Table 1 Comparisons of community variability as a function of different metadata factors. Values indicate median weighted (WUF) and unweighted (UUF) UniFrac distance across individuals. Values in bold indicate statistically significant differences (uncorrected p < 0.05) based on the non parametric Mann-Whitney U test as implemented R. Numbers in parentheses indicate the number of individuals belonging to each group.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Median UniFrac Distance | | | | | | | |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Female (48)* | *Male (30)* | *Female (48)* | *Male (26)* | *Female (35)* | *Male (25)* | *Female (50)* | *Male (28)* |
| Gender – WUF | **0.264** | **0.187** | 0.286 | 0.303 | 0.327 | 0.310 | 0.308 | 0.303 |
| Gender – UUF | 0.592 | 0.588 | **0.481** | **0.452** | 0.612 | 0.611 | 0.373 | 0.365 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (19)* | *No (61)* | *Yes (17)* | *No (58)* | *Yes (13)* | *No (48)* | *Yes (18)* | *No (62)* |
| Antibiotic use – WUF | 0.248 | 0.237 | 0.270 | 0.311 | **0.368** | **0.295** | 0.308 | 0.307 |
| Antibiotic use – UUF | **0.604** | **0.585** | 0.470 | 0.478 | **0.632** | **0.605** | **0.403** | **0.361** |
|  |  | |  | |  | |  | |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (26)* | *No (22)* | *Yes (27)* | *No (21)* | *Yes (20)* | *No (15)* | *Yes (28)* | *No (22)* |
| !Hormonal birth control – WUF | 0.270 | 0.256 | 0.285 | 0.287 | 0.330 | 0.327 | 0.306 | 0.308 |
| !Hormonal birth control – UUF | 0.593 | 0.582 | 0.476 | 0.485 | **0.624** | **0.596** | 0.377 | 0.365 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (32)* | *No (47)* | *Yes (30)* | *No (45)* | *Yes (26)* | *No (35)* | *Yes (32)* | *No (47)* |
| Lives with dogs – WUF | 0.242 | 0.248 | 0.308 | 0.283 | 0.309 | 0.321 | 0.309 | 0.306 |
| Lives with dogs – UUF | 0.595 | 0.586 | 0.479 | 0.476 | 0.607 | 0.611 | 0.359 | 0.373 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (17)* | *No (62)* | *Yes (15)* | *No (60)* | *Yes (15)* | *No (46)* | *Yes (18)* | *No (61)* |
| Lives with cats – WUF | 0.222 | 0.246 | 0.306 | 0.286 | 0.326 | 0.313 | 0.314 | 0.306 |
| Lives with cats – UUF | 0.594 | 0.590 | 0.491 | 0.473 | 0.615 | 0.611 | 0.362 | 0.368 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (28)* | *No (51)* | *Yes (27)* | *No (48)* | *Yes (24)* | *No (37)* | *Yes (30)* | *No (49)* |
| Bites fingernails – WUF | 0.258 | 0.237 | 0.315 | 0.284 | 0.313 | 0.321 | **0.333** | **0.300** |
| Bites fingernails – UUF | 0.593 | 0.587 | 0.476 | 0.478 | 0.611 | 0.612 | **0.385** | **0.358** |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (38)* | *No (41)* | *Yes (35)* | *No (40)* | *Yes (27)* | *No (34)* | *Yes (37)* | *No (42)* |
| Use fabric softener – WUF | 0.248 | 0.223 | 0.287 | 0.298 | 0.329 | 0.310 | 0.301 | 0.310 |
| Use fabric softener – UUF | 0.586 | 0.594 | 0.480 | 0.469 | 0.610 | 0.613 | 0.382 | 0.364 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (25)* | *No (54)* | *Yes (25)* | *No (50)* | *Yes (20)* | *No (41)* | *Yes (26)* | *No (53)* |
