CORRECTION

# Correction: Russians are the fastest 100-km ultra-marathoners in the world

**Beat Knechtle, Pantelis Theodoros Nikolaidis, Fabio Valeri**

There is an error in the legend for Fig 1. Please see the correct legend for Fig 1 here.

There is an error in the legend of Fig 2. Please find the correct legend for Fig 2 here.
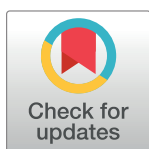
There is an omission of the $R^2$ value in the legend of Table 10. Please see the correct legend for Table 10 here.

There is an omission of the $R^2$ value in the legend of Table 11. Please see the correct legend for Table 11 here.

There is an omission of the $R^2$ value in the legend of Table 12. Please see the correct legend for Table 12 here.

There is an omission of the $R^2$ value in the legend of Table 13. There are two missing lines in Table 13 (race abroad and race abroad*female). Please see the correct Table 13 and correct legend below.

There is an omission of the $R^2$ value and an error in the legend of Table 14. There are two missing lines in Table 14 (race abroad and race abroad*female). Please see the correct Table 14 and correct legend below.
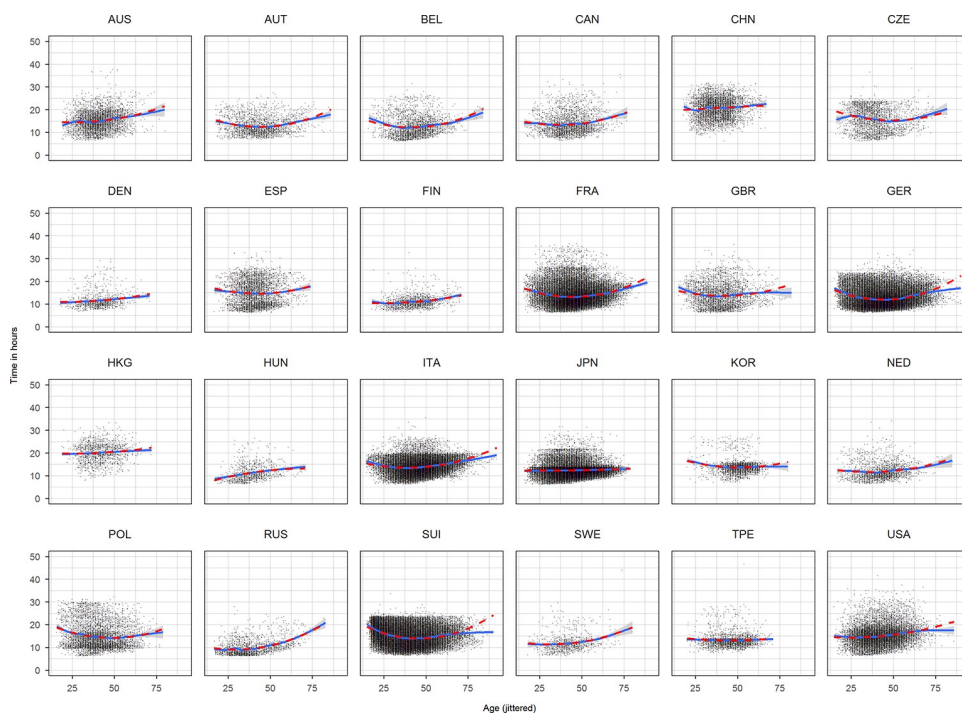
**Fig 1. Scatterplots time against age for each nationality based on the complete dataset.** Age has been jittered.
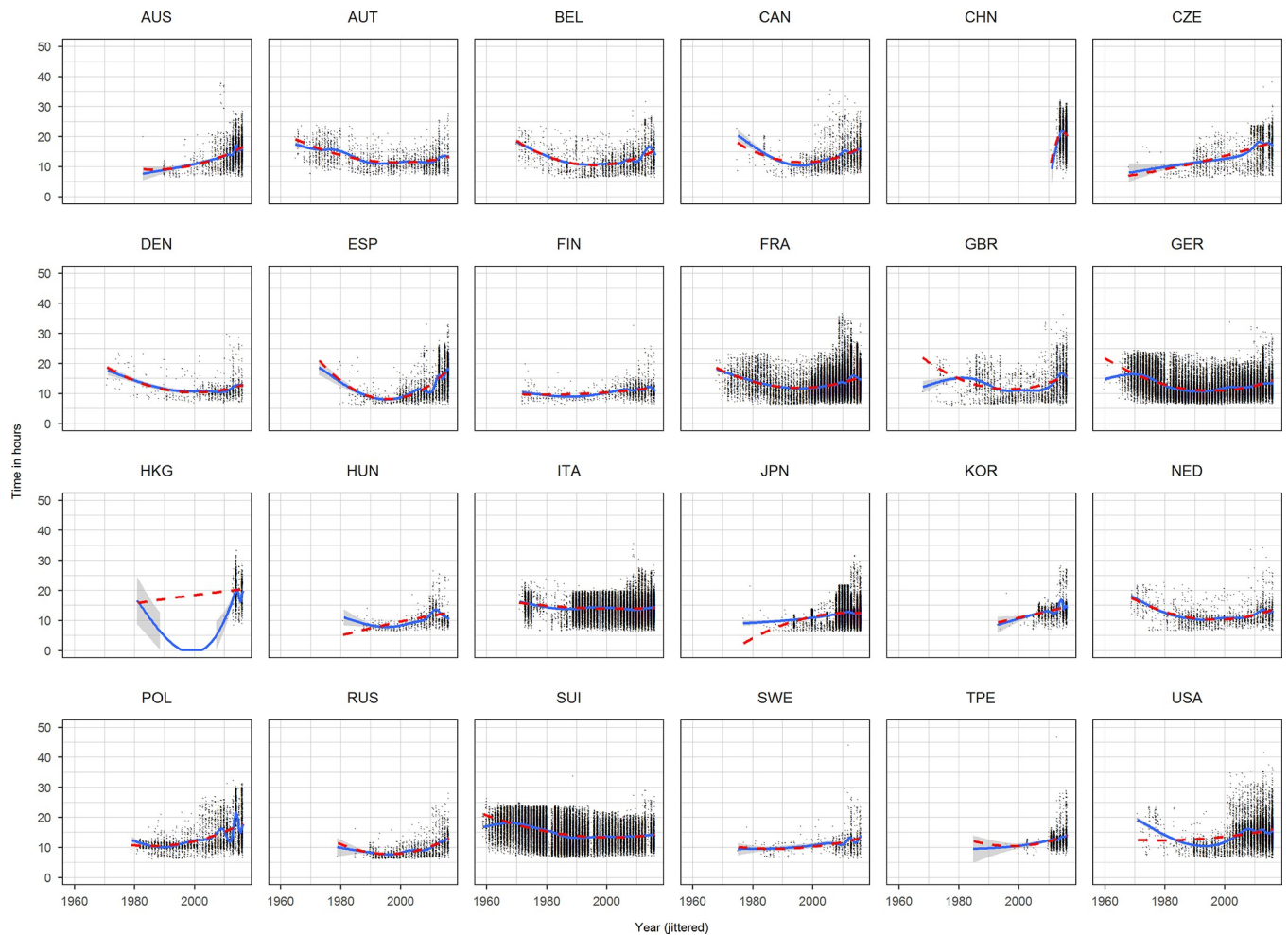
https://doi.org/10.1371/journal.pone.0272170.g001

