

Supplementary Table S4. HC versus ICU-COV(+) (MaAsLin2 test)

feature	metadata	value	coef	stderr	N	N.not.0	pval	qval
1_k_Bacteria.p_Actinobacteria.c_Actinobacteria.o_Actinomycetales.f_Micrococaceae.g_Rothia.s_mucilaginosa.	SampleStatu	Healthy	-6.6724246	0.98128055	42	21	3.57E-08	1.02E-07
2_k_Bacteria.p_Actinobacteria.c_Actinobacteria.o_Actinomycetales.f_Actinomycetaceae.g_Actinomycetaceae.	SampleStatu	Healthy	-6.4952616	1.01633378	42	25	1.33E-07	3.52E-07
3_k_Bacteria.p_Firmicutes.c_Bacilli.o_Lactobacillales.f_Streptococcaceae.g_Streptococcus.	SampleStatu	Healthy	-6.2325409	0.86108871	42	35	8.76E-09	2.74E-08
4_k_Bacteria.p_Fusobacteria.c_Fusobacteria.o_Fusobacteriales.f_Fusobacteriaceae.g_Fusobacterium.	SampleStatu	Healthy	-5.0605709	0.85713464	42	22	6.45E-07	1.54E-06
5_k_Bacteria.p_Proteobacteria.c_Betaproteobacteria.o_Neisseriales.f_Neisseriaceae.g_Neisseria.	SampleStatu	Healthy	-4.3752431	1.02407227	42	16	0.00011604	0.00025687
6_k_Bacteria.p_Firmicutes.c_Bacilli.o_Lactobacillales.f_Carnobacteriaceae.g_Granulicatella.	SampleStatu	Healthy	-3.8302241	0.8914519	42	15	0.00010771	0.00019127
7_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Paraprevotellaceae.g_Prevotella.	SampleStatu	Healthy	-3.7639237	0.71475074	42	18	5.05E-06	1.06E-05
8_k_Bacteria.p_Actinobacteria.c_Coribacteriales.f_Coribacteriaceae.g_Atopobium.	SampleStatu	Healthy	-3.7295556	0.75455511	42	17	1.39E-05	3.80E-05
9_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Prevotellaceae.g_Prevotella.s_melaninogenica.	SampleStatu	Healthy	-3.4911026	0.62413824	42	19	1.76E-06	3.94E-06
10_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Veillonellaceae.g_Veillonella.s_parvula.	SampleStatu	Healthy	-3.1350033	0.92172976	42	16	0.0015338	0.0025687
11_k_Bacteria.p_Proteobacteria.c_Gammaproteobacteria.o_Pasteurellales.f_Pasteurellaceae.g_Haemophilus.s_pasteurellophaga.	SampleStatu	Healthy	-3.0242035	1.11780009	42	21	0.00997375	0.01237706
12_k_Bacteria.p_Proteobacteria.c_Gammaproteobacteria.o_Pasteurellales.f_Pasteurellaceae.g_Aggregatibacter.s_segnis.	SampleStatu	Healthy	-2.7880736	0.90352995	42	11	0.00367617	0.00511683
13_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Peptostreptococcaceae.g_Peptostreptococcus.	SampleStatu	Healthy	-2.6761465	0.82442788	42	11	0.00236901	0.00343673
14_k_Bacteria.p_Firmicutes.c_Erysipelotrichi.o_Erysipelotrichales.f_Erysipelotrichaceae.g_Bulleidia.s_moorei.	SampleStatu	Healthy	-2.6453411	0.58255631	42	16	5.05E-05	9.12E-05
15_k_Bacteria.p_Firmicutes.c_Bacilli.o_Gemellales.f_Gemellaceae.	SampleStatu	Healthy	-2.6063831	0.51793694	42	18	1.07E-05	2.20E-05
16_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Prevotellaceae.g_Prevotella.s_melaninogenica.	SampleStatu	Healthy	-2.3197923	0.91507511	42	8	0.01525594	0.01757867
17_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Lachnospiraceae.g_Oribacterium.	SampleStatu	Healthy	-2.2231695	0.71793214	42	11	0.00356941	0.00503629
18_k_Bacteria.p_Actinobacteria.c_Actinobacteria.o_Actinomycetales.f_Corynebacteriaceae.g_Corynebacterium.	SampleStatu	Healthy	-2.1637992	0.77815578	42	9	0.0082309	0.01059729
19_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Veillonellaceae.g_Veillonella.s_dispar.	SampleStatu	Healthy	-2.1246293	0.81730726	42	13	0.01301367	0.01540573
20_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Lachnospiraceae.g_Moryella.	SampleStatu	Healthy	-2.0760479	0.81982394	42	8	0.01536001	0.01757867
21_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Prevotellaceae.g_Prevotella.s_nanceiensis.	SampleStatu	Healthy	-2.0621589	0.5419849	42	14	0.0004763	0.00076564
22_k_Bacteria.p_Fusobacteria.c_Fusobacteria.o_Fusobacteriales.f_Leptotrichiaceae.g_Leptotrichia.	SampleStatu	Healthy	-2.0504499	0.58403213	42	13	0.00112225	0.00172525
