Table 1 Comparisons of community variability as a function of different metadata factors. Values indicate mean weighted (WUF) and unweighted (UUF) UniFrac distance across individuals. Values in bold indicate statistically significant differences (uncorrected p < 0.05) based on Welch two sample t-tests as implemented in R. Numbers in parentheses indicate the number of individuals belonging to each group.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Mean UniFrac Distance | | | | | | | |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Female (48)* | *Male (30)* | *Female (48)* | *Male (26)* | *Female (35)* | *Male (25)* | *Female (50)* | *Male (28)* |
| Gender – WUF | **0.281** | **0.201** | 0.351 | 0.322 | 0.335 | 0.312 | 0.339 | 0.331 |
| Gender – UUF | 0.593 | 0.584 | **0.506** | **0.469** | 0.608 | 0.601 | 0.379 | 0.369 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (19)* | *No (61)* | *Yes (17)* | *No (58)* | *Yes (13)* | *No (48)* | *Yes (18)* | *No (62)* |
| Antibiotic use – WUF | 0.274 | 0.242 | 0.319 | 0.345 | **0.362** | **0.316** | 0.353 | 0.333 |
| Antibiotic use – UUF | **0.607** | **0.583** | 0.488 | 0.494 | **0.624** | **0.600** | **0.413** | **0.363** |
|  |  | |  | |  | |  | |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (26)* | *No (22)* | *Yes (27)* | *No (21)* | *Yes (20)* | *No (15)* | *Yes (28)* | *No (22)* |
| !Hormonal birth control – WUF | 0.291 | 0.269 | 0.340 | 0.365 | 0.339 | 0.330 | 0.335 | 0.345 |
| !Hormonal birth control – UUF | 0.593 | 0.593 | 0.508 | 0.503 | **0.624** | **0.586** | 0.378 | 0.380 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (32)* | *No (47)* | *Yes (30)* | *No (45)* | *Yes (26)* | *No (35)* | *Yes (32)* | *No (47)* |
| Lives with dogs – WUF | 0.256 | 0.247 | 0.347 | 0.334 | 0.317 | 0.333 | 0.335 | 0.338 |
| Lives with dogs – UUF | 0.592 | 0.588 | 0.493 | 0.492 | 0.599 | 0.610 | 0.363 | 0.378 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (17)* | *No (62)* | *Yes (15)* | *No (60)* | *Yes (15)* | *No (46)* | *Yes (18)* | *No (61)* |
| Lives with cats – WUF | 0.243 | 0.253 | 0.333 | 0.341 | 0.325 | 0.326 | 0.344 | 0.335 |
| Lives with cats – UUF | 0.585 | 0.591 | 0.497 | 0.491 | 0.598 | 0.607 | 0.365 | 0.375 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (28)* | *No (51)* | *Yes (27)* | *No (48)* | *Yes (24)* | *No (37)* | *Yes (30)* | *No (49)* |
| Bites fingernails – WUF | 0.251 | 0.251 | 0.354 | 0.330 | 0.324 | 0.327 | 0.357 | 0.325 |
| Bites fingernails – UUF | 0.590 | 0.589 | 0.494 | 0.491 | 0.609 | 0.602 | **0.387** | **0.363** |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (38)* | *No (41)* | *Yes (35)* | *No (40)* | *Yes (27)* | *No (34)* | *Yes (37)* | *No (42)* |
| Use fabric softener – WUF | 0.264 | 0.239 | 0.333 | 0.345 | 0.326 | 0.326 | 0.333 | 0.341 |
| Use fabric softener – UUF | 0.589 | 0.589 | 0.497 | 0.488 | 0.598 | 0.611 | 0.380 | 0.366 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (25)* | *No (54)* | *Yes (25)* | *No (50)* | *Yes (20)* | *No (41)* | *Yes (26)* | *No (53)* |
| Daily multivitamins – WUF | 0.247 | 0.253 | 0.327 | 0.345 | 0.315 | 0.331 | 0.332 | 0.339 |
| Daily multivitamins – UUF | 0.583 | 0.593 | 0.483 | 0.497 | 0.603 | 0.606 | 0.385 | 0.366 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (19)* | *No (60)* | *Yes (18)* | *No (57)* | *Yes (15)* | *No (46)* | *Yes (20)* | *No (59)* |
| Other supplements – WUF | 0.234 | 0.256 | 0.320 | 0.345 | 0.313 | 0.330 | 0.321 | 0.342 |
| Other supplements – UUF | 0.588 | 0.590 | 0.486 | 0.494 | 0.610 | 0.603 | 0.367 | 0.374 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (8)* | *No (71)* | *Yes (7)* | *No (68)* | *Yes (8)* | *No (53)* | *Yes (8)* | *No (71)* |
| Lactose intolerant – WUF | 0.272 | 0.248 | 0.319 | 0.341 | 0.324 | 0.326 | 0.361 | 0.334 |
| Lactose intolerant – UUF | 0.579 | 0.591 | 0.482 | 0.493 | 0.603 | 0.605 | 0.380 | 0.372 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | Caucasian (66) | Other (12) | Caucasian (60) | Other (14) | Caucasian (49) | Other (11) | Caucasian (64) | Other (14) |
| Race/ethnicity – WUF | 0.246 | 0.279 | 0.331 | 0.374 | 0.325 | 0.329 | 0.337 | 0.341 |
| Race/ethnicity – UUF | 0.589 | 0.589 | 0.489 | 0.511 | 0.607 | 0.590 | 0.374 | 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 | 0.257 | 0.250 | 0.369 | 0.334 | **0.280** | **0.333** | 0.353 | 0.334 |
