

Comorbidities among individuals at risk to develop severe form of COVID-19 in case of SARS-CoV-2 infection

Guyot E^{1*}, Beraud G², Ausset-Morailion A³, Belhassen M¹, Jacoud F¹, Mackosso C³, Solas Chesneau C⁴, Frange P⁵

1. PELyon, Lyon, France; 2. CHR Orléans, Orléans, France; 3. MSD France, Puteaux, France; 4. APHM, Marseille, France; 5. APHP, Paris, France

Introduction

- COVID-19, caused by the severe acute respiratory syndrome coronavirus (SARS-CoV-2), has been declared a global pandemic in 2020 by the World Health Organization (WHO) (1-3).
- SARS-CoV-2 infection tends to progress more rapidly and more frequently to severe COVID-19 among individuals with specific comorbidities (e.g., congestive heart failure, cerebrovascular disease, dementia, diabetes, renal disease, chronic pulmonary disease, paralysis comorbidities, and malignancies) (4,5).

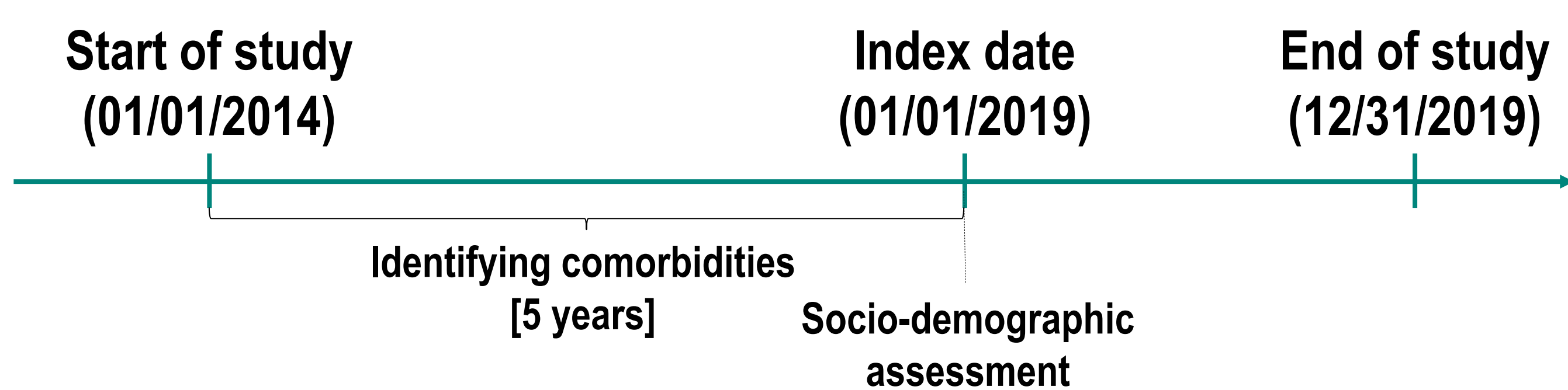
Objective

- The aim of this study was to estimate the adult population at risk of developing a severe form of COVID-19 in case of SARS-CoV-2 infection in France, as well as the repartition of their comorbidities.

Methods

- Data source: Echantillon Généraliste des Bénéficiaires (EGB) a permanent representative sample of the 97th percentile of the French population protected by health insurance = 650,000 individuals.
- Study design: retrospective observational.