**Fig 2. Scatterplots time against race year for each nationality based on the complete dataset.** Race year has been jittered.

https://doi.org/10.1371/journal.pone.0272170.g002

In Table 16, column 3 was erroneously duplicated from column 4. Please see the correct Table 16 below.

The authors provide the following additional information:

After the publication of this article [1], concerns were raised regarding the data analysis presented in [1]. The dataset from 1959 to 2000 is limited and an additional data analysis including only races held since 2000 was performed. For the regression, the median centered age and running year was used. Median of age changed from 44 to 46 and year changed from 2009 to 2012. The number of finishes decreased 32% (from 307,871 to 209,776) by removing finishes before 2000, however, the analysis remains robust. This can be shown by comparing the originally published Fig 9 with the new analysis presented in S1 Fig below.

There are minor changes in the ranks but the main conclusions about Russia and Japan remain the same.

All other results (estimates from regression, distributions, etc.) are only slightly affected. For example, comparing the time estimates in Fig 9 (A to C) and S1 Fig (A to C), there is a shift towards higher running time in each regression type. This can be explained by increased participation of amateur after 1990. But this does not affect the ranks.

**Table 10. Results from linear regression with complete dataset time = sex×(year+year$^2$)+sex×(age+age$^2$)+sex×nationality and referenced to male, age 44, year 2009 and nationality Australia.** $R^2 = 0.26$.

| | Coefficent | Standard error | P-Value |
|---|---|---|---|
| Intercept | 13.879 | 0.0600 | 0.000 |
| Sex (female) | 0.892 | 0.1254 | 0.000 |
| Age | 0.012 | 0.0006 | 0.000 |
| Age squared | 0.0033 | 0.0000 | 0.000 |
| Year | 0.156 | 0.0013 | 0.000 |
| Year squared | 0.0062 | 0.0000 | 0.000 |
| FemalexAge | 0.022 | 0.0019 | 0.000 |
| FemalexAge squared | -0.0066 | 0.0001 | 0.000 |
| FemalexYear | 0.014 | 0.0038 | 0.000 |
| FemalexYear squared | 0.0016 | 0.0001 | 0.000 |
| AUT | -1.922 | 0.0976 | 0.000 |
| BEL | -1.713 | 0.0905 | 0.000 |
| CAN | -0.976 | 0.0967 | 0.000 |
| CHN | 5.199 | 0.0808 | 0.000 |
| CZE | 1.104 | 0.0927 | 0.000 |
| DEN | -2.806 | 0.1301 | 0.000 |
| ESP | -0.069 | 0.0801 | 0.389 |
| FIN | -3.634 | 0.1126 | 0.000 |
| FRA | -0.898 | 0.0621 | 0.000 |
| GBR | -0.597 | 0.0867 | 0.000 |
| GER | -2.075 | 0.0634 | 0.000 |
| HKG | 4.708 | 0.1152 | 0.000 |
| HUN | -3.176 | 0.1334 | 0.000 |
| ITA | -0.378 | 0.0629 | 0.000 |
| JPN | -2.764 | 0.0613 | 0.000 |
| KOR | -1.425 | 0.0895 | 0.000 |
| NED | -2.503 | 0.0985 | 0.000 |
| POL | 0.220 | 0.0758 | 0.004 |
| RUS | -4.524 | 0.1064 | 0.000 |
| SUI | -0.320 | 0.0642 | 0.000 |
| SWE | -2.678 | 0.1339 | 0.000 |
| TPE | -1.956 | 0.0881 | 0.000 |
| USA | 0.079 | 0.0676 | 0.244 |
| AUTxFemale | -0.705 | 0.2708 | 0.009 |
| BELxFemale | -0.245 | 0.2660 | 0.357 |
| CANxFemale | 0.330 | 0.1868 | 0.077 |
| CHNxFemale | -0.070 | 0.1939 | 0.718 |
| CZExFemale | 0.629 | 0.2280 | 0.006 |
| DENxFemale | -0.638 | 0.3222 | 0.048 |
| ESPxFemale | 1.444 | 0.2405 | 0.000 |
| FINxFemale | 0.149 | 0.2622 | 0.569 |
| FRAxFemale | -0.038 | 0.1341 | 0.778 |
| GBRxFemale | -1.098 | 0.1905 | 0.000 |
| GERxFemale | -0.441 | 0.1372 | 0.001 |
| HKGxFemale | 0.476 | 0.2756 | 0.084 |
| HUNxFemale | -0.856 | 0.2987 | 0.004 |

