NISTIR 8280

Ongoing Face Recognition Vendor Test (FRVT)

Part 3: Demographic Effects

Annex 8 : False match rates with matched demographics using application images

This document is an annex of NIST Interagency Report 8280:
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1 Overview

This annex includes figures that shows false match rates for individuals with matched covariates. Each page contains one figure corresponding to one algorithm. Each figure is a heatmap, showing a matrix of values. The value in column j is the FMR obtained when images of persons born in country j are compared with images of other subjects by the grouping criteria defined in row i.

2 Data

The images are all high-quality frontal portraits collected in immigration offices. All images have a white background and are in close approximation to ISO/IEC 39794-5 / ICAO specifications. As such, potential quality related drivers of high false match rates (such as blur) can be expected to be absent.

The total number of images is 883 356. The total number of persons is 696 288. The total number of comparisons is just over 195 billion (195 158 902 823) produced by full cross-comparison of two subject-disjoint and image-disjoint sets containing 442 019 and 441 517 respectively.

3 Fixed Threshold

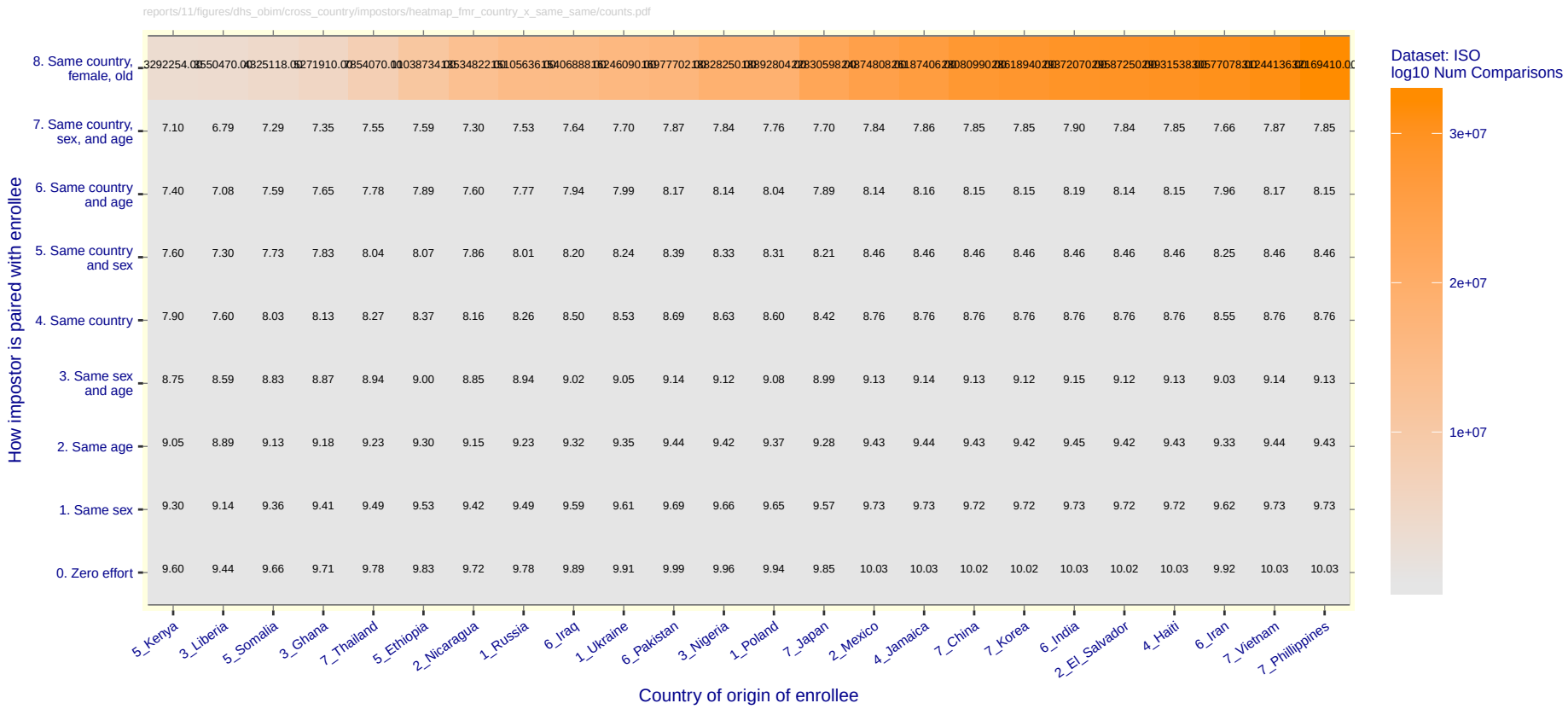
A false match is declared if the comparison score is equal to, or exceeds, a threshold. This same value applies to all comparisons in all cells. The threshold value could be any value germane to that comparison algroithm. The threshold value was taken from a different experiment in which mugshot impostor pairs were compared. It is the value that gave a FMR of 0.00003 over that set.

4 Plot

The rows in the figure define which images are compared, as follows.

- 0 - The bottom row is termed "zero effort" meaning that impostors are selected are entirely randomly. Thus any individual in column j is compared with *all* others regardless of national origin, sex and age.
- 1 - This row includes only impostor comparisons of the same sex. Thus any individual from Vietnam, say, is compared with a worldwide set of impostors of any age.
- 2 - This row includes only impostor comparison of the same age group. Any individual is compared with any person in the same group regardless of sex and national origin. The age groups are $(00-20]$, $(20-35]$, $(35-50]$, $(50-65]$, and $(65-99]$.
- 3 - This row restricts impostors to have the same sex and be in the age group.
- 4 - This row includes only impostor comparison of the same national origin. Any individual is compared with any person from the same country regardless of sex and age.
- 5 - This row restricts impostors to have the same sex and national origin.
- 6 - This row restricts impostors to have the same sex, national origin, and age group membership. Note that subjects will still differ in a number of ways unknown to us - they may have different heights and hair colors, for example.

▷ 7 - The top row differs in that it restricts reports only false match rates for women in the $(65-99]$ category. This demographic often produces the highest false match rates.



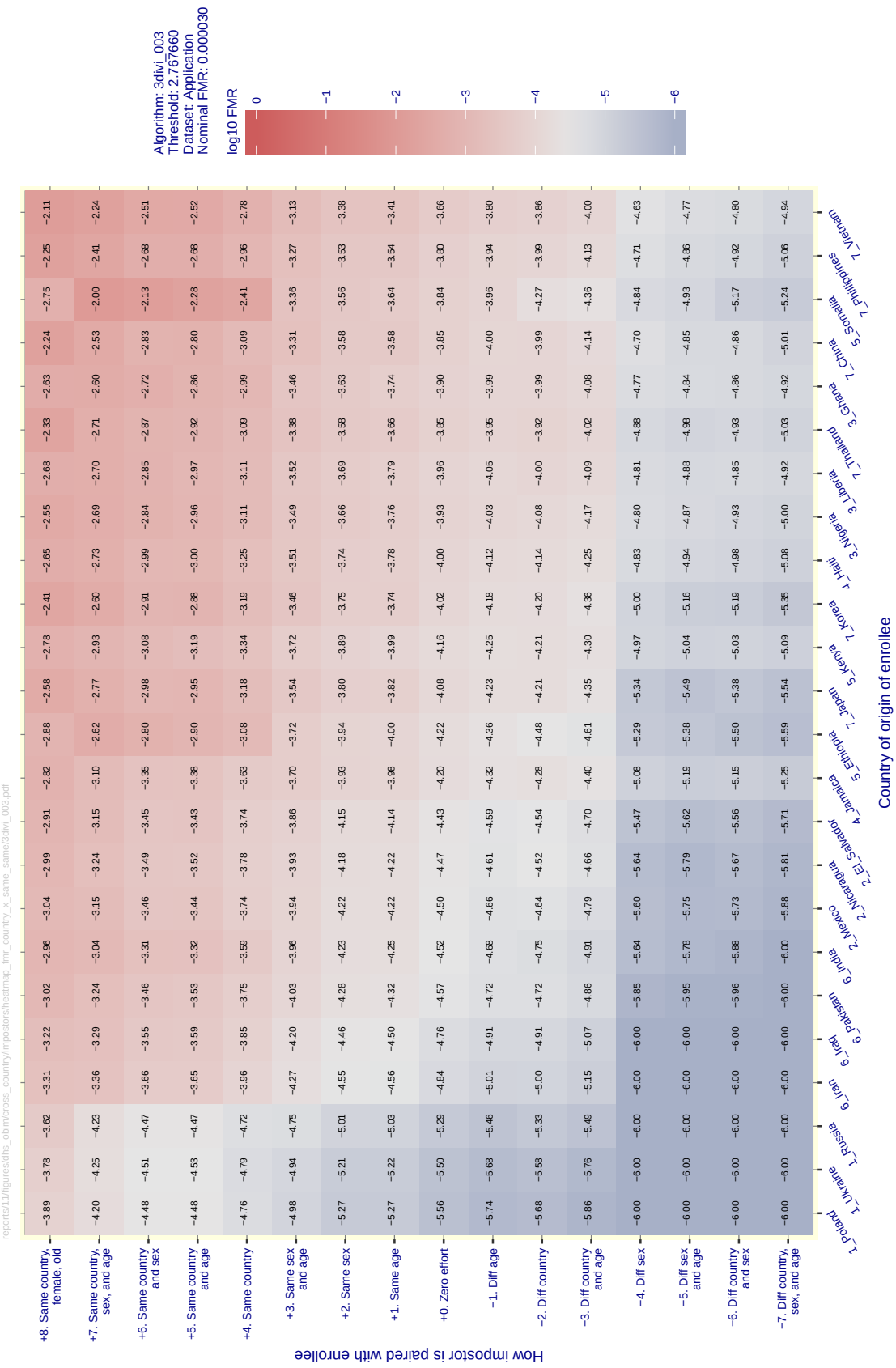


Figure 1: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

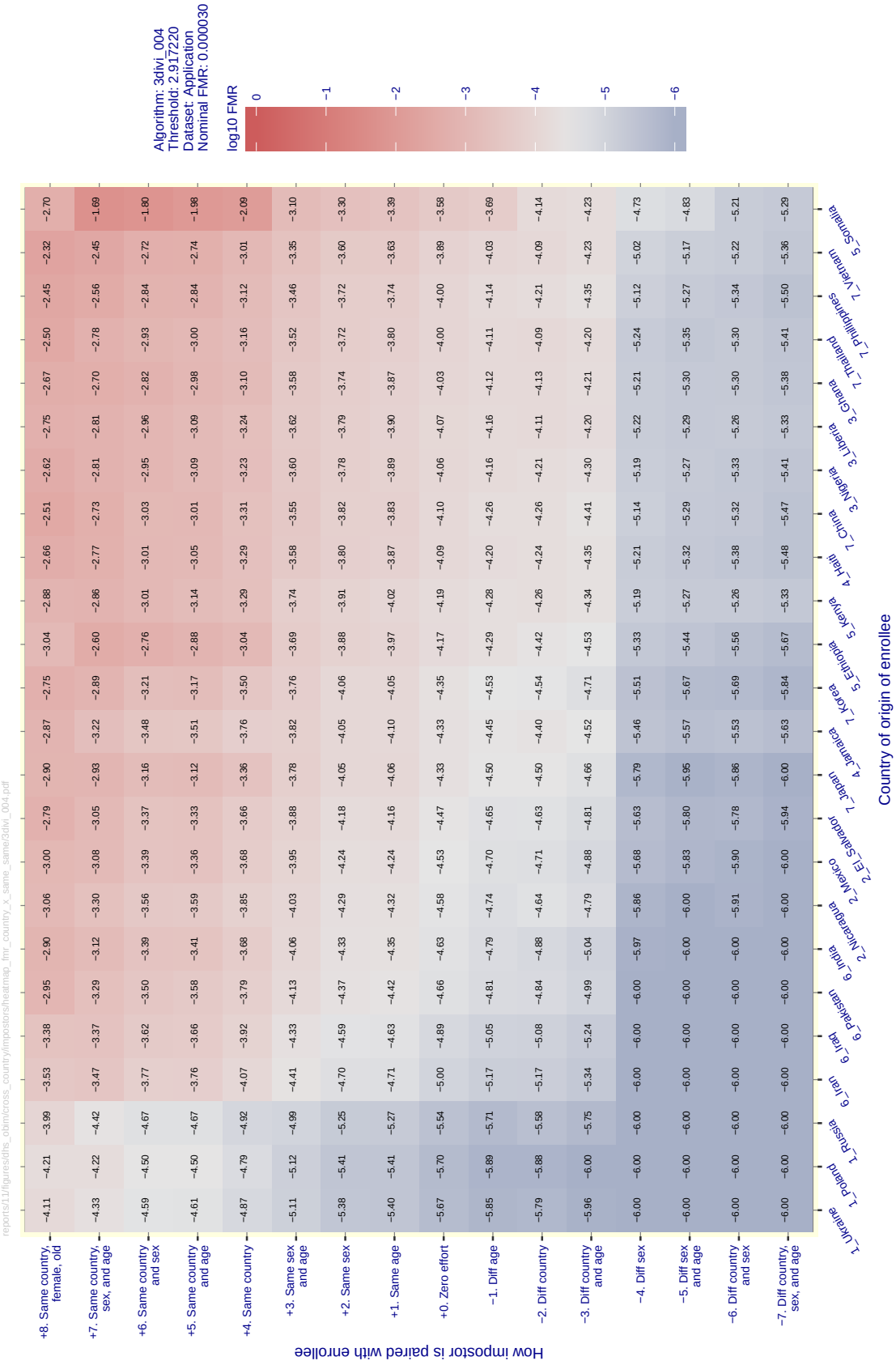
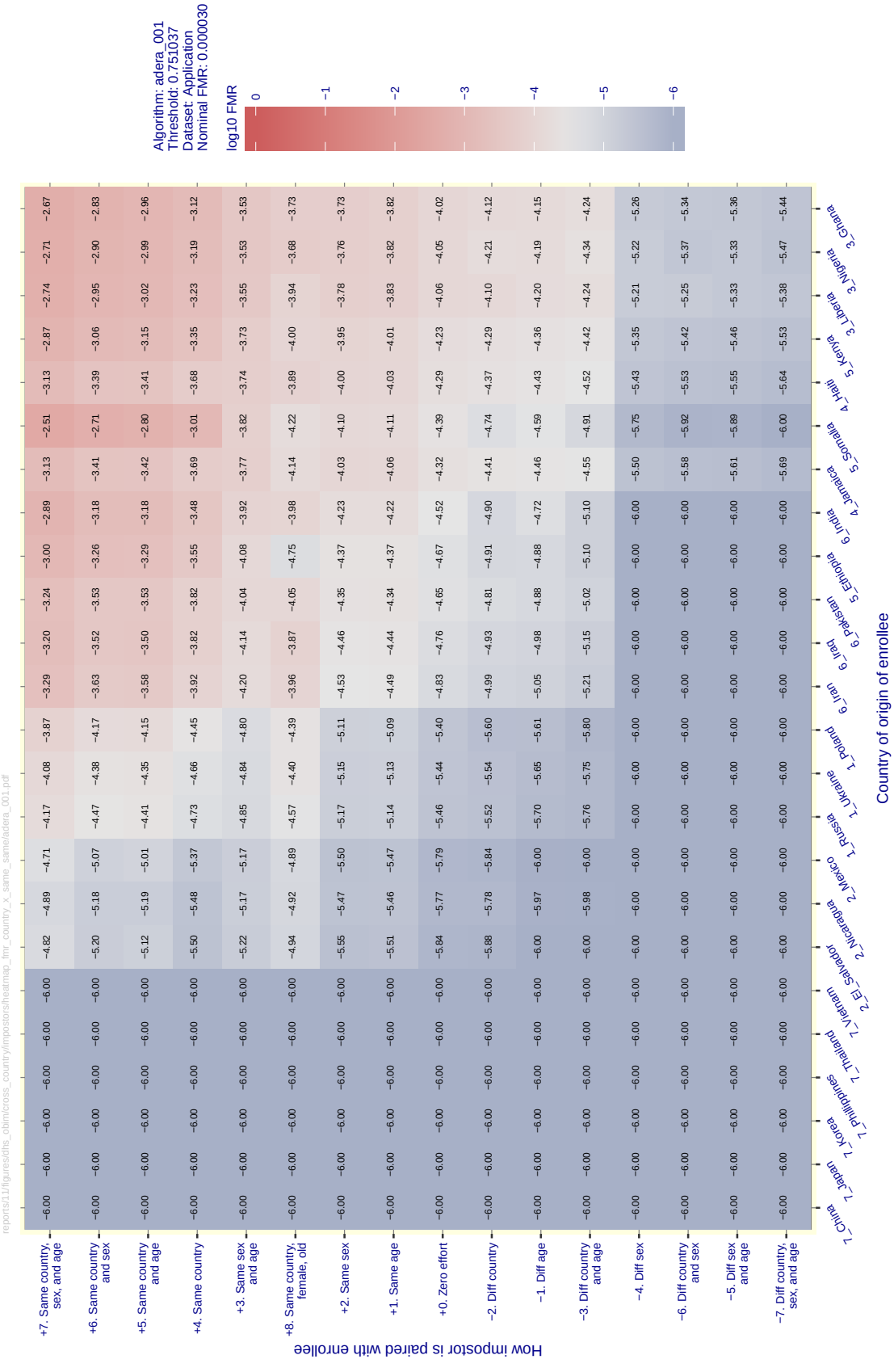


Figure 2: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*



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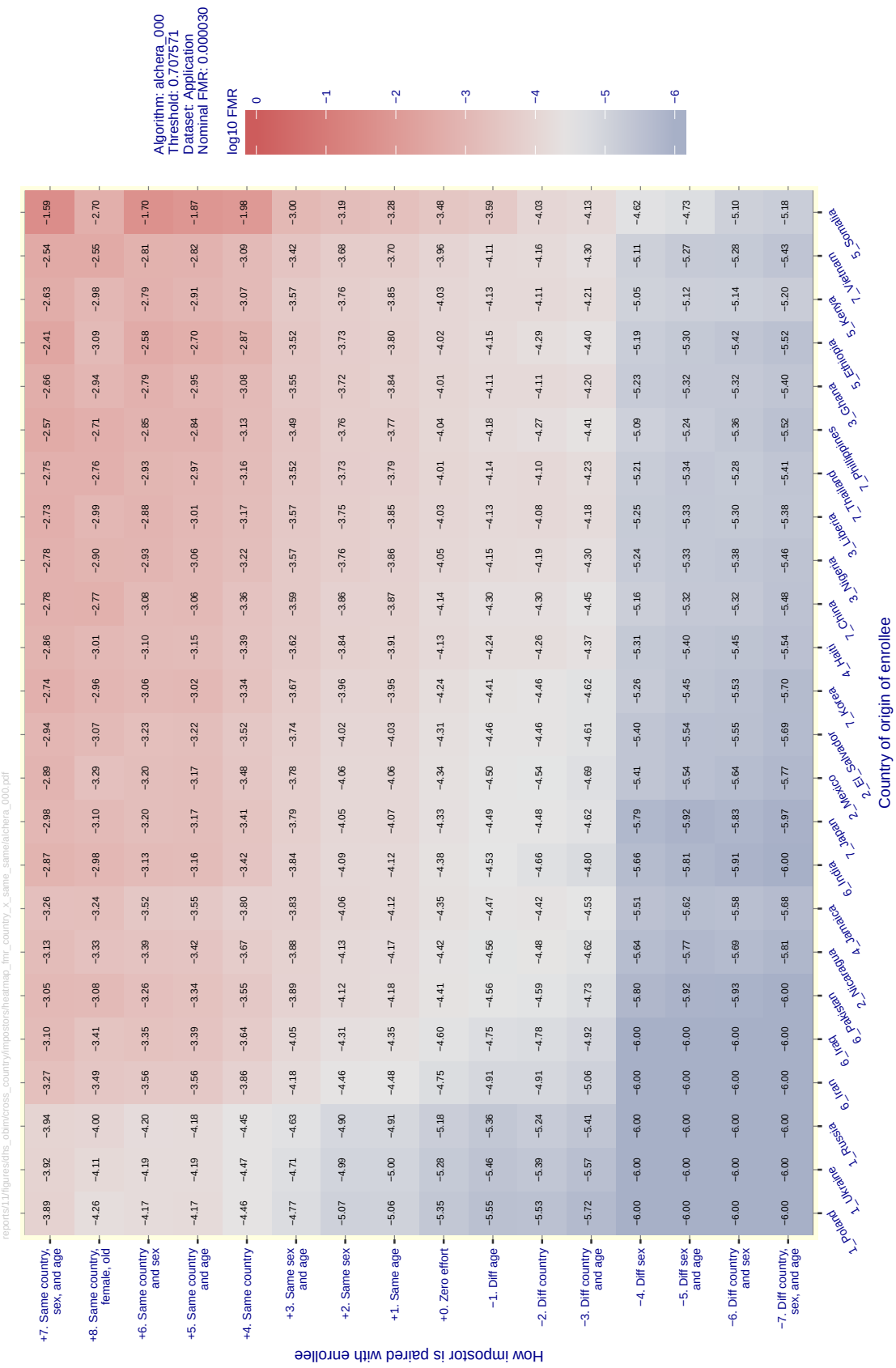


Figure 4: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

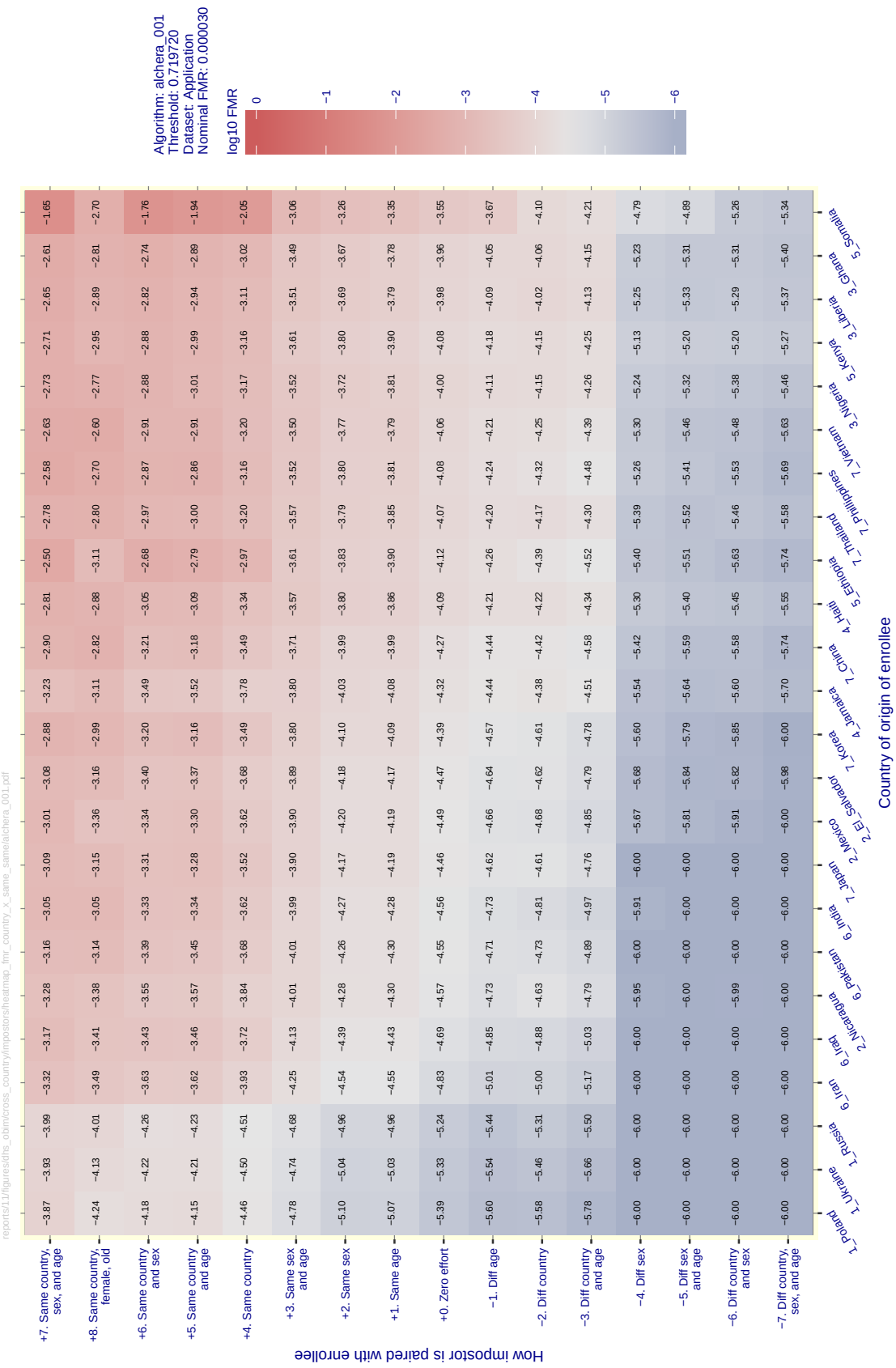


Figure 5: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

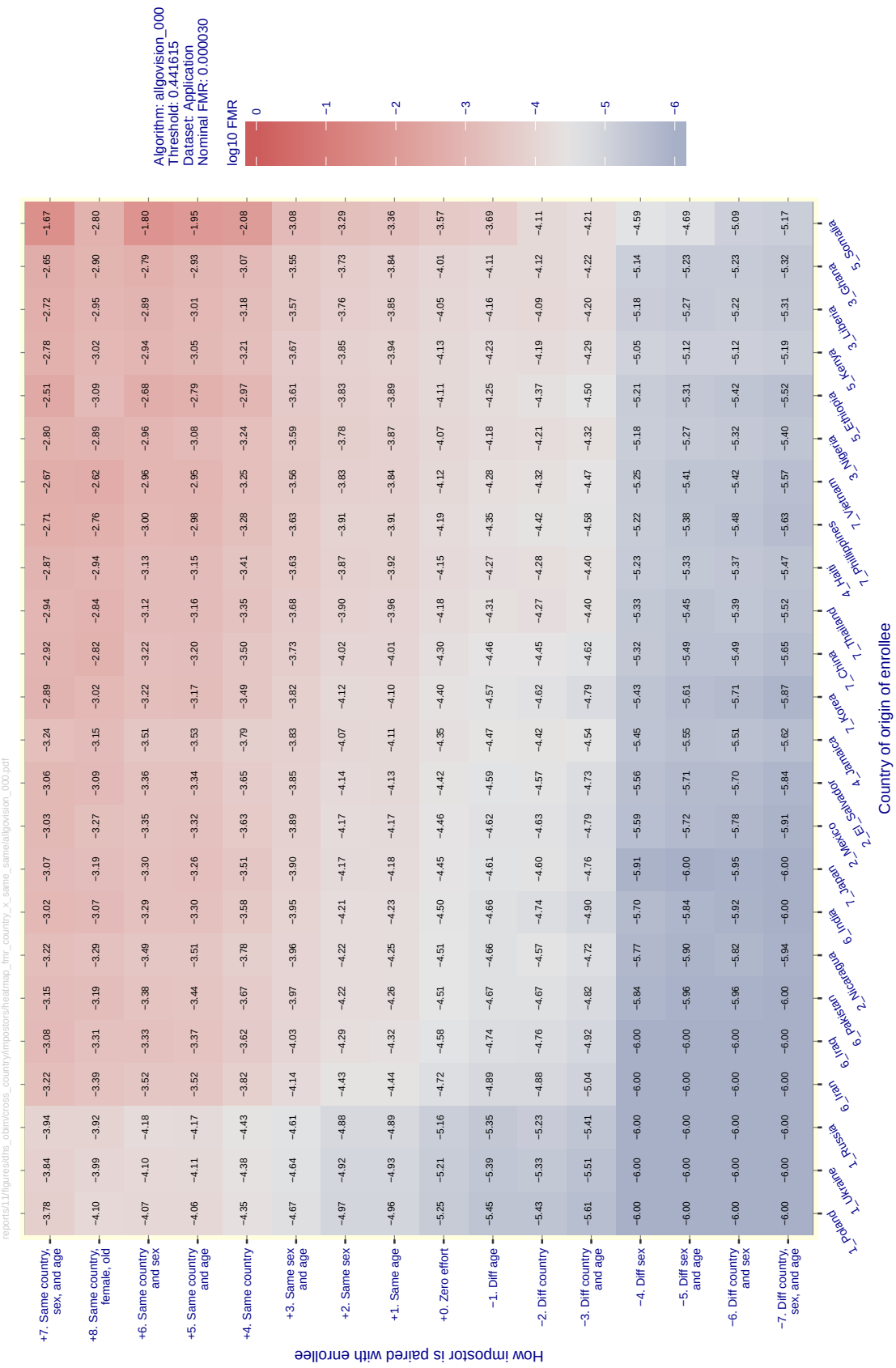


Figure 6: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

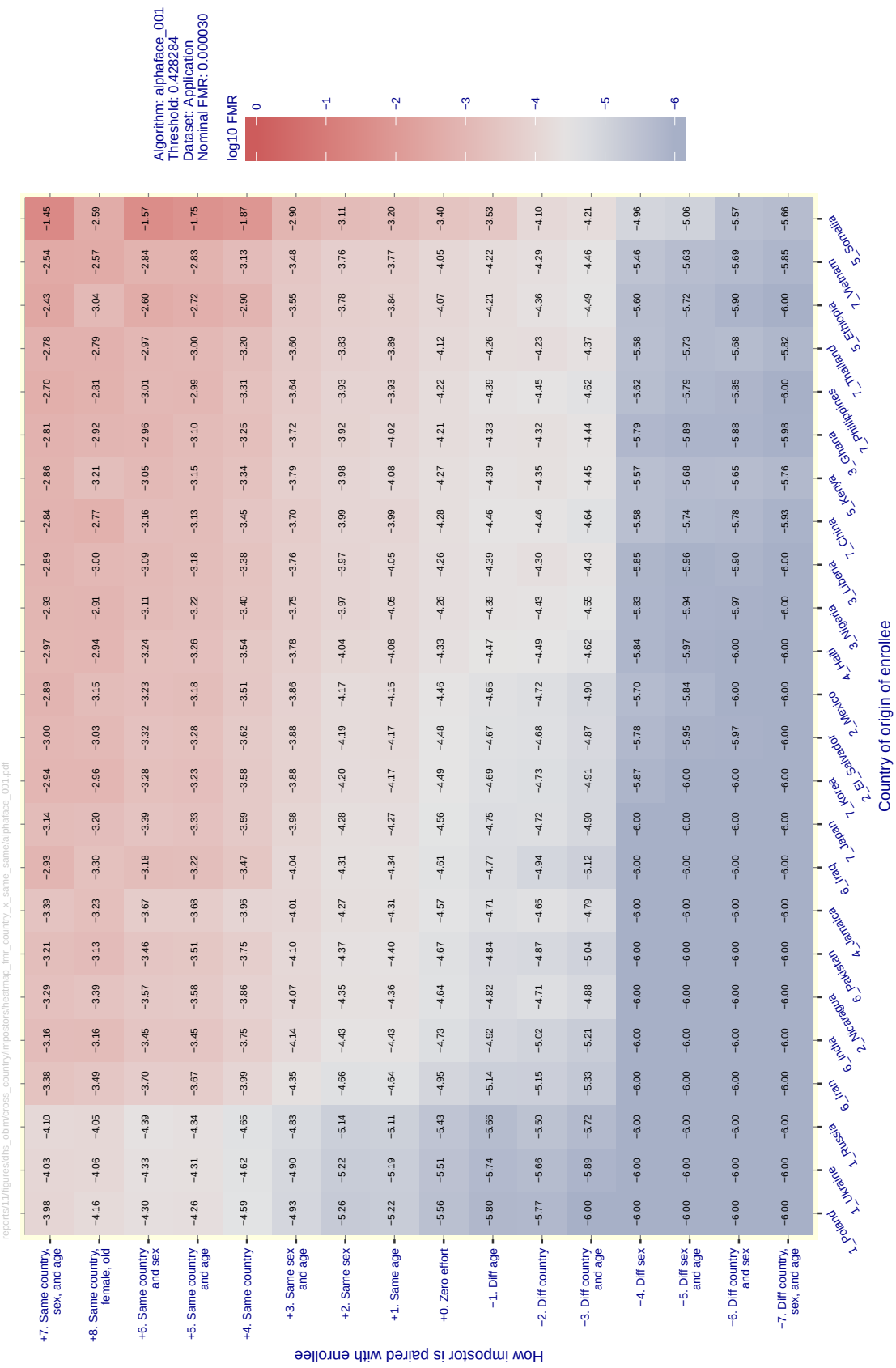


Figure 7: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

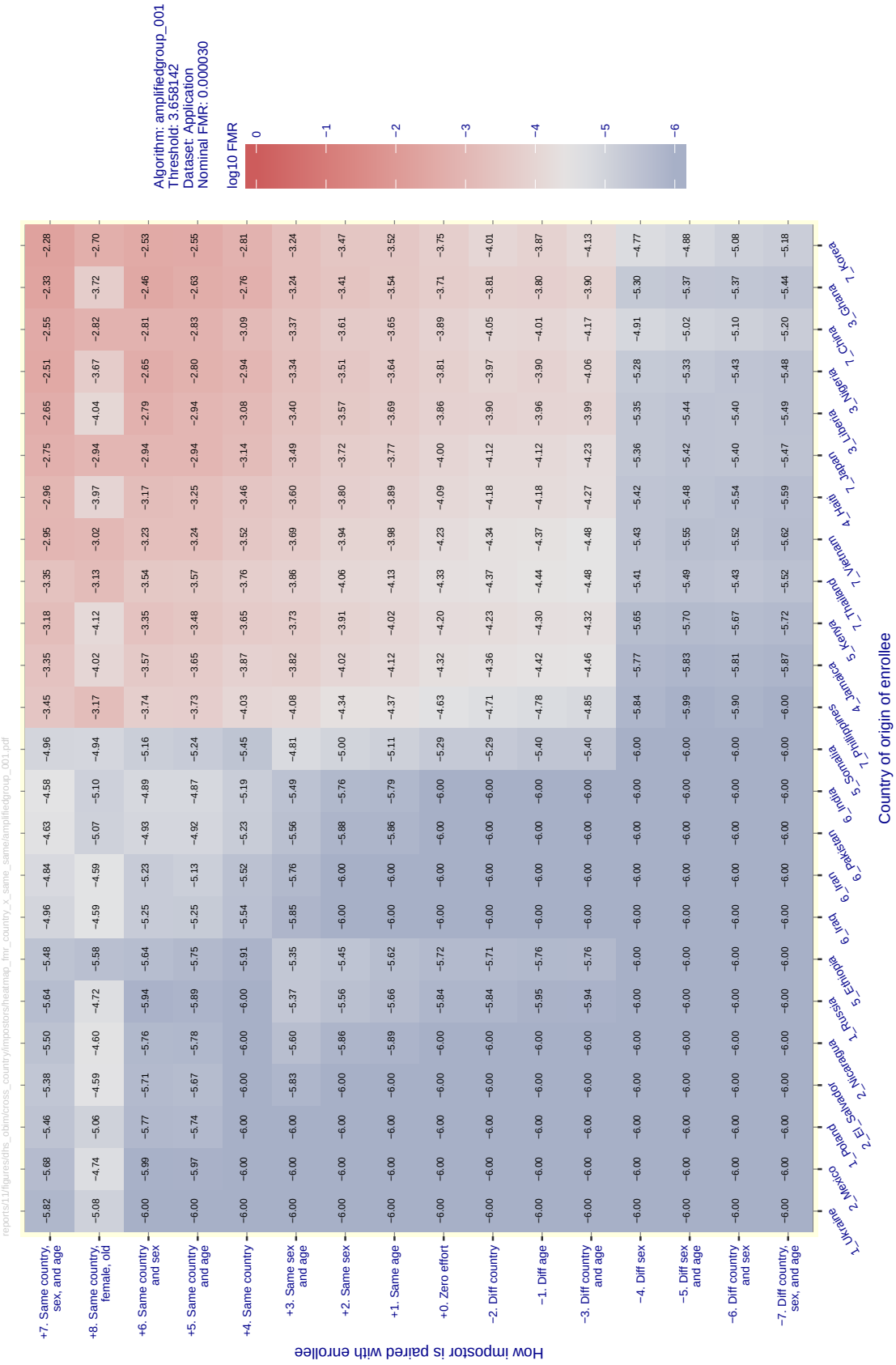
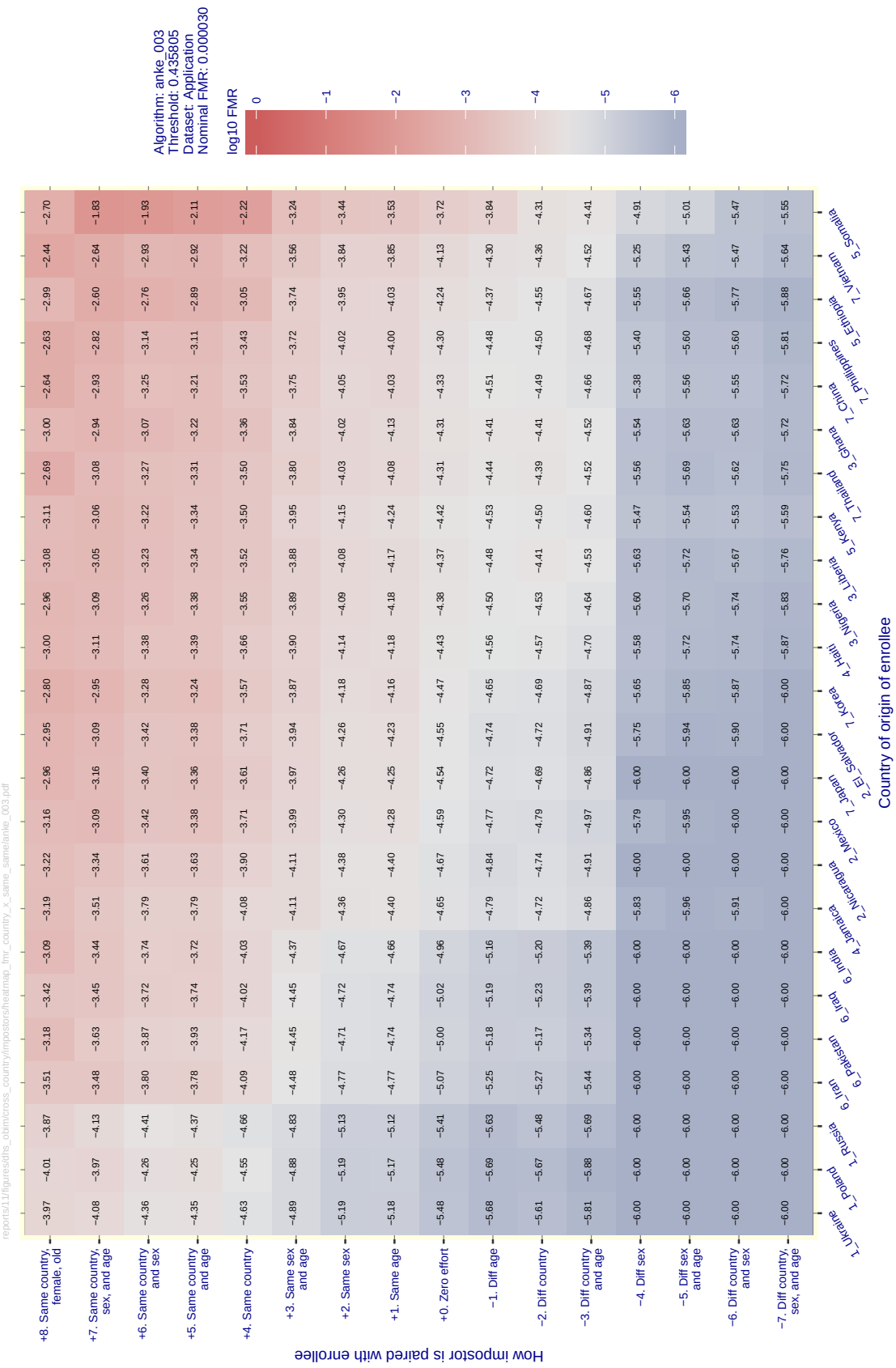


Figure 8: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*



reports/11/figures/dhs_obim/cross_country/impostors/heatmap_fmr_country_x_same_same/anke_003.pdf

Figure 9: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

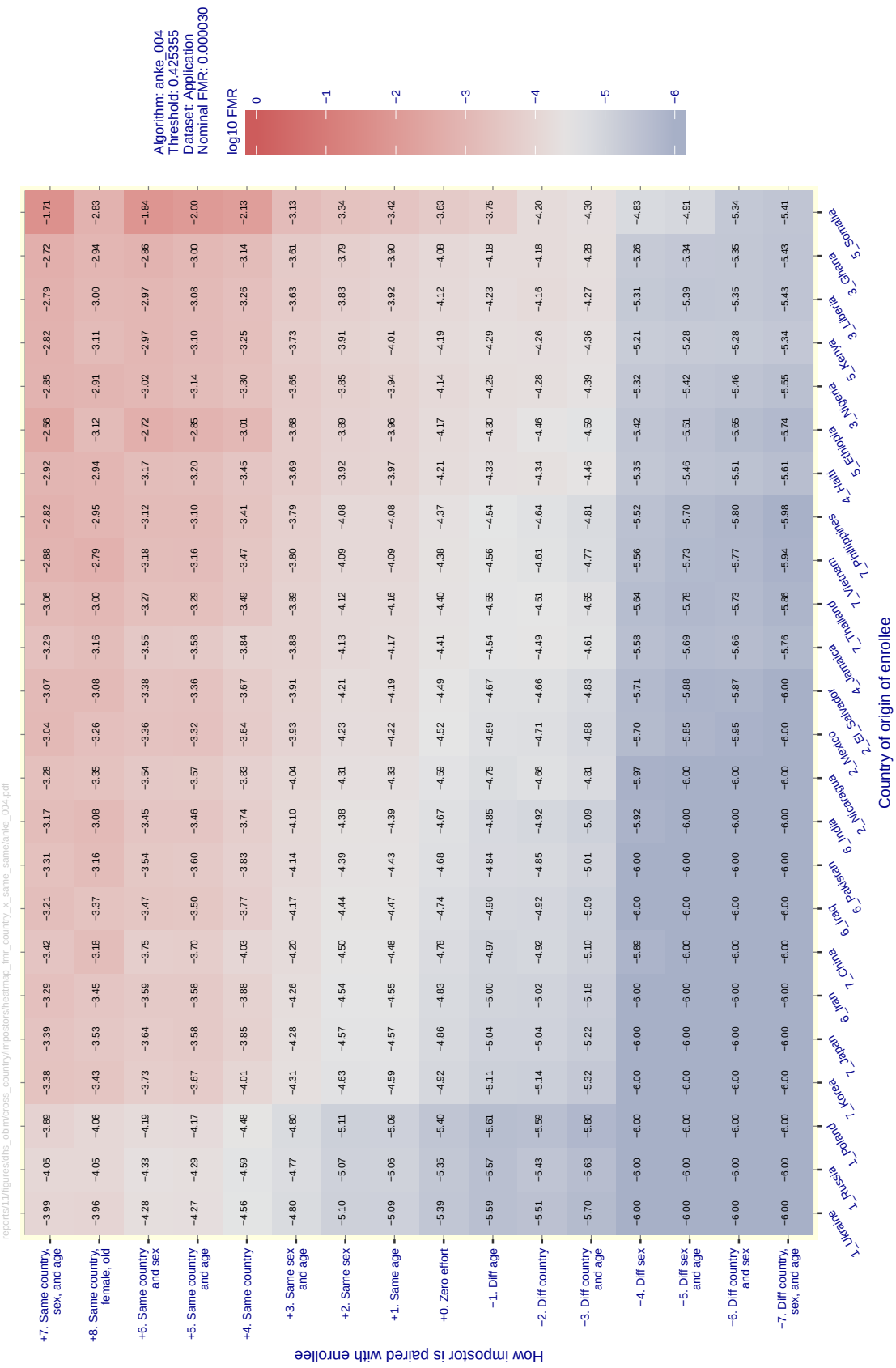


Figure 10: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

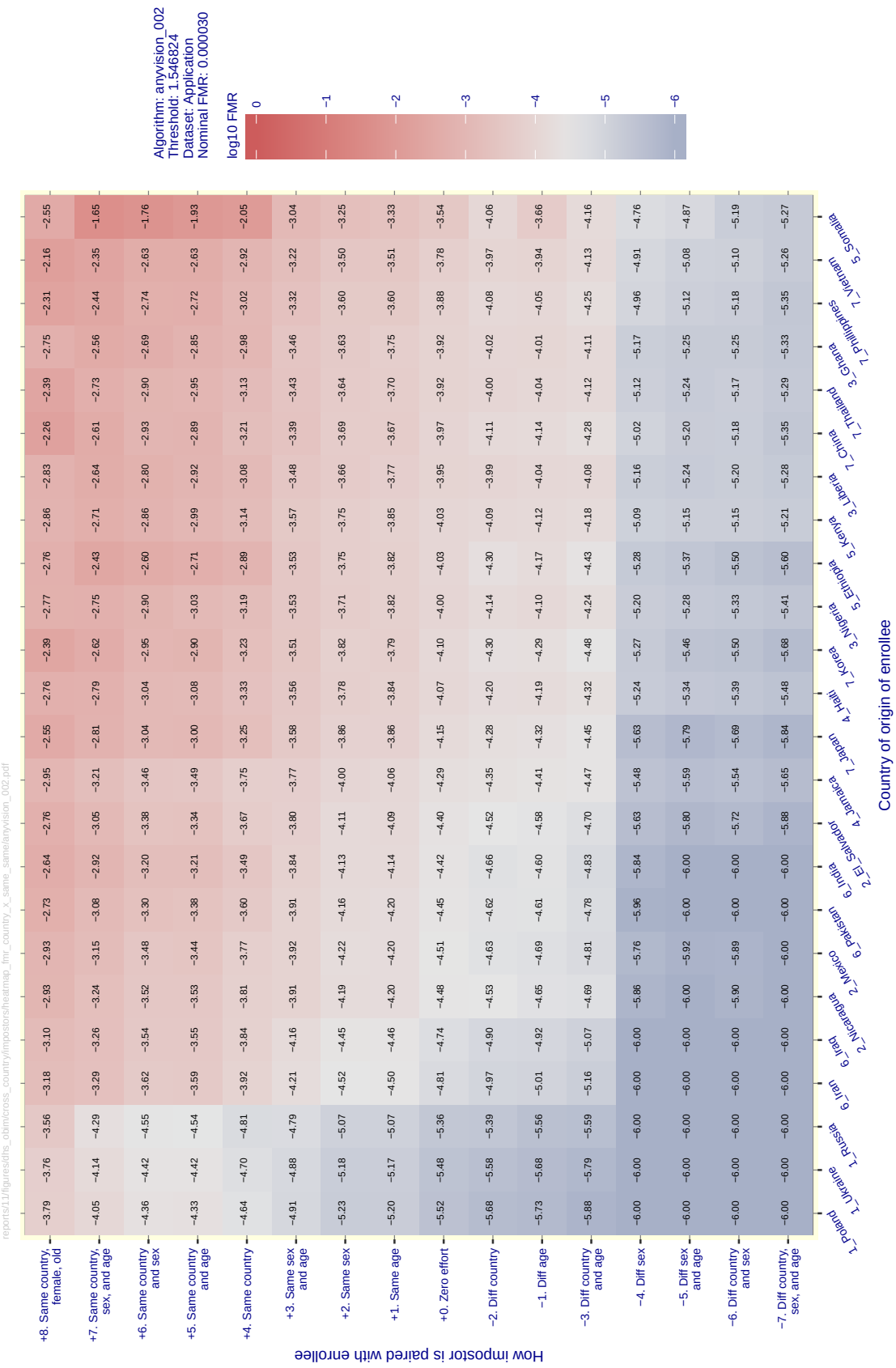


Figure 11: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

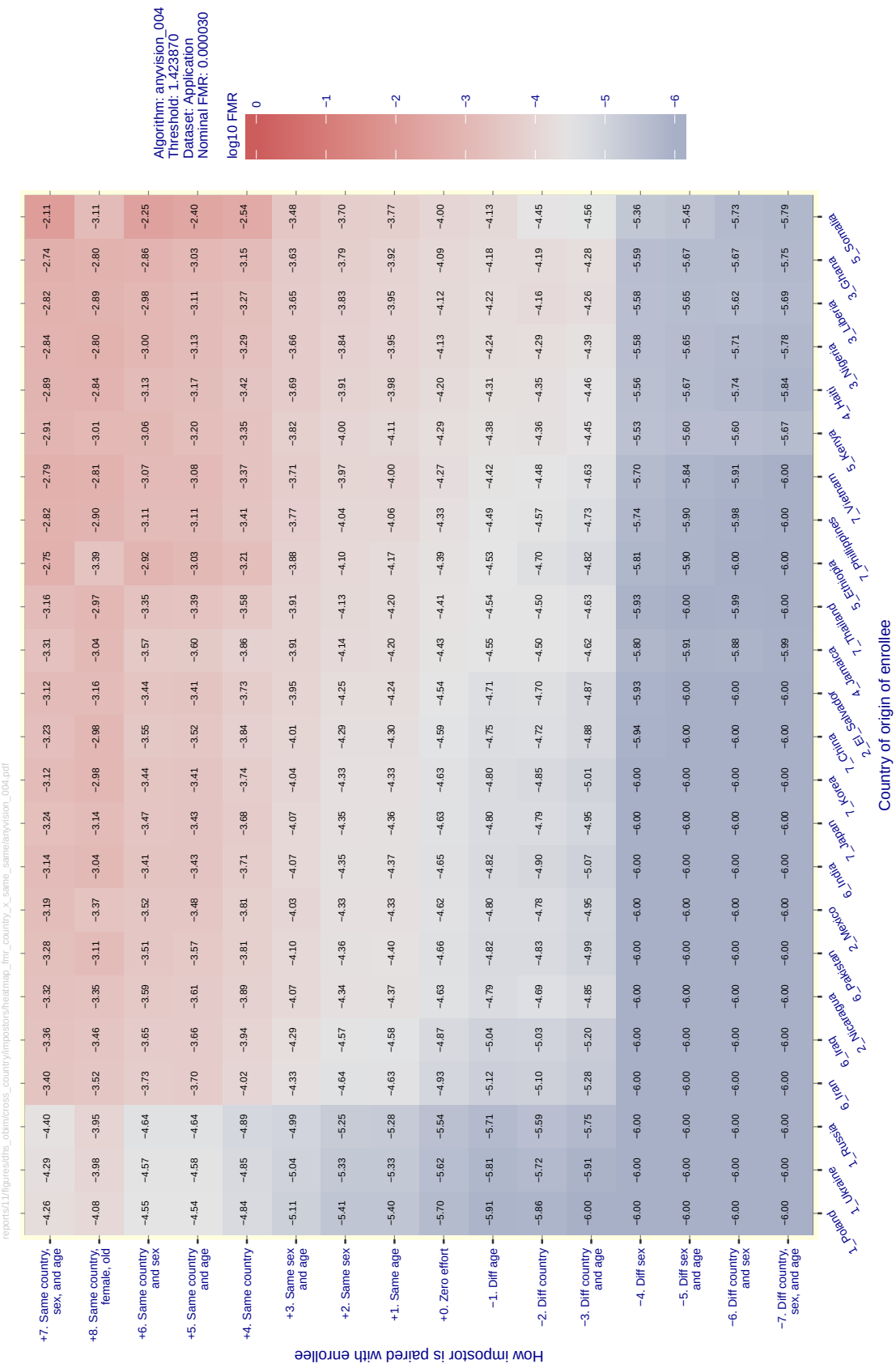
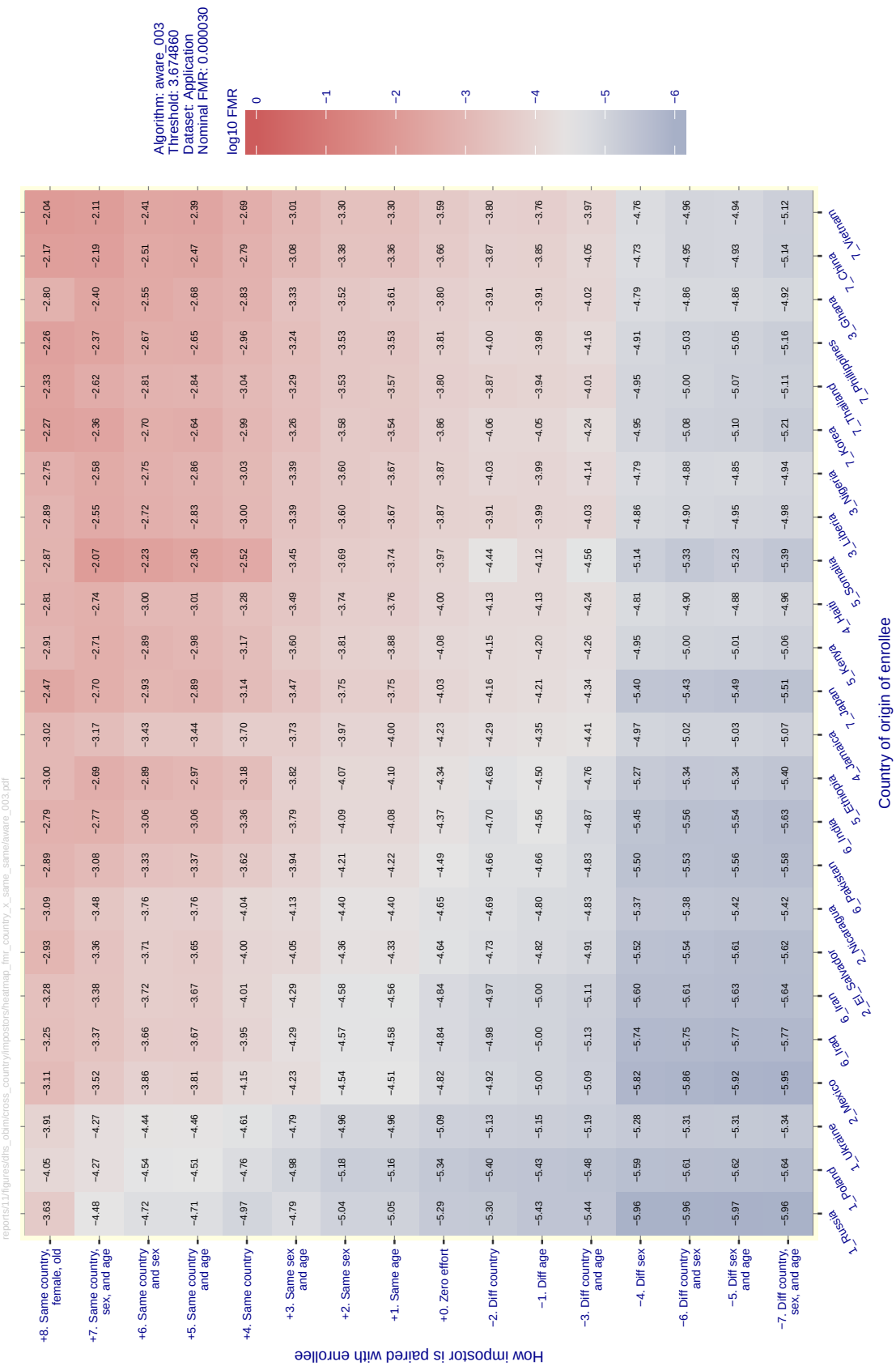


