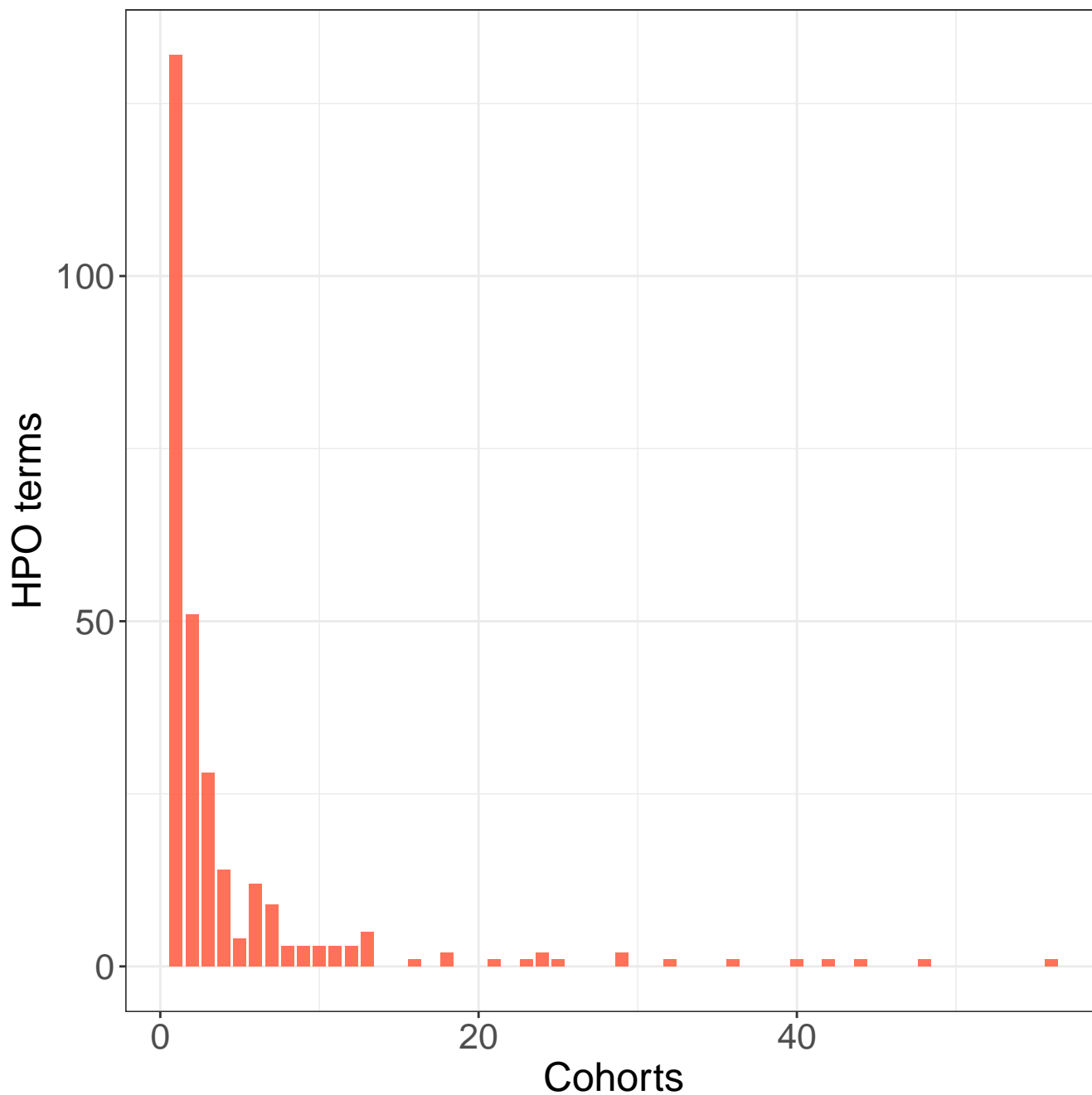
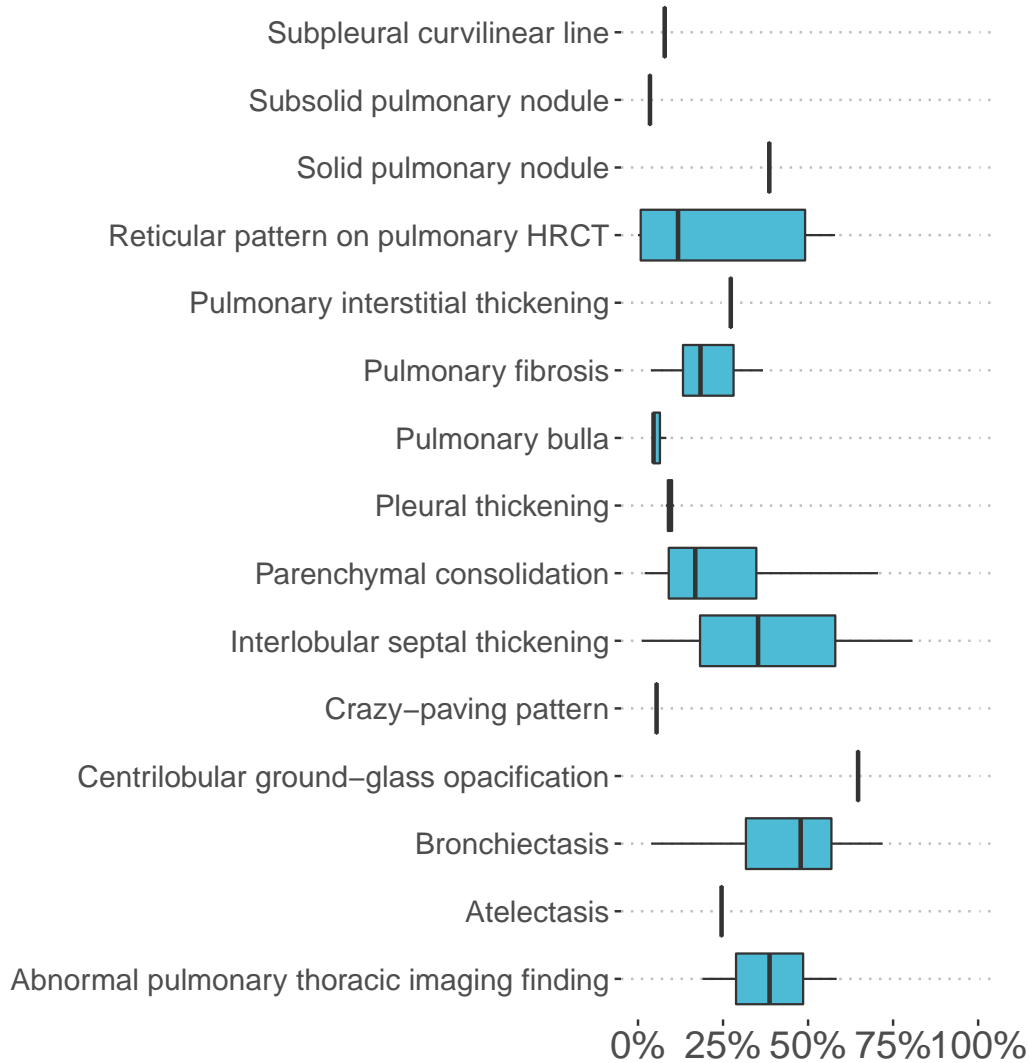


## Supplemental File 1

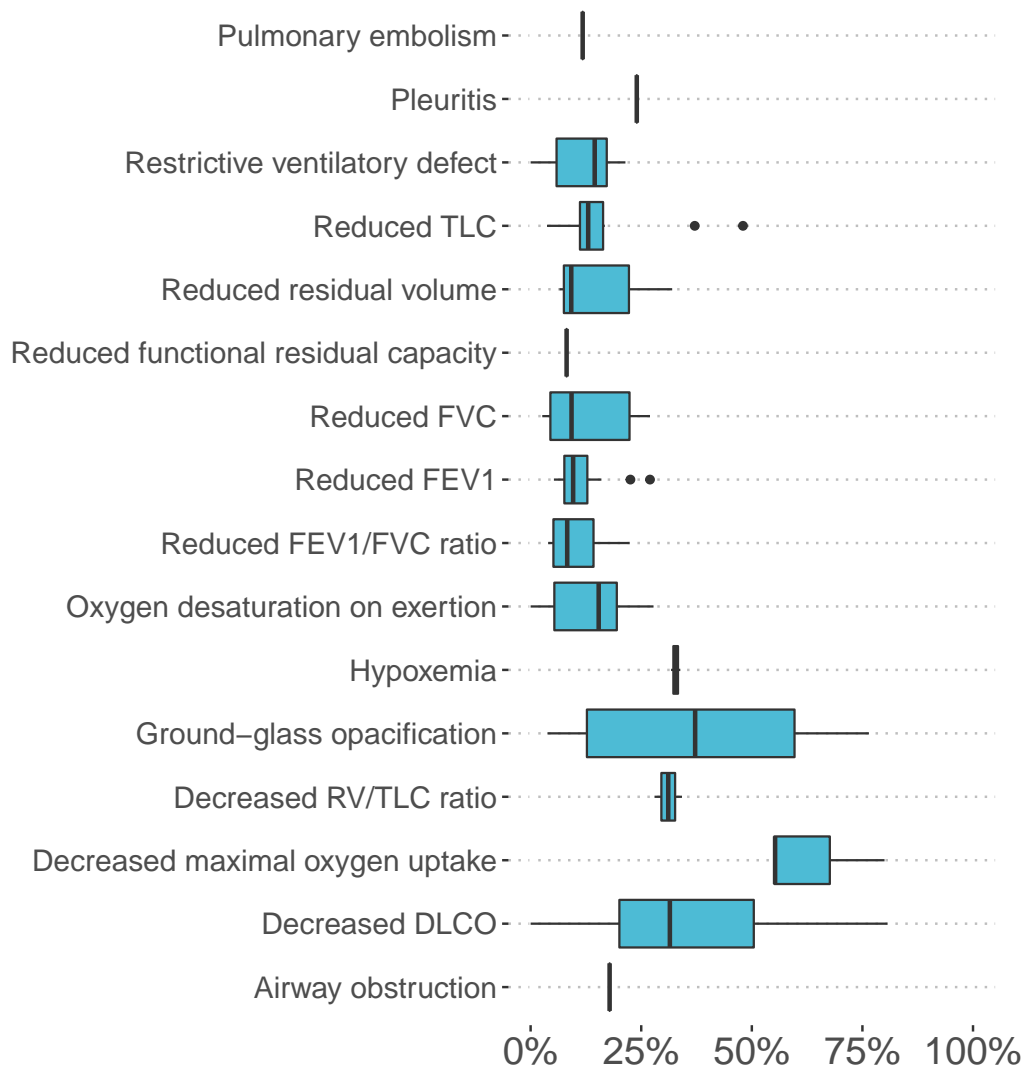
Contains Figure S1 (Number of HPO terms per cohort);  
Figures S2-S25 (Reported frequencies of 287 HPO terms arranged according to categories).  
Table S1. Summary of papers reviewed for inclusion in this work.  
Table S2 (postacute COVID-19 studies curated in this work, including cohort characteristics and PubMed identifiers).  
Table S3 (HPO terms used to annotated PICU cohorts).



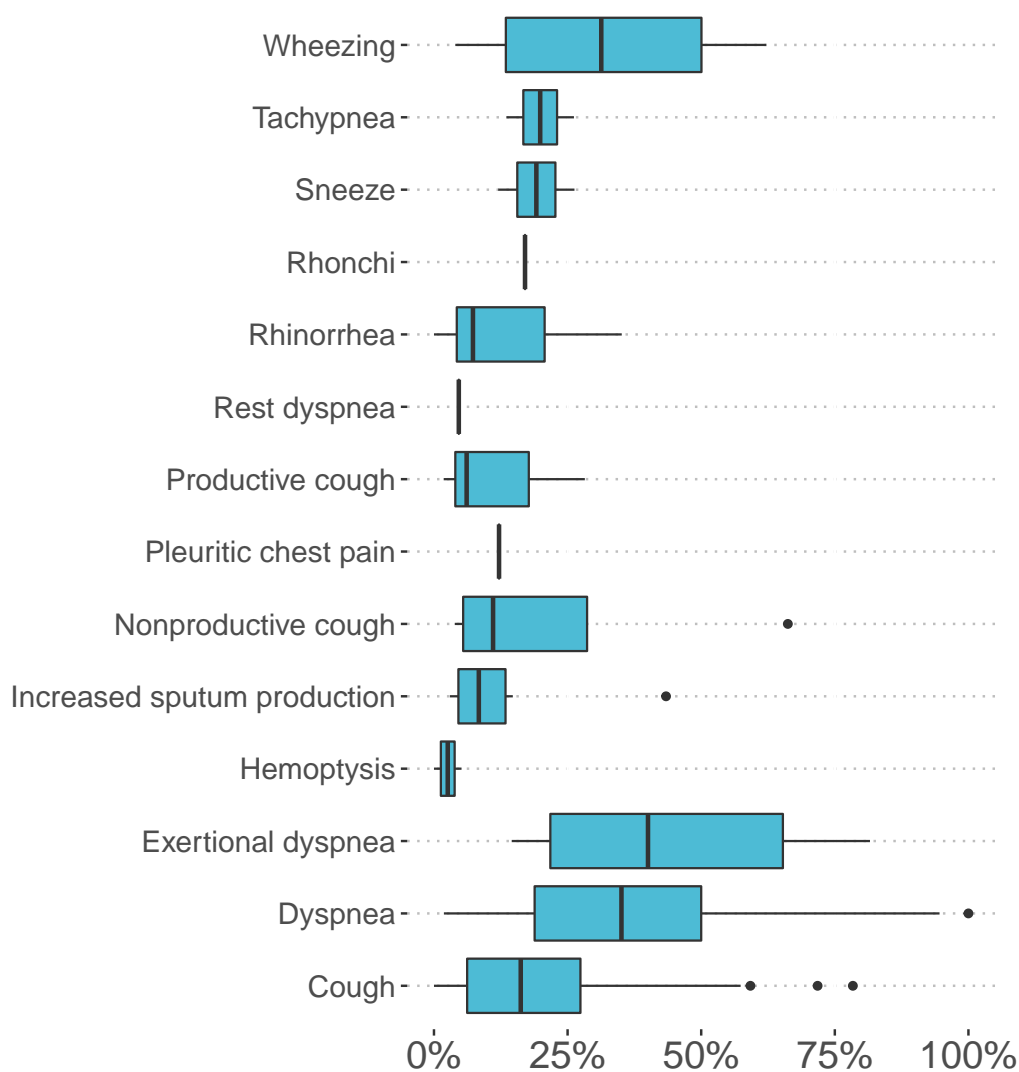
**Figure S1:** 81 cohorts were analyzed for this analysis, being annotated to a total of 287 HPO terms. 132 terms were used for only one cohort, 51 were used for two cohorts, and so on up to one term that was used for 56 cohorts (the maximum). 62 terms (21.6%) were used to annotate at least 5 cohorts.



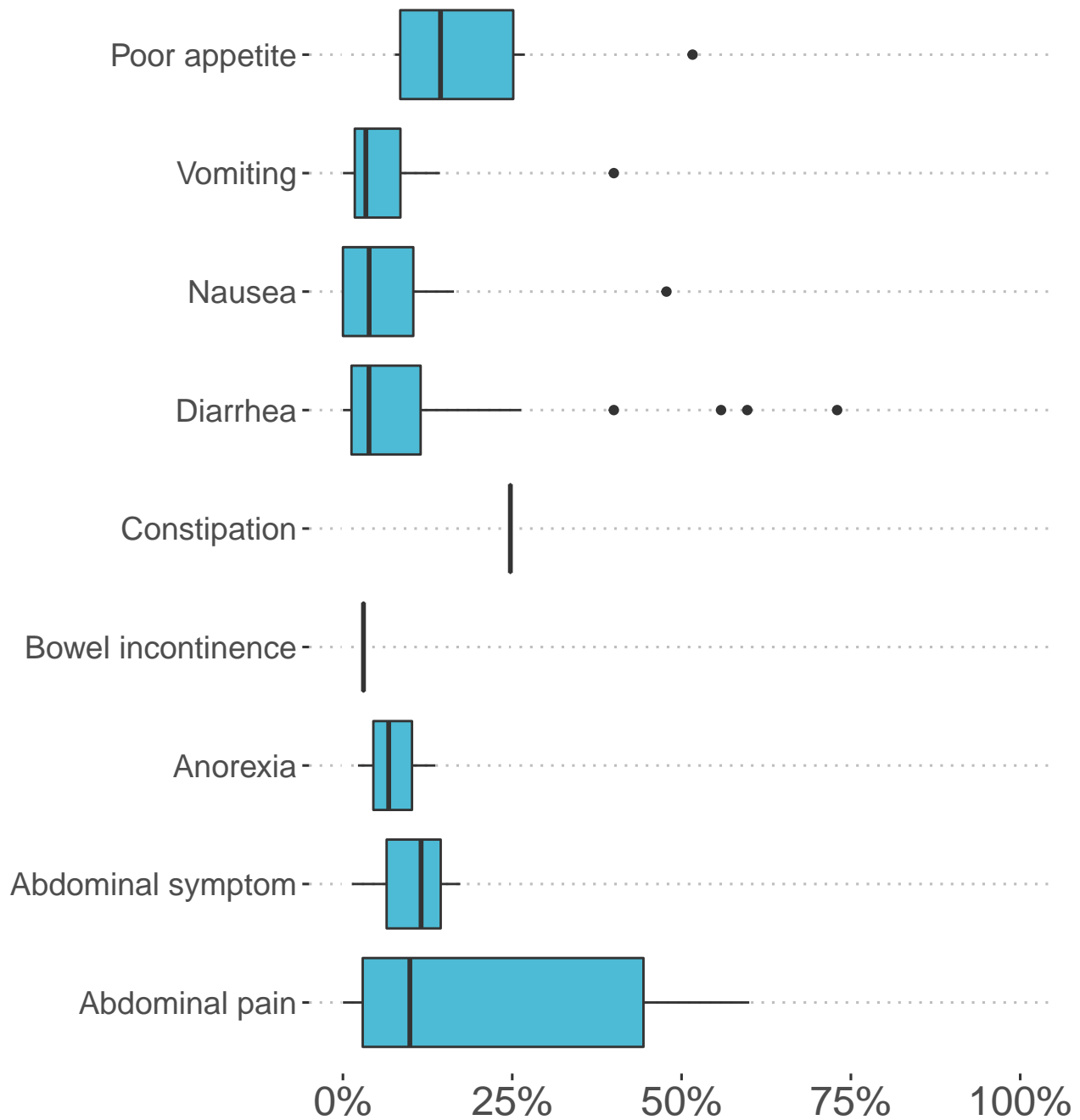
**Figure S2: Reported frequencies of pulmonary imaging findings in persons with long COVID.** Abnormal pulmonary thoracic imaging finding (HP:0031983, 2 studies, median percentage: 38.7%), Atelectasis (HP:0100750, 1 study, median percentage: 24.6%), Bronchiectasis (HP:0002110, 5 studies, median percentage: 47.8%), Centrilobular ground-glass opacification on pulmonary HRCT (HP:0025180, 1 study, median percentage: 64.7%), Crazy-paving pattern (HP:0033659, 1 study, median percentage: 5.5%), Interlobular septal thickening (HP:0030879, 3 studies, median percentage: 35.3%), Parenchymal consolidation (HP:0032177, 8 studies, median percentage: 16.8%), Pleural thickening (HP:0031944, 3 studies, median percentage: 9.4%), Pulmonary bulla (HP:0032446, 3 studies, median percentage: 4.6%), Pulmonary fibrosis (HP:0002206, 6 studies, median percentage: 18.4%), Pulmonary interstitial thickening (HP:0033711, 1 study, median percentage: 27.3%), Reticular pattern on pulmonary HRCT (HP:0025390, 5 studies, median percentage: 11.8%), Solid pulmonary nodule (HP:0033609, 1 study, median percentage: 38.6%), Subsolid pulmonary nodule (HP:0033610, 1 study, median percentage: 3.5%), Subpleural curvilinear line (HP:0033702, 1 study, median percentage: 7.8%)