*(Continued)*

**Table 10.** (Continued)

| | Coefficient | Standard error | P-Value |
|---|---|---|---|
| ITAxFemale | -0.418 | 0.1374 | 0.002 |
| JPNxFemale | -0.661 | 0.1293 | 0.000 |
| KORxFemale | 0.304 | 0.3260 | 0.351 |
| NEDxFemale | -0.548 | 0.2645 | 0.038 |
| POLxFemale | 0.473 | 0.2011 | 0.019 |
| RUSxFemale | -0.358 | 0.2195 | 0.102 |
| SUIxFemale | 0.583 | 0.1439 | 0.000 |
| SWExFemale | -1.207 | 0.3046 | 0.000 |
| TPExFemale | -0.586 | 0.2747 | 0.033 |
| USAxFemale | 0.028 | 0.1383 | 0.840 |

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**Table 11. Results from linear regression with truncated dataset time = sex×(year+year$^2$)+sex×(age+age$^2$)+sex×nationality and referenced to male, age 44, year 2009 and nationality Australia.** $R^2 = 0.17$.

| | Coefficient | Standard error | P-Value |
|---|---|---|---|
| Intercept | 11.110 | 0.0427 | 0.000 |
| Sex (female) | 0.047 | 0.0969 | 0.628 |
| Age | 0.021 | 0.0004 | 0.000 |
| Age squared | 0.0011 | 0.0000 | 0.000 |
| Year | 0.070 | 0.0008 | 0.000 |
| Year squared | 0.0024 | 0.0000 | 0.000 |
| Female×Age | 0.007 | 0.0013 | 0.000 |
| Female×Age squared | -0.0004 | 0.0001 | 0.000 |
| Female×Year | 0.015 | 0.0025 | 0.000 |
| Female×Year squared | 0.0000 | 0.0001 | 0.857 |
| AUT | -0.319 | 0.0614 | 0.000 |
| BEL | -0.705 | 0.0575 | 0.000 |
| CAN | -0.094 | 0.0615 | 0.128 |
| CHN | 0.758 | 0.1064 | 0.000 |
| CZE | -0.561 | 0.0690 | 0.000 |
| DEN | -0.764 | 0.0730 | 0.000 |
| ESP | -1.073 | 0.0559 | 0.000 |
| FIN | -0.880 | 0.0636 | 0.000 |
| FRA | 0.058 | 0.0438 | 0.182 |
| GBR | -0.740 | 0.0589 | 0.000 |
| GER | -0.316 | 0.0441 | 0.000 |
| HKG | 0.787 | 0.1674 | 0.000 |
| HUN | -1.241 | 0.0762 | 0.000 |
| ITA | 0.515 | 0.0443 | 0.000 |
| JPN | 0.261 | 0.0431 | 0.000 |
| KOR | 0.579 | 0.0595 | 0.000 |
| NED | -0.553 | 0.0596 | 0.000 |
| POL | -0.137 | 0.0522 | 0.009 |
| RUS | -2.124 | 0.0616 | 0.000 |
| SUI | 0.242 | 0.0449 | 0.000 |
| SWE | -0.620 | 0.0759 | 0.000 |

*(Continued)*

**Table 11.** (Continued)

|  | Coefficient | Standard error | P-Value |
|---|---|---|---|
| TPE | 0.678 | 0.0545 | 0.000 |
| USA | 0.353 | 0.0484 | 0.000 |
| AUT×Female | 0.222 | 0.1713 | 0.195 |
| BEL×Female | 0.148 | 0.1704 | 0.386 |
| CAN×Female | 0.393 | 0.1282 | 0.002 |
| CHN×Female | 0.127 | 0.3268 | 0.698 |
| CZE×Female | 0.450 | 0.1899 | 0.018 |
| DEN×Female | 0.436 | 0.1792 | 0.015 |
| ESP×Female | 0.693 | 0.1996 | 0.001 |
| FIN×Female | 0.754 | 0.1505 | 0.000 |
| FRA×Female | 0.304 | 0.1015 | 0.003 |
| GBR×Female | -0.434 | 0.1321 | 0.001 |
| GER×Female | 0.521 | 0.1015 | 0.003 |
| HKG×Female | -0.137 | 0.4468 | 0.759 |
| HUN×Female | 0.068 | 0.1701 | 0.691 |
| ITA×Female | 0.134 | 0.1040 | 0.196 |
| JPN×Female | 0.164 | 0.0979 | 0.094 |
| KOR×Female | 0.022 | 0.2418 | 0.928 |
| NED×Female | 0.385 | 0.1582 | 0.015 |
| POL×Female | 0.600 | 0.1476 | 0.000 |
| RUS×Female | 0.534 | 0.1325 | 0.000 |
| SUI×Female | 0.536 | 0.1085 | 0.000 |
| SWE×Female | 0.051 | 0.1715 | 0.767 |
| TPE×Female | -0.158 | 0.1617 | 0.327 |
| USA×Female | 0.108 | 0.1081 | 0.317 |