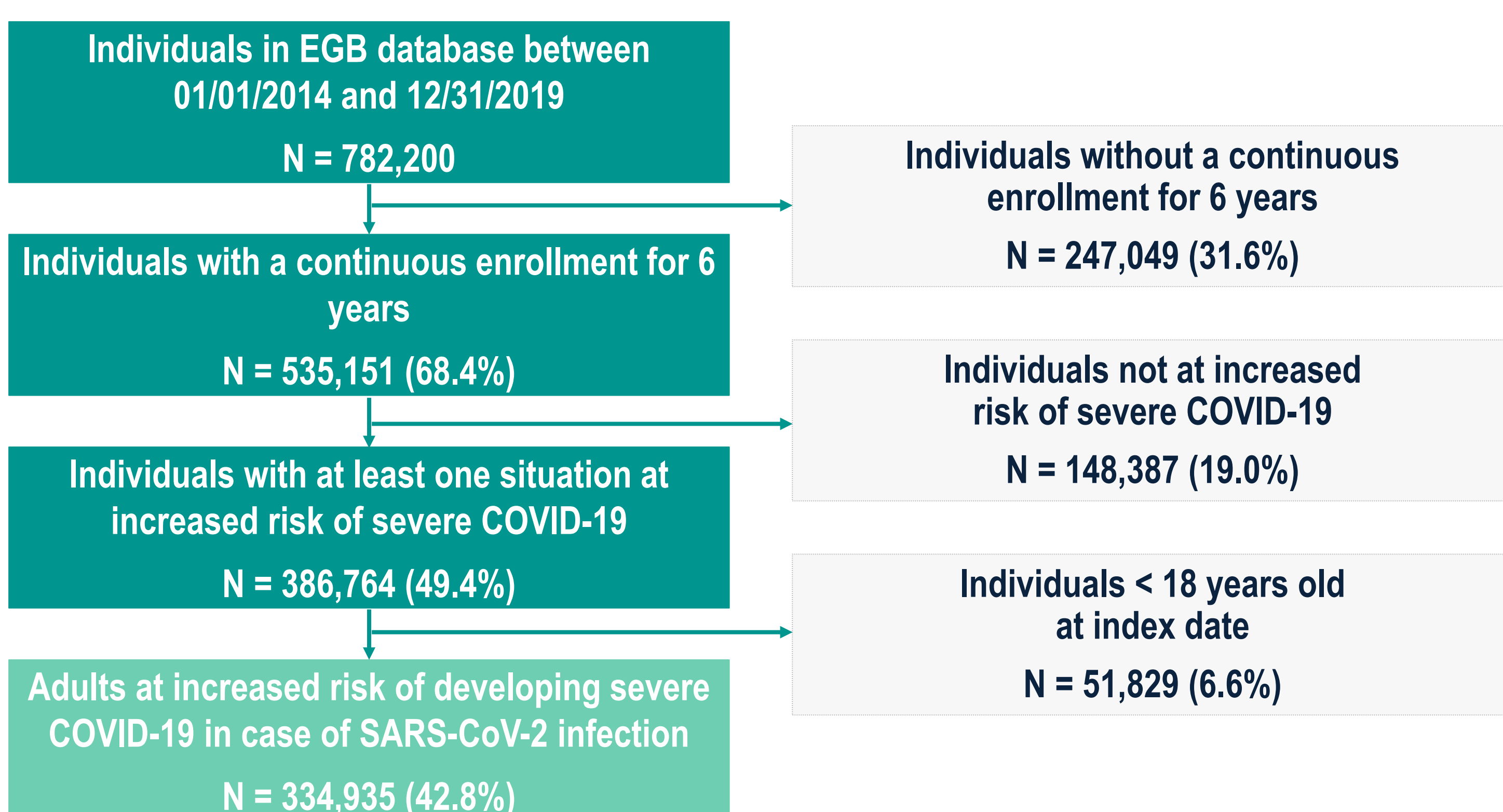
Figure 1. Study design



- Study population:
 - Continuous registration in the database from 01/01/2014 to 12/31/2019 = no exclusions or deaths.
 - Increased risk of developing a severe form of COVID-19 if infected with SARS-CoV-2 (risk estimated from sociodemographic and comorbidity criteria defined by the French National Authority for Health (*Haute Autorité de Santé, HAS*) and adapted to the EGB database (identification through ICD-10 codes of reimbursed long-term disease status, from ICD-10 diagnoses codes or homogeneous healthcare group (GHM) code from hospital, from medication or from medical procedures).
 - Subjects ≥ 18 years of age at index date.

Results (1/2)

Figure 2. Selection of the study population (EGB, France, 2014-2019)