Figure 12: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*



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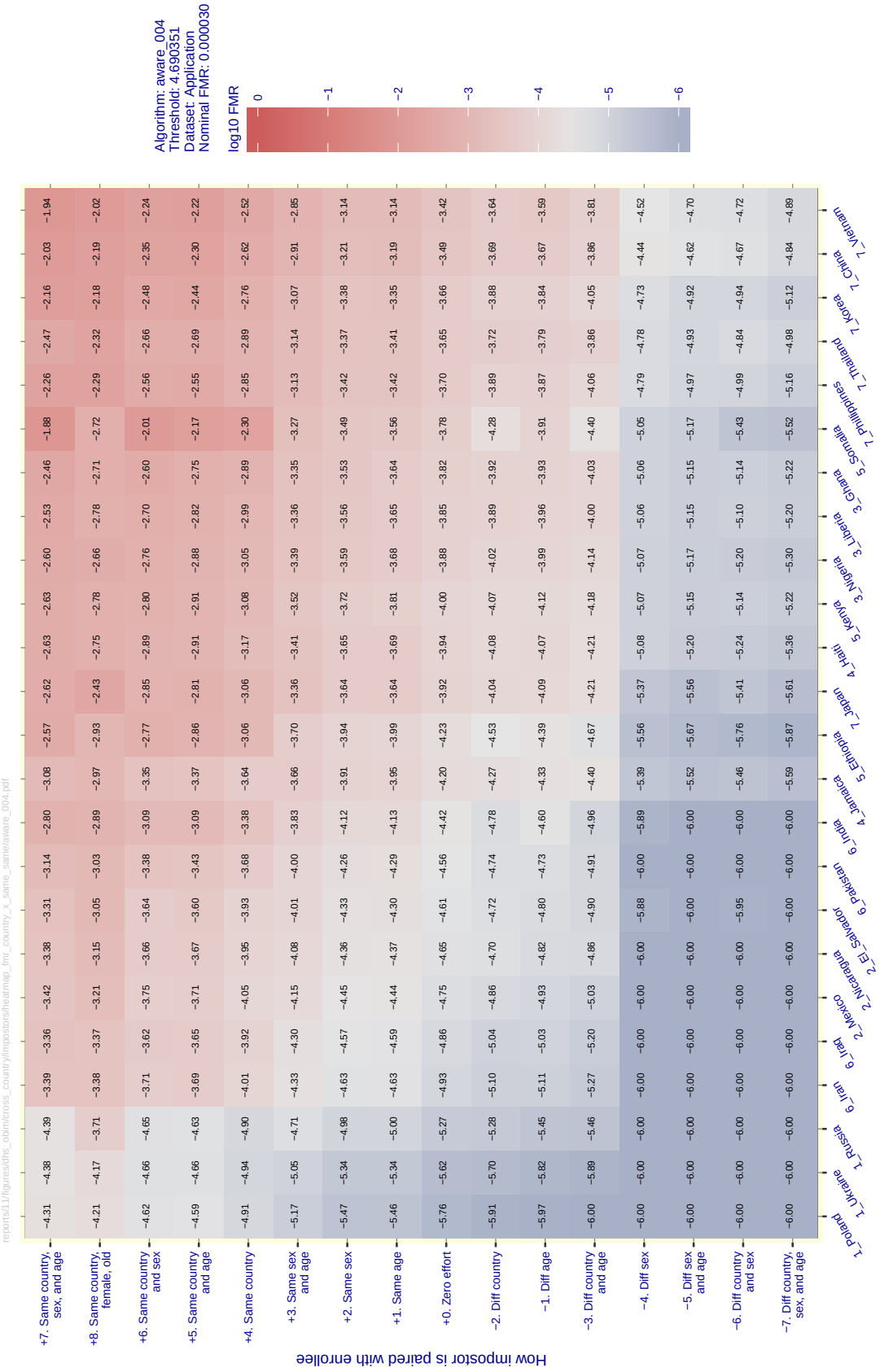


reports/11/figures/dhs_obim/cross_country/impostors/heatmap_fmr_country_x_same_same/aware_004.pdf

Figure 14: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

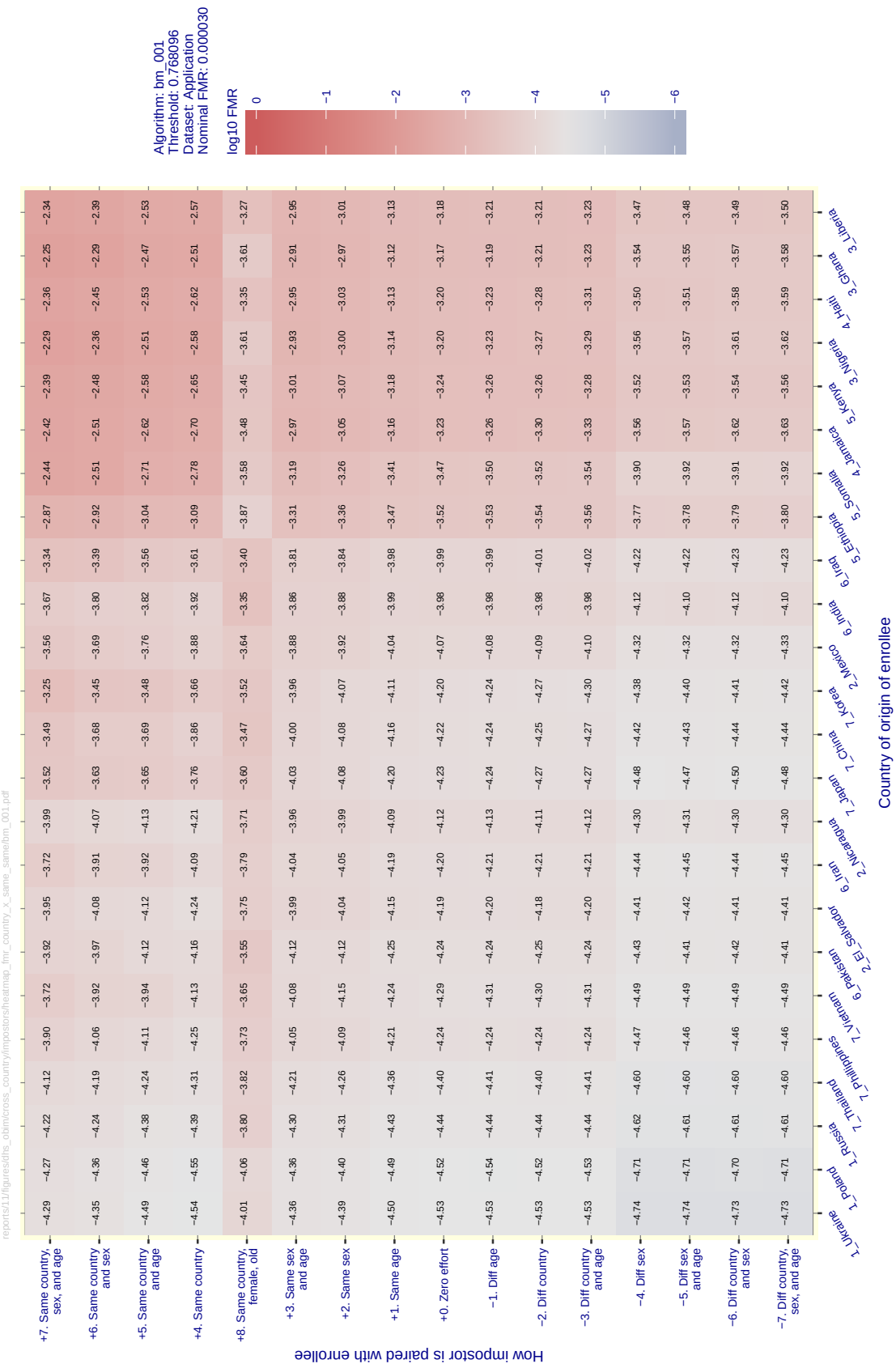


Figure 15: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

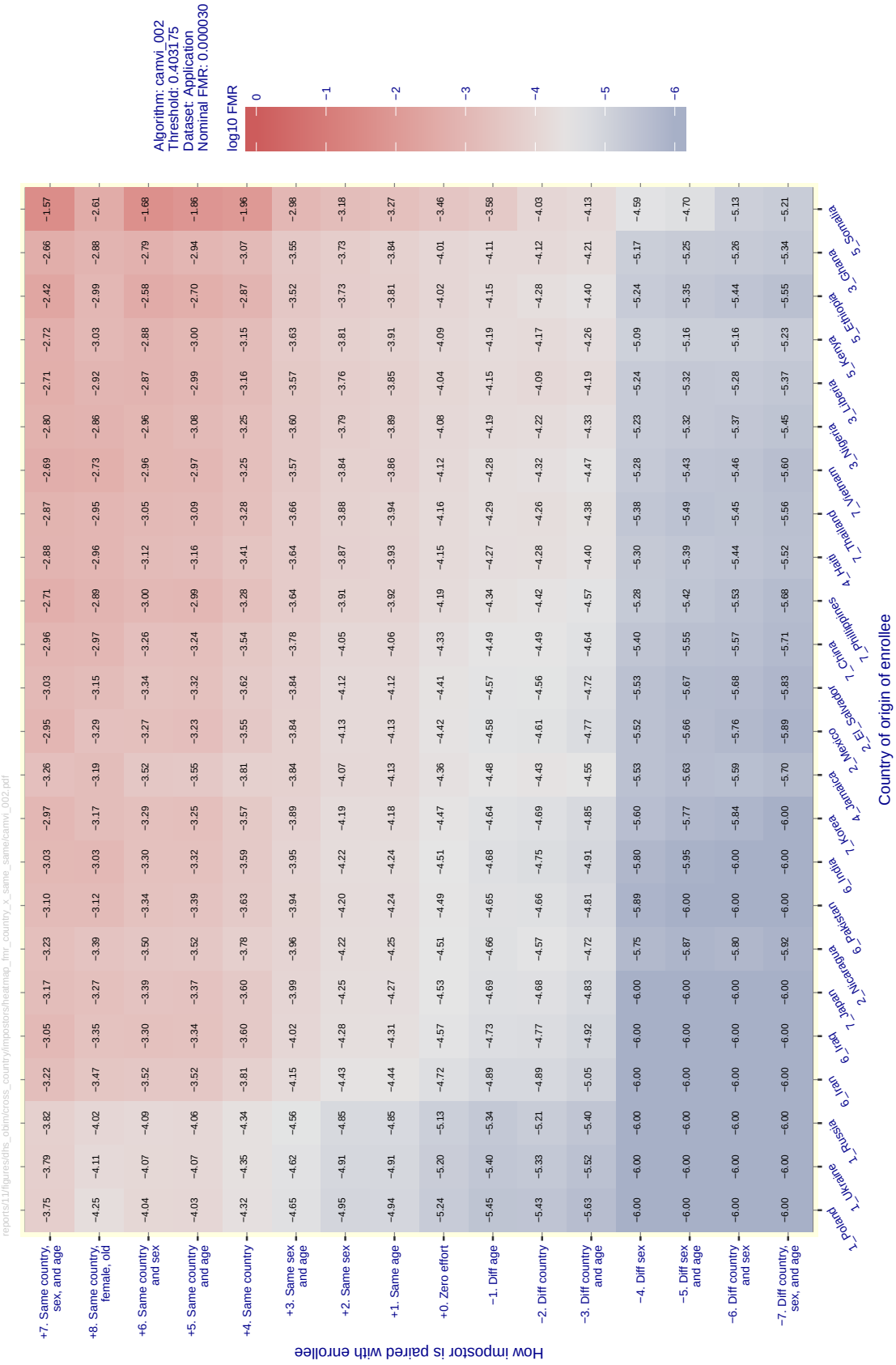


Figure 16: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

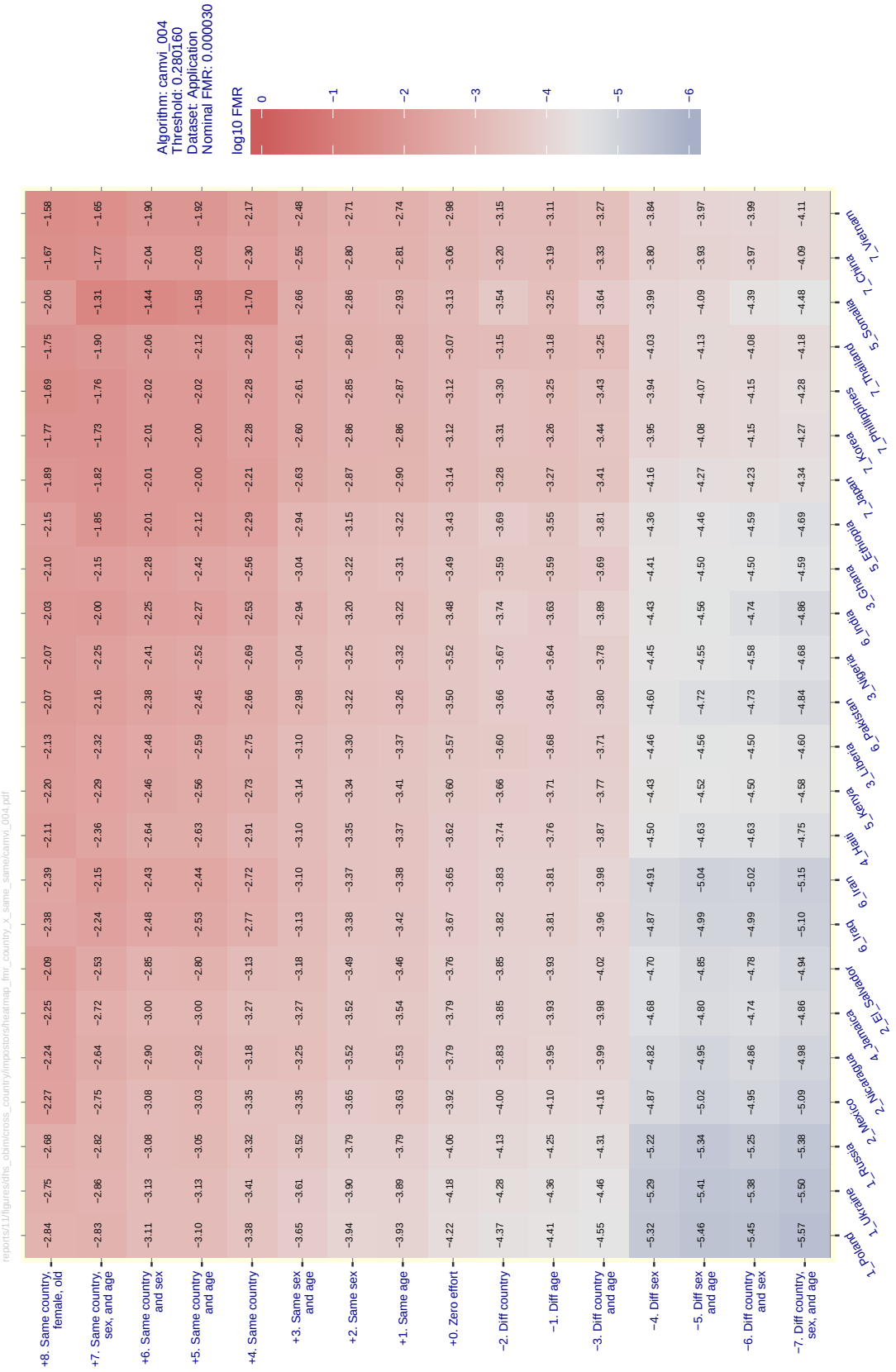


Figure 17: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

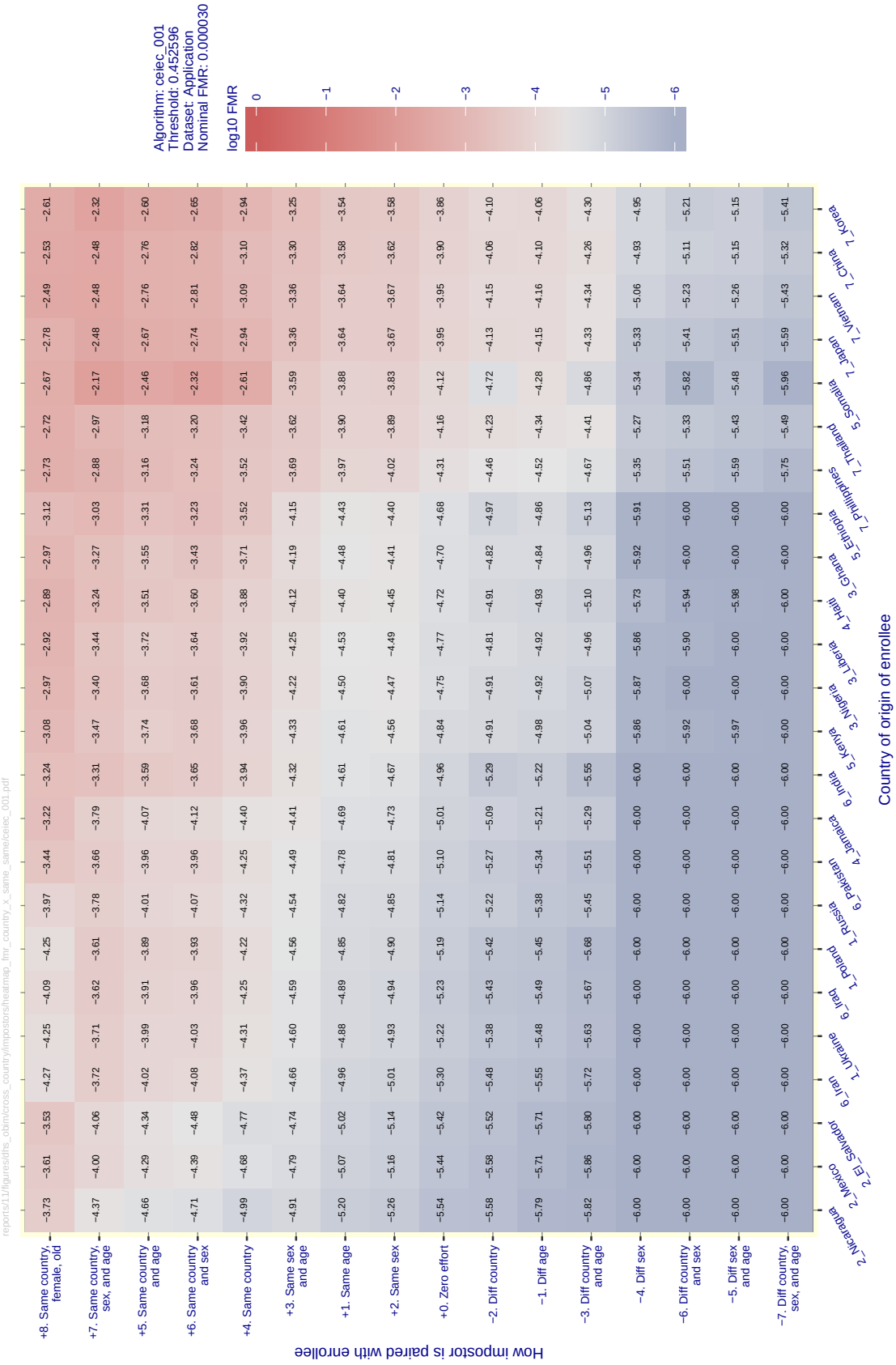


Figure 18: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

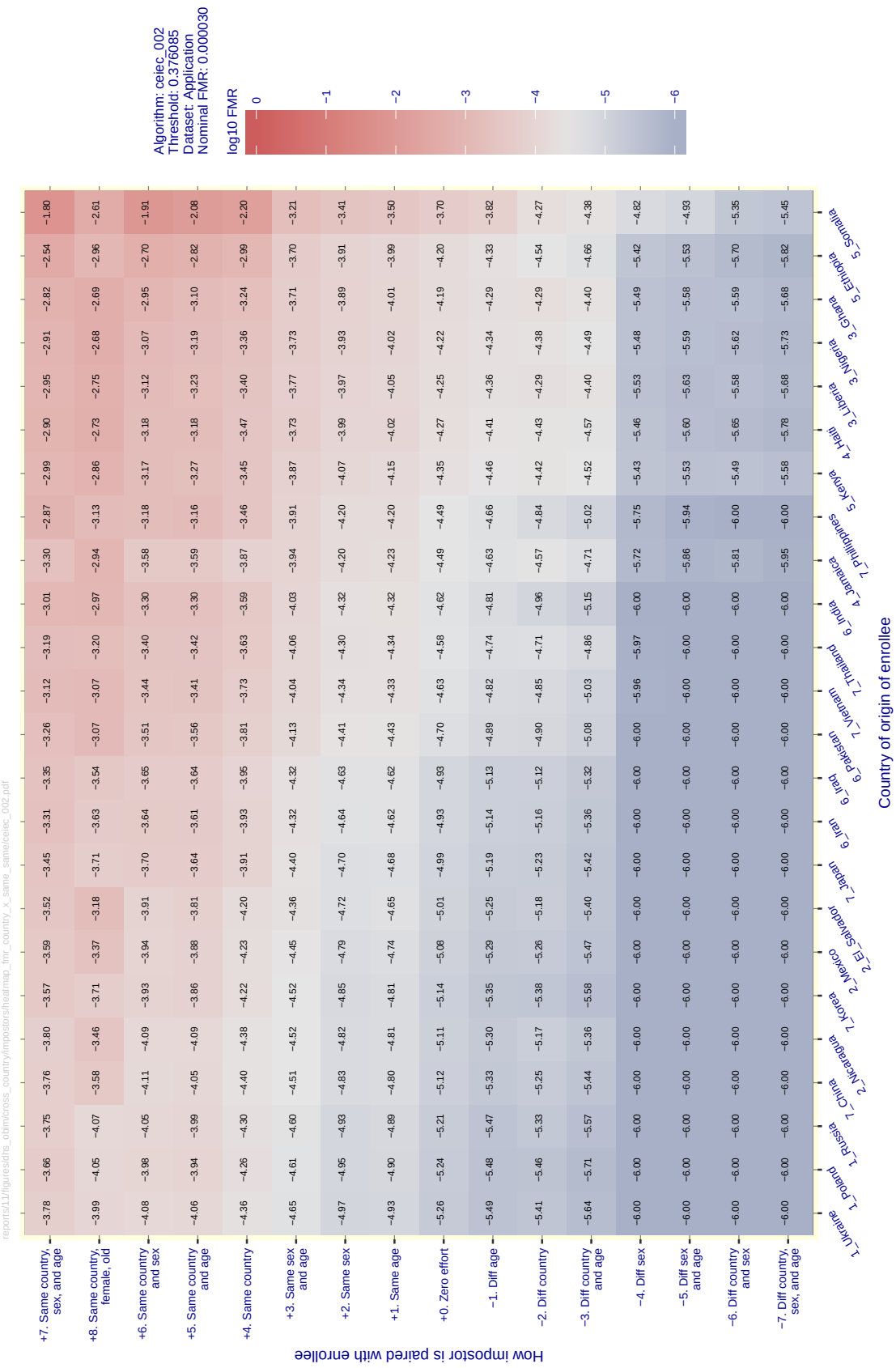


Figure 19: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

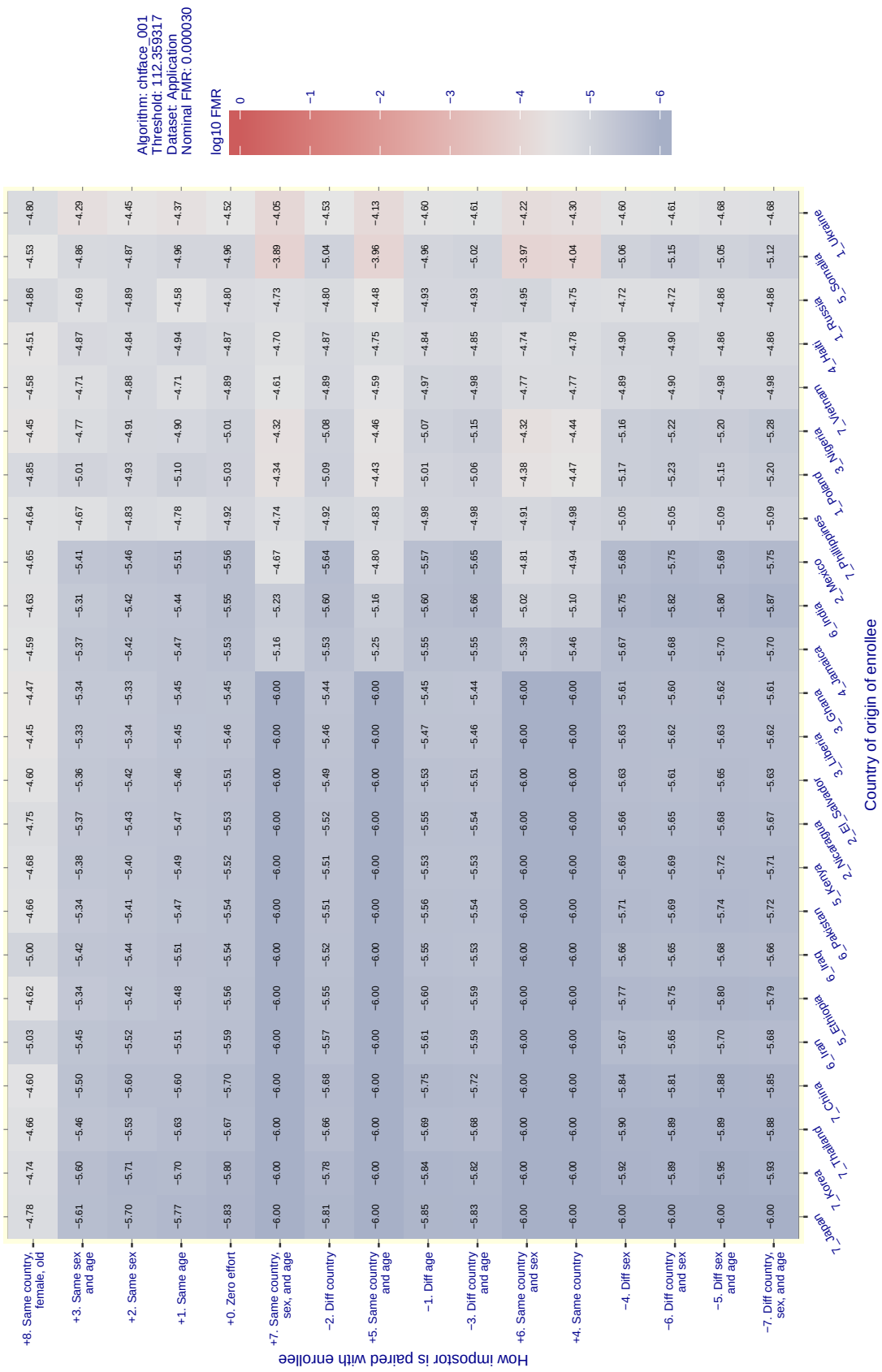


Figure 20: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

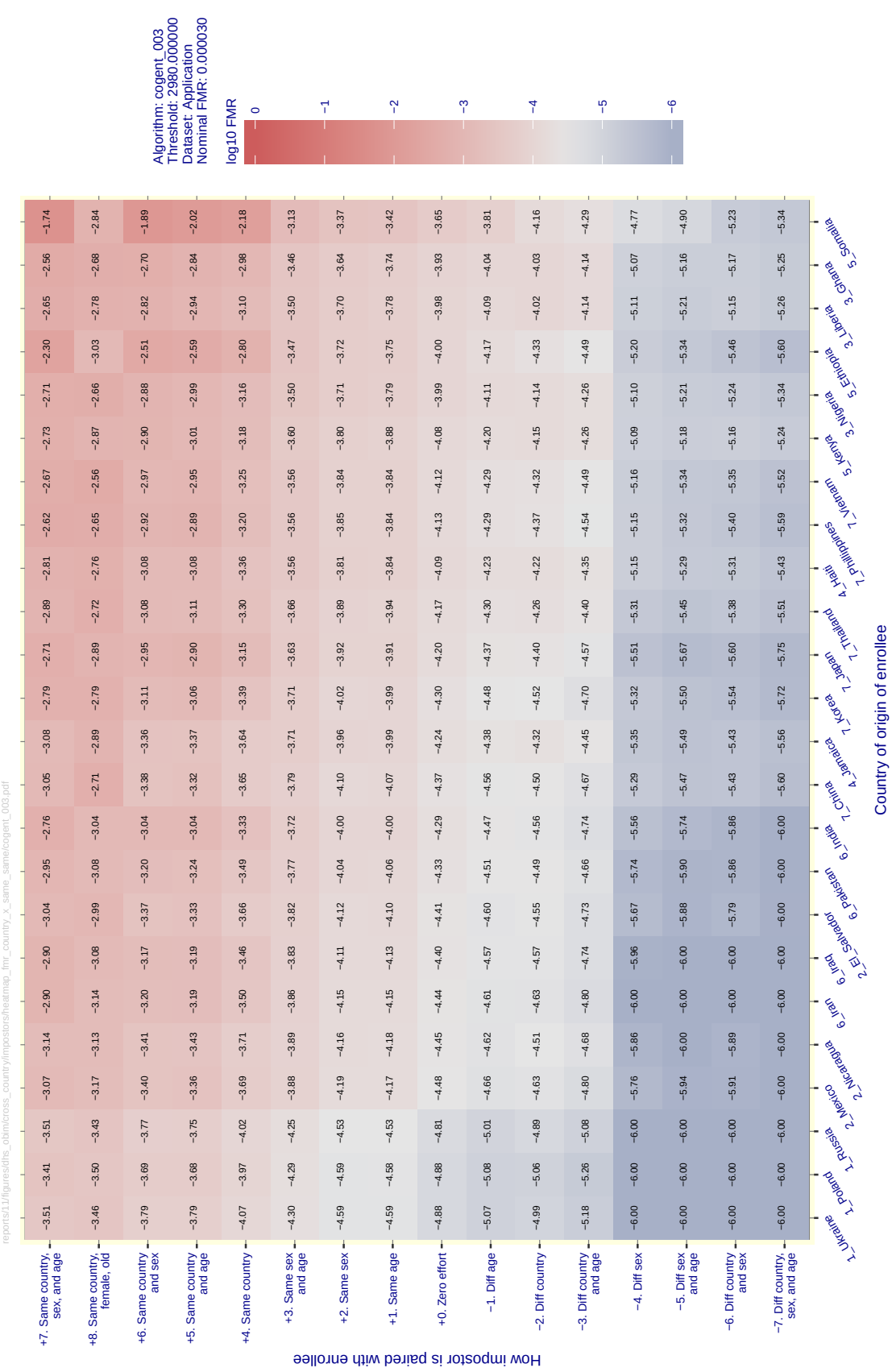


Figure 21: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

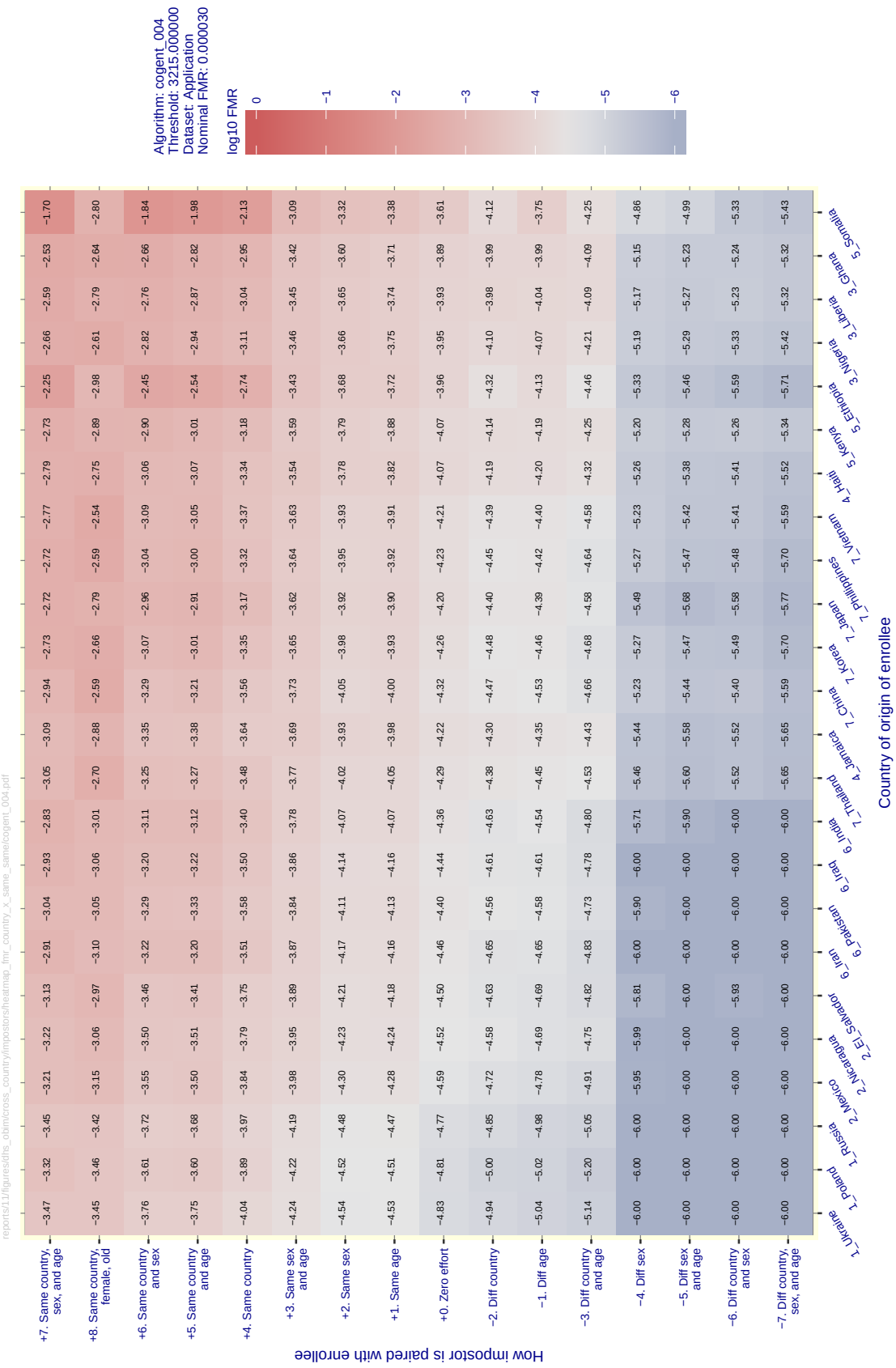


Figure 22: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\mathrm{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