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**Table 12. Results from truncated regression with truncated dataset time = sex×(year+year$^2$)+sex×(age+age$^2$) + sex×nationality and referenced to male, age 44, year 2009 and nationality Australia.** $R^2 = 0.17$.

|  | Coefficient | Standard error | P-Value |
|---|---|---|---|
| Intercept | 11.490 | 0.067 | 0.000 |
| Sex (female) | 0.003 | 0.153 | 0.985 |
| Age | 0.038 | 0.001 | 0.000 |
| Age squared | 0.002 | 0.000 | 0.000 |
| Year | 0.109 | 0.001 | 0.000 |
| Year squared | 0.004 | 0.000 | 0.000 |
| Female×Age | 0.017 | 0.002 | 0.000 |
| Female×Age squared | -0.000 | 0.000 | 0.123 |
| Female×Year | 0.035 | 0.004 | 0.000 |
| Female×Year squared | 0.001 | 0.000 | 0.010 |
| AUT | -0.443 | 0.093 | 0.000 |
| BEL | -0.912 | 0.086 | 0.000 |
| CAN | -0.087 | 0.095 | 0.358 |
| CHN | 1.672 | 0.215 | 0.000 |
| CZE | -0.717 | 0.102 | 0.000 |

*(Continued)*

**Table 12.** (Continued)

| | Coefficient | Standard error | P-Value |
|---|---|---|---|
| DEN | -0.985 | 0.107 | 0.000 |
| ESP | -1.343 | 0.083 | 0.000 |
| FIN | -1.138 | 0.094 | 0.000 |
| FRA | 0.109 | 0.069 | 0.115 |
| GBR | -0.935 | 0.088 | 0.000 |
| GER | -0.405 | 0.069 | 0.000 |
| HKG | 1.454 | 0.330 | 0.000 |
| HUN | -1.538 | 0.109 | 0.000 |
| ITA | 0.856 | 0.070 | 0.000 |
| JPN | 0.497 | 0.068 | 0.000 |
| KOR | 1.226 | 0.106 | 0.000 |
| NED | -0.698 | 0.090 | 0.000 |
| POL | -0.174 | 0.081 | 0.031 |
| RUS | -2.464 | 0.089 | 0.000 |
| SUI | 0.389 | 0.071 | 0.000 |
| SWE | -0.933 | 0.112 | 0.000 |
| TPE | 1.390 | 0.096 | 0.000 |
| USA | 0.614 | 0.078 | 0.000 |
| AUT×Female | 0.377 | 0.259 | 0.146 |
| BEL×Female | 0.676 | 0.255 | 0.008 |
| CAN×Female | 0.625 | 0.201 | 0.002 |
| CHN×Female | 0.245 | 0.701 | 0.726 |
| CZE×Female | 0.496 | 0.284 | 0.081 |
| DEN×Female | 0.672 | 0.268 | 0.012 |
| ESP×Female | 0.871 | 0.296 | 0.003 |
| FIN×Female | 0.852 | 0.232 | 0.000 |
| FRA×Female | 0.570 | 0.161 | 0.000 |
| GBR×Female | -0.414 | 0.196 | 0.034 |
| GER×Female | 0.858 | 0.160 | 0.000 |
| HKG×Female | -0.442 | 0.839 | 0.599 |
| HUN×Female | 0.267 | 0.242 | 0.270 |
| ITA×Female | 0.364 | 0.167 | 0.029 |
| JPN×Female | 0.368 | 0.156 | 0.018 |
| KOR×Female | 0.074 | 0.468 | 0.875 |
| NED×Female | 0.613 | 0.243 | 0.011 |
| POL×Female | 1.219 | 0.241 | 0.000 |
| RUS×Female | 0.699 | 0.194 | 0.000 |
| SUI×Female | 0.950 | 0.173 | 0.000 |
| SWE×Female | 0.311 | 0.258 | 0.228 |
| TPE×Female | -0.190 | 0.294 | 0.517 |
| USA×Female | 0.218 | 0.173 | 0.208 |

**Table 13. Interaction with race site, results from truncated regression with complete data set time = sex×(year+year$^2$)+sex×(age+age$^2$) + sex×nationality×site and referenced to male, age 44, year 2009 and nationality Australia.** $R^2 = 0.28$.