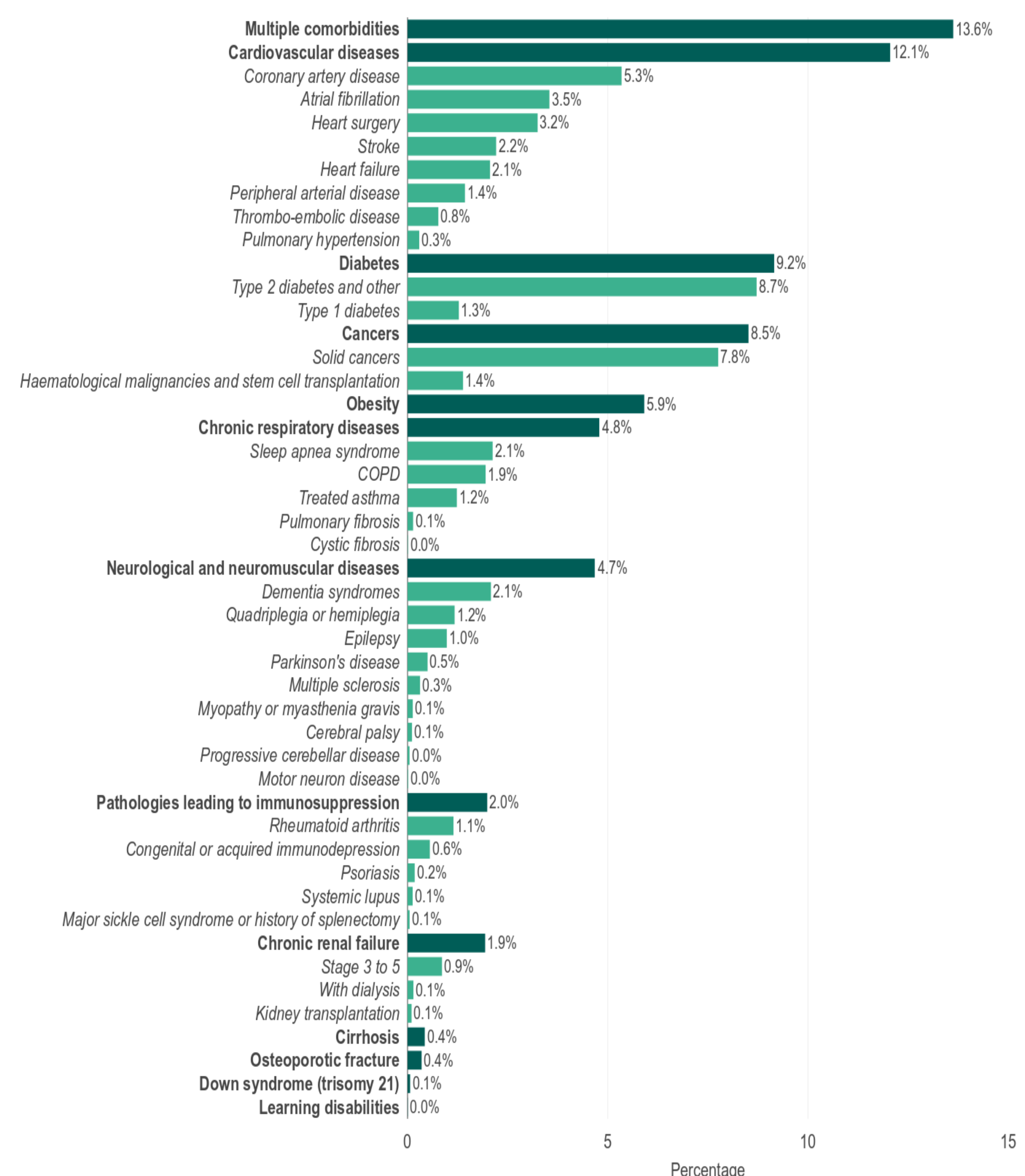
Results (2/2)

Table 1. Description of socio-demographic characteristics of adults at increased risk of progressing to severe form of COVID-19 in case of SARS-CoV-2 infection (EGB, France, 2014-2019)

Socio-demographic characteristics	Overall (N = 334,935)
Male, n (%)	218,760 (65.3%)
Age (in years), mean (SD)	55.1 (19.1)
Free-access-to-care status, n (%)	
Yes	31,973 (9.5%)
No	272,197 (81.3%)
Missing values	30,765 (9.2%)

- In the study population, 107,179 individuals (32.0%) had at least one comorbidity and 45,645 (13.6%) had multiple comorbidities (i.e., at least 2; see figure 3 for the repartition of comorbidities).

Figure 3. Repartition of comorbidities among adults at risk to develop severe form of COVID-19 in case of SARS-CoV-2 infection, N = 334,935



Conclusion

- Using a representative database of the French population, we found that 42.8% of adults were at risk for severe COVID-19 if infected with SARS-CoV-2. By extrapolation, this would represent 23 million French adults. Among them, 32.0%, or 7 million, would have at least one comorbidity.
- These results suggest that the presence of comorbidities may have consequences for treatment and/or healthcare choices.
- Although the use of the EGB database prevented us from studying more recent years, we can expect similar figures for subsequent years.

1. World Health Organization. Archived: WHO Timeline - COVID-19. 27 April 2020
 2. The Center for Systems Science and Engineering at Johns Hopkins University. COVID-19 Dashboard. 2022
 3. Holshue ML, DeBolt C, Lindquist S, et al. First case of 2019 novel coronavirus in the United States. *New England Journal of Medicine*. 2020.
 4. Emami A, Javanmardi F, Pirbonyeh N, Akbari A. Prevalence of underlying diseases in hospitalized patients with COVID-19: a systematic review and meta-analysis. *Archives of academic emergency medicine*. 2020;8(1).
 5. Choi YJ, Park J-Y, Lee HS, et al. Variable effects of underlying diseases on the prognosis of patients with COVID-19. *Plos one*.
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