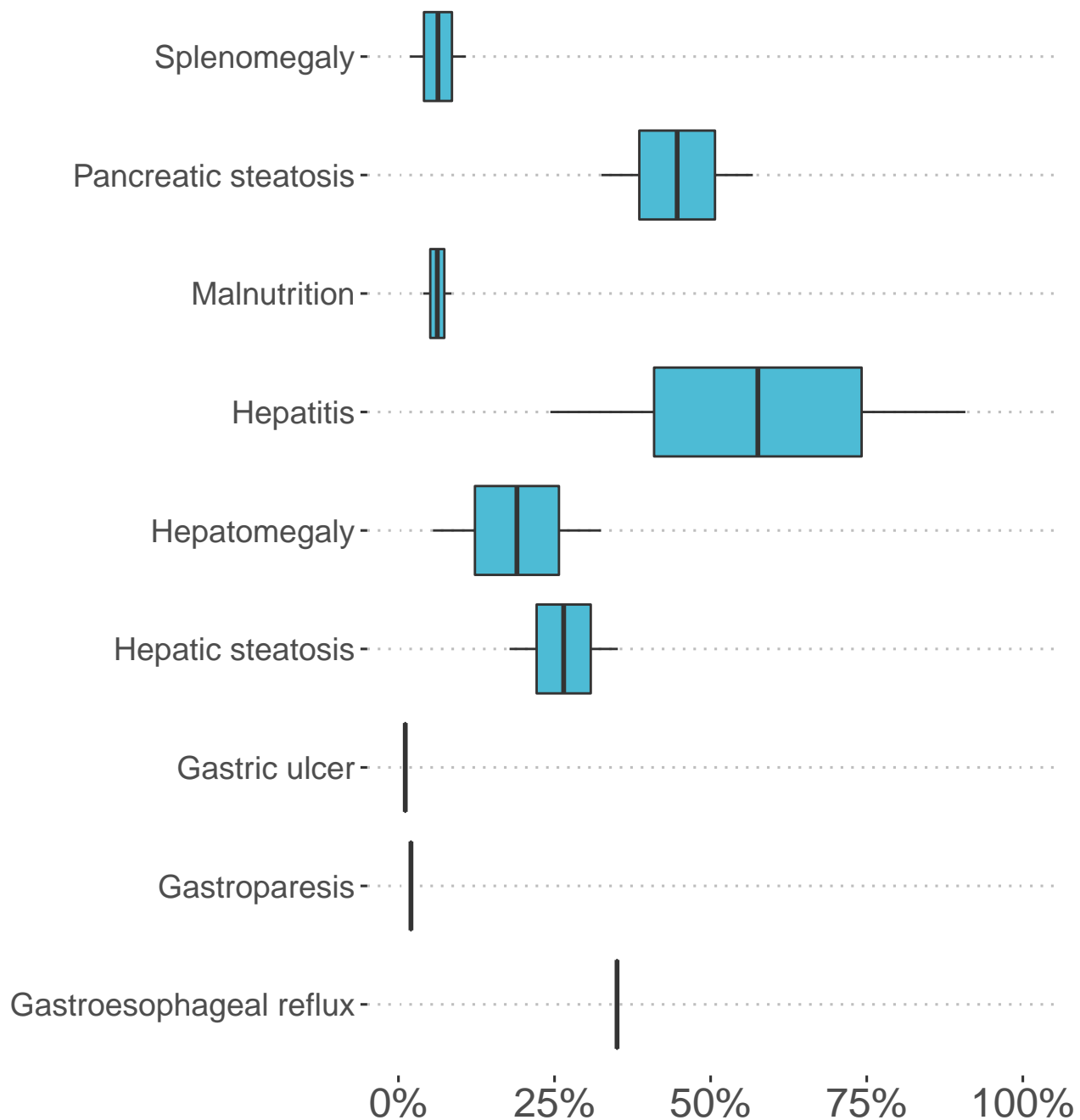
**Figure S3: Reported frequencies of pulmonary findings in persons with long COVID.** Airway obstruction (HP:0006536, 1 study, median percentage: 17.9%), Decreased DLCO (HP:0045051, 18 studies, median percentage: 31.5%), Decreased maximal oxygen uptake (HP:0033760, 3 studies, median percentage: 55.3%), Decreased RV/TLC ratio (HP:0033773, 2 studies, median percentage: 31.1%), Ground-glass opacification (HP:0025179, 13 studies, median percentage: 37.2%), Hypoxemia (HP:0012418, 2 studies, median percentage: 32.8%), Oxygen desaturation on exertion (HP:0030874, 7 studies, median percentage: 15.4%), Reduced FEV1/FVC ratio (HP:0030877, 7 studies, median percentage: 8.3%), Reduced forced expiratory volume in one second (HP:0032342, 12 studies, median percentage: 9.6%), Reduced forced vital capacity (HP:0032341, 8 studies, median percentage: 9.3%), Reduced functional residual capacity (HP:0033750, 1 study, median percentage: 8.1%), Reduced residual volume (HP:0033753, 6 studies, median percentage: 9.2%), Reduced total lung capacity (HP:0033169, 10 studies, median percentage: 13.0%), Restrictive ventilatory defect (HP:0002091, 6 studies, median percentage: 14.5%), Pleuritis (HP:0002102, 1 study, median percentage: 24.0%), Pulmonary embolism (HP:0002204, 1 study, median percentage: 11.8%)



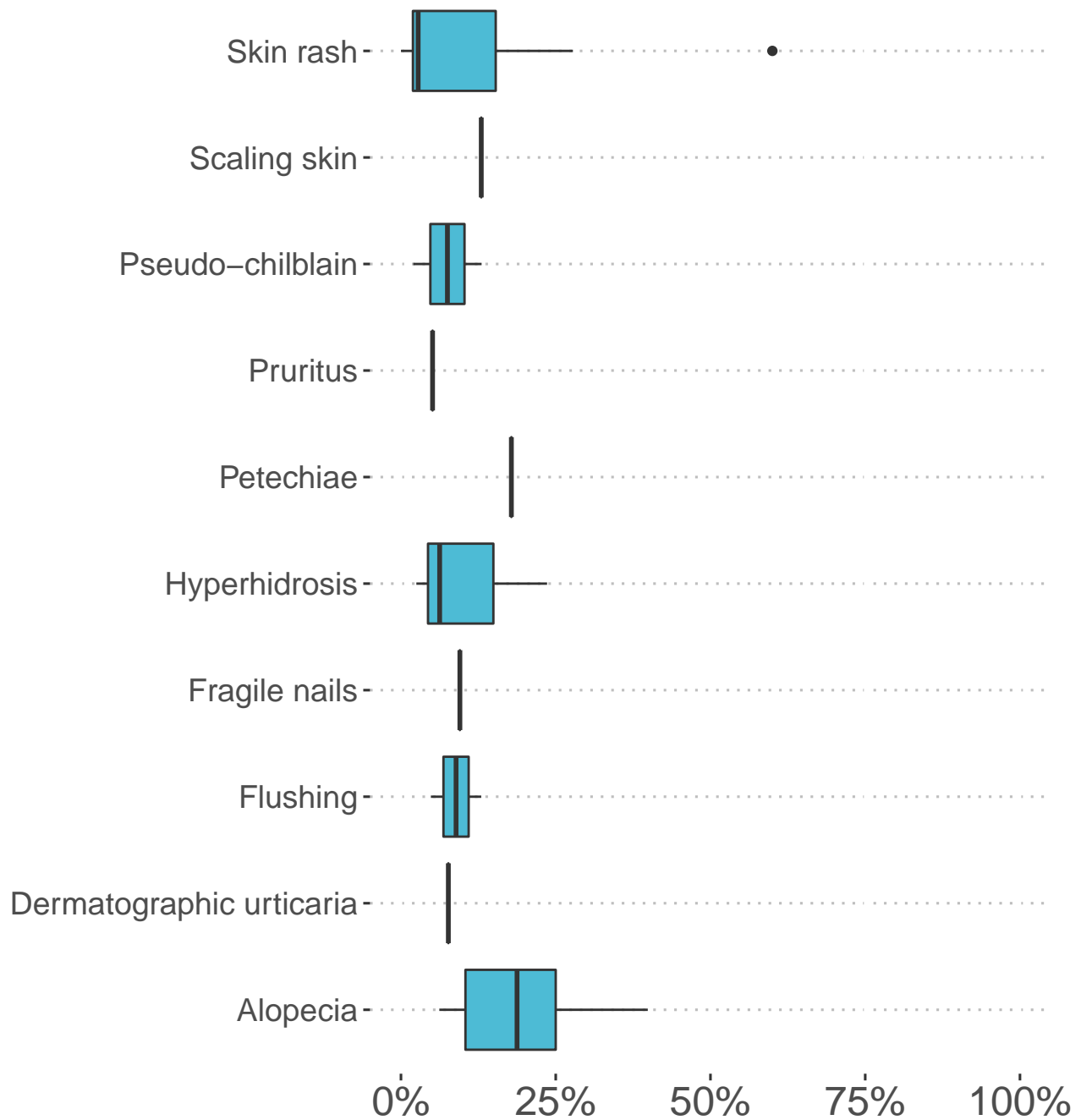
**Figure S4: Reported frequencies of respiratory symptoms in persons with long COVID.** Cough (HP:0012735, 40 studies, median percentage: 16.2%), Dyspnea (HP:0002094, 56 studies, median percentage: 35.1%), Exertional dyspnea (HP:0002875, 6 studies, median percentage: 40.0%), Hemoptysis (HP:0002105, 2 studies, median percentage: 2.6%), Increased sputum production (HP:0033709, 7 studies, median percentage: 8.4%), Nonproductive cough (HP:0031246, 4 studies, median percentage: 11.1%), Pleuritic chest pain (HP:0033771, 1 study, median percentage: 12.2%), Productive cough (HP:0031245, 5 studies, median percentage: 6.1%), Rest dyspnea (HP:0033710, 1 study, median percentage: 4.6%), Rhinorrhea (HP:0031417, 11 studies, median percentage: 7.3%), Rhonchi (HP:0030831, 1 study, median percentage: 17.0%), Sneeze (HP:0025095, 2 studies, median percentage: 19.2%), Tachypnea (HP:0002789, 2 studies, median percentage: 19.9%), Wheezing (HP:0030828, 4 studies, median percentage: 31.3%)



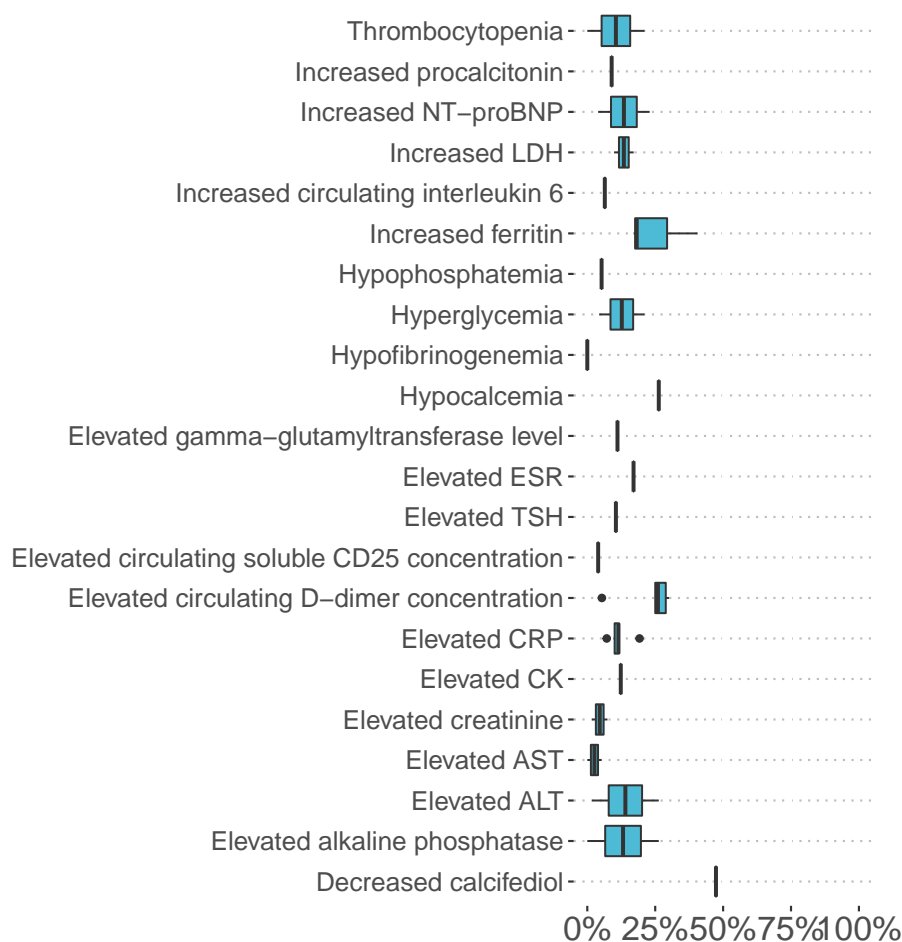
**Figure S5: Reported frequencies of gastrointestinal symptoms in persons with long COVID.** Abdominal pain (HP:0002027, 10 studies, median percentage: 9.9%), Abdominal symptom (HP:0011458, 3 studies, median percentage: 11.5%), Anorexia (HP:0002039, 3 studies, median percentage: 6.8%), Bowel incontinence (HP:0002607, 2 studies, median percentage: 3.0%), Constipation (HP:0002019, 1 study, median percentage: 24.7%), Diarrhea (HP:0002014, 29 studies, median percentage: 3.8%), Early satiety (HP:0033842, 1 study, median percentage: 30.8%), Nausea (HP:0002018, 16 studies, median percentage: 3.9%), Vomiting (HP:0002013, 12 studies, median percentage: 3.4%), Poor appetite (HP:0004396, 6 studies, median percentage: 14.4%)



**Figure S6: Reported frequencies of gastrointestinal findings in persons with long COVID.** Gastroesophageal reflux (HP:0002020, 1 study, median percentage: 35.0%), Gastroparesis (HP:0002578, 1 study, median percentage: 2.0%), Gastric ulcer (HP:0002592, 1 study, median percentage: 1.1%), Hepatic steatosis (HP:0001397, 2 studies, median percentage: 26.5%), Hepatomegaly (HP:0002240, 2 studies, median percentage: 19.0%), Hepatitis (HP:0012115, 2 studies, median percentage: 57.6%), Malnutrition (HP:0004395, 2 studies, median percentage: 6.2%), Pancreatic steatosis (HP:0033757, 2 studies, median percentage: 44.6%), Splenomegaly (HP:0001744, 2 studies, median percentage: 6.3%)

