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Title: Measuring the health of the 2012 European green capital, Vitoria-Gasteiz: "The impact of air pollution and weather conditions on COPD"

Dr. Sophe 4745 García sophe.garciafuika@osakidetza.net MD ¹, Dr. Ines 4746 Carrascosa mariaines.carrascosaanguiano@osakidetza.net MD ¹, Dr. Sandra 4747 Pedrero sandra.pedrero tejada@osakidetza.net MD ¹, Dr. Amando 4748 García amando.garciamontoya@osakidetza.net MD ¹, Dr. Merche 4749 Rodriguez mercedes.rodriguezcasaldeiro@osakidetza.net MD ¹ and Dr. Txema 4751 Merino josemaria.merinomuxika@osakidetza.net MD ². ¹ Pneumology, HUA Santiago, Vitoria-Gasteiz, Basque Country, Spain, 01004 and ² Pneumology, Hospital Basurto, Bilbao, Basque Country, Spain, 48013 .

Body: Background: On October 21, 2010, the European Commission designated Vitoria-Gasteiz European Green Capital 2012. The air that the citizens breathe received the highest score given to any city. Only 65 km far away from Vitoria- Gasteiz, Bilbao is the second industrialized region of Spain, behind Barcelona. Aims: To compare the impact of air pollution and weather conditions on COPD in two cities from the Basque Country, very close by distance, but with a different environmental scenario. Methods: Between January 2010 and December 2010 in Santiago Hospital (Vitoria-Gasteiz) and Basurto Hospital (Bilbao) all admissions for COPD exacerbations were retrospectively evaluated. The daily average values of NO₂ and Ozone (both oxidant air pollutants), and meteorology data were obtained from the Basque Meteorological Agency. Results: Measuring air quality, in Vitoria-Gasteiz the NO₂ exposure average was low. In contrast, in Bilbao, ozone concentration was >100 µg/m³ several times over the year.

Oxidant Pollutant	Concentrations	Limit values (WHO)
NO ₂ (Vitoria-Gasteiz)	28 µg/m ³	40µg/m ³ (mean annual)
Ozone (Bilbao)	>100 µg/m ³	100µg/m ³ maximum daily mean of hour

Pearson correlation for COPD exacerbations rate and air pollution was: Ozone: 0.74 and NO₂: 0,73 (p<0,01). The weather correlation was no significant, but there was an inverse relation between higher NO₂ levels and lower temperatures, (r:0,78;p<0,01). Conclusions: This data shows that air quality improves health, comparing both cities. An increase of air pollution relates to more hospital admissions for COPD exacerbations. During winter NO₂ levels could be related with an increase of heating use at home.

