

## Supplementary Material: Appendix

### Asthma is associated with frailty among community-dwelling adults – the GAZEL cohort.

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### Study design complement

The GAZEL cohort is a population-based cohort of French community-dwelling men and women. Details regarding the study design have been described elsewhere<sup>1</sup>. Briefly, in 1989, 20,625 volunteers (5,614 women and 15,011 men, aged 35 to 50 years) of the French national electricity and gas utility (Electricité de France – Gaz de France, EDF-GDF) accepted to participate. Every year, participants were invited to complete a postal questionnaire including a large set of items dealing with health status, lifestyle, socioeconomic and occupational factors. Data were also collected from national registers and personal and medical departments of EDF-GDF.

### Others variables definition

Sociodemographic characteristics were sex, age, education (university, high school, lower than high school), and marital situation (single, in couple). Lifestyle characteristics were tobacco consumption (non-smoker, current smoker or former smoker) and body mass index. Health problems assessed cancer, cardiovascular diseases, joint pain, psychological problems (depression, stress or anxiety) and diabetes. Cancer and cardiovascular diseases were assessed using validated registers<sup>2,3</sup>. Joint pain, diabetes, and psychological problems were assessed using self-reported information in the 2013, 2014, and 2015 questionnaires (at least one occurrence over the 3 years).

### Statistical methods

Population characteristics were described with number and percentage for categorical variables and by mean, standard deviation, median and range for continuous variables. We used t-test for continuous variables and chi-squared test for categorical variables.

We performed multinomial regression models to investigate the associations between asthma and frailty by using the R-VGAM package (version 1.0-6). Robust participants were considered as the reference group. Results were expressed as odds-ratio (OR) or adjusted odds-ratio (aOR) with 95% confidence intervals (CI 95%).

All the statistical analyses were performed using R statistical software (version 3.4.4).

### Included participants

Our study population consisted of 12,345 GAZEL cohort participants, answering in 2015, with available data on asthma and frailty. Participants not included in the analyses (n=858, 6.5%) were older (mean age 70.1 versus 69.8; p-value=0.01) and more likely to be women (32% versus 26%; p-value <0.001) than those included in the analyses. Their mean BMI, tobacco consumption and asthma status (for both 2015 and 2002 definitions) did not significantly differ (p-values > 0.15).

**References**

1. Goldberg M, Leclerc A, Zins M. Cohort Profile Update: The GAZEL Cohort Study. *Int J Epidemiol*. 2015;44(1):77-77g. doi:10.1093/ije/dyu224
2. Chevalier A, Goldberg M, Godard C, et al. [Cancer incidence among active male workers at Electricite de France-Gaz de France]. *Rev Epidemiol Sante Publique*. 1996;44(1):25-36. <http://www.ncbi.nlm.nih.gov/pubmed/8851940>.
3. Chevalier A, Zins M, Godard C, et al. [ A registry of ischaemic cardiopathies among active workers at Electricité de France-Gaz de France. Program development and first results]. *Rev Epidemiol Sante Publique*. 2001;49(1):51-60. <http://www.ncbi.nlm.nih.gov/pubmed/11226919>.