23_k_Bacteria.p_Bacteroidetes.c_Flavobacteriales.f_Flavobacteriaceae.g_Capnocytophaga.	SampleStatu	Healthy	-1.877544	0.63993966	42	10	0.00551875	0.00738222
24_k_Bacteria.p_Bacteroidetes.c_Flavobacteriales.f_Flavobacteriales.f_Weeksella.	SampleStatu	Healthy	-1.8661723	0.62661523	42	10	0.00490763	0.00673981
25_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Veillonellaceae.g_Veillonella.	SampleStatu	Healthy	-1.8399866	0.67024333	42	10	0.00901358	0.01123193
26_k_Bacteria.p_Proteobacteria.c_Epsilonproteobacteria.o_Campylobacteriales.f_Campylobacteraceae.g_Campylobacter.	SampleStatu	Healthy	-1.8264581	0.50360656	42	13	0.00083995	0.00127395
27_k_Bacteria.p_Firmicutes.c_Bacilli.o_Bacillales.f_Staphylococcaceae.g_Staphylococcus.	SampleStatu	Healthy	-1.5950322	0.70117153	42	8	0.02835198	0.03140058
28_k_Bacteria.p_Firmicutes.c_Bacilli.o_Lactobacillales.f_Aerococcaceae.g_Abitrophia.	SampleStatu	Healthy	-1.4808601	0.47273253	42	11	0.00323708	0.00463083
29_k_Bacteria.p_Actinobacteria.c_Actinobacteria.o_Actinomycetales.f_Corynebacteriaceae.	SampleStatu	Healthy	-1.4725362	0.67994237	42	7	0.03635484	0.03983563
30_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Porphyrionomonadaceae.g_Porphyrionomonas.	SampleStatu	Healthy	-1.3990216	0.53197028	42	9	0.01206521	0.01462026
31_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Tissierellaceae.g_Parvimonas.	SampleStatu	Healthy	-1.3663591	0.53355413	42	9	0.01431949	0.01676031
32_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Mogibacteriaceae.g_Mogibacterium.	SampleStatu	Healthy	-1.3089952	0.51678204	42	13	0.04097762	0.04442837
33_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Porphyrionomonadaceae.g_Porphyrionomonas.s_endodontalis.	SampleStatu	Healthy	-1.2896901	0.45841127	42	10	0.0075646	0.0098627
34_k_Bacteria.p_Proteobacteria.c_Betaproteobacteria.o_Neisseriales.f_Neisseria.	SampleStatu	Healthy	-1.232227	0.41717448	42	12	0.0103088	0.01264055
1_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Bacteroidaceae.g_Bacteroides.s_fragilis.	SampleStatu	Healthy	0.54199996	1.8954621	42	5	0.00671009	0.00886077
2_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Lachnospiraceae.g_Ruminococcus.	SampleStatu	Healthy	0.55874714	0.21321746	42	5	0.01234981	0.01479106
3_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Bacteroidaceae.g_Bacteroides.s_eggerthii.	SampleStatu	Healthy	0.64983165	1.8747928	42	5	0.00127534	0.00193176
4_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Bacteroidaceae.g_Bacteroides.s_plebeius.	SampleStatu	Healthy	0.6556585	0.2684629	42	6	0.01910964	0.02139448
5_k_Bacteria.p_Actinobacteria.c_Actinobacteria.o_Actinomycetales.f_Bifidobacteriaceae.g_Bifidobacterium.	SampleStatu	Healthy	0.73241912	0.29539665	42	5	0.01747059	0.0197744
6_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Lachnospiraceae.g_Roseburia.	SampleStatu	Healthy	0.82946391	0.24352174	42	6	0.00151266	0.00225687
7_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Veillonellaceae.g_Phascocartobacterium.	SampleStatu	Healthy	0.83964982	0.218136	42	7	0.00041756	0.0068267
8_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Lachnospiraceae.g_Lachnobacterium.	SampleStatu	Healthy	0.99838231	0.24515921	42	8	0.00022589	0.00038143
9_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Clostridiaceae.	SampleStatu	Healthy	1.03944738	0.28965162	42	7	0.00086968	0.00139983
10_k_Bacteria.p_Actinobacteria.c_Actinobacteria.o_Bifidobacteriales.f_Bifidobacteriaceae.g_Bifidobacterium.s_adolescentis.	SampleStatu	Healthy	1.07599982	0.22690173	42	9	2.68E-05	5.21E-05
11_k_Bacteria.p_Proteobacteria.c_Gammaproteobacteria.o_Enterobacteriales.f_Enterobacteriaceae.	SampleStatu	Healthy	1.15394738	0.41829359	42	9	0.00870861	0.01107392
