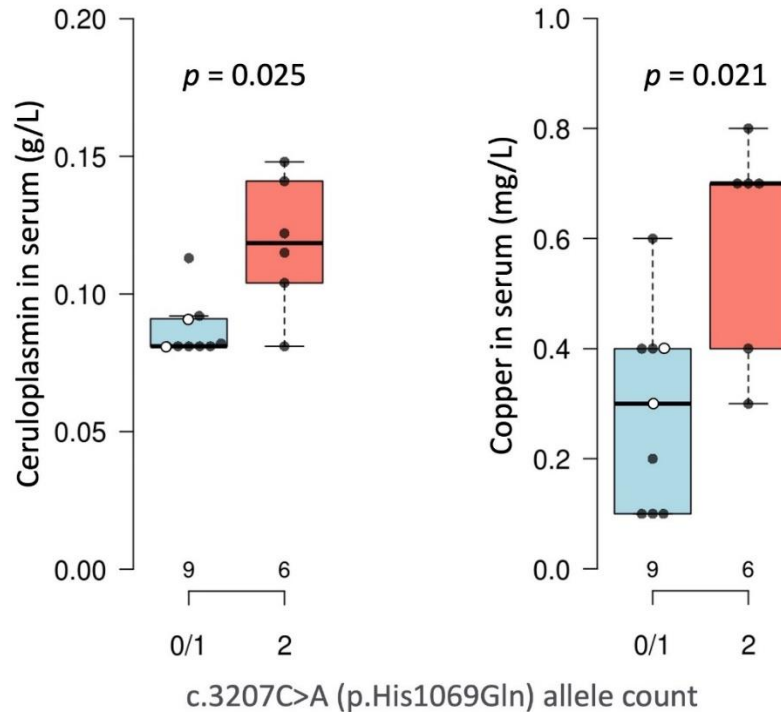
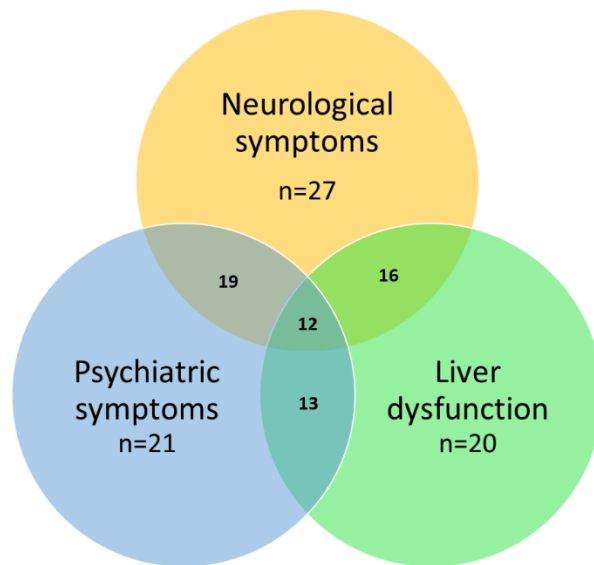


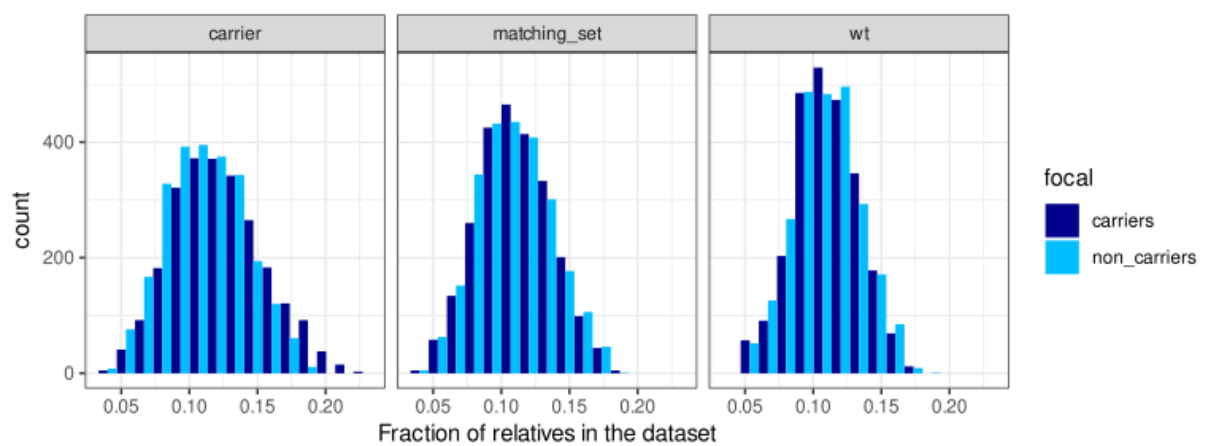
**Supplementary Fig. S1.** First stage of *ATP7B* variant filtration.



**Supplementary Fig. S2.** Serum ceruloplasmin and copper levels in the recall cohort. White dots represent p.His1069Gln variant non-carriers. Numbers of individuals are shown under the boxplots.  $P$  values were calculated using the Mann–Whitney  $U$  test. Thick lines indicate medians and whiskers denote 1.5× interquartile ranges from the first to the third quartiles.

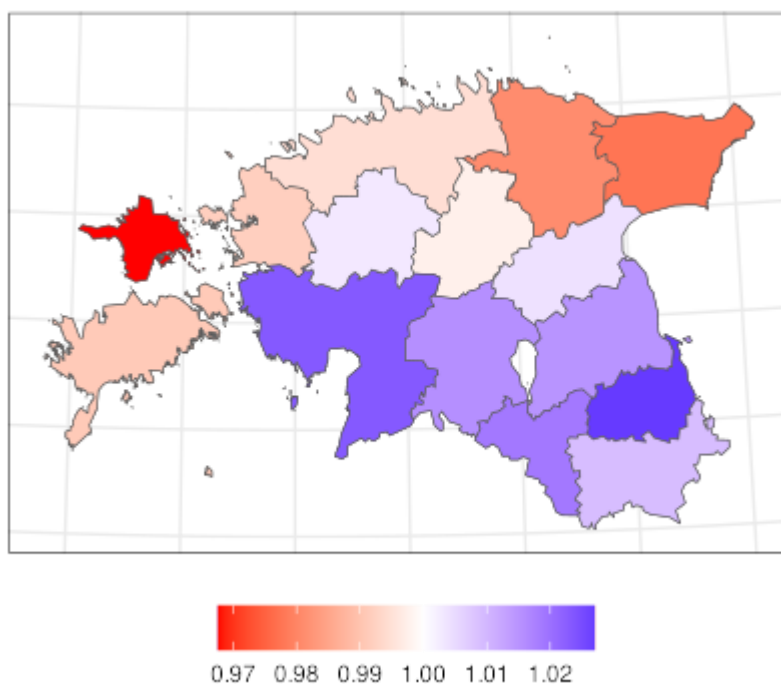


**Supplementary Fig. S3.** Symptom sets among EstBB participants diagnosed with copper metabolism disorders ( $n = 34$ ).



**Supplementary Fig. S4.** Proportions of relatives of p.His1069Gln carriers and matched non-carriers among p.His1069Gln carriers, matched non-carriers, and remaining non-carriers.

### Enrichment in relatedness



**Supplementary Fig. S5.** Patterns of relatedness for EstBB participants carrying the p.His1069Gln variant, mapped by county of birth. Dark-blue and red values indicate more and fewer average numbers of relatives born in the given counties relative to the relatedness of matched non-carriers, respectively.