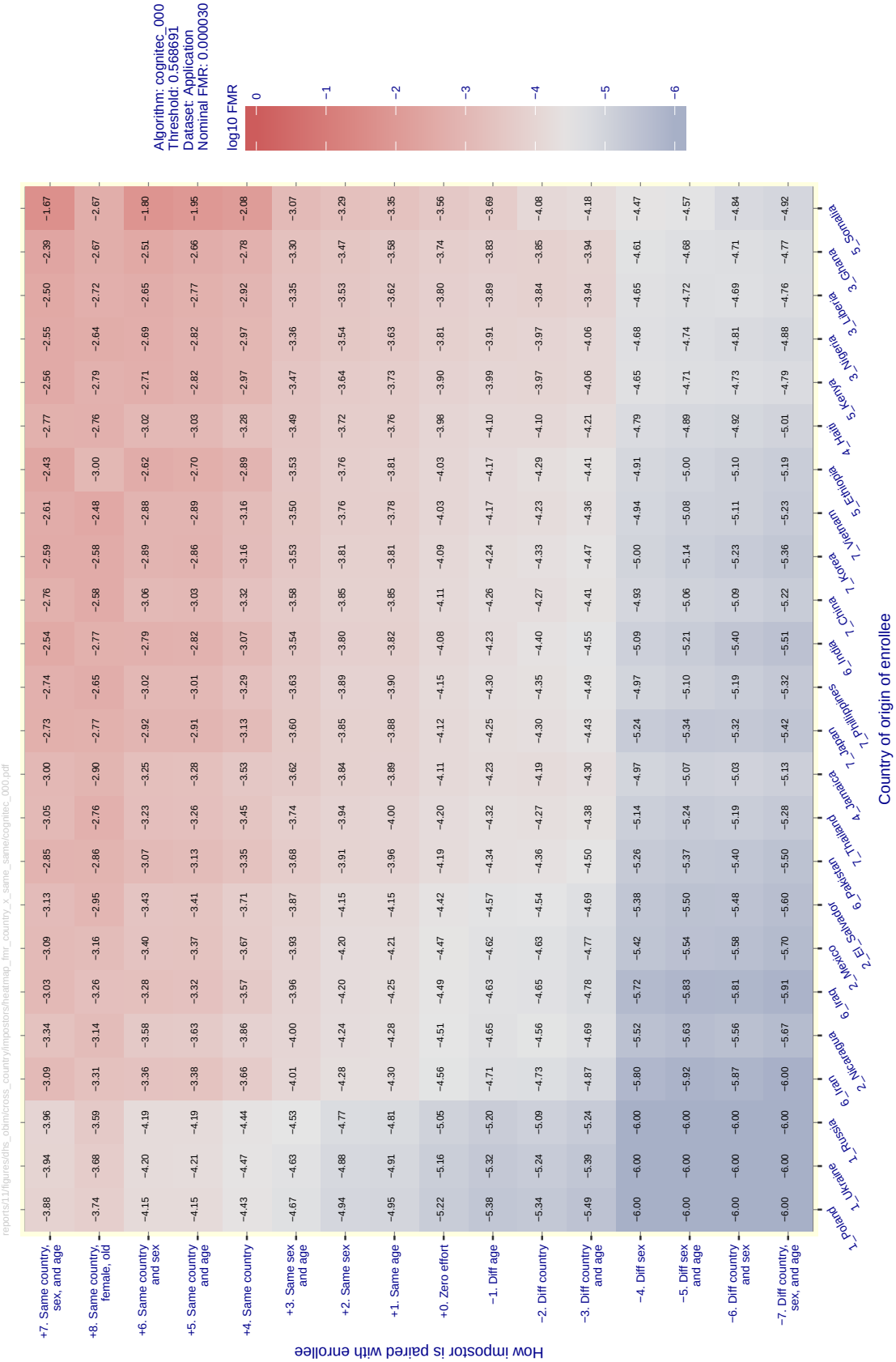


Figure 23: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

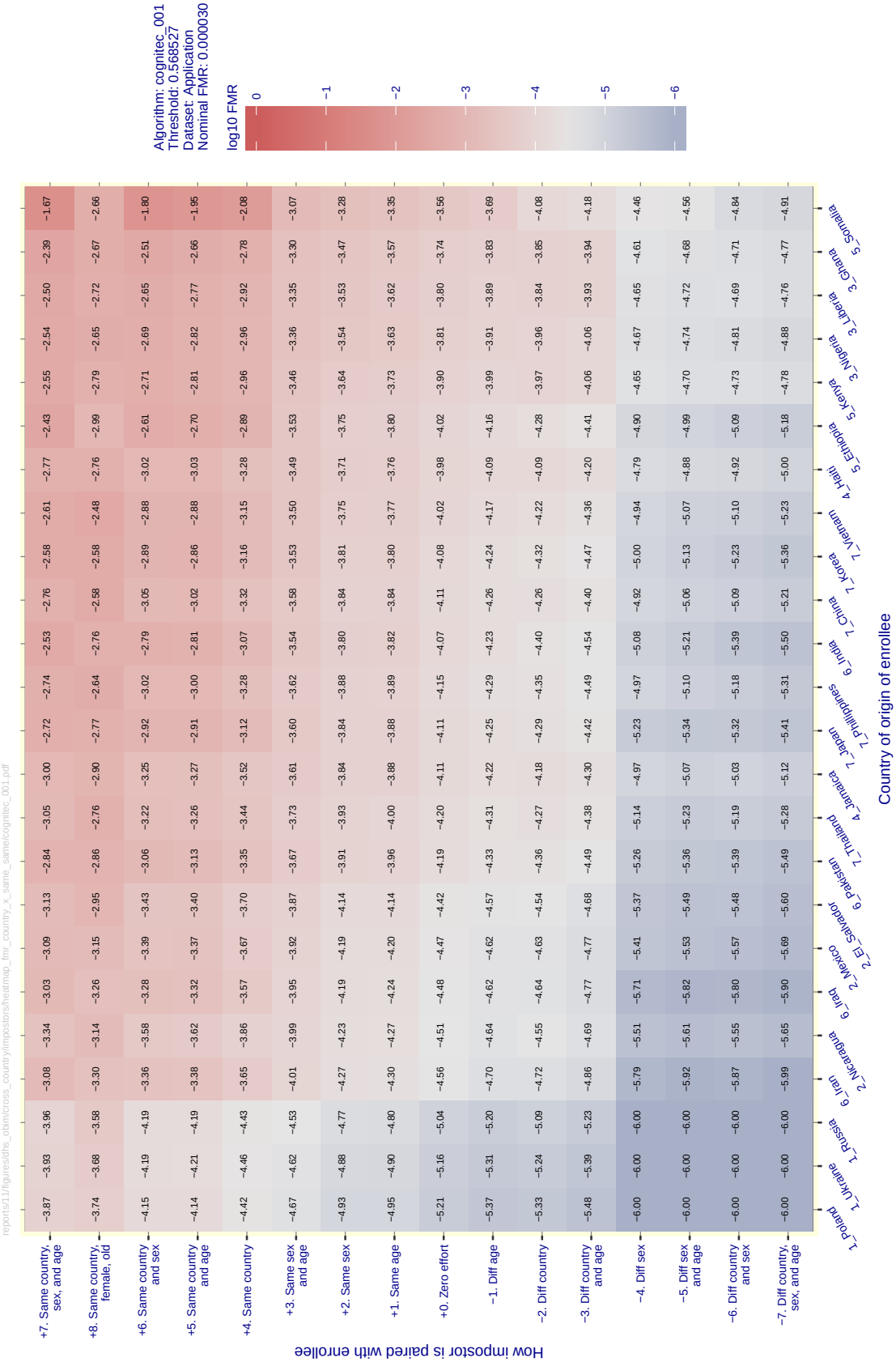


Figure 24: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

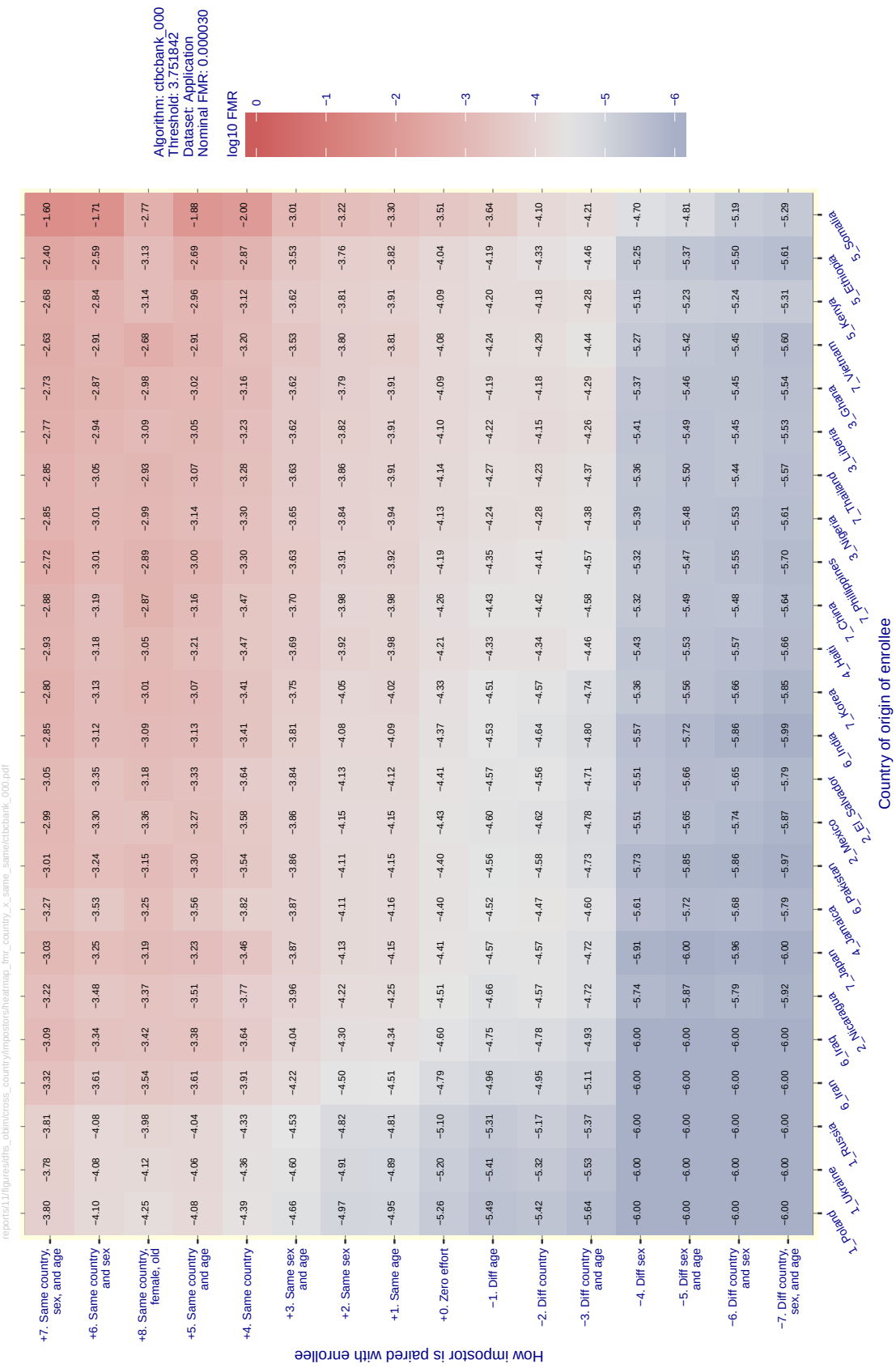


Figure 25: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

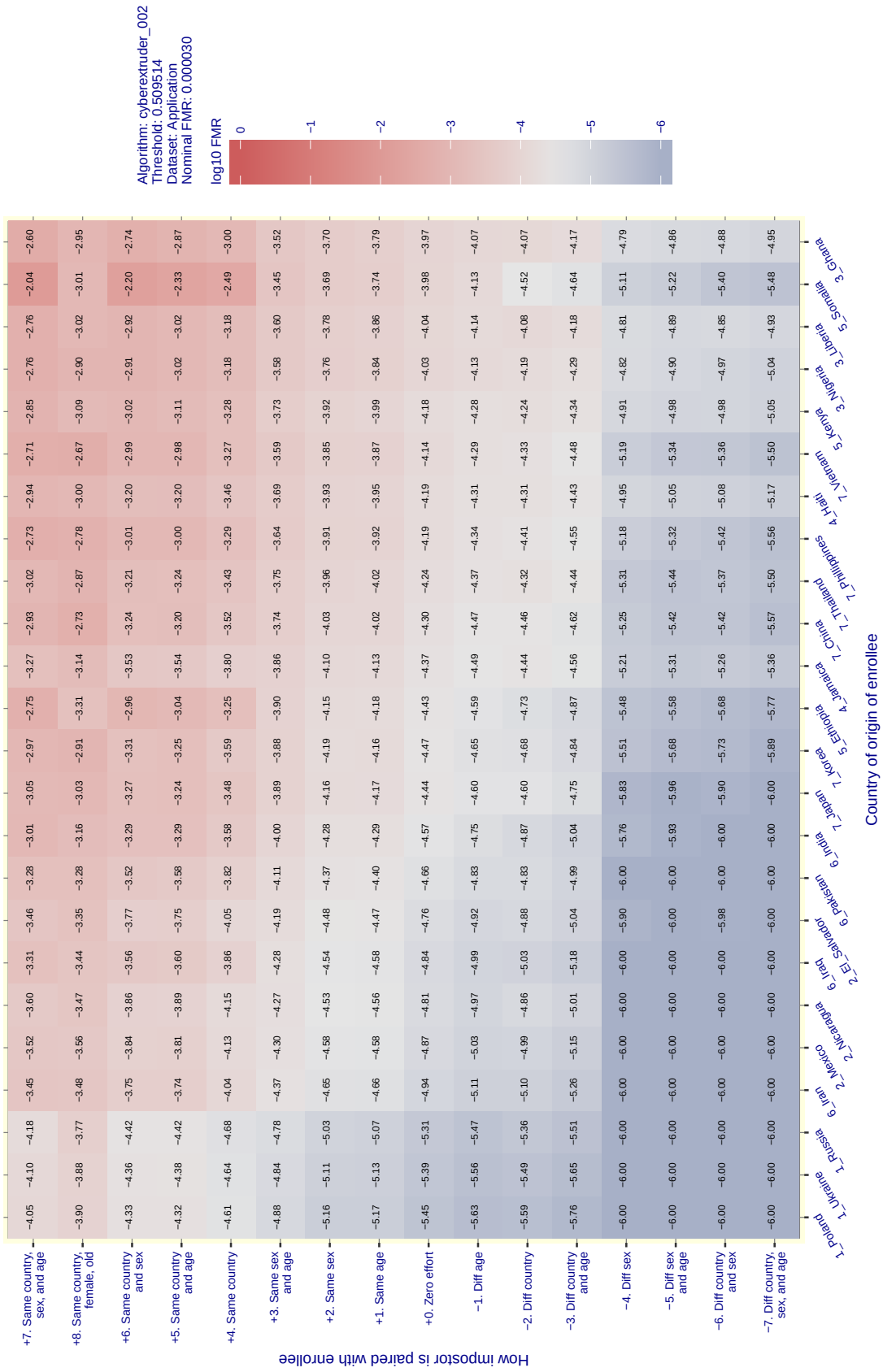


Figure 26: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

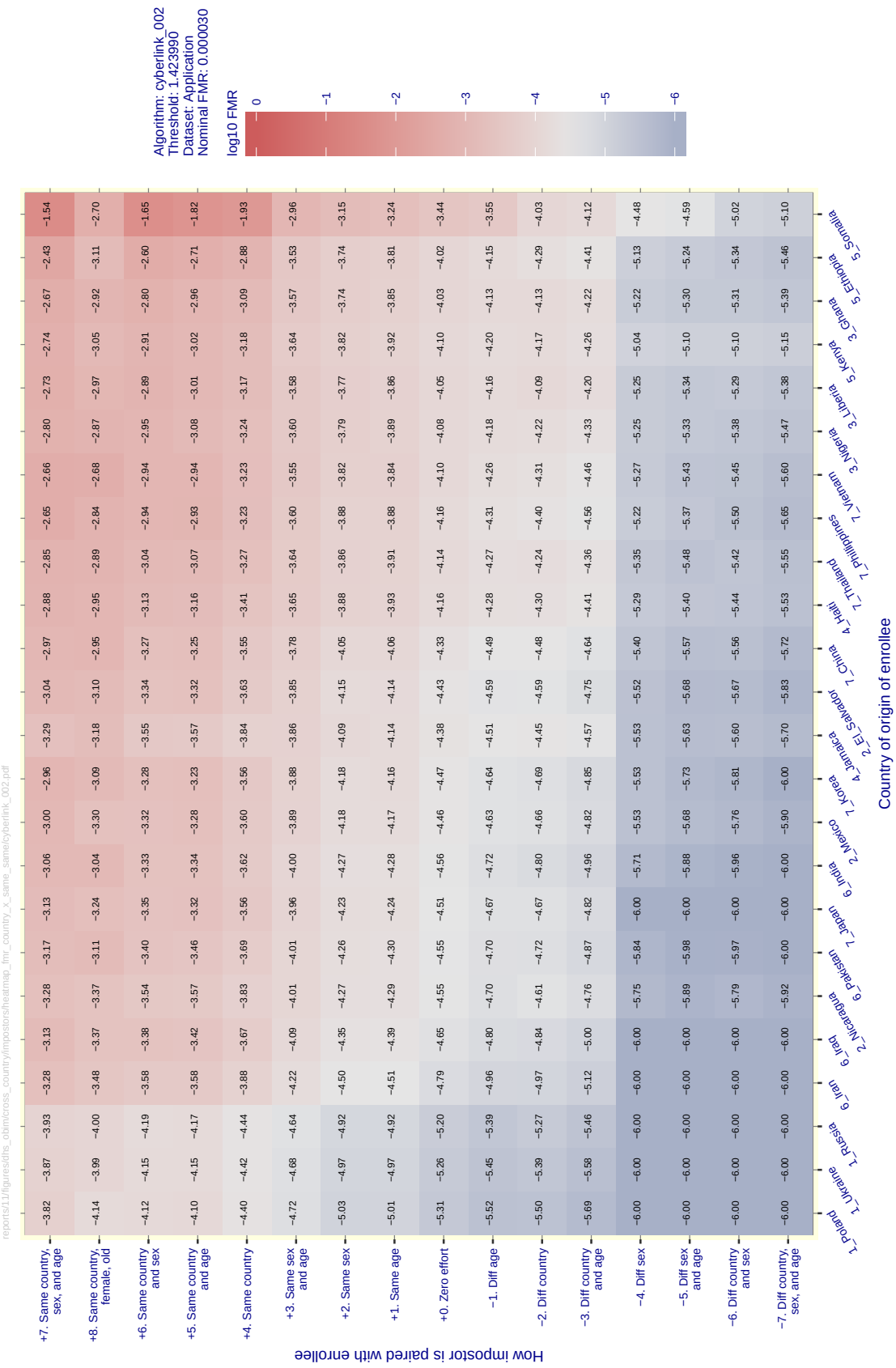


Figure 27: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

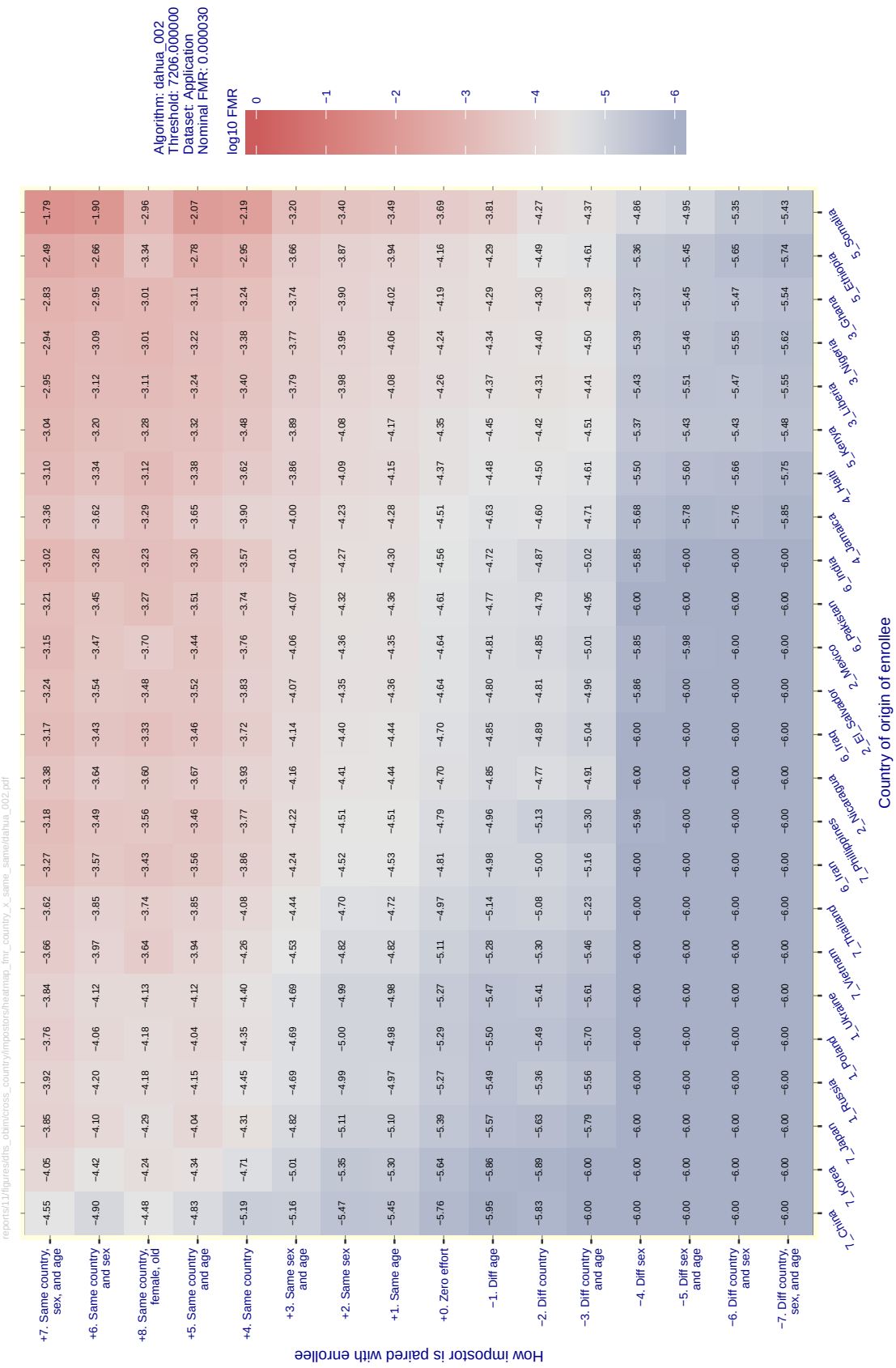


Figure 28: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

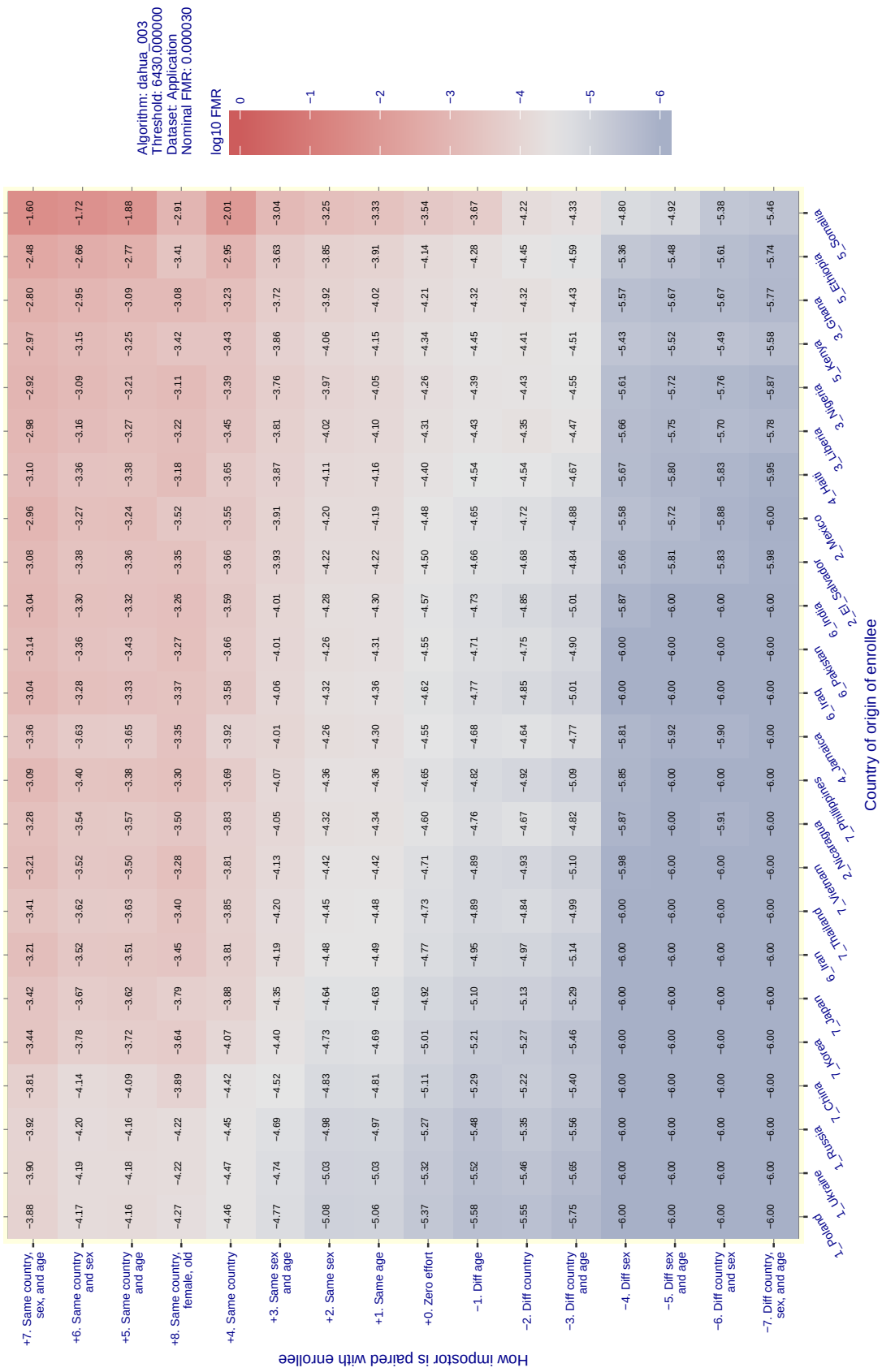


Figure 29: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

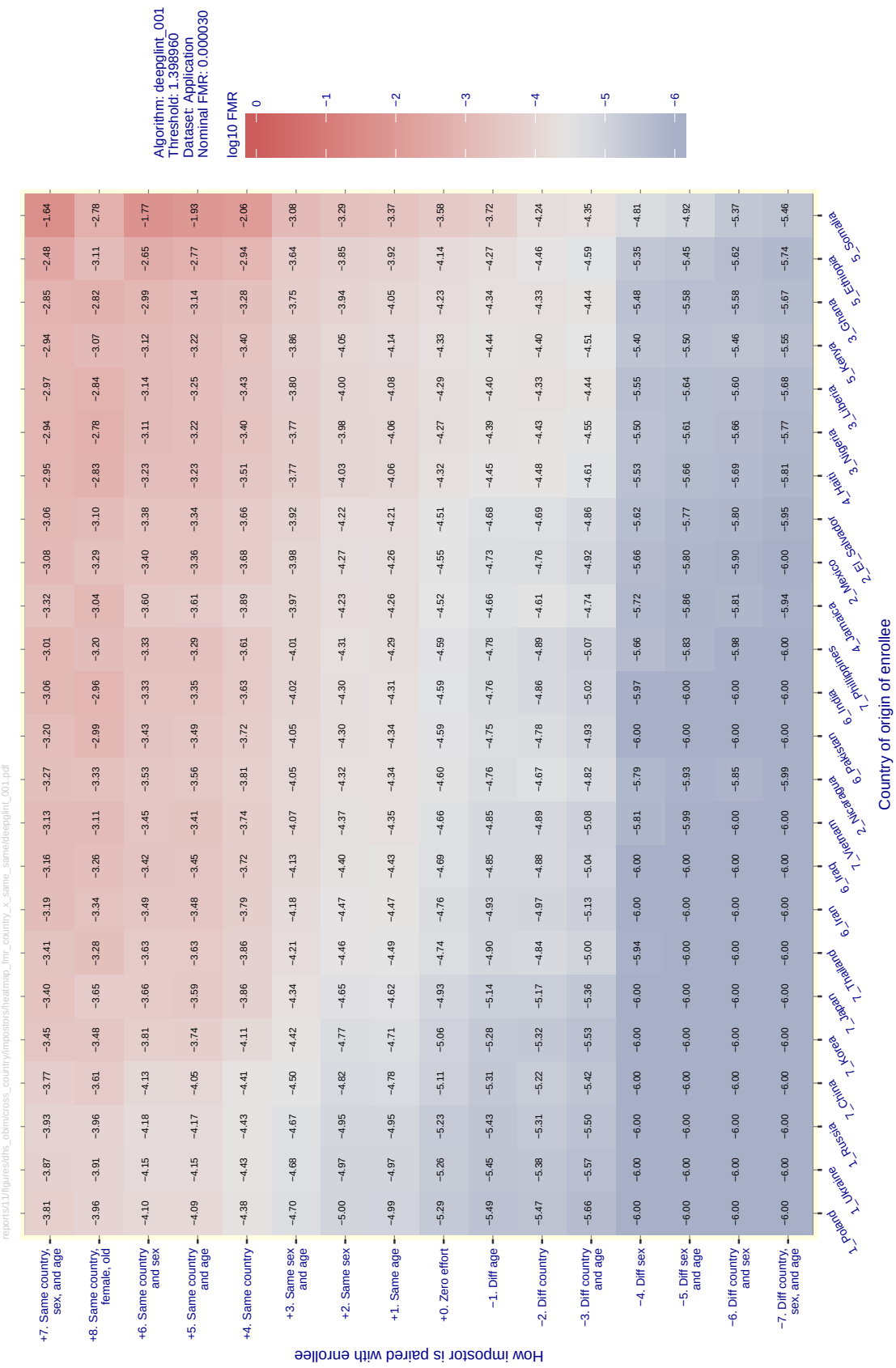


Figure 30: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

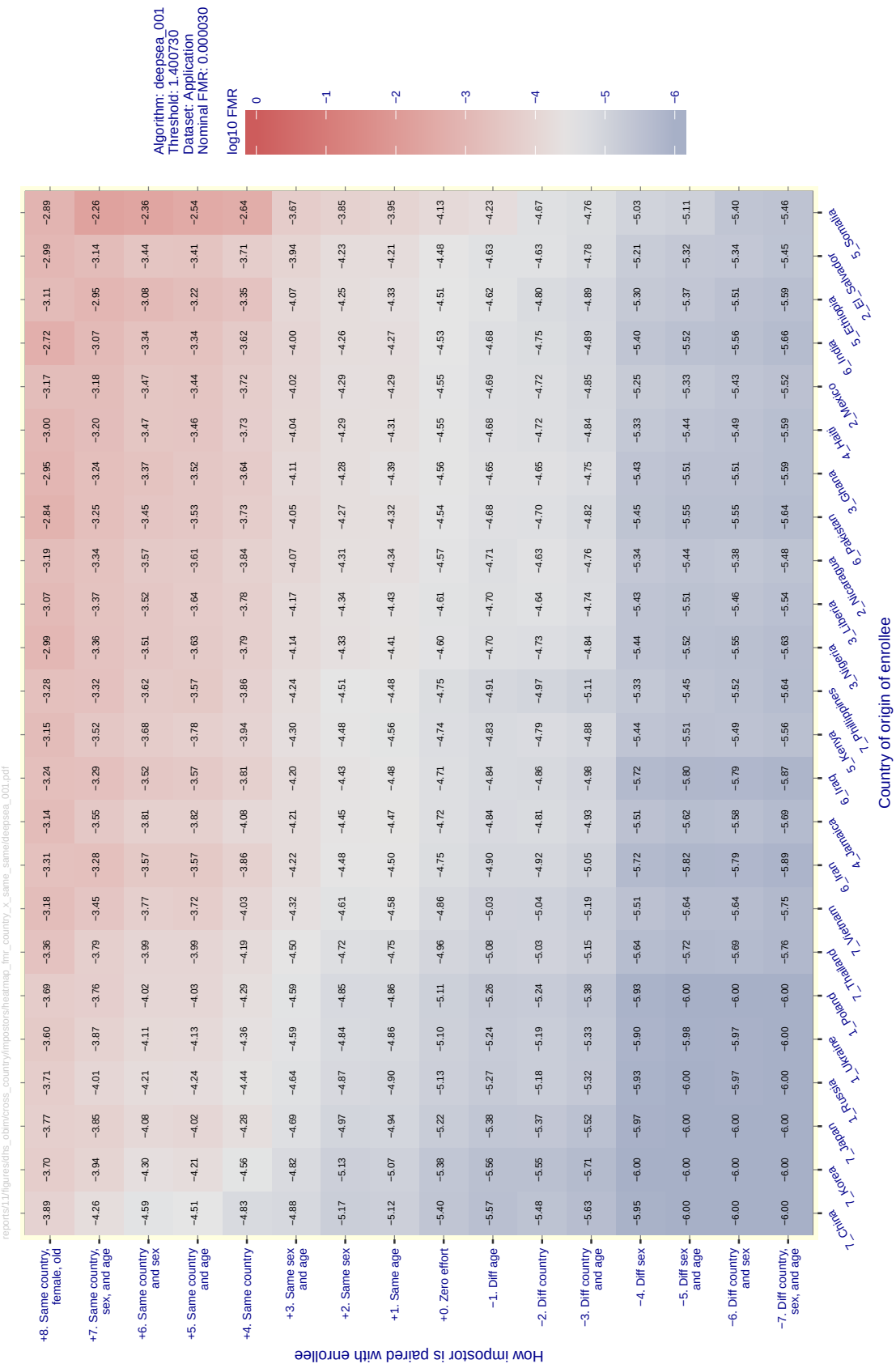


Figure 31: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

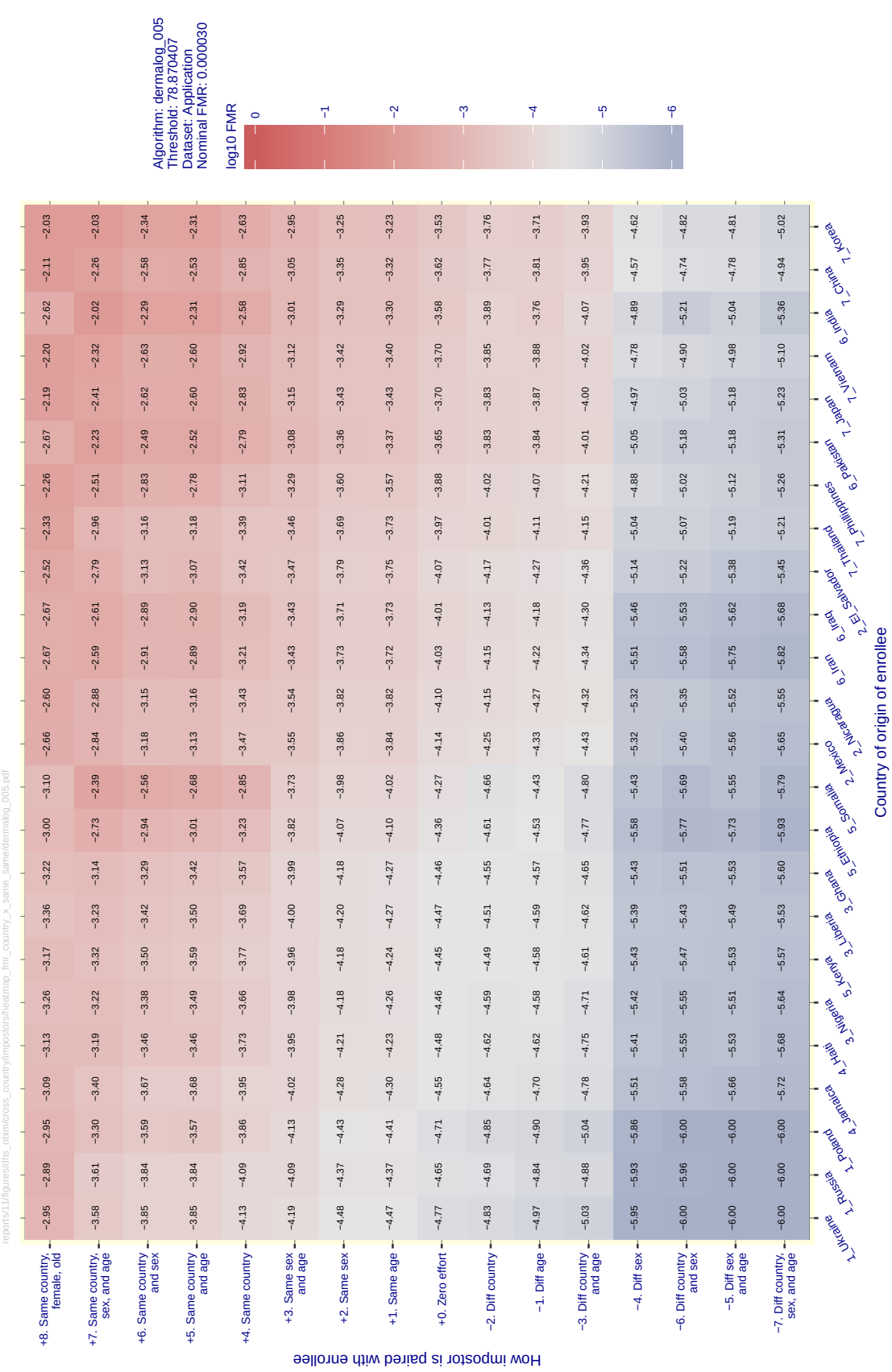


Figure 32: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

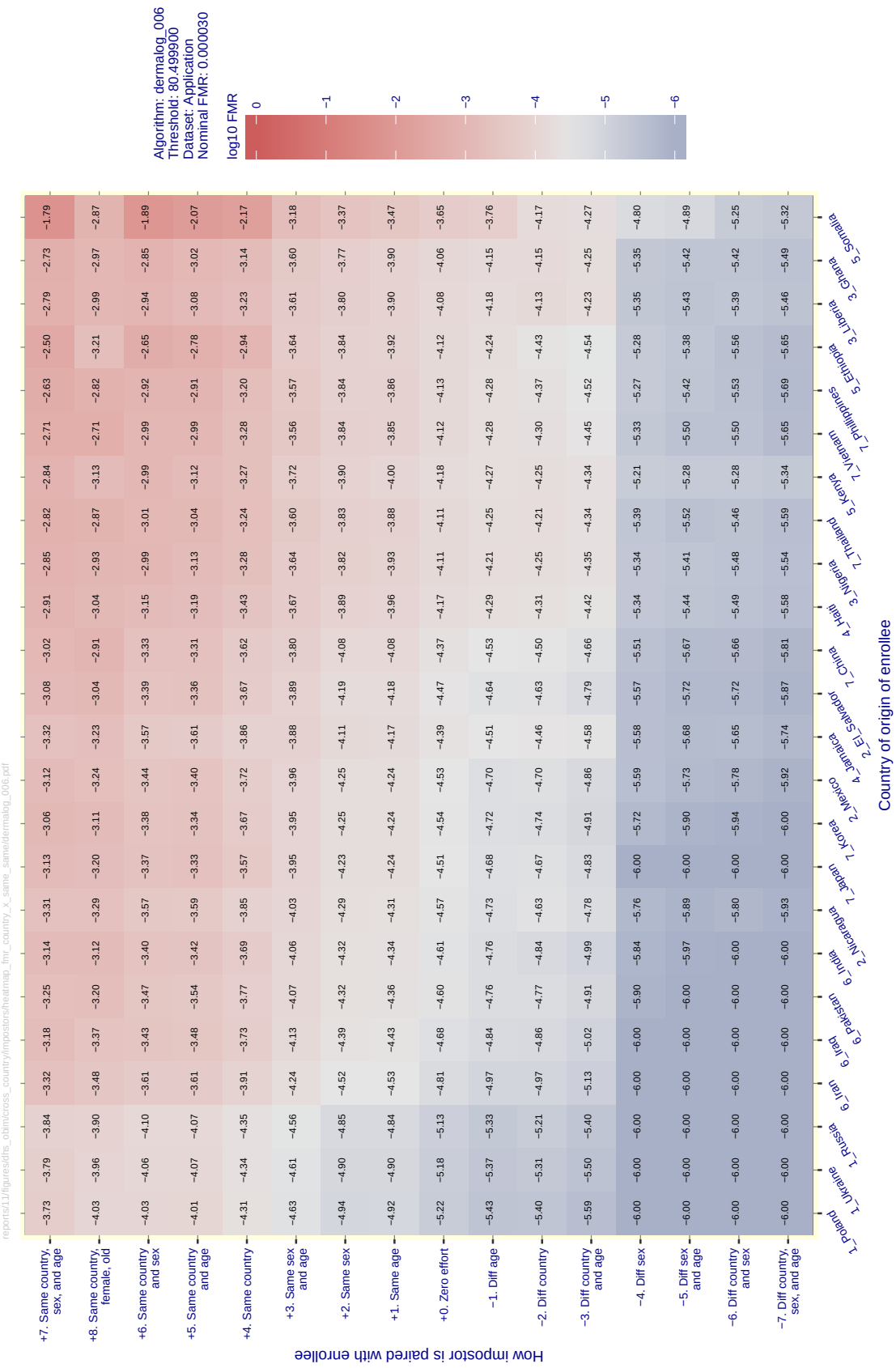


Figure 33: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

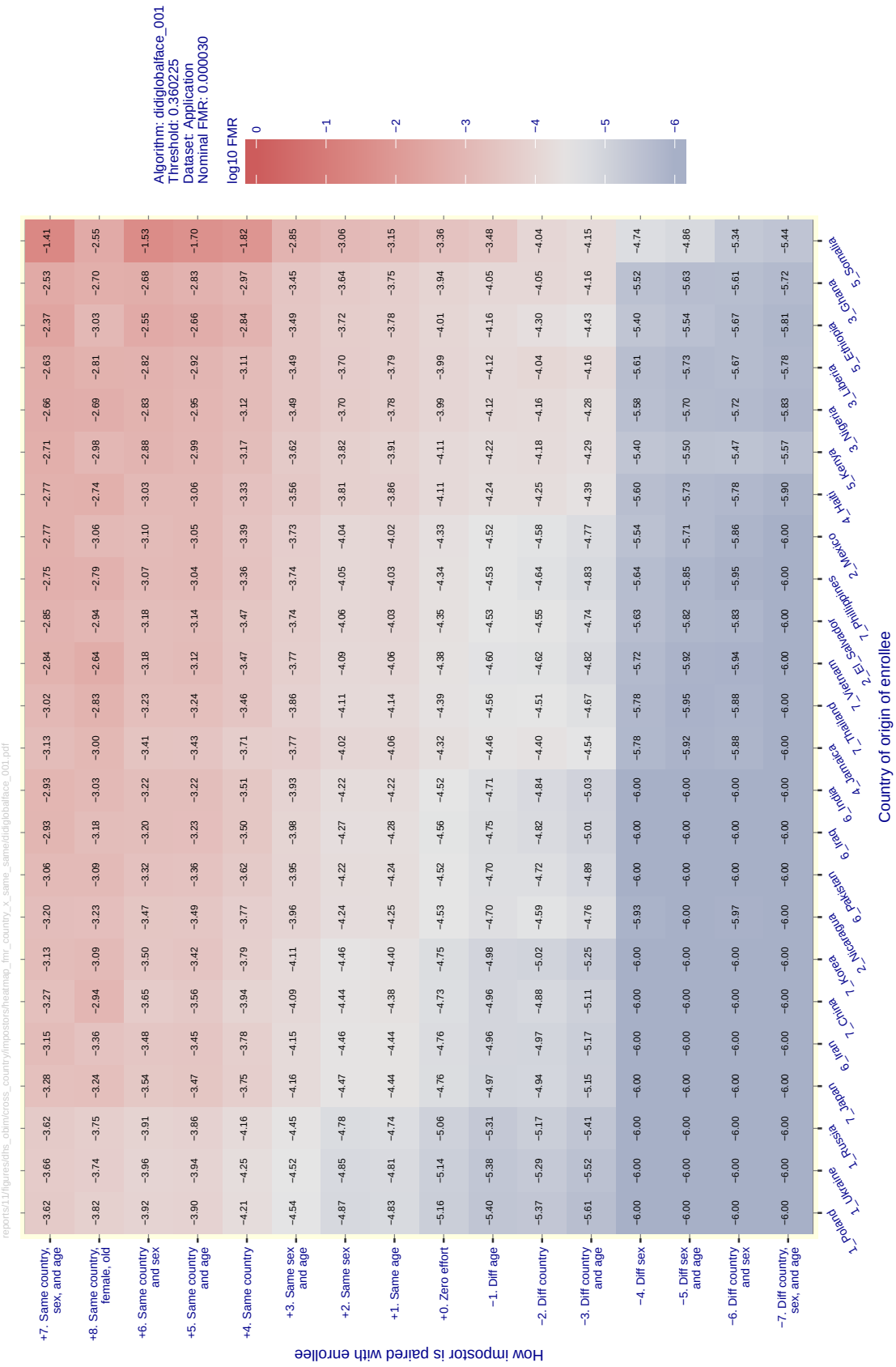


Figure 34: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

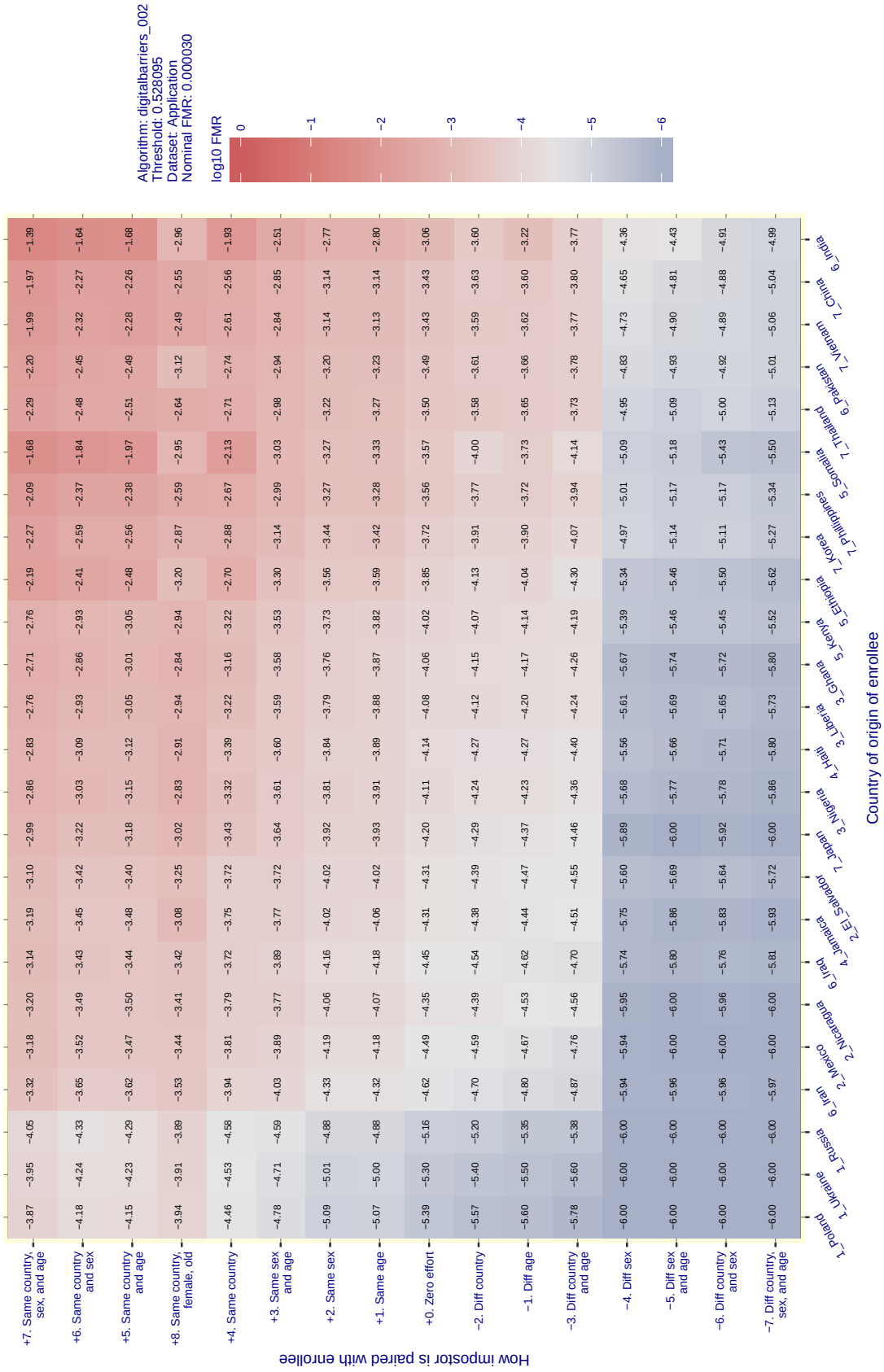


Figure 35: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

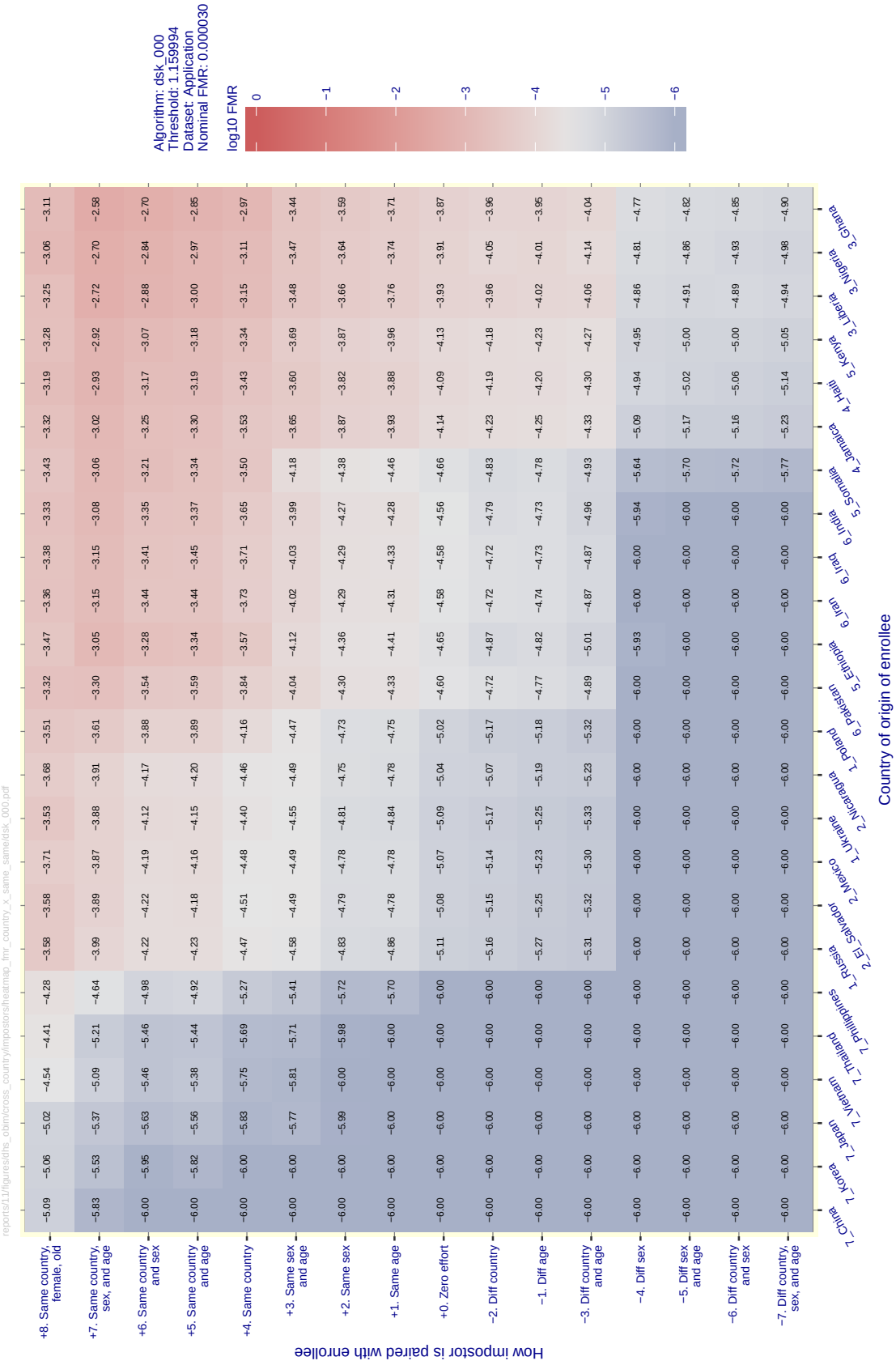
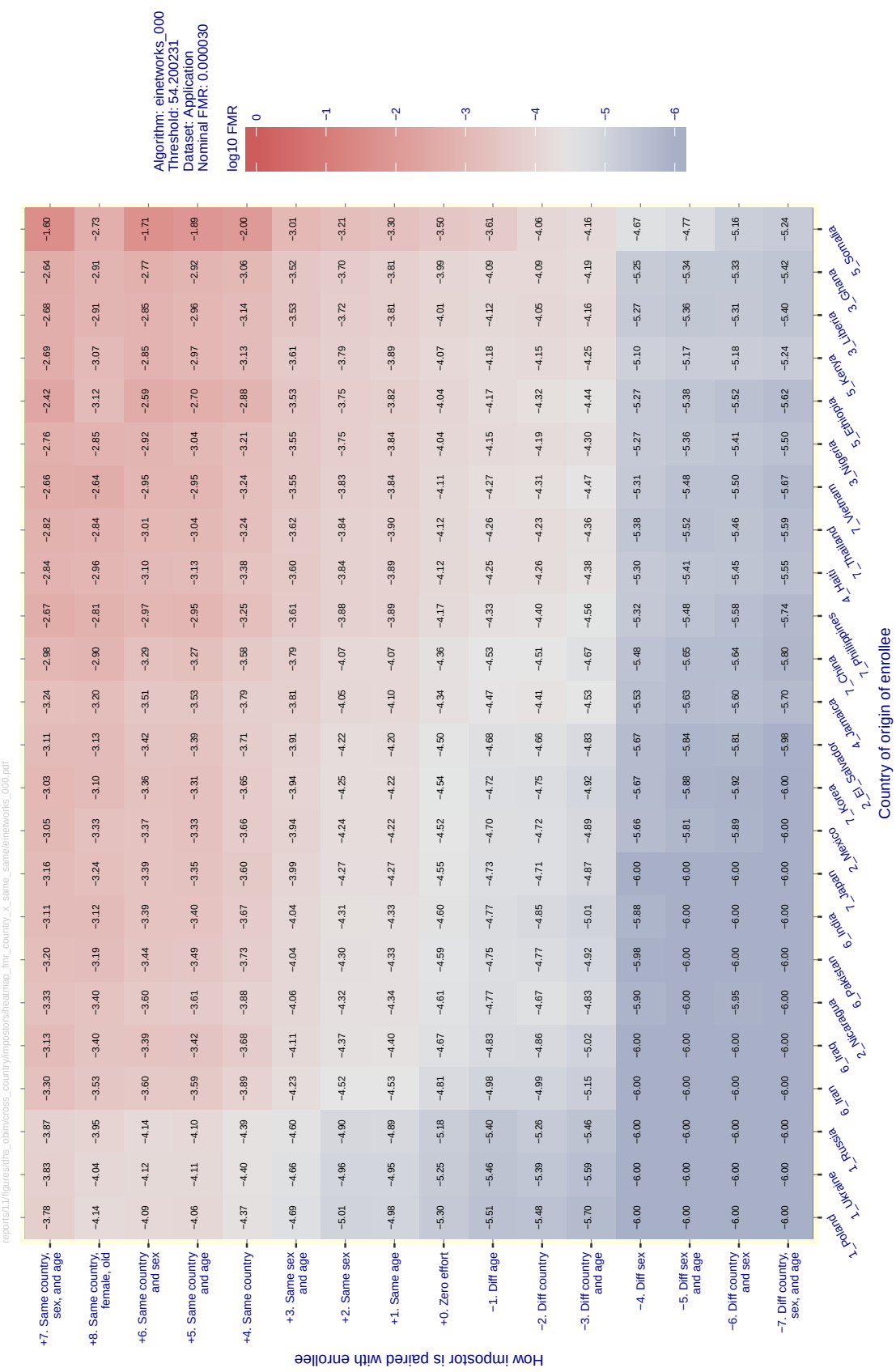


Figure 36: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*



reports/11/figuresdhs_obimcross_country/impostors/heatmap_fmr_country_x_same_same/einetworks_000.pdf

Figure 37: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

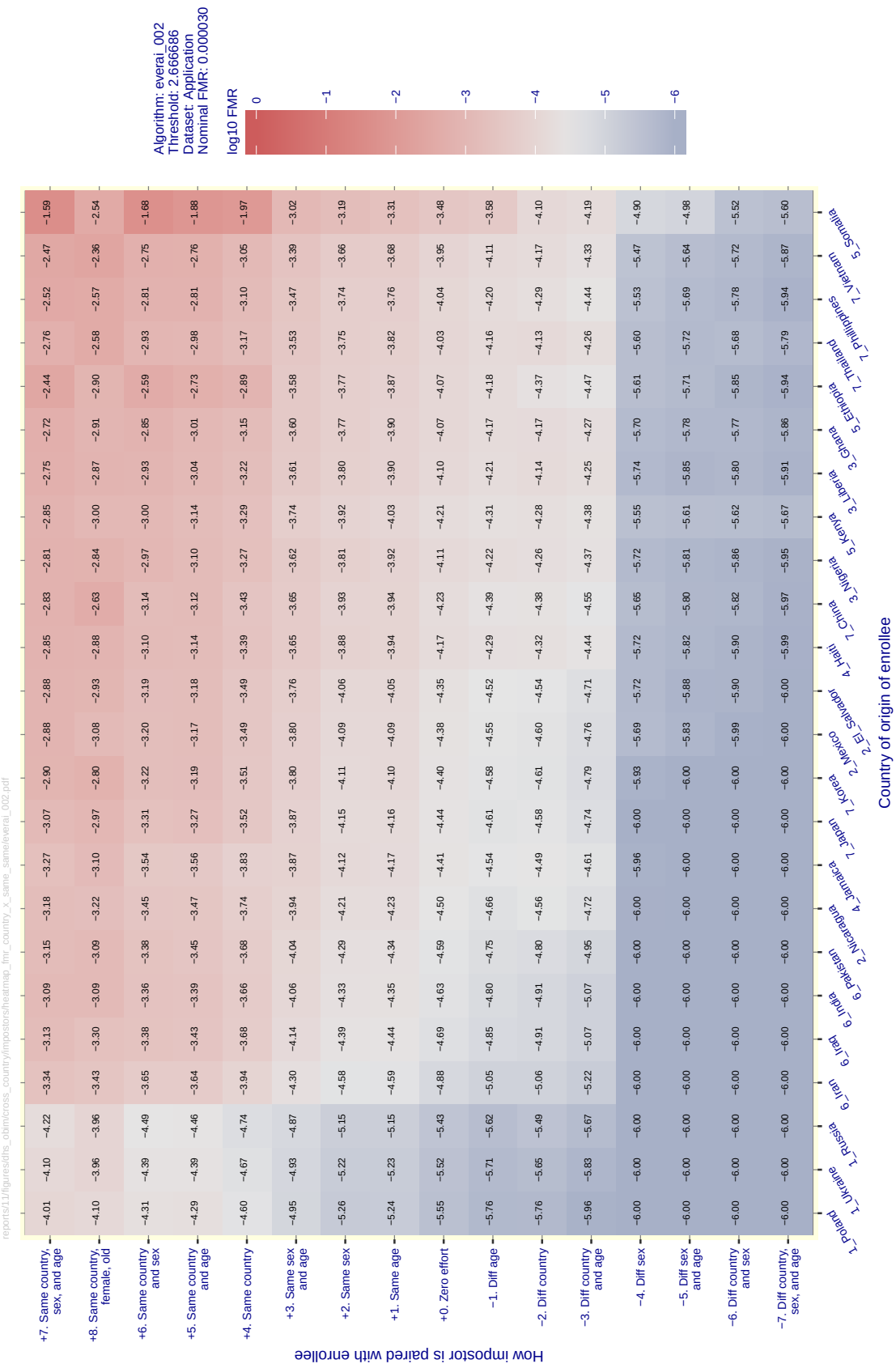


Figure 38: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

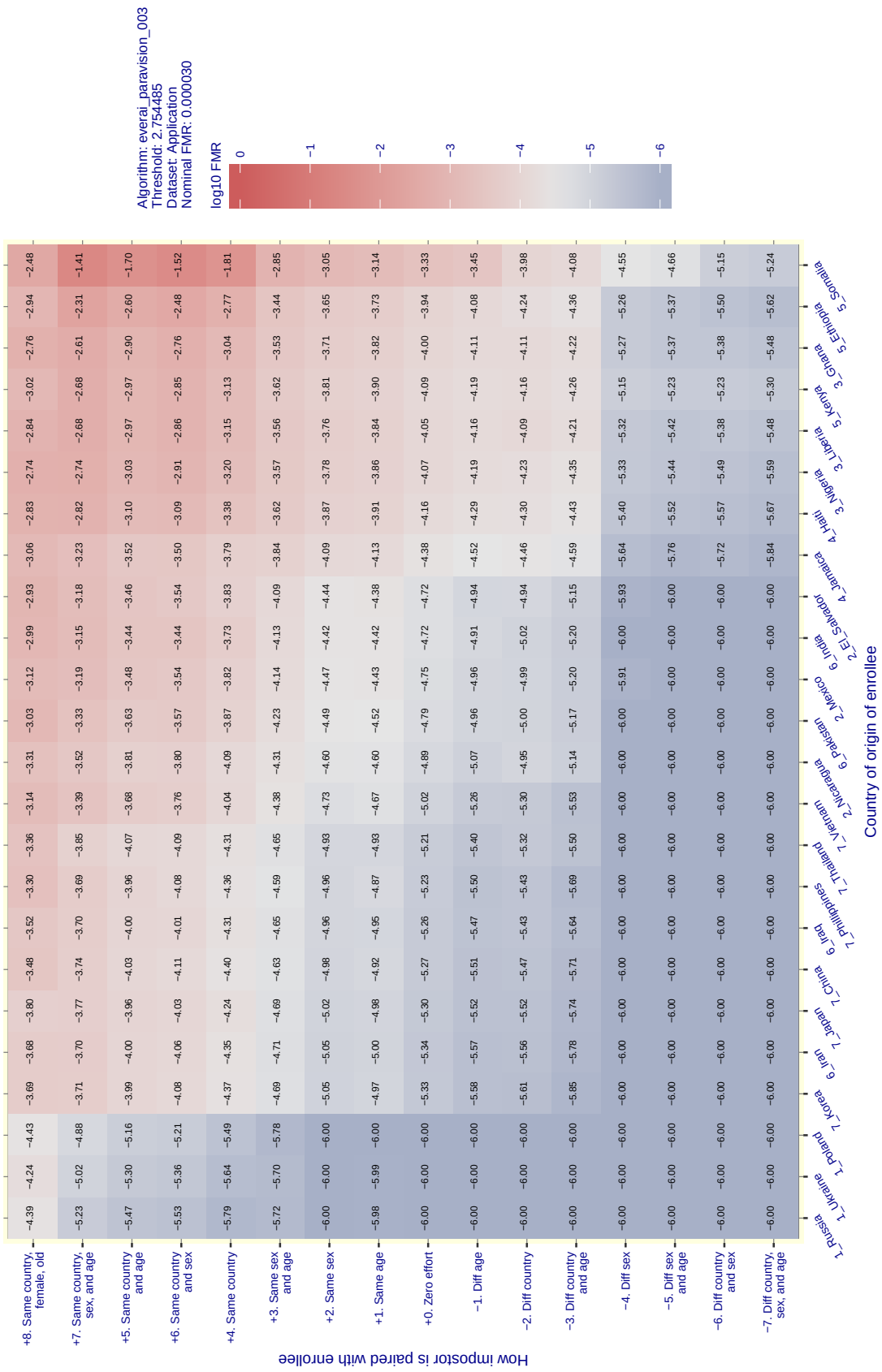


Figure 39: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

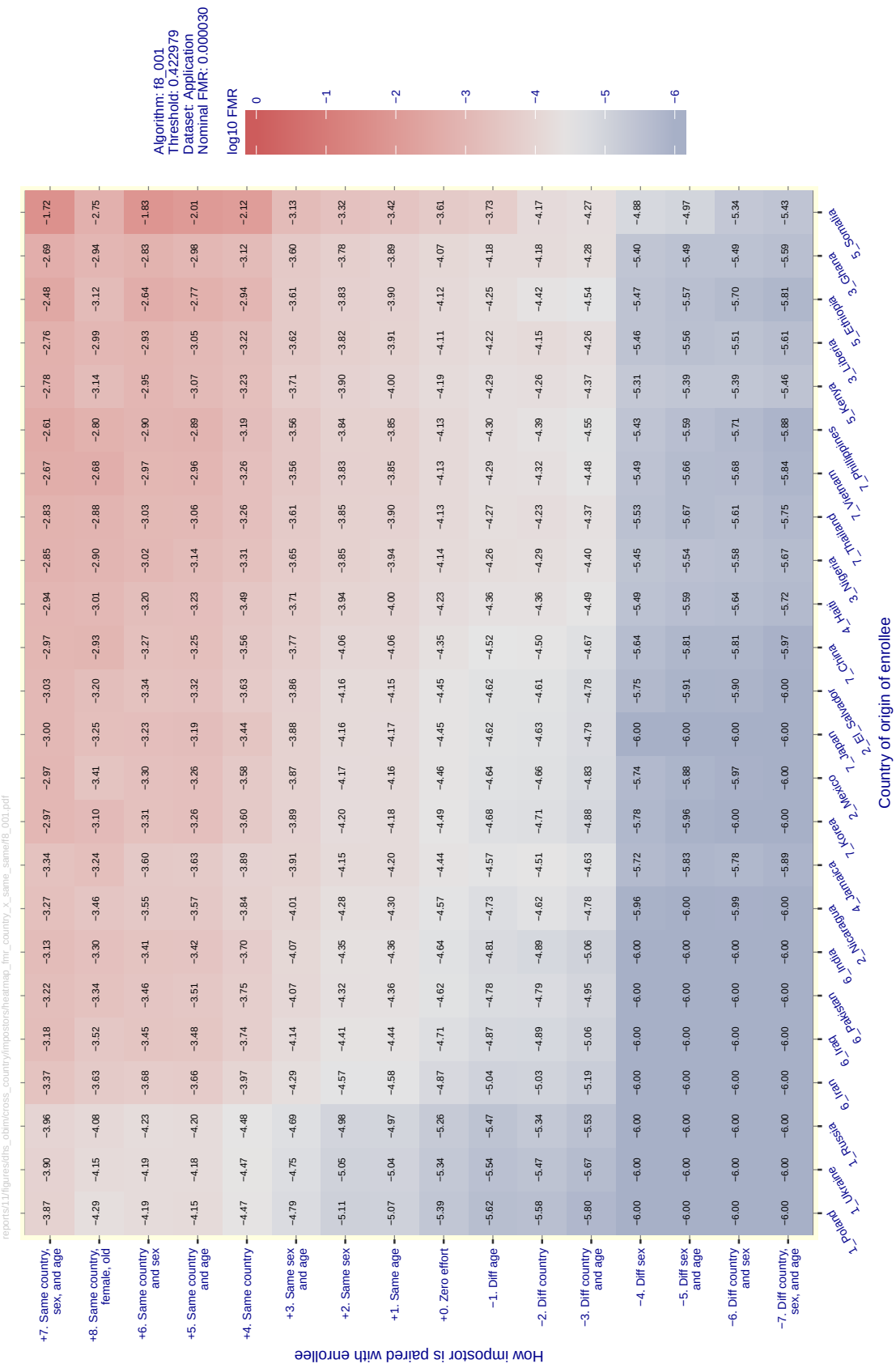


Figure 40: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

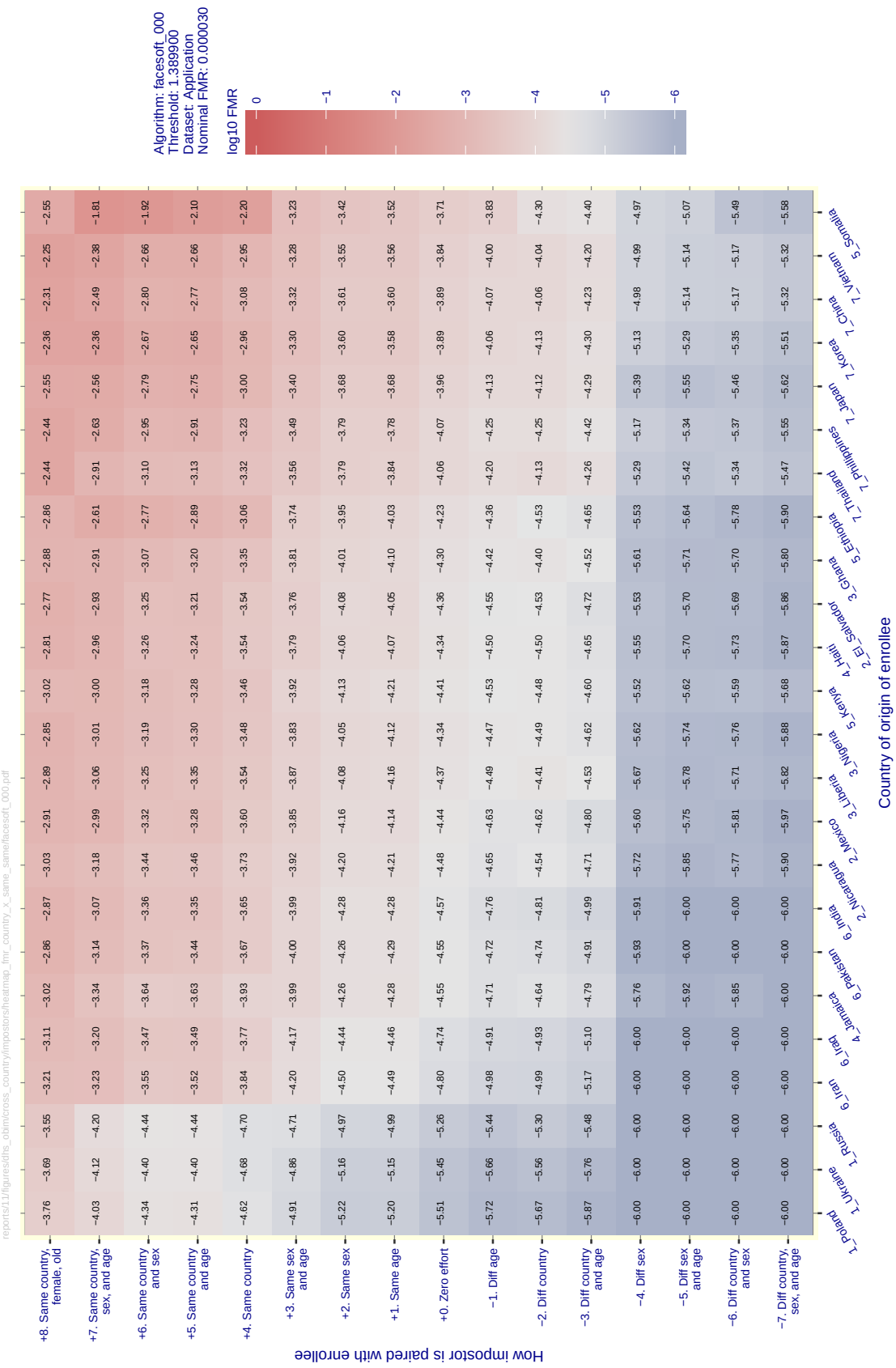


Figure 41: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

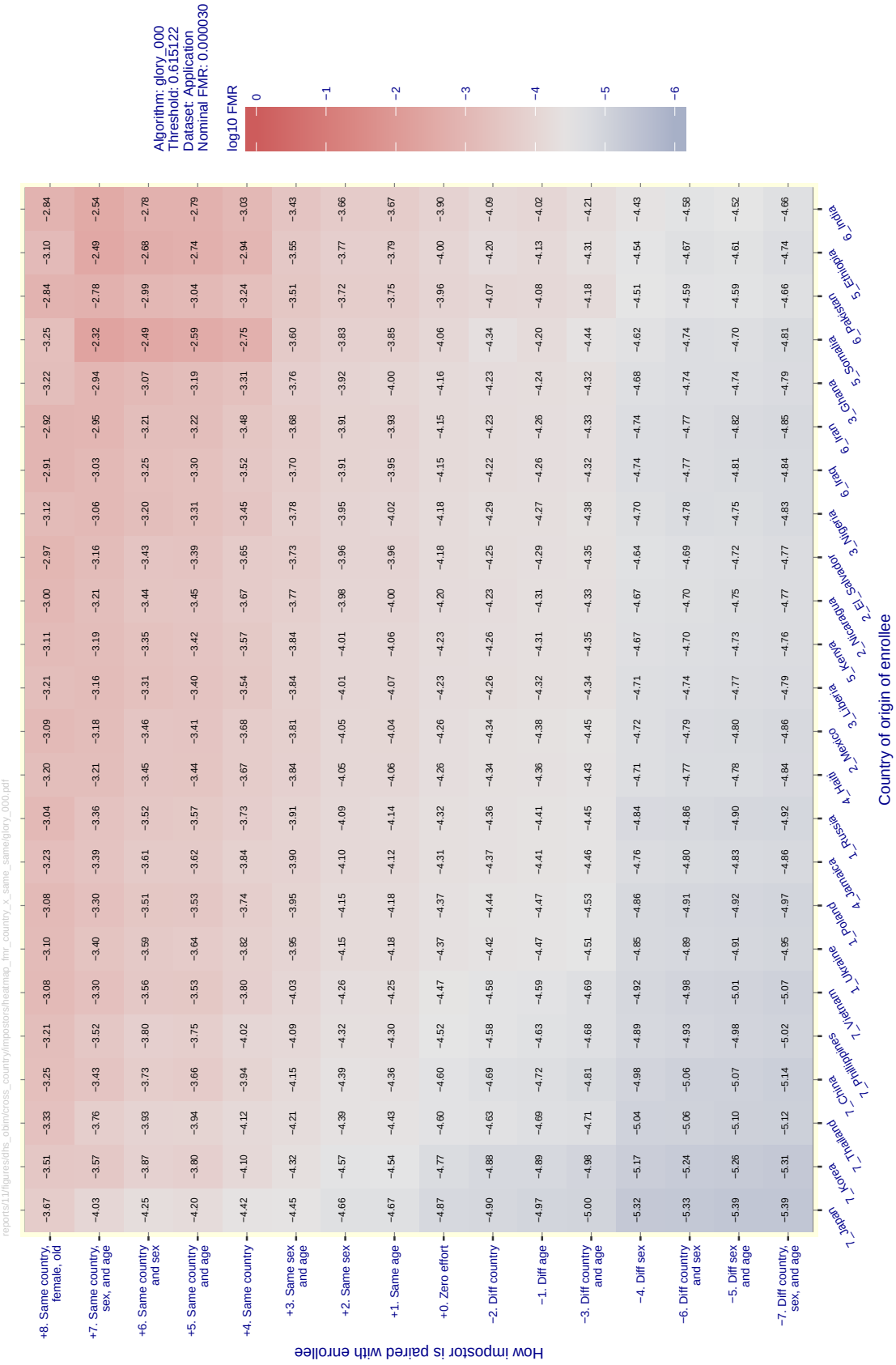


Figure 42: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

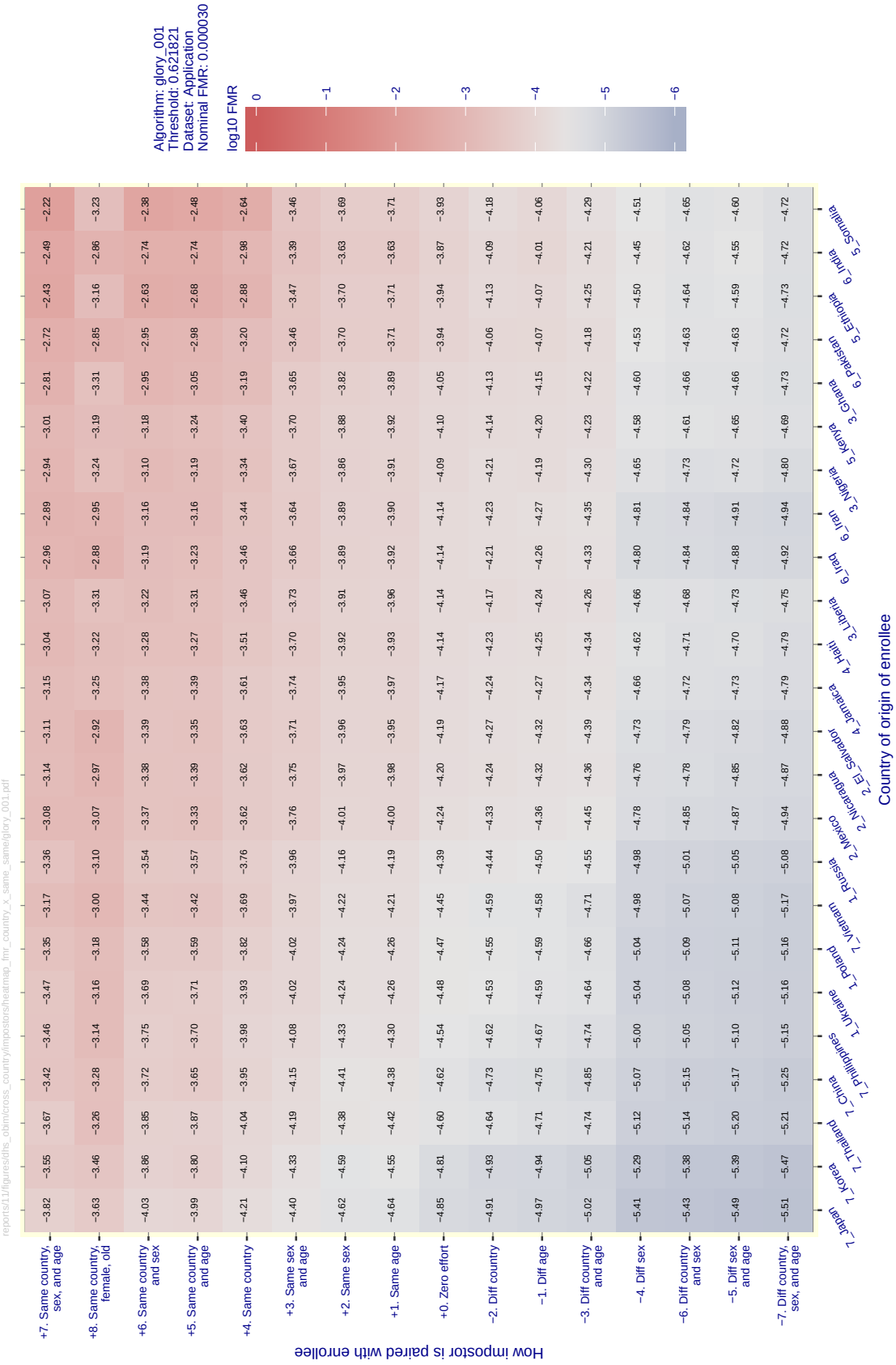


Figure 43: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

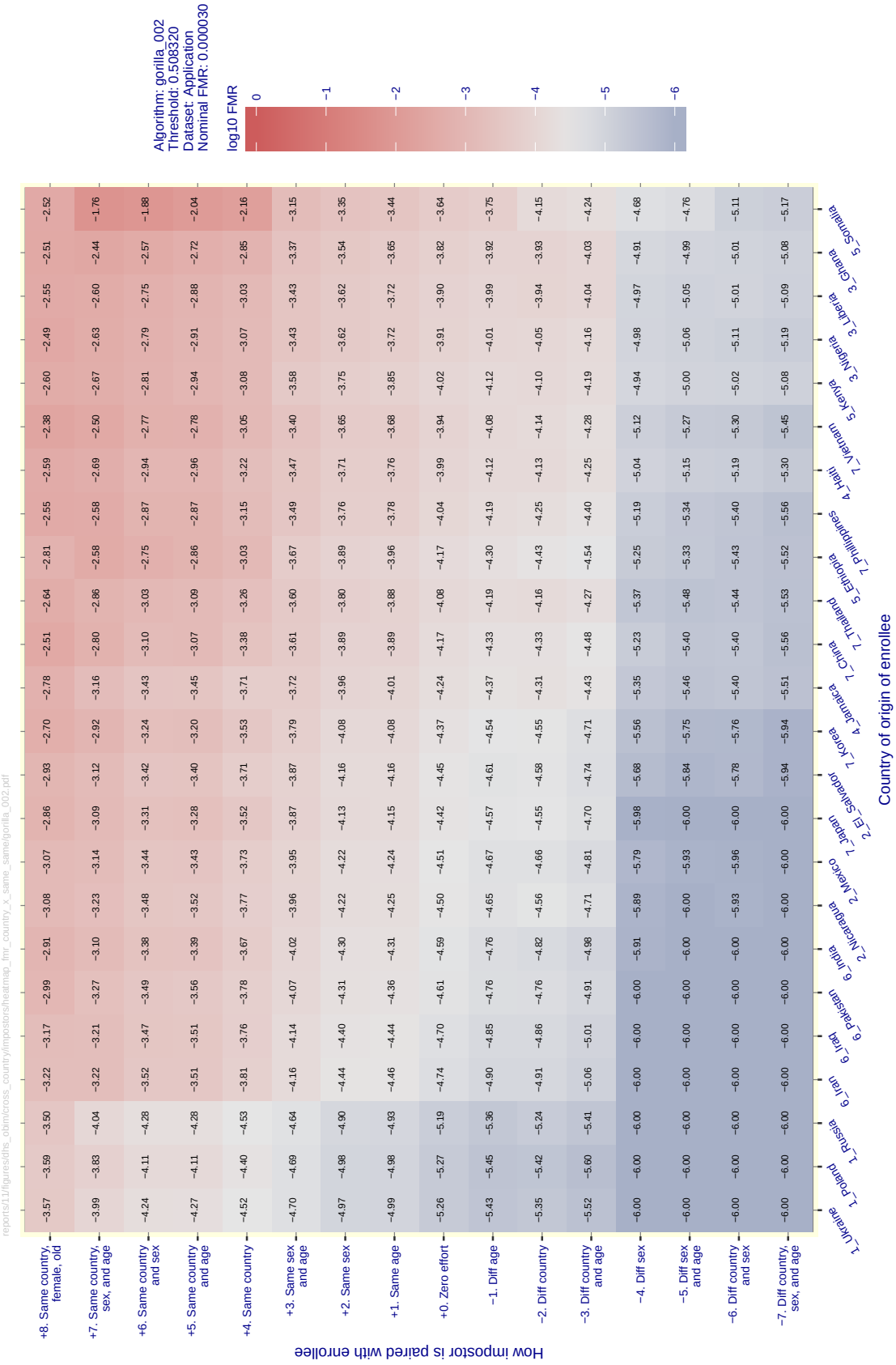


Figure 44: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\mathrm{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

