

Mortality Patterns in Multimorbid Populations

Insights from the Czech National Health Registry (2014–2023)

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OBJECTIVE In this paper, we used the newly developed nationwide dataset of validated chronic diseases from the Czech health registries with two aims:

- (i) the evolution of (multi)morbidity in Czechia
- (ii) changes in mortality rates among (multi)morbid individuals between 2014 and 2023.

DATA The National Registry of Reimbursed Health Services collects data from insurance companies about all contacts between healthcare providers and the insured Czech population. By law, every person with permanent residence in Czechia is required to have health insurance, regardless of their nationality. Therefore, the polymorbidity data are population The data from the National Registry of Reimbursed Health Services are then used to trace patient visits over a 5-year period. Next, the Institute of the Health Information and Statistics of the Czech Republic applies disease-specific rules to validate each diagnosis. The diagnoses validated to date are listed in Table 1.

	Frequency	
	%	N
Chronic obstructive pulmonary disease	12.9	2,793,692
Diabetes	12.3	2,663,063
Cardiovascular diseases	7.4	1,592,074
Neoplasm	5.8	1,243,787
Cerebrovascular diseases	5.0	1,075,364
Liver disease	4.6	989,232
Renal disease	2.4	523,883
Rheumatic diseases	2.2	467,788
Dementia	1.4	312,151
Peptic ulcer	1.3	272,762
Hemiplegy	0.6	138,260

Table 1: : Frequency of validated chronic conditions in the studied population, Czechia, 2022-2023

RESULTS Between 2014 and 2023, an upward trend in disease prevalence was observed in populations with a single disease for most of the leading chronic conditions. In contrast, the prevalence of extremely complex multimorbidity patterns (4+ dis.) declined during this period. Simultaneously, we observed divergent trends in mortality were observed across morbidity groups, as well as within multimorbidity groups. Substantial inequalities in mortality by multimorbidity persist, although they weakened, particularly in the 50-65 age group. Generally, adding additional diagnoses was associated with increased mortality. Between 2014 and 2023, the mortality rate declined in subpopulations with leading morbidities, most notably in those with neoplasms. However, these declines were primarily attributed to changes in multimorbidity composition, which refer to a significant decline in the proportion of individuals with complex multimorbidity, defined as having three or more chronic conditions. In contrast, the rate effect was positive, implying rising intensity of mortality in chronically ill people in Czechia.