| | Coefficient | Standard error | P-Value |
|---|---|---|---|
| Intercept | 14.043 | 0.0615 | 0.000 |
| sex (female) | 1.029 | 0.1296 | 0.000 |
| age | 0.013 | 0.0006 | 0.000 |
| age squared | 0.0032 | 0.0000 | 0.000 |
| year | 0.157 | 0.0013 | 0.000 |
| year squared | 0.0062 | 0.0000 | 0.000 |
| age*female | 0.021 | 0.0019 | 0.000 |
| age squared*female | -0.0007 | 0.0001 | 0.000 |
| year*female | 0.009 | 0.0039 | 0.015 |
| year squared*female | 0.0016 | 0.0001 | 0.000 |
| race abroad | -2.041 | 0.2219 | 0.000 |
| race abroad*female | -0.8183 | 0.4246 | 0.054 |
| AUS | 0.000 | | |
| AUT | -3.621 | 0.1796 | 0.000 |
| BEL | -3.480 | 0.1234 | 0.000 |
| CAN | -1.300 | 0.1076 | 0.000 |
| CHN | 5.201 | 0.0869 | 0.000 |
| CZE | 2.448 | 0.1055 | 0.000 |
| DEN | -3.661 | 0.1475 | 0.000 |
| ESP | -0.399 | 0.0851 | 0.000 |
| FIN | -3.773 | 0.1179 | 0.000 |
| FRA | -1.332 | 0.0637 | 0.000 |
| GBR | -2.477 | 0.1188 | 0.000 |
| GER | -2.968 | 0.0673 | 0.000 |
| HKG | 4.780 | 0.1187 | 0.000 |
| HUN | -3.101 | 0.1529 | 0.000 |
| ITA | -0.511 | 0.0643 | 0.000 |
| JPN | -2.961 | 0.0626 | 0.000 |
| KOR | -1.707 | 0.0907 | 0.000 |
| NED | -3.523 | 0.1151 | 0.000 |
| POL | 0.632 | 0.0801 | 0.000 |
| RUS | -4.060 | 0.1229 | 0.000 |
| SUI | -0.424 | 0.0656 | 0.000 |
| SWE | -3.181 | 0.1519 | 0.000 |
| TPE | -2.170 | 0.0910 | 0.000 |
| USA | -0.012 | 0.0693 | 0.867 |
| AUT*race abroad | 3.994 | 0.2913 | 0.000 |
| BEL*race abroad | 4.684 | 0.2605 | 0.000 |
| CAN*race abroad | 2.645 | 0.2770 | 0.000 |
| CHN*race abroad | 1.420 | 0.2545 | 0.000 |
| CZE*race abroad | -2.328 | 0.2665 | 0.000 |
| DEN*race abroad | 4.545 | 0.3366 | 0.000 |
| ESP*race abroad | 2.878 | 0.2568 | 0.000 |
| FIN*race abroad | 1.972 | 0.3570 | 0.000 |
| FRA*race abroad | 4.657 | 0.2278 | 0.000 |
| GBR*race abroad | 4.787 | 0.2561 | 0.000 |

(*Continued*)

**Table 13.** (Continued)

| | Coefficient | Standard error | P-Value |
|---|---|---|---|
| GER*race abroad | 3.308 | 0.2240 | 0.000 |
| HKG*race abroad | -0.484 | 0.4050 | 0.232 |
| HUN*race abroad | 1.293 | 0.3396 | 0.000 |
| ITA*race abroad | 1.596 | 0.2406 | 0.000 |
| JPN*race abroad | 5.831 | 0.2636 | 0.000 |
| KOR*race abroad | 5.142 | 0.4134 | 0.000 |
| NED*race abroad | 4.362 | 0.2723 | 0.000 |
| POL*race abroad | -0.624 | 0.2490 | 0.012 |
| RUS*race abroad | 0.267 | 0.2873 | 0.353 |
| SUI*race abroad | 2.078 | 0.2632 | 0.000 |
| SWE*race abroad | 3.296 | 0.3443 | 0.000 |
| TPE*race abroad | 2.539 | 0.3055 | 0.000 |
| USA*race abroad | 1.300 | 0.2495 | 0.000 |
| AUT*female | -1.319 | 0.5884 | 0.025 |
| BEL*female | -0.744 | 0.4024 | 0.064 |
| CAN*female | 0.792 | 0.2117 | 0.000 |
| CHN*female | -0.483 | 0.2139 | 0.024 |
| CZE*female | 0.357 | 0.2593 | 0.169 |
| DEN*female | -0.611 | 0.3860 | 0.113 |
| ESP*female | 0.849 | 0.2644 | 0.001 |
| FIN*female | -0.351 | 0.2769 | 0.205 |
| FRA*female | -0.068 | 0.1385 | 0.626 |
| GBR*female | -0.251 | 0.2474 | 0.310 |
| GER*female | -0.913 | 0.1526 | 0.000 |
| HKG*female | 0.650 | 0.2918 | 0.026 |
| HUN*female | -1.180 | 0.4018 | 0.003 |
| ITA*female | -0.491 | 0.1413 | 0.001 |
| JPN*female | -0.781 | 0.1331 | 0.000 |
| KOR*female | -0.311 | 0.3419 | 0.363 |
| NED*female | -0.730 | 0.3210 | 0.023 |
| POL*female | 0.025 | 0.2143 | 0.906 |
| RUS*female | -0.436 | 0.2716 | 0.109 |
| SUI*female | 0.442 | 0.1477 | 0.003 |
| SWE*female | -1.042 | 0.3398 | 0.002 |
| TPE*female | -0.522 | 0.3117 | 0.094 |
| USA*female | 0.092 | 0.1427 | 0.518 |
| AUT* race abroad*female | 1.282 | 0.7599 | 0.092 |
| BEL* race abroad*female | 1.295 | 0.6407 | 0.043 |
| CAN* race abroad*female | -0.998 | 0.5163 | 0.053 |
| CHN* race abroad*female | 1.999 | 0.5403 | 0.000 |
| CZE* race abroad*female | 0.626 | 0.5920 | 0.291 |
| DEN* race abroad*female | -0.217 | 0.7472 | 0.771 |
| ESP* race abroad*female | 2.805 | 0.6440 | 0.000 |
| FIN* race abroad*female | 3.390 | 0.7813 | 0.000 |
| FRA* race abroad*female | 0.269 | 0.4572 | 0.556 |
| GBR* race abroad*female | -0.495 | 0.5127 | 0.335 |
| GER* race abroad*female | 1.253 | 0.4353 | 0.004 |