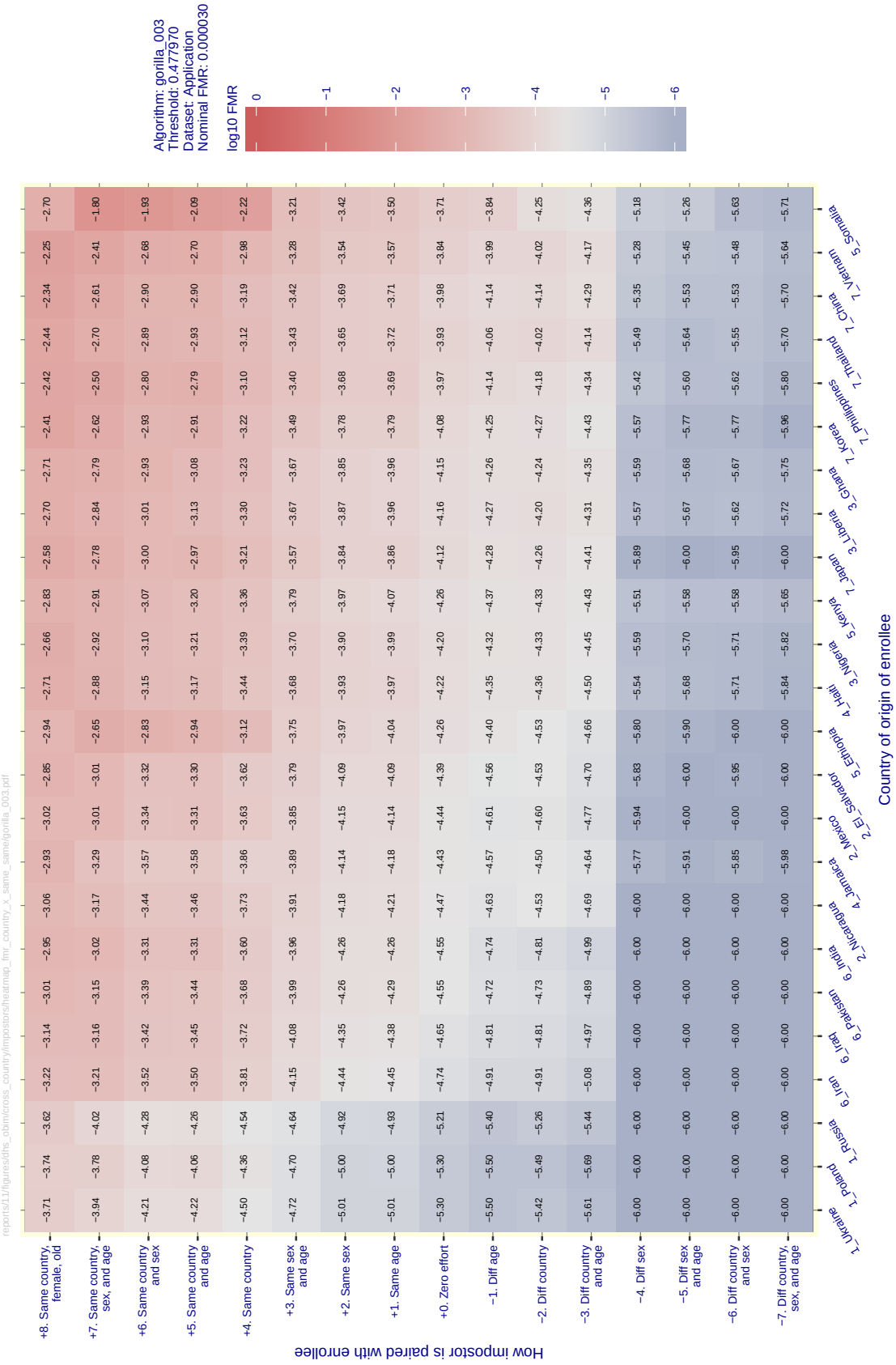


Figure 45: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

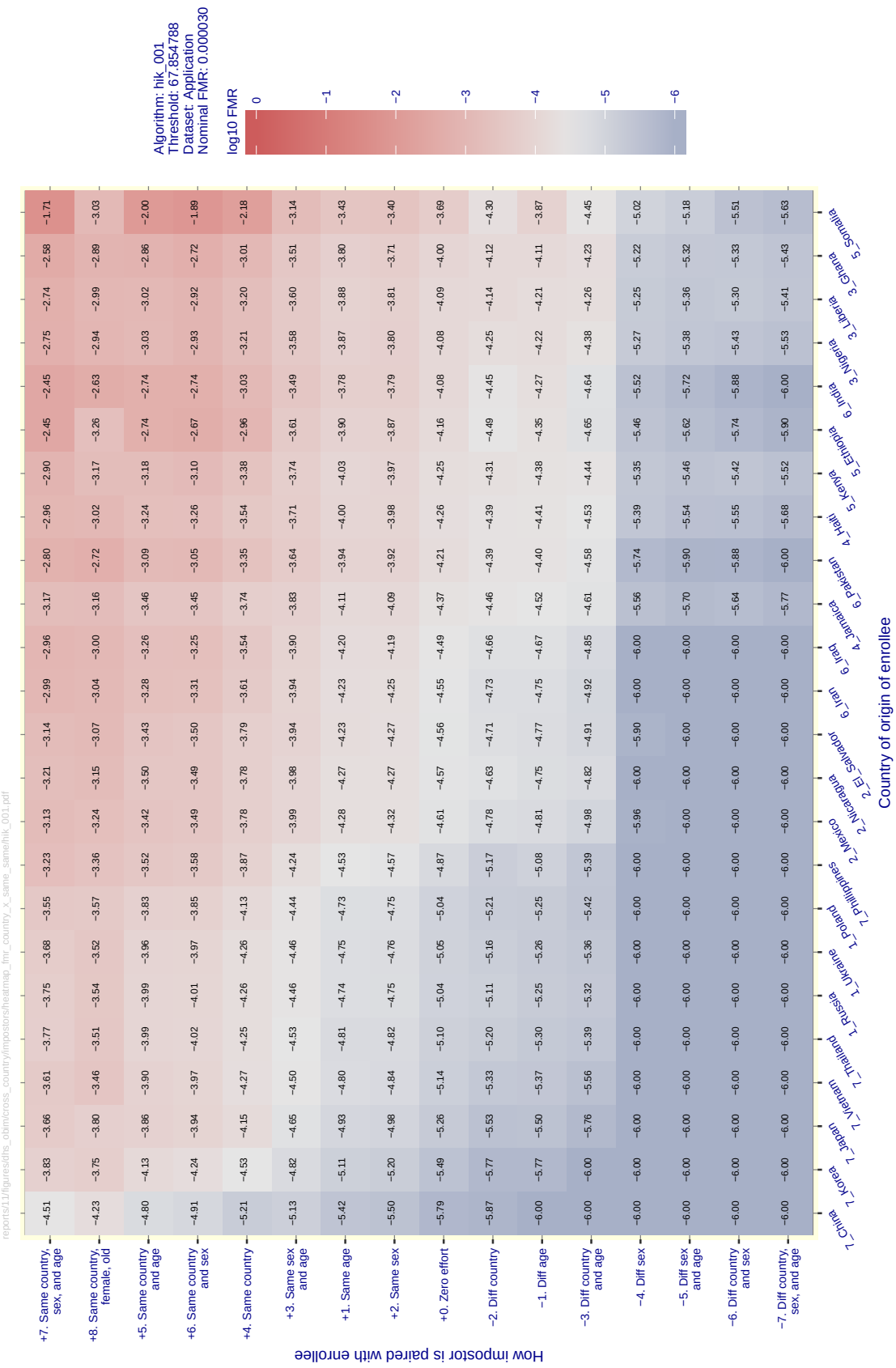


Figure 46: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

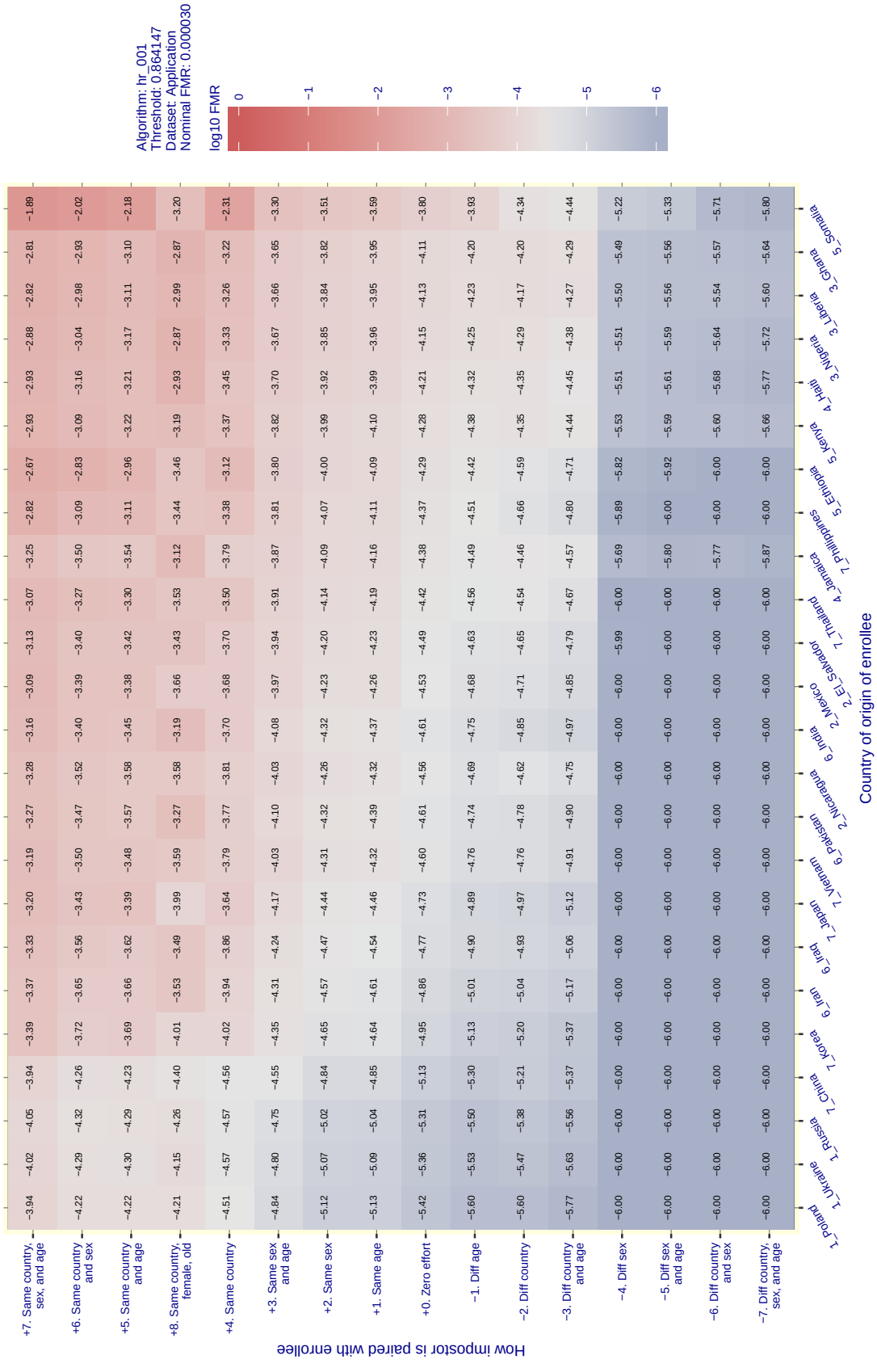


Figure 47: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

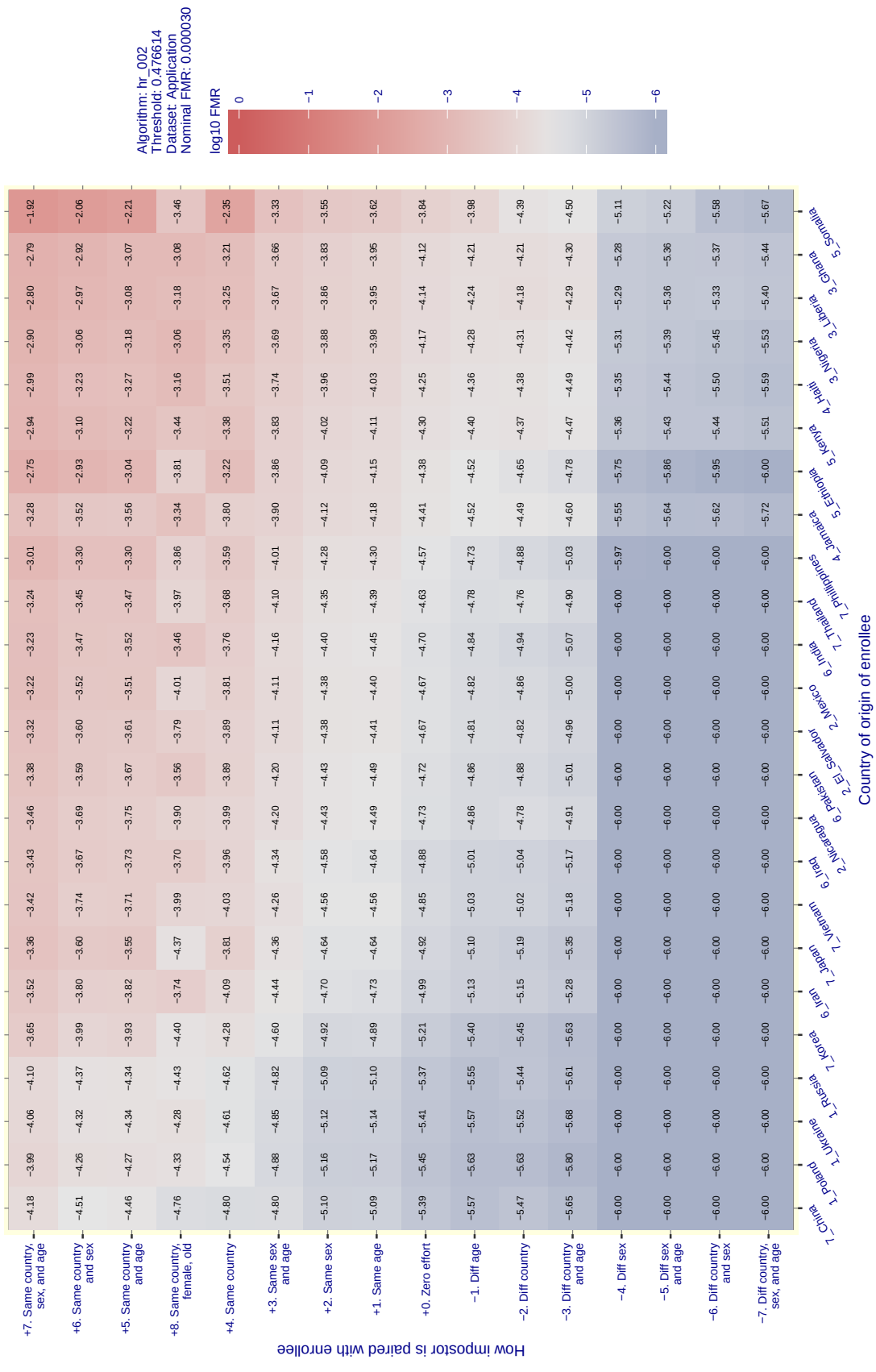


Figure 48: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

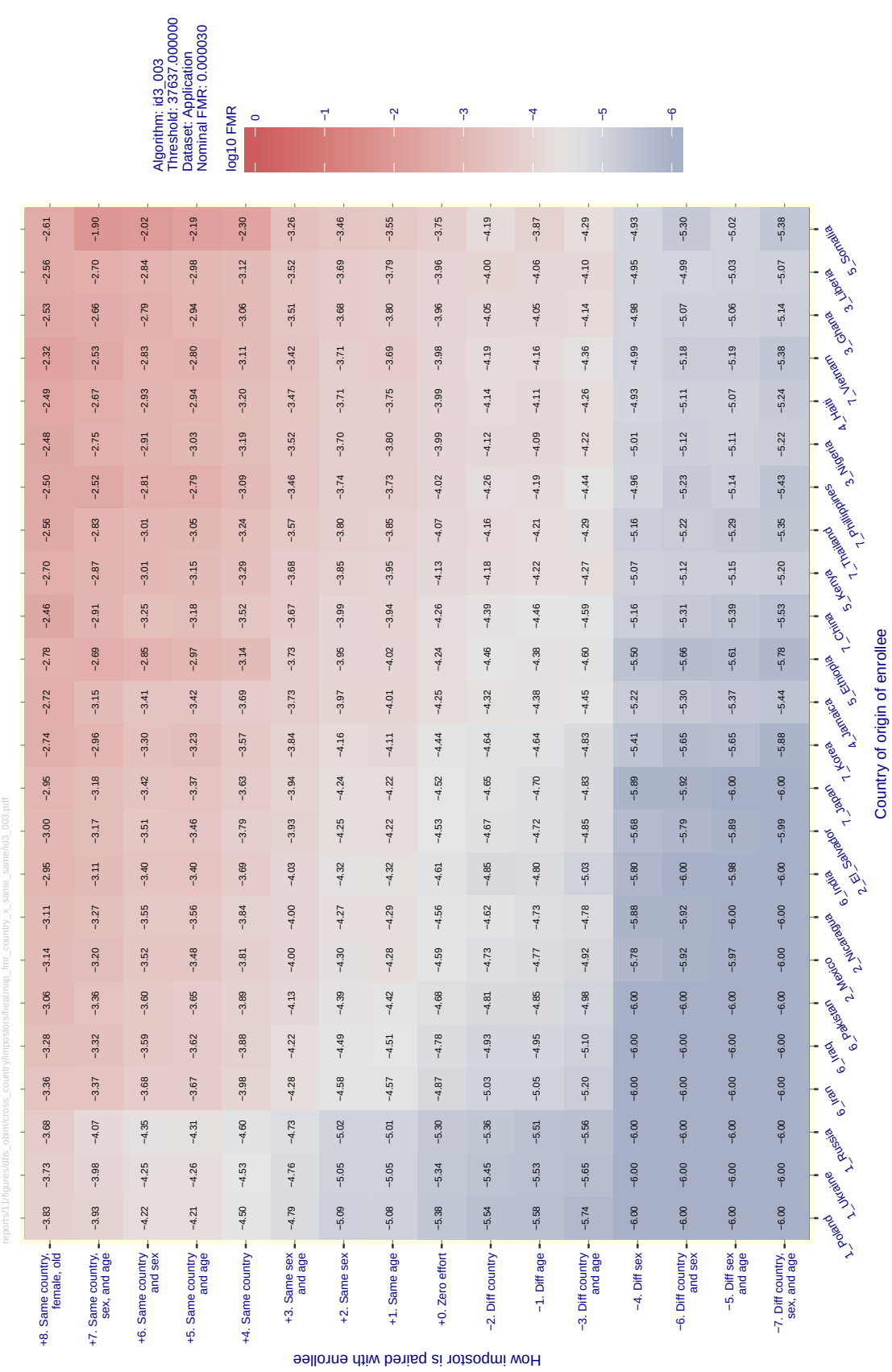


Figure 49: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

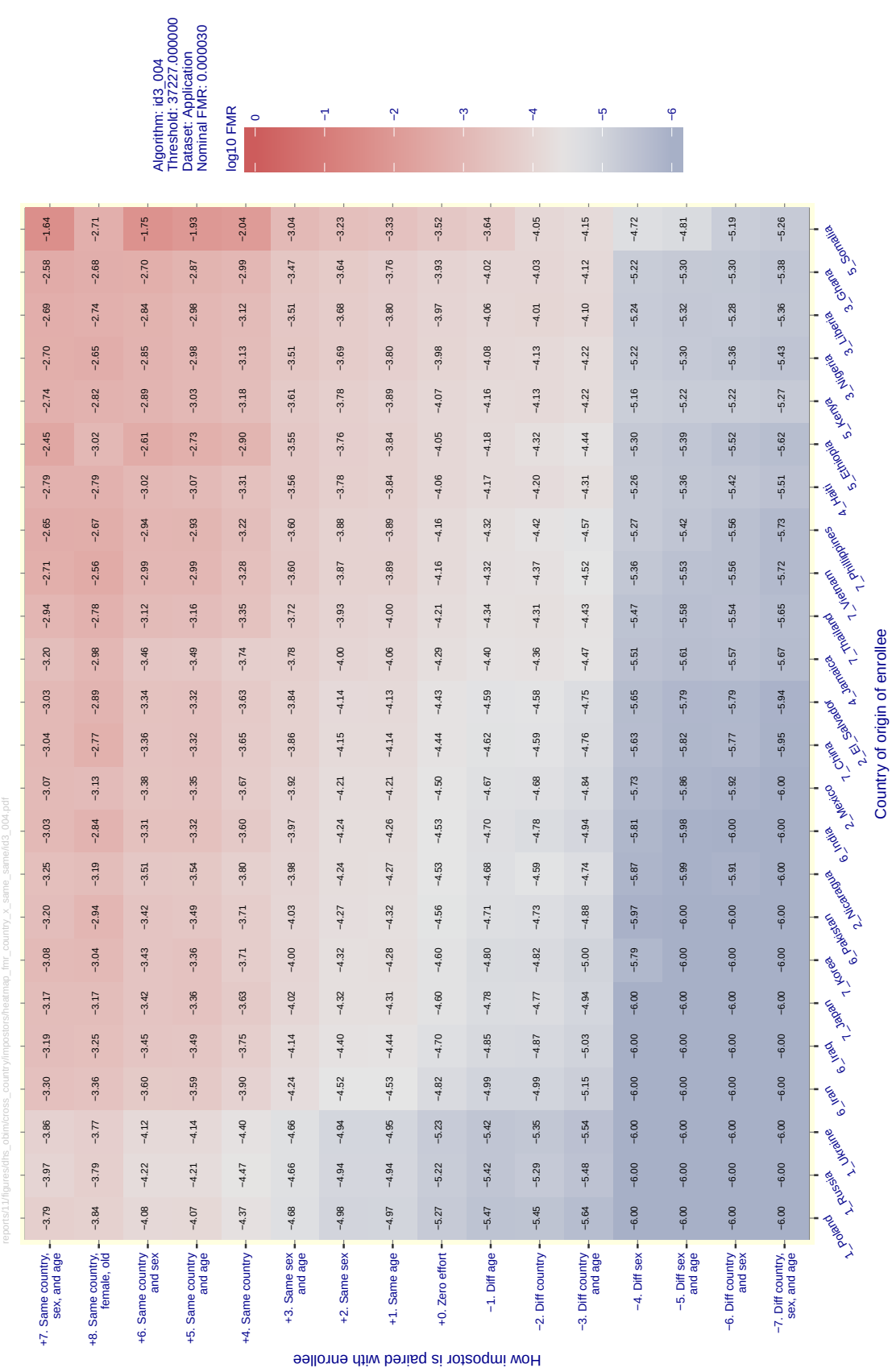


Figure 50: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

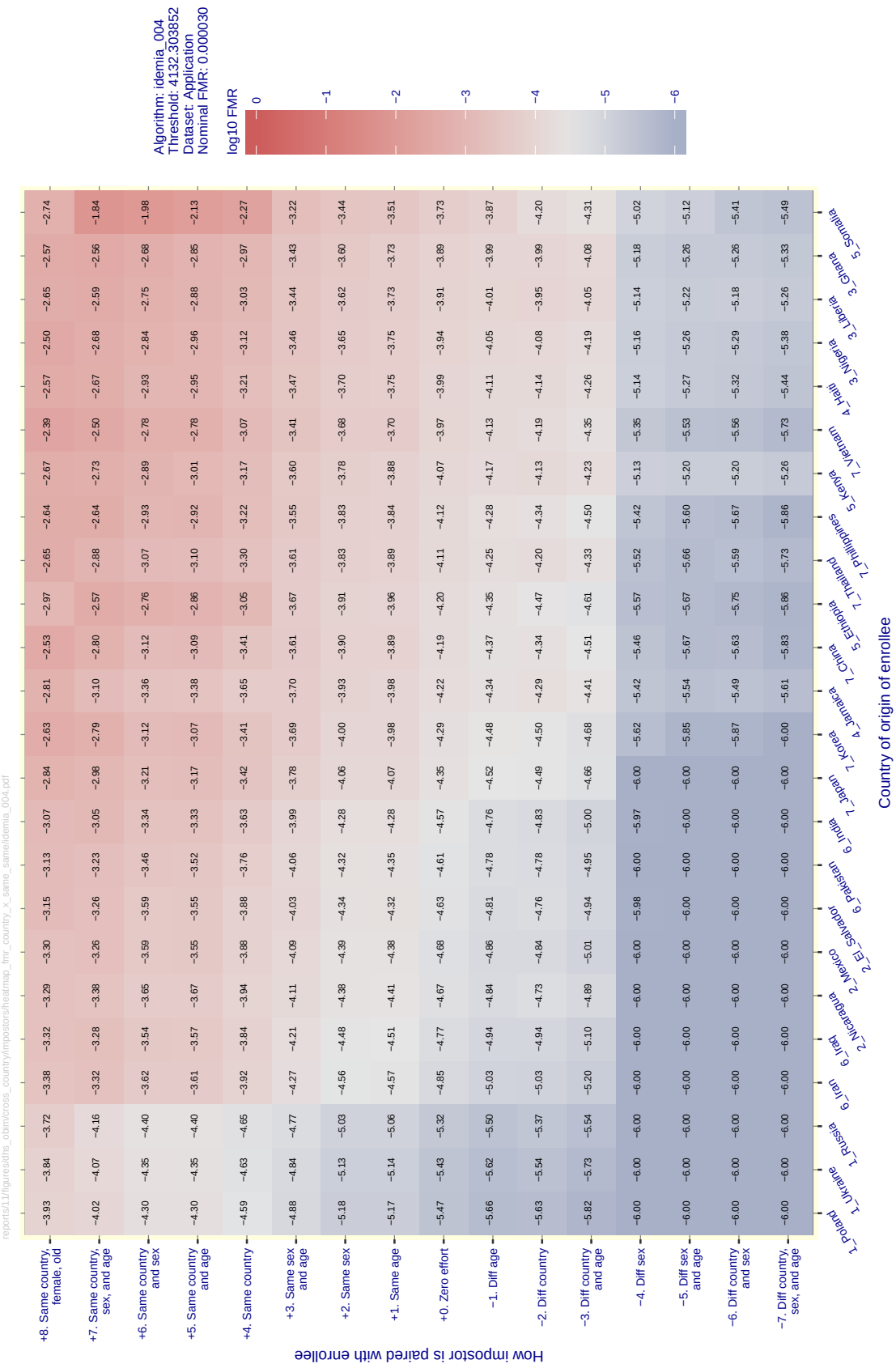
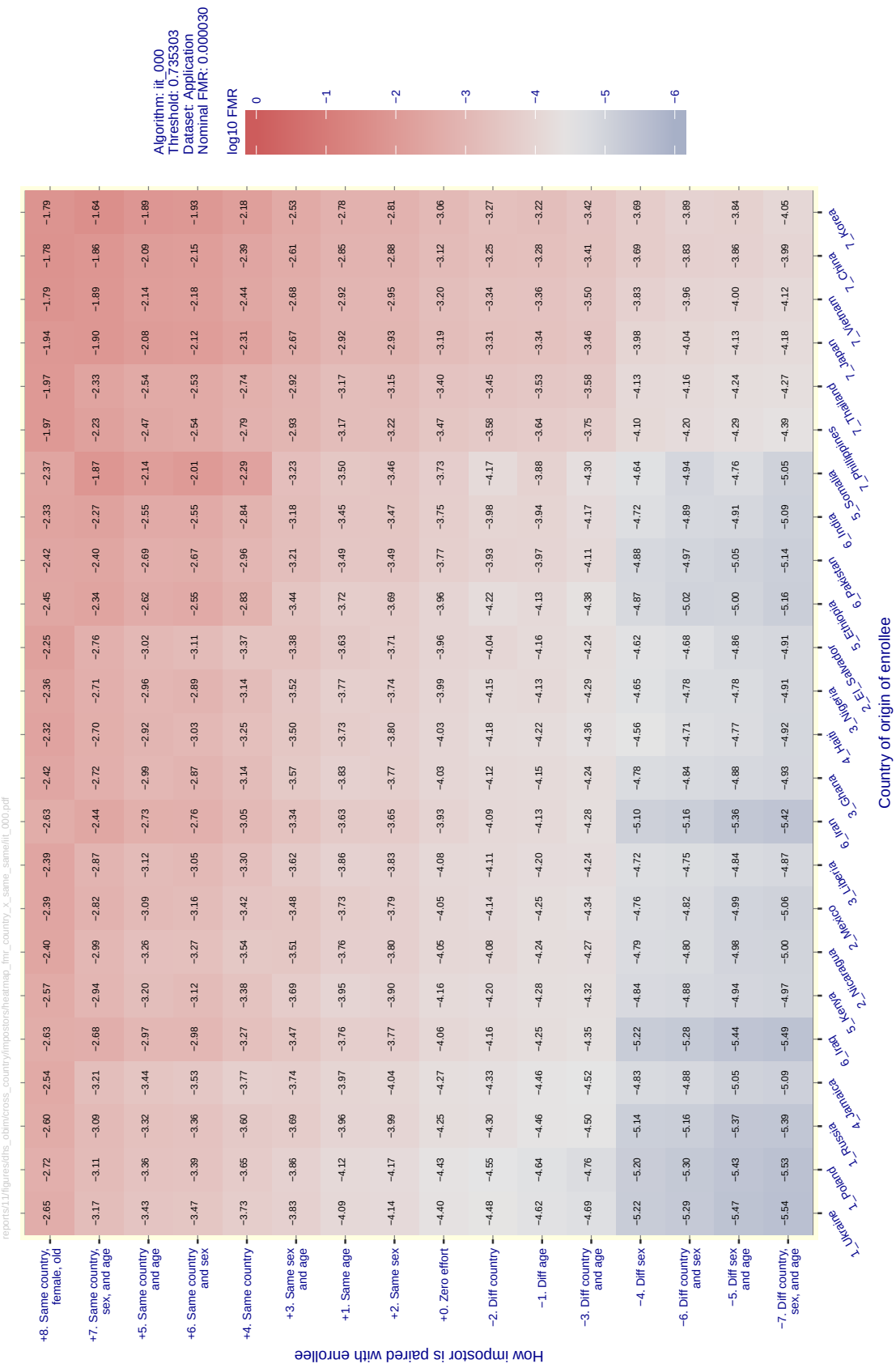


Figure 51: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.



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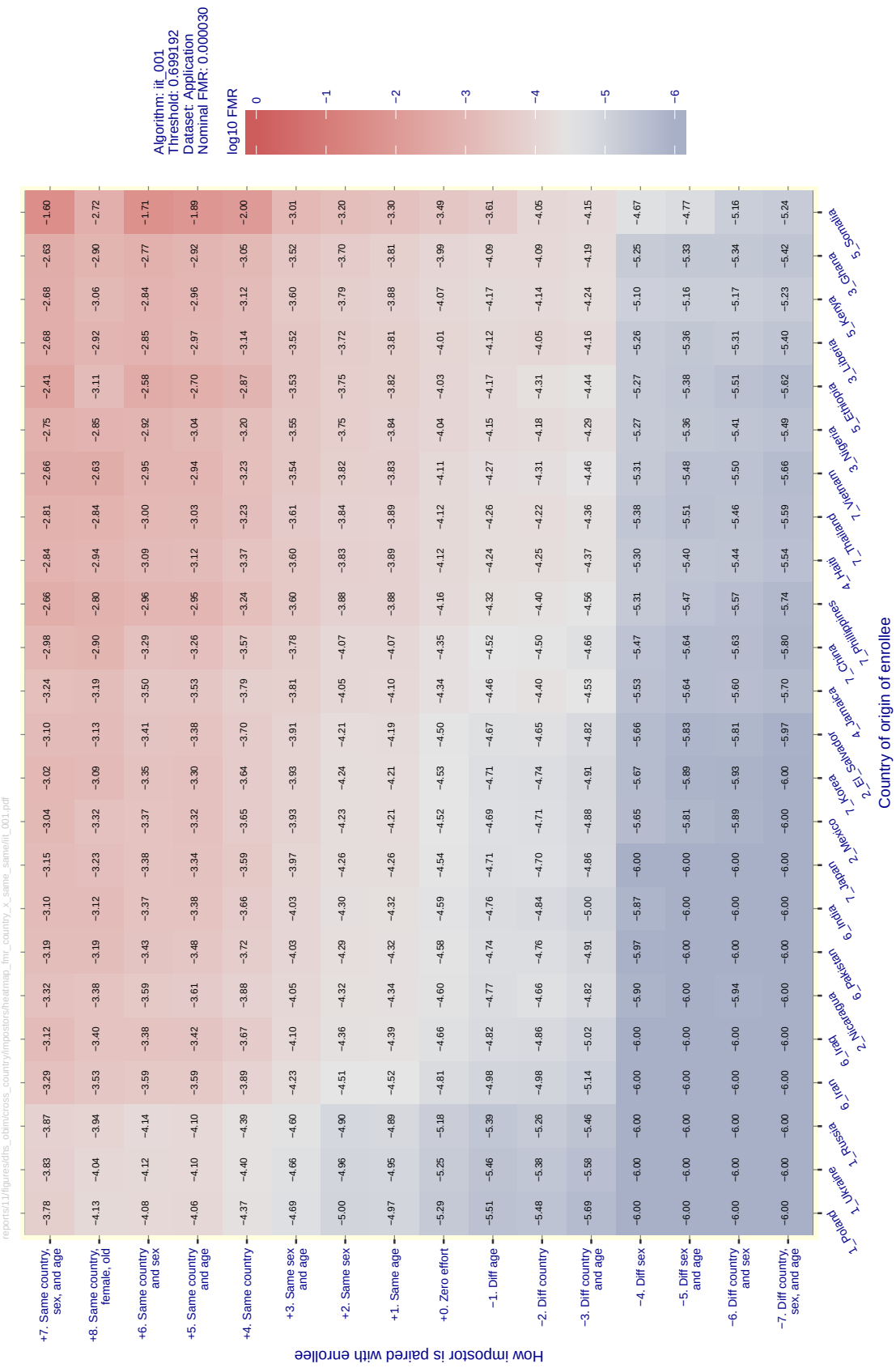

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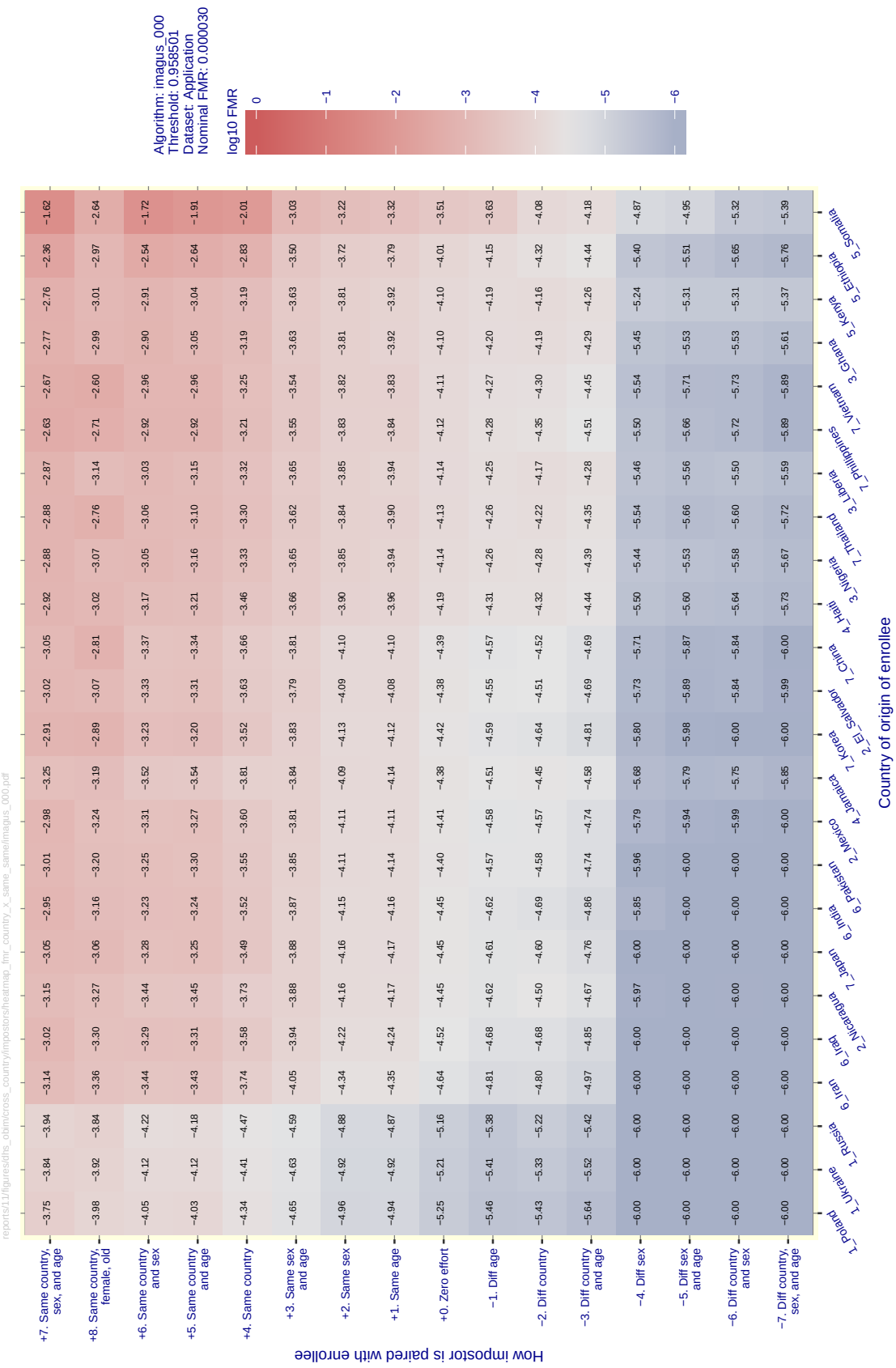