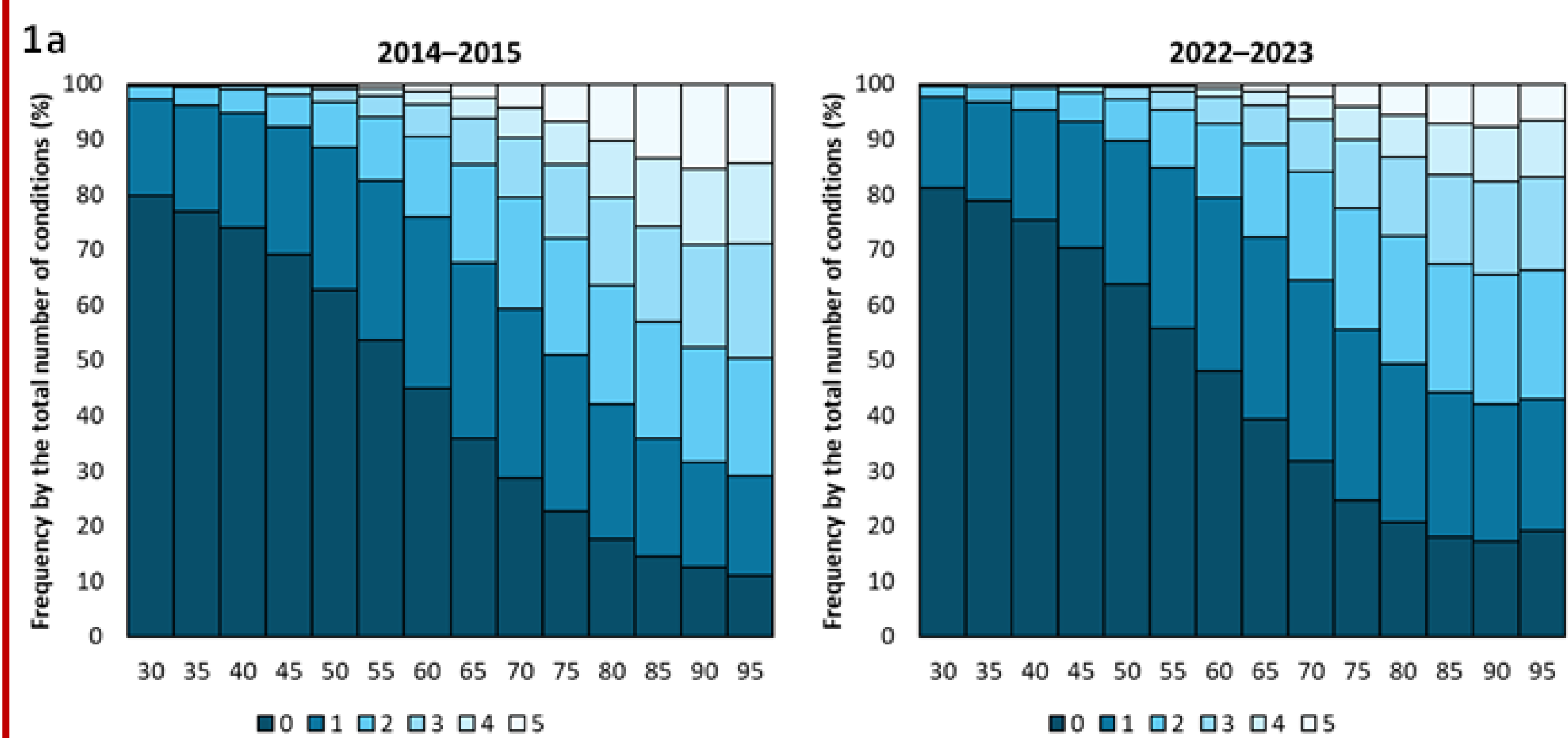


Figure: Distribution by number of chronic conditions and age (1a) and distribution by number of chronic conditions and diseases (1b), comparison of 2014-2015 and 2022-2023