12_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Lachnospiraceae.g_Ruminococcus.	SampleStatu	Healthy	1.29073239	0.21741449	42	11	5.80E-07	1.42E-06
13_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Paraprevotellaceae.g_Paraprevotella.	SampleStatu	Healthy	1.41101275	0.26144828	42	10	3.32E-06	7.27E-06
14_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Bacteroidaceae.g_Bacteroides.s_caccae.	SampleStatu	Healthy	1.56687447	1.5260882	42	15	8.98E-13	3.70E-12
15_k_Bacteria.p_Actinobacteria.c_Actinobacteria.o_Actinomycetales.f_Corynebacteriaceae.g_Corynebacterium.	SampleStatu	Healthy	1.57119195	0.29075276	42	11	4.69E-06	1.01E-05
16_k_Bacteria.p_Lentisphaerae.c_Lentisphaera.o_Victivallales.f_Victivallaceae.	SampleStatu	Healthy	1.71009233	0.24233197	42	9	0.00024285	0.00040345
17_k_Bacteria.p_Proteobacteria.c_Alphaproteobacteria.o_RF32.	SampleStatu	Healthy	1.82647141	0.39332193	42	9	3.66E-05	6.85E-05
18_k_Archaea.p_Euryarchaeota.c_Methanobacteria.o_Methanobacteriales.f_Methanobrevibacter.	SampleStatu	Healthy	1.8428257	0.28015671	42	12	7.29E-08	1.98E-07
19_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Barnesiellaceae.	SampleStatu	Healthy	1.94538944	0.20437056	42	15	7.85E-12	2.99E-11
20_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Bacteroidaceae.g_Bacteroides.s_uniformis.	SampleStatu	Healthy	1.98581858	0.14707132	42	16	1.74E-16	1.12E-15
21_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Lachnospiraceae.g_Blaustia.	SampleStatu	Healthy	2.10418164	0.15086194	42	17	6.10E-17	4.19E-16
22_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Ruminococcaceae.g_Faecalibacterium.s_prausnitzii.	SampleStatu	Healthy	2.12477793	0.22507777	42	15	8.68E-12	3.19E-11
23_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Prevotellaceae.g_Prevotella.s_copri.	SampleStatu	Healthy	2.15952461	0.73254481	42	7	0.00531752	0.00720664
24_k_Bacteria.p_Proteobacteria.c_Betaproteobacteria.o_Burkholderiales.f_Alcaligenaceae.g_Sutterella.	SampleStatu	Healthy	2.26575683	0.28277683	42	14	7.60E-10	2.53E-09
25_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Lachnospiraceae.g_Lachnospira.	SampleStatu	Healthy	2.29296009	0.37375266	42	12	3.05E-07	7.86E-07
26_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Odoribacteraceae.g_Butyricimonas.	SampleStatu	Healthy	2.47119371	0.36406259	42	13	3.71E-108	1.03E-107
27_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Peptostreptococcaceae.	SampleStatu	Healthy	2.52284514	0.51623811	42	10	1.70E-05	3.37E-05
28_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Ruminococcaceae.g_Oscillospira.	SampleStatu	Healthy	2.61758361	0.17280033	42	17	3.65E-18	3.42E-17
29_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Christensenellaceae.	SampleStatu	Healthy	2.67357109	0.46504193	42	13	1.06E-06	2.44E-06
30_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Lachnospiraceae.g_Anaerostipes.	SampleStatu	Healthy	2.8837501	0.42390279	42	14	3.53E-08	1.02E-07
31_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Ruminococcaceae.g_Oscillospira.	SampleStatu	Healthy	2.88844435	0.27359047	42	17	4.79E-13	2.15E-12
32_k_Bacteria.p_Actinobacteria.c_Coribacteriales.f_Coribacteriaceae.g_Coribacterium.	SampleStatu	Healthy	2.90864621	0.39103591	42	18	4.63E-09	1.49E-08
33_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Veillonellaceae.g_Phascocartobacterium.	SampleStatu	Healthy	2.92778035	0.69598365	42	8	0.00014195	0.00024369
34_k_Bacteria.p_Firmicutes.c_Erysipelotrichi.o_Erysipelotrichales.f_Erysipelotrichaceae.	SampleStatu	Healthy	2.9747878	0.243632	42	16	4.52E-15	2.74E-14
35_k_Bacteria.p_Proteobacteria.c_Deltaproteobacteria.o_Desulfobivibrionales.f_Desulfobivibrionaceae.g_Desulfobivibrio.	SampleStatu	Healthy	2.97617455	0.63599776	42	9	3.27E-05	6.23E-05
36_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Mogibacteriaceae.	SampleStatu	Healthy	3.04436735	0.65695656	42	26	3.77E-05	6.93E-05