| On campus housing – UUF | 0.603 | 0.587 | 0.510 | 0.489 | 0.608 | 0.605 | 0.378 | 0.372 |
|  |  |  |  |  |  |  |  |  |
|  | 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 | 0.265 | 0.243 | **0.304** | **0.358** | 0.321 | 0.330 | 0.339 | 0.336 |
| OTC med. for acne – UUF | 0.585 | 0.592 | **0.476** | **0.501** | 0.600 | 0.608 | 0.382 | 0.367 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (10)* | *No (69)* | *Yes (9)* | *No (66)* | *Yes (9)* | *No (52)* | *Yes (8)* | *No (71)* |
| Tonsils removed – WUF | 0.256 | 0.250 | 0.371 | 0.335 | 0.319 | 0.327 | 0.338 | 0.337 |
| Tonsils removed – UUF | 0.579 | 0.591 | 0.505 | 0.491 | 0.596 | 0.607 | 0.369 | 0.373 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (57)* | *No (22)* | *Yes (55)* | *No (20)* | *Yes (45)* | *No (16)* | *Yes (57)* | *No (22)* |
| Chickenpox – WUF | 0.253 | 0.244 | 0.346 | 0.319 | 0.326 | 0.326 | 0.334 | 0.344 |
| Chickenpox – UUF | 0.589 | 0.590 | 0.494 | 0.489 | 0.603 | 0.611 | 0.371 | 0.375 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (23)* | *No (56)* | *Yes (23)* | *No (52)* | *Yes (19)* | *No (42)* | *Yes (23)* | *No (55)* |
| \*Use medication – WUF | 0.260 | 0.247 | 0.320 | 0.348 | 0.336 | 0.321 | 0.334 | 0.339 |
| \*Use medication – UUF | 0.595 | 0.587 | 0.497 | 0.490 | 0.613 | 0.602 | 0.385 | 0.365 |
|  |  |  |  |  |  |  |  |  |
|  | 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 | **0.289** | **0.242** | 0.334 | 0.347 | 0.344 | 0.320 | 0.342 | 0.338 |
| Born via C-section – UUF | 0.598 | 0.586 | 0.492 | 0.495 | 0.612 | 0.602 | **0.398** | **0.367** |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (9)* | *No (70)* | *Yes (10)* | *No (65)* | *Yes (8)* | *No (53)* | *Yes (10)* | *No (69)* |
| Asthma – WUF | 0.252 | 0.251 | 0.331 | 0.340 | 0.312 | 0.328 | **0.298** | **0.342** |
| Asthma – UUF | 0.570 | 0.592 | 0.496 | 0.492 | 0.597 | 0.606 | 0.360 | 0.374 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (34)* | *No (44)* | *Yes (31)* | *No (43)* | *Yes (27)* | *No (34)* | *Yes (35)* | *No (43)* |
| Seasonal allergies – WUF | 0.266 | 0.238 | 0.339 | 0.342 | 0.339 | 0.315 | 0.335 | 0.339 |
| Seasonal allergies – UUF | 0.586 | 0.592 | 0.488 | 0.497 | 0.609 | 0.602 | 0.368 | 0.378 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (13)* | *No (66)* | *Yes (14)* | *No (61)* | *Yes (11)* | *No (50)* | *Yes (12)* | *No (67)* |
| Drug allergies – WUF | **0.295** | **0.242** | 0.301 | 0.348 | 0.317 | 0.328 | 0.333 | 0.337 |
| Drug allergies – UUF | 0.587 | 0.590 | 0.472 | 0.497 | 0.603 | 0.605 | 0.373 | 0.372 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (20)* | *No (59)* | *Yes (18)* | *No (57)* | *Yes (16)* | *No (45)* | *Yes (19)* | *No (60)* |
| Pet allergies – WUF | 0.259 | 0.248 | 0.344 | 0.338 | 0.338 | 0.322 | 0.323 | 0.341 |
| Pet allergies – UUF | 0.589 | 0.589 | 0.492 | 0.493 | 0.610 | 0.603 | 0.361 | 0.376 |
|  |  |  |  |  |  |  |  |  |
|  | 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 | 0.284 | 0.247 | 0.304 | 0.343 | 0.336 | 0.324 | 0.342 | 0.336 |
| Poison ivy/oak allergies – UUF | 0.605 | 0.587 | 0.474 | 0.495 | 0.616 | 0.603 | 0.381 | 0.371 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (12)* | *No (66)* | *Yes (11)* | *No (63)* | *Yes (9)* | *No (52)* | *Yes (12)* | *No (66)* |
| #Skin condition – WUF | 0.238 | 0.252 | 0.319 | 0.340 | 0.292 | 0.332 | 0.355 | 0.333 |
| Skin condition – UUF | 0.588 | 0.589 | **0.471** | **0.495** | 0.596 | 0.607 | 0.356 | 0.375 |
|  |  |  |  |  |  |  |  |  |
|  | Forehead | | Gut | | Palm | | Tongue | |
|  | *Yes (49)* | *No (31)* | *Yes (50)* | *No (25)* | *Yes (39)* | *No (22)* | *Yes (50)* | *No (30)* |
| Reported illness – WUF | 0.250 | 0.250 | 0.331 | 0.354 | 0.334 | 0.311 | 0.337 | 0.339 |
| Reported illness – UUF | 0.588 | 0.591 | 0.492 | 0.494 | 0.612 | 0.592 | 0.377 | 0.370 |

1weighted UniFrac distance

2unweighted UniFrac distance

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Forehead** | | | **Gut** | | | **Palm** | | | **Tongue** | | |
|  | CUB | NAU | NCS | CUB | NAU | NCS | CUB | NAU | NCS | CUB | NAU | NCS |
| University – weighted UniFrac |  |  |  |  |  |  |  |  |  |  |  |  |
| University – unweighted UniFrac |  |  |  |  |  |  |  |  |  |  |  |  |