

Supplementary Table 1 - Phylum-level comparison of Kazakh and other samples

Phylum	MWU P (KZ vs D)	MWU P (KZ vs E)	MWU P (KZ vs S)	MWU P (KZ vs T)
Tenericutes	1.53E-01	4.74E-02	7.59E-01	9.51E-01
Chloroflexi	2.23E-02	3.36E-05	1.24E-03	7.75E-06
Deinococcus-Thermus	3.93E-02	1.11E-02	3.60E-01	1.16E-01
Chlorobi	7.29E-04	2.62E-03	5.77E-04	6.83E-08
Cyanobacteria	4.45E-04	9.05E-01	3.27E-01	1.87E-04
Spirochaetes	1.91E-03	1.25E-01	2.88E-01	1.82E-04
Synergistetes	2.83E-04	3.92E-05	2.83E-02	1.06E-02
Fusobacteria	4.34E-01	9.05E-02	8.02E-05	1.38E-26
Lentisphaerae	1.45E-08	5.69E-01	2.96E-07	1.99E-16
Euryarchaeota	2.02E-10	3.43E-01	8.61E-02	1.47E-16
Verrucomicrobia	8.21E-02	8.13E-04	7.59E-02	1.93E-12
Actinobacteria	1.17E-31	2.25E-17	8.49E-03	1.63E-12
Bacteroidetes	1.15E-30	9.06E-06	5.94E-11	1.76E-34
Firmicutes	2.38E-21	1.51E-01	6.16E-11	4.65E-04
Proteobacteria	2.81E-05	2.57E-04	4.62E-03	2.18E-10
Unknown phylum	2.82E-22	1.53E-02	1.53E-22	2.76E-38

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MWU P (KZ vs SE)	Median KZ abu	Median US	Median DK a	Median ES	Median CN	Median SE abu
3.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.79E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.58E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7.54E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9.14E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.96E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5.74E-04	0.00E+00	0.00E+00	0.00E+00	4.83E-06	4.83E-05	0.00E+00
4.46E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.12E-03	3.78E-05	0.00E+00	4.97E-05	4.70E-06	0.00E+00	1.83E-04
2.86E-08	3.97E-05	1.65E-05	3.49E-04	2.27E-05	0.00E+00	1.72E-03
7.31E-10	7.80E-03	1.02E-03	3.13E-03	1.37E-02	2.43E-03	1.85E-02
1.47E-15	1.69E-01	5.65E-01	2.16E-01	2.63E-01	4.18E-01	8.26E-02
6.02E-35	1.61E-01	7.23E-02	1.53E-01	2.23E-01	1.32E-01	3.51E-01
3.53E-11	8.30E-03	4.41E-03	5.08E-03	5.70E-03	1.51E-02	2.94E-03
2.11E-09	6.08E-01	3.35E-01	5.77E-01	4.39E-01	3.43E-01	5.09E-01

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Fraction KZ	Fraction US	Fraction DK	Fraction ES	Fraction CN	Fraction SE	MWU FDR (KZ)
2.98E-02	7.04E-03	7.75E-03	2.51E-02	2.99E-02	0.00E+00	1.74E-01
5.36E-02	7.04E-03	2.58E-03	8.36E-03	0.00E+00	0.00E+00	3.16E-02
5.95E-02	1.41E-02	1.32E-01	8.08E-02	2.99E-02	1.38E-02	5.14E-02
7.74E-02	0.00E+00	2.33E-02	1.67E-02	0.00E+00	1.38E-02	1.24E-03
8.33E-02	0.00E+00	8.53E-02	5.85E-02	1.63E-02	6.90E-02	8.41E-04
8.33E-02	7.04E-03	1.29E-01	5.85E-02	1.63E-02	7.59E-02	2.95E-03
1.73E-01	4.23E-02	6.20E-02	1.00E-01	2.50E-01	1.38E-02	6.01E-04
3.57E-01	3.59E-01	3.00E-01	5.18E-01	7.42E-01	1.66E-01	4.34E-01
4.94E-01	2.04E-01	4.86E-01	2.84E-01	1.63E-01	1.03E-01	4.11E-08
5.95E-01	2.68E-01	5.99E-01	5.24E-01	2.50E-01	6.55E-01	6.88E-10
7.56E-01	5.85E-01	8.11E-01	6.43E-01	4.16E-01	8.62E-01	9.97E-02
1.00E+00	9.93E-01	1.00E+00	1.00E+00	9.97E-01	1.00E+00	1.99E-30
1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	9.81E-30
1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.01E-20
1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	6.82E-05
1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.60E-21

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| MWU FDR (KZ vs SE) |
|--------------------|--------------------|--------------------|--------------------|
| 9.00E-02 | 7.59E-01 | 9.51E-01 | 4.73E-02 |
| 1.86E-04 | 3.36E-03 | 1.47E-05 | 7.83E-03 |
| 2.64E-02 | 4.56E-01 | 1.47E-01 | 4.73E-02 |
| 7.11E-03 | 1.83E-03 | 1.44E-07 | 1.50E-02 |
| 9.05E-01 | 4.43E-01 | 2.96E-04 | 8.48E-01 |
| 1.98E-01 | 4.21E-01 | 2.96E-04 | 9.17E-01 |
| 1.86E-04 | 5.37E-02 | 1.44E-02 | 6.67E-06 |
| 1.56E-01 | 3.05E-04 | 8.75E-26 | 1.15E-03 |
| 6.36E-01 | 1.41E-06 | 7.56E-16 | 2.68E-13 |
| 4.66E-01 | 1.36E-01 | 6.98E-16 | 3.82E-03 |
| 2.58E-03 | 1.31E-01 | 5.23E-12 | 7.35E-08 |
| 4.27E-16 | 1.79E-02 | 5.15E-12 | 2.63E-09 |
| 8.61E-05 | 3.90E-10 | 1.67E-33 | 1.33E-14 |
| 2.21E-01 | 3.90E-10 | 6.80E-04 | 1.08E-33 |
| 9.78E-04 | 1.10E-02 | 5.19E-10 | 1.59E-10 |
| 3.22E-02 | 2.91E-21 | 5.24E-37 | 6.34E-09 |