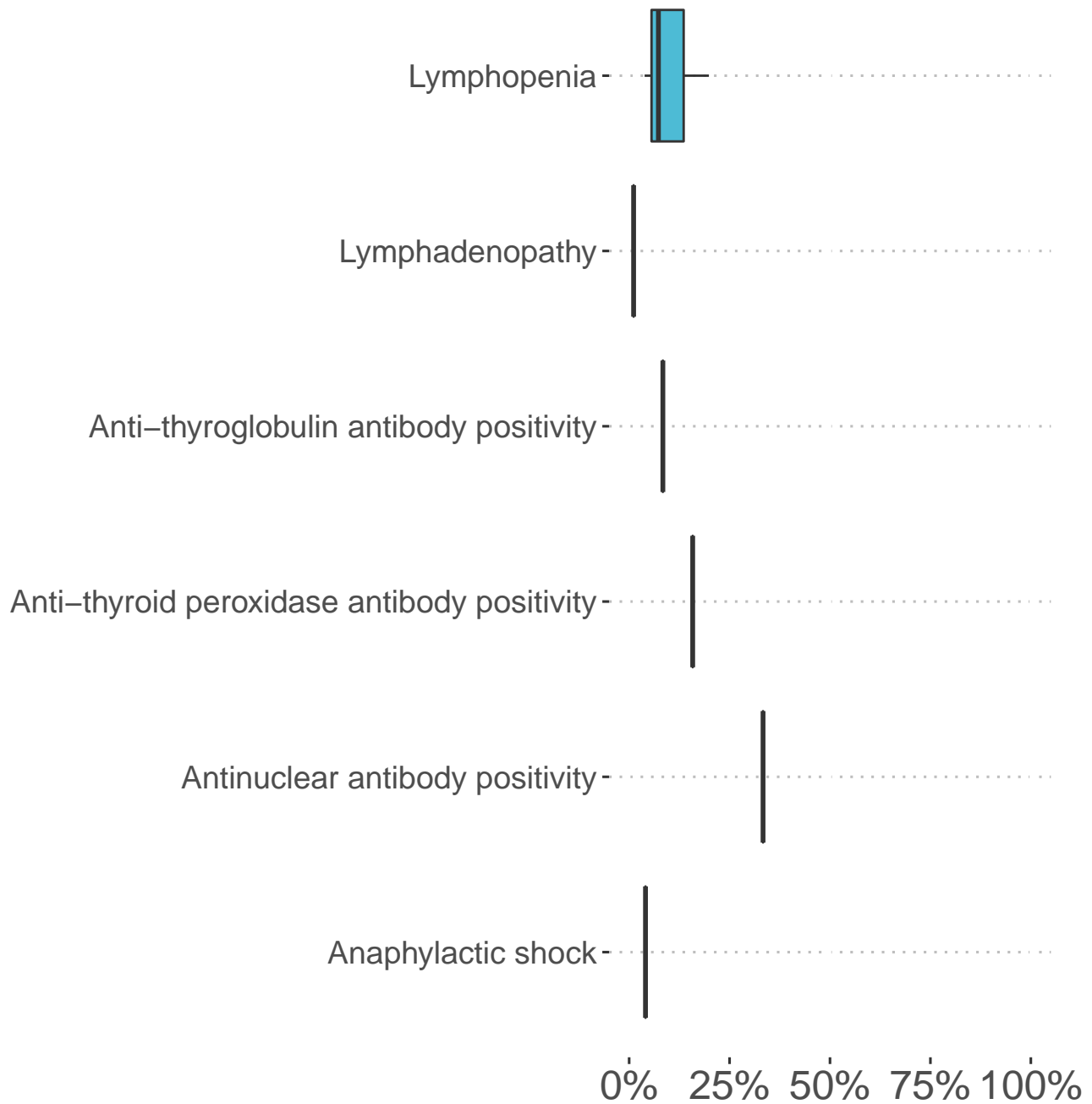


**Figure S7: Reported frequencies of dermatological findings in persons with long COVID.** Alopecia (HP:0001596, 9 studies, median percentage: 18.8%), Dermatographic urticaria (HP:0011971, 1 study, median percentage: 7.7%), Flushing (HP:0031284, 2 studies, median percentage: 8.9%), Fragile nails (HP:0001808, 1 study, median percentage: 9.5%), Hyperhidrosis (HP:0000975, 3 studies, median percentage: 6.3%), Petechiae (HP:0000967, 1 study, median percentage: 17.8%), Pruritus (HP:0000989, 1 study, median percentage: 5.1%), Pseudo-chilblain (HP:0033696, 2 studies, median percentage: 7.5%), Scaling skin (HP:0040189, 1 study, median percentage: 13.0%), Skin rash (HP:0000988, 7 studies, median percentage: 2.8%)

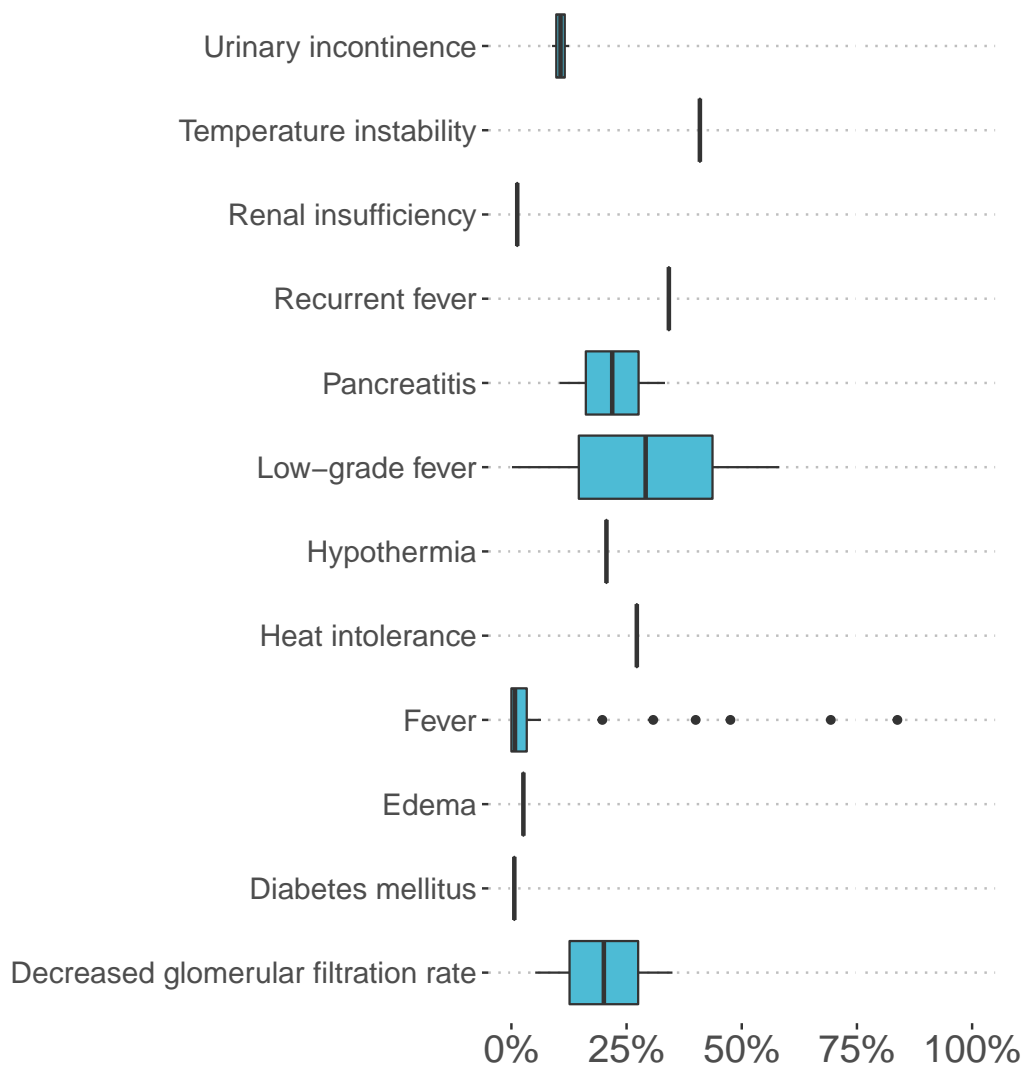


**Figure S8: Reported frequencies of laboratory abnormalities in persons with long COVID.** Decreased circulating calcifediol concentration (HP:0012053, 1 study, median percentage: 47.4%), Elevated circulating alkaline phosphatase concentration (HP:0003155, 2 studies, median percentage: 13.2%), Elevated circulating alanine aminotransferase concentration (HP:0031964, 2 studies, median percentage: 14.0%), Elevated circulating aspartate aminotransferase concentration (HP:0031956, 2 studies, median percentage: 2.6%), Elevated circulating creatinine concentration (HP:0003259, 2 studies, median percentage: 4.6%), Elevated circulating creatine kinase concentration (HP:0003236, 1 study, median percentage: 12.3%), Elevated circulating C-reactive protein concentration (HP:0011227, 6 studies, median percentage: 11.5%), Elevated circulating D-dimer concentration (HP:0033106, 6 studies, median percentage: 26.0%), Elevated circulating soluble CD25 concentration (HP:0033833, 1 study, median percentage: 4.0%), Elevated circulating thyroid-stimulating hormone concentration (HP:0002925, 1 study, median percentage: 10.5%), Elevated erythrocyte sedimentation rate (HP:0003565, 1 study, median percentage: 17.0%), Elevated gamma-glutamyltransferase level (HP:0030948, 1 study, median percentage: 11.1%), Hypocalcemia (HP:0002901, 1 study, median percentage: 26.3%), Hypofibrinogenemia (HP:0011900, 1 study, median percentage: 0.0%), Hyperglycemia (HP:0003074, 2 studies, median percentage: 12.7%), Hypoglycemia (HP:0001943, 1 study, median percentage: 1.7%), Hypophosphatemia (HP:0002148, 1 study, median percentage: 5.3%), Increased circulating ferritin concentration (HP:0003281, 3 studies, median percentage: 18.2%), Increased circulating interleukin 6 (HP:0030783, 2 studies, median percentage: 6.4%), Increased circulating lactate dehydrogenase concentration (HP:0025435, 2 studies, median percentage: 13.5%), Increased circulating NT-proBNP concentration (HP:0031185, 2 studies, median percentage: 13.5%), Increased circulating procalcitonin concentration (HP:0032308, 1 study, median percentage: 9.0%), Thrombocytopenia (HP:0001873, 2 studies, median percentage: 10.5%)

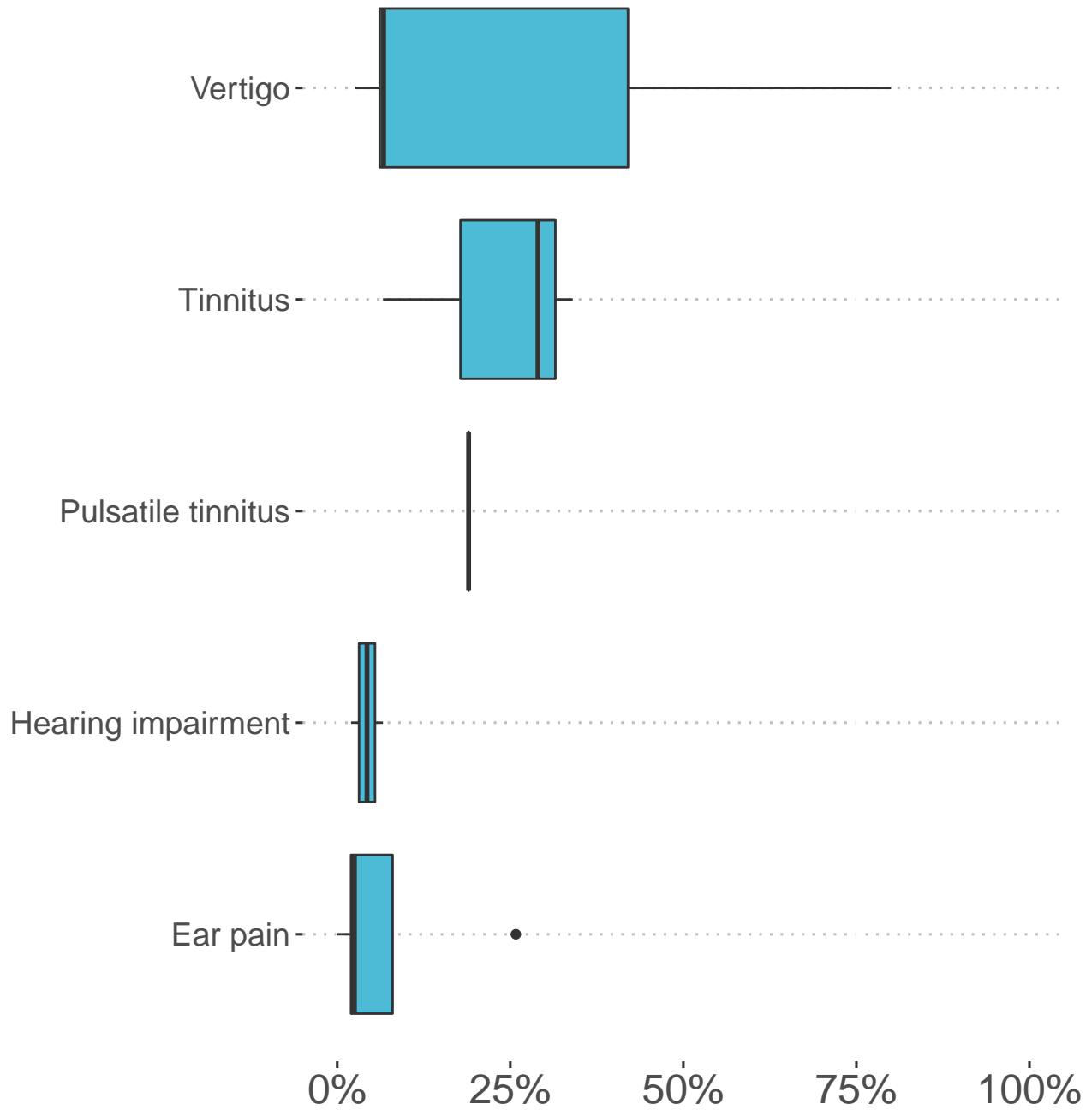




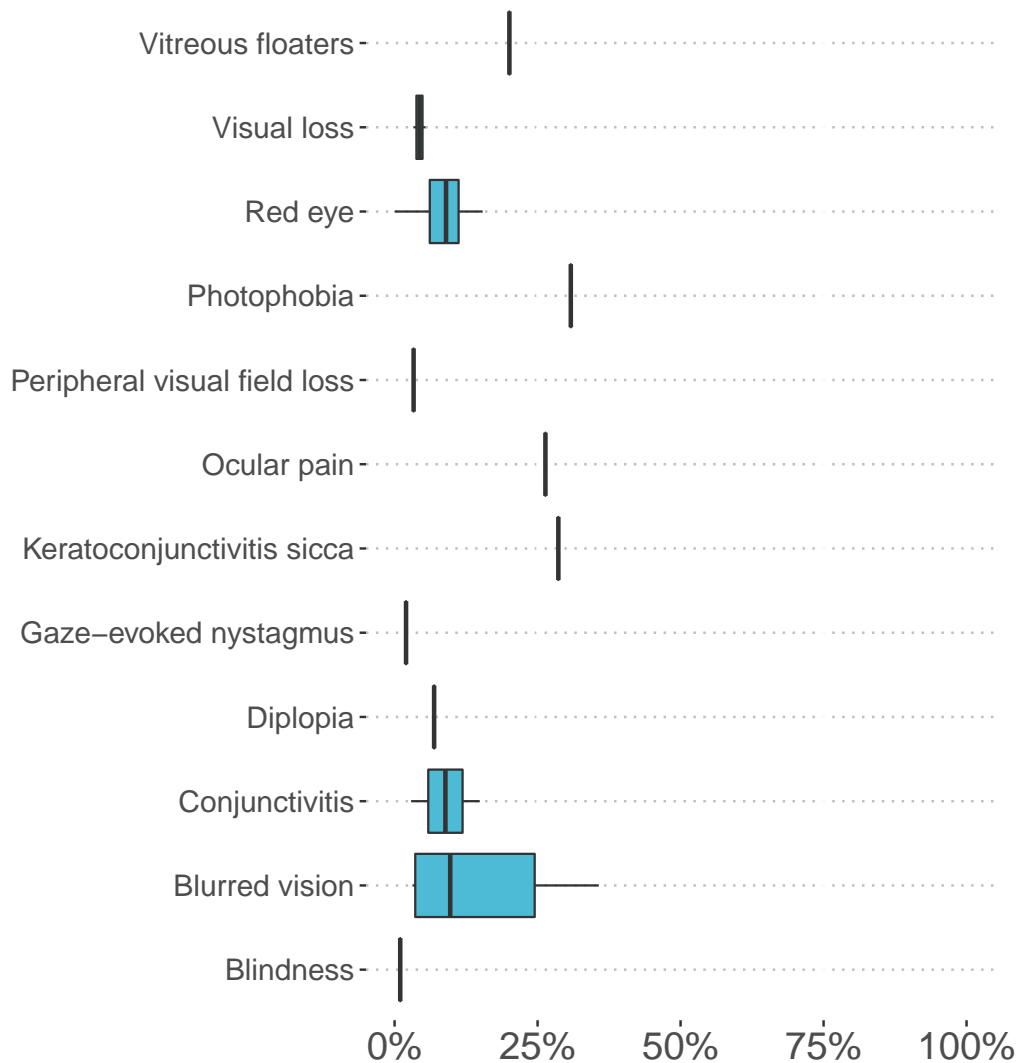
**Figure S9: Reported frequencies of immunology/autoimmunity findings in persons with long COVID.** Anaphylactic shock (HP:0100845, 1 study, median percentage: 4.1%), Antinuclear antibody positivity (HP:0003493, 1 study, median percentage: 33.3%), Anti-thyroid peroxidase antibody positivity (HP:0025379, 1 study, median percentage: 15.8%), Anti-thyroglobulin antibody positivity (HP:0032069, 1 study, median percentage: 8.4%), Lymphadenopathy (HP:0002716, 1 study, median percentage: 1.1%), Lymphopenia (HP:0001888, 3 studies, median percentage: 7.3%)



