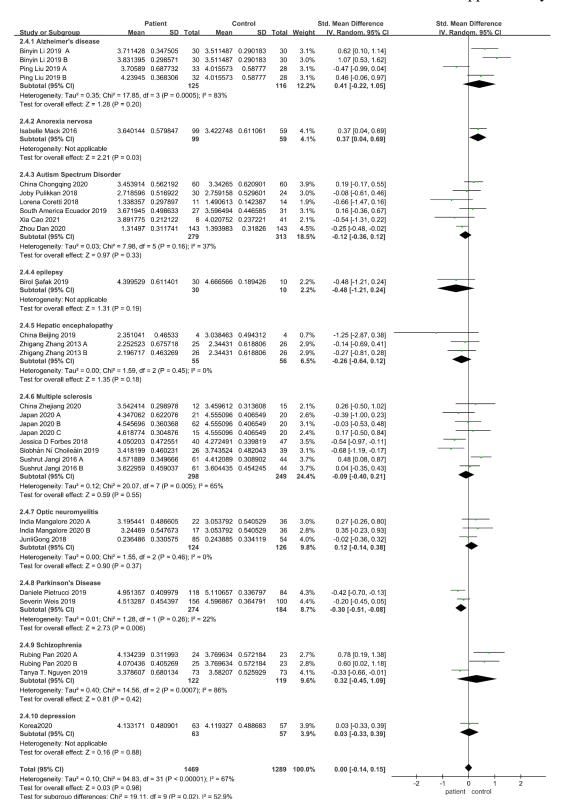


Supplementary Material

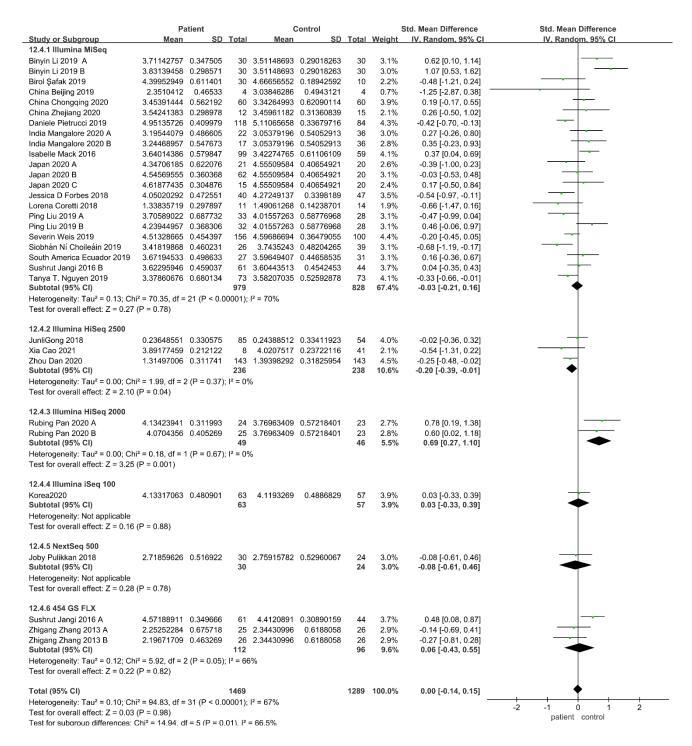
2 Supplementary Figures

	Patient			Control			Std. Mean Difference		Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Binyin Li 2019 A	3.711428	0.347505	30	3.511487	0.290183	30	3.1%	0.62 [0.10, 1.14]	
Binyin Li 2019 B	3.831395	0.298571	30	3.511487	0.290183	30	3.0%	1.07 [0.53, 1.62]	
Birol Şafak 2019	4.399529	0.611401	30	4.666566	0.189426	10	2.2%	-0.48 [-1.21, 0.24]	
China Beijing 2019	2.351041	0.46533	4	3.038463	0.494312	4	0.7%	-1.25 [-2.87, 0.38]	•
China Chongqing 2020	3.453914	0.562192	60	3.34265	0.620901	60	3.9%	0.19 [-0.17, 0.55]	
China Zhejiang 2020	3.542414	0.298978	12	3.459612	0.313608	15	2.1%	0.26 [-0.50, 1.02]	
Daniele Pietrucci 2019	4.951357	0.409979	118	5.110657	0.336797	84	4.3%	-0.42 [-0.70, -0.13]	
India Mangalore 2020 A	3.195441	0.486605	22	3.053792	0.540529	36	3.0%	0.27 [-0.26, 0.80]	
India Mangalore 2020 B	3.24469	0.547673	17	3.053792	0.540529	36	2.8%	0.35 [-0.23, 0.93]	
Isabelle Mack 2016	3.640144	0.579847	99	3.422748	0.611061	59	4.1%	0.37 [0.04, 0.69]	
Japan 2020 A	4.347062	0.622076	21	4.555096	0.406549	20	2.6%	-0.39 [-1.00, 0.23]	
Japan 2020 B	4.545696	0.360368	62	4.555096	0.406549	20	3.1%	-0.03 [-0.53, 0.48]	
Japan 2020 C	4.618774	0.304876	15	4.555096	0.406549	20	2.4%	0.17 [-0.50, 0.84]	
Jessica D Forbes 2018	4.050203	0.472551	40	4.272491	0.339819	47	3.5%	-0.54 [-0.97, -0.11]	
Joby Pulikkan 2018	2.718596	0.516922	30	2.759158	0.529601	24	3.0%	-0.08 [-0.61, 0.46]	
JunliGong 2018	0.236486	0.330575	85	0.243885	0.334119	54	4.0%	-0.02 [-0.36, 0.32]	