Figure 54: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

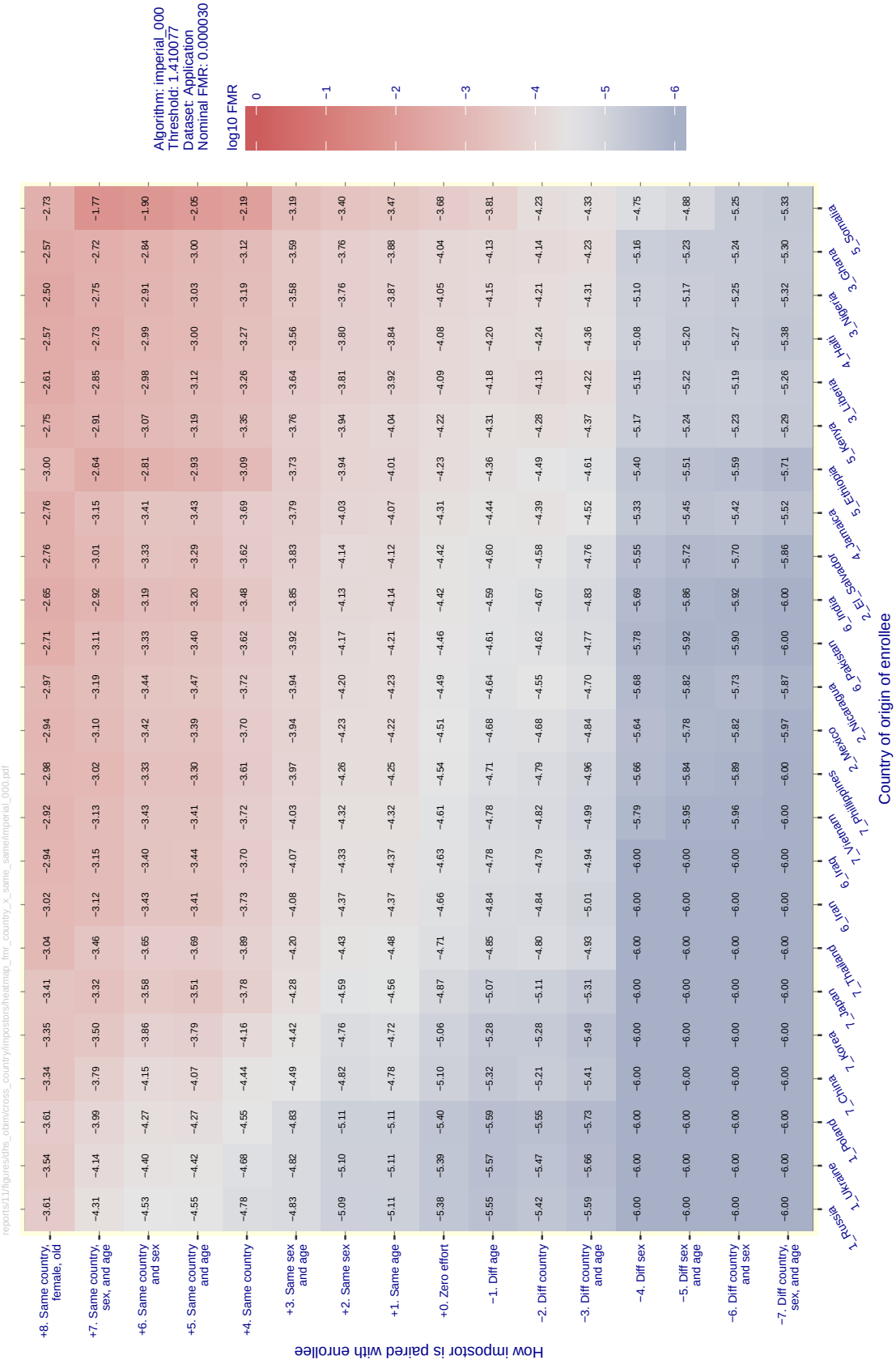


Figure 55: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

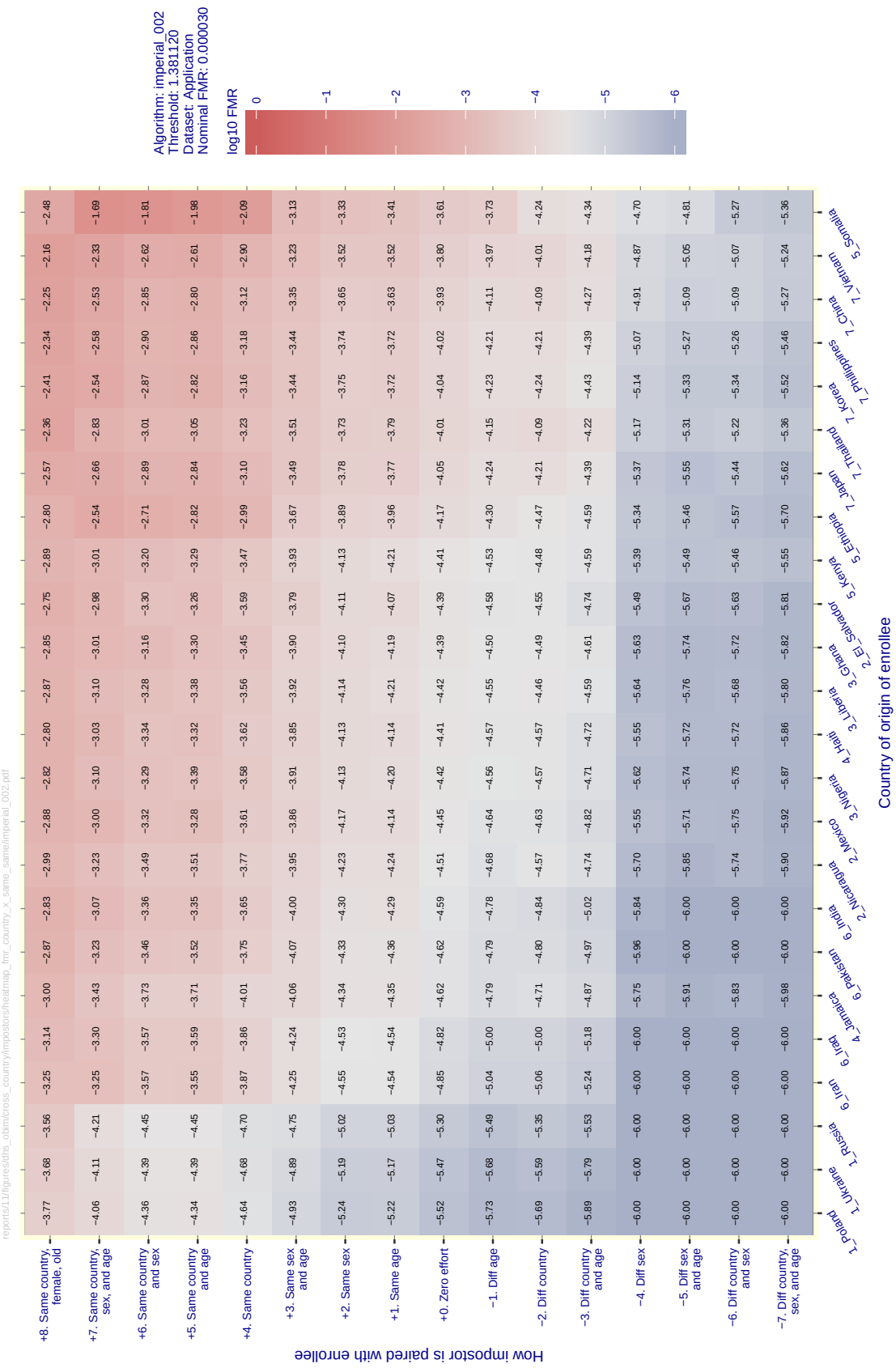


Figure 56: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

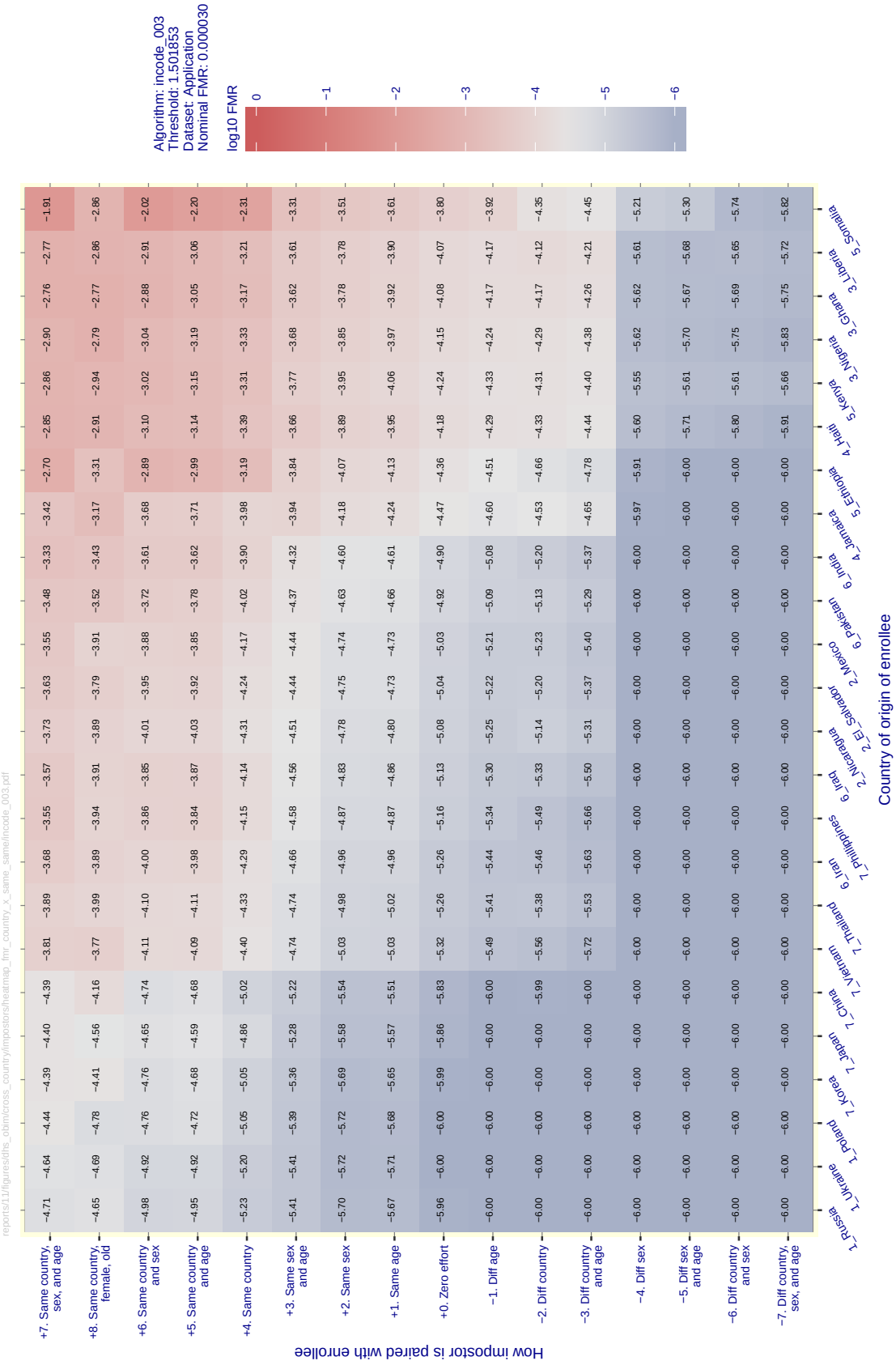


Figure 57: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

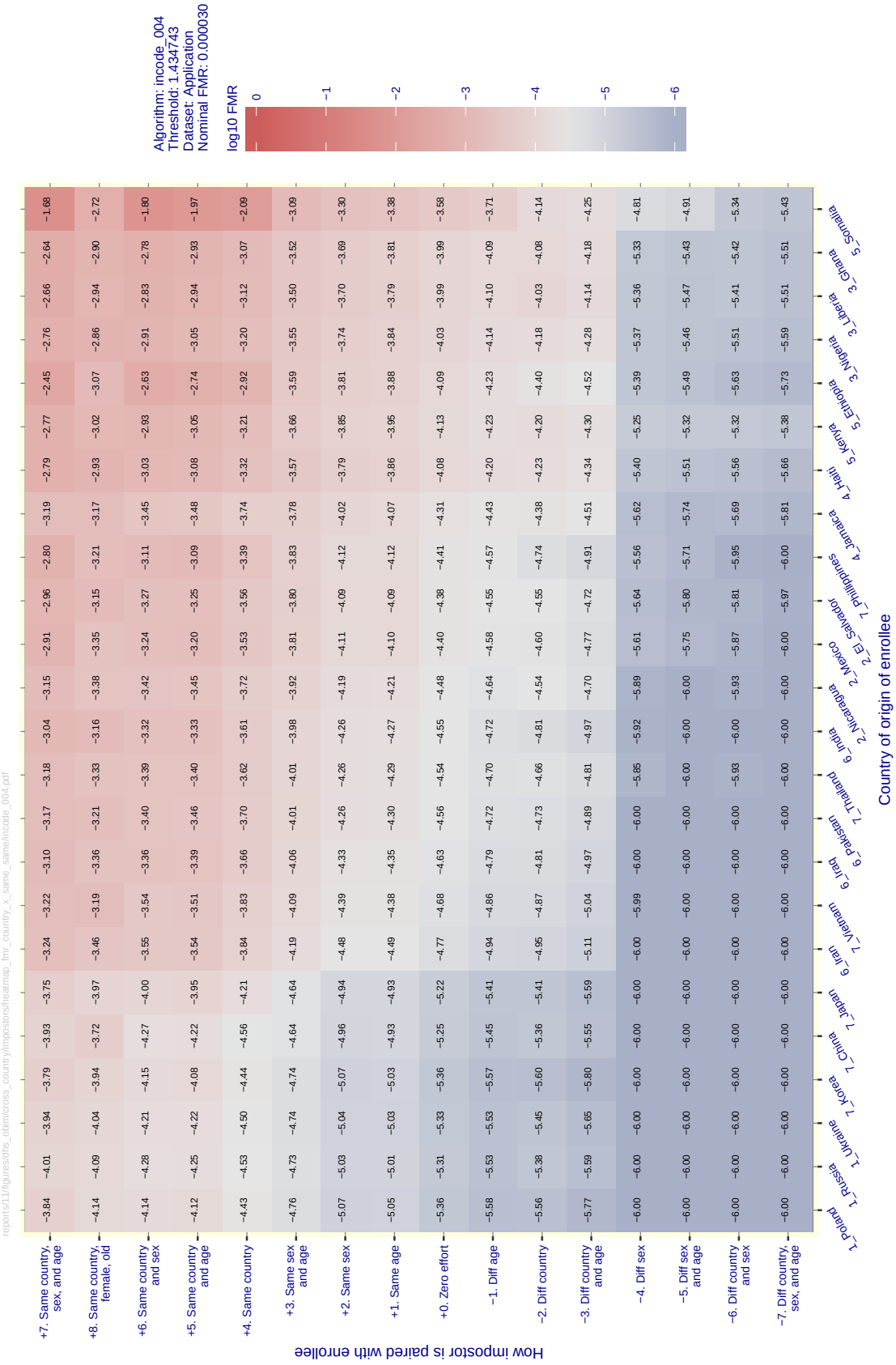


Figure 58: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

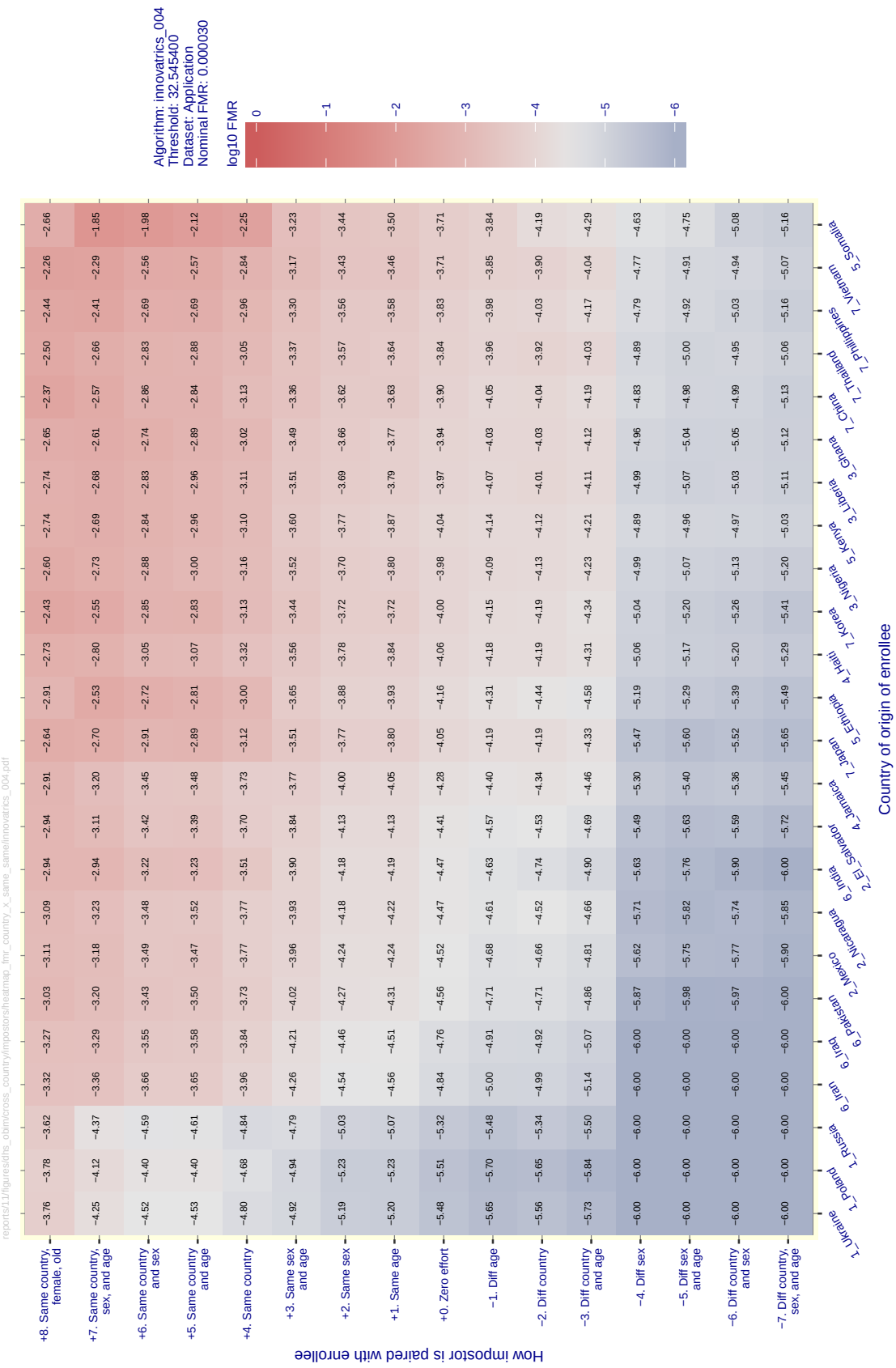


Figure 59: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

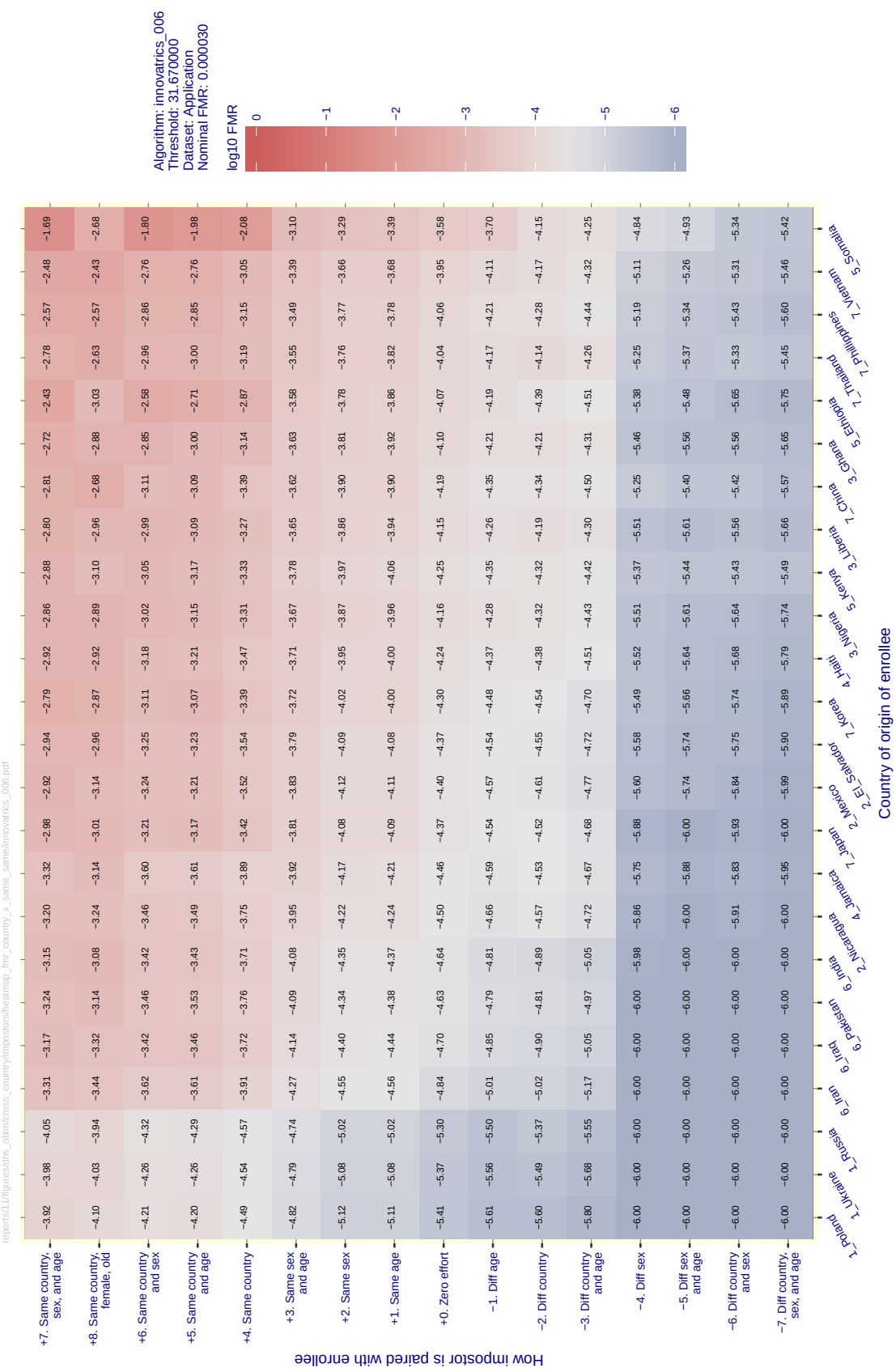


Figure 60: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

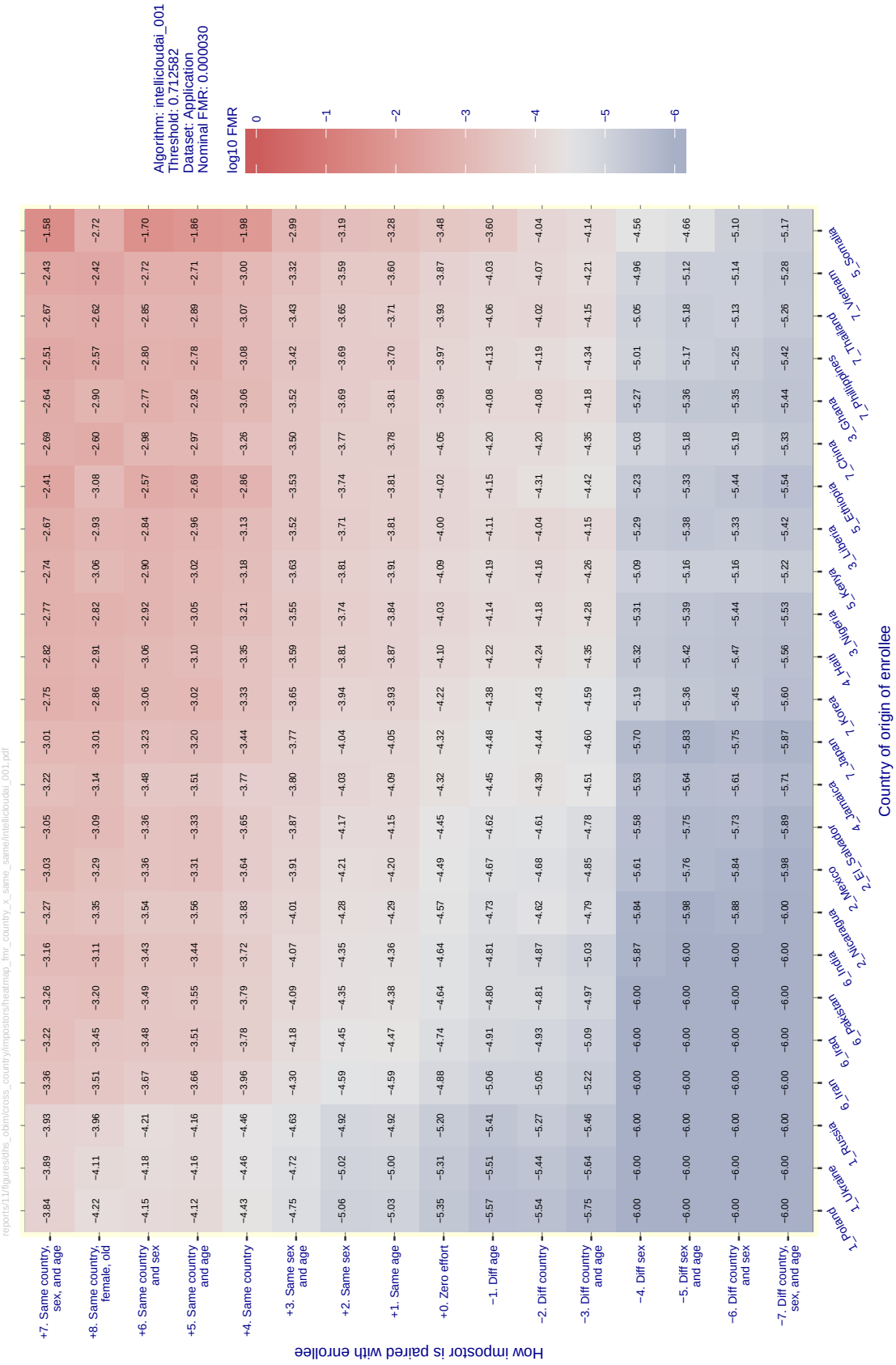


Figure 61: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

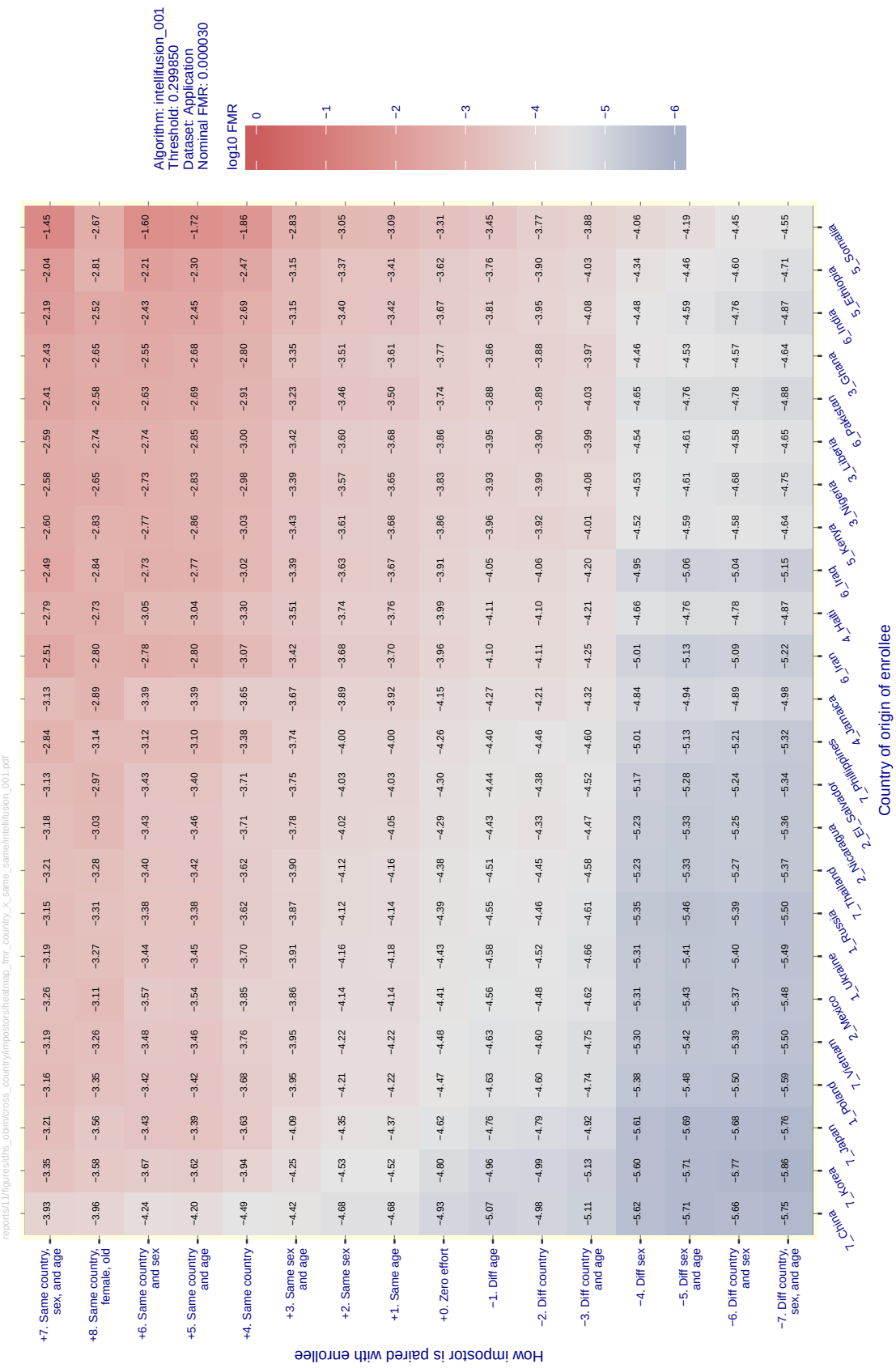
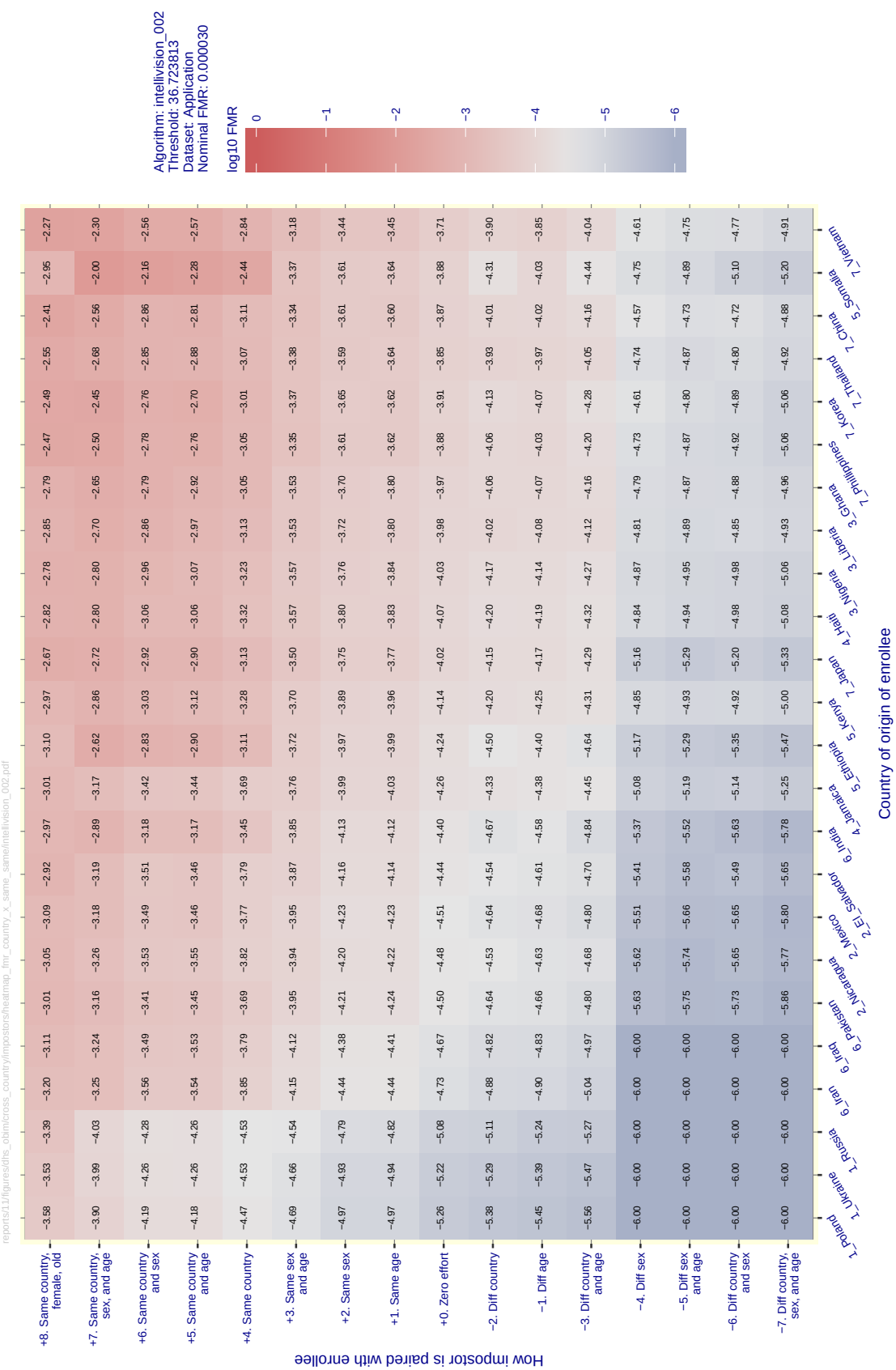


Figure 62: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*



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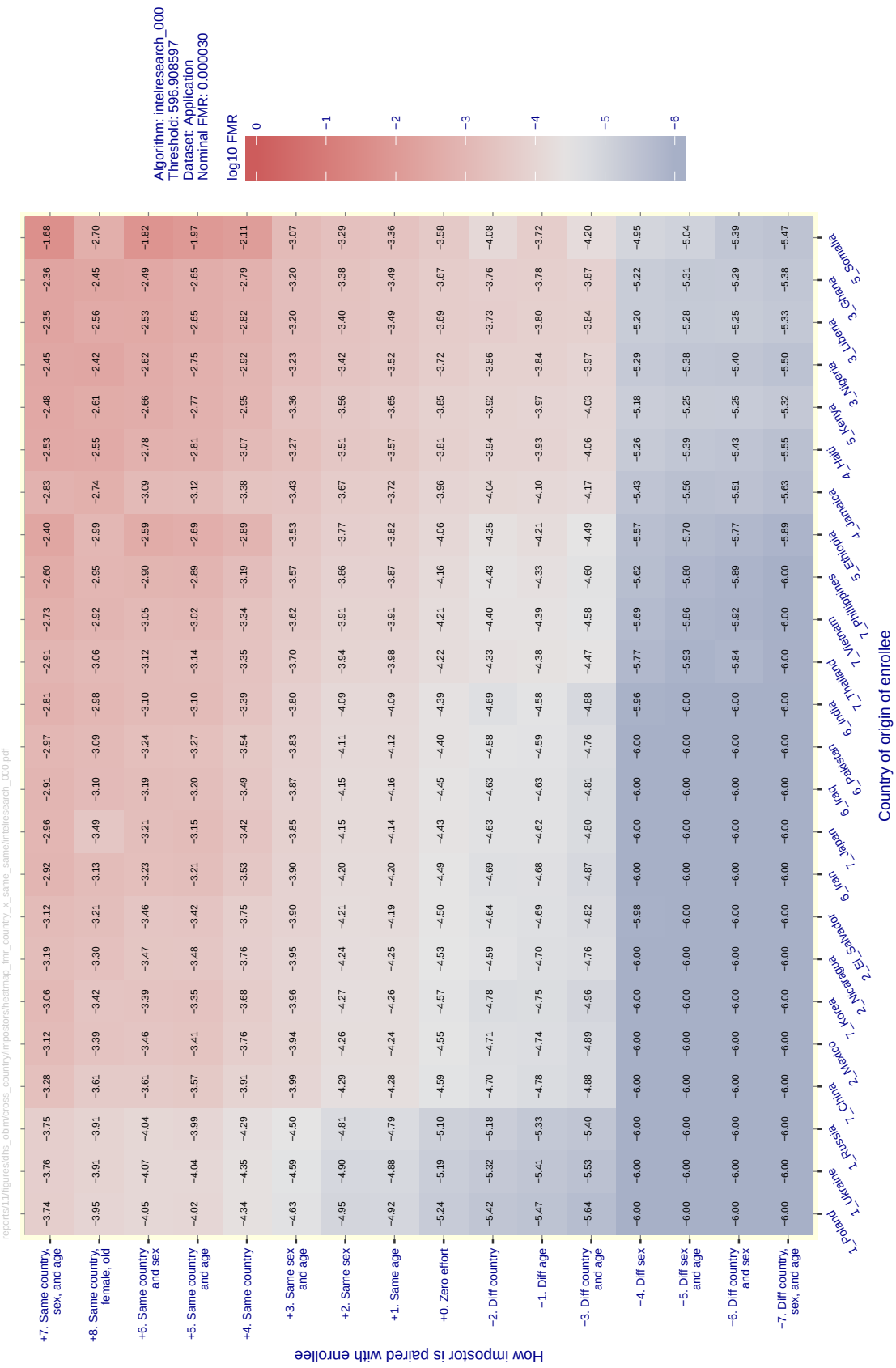

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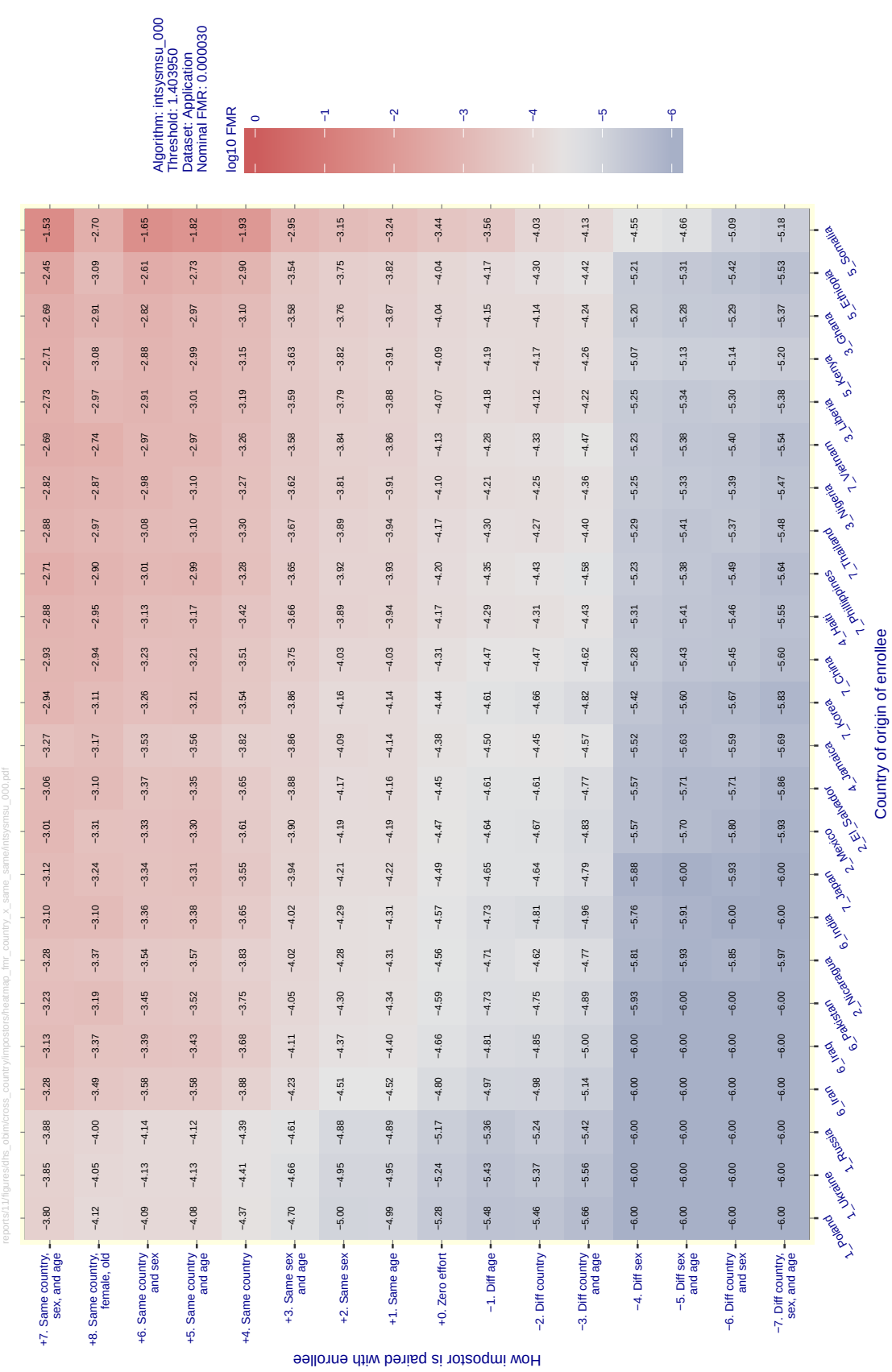

reports/11/figures/ths_obim/cross_country/impostors/heatmap_fmr_country_x_same_same/intsysmsu_000.pdf

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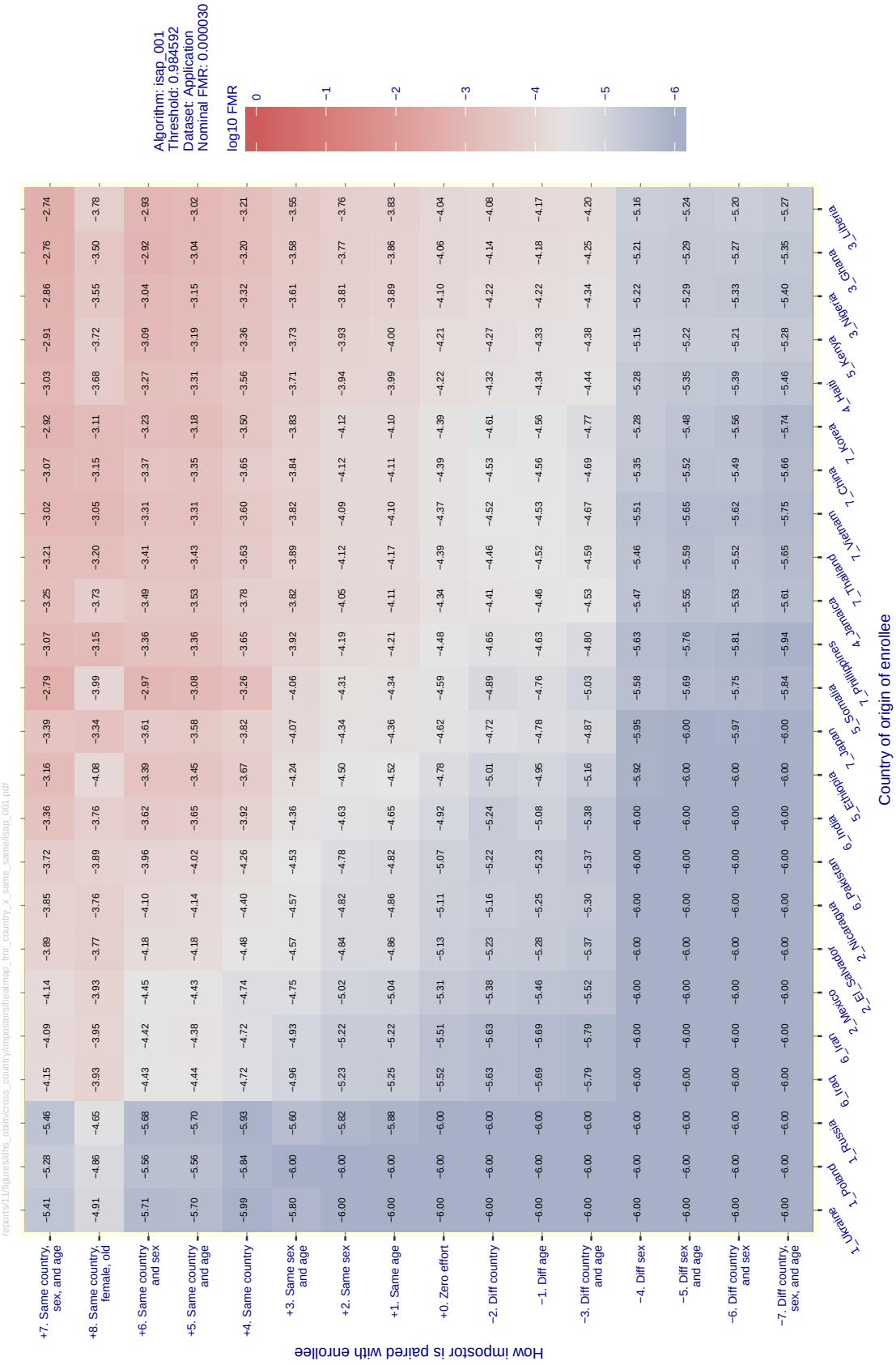

reports/11/figures/dhs_obim/cross_country/impostors/heatmap_fmr_country_x_same_same/isap_001.pdf

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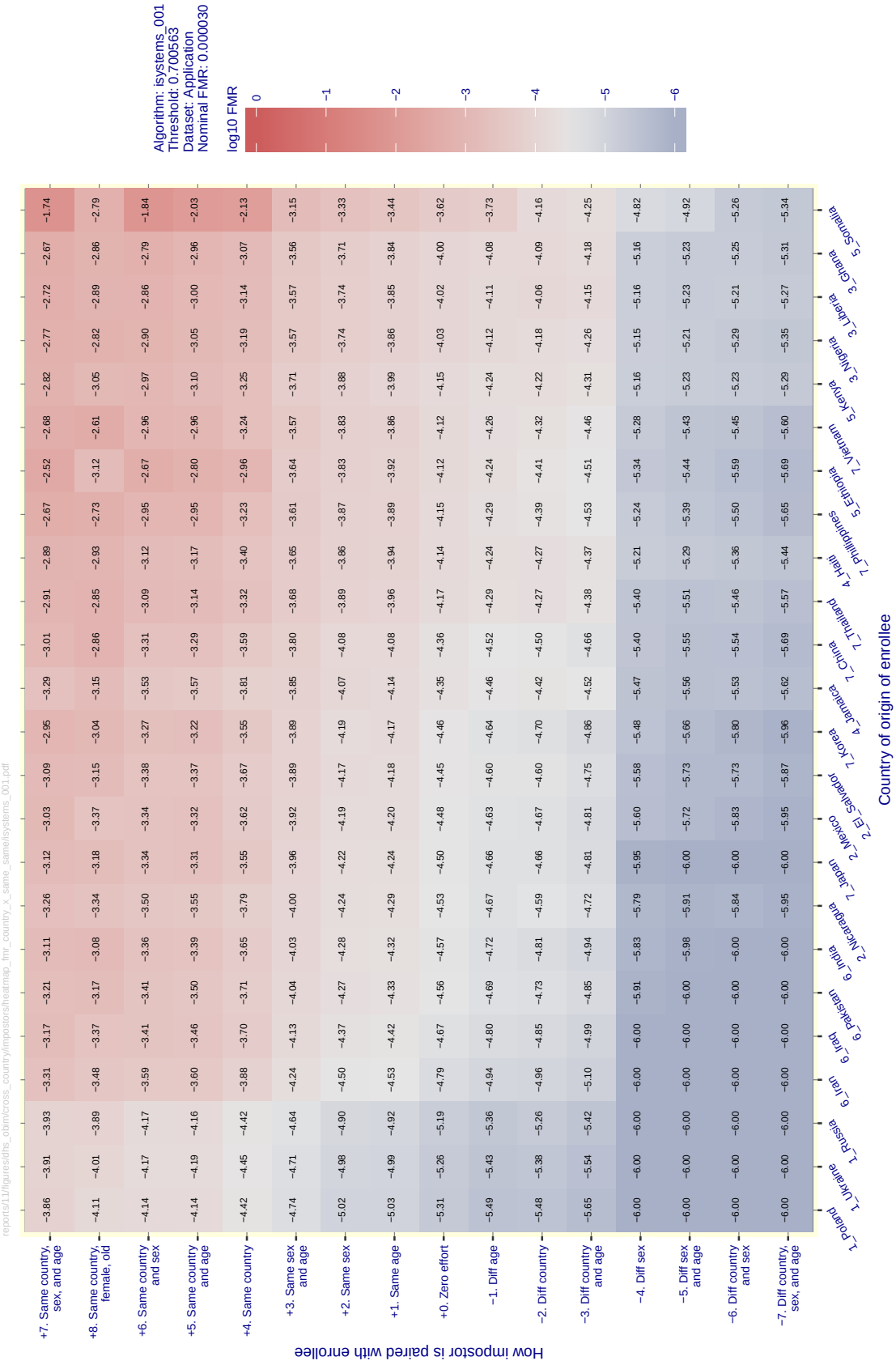


Figure 67: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

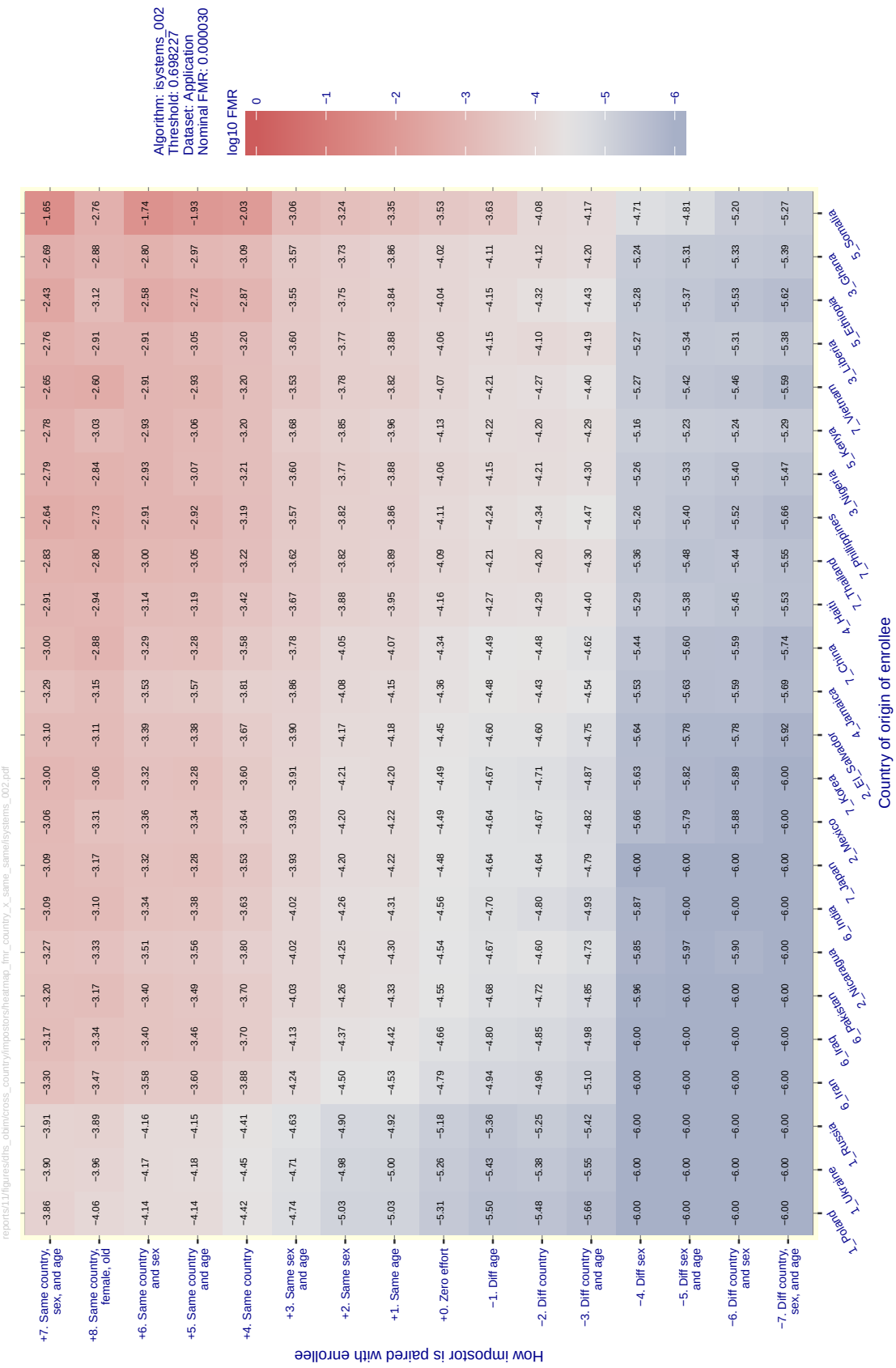


Figure 68: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

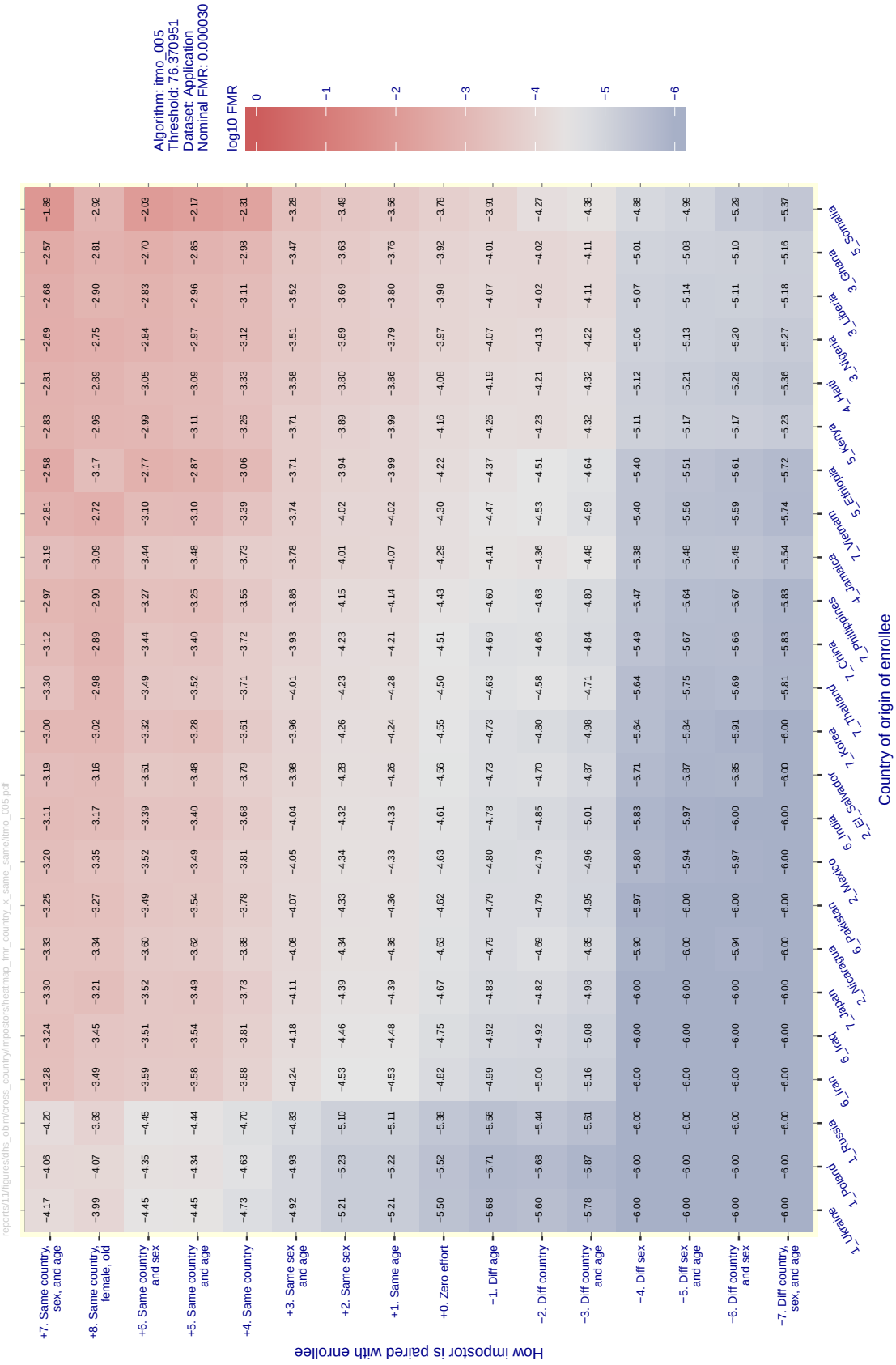


Figure 69: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

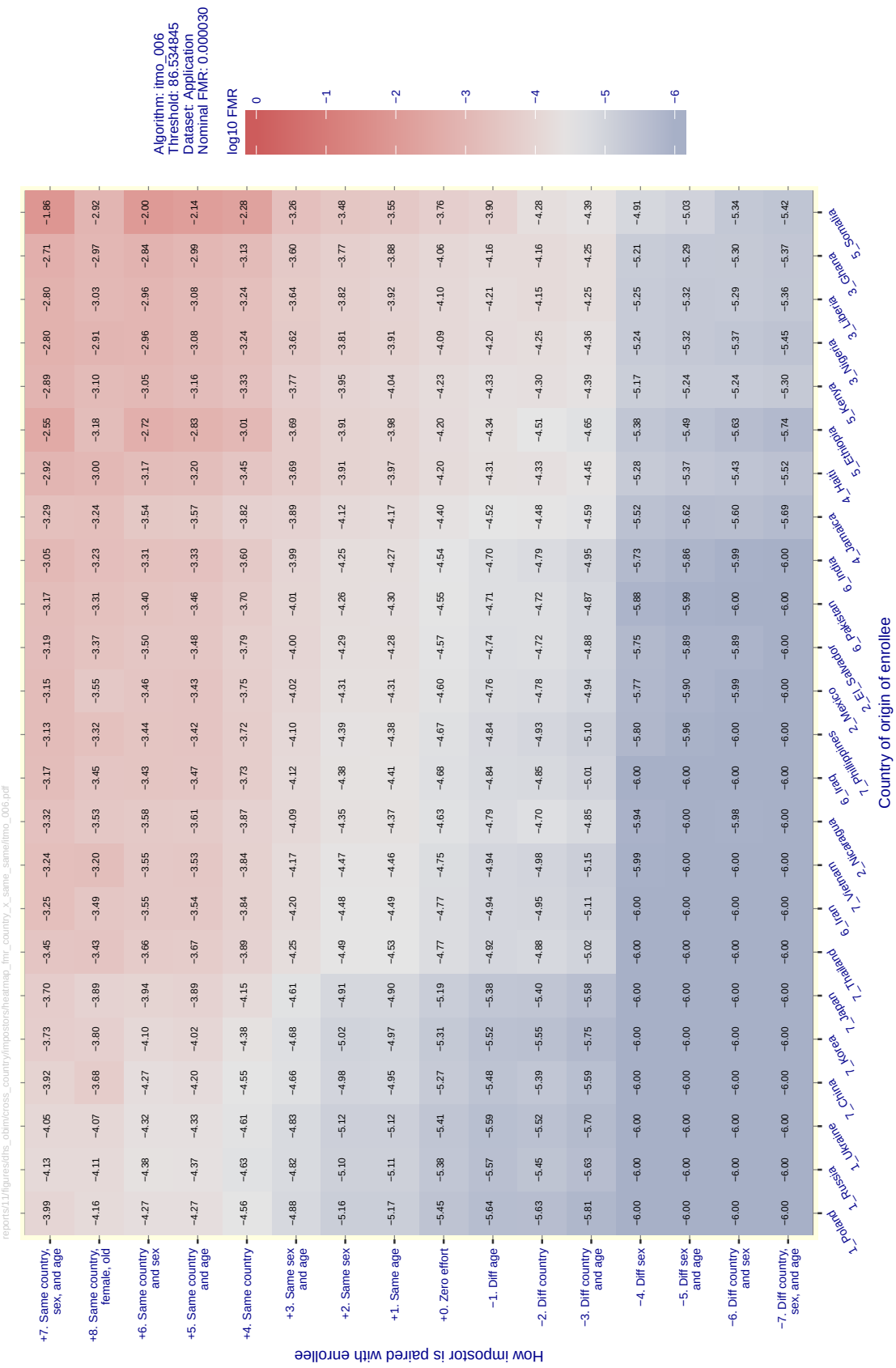
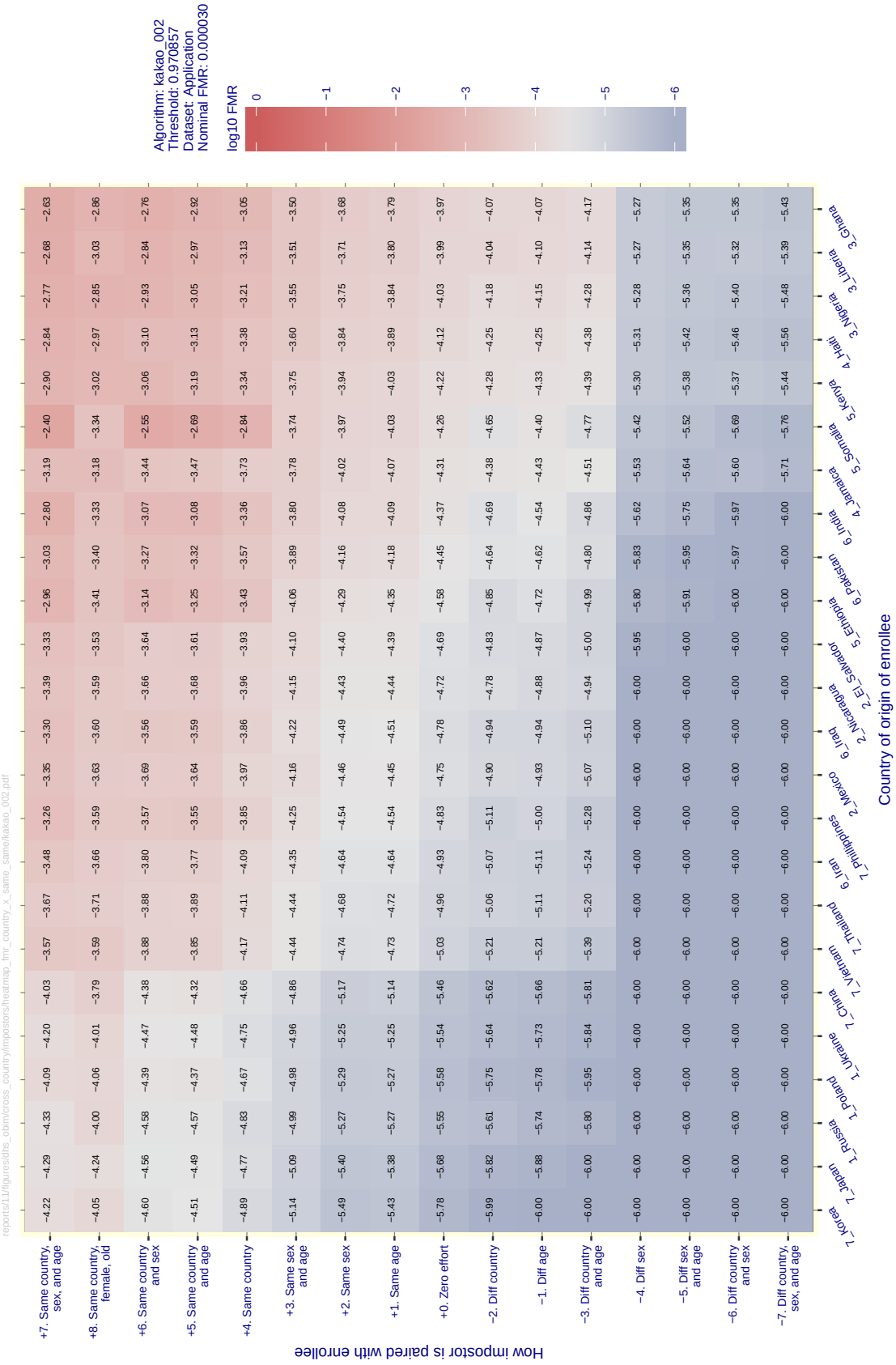


Figure 70: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*



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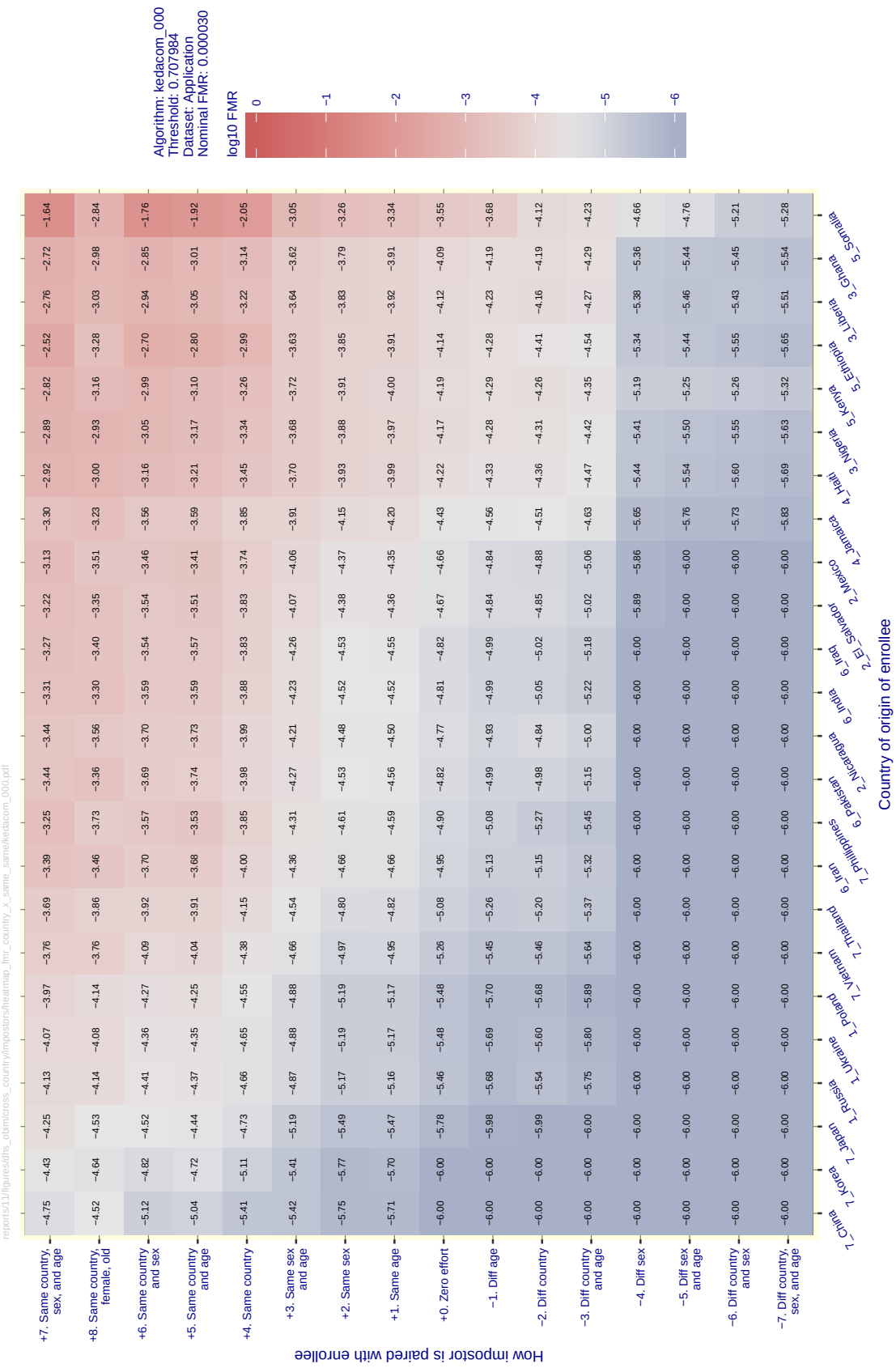