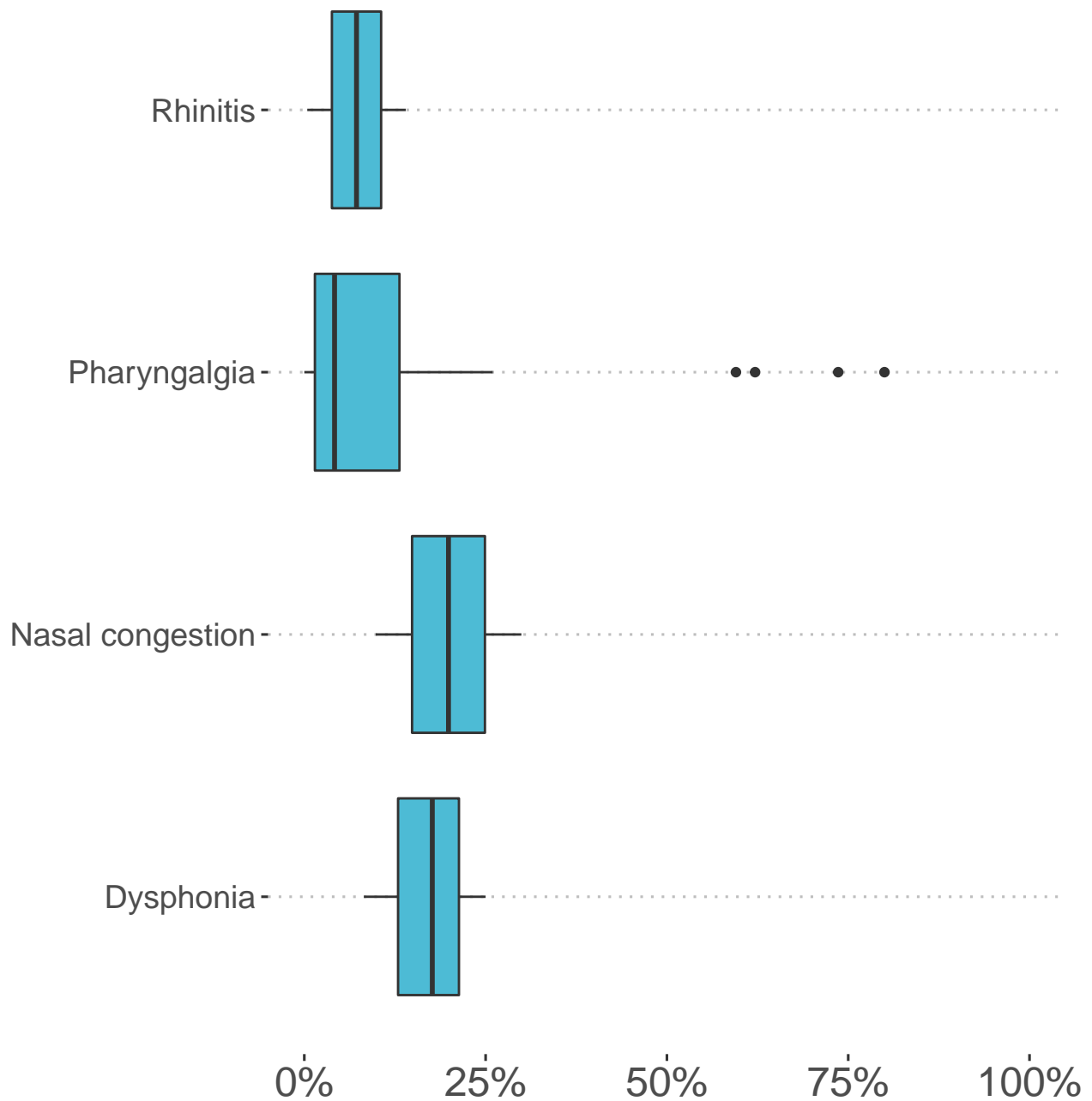
**Figure S10: Reported frequencies of reproductive, genitourinary, endocrine, or metabolism findings in persons with long COVID.** Decreased glomerular filtration rate (HP:0012213, 2 studies, median percentage: 20.1%), Diabetes mellitus (HP:0000819, 1 study, median percentage: 0.6%), Edema (HP:0000969, 1 study, median percentage: 2.6%), Female sexual dysfunction (HP:0030014, 1 study, median percentage: 8.0%), Fever (HP:0001945, 29 studies, median percentage: 0.8%), Heat intolerance (HP:0002046, 1 study, median percentage: 27.2%), Hypothermia (HP:0002045, 1 study, median percentage: 20.6%), Irregular menstruation (HP:0000858, 1 study, median percentage: 26.5%), Low-grade fever (HP:0011134, 2 studies, median percentage: 29.1%), Male sexual dysfunction (HP:0040307, 1 study, median percentage: 14.6%), Menorrhagia (HP:0000132, 1 study, median percentage: 20.1%), Pancreatitis (HP:0001733, 2 studies, median percentage: 21.9%), Postmenopausal bleeding (HP:0033840, 1 study, median percentage: 3.1%), Recurrent fever (HP:0001954, 1 study, median percentage: 34.2%), Renal insufficiency (HP:0000083, 1 study, median percentage: 1.3%), Temperature instability (HP:0005968, 1 study, median percentage: 40.9%), Testicular pain (HP:0033839, 1 study, median percentage: 10.3%), Urinary incontinence (HP:0000020, 3 studies, median percentage: 12.5%)



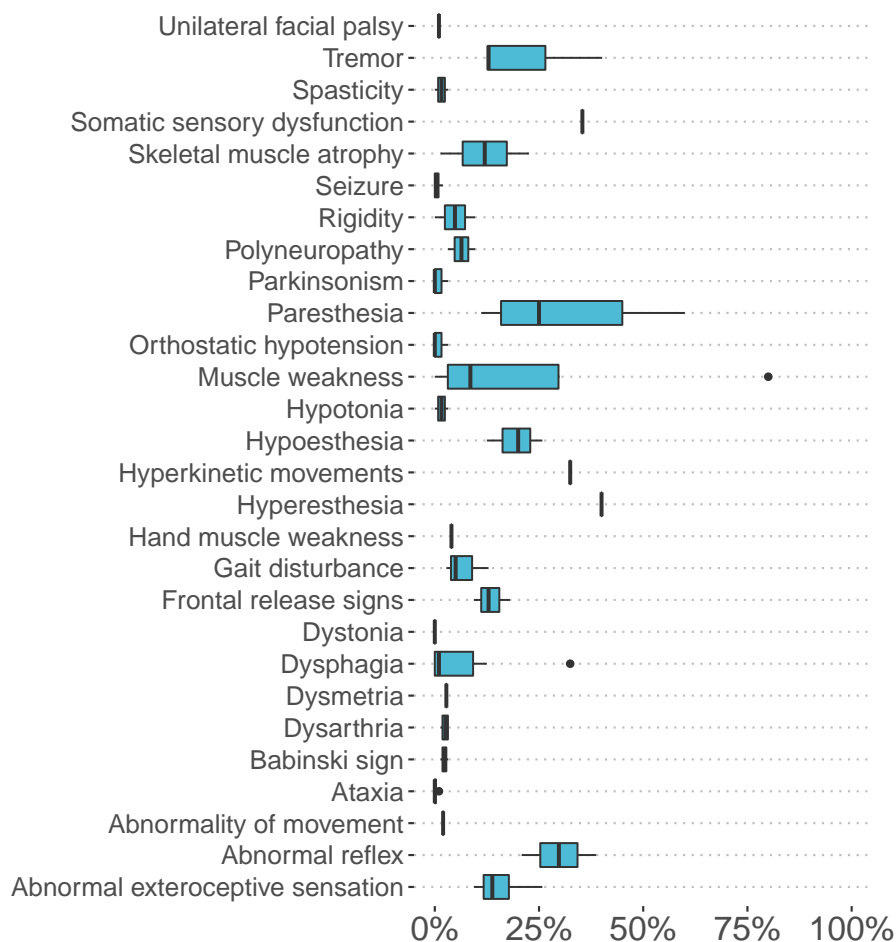
**Figure S11: Reported frequencies of ear disorders in persons with long COVID.** Ear pain (HP:0030766, 5 studies, median percentage: 2.5%), Hearing impairment (HP:0000365, 3 studies, median percentage: 6.6%), Hyperacusis (HP:0010780, 1 study, median percentage: 34.7%), Pulsatile tinnitus (HP:0008629, 1 study, median percentage: 19.0%), Tinnitus (HP:0000360, 3 studies, median percentage: 29.0%), Vertigo (HP:0002321, 10 studies, median percentage: 6.7%)



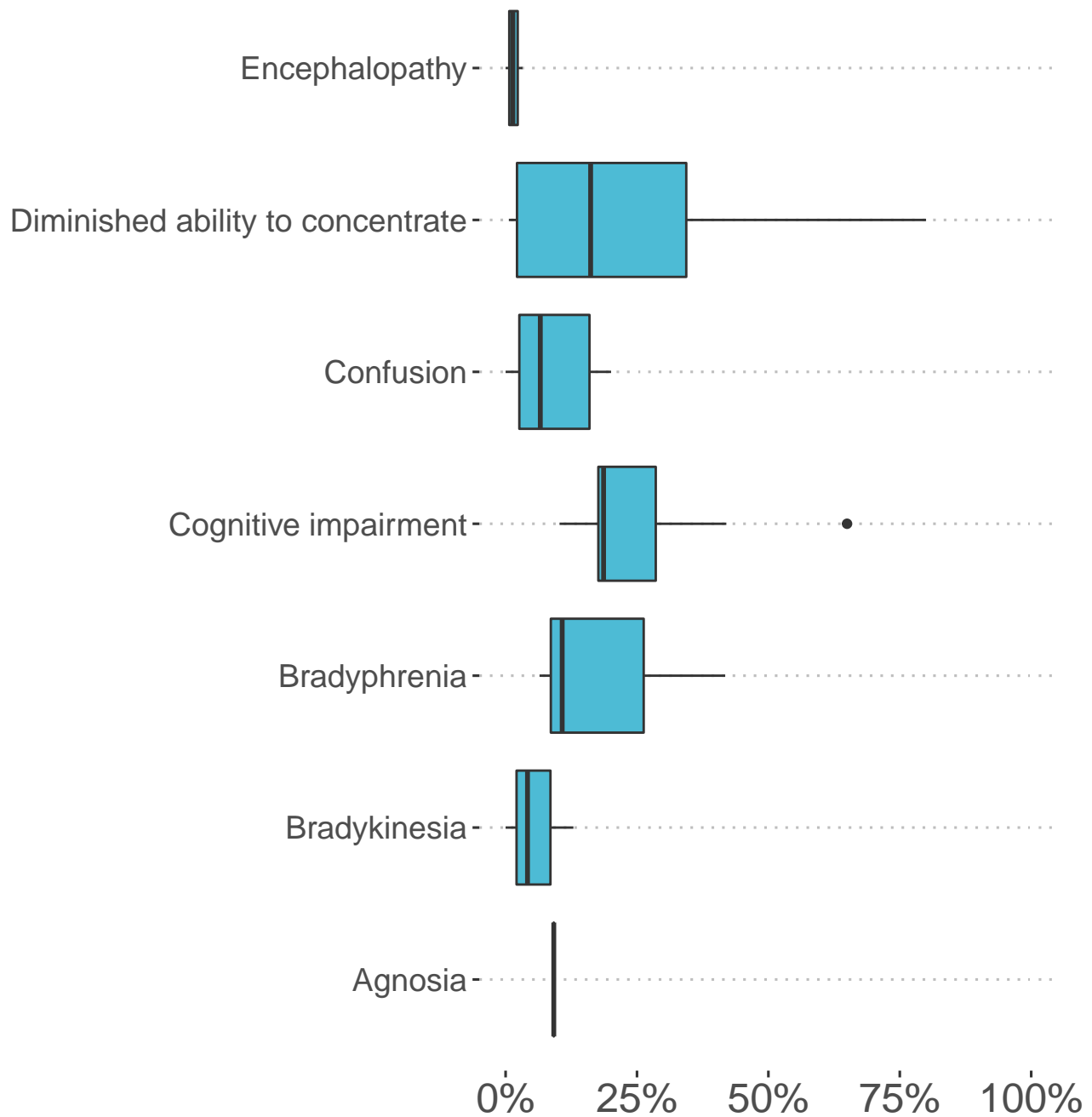
**Figure S12: Reported frequencies of ocular abnormalities in persons with long COVID.** Blindness (HP:0000618, 1 study, median percentage: 1.0%), Blurred vision (HP:0000622, 7 studies, median percentage: 9.7%), Conjunctivitis (HP:0000509, 2 studies, median percentage: 8.9%), Diplopia (HP:0000651, 1 study, median percentage: 6.9%), Gaze-evoked nystagmus (HP:0000640, 1 study, median percentage: 2.0%), Keratoconjunctivitis sicca (HP:0001097, 1 study, median percentage: 28.6%), Ocular pain (HP:0200026, 1 study, median percentage: 26.4%), Ocular pruritus (HP:0033841, 1 study, median percentage: 24.2%), Peripheral visual field loss (HP:0007994, 1 study, median percentage: 3.3%), Photophobia (HP:0000613, 1 study, median percentage: 30.8%), Red eye (HP:0025337, 4 studies, median percentage: 9.0%), Visual loss (HP:0000572, 2 studies, median percentage: 4.3%), Vitreous floaters (HP:0100832, 1 study, median percentage: 20.1%)



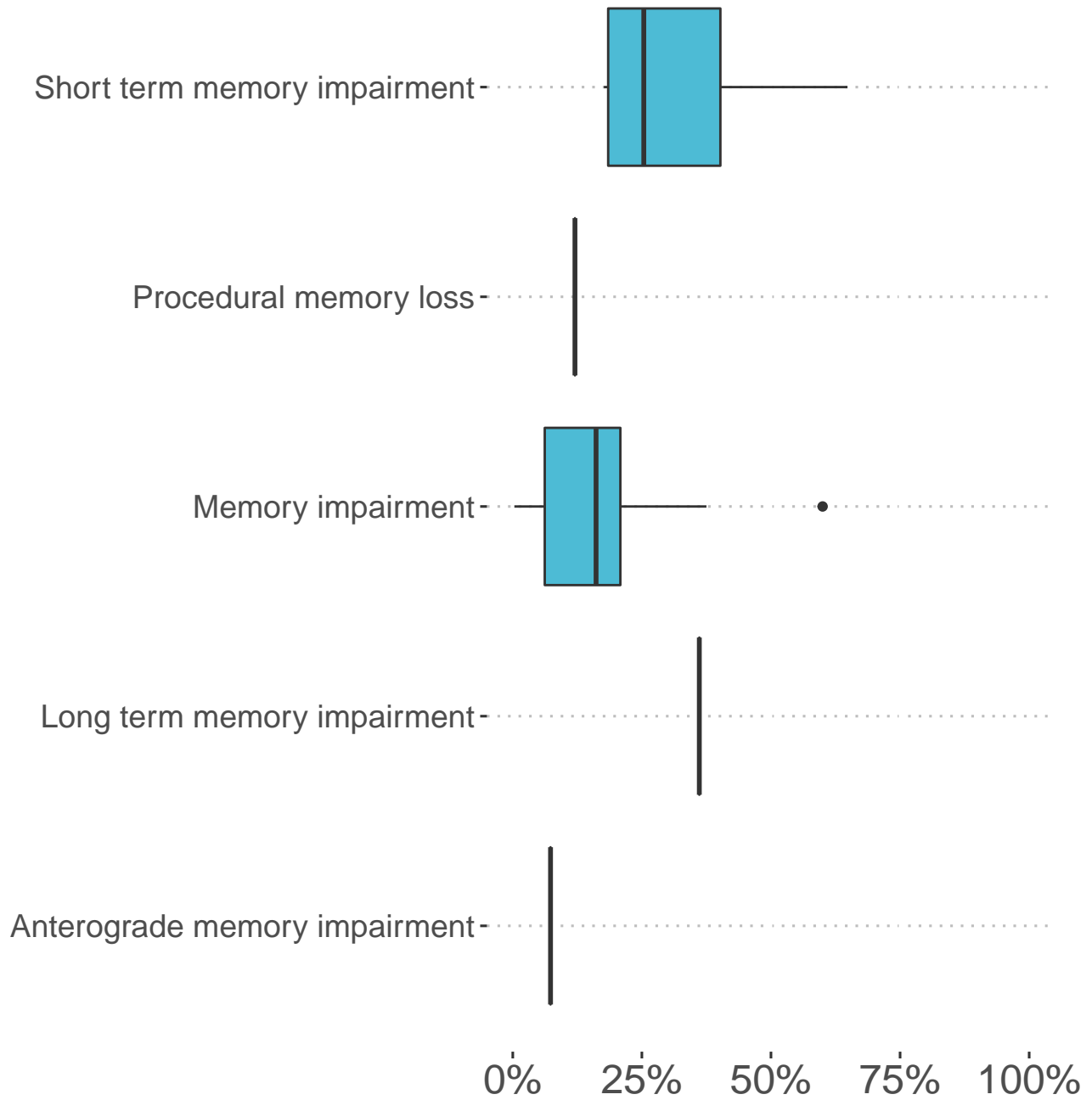
**Figure S13: Reported frequencies of nose and throat symptoms in persons with long COVID.** Dysphonia (HP:0001618, 4 studies, median percentage: 21.3%), Nasal congestion (HP:0001742, 2 studies, median percentage: 19.9%), Pharyngalgia (HP:0033050, 23 studies, median percentage: 4.2%), Rhinitis (HP:0012384, 2 studies, median percentage: 7.2%)



**Figure S14: Reported frequencies of neuropsychiatric findings in persons with long COVID.** Abnormal exteroceptive sensation (HP:0033747, 4 studies, median percentage: 13.8%), Abnormal reflex (HP:0031826, 2 studies, median percentage: 29.8%), Abnormality of movement (HP:0100022, 1 study, median percentage: 2.0%), Ataxia (HP:0001251, 4 studies, median percentage: 0.0%), Babinski sign (HP:0003487, 2 studies, median percentage: 2.3%), Dysarthria (HP:0001260, 4 studies, median percentage: 2.6%), Dysmetria (HP:0001310, 1 study, median percentage: 2.8%), Dysphagia (HP:0002015, 7 studies, median percentage: 1.0%), Dystonia (HP:0001332, 2 studies, median percentage: 0.0%), Facial paralysis (HP:0007209, 1 study, median percentage: 3.4%), Frontal release signs (HP:0000743, 3 studies, median percentage: 12.9%), Gait disturbance (HP:0001288, 3 studies, median percentage: 5.0%), Hand muscle weakness (HP:0030237, 1 study, median percentage: 4.0%), Hyperesthesia (HP:0100963, 1 study, median percentage: 40.0%), Hyperkinetic movements (HP:0002487, 1 study, median percentage: 32.5%), Hypoesthesia (HP:0033748, 4 studies, median percentage: 22.9%), Hypotonia (HP:0001252, 2 studies, median percentage: 1.6%), Muscle spasm (HP:0003394, 1 study, median percentage: 32.5%), Muscle weakness (HP:0001324, 4 studies, median percentage: 8.5%), Orthostatic hypotension (HP:0001278, 3 studies, median percentage: 0.0%), Paresthesia (HP:0003401, 6 studies, median percentage: 25.0%), Parkinsonism (HP:0001300, 3 studies, median percentage: 0.0%), Polyneuropathy (HP:0001271, 2 studies, median percentage: 6.4%), Rigidity (HP:0002063, 2 studies, median percentage: 4.8%), Seizure (HP:0001250, 6 studies, median percentage: 0.3%), Skeletal muscle atrophy (HP:0003202, 2 studies, median percentage: 12.0%), Somatic sensory dysfunction (HP:0003474, 1 study, median percentage: 35.4%), Spasticity (HP:0001257, 2 studies, median percentage: 1.6%), Tremor (HP:0001337, 3 studies, median percentage: 12.9%), Unilateral facial palsy (HP:0012799, 1 study, median percentage: 1.0%)