(*Continued*)

**Table 13.** (Continued)

| | Coefficient | Standard error | P-Value |
|---|---|---|---|
| HKG* race abroad*female | 0.018 | 0.8207 | 0.982 |
| HUN* race abroad*female | 1.499 | 0.6920 | 0.030 |
| ITA* race abroad*female | -0.461 | 0.4999 | 0.356 |
| JPN* race abroad*female | -1.423 | 0.4972 | 0.004 |
| KOR* race abroad*female | 2.612 | 1.0283 | 0.011 |
| NED* race abroad*female | 0.832 | 0.6342 | 0.189 |
| POL* race abroad*female | 2.097 | 0.5893 | 0.000 |
| RUS* race abroad*female | 1.199 | 0.5560 | 0.031 |
| SUI* race abroad*female | -1.618 | 0.5741 | 0.005 |
| SWE* race abroad*female | -0.180 | 0.7703 | 0.816 |
| TPE* race abroad*female | -0.115 | 0.6995 | 0.870 |
| USA* race abroad*female | -1.330 | 0.4787 | 0.005 |

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**Table 14. Interaction with race site, results from linear regression with truncated dataset time = sex×(year+year$^2$)+sex×(age+age$^2$) + sex×nationality×site and referenced to male, age 44, year 2009, site at home and nationality Australia.** $R^2 = 0.20$.

| | Coefficient | Standard error | P-Value |
|---|---|---|---|
| Intercept | 11.319 | 0.0447 | 0.000 |
| sex (female) | 0.139 | 0.1045 | 0.182 |
| age | 0.020 | 0.0004 | 0.000 |
| age squared | 0.0011 | 0.0000 | 0.000 |
| year | 0.068 | 0.0008 | 0.000 |
| year squared | 0.0024 | 0.0000 | 0.000 |
| age*female | 0.005 | 0.0013 | 0.000 |
| age squared*female | -0.0004 | 0.0001 | 0.000 |
| year*female | 0.006 | 0.0025 | 0.013 |
| year squared*female | -0.0002 | 0.0001 | 0.152 |
| race abroad | -1.747 | 0.1297 | 0.000 |
| race abroad*female | 0.1782 | 0.2556 | 0.486 |
| AUS | | | |
| AUT | -1.092 | 0.0953 | 0.000 |
| BEL | -1.228 | 0.0701 | 0.000 |
| CAN | -0.128 | 0.0668 | 0.056 |
| CHN | 0.601 | 0.1196 | 0.000 |
| CZE | -0.314 | 0.0984 | 0.001 |
| DEN | -0.831 | 0.0792 | 0.000 |
| ESP | -1.188 | 0.0601 | 0.000 |
| FIN | -0.994 | 0.0667 | 0.000 |
| FRA | -0.136 | 0.0458 | 0.003 |
| GBR | -1.322 | 0.0737 | 0.000 |
| GER | -1.040 | 0.0472 | 0.000 |
| HKG | 0.841 | 0.2060 | 0.000 |
| HUN | -0.986 | 0.0867 | 0.000 |
| ITA | 0.336 | 0.0463 | 0.000 |
| JPN | 0.074 | 0.0451 | 0.102 |
| KOR | 0.432 | 0.0609 | 0.000 |