Figure 72: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

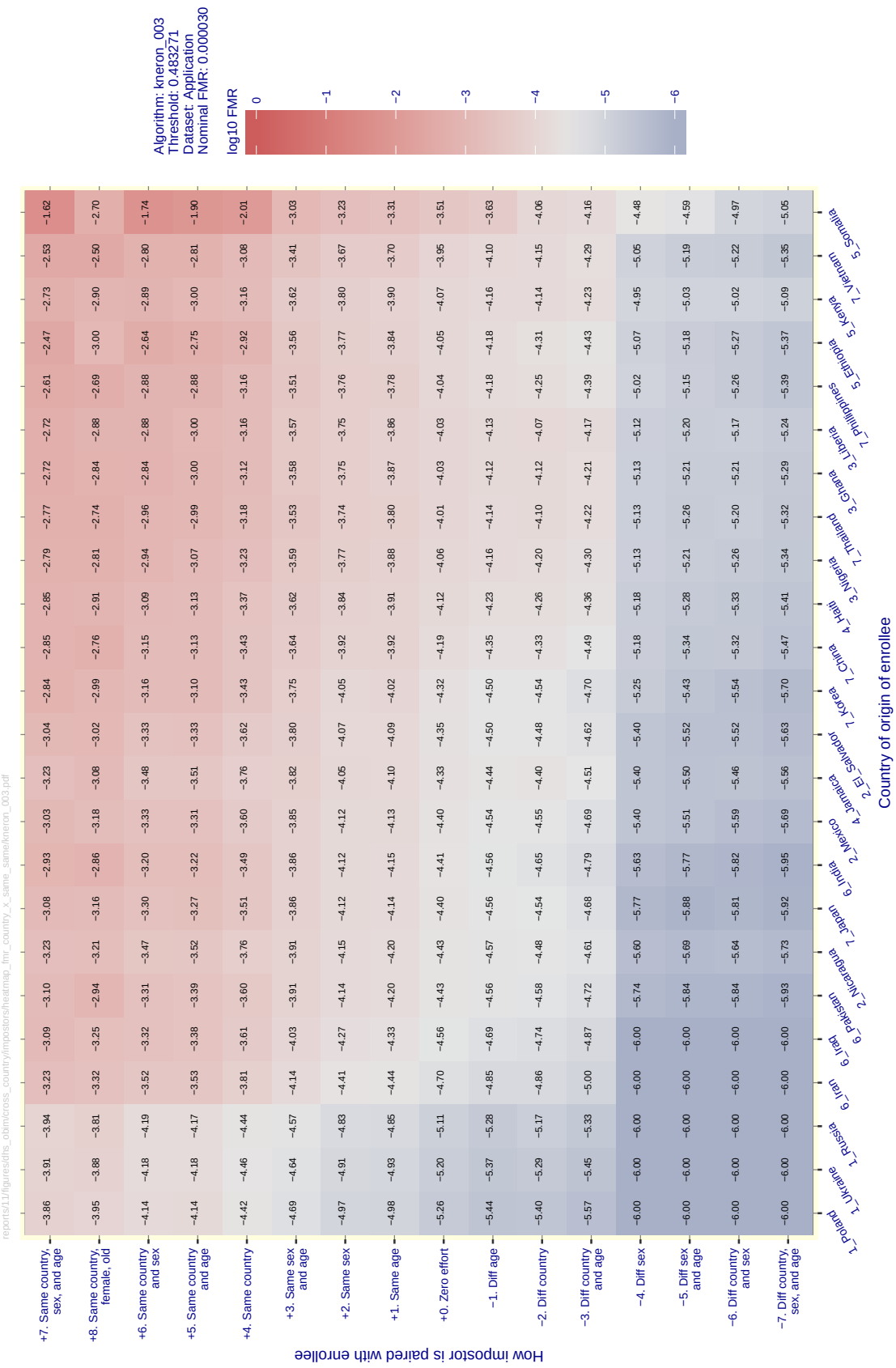


Figure 73: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

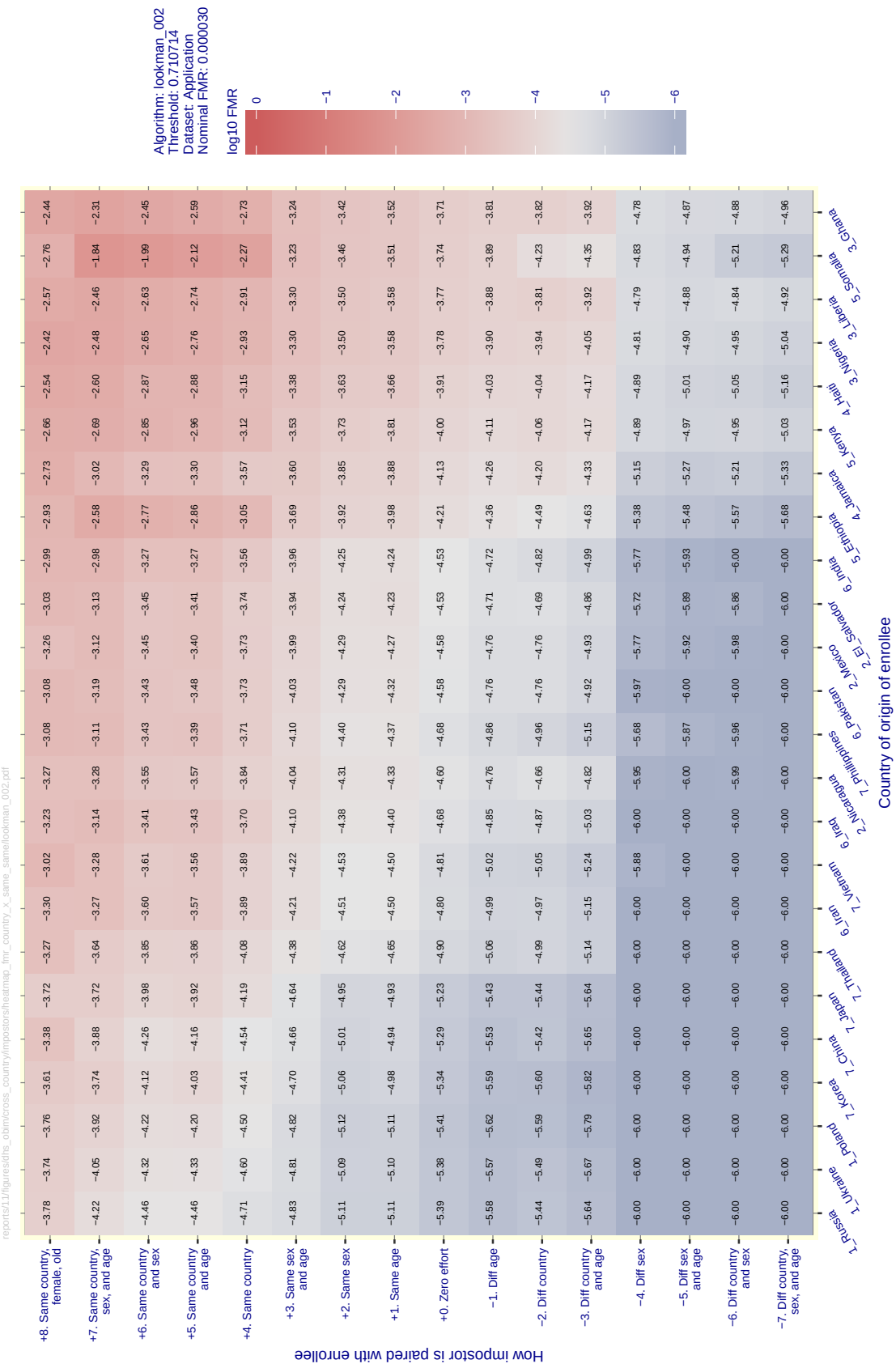


Figure 74: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

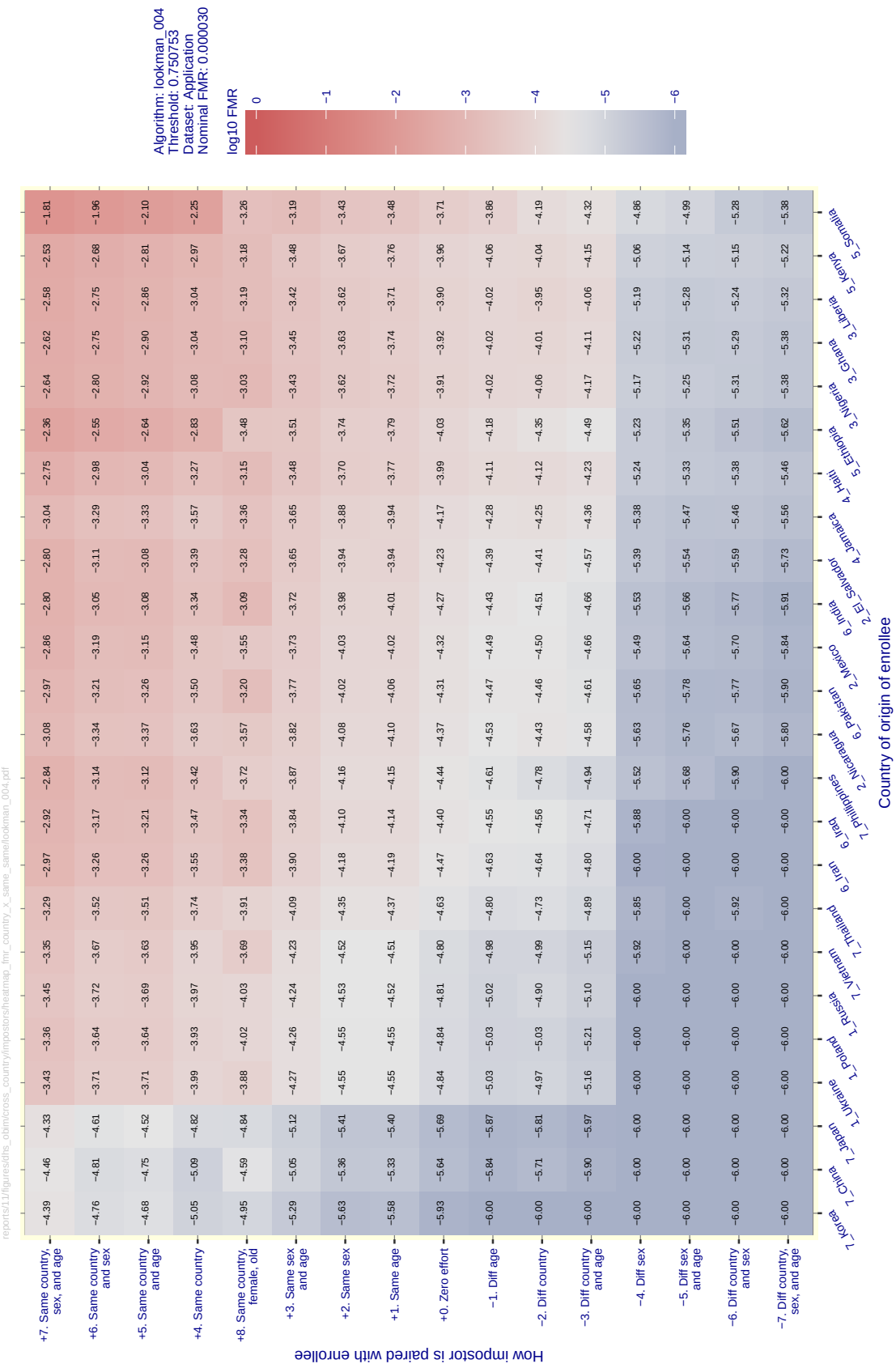


Figure 75: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

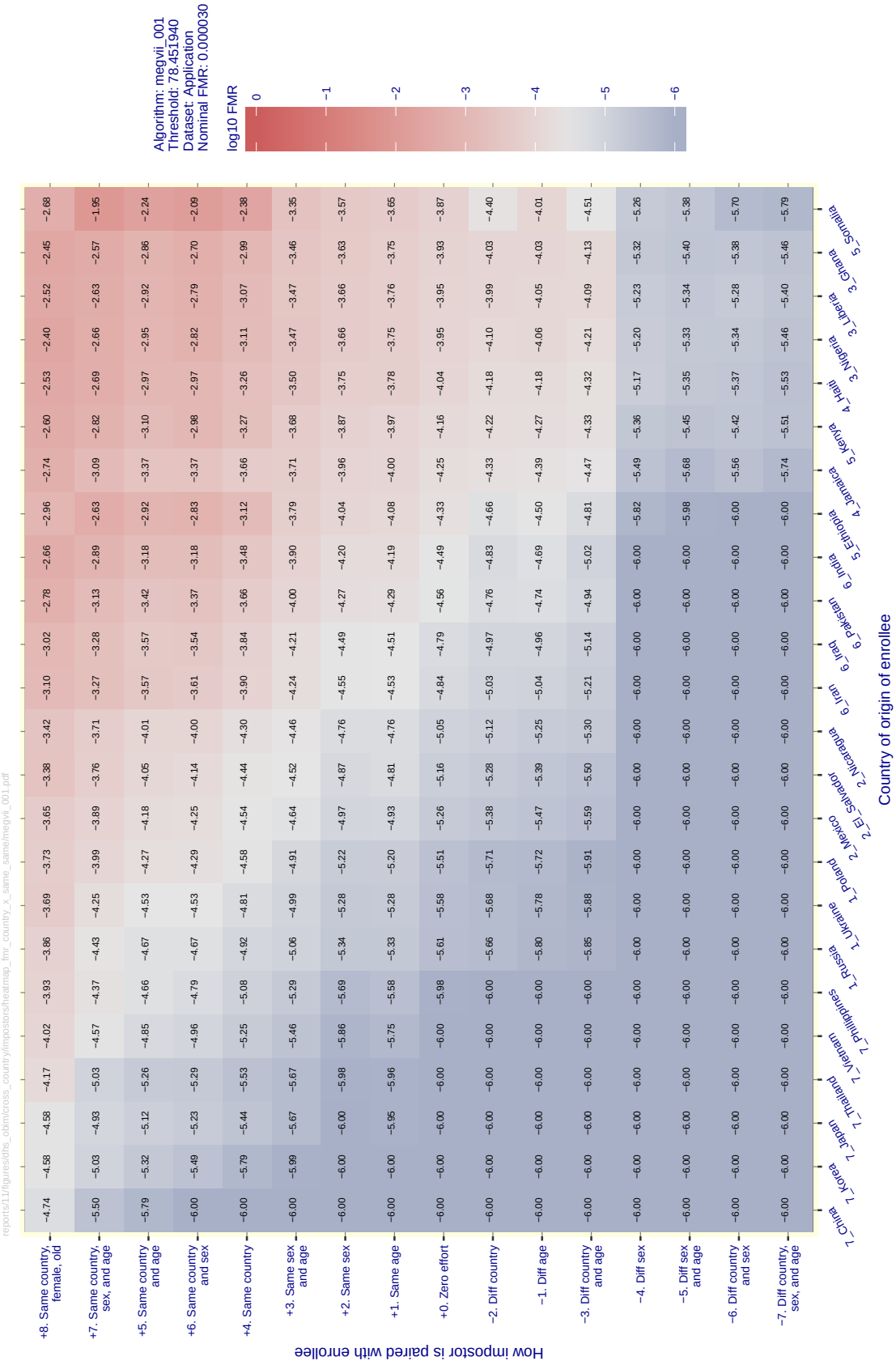


Figure 76: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

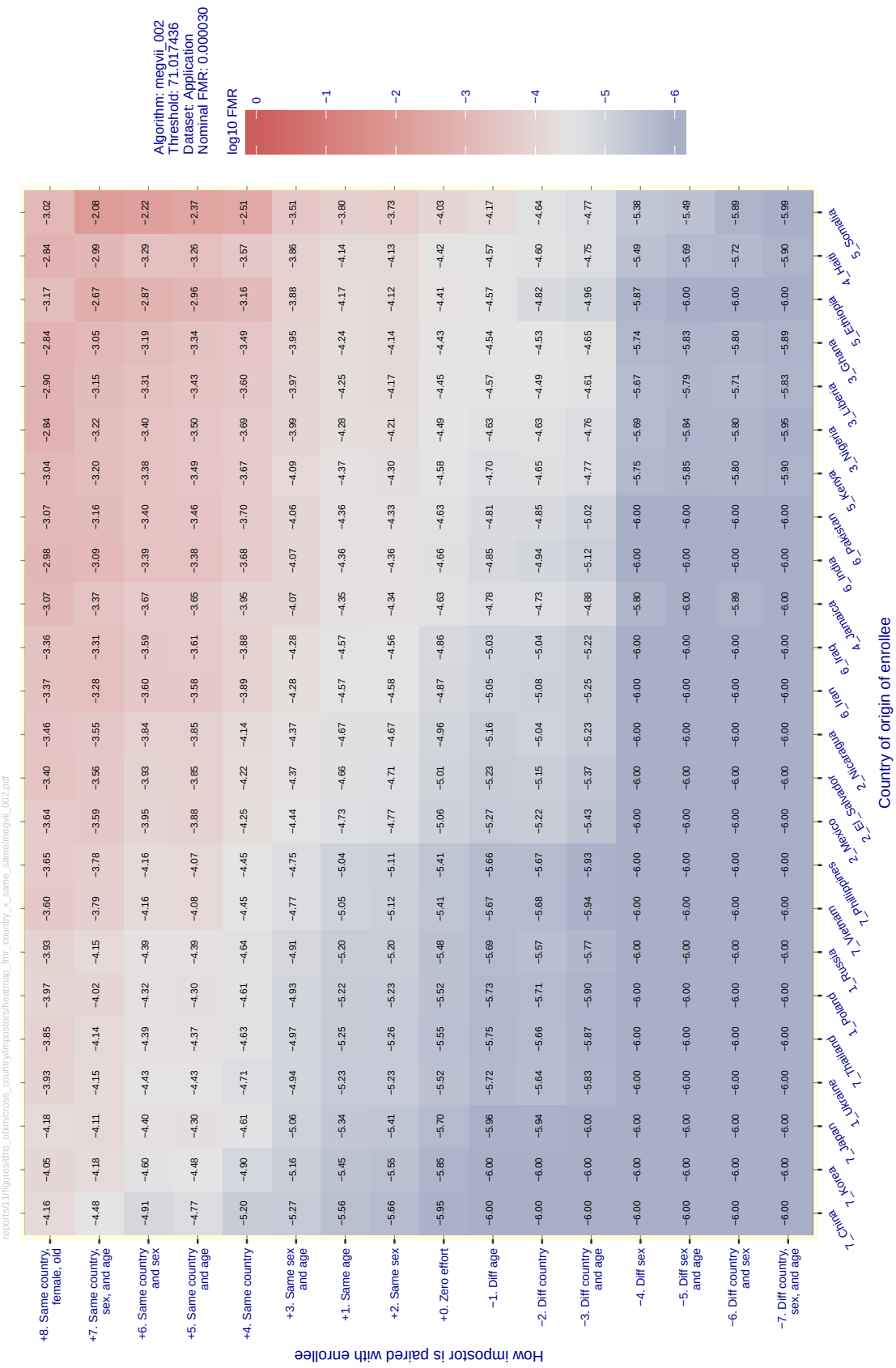


Figure 77: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

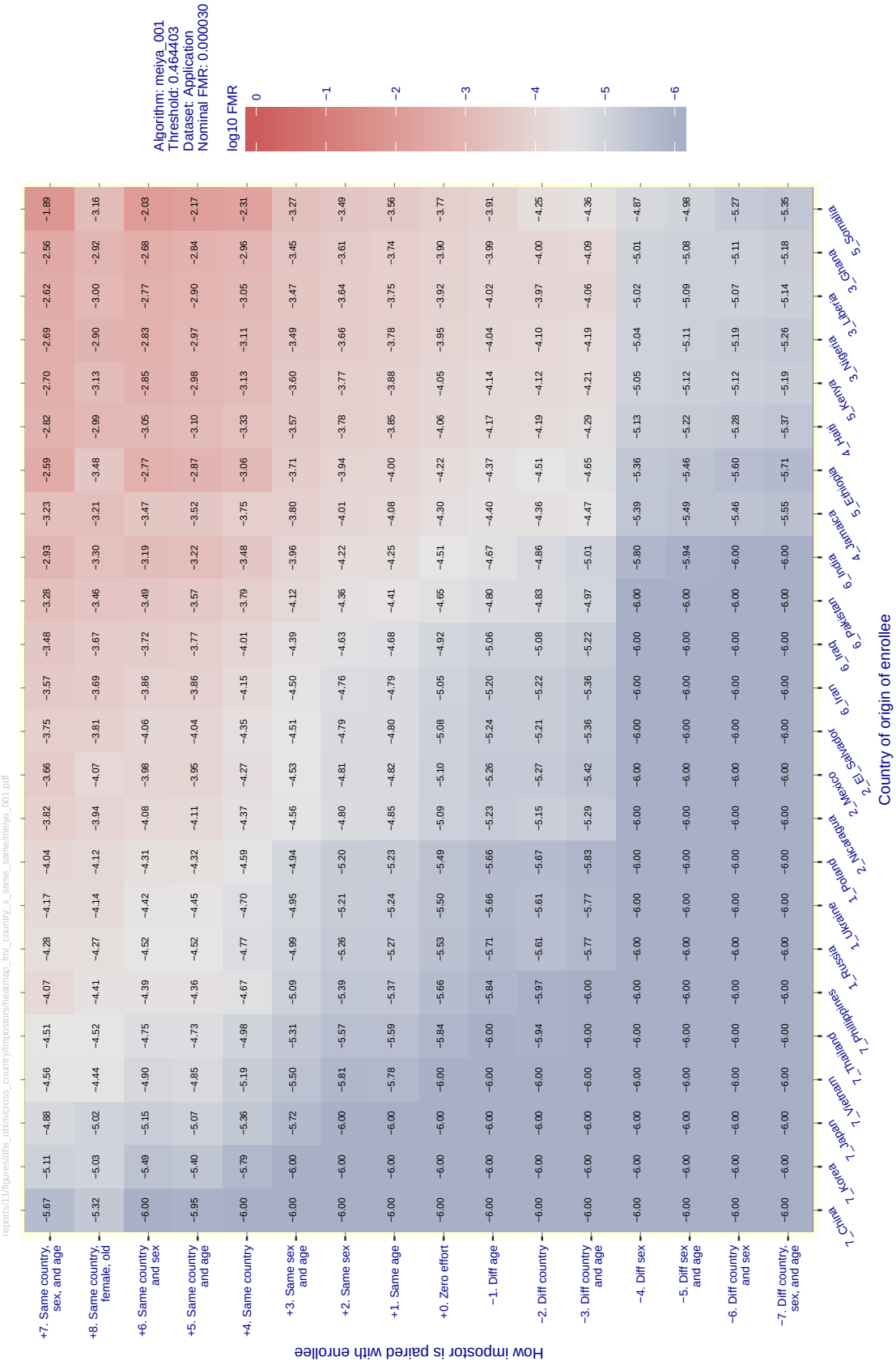


Figure 78: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

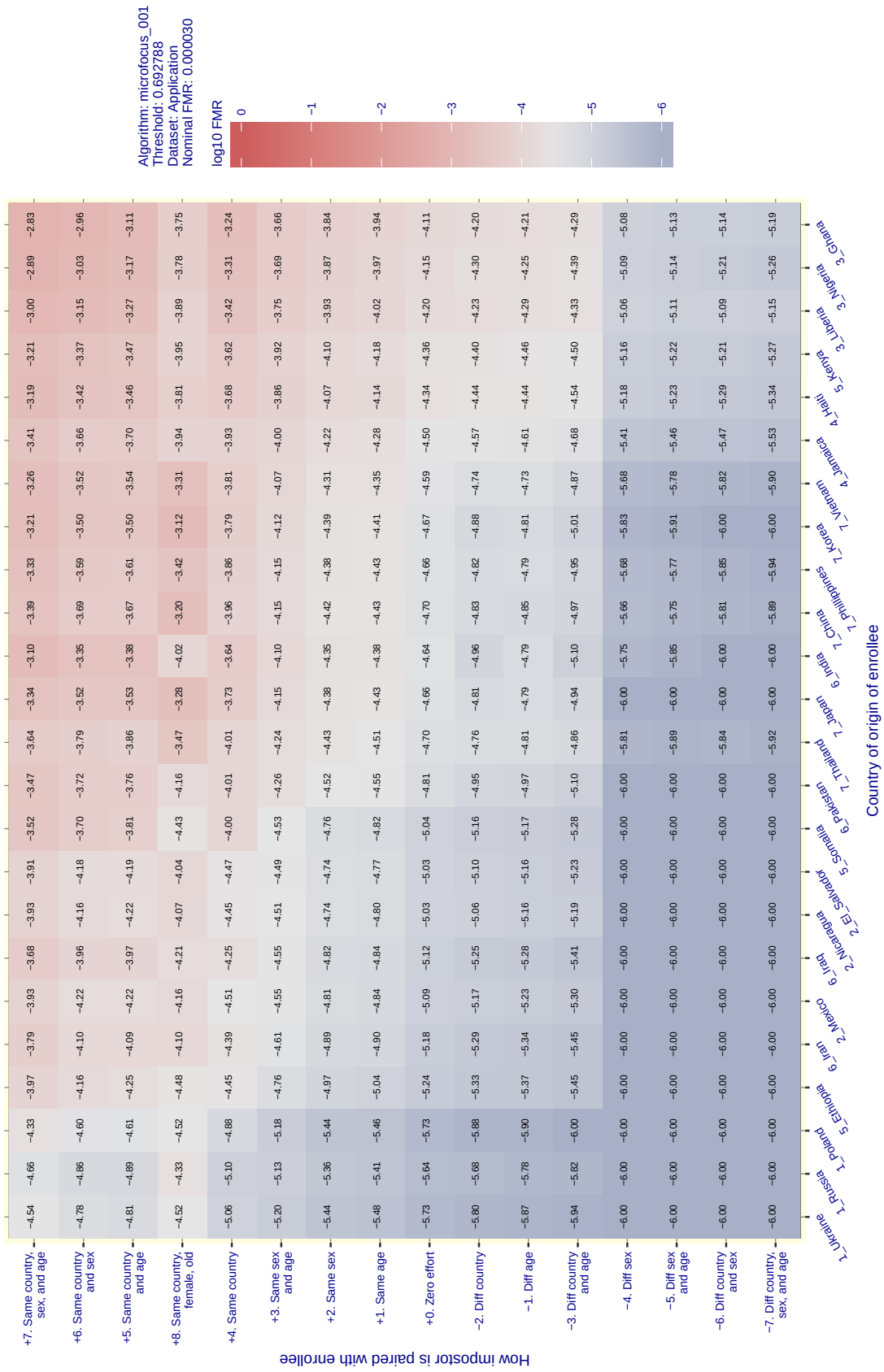


Figure 79: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

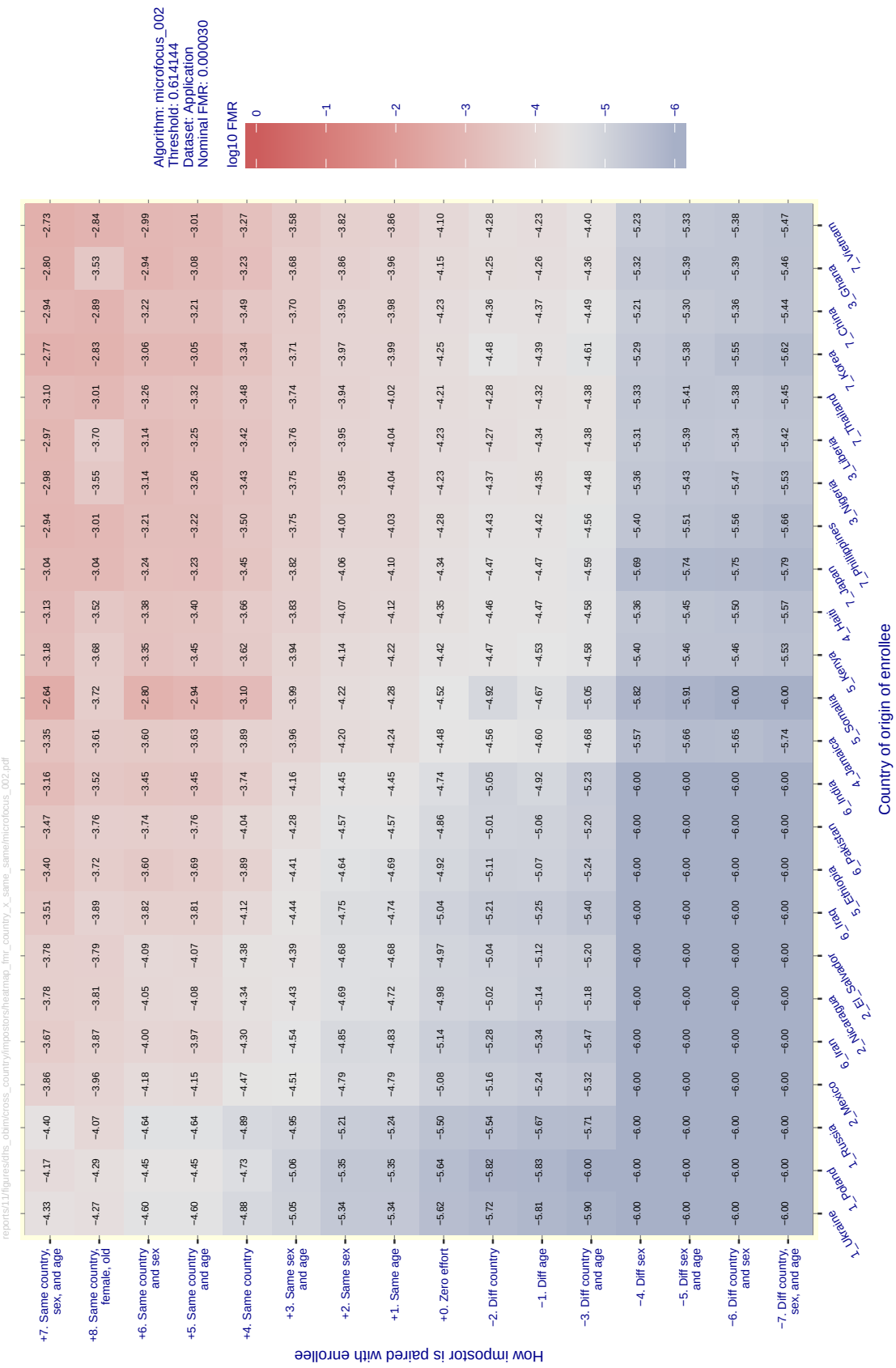


Figure 80: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

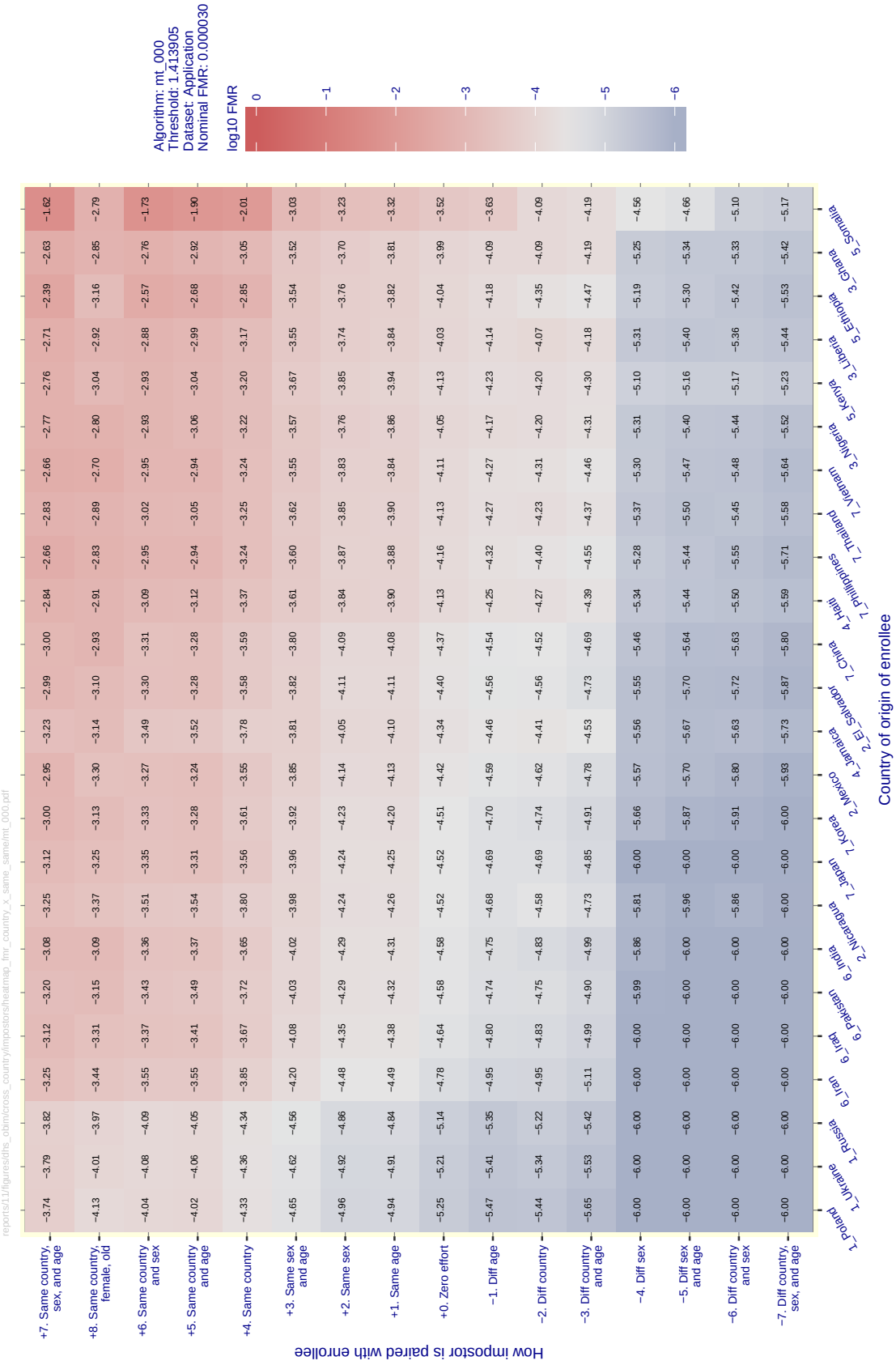


Figure 81: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

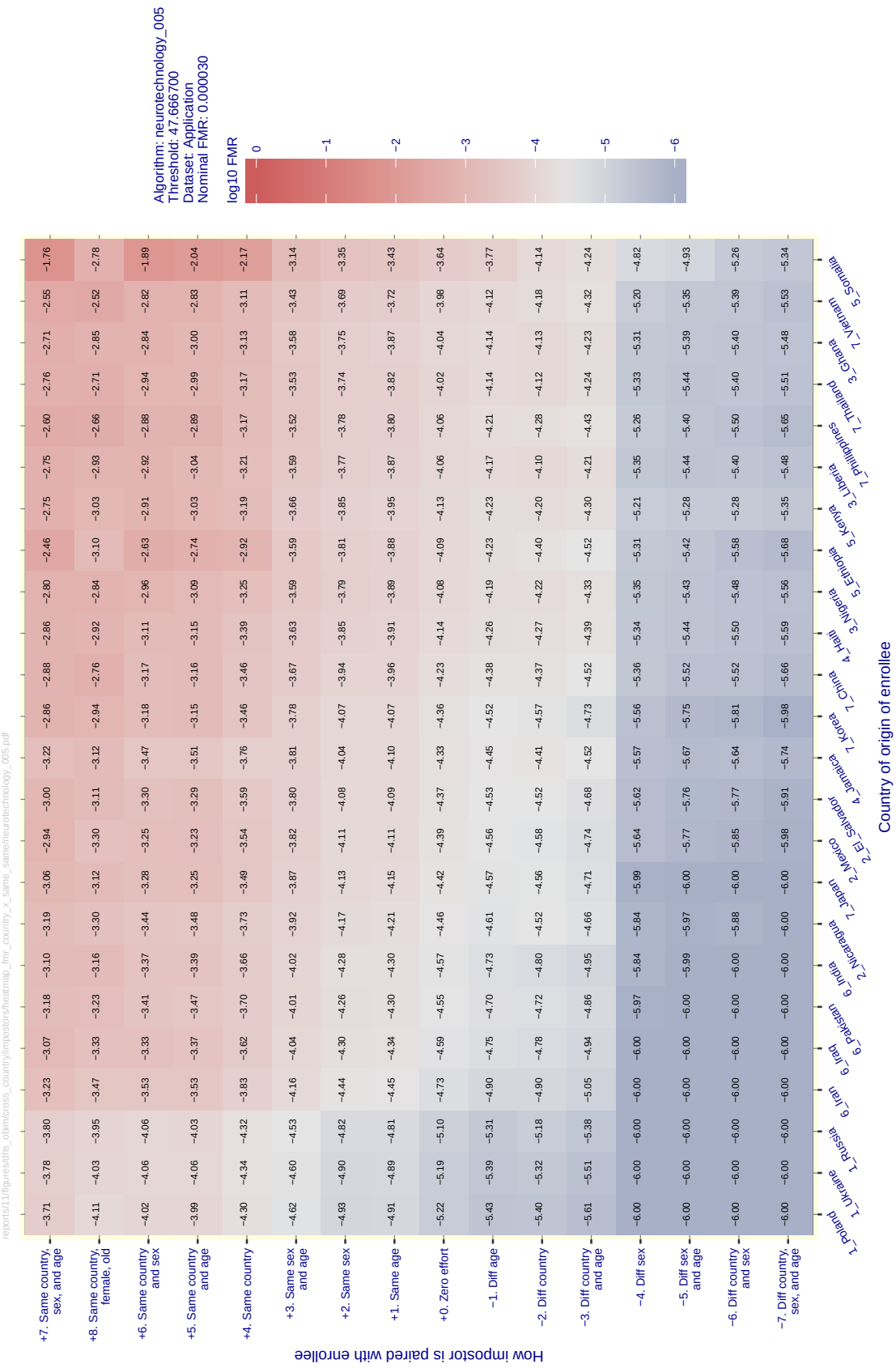


Figure 82: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

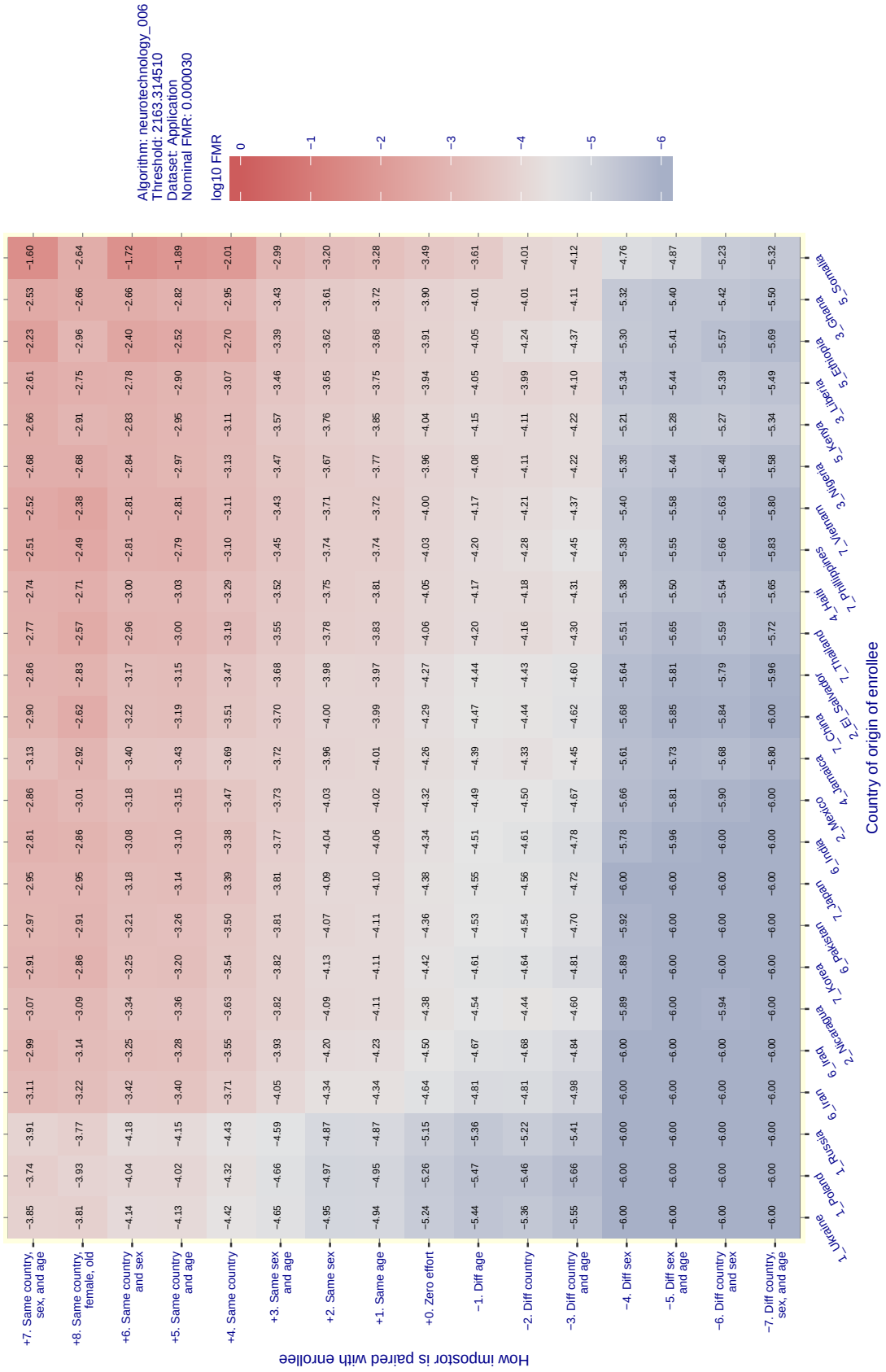
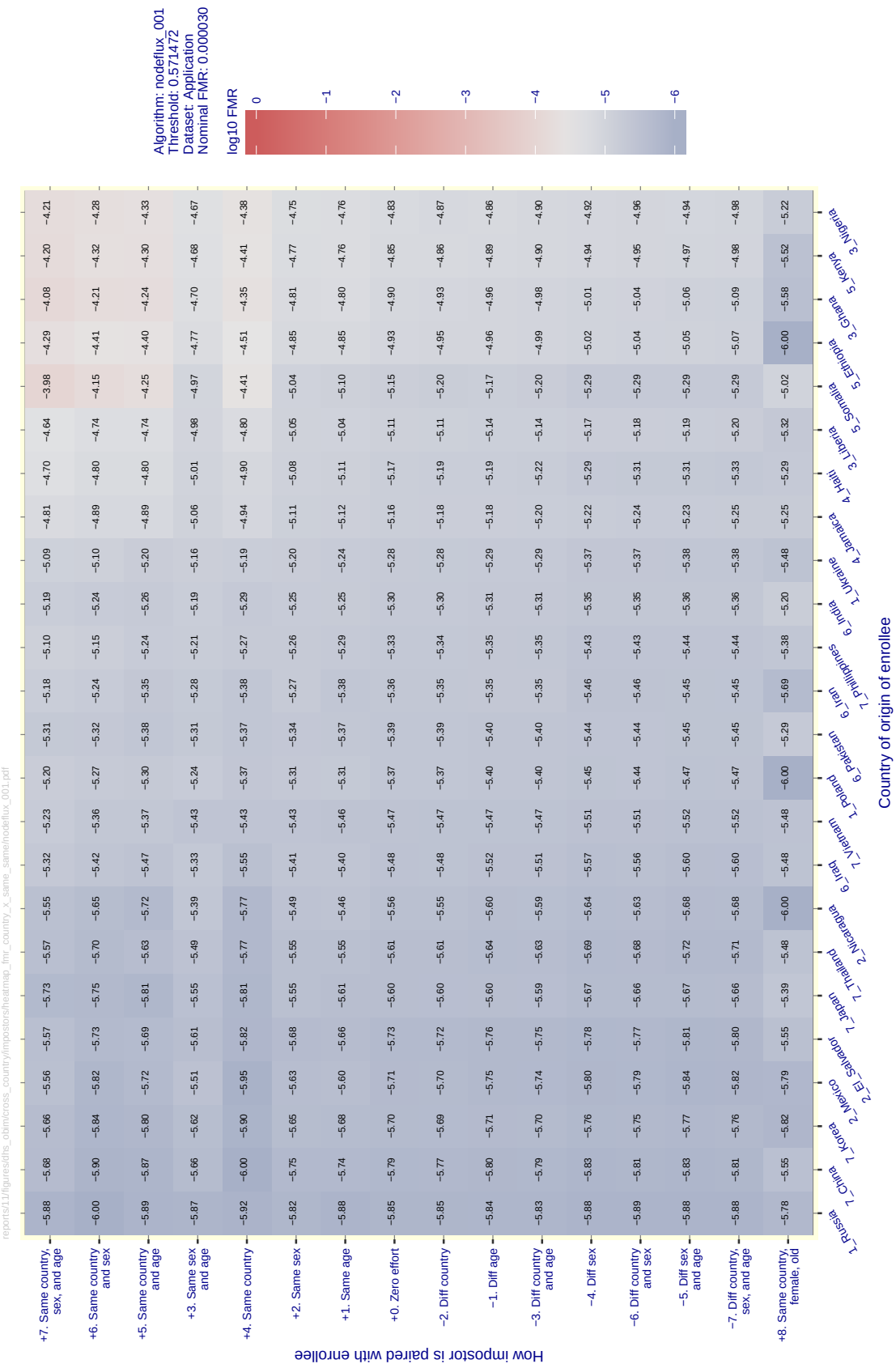


Figure 83: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*



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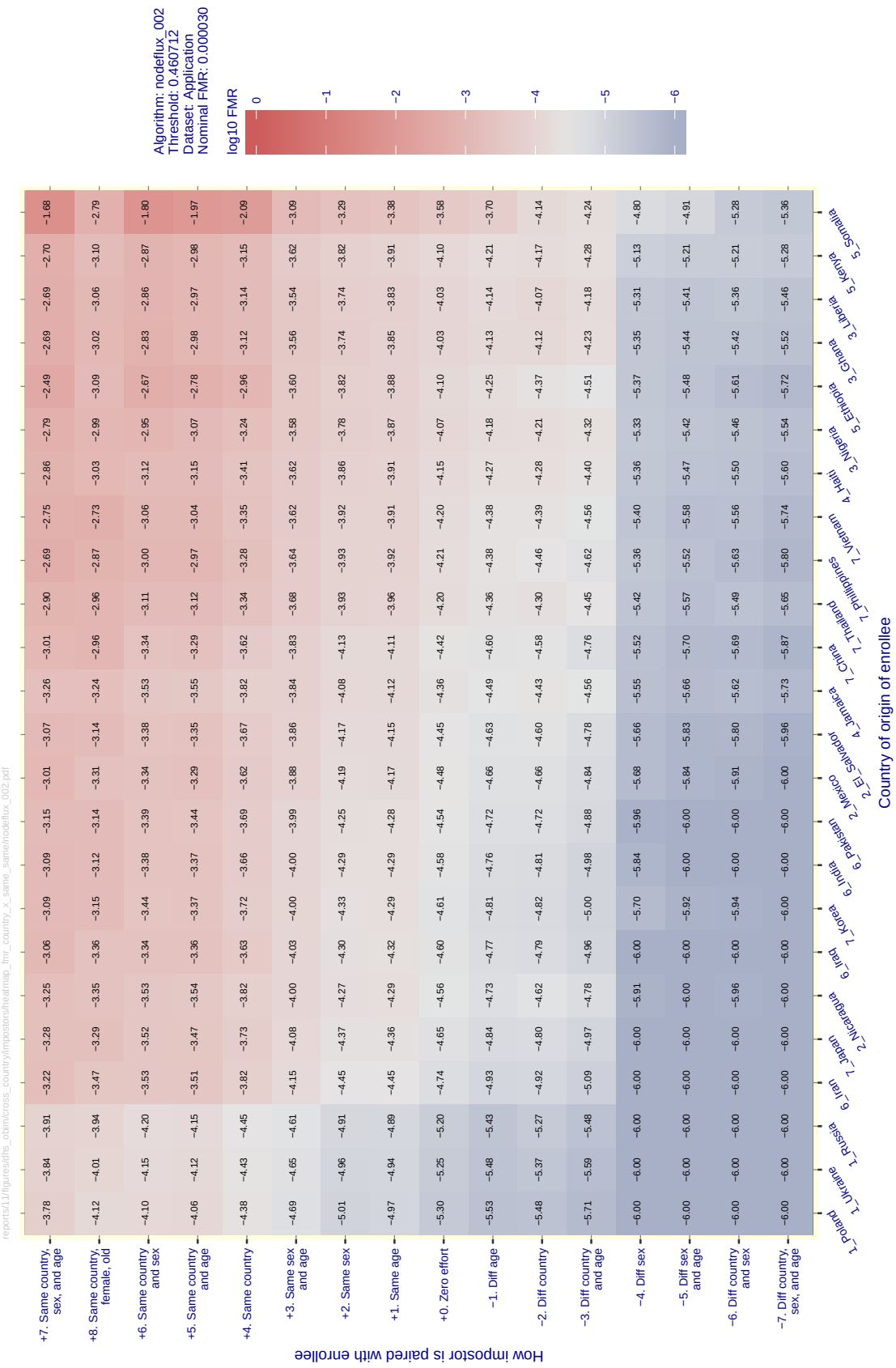

Figure 85: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

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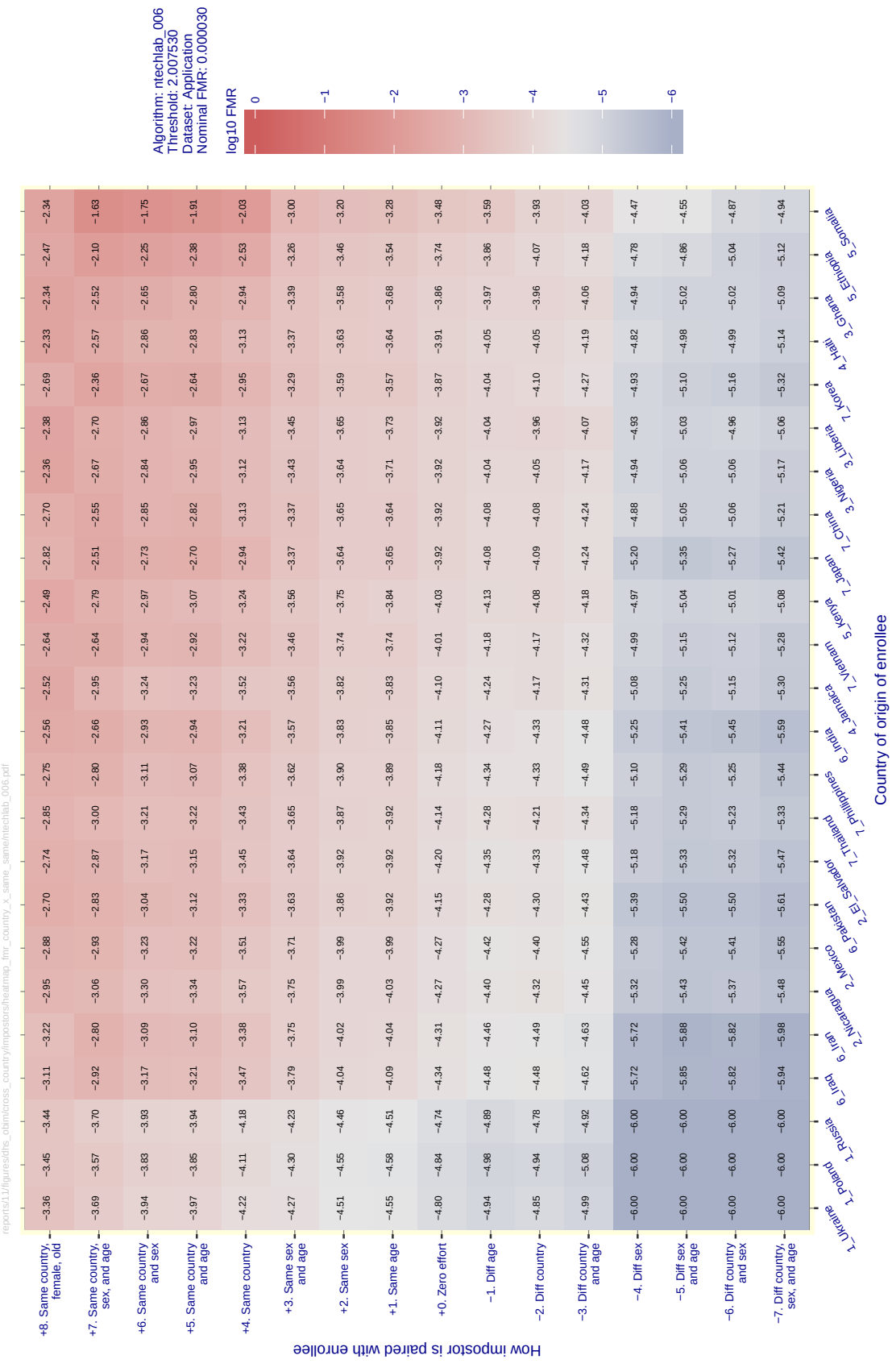