| Daily multivitamins – WUF | 0.246 | 0.245 | 0.287 | 0.298 | 0.284 | 0.327 | 0.298 | 0.310 |
| Daily multivitamins – UUF | 0.587 | 0.592 | 0.468 | 0.481 | 0.609 | 0.615 | 0.390 | 0.359 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (19)* | *No (60)* | *Yes (18)* | *No (57)* | *Yes (15)* | *No (46)* | *Yes (20)* | *No (59)* |
| Other supplements – WUF | 0.238 | 0.246 | 0.273 | 0.306 | 0.291 | 0.326 | 0.295 | 0.310 |
| Other supplements – UUF | 0.593 | 0.590 | 0.460 | 0.482 | 0.611 | 0.611 | 0.359 | 0.377 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (8)* | *No (71)* | *Yes (7)* | *No (68)* | *Yes (8)* | *No (53)* | *Yes (8)* | *No (71)* |
| Lactose intolerant – WUF | 0.238 | 0.246 | 0.301 | 0.286 | 0.331 | 0.316 | 0.340 | 0.306 |
| Lactose intolerant – UUF | 0.591 | 0.592 | 0.469 | 0.478 | 0.613 | 0.611 | 0.378 | 0.362 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | Caucasian (66) | Other (12) | Caucasian (60) | Other (14) | Caucasian (49) | Other (11) | Caucasian (64) | Other (14) |
| Race/ethnicity – WUF | 0.242 | 0.280 | 0.286 | 0.334 | 0.310 | 0.327 | 0.308 | 0.305 |
| Race/ethnicity – UUF | 0.591 | 0.581 | 0.474 | 0.496 | 0.611 | 0.611 | 0.365 | 0.373 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (11)* | *No (68)* | *Yes (11)* | *No (64)* | *Yes (8)* | *No (53)* | *Yes (13)* | *No (66)* |
| On campus housing – WUF | 0.238 | 0.246 | 0.348 | 0.285 | **0.263** | **0.326** | 0.306 | 0.308 |
| On campus housing – UUF | 0.597 | 0.591 | 0.525 | 0.473 | 0.602 | 0.612 | 0.382 | 0.361 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (28)* | *No (51)* | *Yes (26)* | *No (49)* | *Yes (26)* | *No (35)* | *Yes (27)* | *No (52)* |
| OTC med. for acne – WUF | 0.246 | 0.237 | 0.273 | 0.315 | 0.326 | 0.316 | 0.301 | 0.308 |
| OTC med. for acne – UUF | 0.586 | 0.593 | 0.468 | 0.482 | 0.612 | 0.611 | 0.390 | 0.361 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (10)* | *No (69)* | *Yes (9)* | *No (66)* | *Yes (9)* | *No (52)* | *Yes (8)* | *No (71)* |
| Tonsils removed – WUF | 0.245 | 0.246 | 0.313 | 0.289 | 0.278 | 0.323 | 0.314 | 0.306 |
| Tonsils removed – UUF | 0.582 | 0.592 | 0.478 | 0.477 | 0.612 | 0.611 | 0.363 | 0.368 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (57)* | *No (22)* | *Yes (55)* | *No (20)* | *Yes (45)* | *No (16)* | *Yes (57)* | *No (22)* |
| Chickenpox – WUF | 0.246 | 0.227 | 0.301 | 0.264 | 0.320 | 0.318 | 0.307 | 0.308 |
| Chickenpox – UUF | 0.592 | 0.588 | 0.476 | 0.481 | 0.612 | 0.610 | 0.361 | 0.377 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (23)* | *No (56)* | *Yes (23)* | *No (52)* | *Yes (19)* | *No (42)* | *Yes (23)* | *No (55)* |
| \*Use medication – WUF | 0.246 | 0.238 | 0.301 | 0.290 | 0.329 | 0.313 | 0.307 | 0.308 |
| \*Use medication – UUF | 0.594 | 0.589 | 0.482 | 0.473 | 0.621 | 0.608 | 0.383 | 0.359 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (16)* | *No (60)* | *Yes (16)* | *No (56)* | *Yes (12)* | *No (46)* | *Yes (16)* | *No (61)* |
| Born via C-section – WUF | **0.290** | **0.238** | 0.288 | 0.303 | 0.354 | 0.305 | 0.309 | 0.308 |