Korea2020	4.133171	0.480901	63	4.119327	0.488683	57	3.9%	0.03 [-0.33, 0.39]	+
Lorena Coretti 2018	1.338357	0.297897	11	1.490613	0.142387	14	1.9%	-0.66 [-1.47, 0.16]	
Ping Liu 2019 A	3.70589	0.687732	33	4.015573	0.58777	28	3.1%	-0.47 [-0.99, 0.04]	
Ping Liu 2019 B	4.23945	0.368306	32	4.015573	0.58777	28	3.1%	0.46 [-0.06, 0.97]	
Rubing Pan 2020 A	4.134239	0.311993	24	3.769634	0.572184	23	2.7%	0.78 [0.19, 1.38]	
Rubing Pan 2020 B	4.070436	0.405269	25	3.769634	0.572184	23	2.8%	0.60 [0.02, 1.18]	
Severin Weis 2019	4.513287	0.454397	156	4.596867	0.364791	100	4.4%	-0.20 [-0.45, 0.05]	
Siobhán Ní Choileáin 2019	3.418199	0.460231	26	3.743524	0.482043	39	3.1%	-0.68 [-1.19, -0.17]	
South America Ecuador 2019	3.671945	0.498633	27	3.596494	0.446585	31	3.1%	0.16 [-0.36, 0.67]	
Sushrut Jangi 2016 A	4.571889	0.349666	61	4.412089	0.308902	44	3.7%	0.48 [0.08, 0.87]	
Sushrut Jangi 2016 B	3.622959	0.459037	61	3.604435	0.454245	44	3.7%	0.04 [-0.35, 0.43]	
Tanya T. Nguyen 2019	3.378607	0.680134	73	3.58207	0.525929	73	4.1%	-0.33 [-0.66, -0.01]	
Xia Cao 2021	3.891775	0.212122	8	4.020752	0.237221	41	2.1%	-0.54 [-1.31, 0.22]	
Zhigang Zhang 2013 A	2.252523	0.675718	25	2.34431	0.618806	26	2.9%	-0.14 [-0.69, 0.41]	
Zhigang Zhang 2013 B	2.196717	0.463269	26	2.34431	0.618806	26	2.9%	-0.27 [-0.81, 0.28]	
Zhou Dan 2020	1.31497	0.311741	143	1.393983	0.31826	143	4.5%	-0.25 [-0.48, -0.02]	_
Total (95% CI)			1469			1289	100.0%	0.00 [-0.14, 0.15]	\(\begin{array}{cccccccccccccccccccccccccccccccccccc
Heterogeneity: Tau ² = 0.10; Chi ² = 94.83, df = 31 (P < 0.00001); I ² = 67%								_	-2 -1 0 1 2
Test for overall effect: Z = 0.03	(P = 0.98)								-2 -1 0 1 2 patient control