Figure 87: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

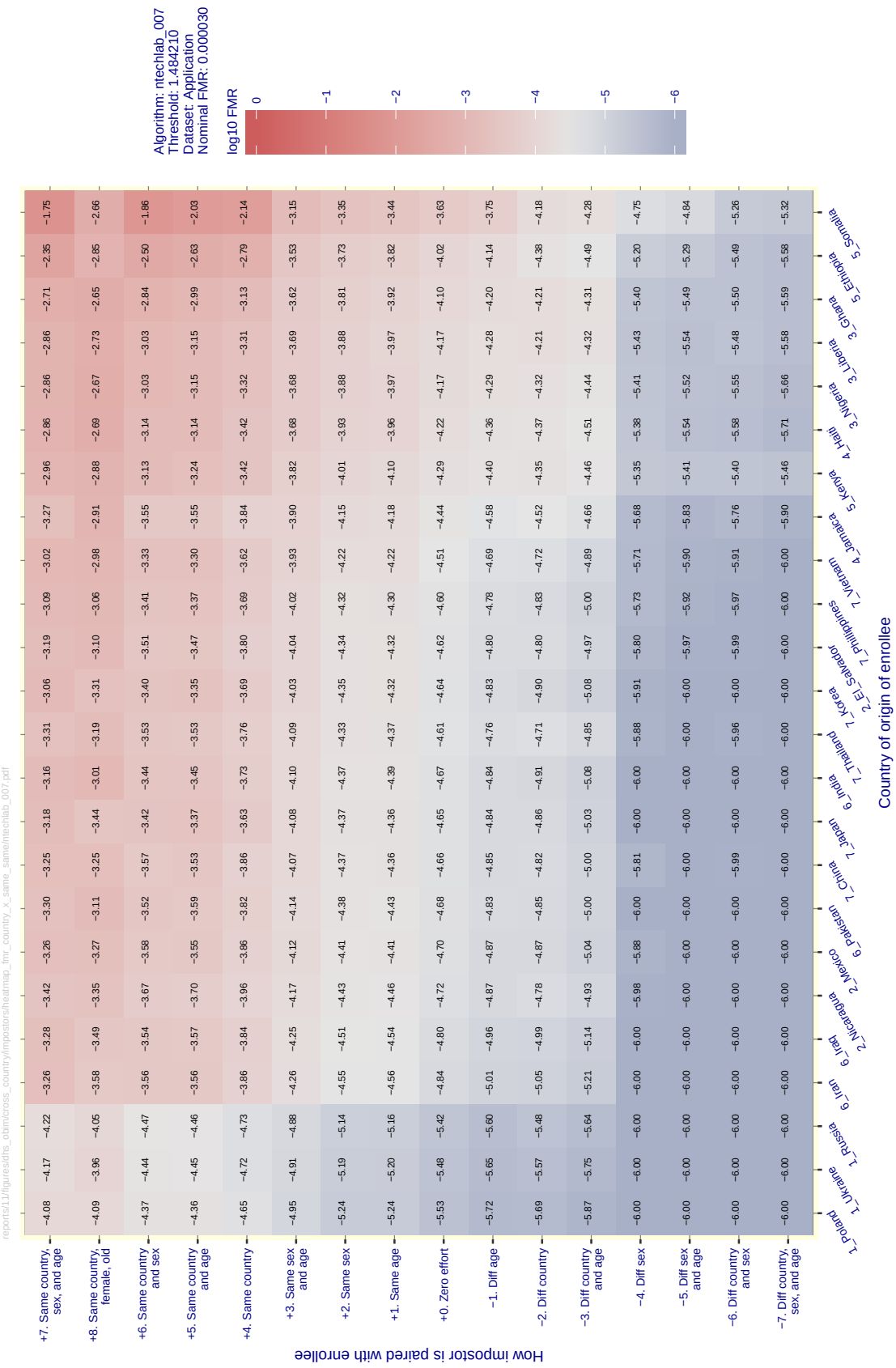


Figure 88: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

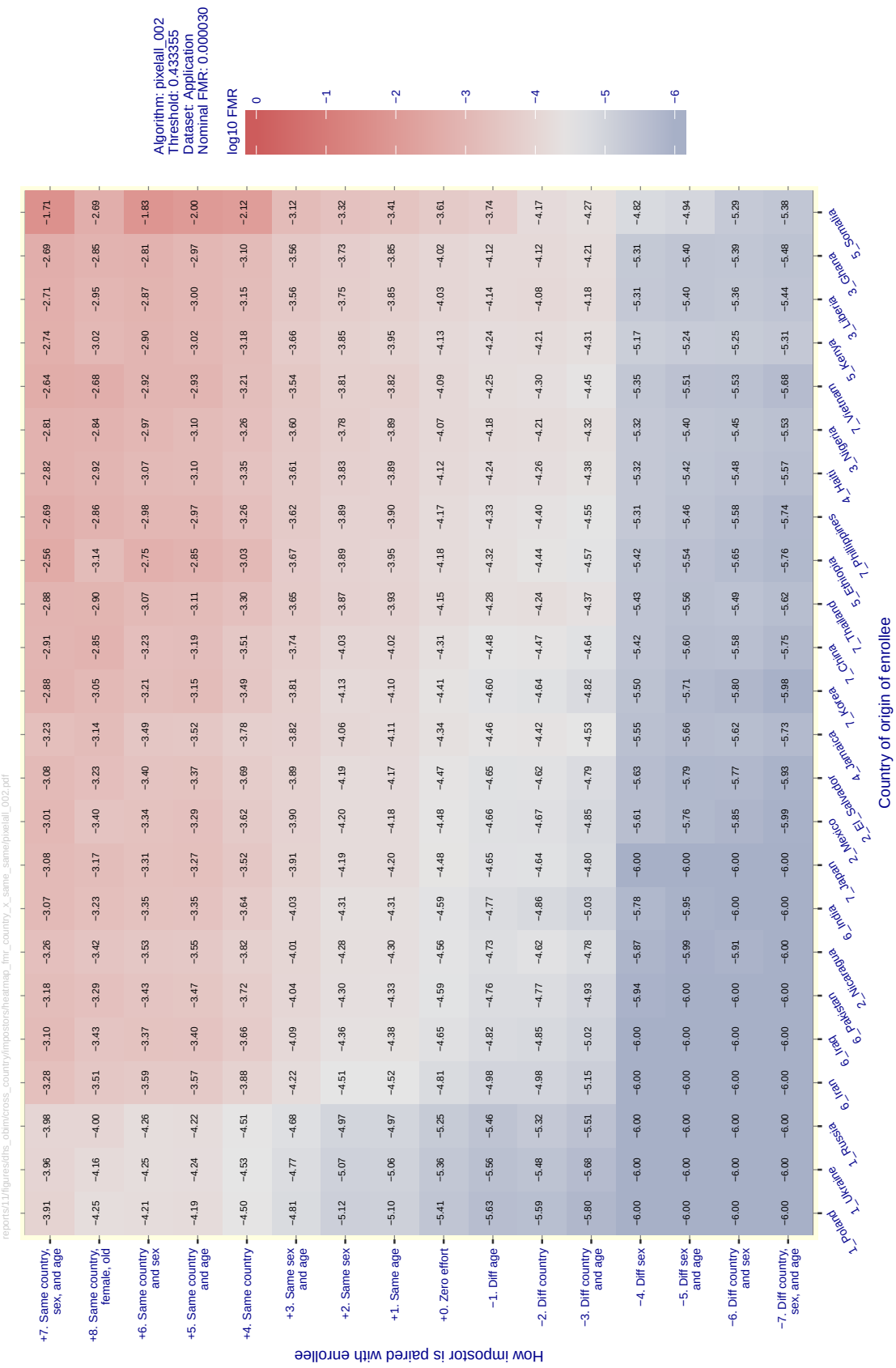
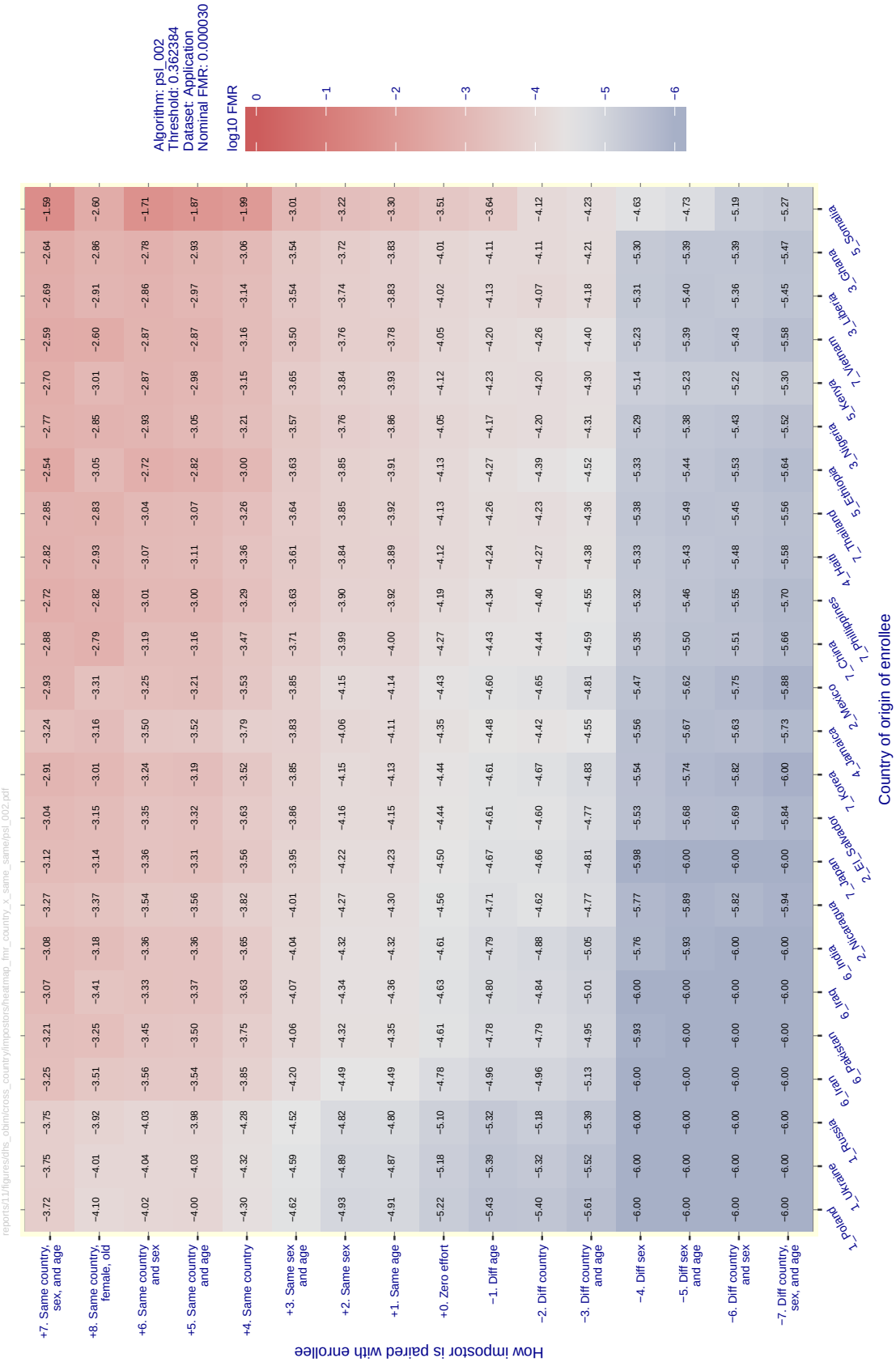


Figure 89: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.



reports/11/figures/dhs_obim/cross_country/impostors/heatmap_fmr_country_x_same_same/psl_002.pdf

Figure 90: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

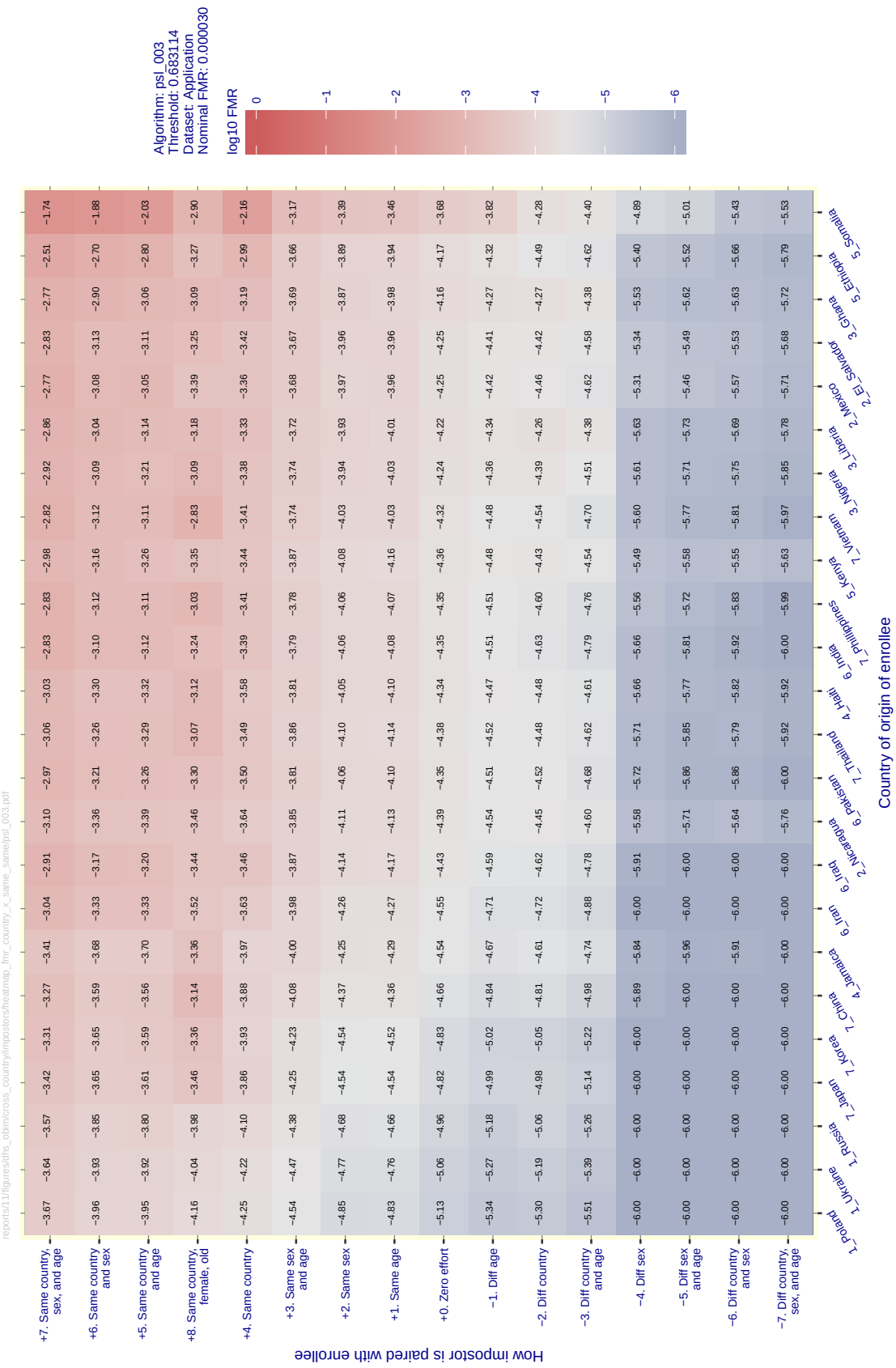


Figure 91: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

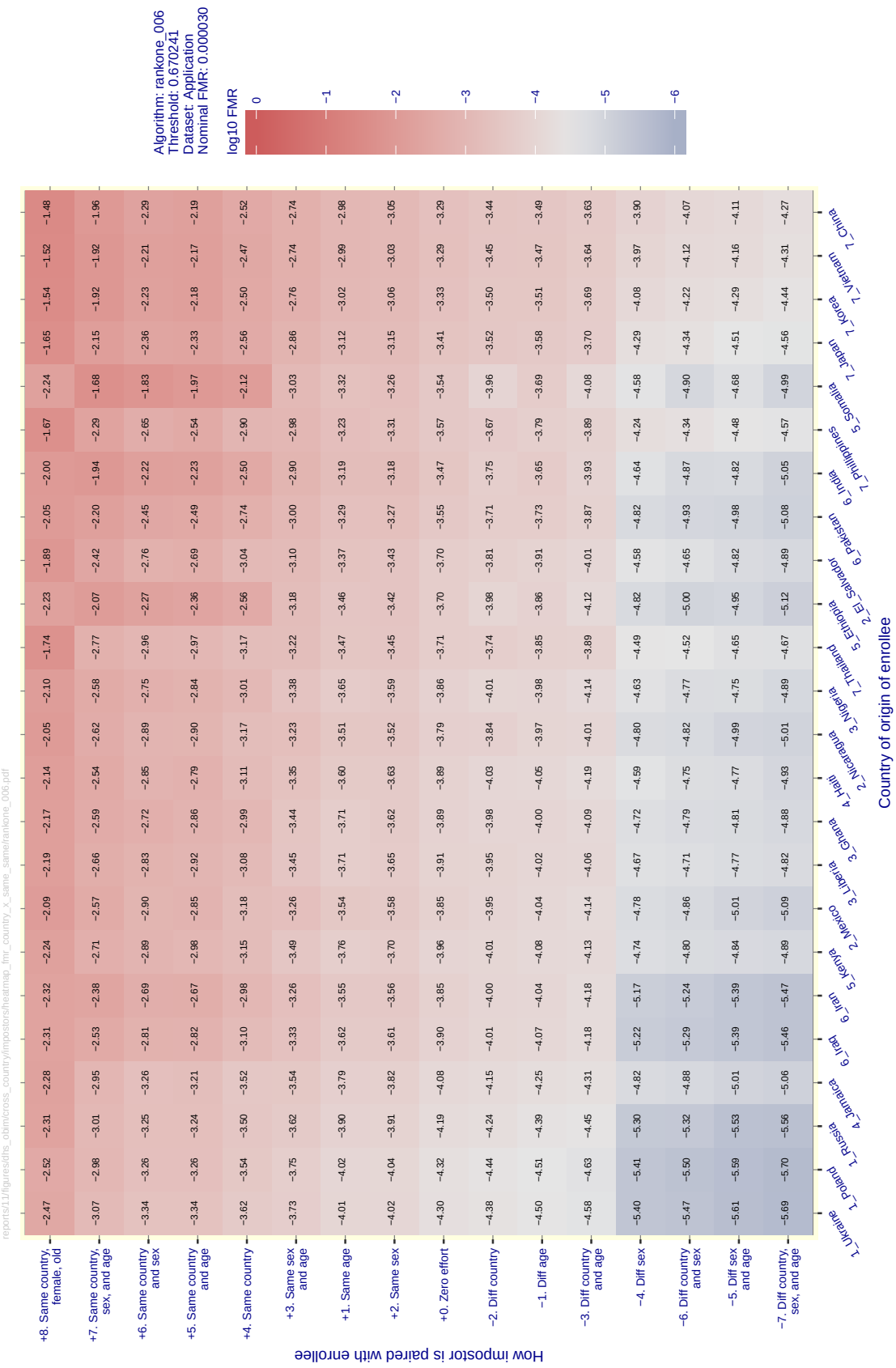


Figure 92: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

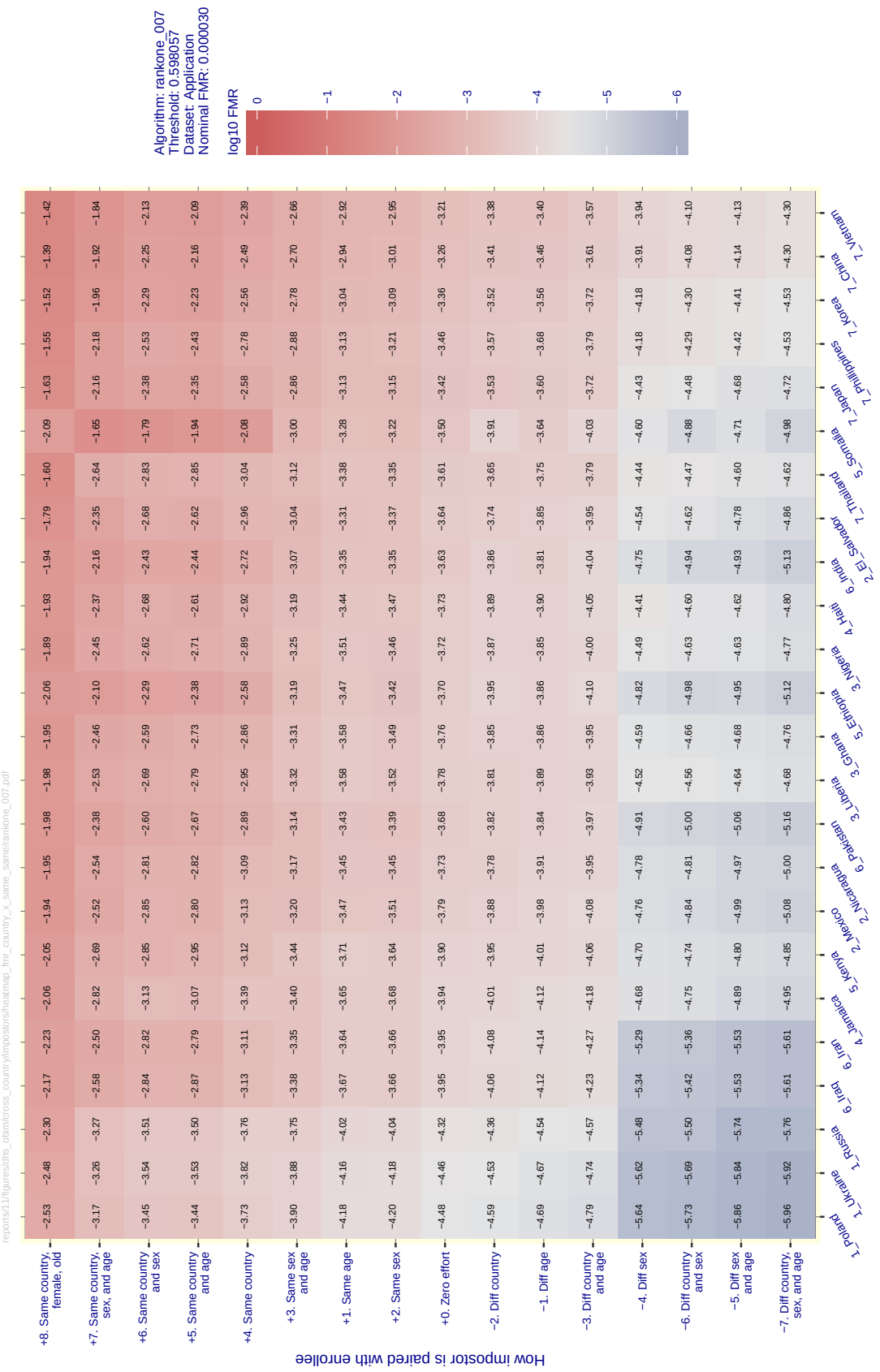


Figure 93: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

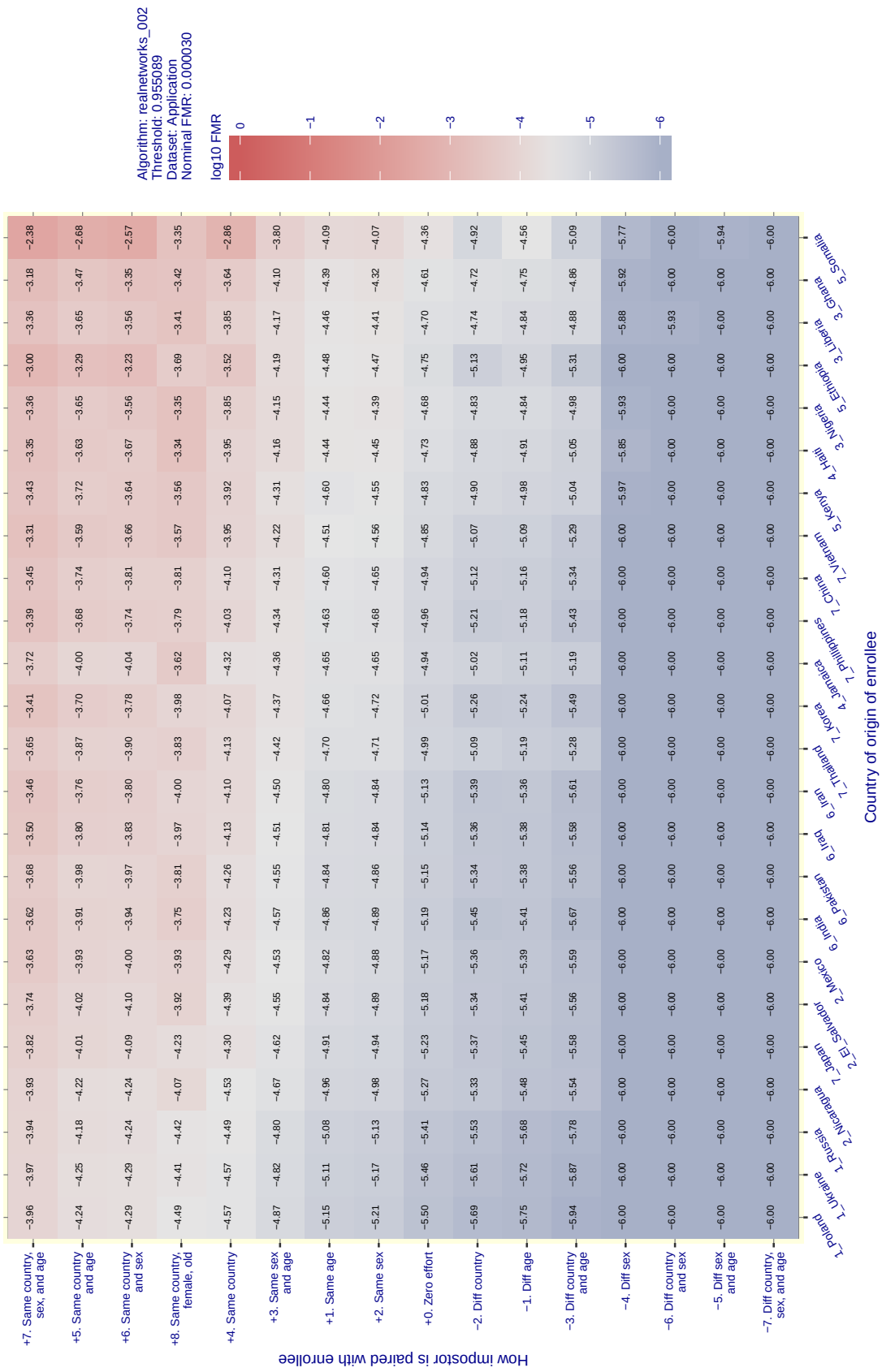


Figure 94: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

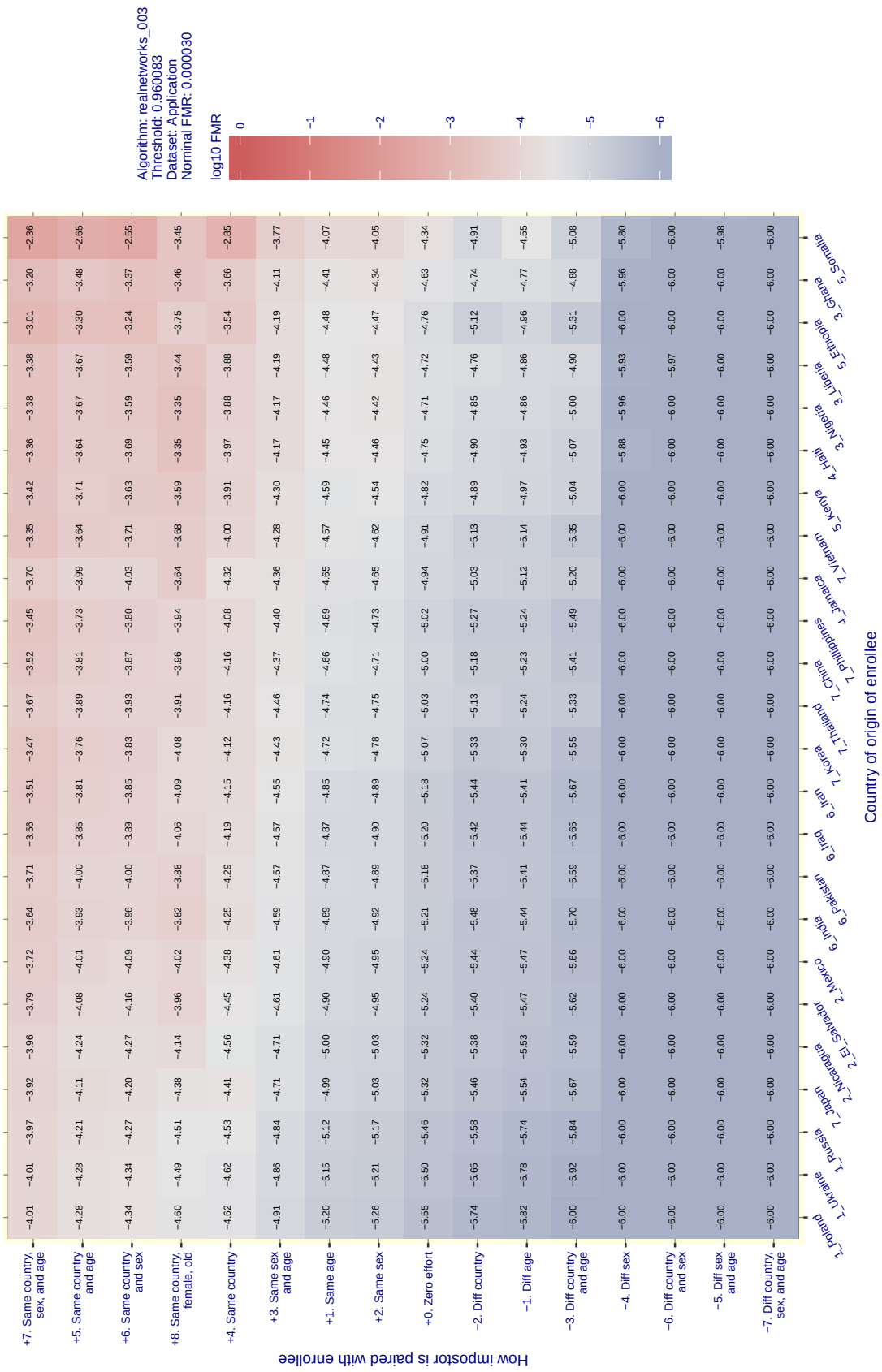


Figure 95: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

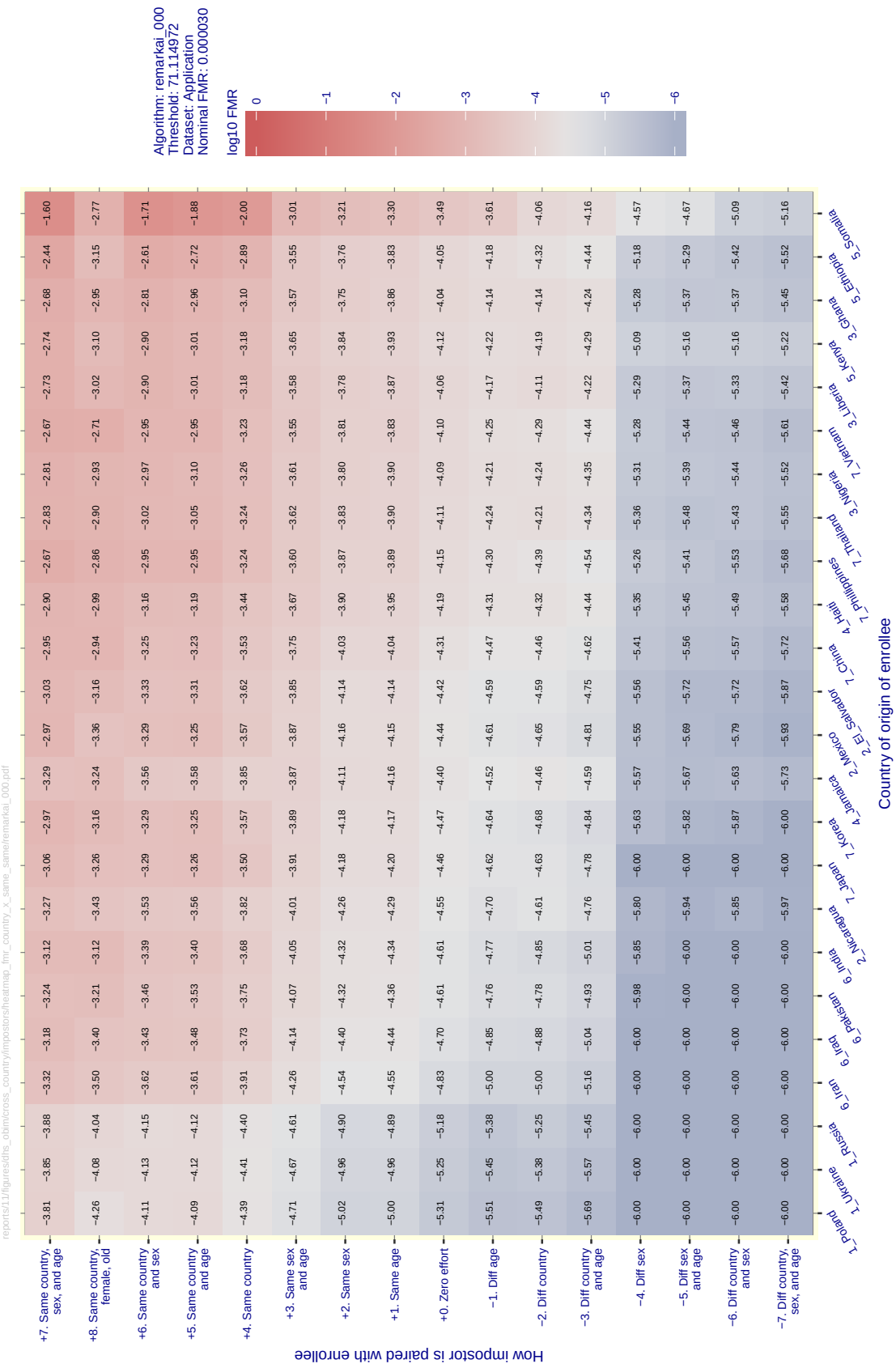
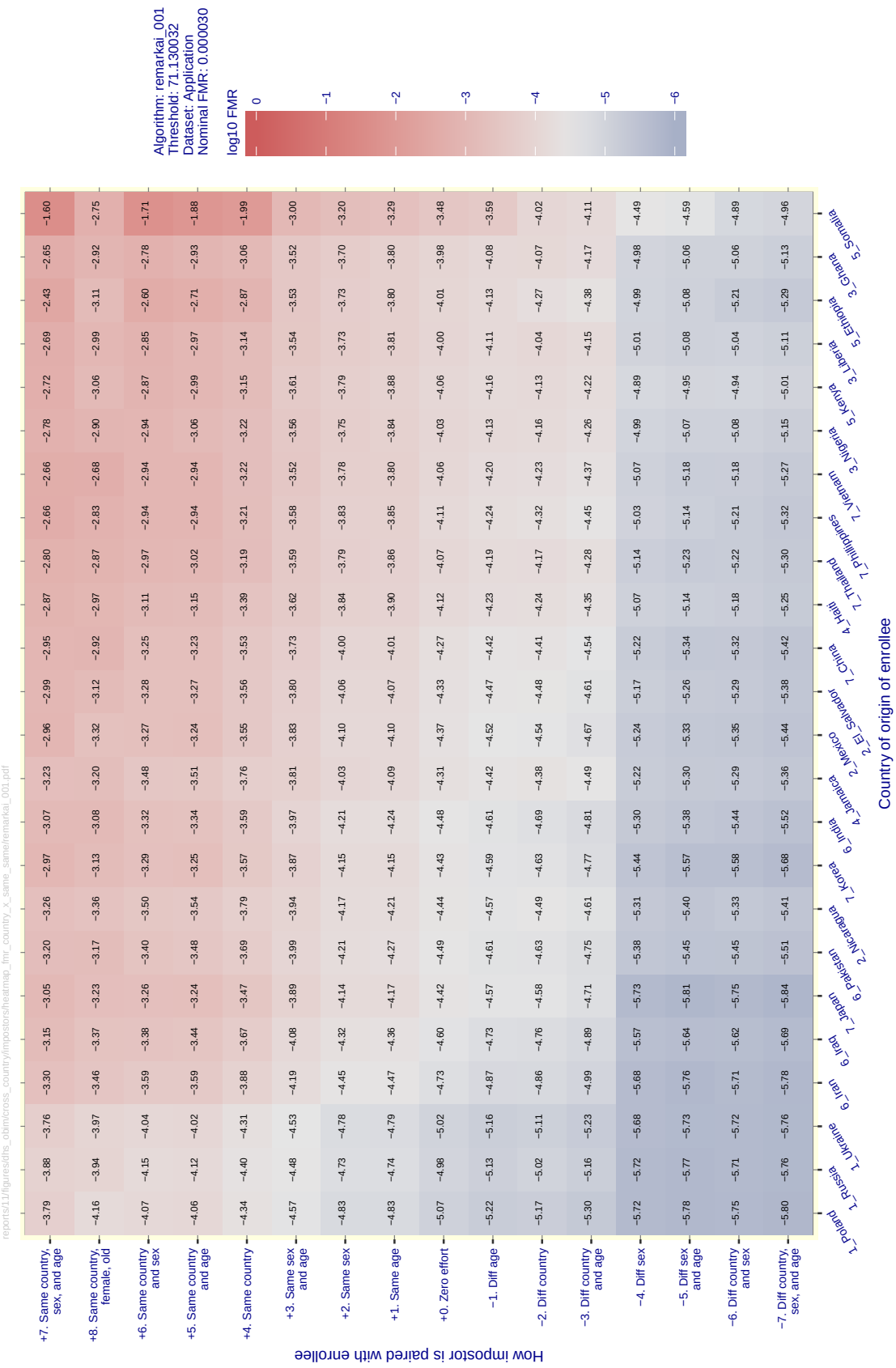


Figure 96: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*



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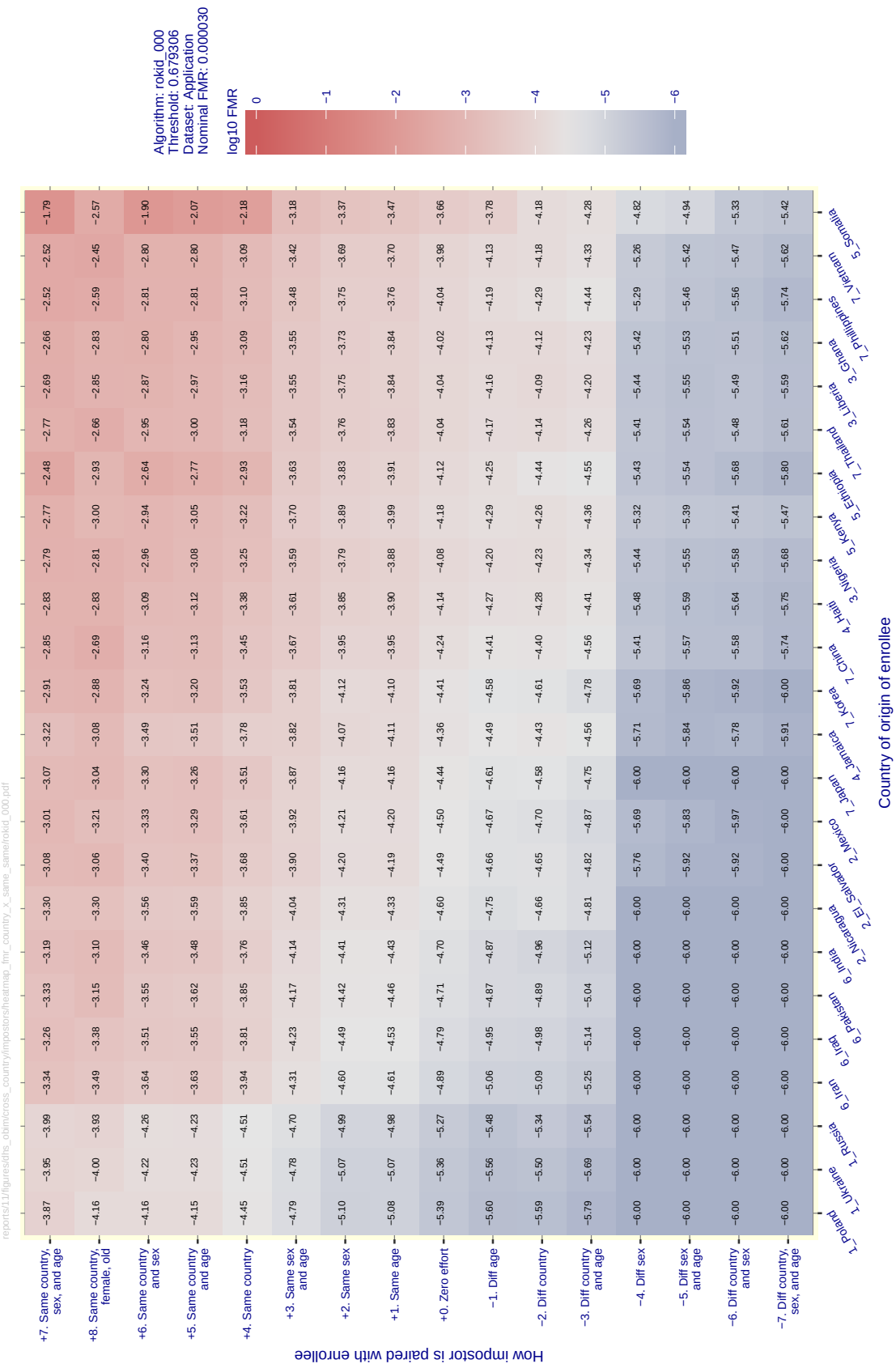


