days of restricted activities, compared to approximately 13 percent in the non-COPD group. After adjusting for age, the difference in these rates resulted in a two-fold increase in the risk of 14 or more restricted activity days among the COPD group. Similarly, the risk of poor sleep days and lack of exercise in the past month was significantly higher in the COPD group.

Regarding the association between COPD and chronic disease, for each of the chronic diseases that we examined (Table 2), both the prevalence estimates and the age-adjusted relative risks were statistically significantly higher for respondents with COPD. Considering the shared symptoms of asthma and COPD, we found that almost 40 percent of those with COPD also had current asthma. For the chronic conditions index variable, about 22 percent of those with COPD reported having three or more chronic diseases, as compared to about 3 percent of those without COPD. After adjusting for age, the likelihood of having three or more chronic diseases was about five times higher in the COPD group. It is also noteworthy, and consistent with a recent study<sup>3</sup> that the risk of having a heart attack, or coronary heart disease, or stroke was significantly higher among those with COPD.

In conclusion, findings from this study suggest that COPD is a disease not limited to the airways, but one which is often associated with other chronic diseases. COPD is also associated with poor quality of life. Given the complexity of the disease, in order to improve the health status of those with COPD, treatment of the disease requires focus not only on controlling symptoms and reducing exacerbations, but also on treatment of potential comorbid chronic conditions.

**Suggested citation:** Herrick H. *Chronic Obstructive Pulmonary Disease (COPD) and Comorbidity*. North Carolina BRFSS Surveillance Update, No. 4. Raleigh, NC: DHHS, Chronic Disease

**Table 2.**  
**Weighted Prevalence and Age-adjusted Relative Risk of Chronic Diseases Among Adults With and Without COPD: 2009 NC BRFSS Survey (N=12,337)**

Chronic Diseases	Prevalence		Relative Risk	
	COPD %	No COPD %	aRR	95% C.I.
Arthritis	56.7	26.1	1.64*	1.46–1.84
Diabetes	21.9	9.1	1.76*	1.39–2.24
History of heart attack	14.6	3.8	2.58*	2.00–3.33
History of coronary heart disease	18.0	3.7	3.49*	2.50–4.88
History of stroke	7.9	2.5	2.04*	1.53–2.74
Kidney disease	5.9	1.7	2.85*	1.89–4.30
Current asthma	39.8	5.9	7.50*	6.24–9.02
Index of chronic diseases three or more chronic diseases	21.5	2.8	4.95*	3.93–6.25

Abbreviations: COPD—chronic obstructive pulmonary disease; aRR—age-adjusted relative risk.  
\*Statistically significant  $p < 0.05$

and Injury Section, State Center for Health Statistics, February 2011. (Updated citation: Herrick H. *Chronic Obstructive Pulmonary Disease (COPD) and Comorbidity*. SCHS Surveillance Brief, No. 2. Raleigh NC: DHHS, State Center for Health Statistics, October 2015.)

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The Behavioral Risk Factor Surveillance System (BRFSS) is a random telephone health survey of non-institutionalized adults aged 18 and older in households sponsored by the Centers for Disease Control and Prevention (CDC). The North Carolina BRFSS operates through the State Center for Health Statistics' Survey Center, Division of Public Health, conducting interviews monthly in both English and Spanish. Go to [www.schs.state.nc.us/SCHS/brfss/questions.html](http://www.schs.state.nc.us/SCHS/brfss/questions.html) to view the 2009 questionnaire. For more detailed information about the survey, please visit the NC-BRFSS website at [www.schs.state.nc.us/SCHS/brfss](http://www.schs.state.nc.us/SCHS/brfss) or contact the BRFSS Coordinator at (919) 855-4485.