*(Continued)*

**Table 14.** (Continued)

| | Coefficient | Standard error | P-Value |
|---|---|---|---|
| NED | -0.856 | 0.0658 | 0.000 |
| POL | -0.105 | 0.0567 | 0.063 |
| RUS | -1.672 | 0.0706 | 0.000 |
| SUI | 0.001 | 0.0469 | 0.986 |
| SWE | -0.661 | 0.0835 | 0.000 |
| TPE | 0.510 | 0.0568 | 0.000 |
| USA | 0.273 | 0.0507 | 0.000 |
| AUT*race abroad | 2.484 | 0.1627 | 0.000 |
| BEL*race abroad | 2.343 | 0.1501 | 0.000 |
| CAN*race abroad | 0.957 | 0.1663 | 0.000 |
| CHN*race abroad | 1.571 | 0.2566 | 0.000 |
| CZE*race abroad | 1.002 | 0.1705 | 0.000 |
| DEN*race abroad | 1.025 | 0.1950 | 0.000 |
| ESP*race abroad | 1.297 | 0.1558 | 0.000 |
| FIN*race abroad | 0.860 | 0.1944 | 0.000 |
| FRA*race abroad | 1.484 | 0.1350 | 0.000 |
| GBR*race abroad | 2.418 | 0.1524 | 0.000 |
| GER*race abroad | 2.584 | 0.1308 | 0.000 |
| HKG*race abroad | 1.065 | 0.3543 | 0.003 |
| HUN*race abroad | 0.197 | 0.1876 | 0.295 |
| ITA*race abroad | 0.735 | 0.1427 | 0.000 |
| JPN*race abroad | -0.399 | 0.1659 | 0.016 |
| KOR*race abroad | 0.012 | 0.2824 | 0.965 |
| NED*race abroad | 2.018 | 0.1583 | 0.000 |
| POL*race abroad | 0.864 | 0.1450 | 0.000 |
| RUS*race abroad | -0.102 | 0.1583 | 0.520 |
| SUI*race abroad | 0.884 | 0.1622 | 0.000 |
| SWE*race abroad | 1.021 | 0.1956 | 0.000 |
| TPE*race abroad | 1.460 | 0.1714 | 0.000 |
| USA*race abroad | 0.567 | 0.1488 | 0.000 |
| AUT*female | -0.564 | 0.3079 | 0.067 |
| BEL*female | 0.207 | 0.2213 | 0.349 |
| CAN*female | 0.324 | 0.1445 | 0.025 |
| CHN*female | 0.293 | 0.3774 | 0.437 |
| CZE*female | -0.191 | 0.2767 | 0.489 |
| DEN*female | 0.408 | 0.2037 | 0.045 |
| ESP*female | 0.377 | 0.2155 | 0.081 |
| FIN*female | 0.567 | 0.1591 | 0.000 |
| FRA*female | 0.296 | 0.1089 | 0.007 |
| GBR*female | -0.032 | 0.1626 | 0.845 |
| GER*female | 0.371 | 0.1127 | 0.001 |
| HKG*female | 0.798 | 0.8050 | 0.321 |
| HUN*female | -0.139 | 0.2253 | 0.536 |
| ITA*female | 0.161 | 0.1113 | 0.149 |
| JPN*female | 0.144 | 0.1053 | 0.171 |
| KOR*female | 0.088 | 0.2539 | 0.729 |
| NED*female | 0.278 | 0.1813 | 0.125 |

(*Continued*)

**Table 14.** (Continued)

| | Coefficient | Standard error | P-Value |
|---|---|---|---|
| POL*female | 0.191 | 0.1639 | 0.244 |
| RUS*female | 0.284 | 0.1617 | 0.079 |
| SUI*female | 0.454 | 0.1155 | 0.000 |
| SWE*female | 0.024 | 0.1890 | 0.897 |
| TPE*female | -0.121 | 0.1845 | 0.512 |
| USA*female | 0.234 | 0.1167 | 0.045 |
| AUT* race abroad*female | 0.658 | 0.4180 | 0.115 |
| BEL* race abroad*female | -0.506 | 0.3768 | 0.179 |
| CAN* race abroad*female | -0.052 | 0.3147 | 0.868 |
| CHN* race abroad*female | -0.906 | 0.7296 | 0.214 |
| CZE* race abroad*female | 0.692 | 0.4175 | 0.098 |
| DEN* race abroad*female | -0.199 | 0.4214 | 0.637 |
| ESP* race abroad*female | 1.056 | 0.5267 | 0.045 |
| FIN* race abroad*female | 0.958 | 0.4499 | 0.033 |
| FRA* race abroad*female | -1.505 | 0.2853 | 0.000 |
| GBR* race abroad*female | -1.157 | 0.3115 | 0.000 |
| GER* race abroad*female | -0.119 | 0.2609 | 0.648 |
| HKG* race abroad*female | -1.186 | 0.9940 | 0.233 |
| HUN* race abroad*female | 0.672 | 0.3816 | 0.078 |
| ITA* race abroad*female | -1.355 | 0.3009 | 0.000 |
| JPN* race abroad*female | -0.214 | 0.3048 | 0.482 |
| KOR* race abroad*female | 0.116 | 0.7603 | 0.878 |
| NED* race abroad*female | -0.144 | 0.3698 | 0.697 |
| POL* race abroad*female | 0.900 | 0.3611 | 0.013 |
| RUS* race abroad*female | 0.585 | 0.3127 | 0.061 |
| SUI* race abroad*female | -0.592 | 0.3508 | 0.091 |
| SWE* race abroad*female | -0.452 | 0.4260 | 0.289 |
| TPE* race abroad*female | -0.285 | 0.3870 | 0.461 |
| USA* race abroad*female | -0.878 | 0.2887 | 0.002 |

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**Table 16. Comparing times in hours with finishes performed at home.** Times were computed based on the model time = sex×(year+year$^2$) +sex×(age+age$^2$) + sex×nationality×site and referenced to male, age 44, year 2009 and nationality Australia.

| | A Data: complete Linear regression with fixed effects | | % Difference between Races abroad /at home | B Data: truncated at 14 hours Linear regression with fixed effects | | % Difference between races at home /on abroad | C Data: truncated at 14 hours Truncated linear regression with fixed effects | | % Difference between Races abroad /at home |
|---|---|---|---|---|---|---|---|---|---|
| | Races at home | Races abroad | | Races at home | Races abroad | | Races at home | Races abroad | |
| AUS | 14.0 | 12.0 | -14.5% | 11.3 | 9.6 | -15.4% | 11.7 | 9.6 | -17.8% |
| AUT | 10.4 | 12.4 | 18.7% | 10.2 | 11.0 | 7.2% | 10.5 | 11.4 | 9.3% |
| BEL | 10.6 | 13.2 | 25.0% | 10.1 | 10.7 | 5.9% | 10.2 | 10.9 | 6.5% |
| CAN | 12.7 | 13.3 | 4.7% | 11.2 | 10.4 | -7.1% | 11.7 | 10.6 | -9.4% |
| CHN | 19.2 | 18.6 | -3.2% | 11.9 | 11.7 | -1.5% | 13.1 | 13.2 | 0.7% |
| CZE | 16.5 | 12.1 | -26.5% | 11.0 | 10.3 | -6.8% | 11.3 | 10.3 | -8.8% |
| DEN | 10.4 | 12.9 | 24.1% | 10.5 | 9.8 | -6.9% | 10.7 | 9.9 | -7.2% |
| ESP | 13.6 | 14.5 | 6.1% | 10.1 | 9.7 | -4.4% | 10.3 | 10.0 | -3.2% |