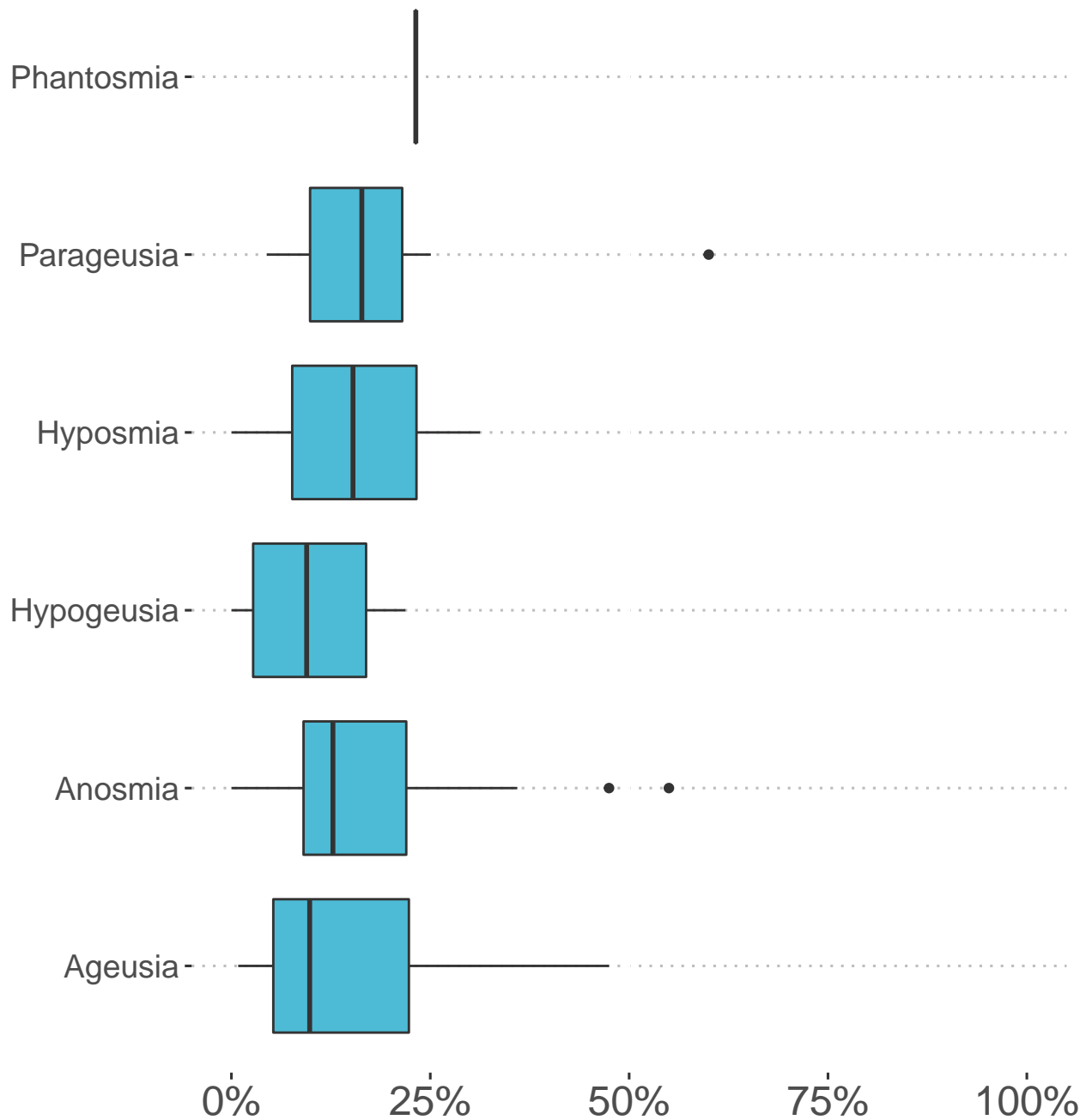


**Figure S15: Reported frequencies of cognitive dysfunction in persons with long COVID.** Agnosia (HP:0010524, 1 study, median percentage: 9.2%), Bradykinesia (HP:0002067, 3 studies, median percentage: 4.2%), Bradyphrenia (HP:0031843, 3 studies, median percentage: 10.8%), Cognitive impairment (HP:0100543, 13 studies, median percentage: 18.6%), Confusion (HP:0001289, 6 studies, median percentage: 6.6%), Diminished ability to concentrate (HP:0031987, 9 studies, median percentage: 16.2%), Encephalopathy (HP:0001298, 3 studies, median percentage: 1.4%), Tachyphrenia (HP:0033844, 1 study, median percentage: 15.2%)

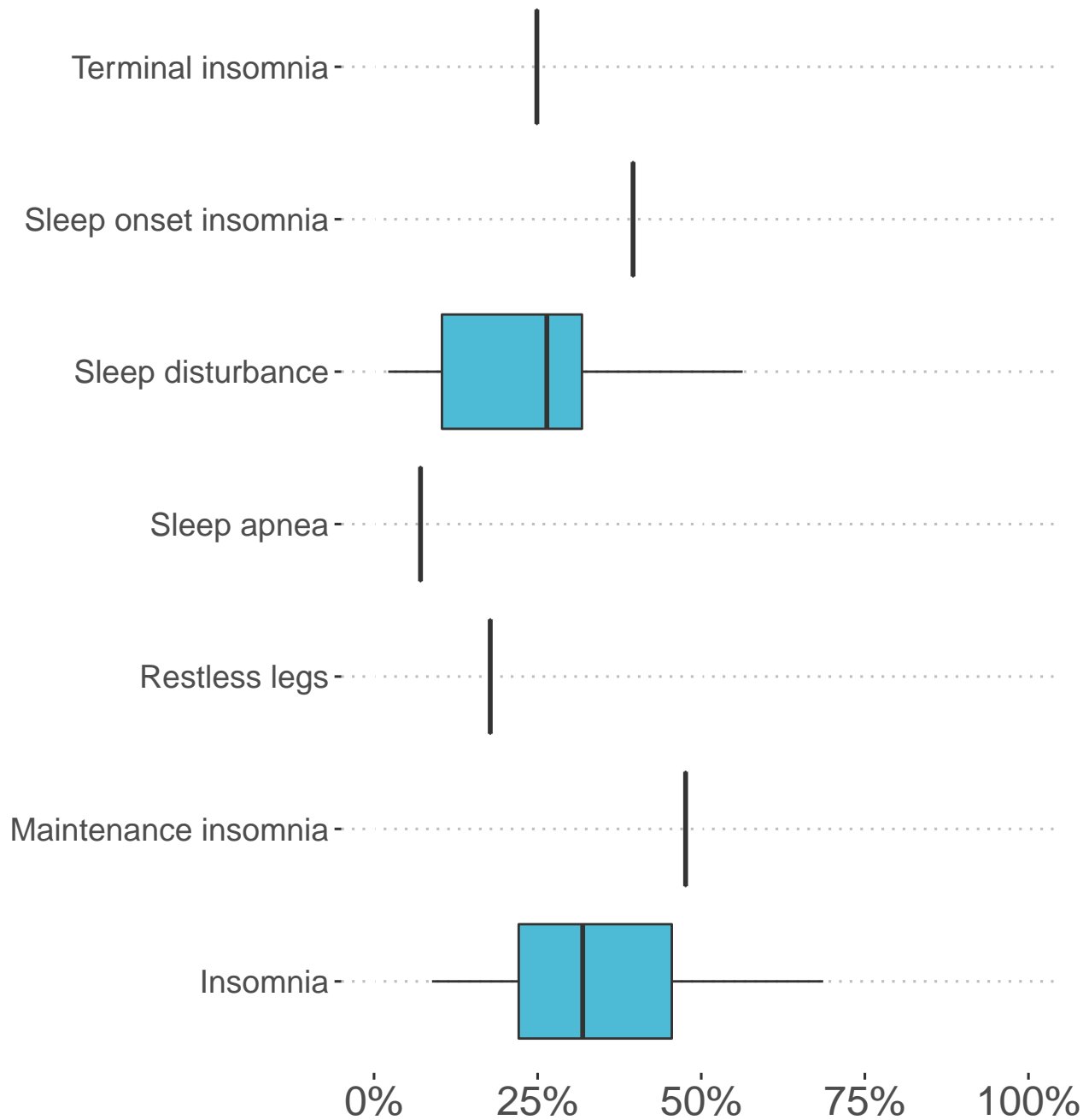


**Figure S16: Reported frequencies of memory impairment in persons with long COVID.** Anterograde memory impairment (HP:0033689, 1 study, median percentage: 7.3%), Long term memory impairment (HP:0033688, 1 study, median percentage: 36.1%), Memory impairment (HP:0002354, 13 studies, median percentage: 16.1%), Procedural memory loss (HP:0033691, 1 study, median percentage: 12.0%), Short term memory impairment (HP:0033687, 4 studies, median percentage: 25.4%)

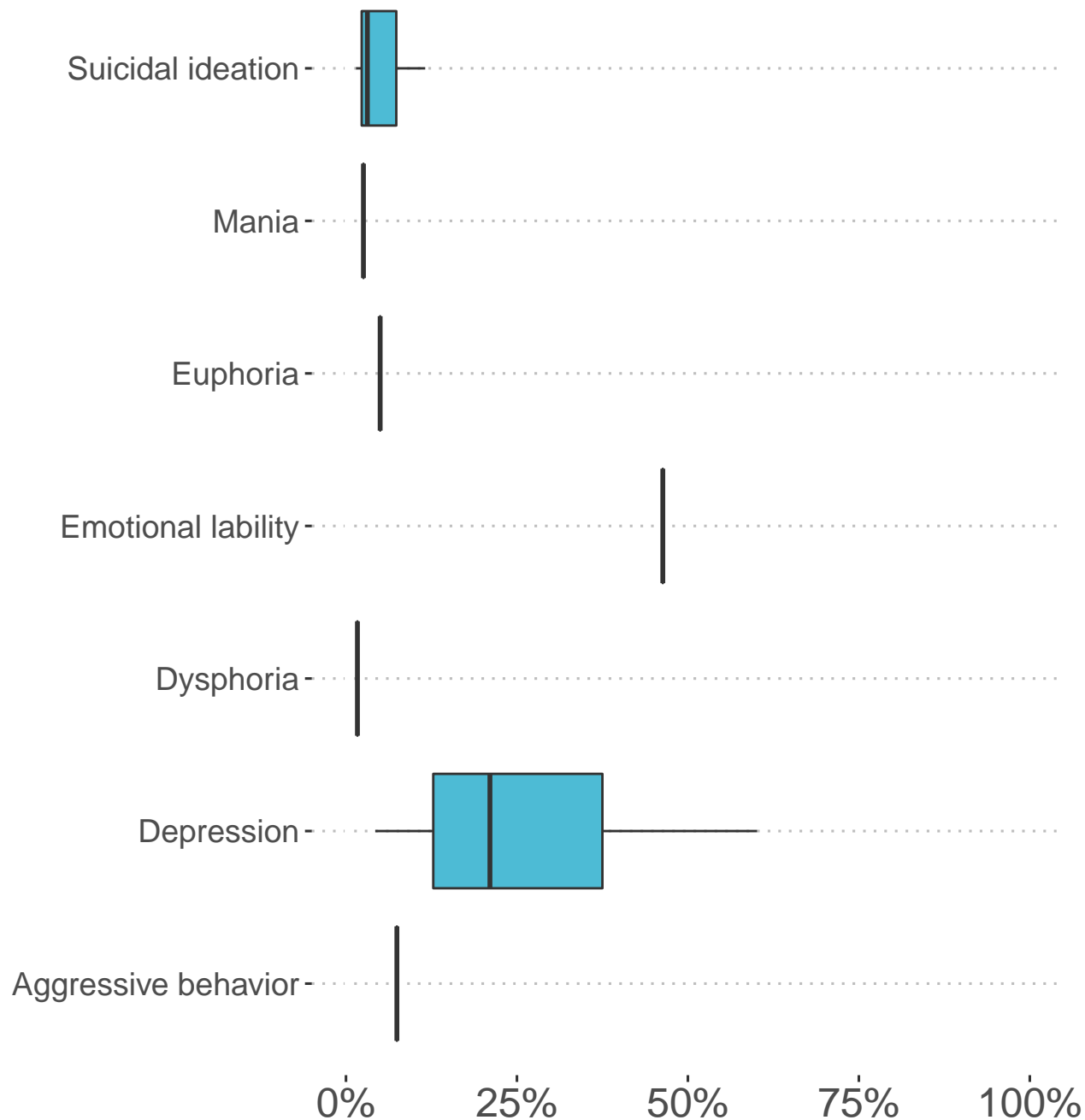




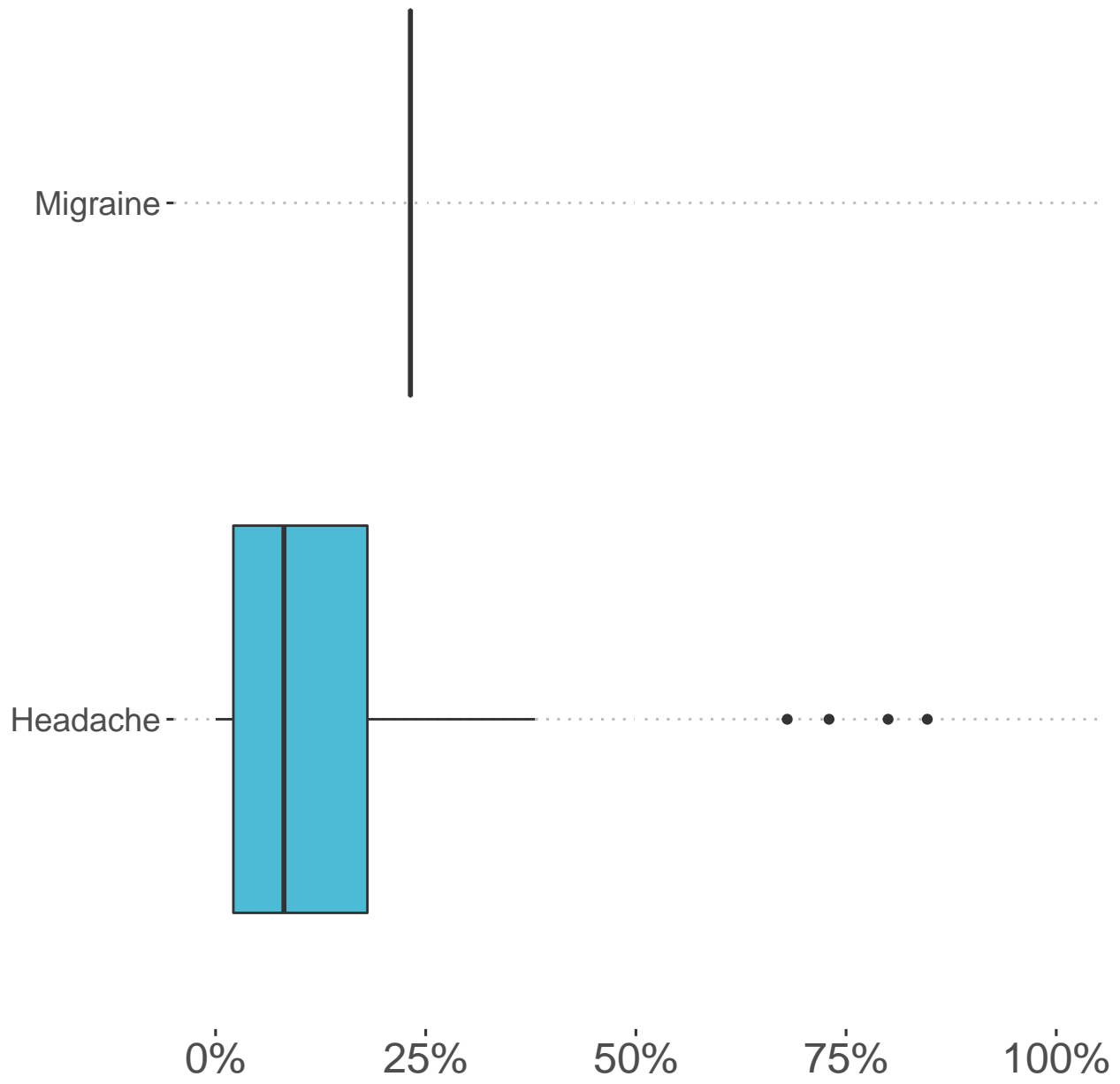
**Figure S17: Reported frequencies of abnormalities of smell and taste in persons with long COVID.** Ageusia (HP:0041051, 21 studies, median percentage: 9.8%), Anosmia (HP:0000458, 44 studies, median percentage: 12.8%), Hypogeusia (HP:0000224, 4 studies, median percentage: 9.5%), Hyposmia (HP:0004409, 3 studies, median percentage: 15.3%), Parageusia (HP:0031249, 11 studies, median percentage: 16.4%), Phantageusia (HP:0033847, 1 study, median percentage: 9.0%), Phantosmia (HP:0033693, 1 study, median percentage: 23.2%)



