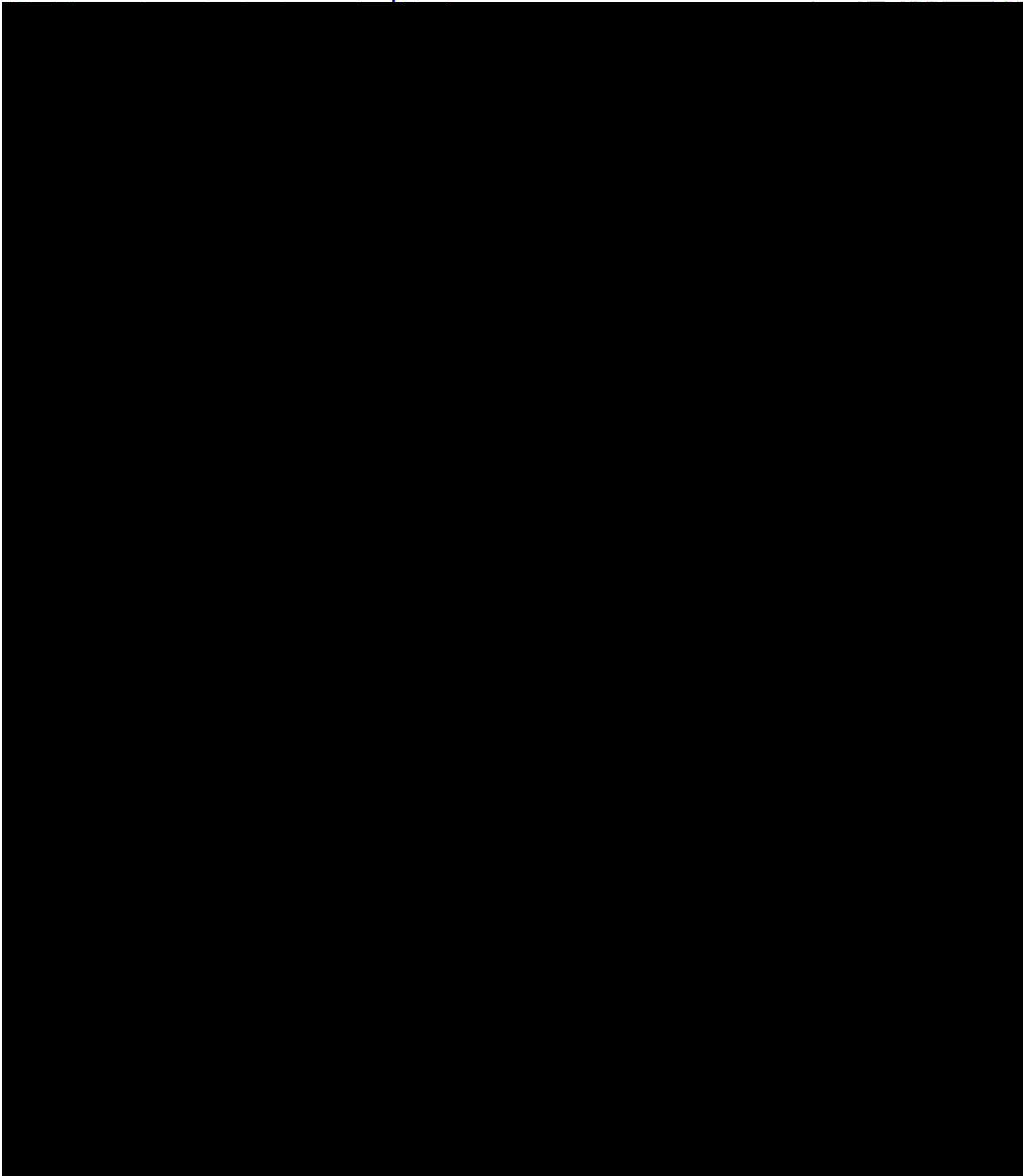
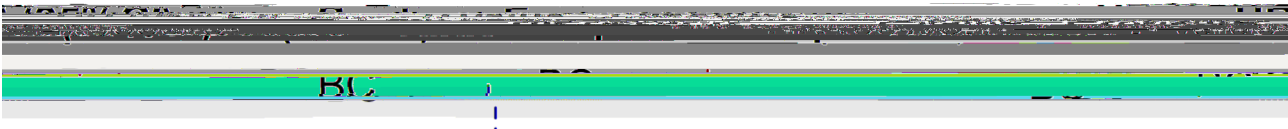


Results

Descriptive results

In total, 7,032 participants with a mean age of 57.14 (range: 45–95) years were enrolled in our study. After a follow-up of 36,997 person-years and an average of 5.26 years, 3,119 (44.4%) individuals developed hypertension. Statistical differences could be significantly observed between non-hypertension and incident hypertension individuals in terms of age, sex, educational qualifications, marital status, BMI, drinking status, smoking status, cooking fuel, and diabetes prevalence ($P < 0.05$) (Table 1). Individuals with hypertension seemed to be elderly, unmarried, with high BMI or lower education level contrary to some without hypertension.

Table 2 outlines the annual distributions of $PM_{2.5}$, its components and meteorological factors in lag 1 year,



is derived from various sources, such as transport emissions and fuel combustion [30], and the main sources of SO_4^{2-} are fossil fuel combustion and wildfires [31]. NH_4^+ and NO_3^- are usually attributed to traffic emissions [32].

Thus, it is necessary to evaluate the effect of individual and mixed exposure to $\text{PM}_{2.5}$ components on incident hypertension in our study.

Our study found that BC and SO_4^{2-} showed strong associations with incident hypertension among five components, similar to previous studies [33, 34]. However, another study has shown that NO_3^- contributed the most to hypertension incidence, DBP, and SBP among five components [17]. The difference might be related

middle-aged and elderly) and statistical methods. Paying attention to hypertension in the middle-aged and elderly population is essential.

QG analyses have shown that the risk of hypertension incidence increases with increasing mixed exposure to PM

32. Jiang N, Lv Z, Zhang R, Zhu R, Qu G. Characteristics, source analysis, and health risk of PM_{2.5} in the urban tunnel environment associated with E10 petrol usage. *Environ Sci Pollut Res Int*. 2024;31(21):30454–66. <https://doi.org/10.1007/s11356-024-33194-0>
33. Shen Y, Yu G, Liu C, Wang W, Kan H, Zhang J, et al. Prenatal exposure to PM_{2.5} and its specific components and risk of hypertensive disorders in pregnancy: a nationwide cohort study in China. *Environ Sci Technol*. 2022;56(16):11473–81. <https://doi.org/10.1021/acs.est.2c01103>.
34. Bista S, Chatzidiakou L, Jones RL, Benmarhnia T, Postel-Vinay N, Chaix B.