| Born via C-section – UUF | 0.596 | 0.590 | 0.469 | 0.479 | 0.629 | 0.608 | **0.399** | **0.359** |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (9)* | *No (70)* | *Yes (10)* | *No (65)* | *Yes (8)* | *No (53)* | *Yes (10)* | *No (69)* |
| Asthma – WUF | 0.223 | 0.246 | 0.317 | 0.294 | 0.259 | 0.321 | 0.270 | 0.308 |
| Asthma – UUF | 0.564 | 0.592 | 0.491 | 0.470 | 0.594 | 0.612 | 0.363 | 0.368 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (34)* | *No (44)* | *Yes (31)* | *No (43)* | *Yes (27)* | *No (34)* | *Yes (35)* | *No (43)* |
| Seasonal allergies – WUF | **0.257** | **0.234** | 0.294 | 0.295 | 0.329 | 0.310 | 0.308 | 0.306 |
| Seasonal allergies – UUF | 0.593 | 0.591 | 0.468 | 0.484 | 0.615 | 0.609 | 0.362 | 0.368 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (13)* | *No (66)* | *Yes (14)* | *No (61)* | *Yes (11)* | *No (50)* | *Yes (12)* | *No (67)* |
| Drug allergies – WUF | 0.261 | 0.242 | 0.275 | 0.295 | 0.292 | 0.320 | 0.309 | 0.307 |
| Drug allergies – UUF | 0.587 | 0.592 | 0.457 | 0.480 | 0.614 | 0.611 | 0.373 | 0.362 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (20)* | *No (59)* | *Yes (18)* | *No (57)* | *Yes (16)* | *No (45)* | *Yes (19)* | *No (60)* |
| Pet allergies – WUF | 0.242 | 0.246 | 0.291 | 0.294 | 0.337 | 0.311 | 0.306 | 0.308 |
| Pet allergies – UUF | 0.593 | 0.591 | 0.469 | 0.478 | 0.615 | 0.610 | 0.361 | 0.377 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (9)* | *No (70)* | *Yes (8)* | *No (67)* | *Yes (8)* | *No (53)* | *Yes (8)* | *No (71)* |
| Poison ivy/oak allergies – WUF | 0.262 | 0.245 | 0.261 | 0.295 | 0.327 | 0.320 | 0.320 | 0.307 |
| Poison ivy/oak allergies – UUF | 0.604 | 0.591 | 0.474 | 0.478 | 0.610 | 0.612 | 0.379 | 0.362 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (12)* | *No (66)* | *Yes (11)* | *No (63)* | *Yes (9)* | *No (52)* | *Yes (12)* | *No (66)* |
| #Skin condition – WUF | 0.230 | 0.246 | 0.295 | 0.287 | 0.278 | 0.323 | 0.329 | 0.303 |
| #Skin condition – UUF | 0.589 | 0.591 | 0.465 | 0.478 | 0.593 | 0.613 | 0.344 | 0.371 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (49)* | *No (31)* | *Yes (50)* | *No (25)* | *Yes (39)* | *No (22)* | *Yes (50)* | *No (30)* |
| Reported illness – WUF | 0.246 | 0.231 | 0.290 | 0.295 | 0.329 | 0.297 | 0.307 | 0.308 |
| Reported illness – UUF | 0.590 | 0.593 | 0.479 | 0.470 | 0.614 | 0.587 | 0.377 | 0.359 |

1weighted UniFrac distance

2unweighted UniFrac distance

!analysis restricted to females.

\*category includes a wide variety of prescription and over the counter medications.

#skin conditions include eczema, rosacea, psoriasis, or subacute cutaneous lupus erythematosus.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Forehead | | | Gut | | | Palm | | | Tongue | | |
|  | CUB (33) | NAU (33) | NCS (14) | CUB (30) | NAU (34) | NCS (11) | CUB (29) | NAU (20) | NCS (12) | CUB (31) | NAU (35) | NCS (14) |
| University – WUF | 0.245 | 0.248 | 0.238 | 0.261 | 0.305 | 0.348 | 0.321 | 0.335 | 0.268 | 0.307 | 0.308 | 0.301 |
| University – UUF | 0.587 | 0.576 | 0.601 | 0.470 | 0.473 | 0.514 | 0.611 | 0.609 | 0.616 | 0.362 | 0.378 | 0.372 |