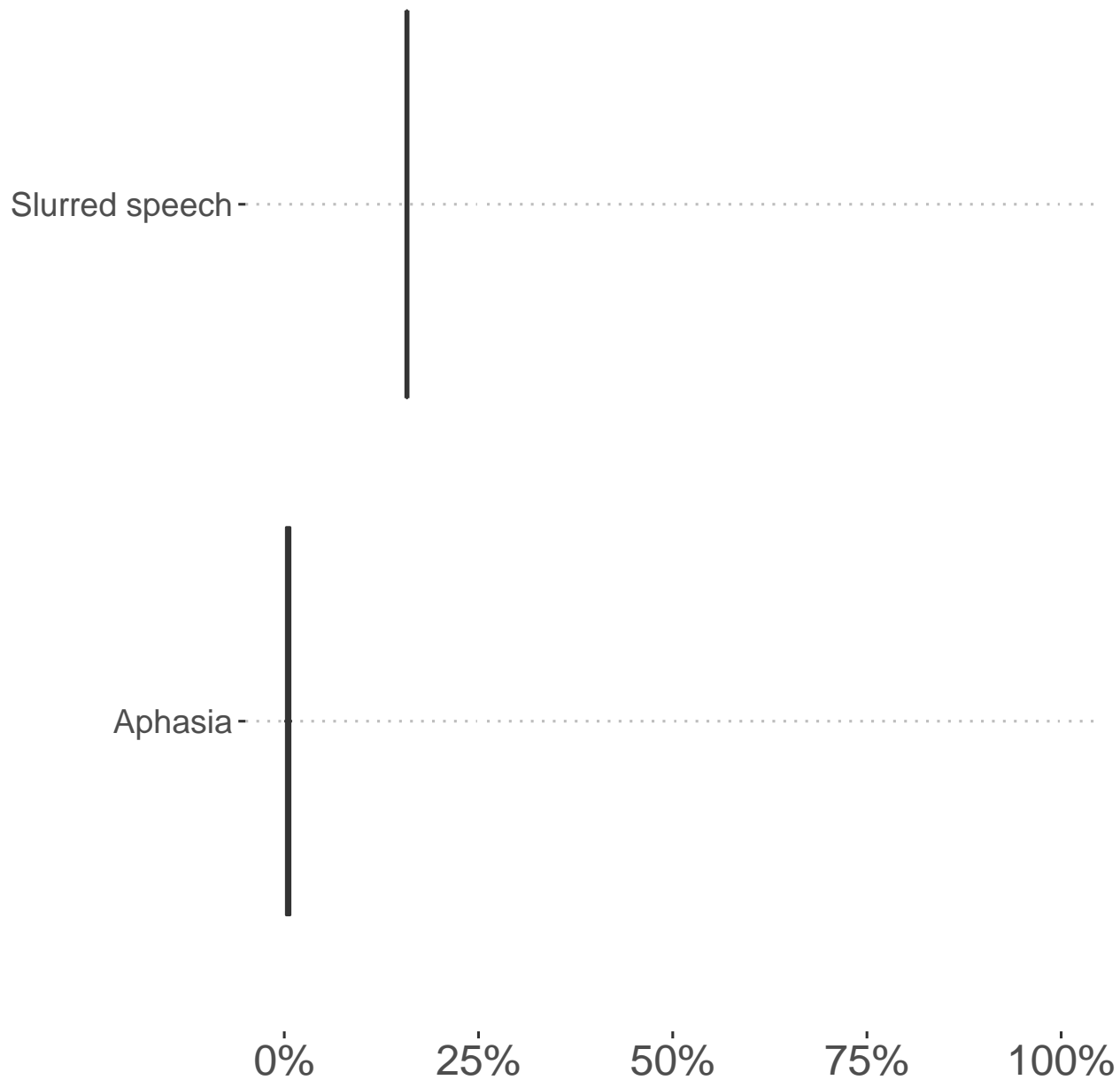
**Figure S18: Reported frequencies of sleep impairment in persons with long COVID.** Insomnia (HP:0100785, 12 studies, median percentage: 31.9%), Maintenance insomnia (HP:0031355, 1 study, median percentage: 47.6%), Restless legs (HP:0012452, 1 study, median percentage: 17.8%), Sleep apnea (HP:0010535, 1 study, median percentage: 7.1%), Sleep disturbance (HP:0002360, 11 studies, median percentage: 26.4%), Sleep onset insomnia (HP:0031354, 1 study, median percentage: 39.6%), Terminal insomnia (HP:0031356, 1 study, median percentage: 24.9%)



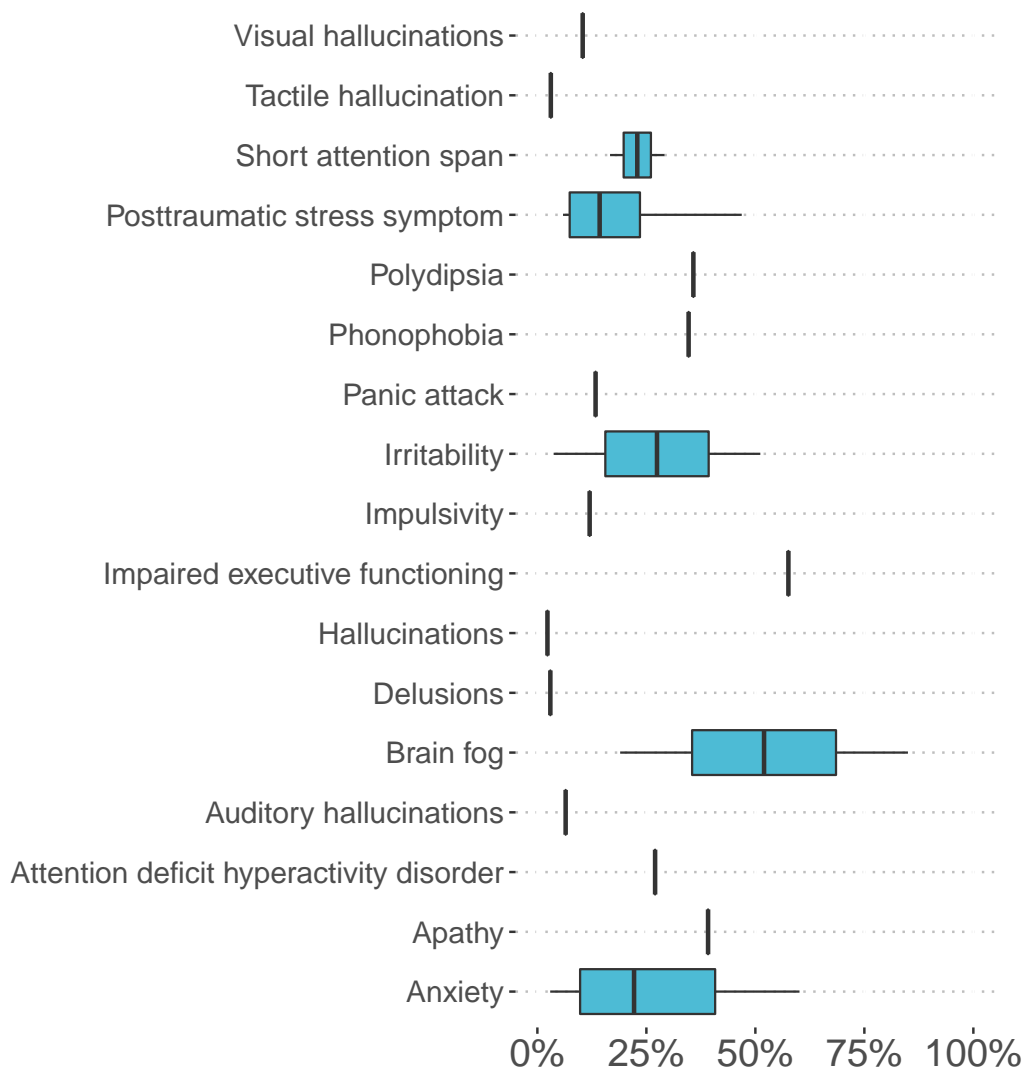
**Figure S19: Reported frequencies of emotion/mood abnormalities in persons with long COVID.** Aggressive behavior (HP:0000718, 1 study, median percentage: 7.4%), Depression (HP:0000716, 25 studies, median percentage: 21.1%), Dysphoria (HP:0033838, 1 study, median percentage: 1.7%), Emotional lability (HP:0000712, 1 study, median percentage: 46.3%), Euphoria (HP:0031844, 1 study, median percentage: 5.0%), Mania (HP:0100754, 1 study, median percentage: 2.6%), Sense of impending doom (HP:0033845, 1 study, median percentage: 33.7%), Suicidal ideation (HP:0031589, 3 studies, median percentage: 3.1%), Tearfulness (HP:0033705, 1 study, median percentage: 42.5%)



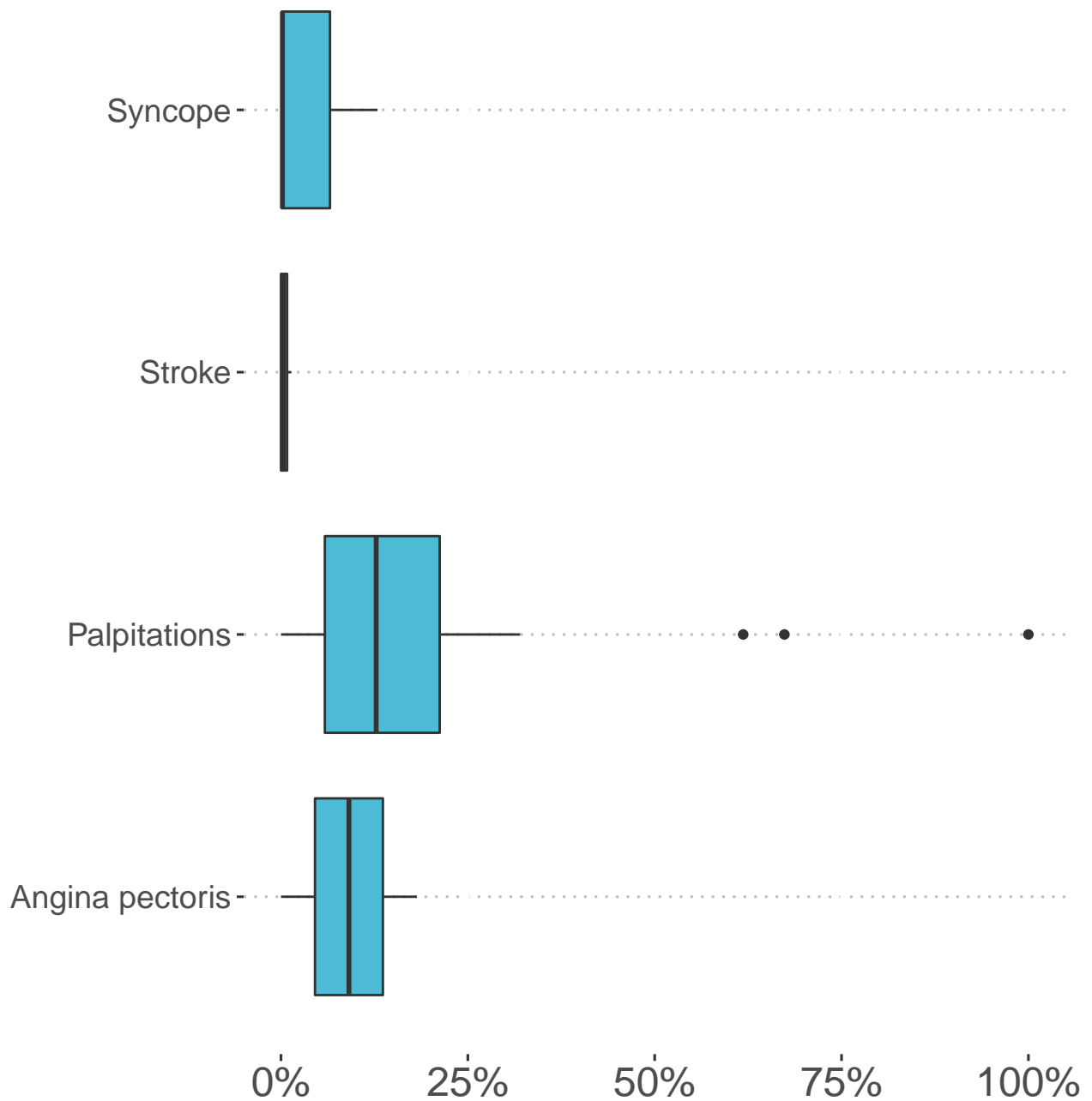
**Figure S20: Reported frequencies of headache in persons with long COVID.** Headache (HP:0002315, 42 studies, median percentage: 8.1%), Migraine (HP:0002076, 1 study, median percentage: 23.2%)



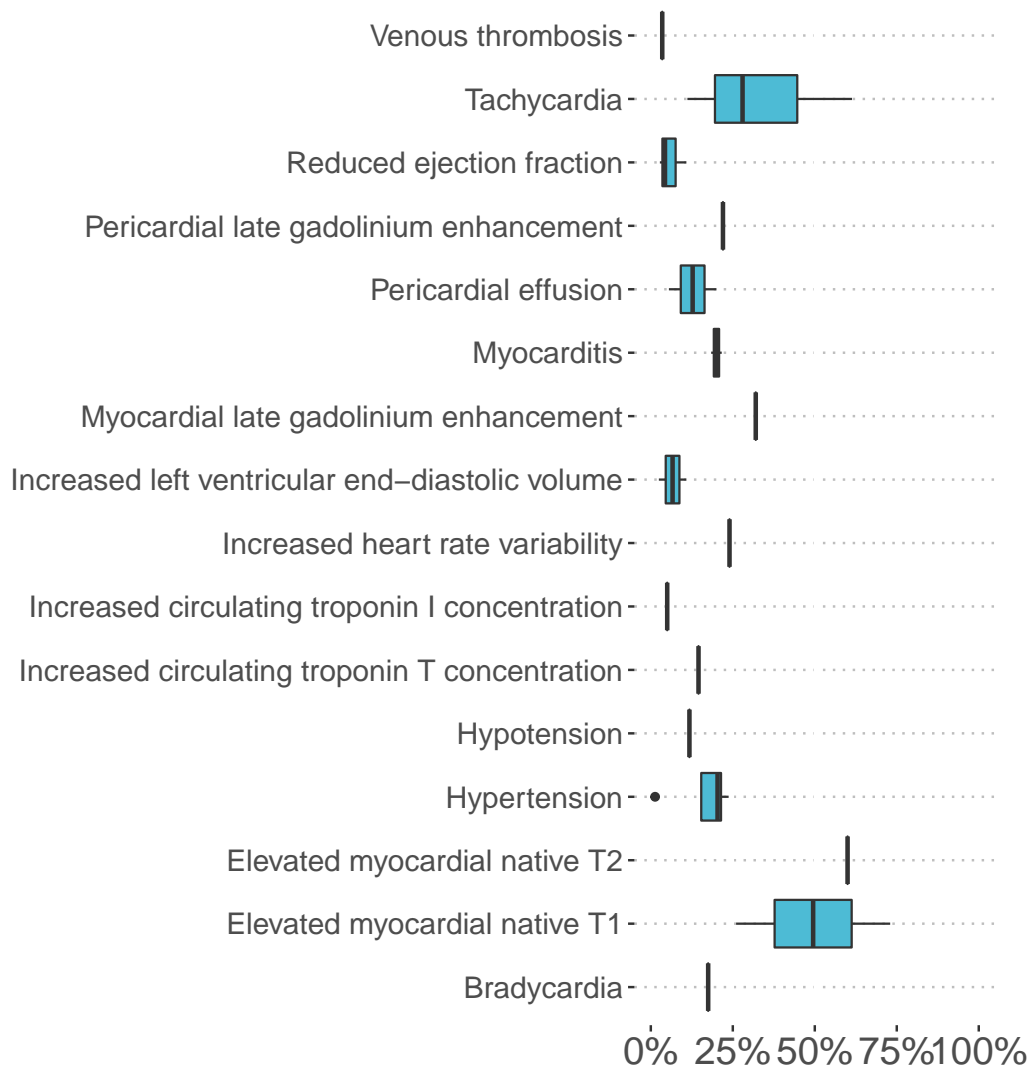
**Figure S21: Reported frequencies of speech and language abnormalities in persons with long COVID.** Anomic aphasia (HP:0030784, 1 study, median percentage: 46.3%), Aphasia (HP:0002381, 2 studies, median percentage: 0.5%), Bilingual aphasia (HP:0033849, 1 study, median percentage: 28.9%), Expressive aphasia (HP:0002427, 1 study, median percentage: 22.2%), Receptive aphasia (HP:0033848, 1 study, median percentage: 23.8%), Slurred speech (HP:0001350, 1 study, median percentage: 15.8%)



**Figure S22: Reported frequencies of behavioral abnormalities in persons with long COVID.** Anxiety (HP:0000739, 24 studies, median percentage: 22.2%), Apathy (HP:0000741, 1 study, median percentage: 39.2%), Attention deficit hyperactivity disorder (HP:0007018, 1 study, median percentage: 27.0%), Auditory hallucinations (HP:0008765, 1 study, median percentage: 6.5%), Brain fog (HP:0033630, 3 studies, median percentage: 85.0%), Delusions (HP:0000746, 1 study, median percentage: 3.0%), Hallucinations (HP:0000738, 1 study, median percentage: 2.3%), Impaired executive functioning (HP:0033051, 1 study, median percentage: 57.6%), Impulsivity (HP:0100710, 1 study, median percentage: 12.0%), Irritability (HP:0000737, 2 studies, median percentage: 27.4%), Panic attack (HP:0025269, 1 study, median percentage: 13.4%), Phonophobia (HP:0002183, 1 study, median percentage: 34.7%), Polydipsia (HP:0001959, 1 study, median percentage: 35.8%), Posttraumatic stress symptom (HP:0033676, 13 studies, median percentage: 14.3%), Short attention span (HP:0000736, 2 studies, median percentage: 22.9%), Tactile hallucination (HP:0033694, 1 study, median percentage: 3.1%), Visual hallucinations (HP:0002367, 1 study, median percentage: 10.4%)

