sibility of residual confounding by difficult-to-measure or unmeasured covariates in this cross-sectional study.

Future longitudinal studies could advance our understanding of the vascular effects of household air pollution in children and should incorporate measures of PM pollution exposure and BP over a span of years.

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Only Coarse Particles From the Sahara?

To the Editor:

Despite limited evidence, concerns regarding the health effects of Saharan dust are growing.[1] The few studies on asthma[2,3] and mortality,[4–6] regardless of their specific aims, methodologies, and findings, could be considered pioneering; however, they exhibit low statistical power and uncertainties in characterizing the exposure of populations to dust episodes.

The first critical step in defining exposure is to identify the days affected by Saharan dust events. In general, the classification is based on in situ or remote sensing (both ground-based or satellite) measurements of various aerosol fractions together with atmospheric transport/emission modeling studies. No analysis is available in the literature on the impact of the various classification methods.

However, the main issue in defining exposure is characterizing the size distribution of Saharan particles and identifying the ideal specific particulate fractions ($PM_{2.5}$, $PM_{2.5–10}$, PM_{10}, $PM_{1–10}$, and PM_1) to characterize Saharan outbreaks and dust exposure unambiguously.

Most epidemiologic papers refer to Saharan dust as coarse particles (usually considered as $PM_{2.5–10}$); this definition, however, is inconsistent with the typical size distribution of Saharan particles observed at the Italian Climate Observatory "O. Vittori" at Mt. Cimone (2165 m above sea level).[7] This station, which belongs to the Global Atmosphere Watch program of the World Meteorological Organization, is ideal for intercepting Saharan air masses before they mix with urban pollution and is equipped with an optical particle counter (Grimm 1.108) capable of detecting particles with diameter (Dp) between 300 nm and 20 μm.

The Figure shows the average aerosol size distributions observed between August 2002 and December 2010 during Saharan dust events and under dust-free conditions. The Saharan dust events are identified by analyzing temporal patterns of concentrations of particles larger than 1 μm and by analyzing 3-dimensional back trajectories. This multiyear analysis clearly shows that the contribution of Saharan dust to size classes <2.5 μm is dominant in terms of numbers and substantial in terms of mass. Over the entire particle size range, 99.5% of the number and 38% of the mass are <2.5 μm during Saharan dust events. Considering only particles larger than 1 μm (considered the lower limit of coarse particles), 91% of the number and 34% of the mass during Saharan dust events fall within the range of 1–2.5 μm. Observations carried out at Mt. Cimone from 2008 to 2010 using a condensation particle counter showed that particles smaller than 300 nm are nearly unaffected by Saharan outbreaks. The contribution of particles larger than 10 μm is almost negligible.

These data confirm findings in previous studies on African dust size distributions over the western Atlantic, which showed that one-third to one-half of the dust mass was <2.5 μm.[8] Some differ-

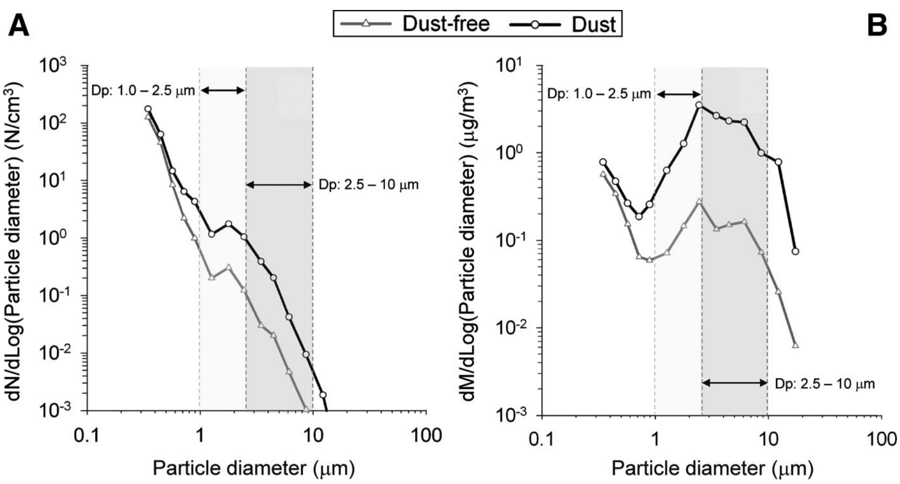

FIGURE. Average particle size distribution by (A) number and (B) mass on a logarithmic scale, as observed in the 2002–2010 period at the Mt. Cimone station (2165 m above sea level). Dp is particle diameter.

ences may be found in areas closer to the Sahara because of the greater presence of coarse giant particles (>10 μm) that are strongly affected by gravitational deposition during long-range transport.

Although Saharan dust events in some regions increase the concentrations of primarily $PM_{2.5-10}$ particles, the Saharan particle size distributions are strongly affected by smaller size fractions, particularly $PM_{1-2.5}$ particles. This information is especially important when establishing chemical analyses of specific size fractions and investigating the health effects and mechanisms of action for Saharan particles. More care should be devoted to characterizing exposure to Saharan particles, both in terms of the size distribution and of the chemical-physical changes of Saharan air masses during their transport.

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Sleep Disorders and Traffic Accidents

To the Editor:

Sleep complaints are common in the general population.[1] A growing body of evidence indicates that inadequate sleep results in cognitive impairment.[2] Automobile accidents have been shown to be one of the most ominous consequences of insomnia.[3] A systematic review found that as many as 20% of traffic accidents were associated with sleep deprivation.[4] Some prior studies, however, have relied on self-reported information or had small cohorts or lacked a control group. We conducted a longitudinal nationwide population-based study by analyzing the claim data of Taiwan NHI (National Health Insurance)[5] to investigate whether primary insomnia contributes to the incidence and severity of traffic accidents.

The study group was selected from people 20 years of age and older, with at least 1 inpatient or 3 outpatient claims for primary insomnia (ICD-9-CM 780.5) during 2002–2006. We excluded those with nonprimary sleep disorders (ICD-9-CM 327) and sleep symptoms related with mental disorders (ICD-9-CM 307.4), as well as those with sleep disorders or traffic accidents between 1996 and 2001. The study group was 1:2 matched, according to sex and age, with a randomly selected control group among those without a sleep disorder. To determine the impact of sleep disorders on the incidence of admission due to traffic accidents, we followed all persons for 2 years or until hospital admission due to traffic accident. To estimate the severity of traffic accidents, we assessed length of admission, incidence of intensive care unit (ICU) admission, length of ICU stay, and inhospital mortality.

The study group comprised 59,940 patients and the control group comprised 119,880 persons. The prevalence of sleep disorders requiring medical care rose gradually during the study period, approaching 8% in 2008. Sleep disorders had a female predominance (62%