Supplementary Figure 1. Forest plots of alpha diversity in the gut microbiome of patients with neurological diseases compared with healthy controls. Abbreviations: SMD, standardized mean difference; SD, standard deviation.

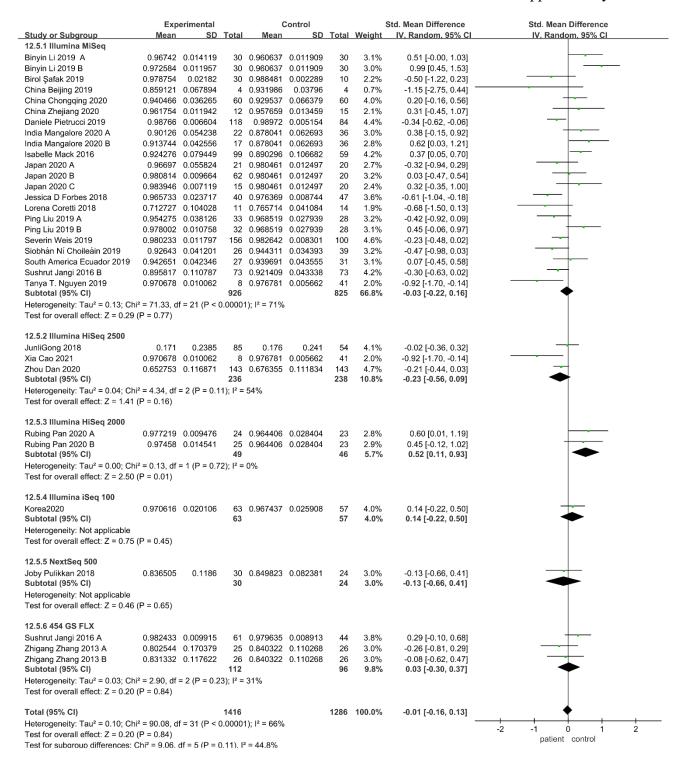


Supplementary Figure 2. Forest plot of the Shannon for the diseases. Abbreviations: SMD, standardized mean difference; SD, standard deviation.



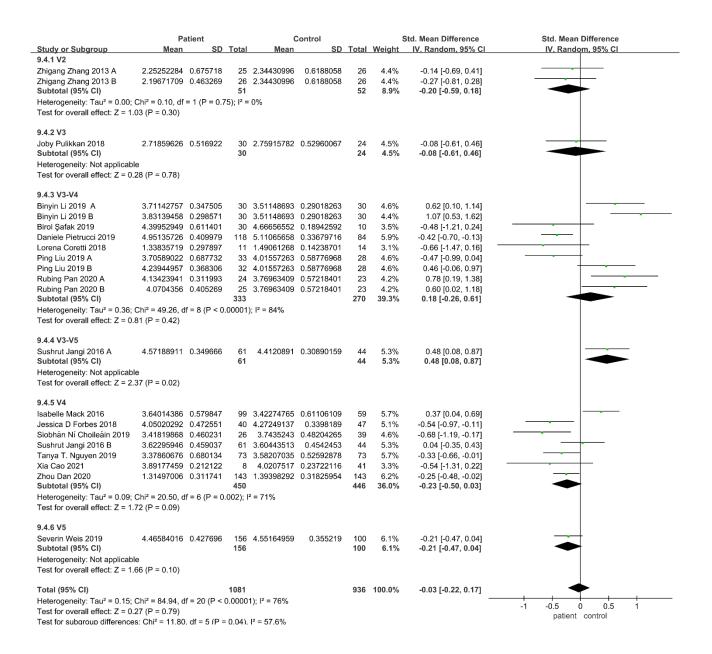
Supplementary Figure 3. Forest plot of the Shannon for the sequencing instrument.