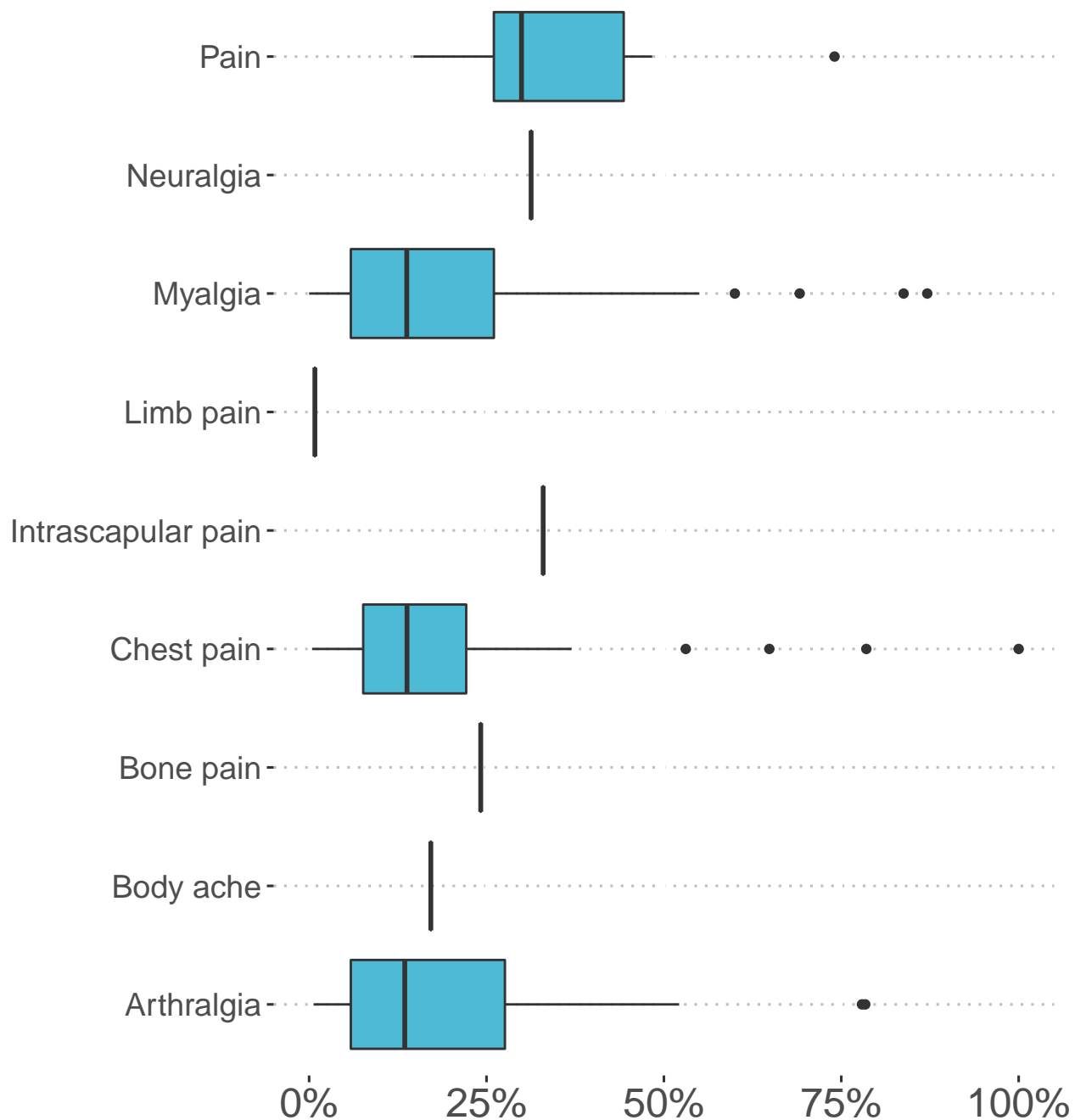


**Figure S23: Reported frequencies of cardiovascular symptoms in persons with long COVID.** Angina pectoris (HP:0001681, 2 studies, median percentage: 9.1%), Palpitations (HP:0001962, 18 studies, median percentage: 12.7%), Stroke (HP:0001297, 4 studies, median percentage: 0.3%), Syncope (HP:0001279, 3 studies, median percentage: 0.2%)

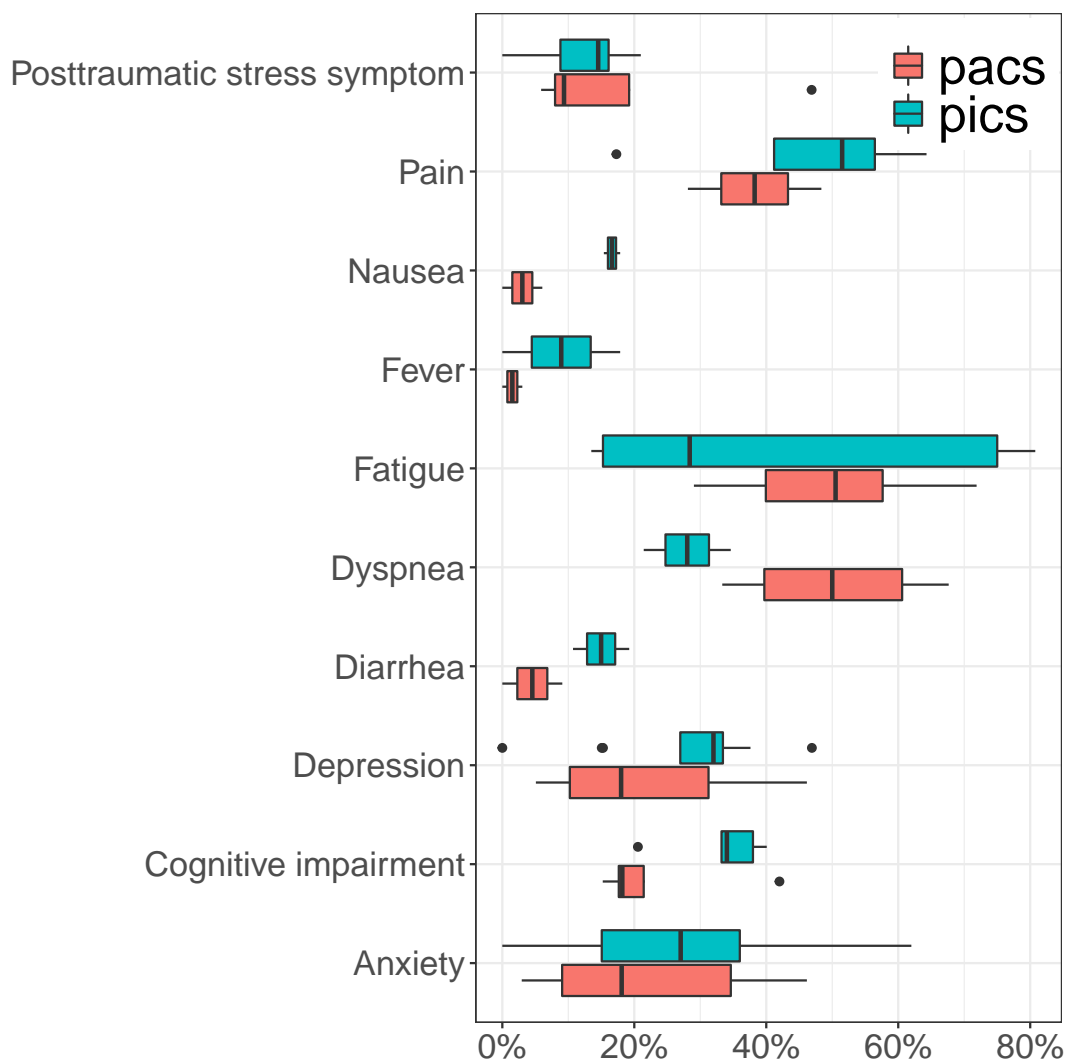


**Figure S24: Reported frequencies of cardiovascular findings in persons with long COVID.** Bradycardia (HP:0001662, 1 study, median percentage: 17.5%), Elevated myocardial native T1 (HP:4000006, 2 studies, median percentage: 49.5%), Elevated myocardial native T2 (HP:4000003, 1 study, median percentage: 60.0%), Hypertension (HP:0000822, 4 studies, median percentage: 20.4%), Hypotension (HP:0002615, 1 study, median percentage: 11.8%), Increased circulating troponin T concentration (HP:0410174, 1 study, median percentage: 14.5%), Increased circulating troponin I concentration (HP:0410173, 1 study, median percentage: 5.0%), Increased heart rate variability (HP:0031862, 1 study, median percentage: 24.0%), Increased left ventricular end-diastolic volume (HP:0033755, 2 studies, median percentage: 6.6%), Myocardial late gadolinium enhancement (HP:4000004, 1 study, median percentage: 32.0%), Myocarditis (HP:0012819, 2 studies, median percentage: 20.0%), Pericardial effusion (HP:0001698, 2 studies, median percentage: 12.8%), Pericardial late gadolinium enhancement (HP:4000005, 1 study, median percentage: 22.0%), Reduced ejection fraction (HP:0012664, 3 studies, median percentage: 4.3%), Tachycardia (HP:0001649, 3 studies, median percentage: 28.0%), Venous thrombosis (HP:0004936, 1 study, median percentage: 3.5%)





**Figure S25: Reported frequencies of pain in persons with long COVID.** Arthralgia (HP:0002829, 24 studies, median percentage: 13.5%), Body ache (HP:0033047, 1 study, median percentage: 17.2%), Bone pain (HP:0002653, 1 study, median percentage: 24.2%), Chest pain (HP:0100749, 32 studies, median percentage: 13.8%), Intrascapular pain (HP:0033746, 1 study, median percentage: 33.0%), Limb pain (HP:0009763, 1 study, median percentage: 0.8%), Myalgia (HP:0003326, 36 studies, median percentage: 13.8%), Neuralgia (HP:0033345, 1 study, median percentage: 31.3%), Pain (HP:0012531, 8 studies, median percentage: 29.9%)



**Figure S26:** Frequencies of features reported in PASC following ICU admission in the acute phase compared to PICS. There is an overlap of the overall experienced symptoms between PASC and PICS, such as Post-traumatic stress and Anxiety, whereas unique to PASC, individuals reported Dyspnea (50%) nearly twice as frequently as the general PICS populations (28%). While reported in both groups, those in the PICS population report more substantial Pain (55%), Nausea (18%), Fever (9%), Diarrhea (18%), Depression (32%) and Cognitive impairment (35%). Fatigue was overwhelmingly reported in those with PICS, though of note, median reports of fatigue in PASC cohorts is over 50% of those who suffer. Dyspnea and fatigue are the most commonly reported symptoms in the PASC cohort. In light of the heterogeneity of study designs, we did not perform formal statistical testing for difference in mean frequencies for the two groups.

Category	Count
longcovid cohort counts	48
long covid cohort other	91
acute COVID-19	9
PICS	1
SARS1	10
research	3
review	67
no pmid	74

**Table S1:** Papers considered for inclusion for curation. We searched for publications on long COVID using CoronaCentral, which uses machine learning to process the literature on SARS-CoV-2. We retrieved 303 articles predicted to be relevant to long COVID on April 29th, 2021. We included papers about long COVID that reported counts of individual features in groups of individuals following acute COVID-19 infection (`longcovid cohort counts`). We excluded papers about long COVID that reported other clinical aspects (`long covid cohort other`), papers that primarily studies acute COVID-19 (`acute`), post ICU syndrome (`PICS`), sequelae following infection with SARS (`SARS1`), papers with molecular research about acute COVID-19 or long COVID (`research`), review papers (`review`), and manuscripts that were not listed in PubMed (`no pmid`). In addition, ten publications with PubMed identifiers were identified by manual searches [1, 2, 3, 4, 5, 6, 7, 8, 9, 10] and one preprint was chosen from medRxiv [11].

**Table S2:** Post acute COVID studies included in this analysis.

<b>Author, Year</b>	<b>Cohort type</b>		<b>Age</b>	<b>m/N</b>	<b>Study Type</b>	<b>Days</b>
Carvalho-Schneider (2021) [4]	mixed patient	in/out- (non-ICU)	49.0y	66/150	Telephone questionnaire	60.0 d
Arnold (2020) [12]	ICU		62.0y	11/18	Clinical exam	84.0 d
Tenforde (2020) [8]	out-patient		42.5y	120/264	Telephone questionnaire	17.5 d
Carvalho-Schneider (2021) [4]	mixed patient	in/out- (non-ICU)	49.0y	66/150	Telephone questionnaire	30.0 d
Petersen (2020) [13]	out-patient		39.9y	82/180	Telephone questionnaire	99.0 d
Garg (2021) [14]	out-patient		37.0y	10/19	Clinical exam	47.0 d
Zhao (2020) [9]	in-patient		47.7y	32/55	Clinical exam	78.5 d (h)
Taboada (2021) [15]	ICU		65.5y	59/91	Clinical exam	180.0 d (h)
Garrigues (2020) [16]	in-patient	(non-ICU)	64.1y	56/96	Telephone questionnaire	110.9 d
Mandal (2020) [17]	in-patient		59.9y	238/384	Telephone clinical mixed	54.0 d (h)
Weerahandi (2021) [18]	in-patient		62.0y	95/152	Telephone online questionnaire	37.0 d (h)
Goertz (2020) [19]	mixed patient	in/out- (non-ICU)	47.0y	310/2113	Written questionnaire	79.0 d
Venturelli (2021) [20]	mixed patient	in/out-	63.0y	515/767	Clinical exam	81.0 d (h)
Halpin (2021) [21]	ICU		58.5y	19/32	Telephone questionnaire	48.0 d (h)
Trinkmann (2021) [22]	mixed patient	in/out-	48.0y	108/246	Clinical exam	68.0 d

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Author, Year	Cohort type		Age	m/N	Study Type	Days
Halpin (2021) [21]	in-patient	(non-ICU)	70.5y	35/68	Telephone questionnaire	48.0 d (h)
Ramani (2021) [23]	in-patient		55.0y	34/58	Clinical exam	48.0 d (h)
Carfi (2020) [24]	in-patient		56.5y	90/153	Clinical exam	60.3 d
Rosales-Castillo (2021) [25]	in-patient		60.2y	66/118	Clinical exam	50.8 d (h)
Townsend (2020) [26]	mixed	in/out-patient	49.5y	59/128	Clinical exam	72.0 d
de Graaf (2021) [27]	in-patient	(non-ICU)	60.8y	29/47	Clinical exam	42.0 d (h)
Ludvigsson (2021) [1]	out-patient		12.0y	1/5	Telephone questionnaire	210.0 d
Moreno-Perez (2021) [28]	mixed	in/out-patient	56.0y	146/277	Clinical exam	77.0 d
Chopra (2020) [10]	in-patient		62.0y	253/488	Telephone questionnaire	60.0 d (h)
Huang (2021) [29]	in-patient		57.0y	897/1733	Clinical exam	186.0 d
van den Borst (2020) [30]	ICU		60.0y	35/46	Clinical exam	91.0 d (h)
Havervall (2021) [5]	out-patient		43.0y	55/323	Written questionnaire	240.0 d
Havervall (2021) [5]	out-patient		43.0y	55/323	Written questionnaire	120.0 d
Havervall (2021) [5]	out-patient		43.0y	55/323	Written questionnaire	60.0 d
van den Borst (2020) [30]	out-patient		52.0y	8/27	Clinical exam	91.0 d (h)
van den Borst (2020) [30]	in-patient	(non-ICU)	61.0y	31/51	Clinical exam	91.0 d (h)
Arnold (2020) [12]	in-patient	(non-ICU)	57.0y	44/65	Clinical exam	84.0 d
Arnold (2020) [12]	in-patient	(non-ICU)	47.0y	13/27	Clinical exam	84.0 d

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Author, Year	Cohort type		Age	m/N	Study Type	Days
Zhang (2021) [31]	in-patient		42.5y	294/527	Clinical exam	180.0 d (h)
Zhang (2021) [31]	in-patient		42.5y	294/527	Clinical exam	90.0 d (h)
Rass (2021) [32]	out-patient		45.0y	10/32	Clinical exam	90.0 d (h)
Munro (2020) [33]	in-patient		64.0y	120/138	Telephone questionnaire	56.0 d (h)
Ramani (2021) [34]	ICU		56.0y	17/28	Clinical exam	39.5 d (h)
Wong (2020) [35]	in-patient		62.0y	50/78	Clinical exam	91.0 d
Akter (2020) [36]	in-patient		40.0y	558/734	Telephone questionnaire	28.0 d
Daher (2020) [37]	ICU		64.0y	22/33	Clinical exam	56.0 d (h)
Stavem (2020) [38]	out-patient		49.7y	198/451	Written questionnaire	117.0 d
Jacobs (2020) [39]	in-patient	(non-ICU)	57.0y	112/183	Telephone email questionnaire	35.0 d (h)
Writing Committee (2021) [40]	in-patient	(non-ICU)	60.9y	76/126	Telephone clinical mixed	121.0 d (h)
Writing Committee (2021) [40]	ICU		60.9y	43/73	Telephone clinical mixed	93.0 d (h)
González (2021) [41]	ICU		60.0y	46/62	Clinical exam	90.0 d (h)
Iqbal (2021) [42]	mixed patient	in/out-patient	32.1y	71/158	Telephone questionnaire	38.1 d (h)
Prieto (2021) [43]	mixed patient	in/out-patient	43.0y	38/85	Clinical exam	53.0 d
Cheng (2021) [2]	mixed patient	in/out-patient	73.0y	76/139	Telephone clinical mixed	63.0 d
Graham (2021) [44]	out-patient		43.2y	17/50	Telephone clinical mixed	141.0 d

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Author, Year	Cohort type		Age	m/N	Study Type	Days
Dennis (2021) [45]	mixed patient	in/out- (non-ICU)	44.0y	49/201	Clinical exam	141.0 d
Ordinola Navarro (2021) [46]	mixed patient	in/out-	58.0y	50/115	Clinical exam	40.0 d
Bellan (2021) [6]	in-patient		61.0y	142/238	Telephone questionnaire	105.0 d (h)
Puntmann (2020) [47]	mixed patient	in/out-	49.0y	53/100	Clinical exam	71.0 d
Dennis (2021) [45]	out-patient		43.0y	45/163	Clinical exam	141.0 d
Sonnweber (2020) [48]	mixed patient	in/out-	57.0y	82/145	Clinical exam	103.0 d
Sonnweber (2020) [48]	mixed patient	in/out-	57.0y	82/145	Clinical exam	63.0 d
Dennis (2021) [45]	in-patient		50.0y	14/37	Clinical exam	138.0 d
Jacobson (2021) [49]	in-patient		50.6y	14/22	Clinical exam	119.3 d
Zhang (2021) [31]	in-patient		42.5y	294/527	Clinical exam	28.0 d (h)
Rass (2021) [32]	in-patient	(non-ICU)	61.0y	48/72	Clinical exam	90.0 d (h)
Rass (2021) [32]	ICU		58.0y	24/31	Clinical exam	90.0 d (h)
Jacobson (2021) [49]	out-patient		41.6y	49/96	Clinical exam	119.3 d
Chun (2021) [50]	mixed patient	in/out-	53.0y	34/61	Clinical exam	63.0 d
Baricich (2021) [51]	in-patient		57.9y	123/204	Clinical exam	124.7 d (h)
Townsend (2021) [52]	mixed patient	in/out-	47.3y	65/150	Clinical exam	80.5 d
Garrigues (2020) [16]	ICU		59.6y	19/24	Telephone questionnaire	110.9 d
Liu (2020) [3]	in-patient		46.6y	21/51	Clinical exam	28.0 d (h)
Suárez-Robles (2020) [53]	in-patient		58.5y	62/134	Telephone questionnaire	90.0 d (h)