*(Continued)*

**Table 16.** (Continued)

| | A | | % Difference | B | | % Difference | C | | % Difference |
|---|---|---|---|---|---|---|---|---|---|
| | Data: complete | | between | Data: truncated at 14 hours | | between | Data: truncated at 14 hours | | between |
| | Linear regression | | Races abroad | Linear regression | | races at home | Truncated linear regression | | Races abroad |
| | with fixed effects | | /at home | with fixed effects | | /on abroad | with fixed effects | | /at home |
| | Races at home | Races abroad | | Races at home | Races abroad | | Races at home | Races abroad | |
| FIN | 10.3 | 10.2 | -0.7% | 10.3 | 9.4 | -8.6% | 10.4 | 9.3 | -10.6% |
| FRA | 12.7 | 15.3 | 20.6% | 11.2 | 10.9 | -2.4% | 11.6 | 11.2 | -3.4% |
| GBR | 11.6 | 14.3 | 23.7% | 10.0 | 10.7 | 6.7% | 10.1 | 10.9 | 8.1% |
| GER | 11.1 | 12.3 | 11.4% | 10.3 | 11.1 | 8.1% | 10.4 | 11.5 | 10.6% |
| HKG | 18.8 | 16.3 | -13.4% | 12.2 | 11.5 | -5.6% | 13.1 | 11.2 | -14.5% |
| HUN | 10.9 | 10.2 | -6.8% | 10.3 | 8.8 | -15.0% | 10.5 | 8.9 | -15.3% |
| ITA | 13.5 | 13.1 | -3.3% | 11.7 | 10.6 | -8.7% | 12.4 | 10.8 | -12.9% |
| JPN | 11.1 | 14.9 | 34.2% | 11.4 | 9.2 | -18.8% | 12.0 | 9.4 | -21.4% |
| KOR | 12.3 | 15.4 | 25.1% | 11.8 | 10.0 | -14.8% | 12.8 | 10.3 | -19.4% |
| NED | 10.5 | 12.8 | 22.1% | 10.5 | 10.7 | 2.6% | 10.6 | 11.0 | 4.0% |
| POL | 14.7 | 12.0 | -18.2% | 11.2 | 10.3 | -7.9% | 11.6 | 10.5 | -9.2% |
| RUS | 10.0 | 8.2 | -17.8% | 9.6 | 7.8 | -19.2% | 9.5 | 7.9 | -17.2% |
| SUI | 13.6 | 13.7 | 0.3% | 11.3 | 10.5 | -7.6% | 11.8 | 10.4 | -12.3% |
| SWE | 10.9 | 12.1 | 11.6% | 10.7 | 9.9 | -6.8% | 10.7 | 9.8 | -8.5% |
| TPE | 11.9 | 12.4 | 4.2% | 11.8 | 11.5 | -2.4% | 12.9 | 12.2 | -5.8% |
| USA | 14.0 | 13.3 | -5.3% | 11.6 | 10.4 | -10.2% | 12.4 | 10.6 | -14.1% |

Additionally, the distributions do not change dramatically. The main groupings (1 = CHN, HKG), (2 = RUS) and (3 = KOR,JAP,TPE) remain, whereas groups (4) and (5) changed slightly: France, Canada and Poland changed from group 5 to group 4 which has a slight lower skewness than group 5. These changes should not be overinterpreted since these both groups are very similar. This can be seen comparing the new analysis in S2 Fig and S3 Fig with the originally published Fig 3 and Fig 4, respectively. In summary, the new analysis confirms the conclusion in the original analysis.

The authors provide the following updated information regarding the regression analysis:

Linear regression with truncated data gives biased estimates. The bias can be omitted or attenuated using truncated regression. To see if the conclusion from linear regression can be confirmed we used a method (trunc reg), which considers the bias due to truncated data. To compare finishes with similar conditions as in Japan, which have a cut at about 15 hours, we decided to truncate the data at 15 hours in all nations.

## Supporting information

**S1 Fig. The upper panel shows the adjusted time for each nationality in ascending order at reference sex = male, age = 46 and year = 2012 including only finishes since 2000.** (A) is based on linear regression of the complete dataset, (B) on the truncated dataset and (C) on the truncated regression of the truncated dataset. The lower panel with figures (D) and (E) shows the changes in rank from (A) to (B) and (B) to (C).
(TIF)

**S2 Fig. Histograms, density plots and normal distributions based on mean and standard deviation for each country including only finishes since 2000.** The diagrams are positioned

according to the hierarchical cluster analysis. Graphs are based on the complete dataset.
(TIF)

**S3 Fig. Scatterplot with excess against skewness including only finishes since 2000.** Groups of nation are distinguished by different colours.
(TIF)

## Reference

1.  Knechtle B, Nikolaidis PT, Valeri F (2018) Russians are the fastest 100-km ultra-marathoners in the world. PLoS ONE  13(7): e0199701. https://doi.org/10.1371/journal.pone.0199701 PMID: 29995926