# Chronic Obstructive Pulmonary Disease (COPD) in People Exposed to Wood Smoke
# PREPOCOL: A population based study

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## Rationale

Forty percent of the world population use biomass fuels, especially wood, for cooking or heating. The majority of studies relating domiciliary exposure to wood smoke (WS) to COPD have been case-control studies. The aim of this population-based study was to describe the prevalence and to characterize the people with COPD related to WS.

## Methods

Analytical cross-sectional, probabilistic, population-based study (PREPOCOL) in people older than 40 years in five Colombian cities. Each subject answered a respiratory questionnaire including questions regarding WS exposure, and performed spirometry before and after bronchodilator. COPD was defined by a $FEV_1$/FVC postbronchodilator <70%. Subjects were separated in three groups: 1) Exposed to WS – Never tobacco smokers (WS group); 2) Exposed to tobacco smoke – Never exposed to WS (TS group); 3) Exposed to both wood and tobacco smoke (MS group). Student t, $\chi^2$ and logistic regression were used.

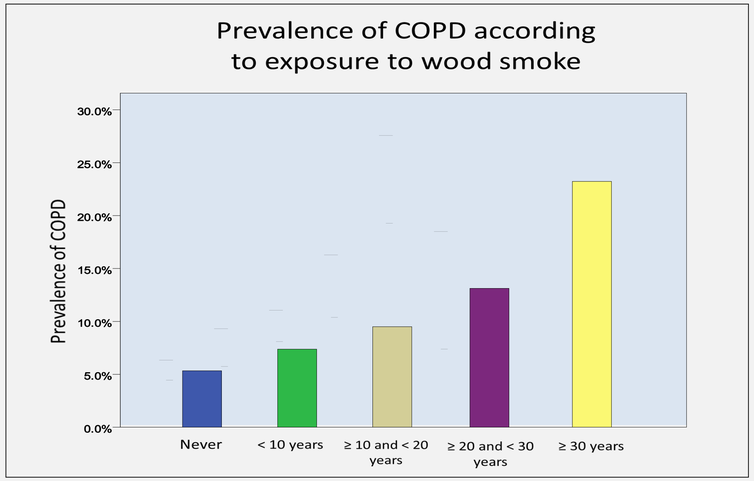
## Results

We included 5539 subjects, according to exposure: WS:30,9%, TS:18,7%, MS:29,8%, and none:20,6%. The prevalence of COPD was: overall: 8.9%, WS:6,7%, TS:7,8%, and MS:16,0% (p<0,001). Fifty-three percent of people with COPD had both WS and TS exposure. The prevalence of COPD was higher as the length of WS exposure increased (figure). WS exposure ≥10 years was a risk factor for COPD: overall: OR:1.50, CI95%: 1,22–1,86, female: OR:1,84, CI95%: 1,31–2,60, male: OR:1,53, CI95%: 1,08–2,18. Table shows the characteristics of subjects. In comparison with TS and MS, WS COPD subjects were predominantly female, had lower height and higher BMI. COPD subjects with both exposures had lower $FEV_1$ and $FEV_1$/FVC and more frequent cough (p=0.014) and phlegm (p<0,001) than those exposed to only WS or TS.

**Characteristics of people with COPD according to exposure**

| | WS (n=114) | TS (n=81) | MS (n=264) | p |
|---|---|---|---|---|
| Female, % | 78,9 | 39,5 | 36,7 | <0,001 |
| Age, years | 64,3 11,1 | 61,5 10,9 | 66,9 10,7 | <0,001 |
| Height, cm | 154,1 8,5 | 162,3 8,1 | 159,6 9,5 | <0,001 |
| BMI, kg/m² | 25,8 4,8 | 23,9 4,0 | 24,9 4,8 | 0,026 |
| FVC, %pred | 95,5 19,8 | 95,5 18,7 | 92,4 18,1 | 0,204 |
| $FEV_1$, %pred | 76,9 19,0 | 73,9 18,4 | 71,7 19,3 | 0,048 |
| $FEV_1$/FVC, % | 63,8 6,3 | 61,2 7,9 | 60,5 9,2 | 0,002 |

Values as mean SD or %. BMI: Body mass index. W: wood. T: tobacco. M: mixed. S: smoke




## Conclusions

In this population-based study from a developing country, the exposure to WS was more frequent than TS and was an independent risk factor for COPD, both in women and men. The prevalence of COPD was significantly higher in MS group (both exposures). Similarly, subjects with COPD exposed to both WS and TS had more symptoms and more severe obstruction than those exposed to only WS or TS. An additive effect of both exposures, to WS and TS, is apparent for increasing the prevalence of COPD and the frequency of symptoms in COPD subjects.