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Author, Year	Cohort type		Age	m/N	Study Type	Days
Bellan (2021) [6]	in-patient		61.0y	142/238	Clinical exam	105.0 d (h)
Darley (2021) [54]	mixed	in/out-patient	47.0y	51/78	Clinical exam	69.0 d
Liang (2020) [55]	in-patient	(non-ICU)	41.3y	21/76	Clinical exam	90.0 d (h)
Xiong (2021) [7]	in-patient		52.0y	245/538	Telephone questionnaire	97.0 d (h)
Blanco [56] (2021)	in-patient		55.0y	64/100	Clinical exam	104.0 d
Logue [57] (2021)	in-patient		54.0y	8/16	Written questionnaire	169.0 d
Logue [57] (2021)	out-patient		46.3y	68/161	Written questionnaire	169.0 d
Davis2020	mixed	in/out-patient	45.0y	793/3762	Online questionnaire	114.5 d
Abdallah [58] (2021)	in-patient		59.1y	16/25	Clinical exam	102.3 d (h)
de Graaf [27] (2021)	ICU		60.8y	22/34	Clinical exam	42.0 d (h)
De Lorenzo (2020) [59]	in-patient		61.0y	92/126	Clinical exam	21.5 d (h)
De Lorenzo (2020) [59]	out-patient		50.0y	31/59	Clinical exam	26.0 d
Abdallah [58] (2021)	out-patient		42.4y	20/38	Clinical exam	129.8 d



**Table S3:** Post-ICU syndrome (PICS) phenotypic features curated from studies analyzed in this work.  
**days:** Number of days following discharge from ICU

HPO label	HPO id	PMID	author (year)	days	counts	perc.
Diarrhea	HP:0002014	23856099	Choi (2013)	120	5/26	19.2%
Diarrhea	HP:0002014	23856099	Choi (2013)	60	3/28	10.7%
Memory impairment	HP:0002354	33593406	Kawakami (2021)	180	36/61	59.0%
Sleep disturbance	HP:0002360	29243344	Langerud (2018)	360	40/89	44.9%
Sleep disturbance	HP:0002360	29243344	Langerud (2018)	90	58/118	49.2%
Sleep disturbance	HP:0002360	23856099	Choi (2013)	120	12/26	46.2%
Sleep disturbance	HP:0002360	23856099	Choi (2013)	60	18/28	64.3%
Poor appetite	HP:0004396	23856099	Choi (2013)	120	6/26	23.1%
Poor appetite	HP:0004396	33625631	Miyamoto (2021)	90	6/81	7.4%
Poor appetite	HP:0004396	23856099	Choi (2013)	60	8/28	28.6%
Dyspnea	HP:0002094	23856099	Choi (2013)	120	9/26	34.6%
Dyspnea	HP:0002094	23856099	Choi (2013)	60	6/28	21.4%
Diminished physical functioning	HP:0033666	24815803	Jackson (2014)	360	102/374	27.3%
Diminished physical functioning	HP:0033666	32995017	Shima (2020)	90	37/117	31.6%
Diminished physical functioning	HP:0033666	29787415	Marra (2018)	90	100/383	26.1%
Diminished physical functioning	HP:0033666	33593406	Kawakami (2021)	180	31/61	50.8%
Diminished physical functioning	HP:0033666	29787415	Marra (2018)	360	69/332	20.8%
Diminished physical functioning	HP:0033666	24815803	Jackson (2014)	90	139/428	32.5%
Diminished physical functioning	HP:0033666	32995017	Shima (2020)	360	15/74	20.3%
Posttraumatic stress symptom	HP:0033676	24815803	Jackson (2014)	360	24/361	6.6%
Posttraumatic stress symptom	HP:0033676	32398018	Tripathy (2020)	180	0/322	0.0%
Posttraumatic stress symptom	HP:0033676	30466485	Hatch (2018)	90	504/3151	16.0%
Posttraumatic stress symptom	HP:0033676	32995017	Shima (2020)	90	17/117	14.5%
Posttraumatic stress symptom	HP:0033676	29243344	Langerud (2018)	360	13/89	14.6%
Posttraumatic stress symptom	HP:0033676	29243344	Langerud (2018)	90	15/118	12.7%
Posttraumatic stress symptom	HP:0033676	24815803	Jackson (2014)	90	27/415	6.5%

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HPO label	HPO id	PMID	author (year)	days	counts	perc.
Posttraumatic stress symptom	HP:0033676	32643362	Anon (2020)	90	8/73	11.0%
Posttraumatic stress symptom	HP:0033676	33625631	Miyamoto (2021)	90	17/81	21.0%
Posttraumatic stress symptom	HP:0033676	30466485	Hatch (2018)	360	567/3151	18.0%
Posttraumatic stress symptom	HP:0033676	32995017	Shima (2020)	360	12/74	16.2%
Fatigue	HP:0012378	29243344	Langerud (2018)	360	12/89	13.5%
Fatigue	HP:0012378	29243344	Langerud (2018)	90	18/118	15.3%
Fatigue	HP:0012378	23856099	Choi (2013)	120	21/26	80.8%
Fatigue	HP:0012378	33625631	Miyamoto (2021)	90	23/81	28.4%
Fatigue	HP:0012378	23856099	Choi (2013)	60	21/28	75.0%
Diminished mental health	HP:0033667	33593406	Kawakami (2021)	180	14/61	23.0%
Restrictive ventilatory defect	HP:0002091	32643362	Anon (2020)	90	18/73	24.7%
Cognitive impairment	HP:0100543	29787415	Marra (2018)	90	128/337	38.0%
Cognitive impairment	HP:0100543	24088092	Pandharipande (2013)	90	228/569	40.1%
Cognitive impairment	HP:0100543	29787415	Marra (2018)	360	97/292	33.2%
Cognitive impairment	HP:0100543	32643362	Anon (2020)	90	15/73	20.5%
Cognitive impairment	HP:0100543	24088092	Pandharipande (2013)	360	130/382	34.0%
Insomnia	HP:0100785	33625631	Miyamoto (2021)	90	9/81	11.1%
Pain	HP:0012531	29243344	Langerud (2018)	90	58/118	49.2%
Pain	HP:0012531	23856099	Choi (2013)	120	14/26	53.8%
Pain	HP:0012531	33625631	Miyamoto (2021)	90	14/81	17.3%
Pain	HP:0012531	23856099	Choi (2013)	60	18/28	64.3%
Depression	HP:0000716	24815803	Jackson (2014)	360	116/347	33.4%
Depression	HP:0000716	32398018	Tripathy (2020)	180	0/180	0.0%
Depression	HP:0000716	30466485	Hatch (2018)	90	1029/3319	31.0%
Depression	HP:0000716	32995017	Shima (2020)	90	44/117	37.6%
Depression	HP:0000716	29243344	Langerud (2018)	360	24/89	27.0%
Depression	HP:0000716	29243344	Langerud (2018)	90	18/118	15.3%
Depression	HP:0000716	29787415	Marra (2018)	90	121/363	33.3%
Depression	HP:0000716	29787415	Marra (2018)	360	97/313	31.0%
Depression	HP:0000716	24815803	Jackson (2014)	90	149/407	36.6%
Depression	HP:0000716	32643362	Anon (2020)	90	11/73	15.1%
Depression	HP:0000716	33625631	Miyamoto (2021)	90	38/81	46.9%
Depression	HP:0000716	30466485	Hatch (2018)	360	1062/3319	32.0%

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<b>HPO label</b>	<b>HPO id</b>	<b>PMID</b>	<b>author (year)</b>	<b>days</b>	<b>counts</b>	<b>perc.</b>
Depression	HP:0000716	32995017	Shima (2020)	360	24/74	32.4%
Anxiety	HP:0000739	32398018	Tripathy (2020)	180	0/180	0.0%
Anxiety	HP:0000739	30466485	Hatch (2018)	90	1192/3312	36.0%
Anxiety	HP:0000739	32995017	Shima (2020)	90	37/117	31.6%
Anxiety	HP:0000739	29243344	Langerud (2018)	360	11/89	12.4%
Anxiety	HP:0000739	29243344	Langerud (2018)	90	28/118	23.7%
Anxiety	HP:0000739	32643362	Anon (2020)	90	11/73	15.1%
Anxiety	HP:0000739	33625631	Miyamoto (2021)	90	33/81	40.7%
Anxiety	HP:0000739	30466485	Hatch (2018)	360	2053/3312	62.0%
Anxiety	HP:0000739	32995017	Shima (2020)	360	20/74	27.0%
Fever	HP:0001945	23856099	Choi (2013)	120	0/26	0.0%
Fever	HP:0001945	23856099	Choi (2013)	60	5/28	17.9%
Muscle weakness	HP:0001324	23856099	Choi (2013)	120	16/26	61.5%
Muscle weakness	HP:0001324	32643362	Anon (2020)	90	28/73	38.4%
Muscle weakness	HP:0001324	33625631	Miyamoto (2021)	90	31/81	38.3%
Muscle weakness	HP:0001324	23856099	Choi (2013)	60	18/28	64.3%
Nausea	HP:0002018	23856099	Choi (2013)	120	4/26	15.4%
Nausea	HP:0002018	23856099	Choi (2013)	60	5/28	17.9%
Constipation	HP:0002019	23856099	Choi (2013)	120	4/26	15.4%
Constipation	HP:0002019	23856099	Choi (2013)	60	2/28	7.1%

## Supplemental Note 1

This note provides background information and comments about selected phenotypic features mentioned in the main manuscript.

General (constitutional) symptoms were commonly reported. The most commonly reported symptom was *Fatigue* (HP:0012378). Other symptoms reported in 10 or more cohorts included *Abdominal pain* (HP:0002027), *Arthralgia* (HP:0002829), *Chest pain* (HP:0100749), *Difficulty walking* (HP:0002355), *Myalgia* (HP:0003326), and *Pharyngalgia* (HP:0033050) (See **Figure 2** in the main manuscript and **Figure S25**).

Abdominal complaints such as *Nausea* (HP:0002018), *Vomiting* (HP:0002013), *Diarrhea* (HP:0002014), and *Poor appetite* (HP:0004396) are commonly reported in persons with long COVID (**Figure S5**). *Hepatic steatosis* (HP:0001397) and *Pancreatic steatosis* (HP:0033757), *Hepatomegaly* (HP:0002240), *Splenomegaly* (HP:0001744), and *Hepatitis* (HP:0012115) were reported in one publication that described two cohorts, whereby the frequency of these features was significantly higher than in healthy controls [45]. However, given that these features are relatively common in the general population [60], additional research will be required to assess the extent of increased risk exists for persons with long COVID (**Figure S6**).

Persistent lung abnormalities were the most common long-term sequelae of Severe Acute Respiratory syndrome (SARS) and Middle East Respiratory Syndrome (MERS), epidemic viral illness related to betacoronavirus infection [61]. Respiratory abnormalities are also very common in long COVID. Fourteen imaging abnormalities ascertained by computed tomography or plain-film radiography were reported (**Figure S2**). Thirteen abnormalities ascertained by pulmonary function testing (PFT) were reported, often related to restrictive ventilatory defects and reduced diffusion capacity (**Figure S3**). The most commonly reported symptom was *Dyspnea* (HP:0002094), whose occurrence and severity correlate with defects in PFT [55].

Cardiovascular symptoms were relatively common, including *Angina pectoris* (HP:0001681), *Palpitations* (HP:0001962), and *Syncope* (HP:0001279) (**Figure S23**). A small number of cohorts documented abnormal echocardiographic and cardiac magnetic resonance imaging findings as well as heart rhythm abnormalities (**Figure S24**).

*Acute kidney injury* (HP:0001919) is a common complication of COVID-19. AKI is a risk factor for the development of chronic kidney disease (CKD) [62]. In a recently published study from Sweden, among a group of 60 ICU patients admitted for COVID-19 infection, inpatient AKI severity was associated with higher CKD stages at 3- to 6-month follow up [63]. Another study from the USA recently reported that AKI in the setting of COVID-19, was associated with a greater rate of eGFR decrease after discharge compared with AKI without COVID-19.26 Another study reported decreased glomerular filtration rate in 35% of patients six months following discharge for acute COVID-19 [29]. However, a recent study suggested that most patients with AKI in the setting of COVID-19 will experience long-term renal recovery [64]. More studies with longer follow-up will help our understanding on the long-term renal consequences of COVID-19 (**Figure S10**).

*Blurred vision* (HP:0000622) was the most commonly reported ocular finding, affecting 15% of long COVID patients. Other findings, such as *Photophobia* (HP:0000613), *Ocular pain* (HP:0200026), and *Vitreous floaters* (HP:0100832), were reported in one or two cohorts each (**Figure S12**), but further work will be required to define the natural history of ocular complaints in long COVID. *Vertigo* (HP:0002321; dizziness) was reported in 25.5% of participants of 10 cohorts. *Ear pain* (HP:0030766) and *Tinnitus* (HP:0000360) were also common (**Figure S11**).

The largest number of distinct symptoms and findings were reported for the nervous system, which could be associated with both peripheral or central nervous system dysfunction. Symptoms related to *Cognitive impairment* (HP:0100543) and *Tremor* (HP:0001337), as well as *Paresthesia* (HP:0003401)

and related findings, were all commonly reported (**Figures S15 and S14**) . Symptoms included reduced or abolished sense of taste and smell (**Figure S17**), *Diminished ability to concentrate* (HP:0031987), *Bradyphrenia* (HP:0031843), and *Headache* (HP:0002315) (**Figures S15 and S20**). .

Many cases of COVID-19 are marked by short- and long-term psychiatric symptoms. While it has been suggested that these symptoms occur through viral invasion of the brain, without definitive evidence, it seems more likely that the psychiatric effects of COVID-19 infection are due to a combination of neuroinflammation and microvascular injury [65]. Evidence exists for an increased incidence of new-onset mental illness in patients with prior COVID-19 infection compared to controls with a comparable health event [66]. Apart from the direct effects of COVID-19 infection, mental health is sensitive to societal events such as the restrictions imposed in many countries in response to the COVID-19 pandemic, and it has been reported that the overall prevalence of depression symptoms in the US increased more than 3-fold during the COVID-19 pandemic [67]. Additionally, some anxiety and mood symptoms may be due to testing issues resulting in inadequate care: one study found that anxiety and mood symptoms were more common in those without lab confirmation of COVID, and that those without lab confirmation experienced an 8-week delay in care [68]. Another showed that those without lab confirmation were less likely to have adequate rest, less likely to have had time off, more likely to experience loss of income, and more likely to be unable to live alone at 6 weeks [69]. Given the myriad of societal changes, psychiatric symptoms of long COVID must be considered in light of both biological and social factors affecting disease. In the cohorts analyzed in our study, anxiety and depression were reported in 22 and 23 cohorts respectively (**Figure 2** in the main manuscript), but a wide range of other complaints including Depression (HP:0000716), *Anxiety* (HP:0000739), *Posttraumatic stress symptom* (HP:0033676), and *Irritability* (HP:0000737) were also reported (**Figures S19 and S22**).

Sleep-related symptoms were commonly reported in multiple studies. The term *Sleep disturbance* (HP:0002360) was identified in ten cohorts. Sleep disturbances were reported by 24.0% of patients in these cohorts. More specific sleep related features (i.e., child terms of Sleep Disturbance) were also reported. *Insomnia* (HP:0100785) was the most prevalent feature, followed by *Restless legs* (HP:0012452) and *Sleep apnea* (HP:0010535). Specific types of insomnia, as represented by child terms *Sleep onset insomnia* (HP:0031354), *Maintenance insomnia* (HP:0031355), and *Terminal insomnia* (HP:0031356) were also reported in one cohort by 39.6%, 47.6% and 24.9% of patients, respectively (**Figure S18**). Because sleep and circadian disruptions may affect multiple organ systems, the impact of these disruptions should be considered when investigating other domains such as respiratory, neurological, and behavioral function. *Fatigue* (HP:0012378), an inexact term characterized by extreme tiredness and impaired daytime function, was reported by 70.2% of patients across 34 studies. Patients reporting fatigue represented a very heterogeneous group including those with mild to severe disease, and seen in both those hospitalized and not hospitalized. While fatigue is commonly associated with sleep disturbance [70], this relationship is not fully characterized but is believed to be mediated by inflammatory molecules such interleukins 1 and -6, and neuropeptides such as hypocretin-1. Acutely, fatigue may be a compensatory mechanism to drive increased sleep responses after immune challenges, but long-term may represent a maladaptive response [71].

*Brain fog* (HP:0033630), another term commonly used by patients with sleep problems to describe decreased cognitive ability [72], was reported in 44.6% of patients across two studies. The relationship between brain fog, sleep, and fatigue is poorly understood but the high number of patients reporting on this in these two studies suggests it should be included in future investigations of sleep fatigue, and cognitive dysfunction association with long COVID. Finally, several other neurological and psychiatric features observed in long COVID patients and highlighted by this review could be attributed to changes in sleep and circadian rhythms observed in these patients during and after COVID infection, including *Diminished ability to concentrate* (HP:0031987), *Short term memory impairment* (HP:0033687), *Irritability*

*tability* (HP:0000737), *Emotional lability* (HP:0000712), *Memory impairment* (HP:0002354), *Headache* (HP:0002315), *Depression* (HP:0000716), *Anxiety* (HP:0000739), *Cognitive impairment* (HP:0100543), *Pain* (HP:0012531), and *Apathy* (HP:0000741). Dissecting the directionality of sleep disturbances and symptoms related to other systems is fundamental to develop approaches that might positively impact the quality of life in long COVID patients.

## **Supplemental Note 2: Post ICU Syndrome (PICS) vs. long COVID**

In addition to identifying studies for long COVID, we also curated 18 other studies (Supplemental Table S3), which directly discussed post-Intensive Care Unit (ICU) care and recovery with 13,358 patients, annotated to 19 HPO terms. While long COVID has been identified as a novel consequence of COVID-19, there is a direct need to understand long COVID as it pertains specifically to critically ill individuals that were hospitalized in the ICU - a unique population. In addition to understanding long COVID, one must consider the phenomenon of Post-Intensive Care Syndrome (PICS), which is an all-encompassing term for the myriad of symptoms experienced by those who survive critical illness and their families, lasting months to years in duration [?]. As the focus shifts from survival to survivorship, healthcare providers and researchers must consider the lasting effects of the ICU environment and its associated therapies on individuals who concurrently are diagnosed with COVID-19. While life-preserving, many of these therapies come with consequences seen in PICS – physical, cognitive, and emotional. Examples may include, but are not limited to, ICU-acquired weakness propagated by prolonged immobilization, neuromuscular blockade, sedation, and/or corticosteroids [?]. Many of the symptoms experienced by ICU survivors are shared with those who are critically ill COVID-19 survivors who required ICU admission, but also those who did not require ICU [?]. This further elucidates the point that both long COVID and PICS are unique and distinct phenomena, which have shared symptomatology in the presence of critical illness. Early recognition and intervention are necessary to offset these untoward long-term side effects.

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