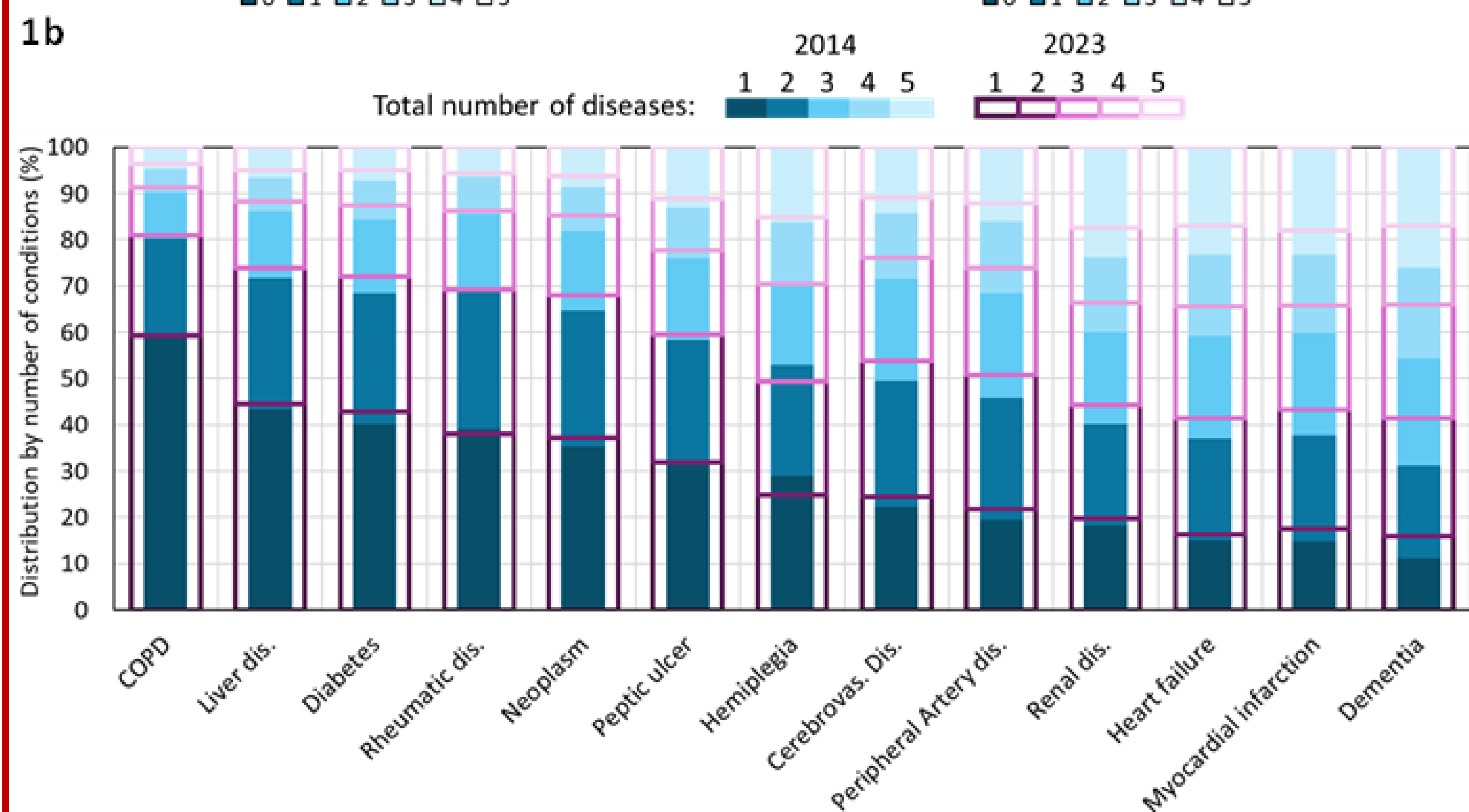
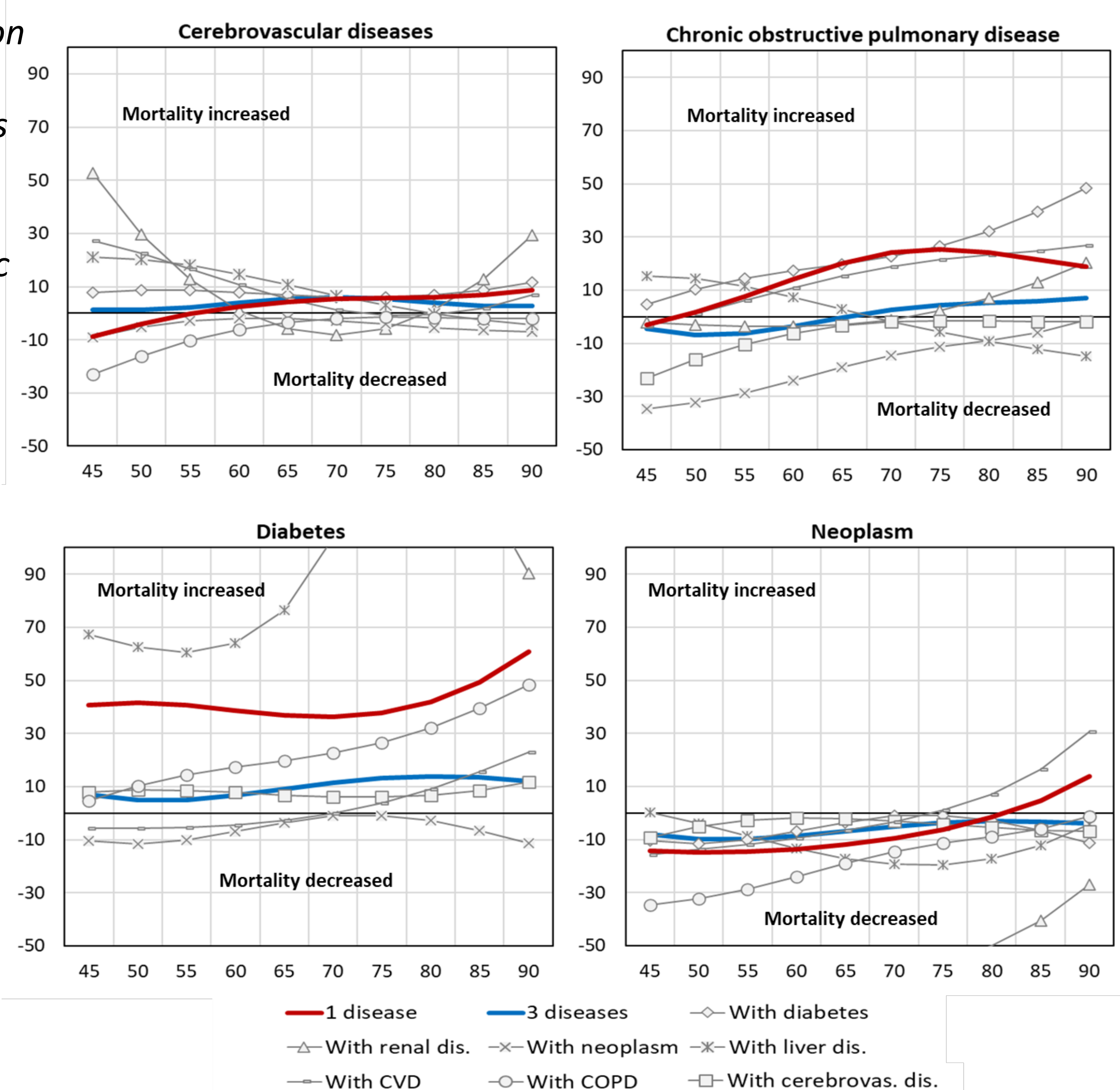


Figure: Relative change in age-specific mortality rates between 2014-2015 and 2022-2023 in subpopulations defined by multimorbidity, Czechia (2)



	Cerebrovas. dis.	COPD	Diabetes	Neoplasm
CDR 2014-2015 (‰)	95.041	36.703	41.108	85.862
CDR 2022-2023 (‰)	89.238	33.465	40.143	78.935
Difference	-5.803	-3.237	-0.965	-6.927
Rate effect	2.772	0.681	3.502	-2.820
Multimorbidity effect	-8.775	-5.548	-7.021	-8.614
Age effect	0.199	1.630	2.553	4.507
Total	-5.803	-3.237	-0.965	-6.927

Table 2: Contributions of intensity of mortality, age composition and multimorbidity composition to the change in crude death rates between 2014-2015 and 2022-2023 in populations by leading morbidities