Abbreviations: SMD, standardized mean difference; SD, standard deviation.



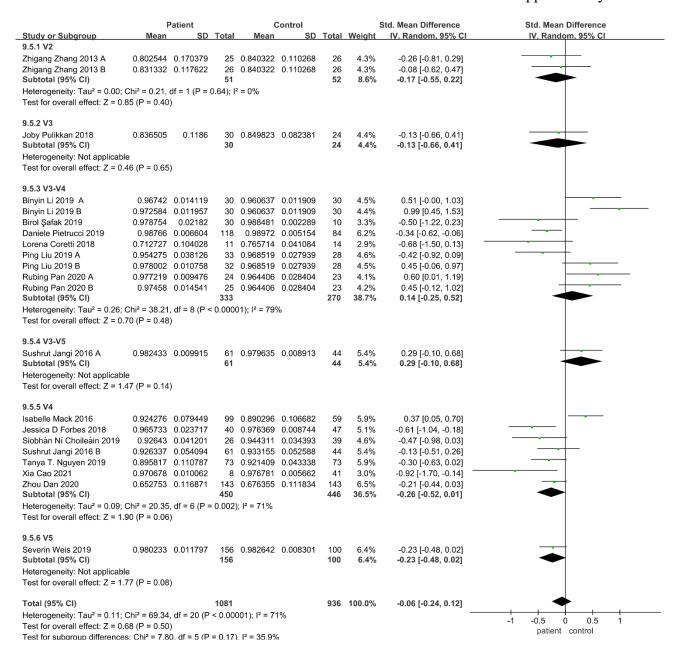
Supplementary Figure 4. Forest plot of the Simpson for the sequencing instrument.

Abbreviations: SMD, standardized mean difference; SD, standard deviation.

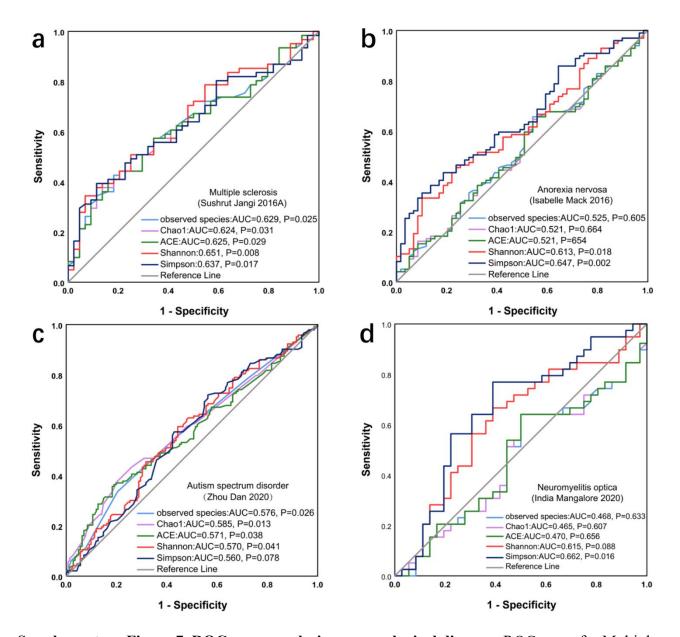


Supplementary Figure 5. Forest plot of the Shannon for the sequencing region. Abbreviations: SMD, standardized mean difference; SD, standard deviation.

Supplementary Material



Supplementary Figure 6. Forest plot of the Simpson for the sequencing region. Abbreviations: SMD, standardized mean difference; SD, standard deviation.



Supplementary Figure 7. ROC curve analysis on neurological diseases. ROC curve for Multiple sclerosis (a), Anorexia nervosa (b), Autism spectrum disorder (c) and Neuromyelitis optica (d). Abbreviations: ROC, receiver operating characteristic; AUC, area under the curve.