37_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Lachnospiraceae.g_Blaustia.	SampleStatu	Healthy	3.0684041	0.18240571	42	17	9.62E-20	9.91E-19
38_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Lachnospiraceae.g_Coproccoccus.	SampleStatu	Healthy	3.08034705	0.25950789	42	16	1.10E-14	5.88E-14
39_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Ruminococcaceae.g_Faecalibacterium.	SampleStatu	Healthy	3.11265468	0.26741439	42	16	2.03E-14	9.96E-14
40_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Odoribacteraceae.g_Odoribacter.	SampleStatu	Healthy	3.28631059	0.22574437	42	17	1.41E-17	1.12E-16
41_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Clostridiaceae.	SampleStatu	Healthy	3.30534088	0.32112997	42	16	8.35E-13	3.58E-12
42_k_Bacteria.p_Tenericutes.c_Mollicutes.o_RF39.	SampleStatu	Healthy	3.46872786	0.58086456	42	15	5.18E-07	1.30E-06
43_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.	SampleStatu	Healthy	3.63837992	0.44572097	42	18	4.76E-10	1.63E-09
44_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Lachnospiraceae.g_Dorea.	SampleStatu	Healthy	3.71732491	0.37646542	42	15	2.78E-12	1.10E-11
45_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Porphyrionomonadaceae.g_Parabacteroides.	SampleStatu	Healthy	4.08827057	0.20354278	42	17	1.67E-22	2.46E-21
46_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Porphyrionomonadaceae.g_Parabacteroides.s_distans.	SampleStatu	Healthy	4.14061401	0.47805372	42	14	1.03E-10	3.65E-10
47_k_Bacteria.p_Proteobacteria.c_Deltaproteobacteria.o_Desulfobivibrionales.f_Desulfobivibrionaceae.g_Bilophia.	SampleStatu	Healthy	4.31130489	0.37632357	42	16	3.32E-14	1.56E-13
48_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Ruminococcaceae.	SampleStatu	Healthy	4.38222594	0.17728863	42	18	2.76E-31	2.84E-29
49_k_Bacteria.p_Verrucomicrobia.c_Verrucomicrobiae.o_Verrucomicrobiales.f_Verrucomicrobiaceae.g_Akkermansia.s_muciniphila.	SampleStatu	Healthy	4.43340883	0.64529897	42	14	2.84E-08	8.61E-08
50_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Bacteroidaceae.g_Bacteroides.s_ovatus.	SampleStatu	Healthy	4.49590328	0.76242569	42	11	6.60E-07	1.55E-06
51_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Ruminococcus.	SampleStatu	Healthy	4.53975407	0.15819605	42	18	2.65E-28	6.83E-27
52_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Clostridiaceae.g_Clostridium.	SampleStatu	Healthy	4.6844651	0.38628836	42	16	5.61E-15	3.21E-14
53_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Ruminococcaceae.g_Ruminococcus.	SampleStatu	Healthy	4.95529673	0.35246918	42	17	3.48E-17	2.56E-16
54_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Lachnospiraceae.g_Lachnospira.	SampleStatu	Healthy	5.06248832	0.30064747	42	17	9.29E-20	9.91E-19
55_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Rikenellaceae.	SampleStatu	Healthy	5.63061896	0.21102905	42	19	3.61E-27	7.44E-26
56_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Ruminococcaceae.	SampleStatu	Healthy	5.71628244	0.19147029	42	18	5.84E-29	2.01E-27
57_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Christensenellaceae.	SampleStatu	Healthy	6.09092599	0.5074376	42	17	7.76E-15	4.20E-14
58_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Lachnospiraceae.	SampleStatu	Healthy	6.75439804	0.45287983	42	25	6.21E-18	5.33E-17
59_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.	SampleStatu	Healthy	8.48481032	0.39862906	42	24	1.99E-23	3.42E-22
60_k_Bacteria.p_Bacteroidetes.c_Bacteroidia.o_Bacteroidales.f_Bacteroidaceae.g_Bacteroides.	SampleStatu	Healthy	9.79881246	0.53866968	42	21	5.99E-21	7.72E-20
61_k_Bacteria.p_Firmicutes.c_Clostridia.o_Clostridiales.f_Lachnospiraceae.	SampleStatu	Healthy	10.055584	0.31772001	42	22	6.21E-30	3.20E-28