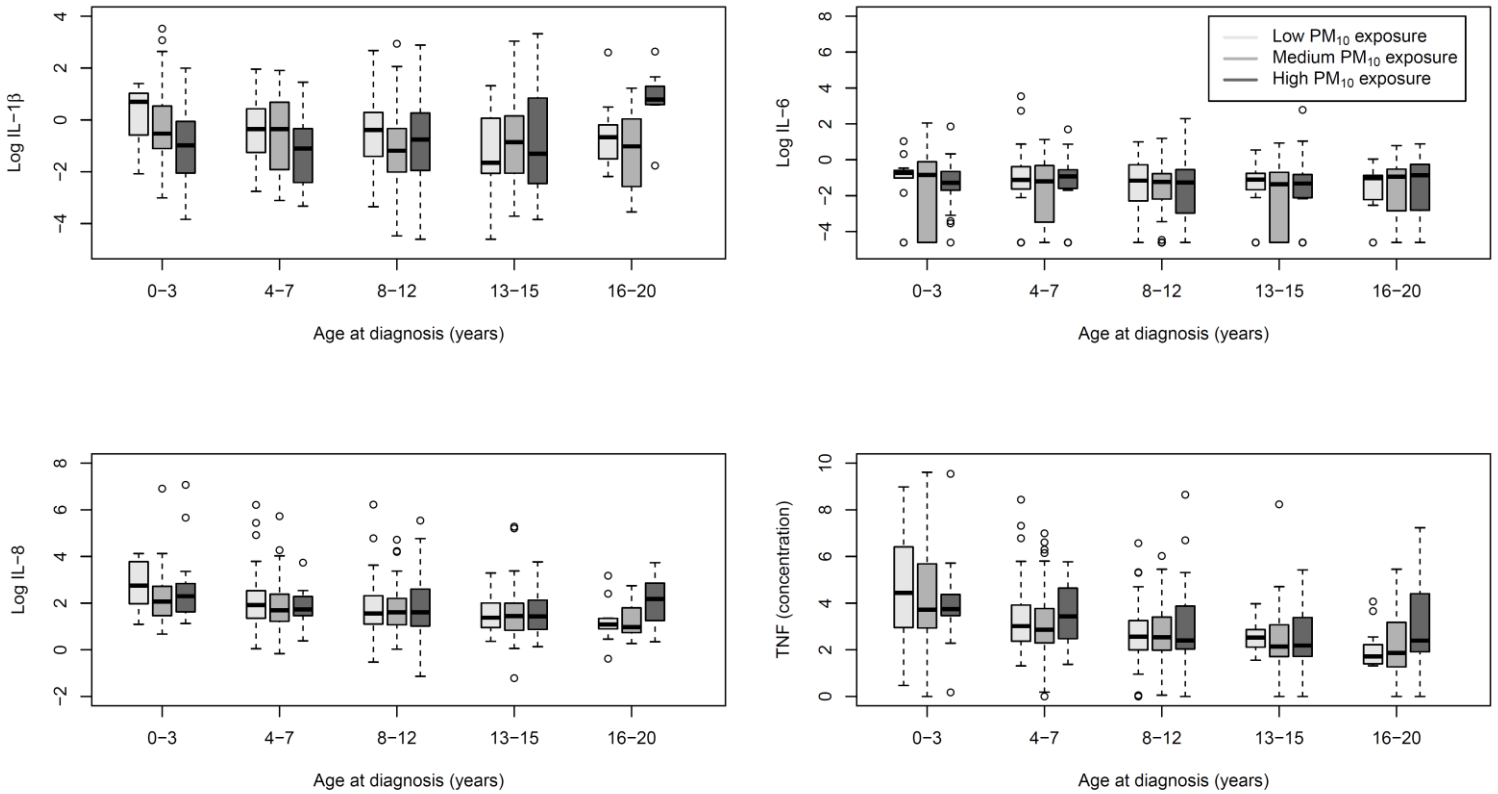

Supplemental figure. Boxplots of the inflammatory markers IL-1β, IL-6, IL-8 (each on a logarithmic scale), and TNF by age group and low, medium, and high exposure to PM_{10} (defined as the lowest quartile, interquartile range, and highest quartile of exposure). Box: interquartile range; whiskers: 1.5 × interquartile range; circles: outliers. The category limits correspond to the 10th, 30th, 70th, and 90th percentiles of age at diagnosis in the dataset.

Exposure assessment

The concentrations of particulate matter (PM) with an aerodynamic diameter of <10 µm (PM_{10}) and nitrogen dioxide (NO_2) at the residential addresses of patients were obtained from freely available European maps with a resolution of 1 km (http://www.integrated-assessment.eu/node/831). These maps were developed for the then 15 member states (EU-15) for the year 2001 as part of the Air Pollution Modelling for Support to Policy on Health and Environmental Risks in Europe (APMoSPHERE; http://www.apmosphere.org/) project.[1] PM_{10} and NO_2 were modelled by kriging and land use regression (LUR) techniques using routine monitoring data in Airbase, a European database of air quality based on routine air pollution monitoring in the EU member states. Separate models were developed for the global, rural, and urban scales, and composite maps were prepared.

Greenness was assessed using the Normalized Difference Vegetation Index (NDVI), which was derived from MODerate-resolution Imaging Spectroradiometer (MODIS) satellite images (http://glcf.umd.edu/data/modis/index.shtml/). NDVI is a common indicator of green vegetation, which was developed to analyse surface reflectance measurements.[2] The algorithm for NDVI is based on two vegetation-informative bands: near-infrared (NIR; from 841 nm to 876 nm) and visible red (RED; from 620 nm to 670 nm). To obtain the maximum exposure contrasts, we obtained the 32-day composite for the maximum vegetation period for the year 2005 (10 June to 11 July). We calculated NDVI at a resolution of 500 m using the formula: NDVI = (NIR – RED)/(NIR + RED) and derived the respective NDVI value for each residential address.

The concentrations of particulate matter with an aerodynamic diameter of <2.5 µm ($PM_{2.5}$) and $PM_{2.5}$ absorbance at the residential addresses was estimated using a combination of actual measurements and modelling. These pollutants were measured as part of the European Study of Cohorts for Air Pollution Effects study (ESCAPE; http://www.escapeproject.eu/) at 20 monitoring sites distributed throughout Upper Bavaria and Swabia in three periods of 2 weeks

per site in cold, warm, and intermediate temperature seasons from October 2008 to July 2009 [3,4]. The annual mean $PM_{2.5}$ concentration and $PM_{2.5}$ absorbance were estimated for all residences using the ESCAPE LUR models [5,6].

The distance from the residential address to the nearest major road was also calculated. Major roads were defined as street segments with a daily traffic volume of more than 5 000 vehicles per day. For these calculations, we used road data from the Bavarian Survey Office for the year 2005 with a spatial resolution of <5 m.

$PM_{2.5}$ concentrations, $PM_{2.5}$ absorbance, and the distance to the nearest major road were calculated for 400 patients residing in Upper Bavaria and Swabia because the LUR models were only developed for these two administrative regions of Bavaria, and road data were only available for these regions.

All data management and calculations were performed using ArcGIS 10.1 Geographical Information System (GIS) (ESRI, Redlands, CA, USA).

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