Figure 98: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

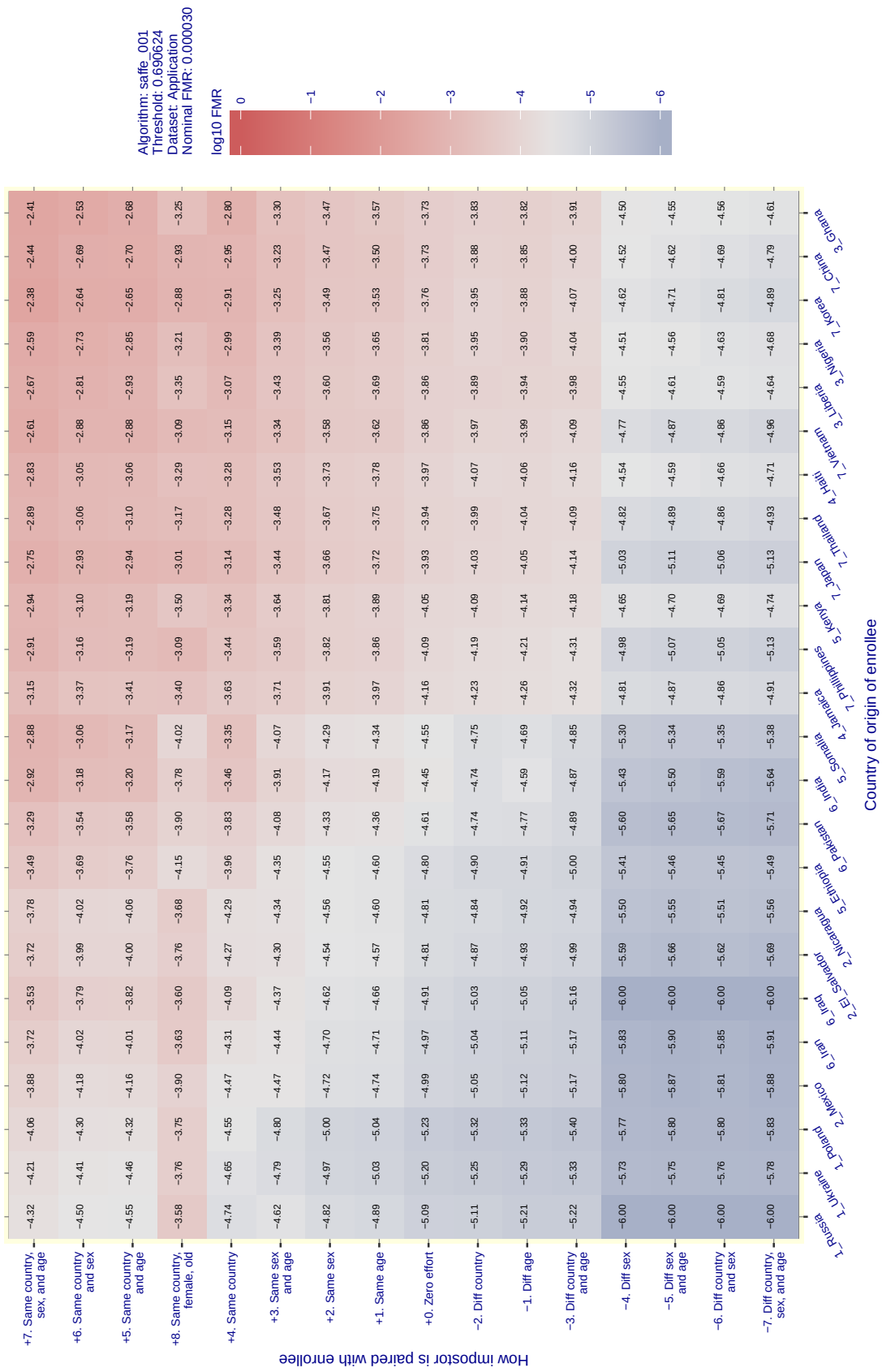


Figure 99: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

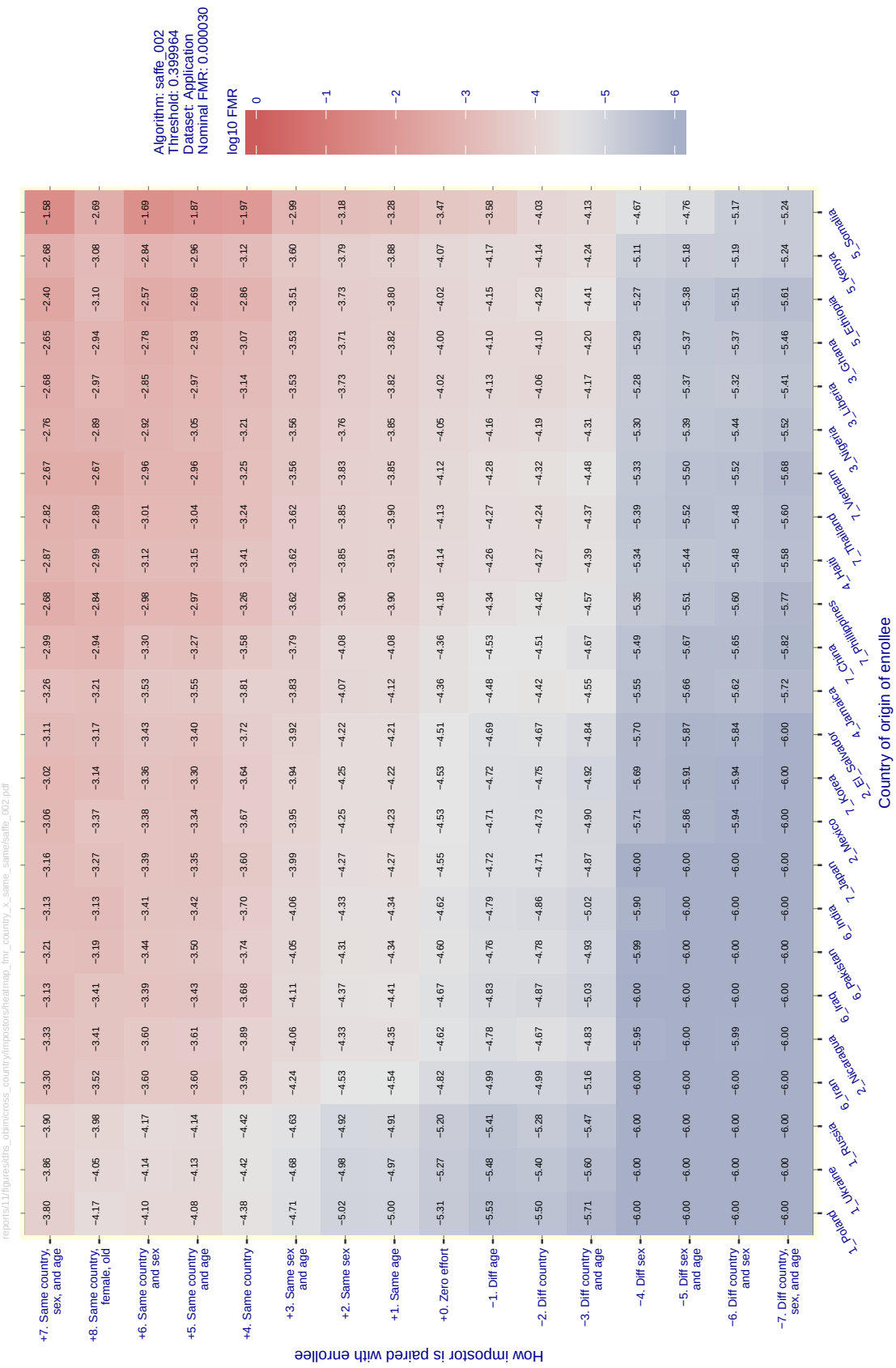


Figure 100: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

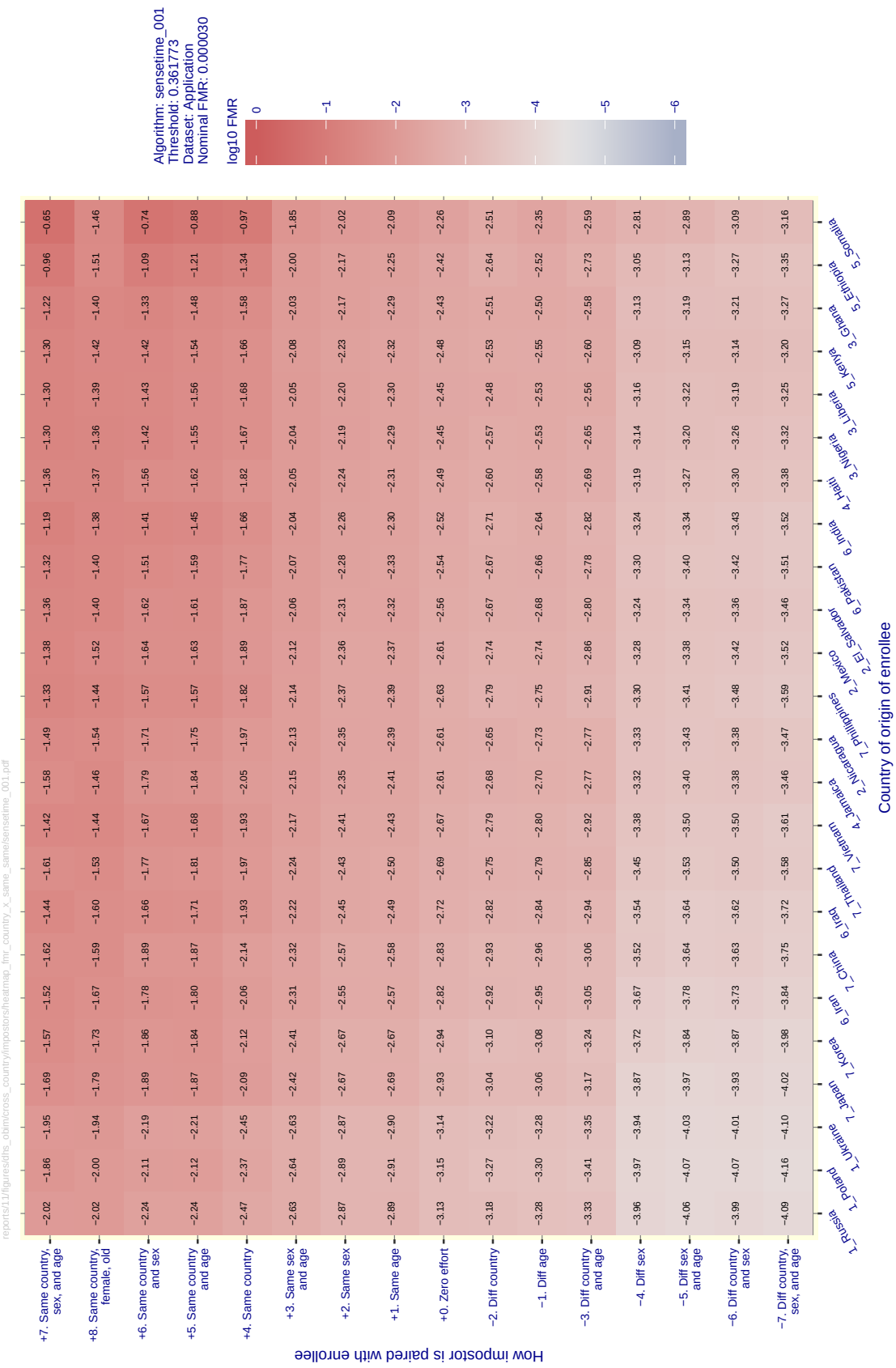


Figure 101: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

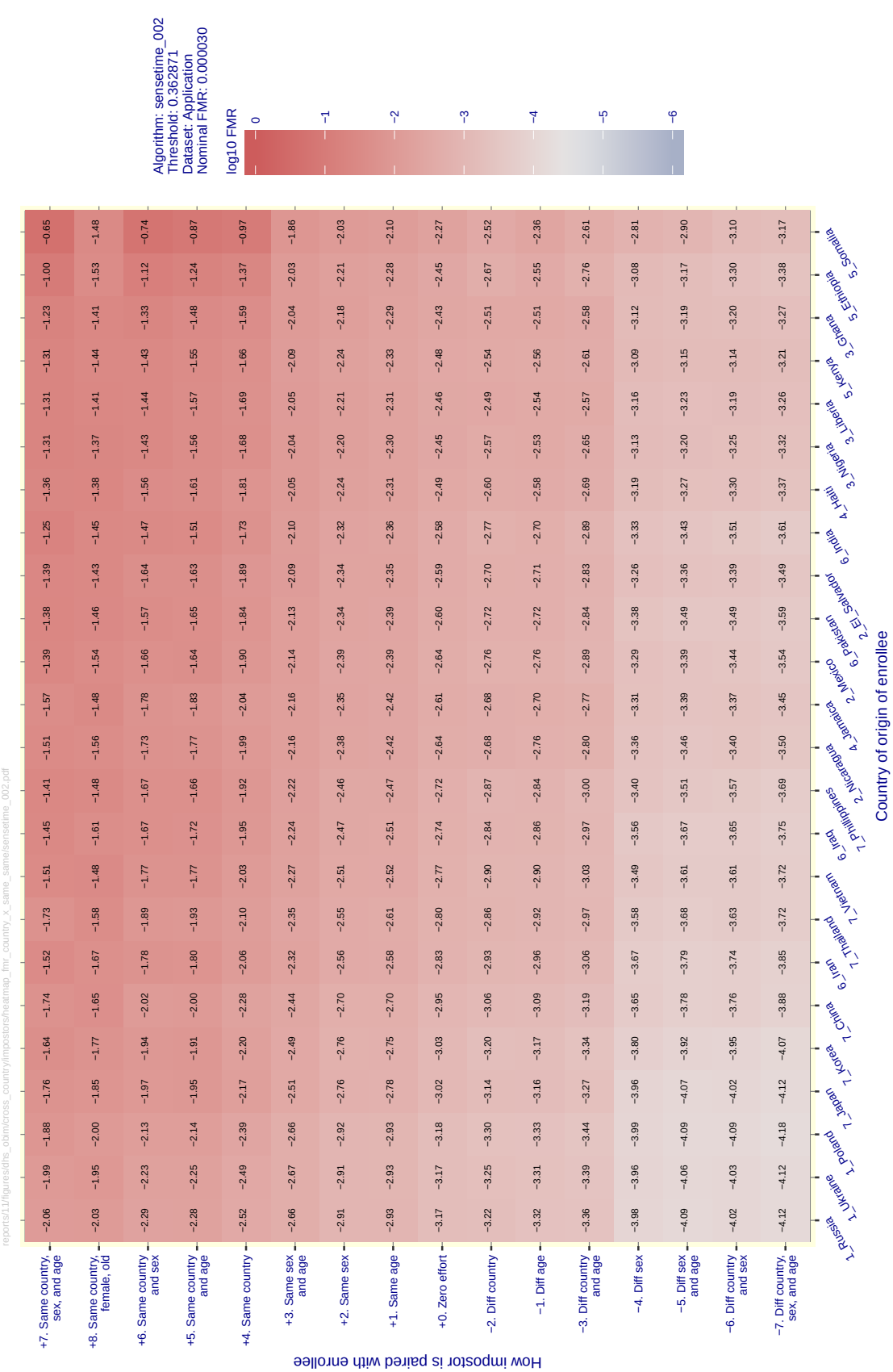


Figure 102: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

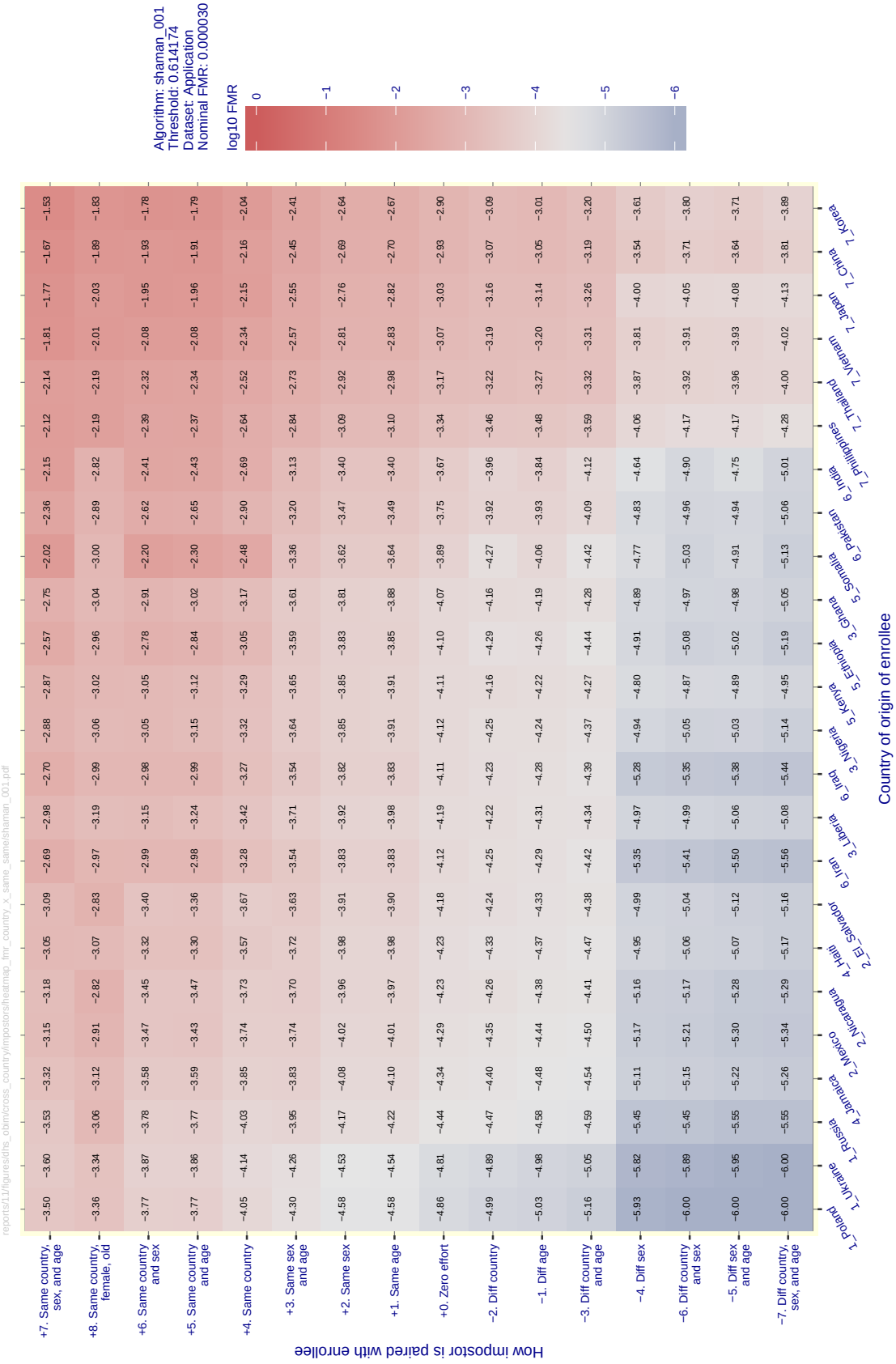


Figure 103: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

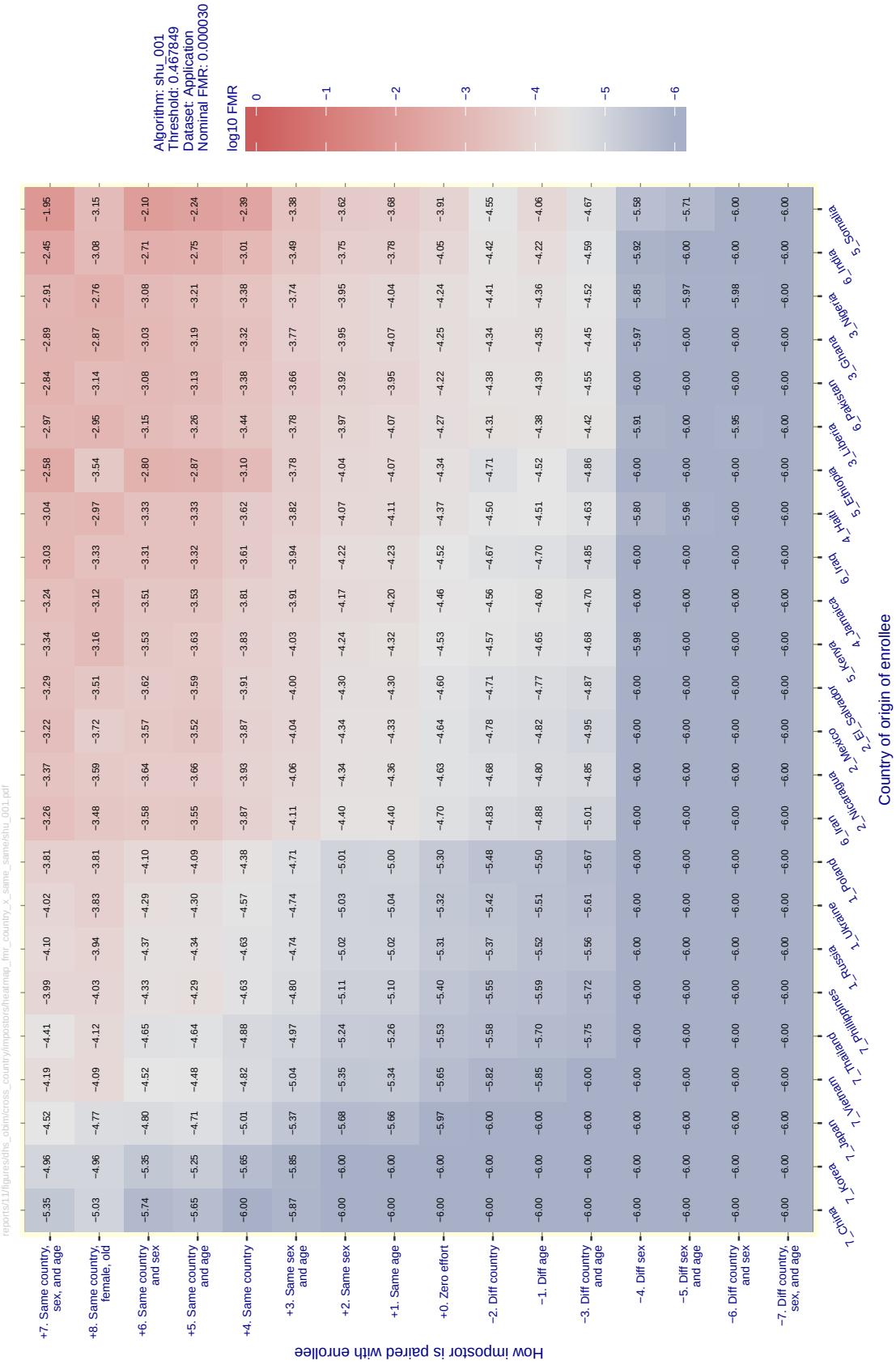


Figure 104: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

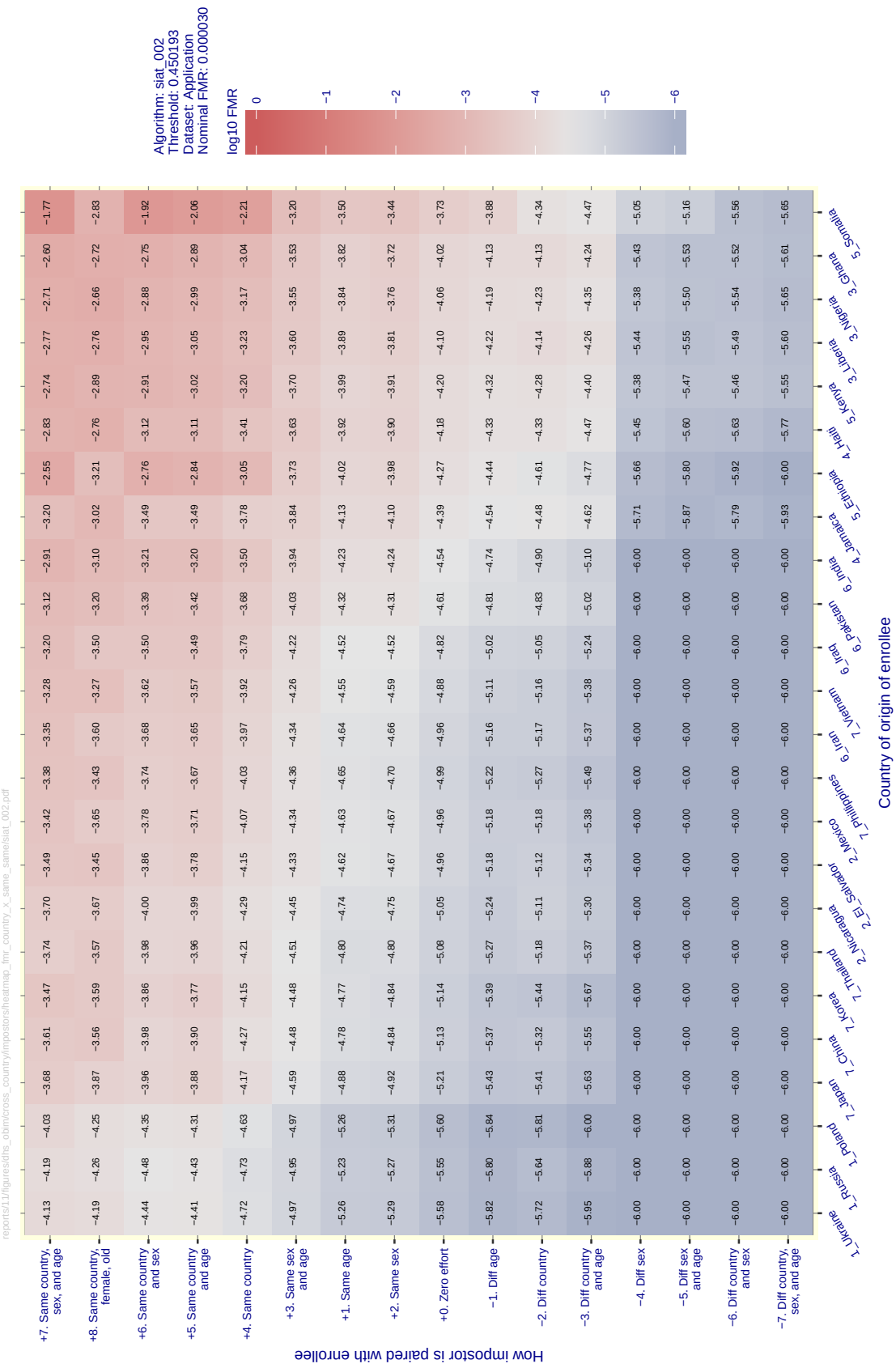
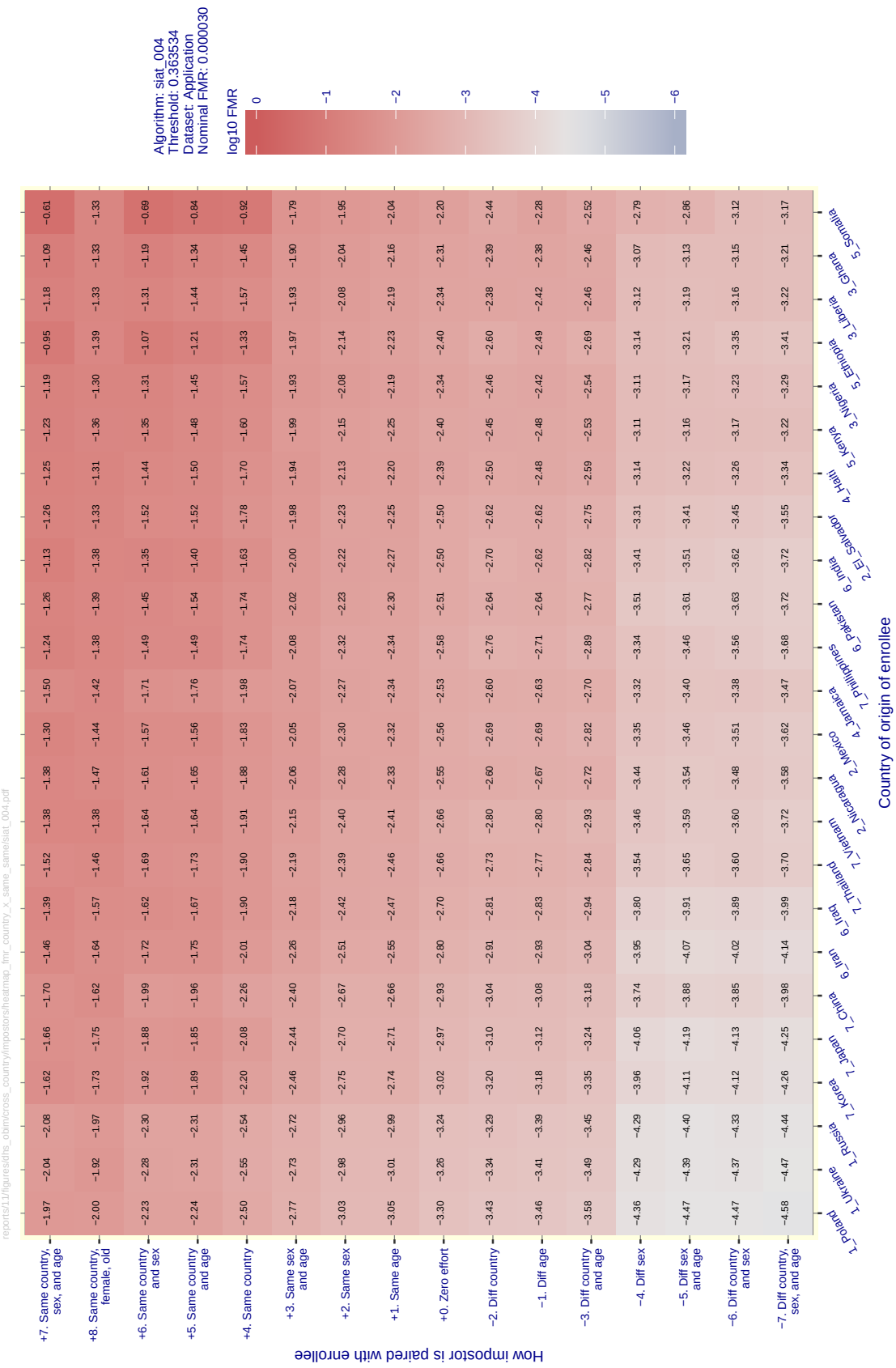


Figure 105: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.



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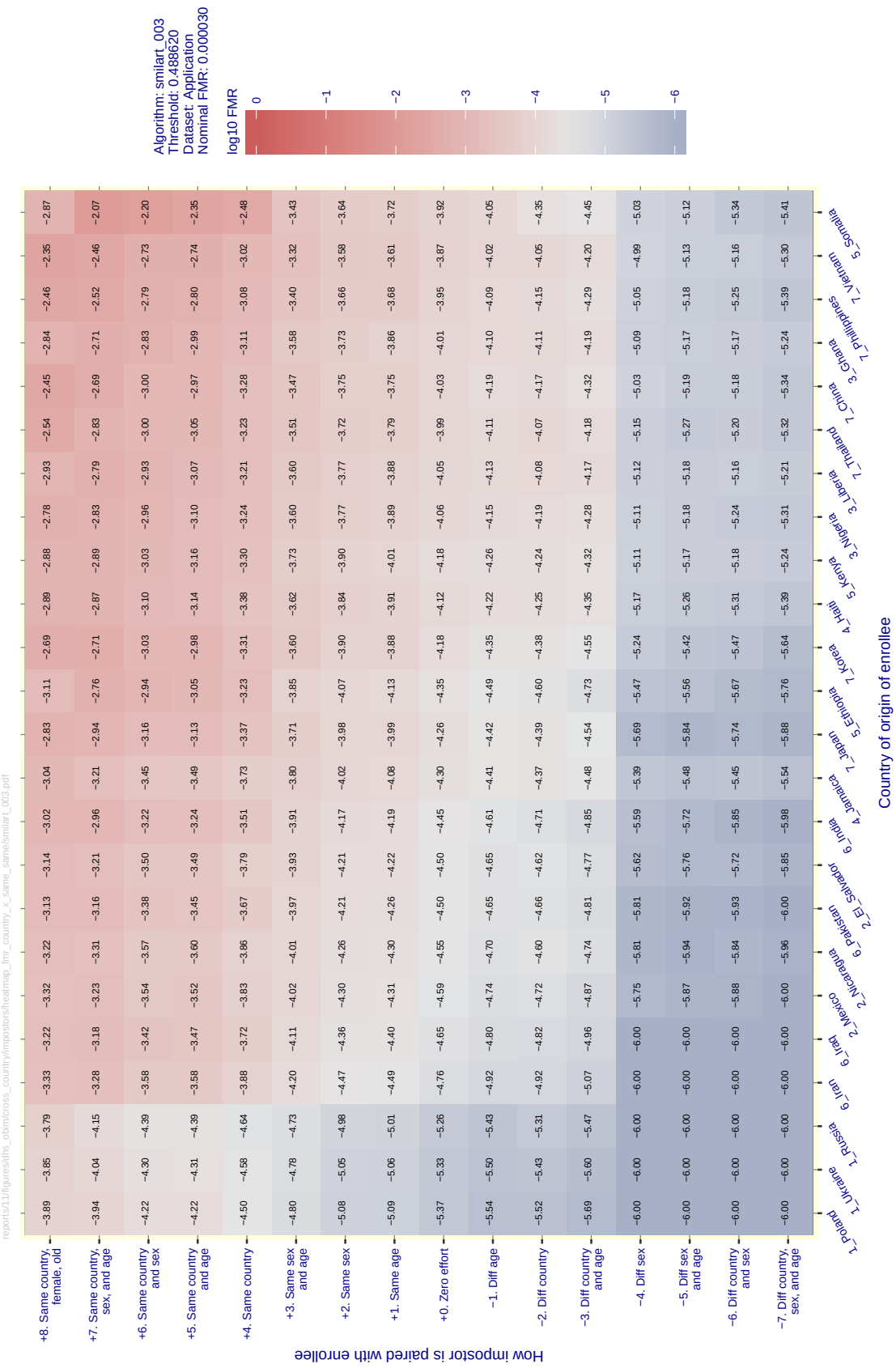

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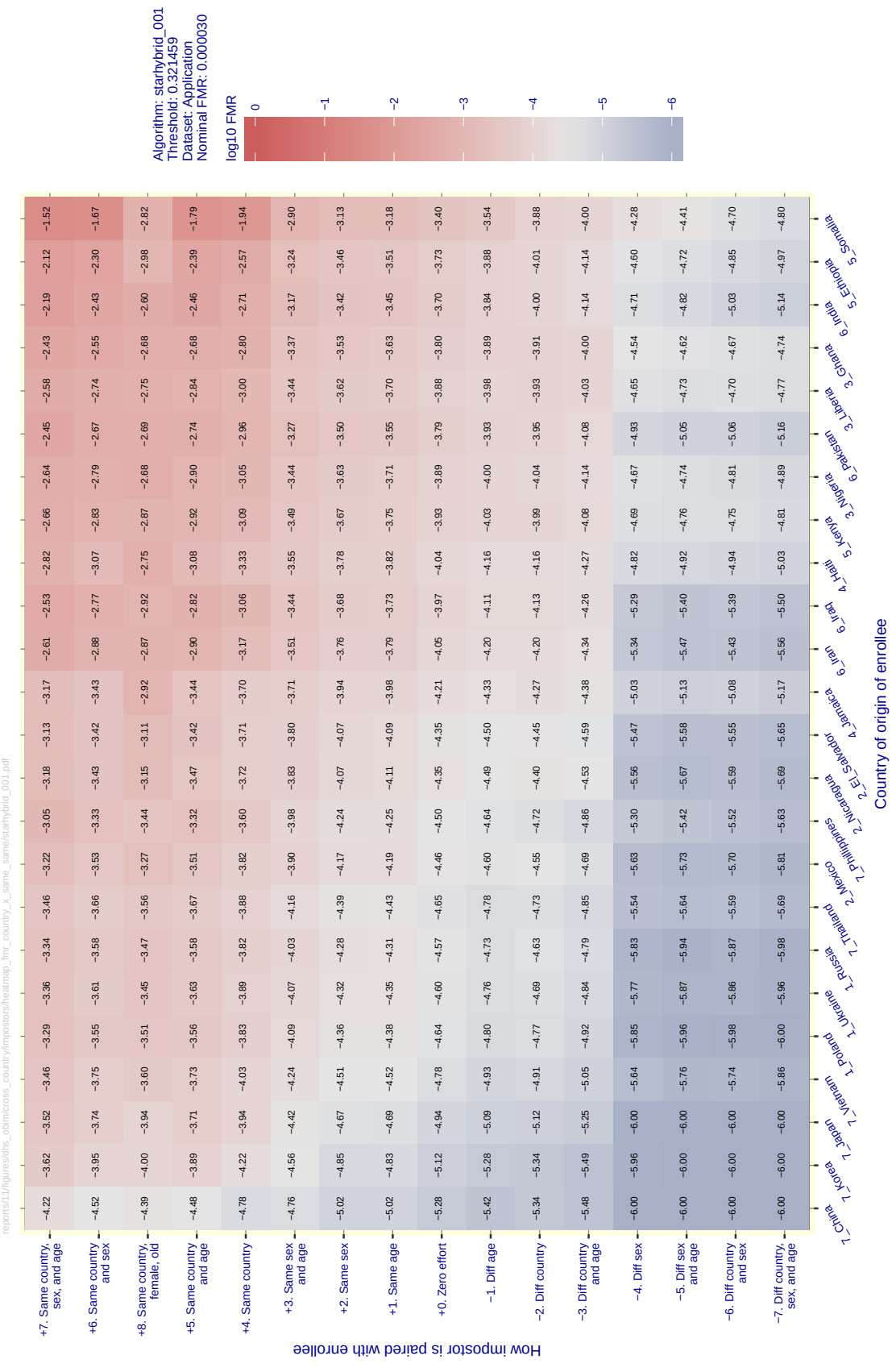


reports/11/figures/ths_obim/cross_country/impostors/heatmap_fmr_country_x_same_same/starhybrid_001.pdf

Figure 108: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

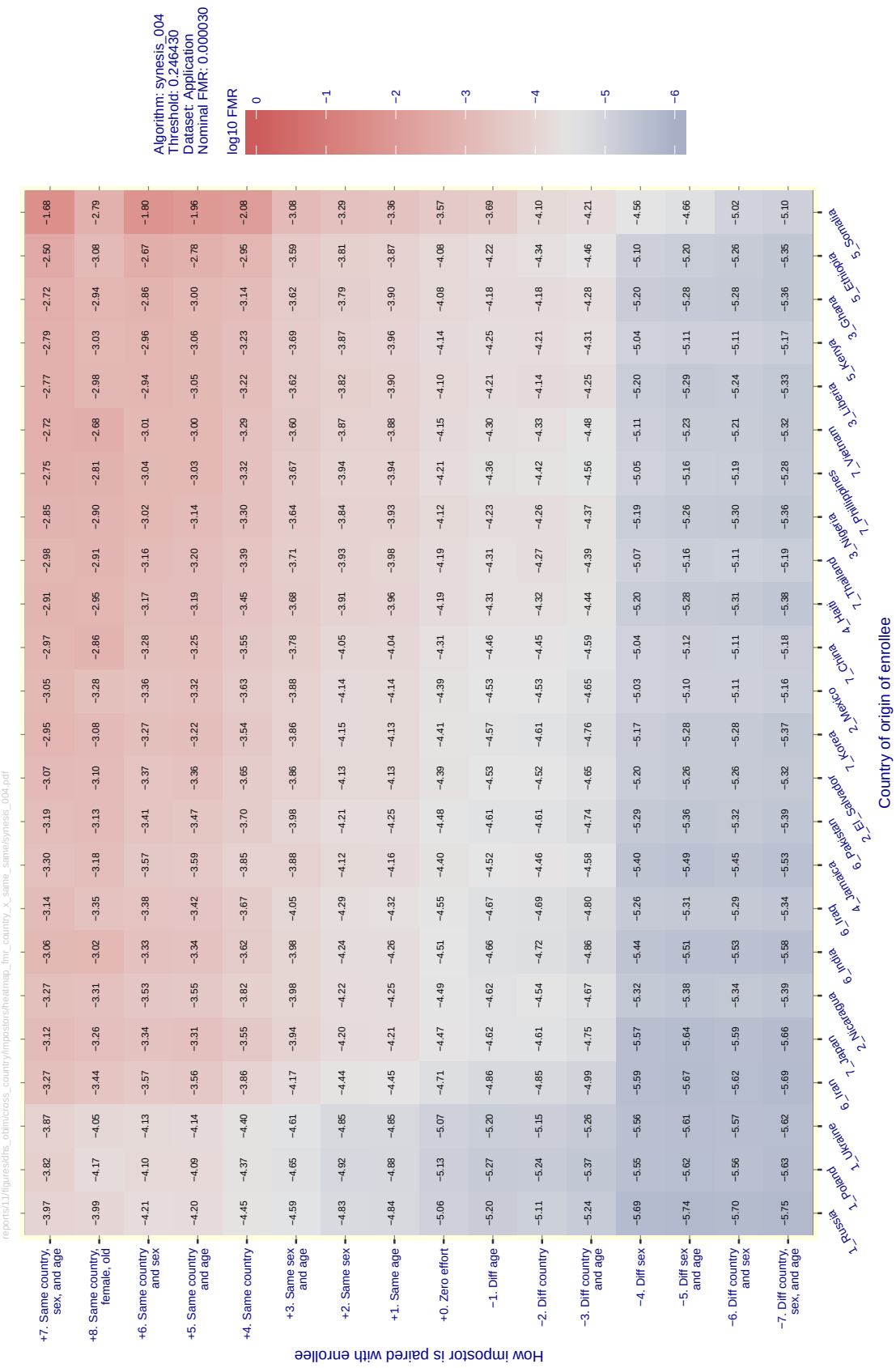
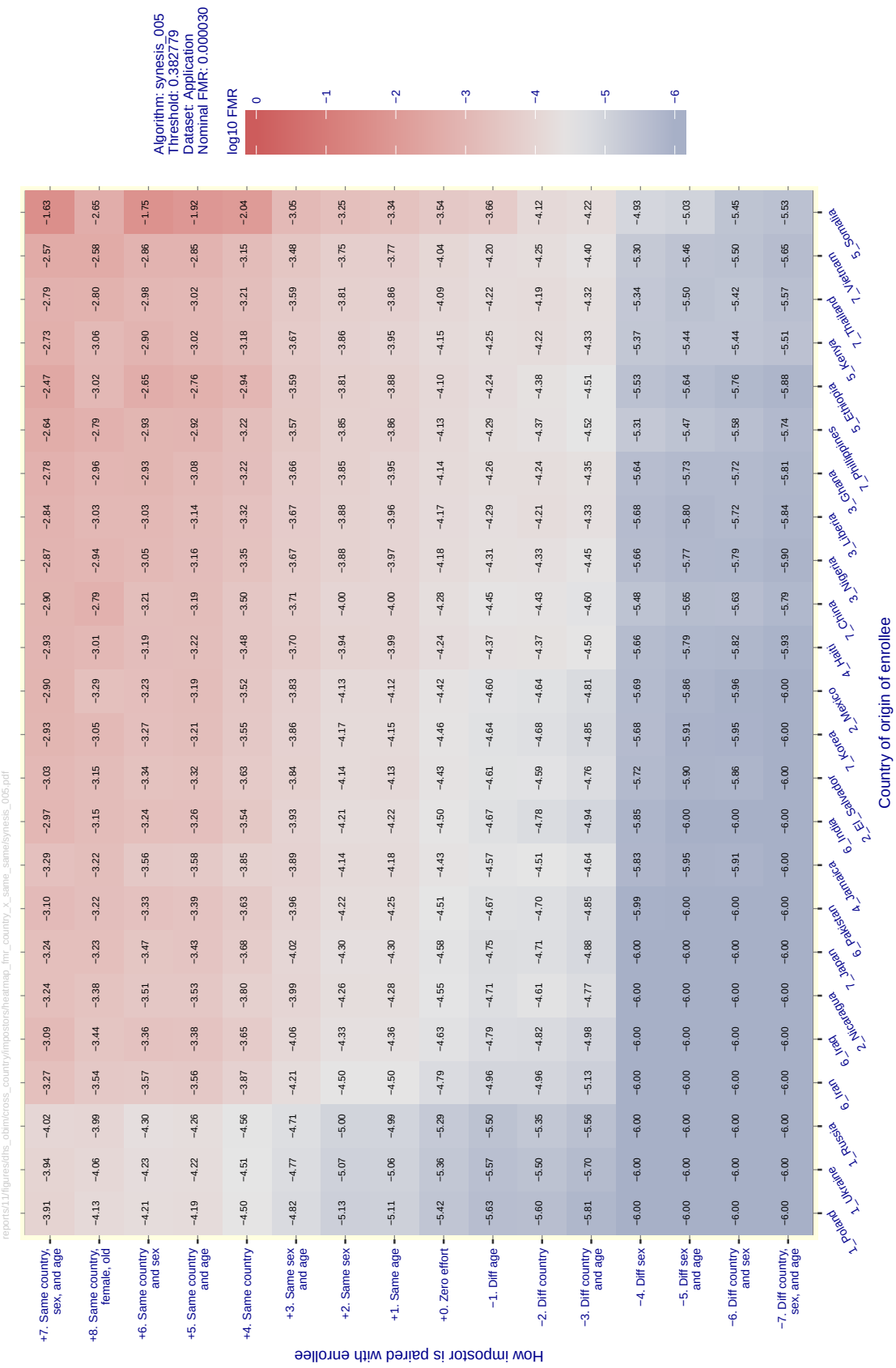


Figure 109: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.



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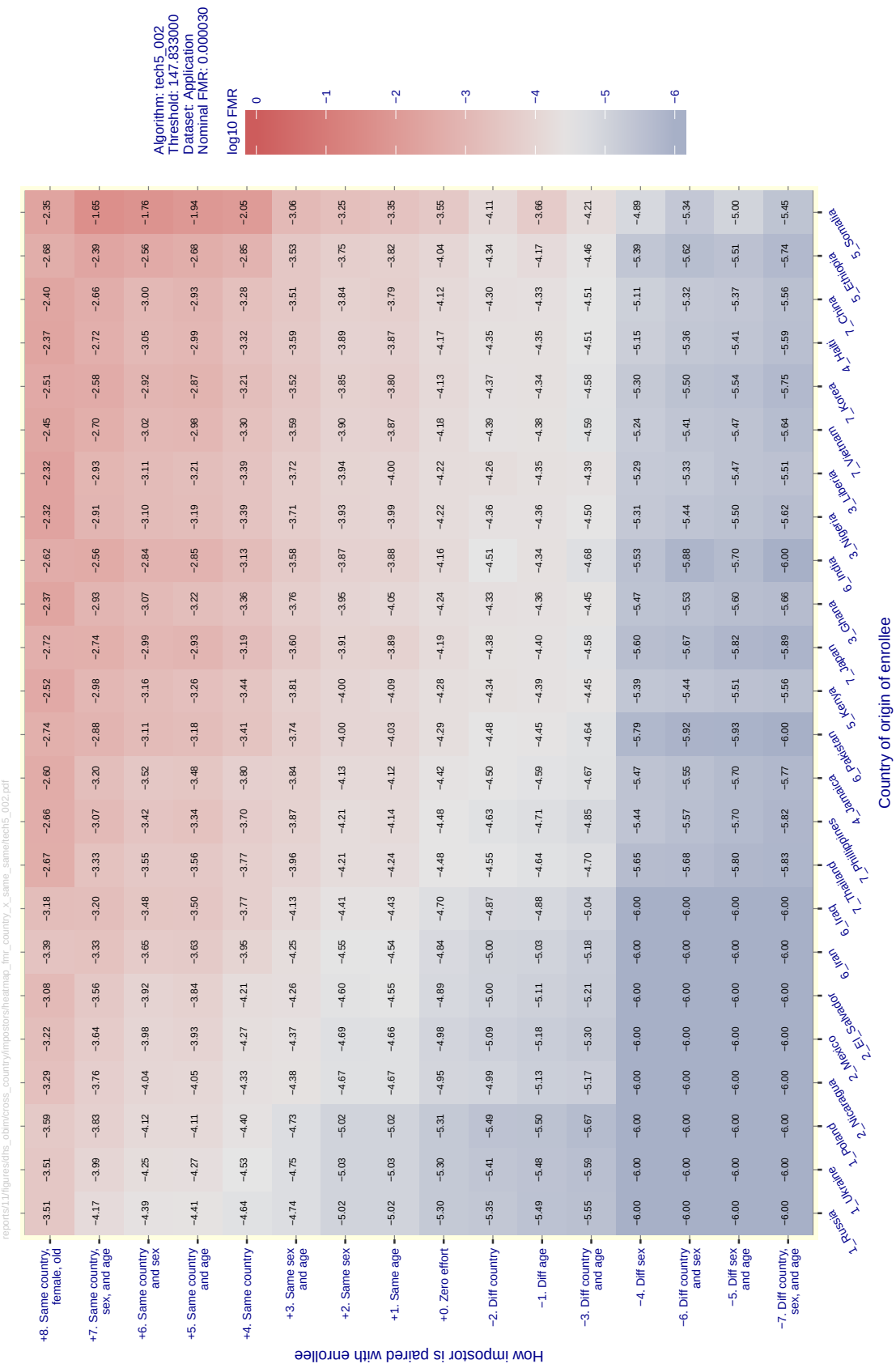
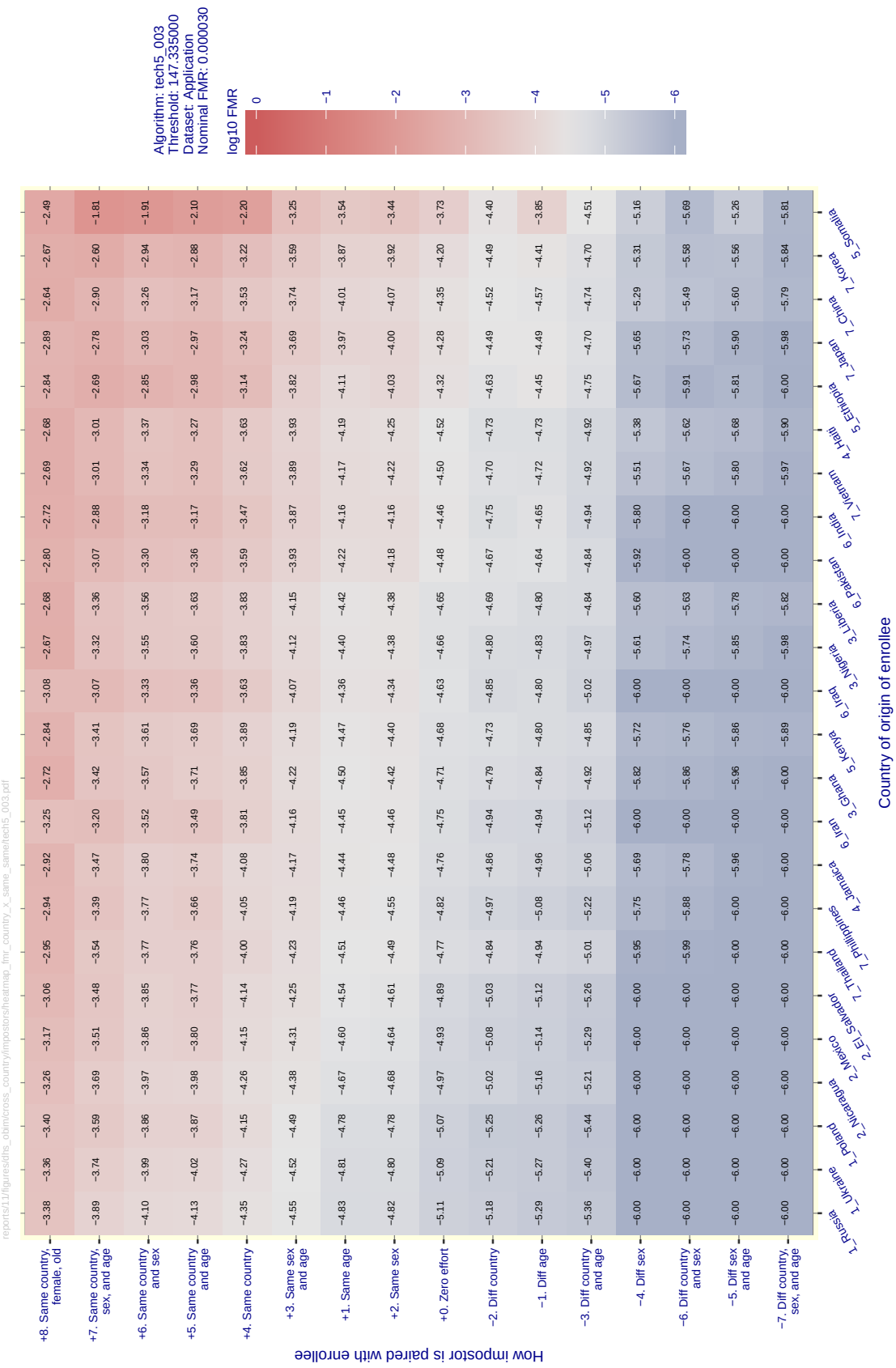


Figure 111: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.



reports/11/figures/ths_obim/cross_country/impostors/heatmap_fmr_country_x_same_same/tech5_003.pdf

Figure 112: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

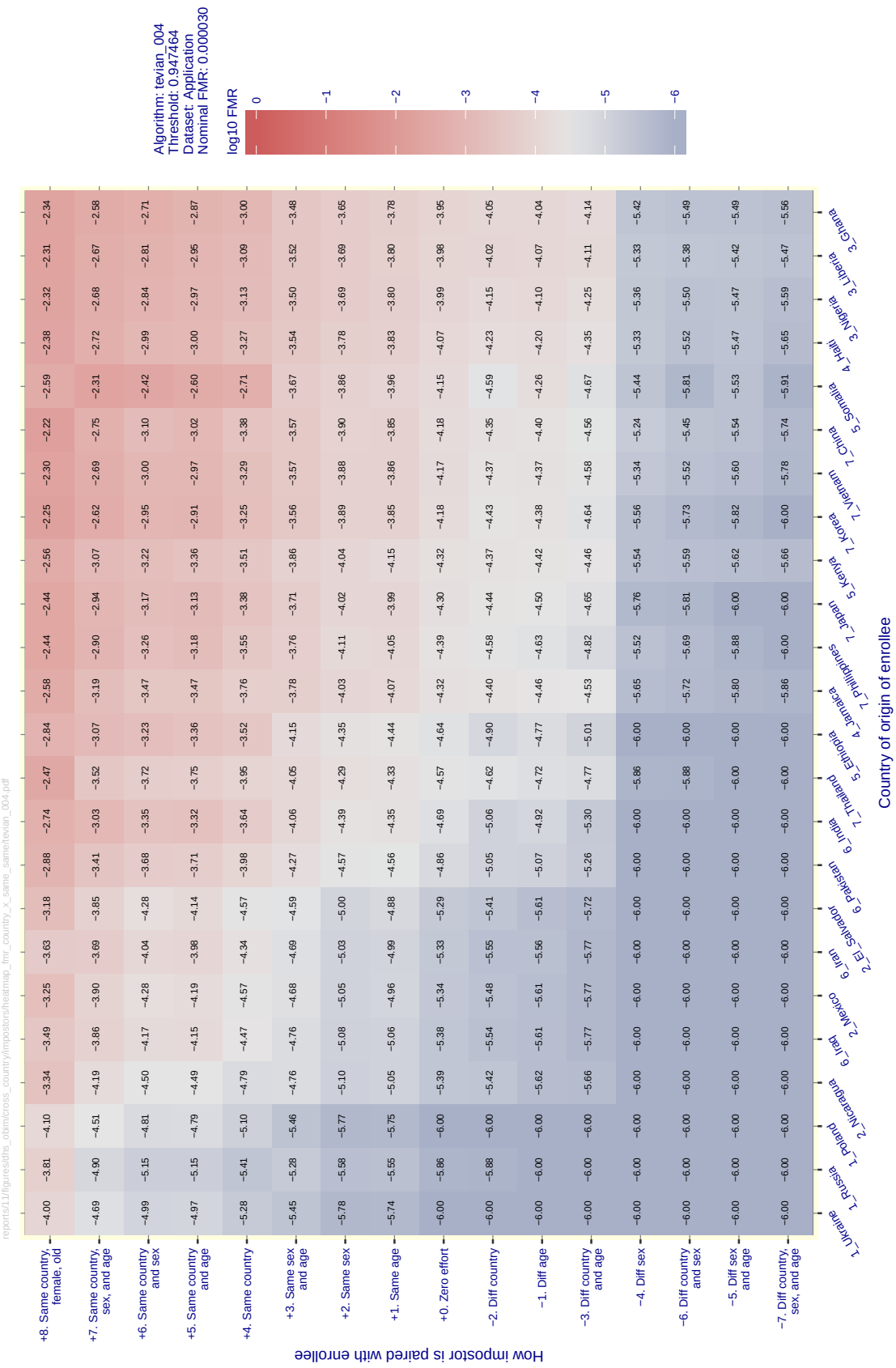


Figure 113: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

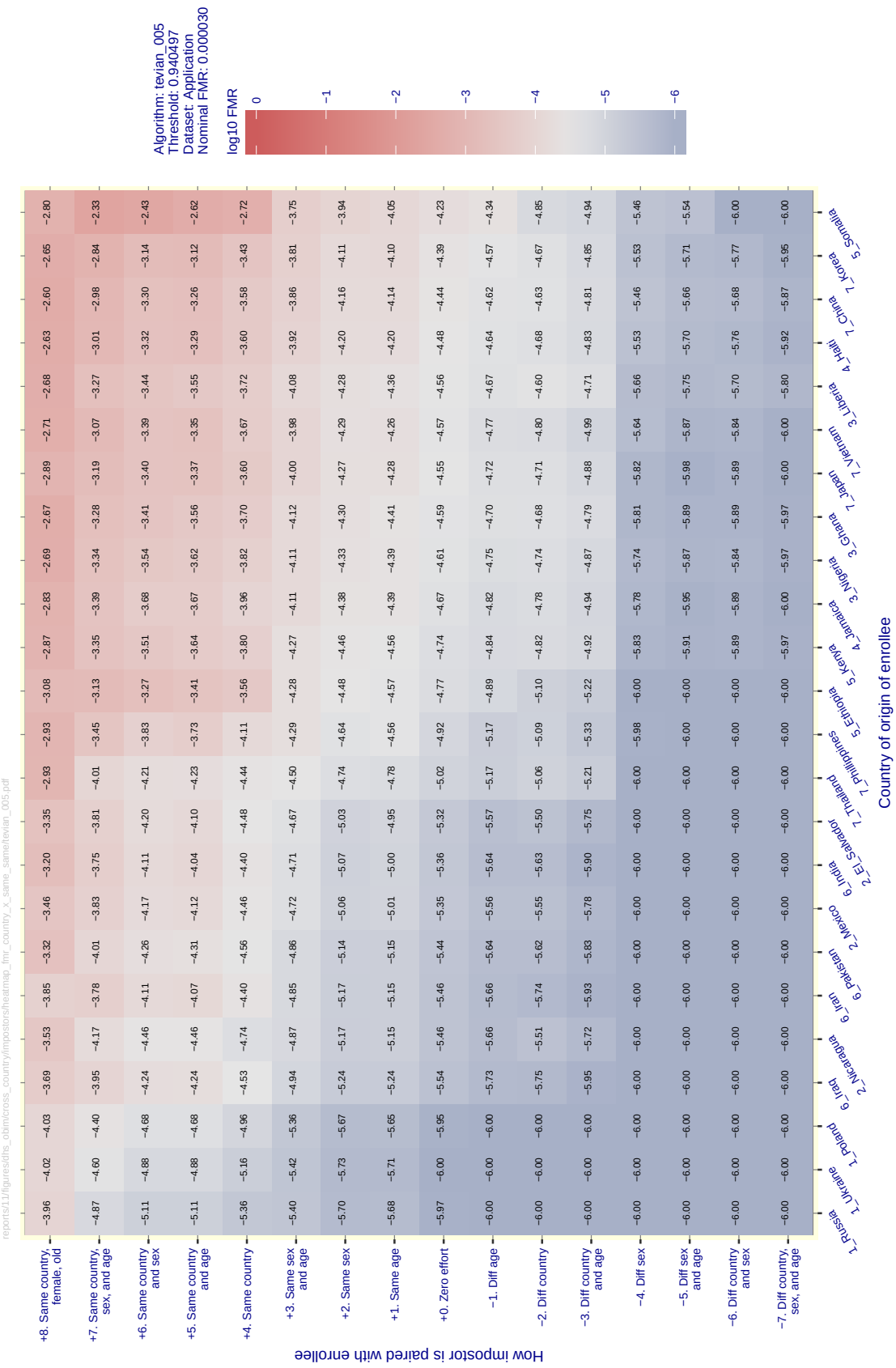


Figure 114: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

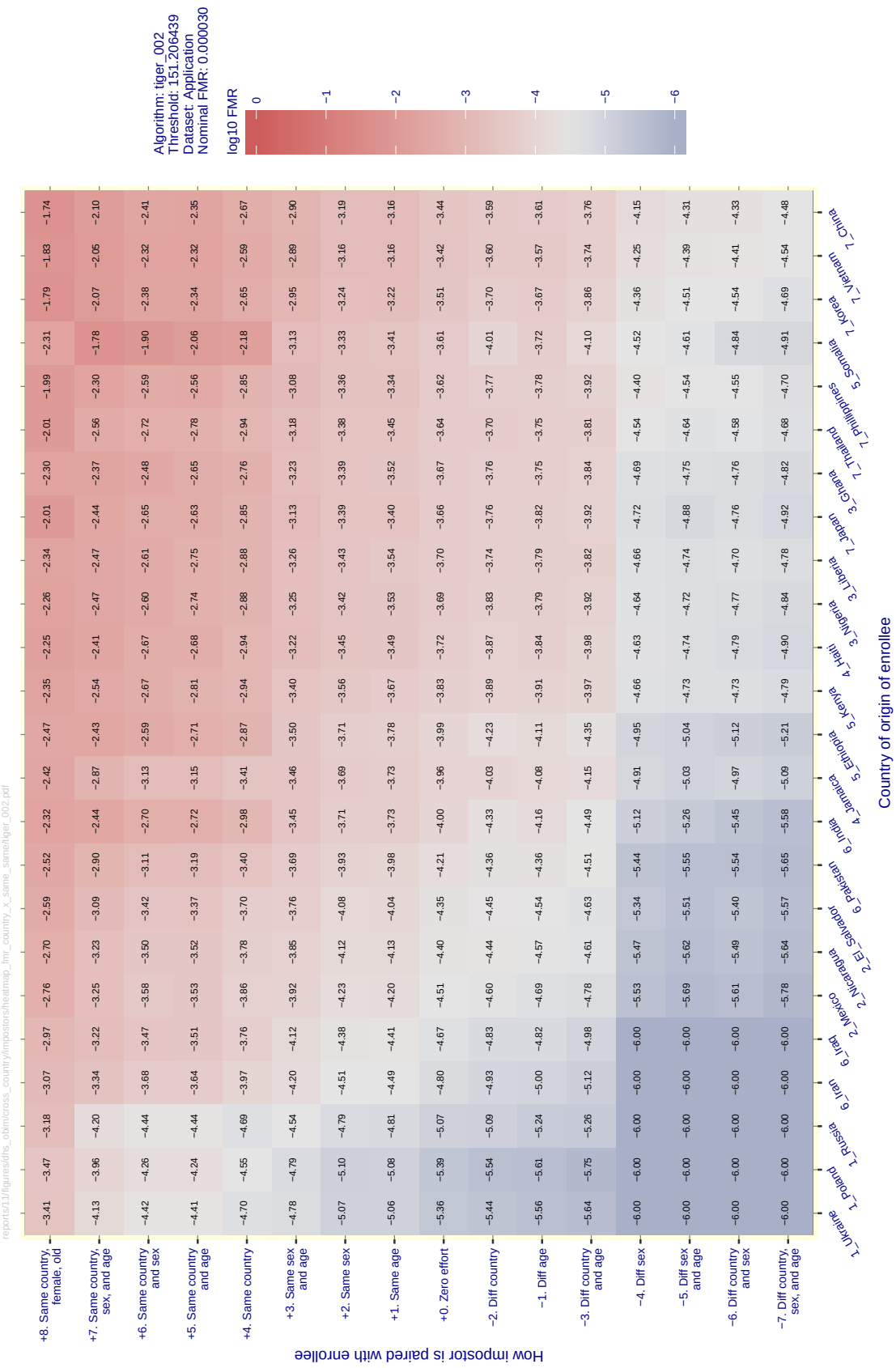


Figure 115: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

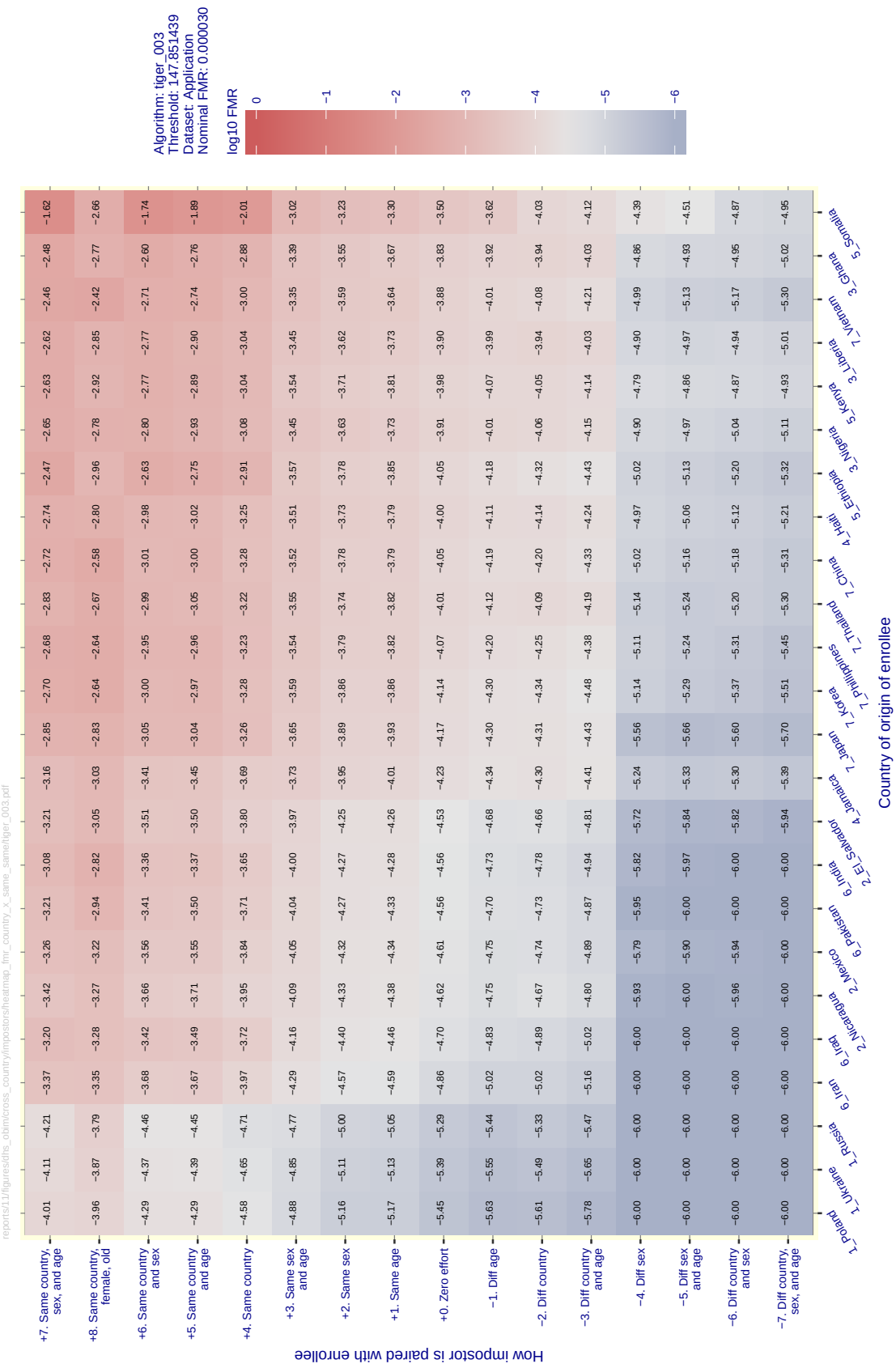


Figure 116: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

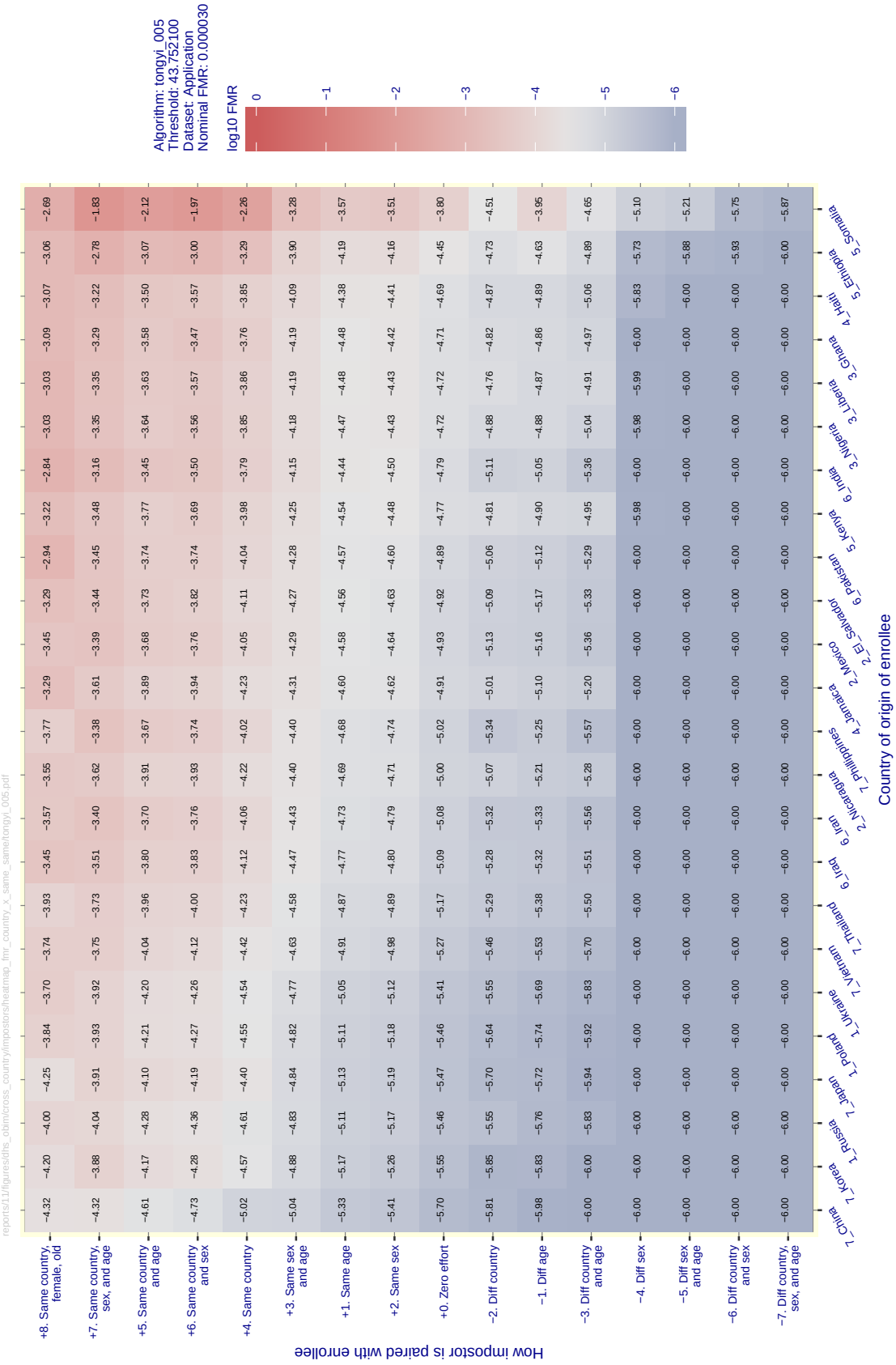


Figure 117: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

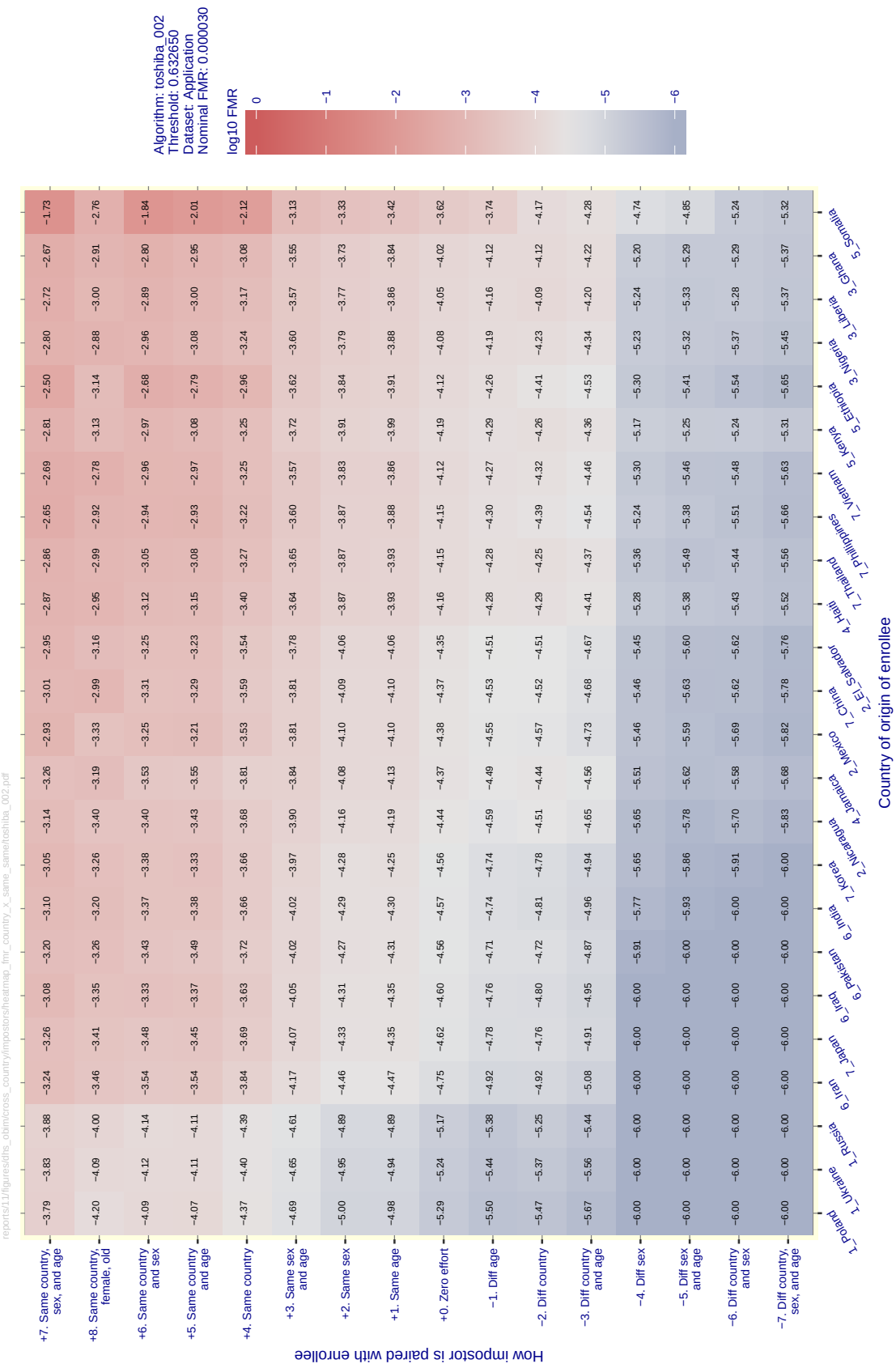


Figure 118: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

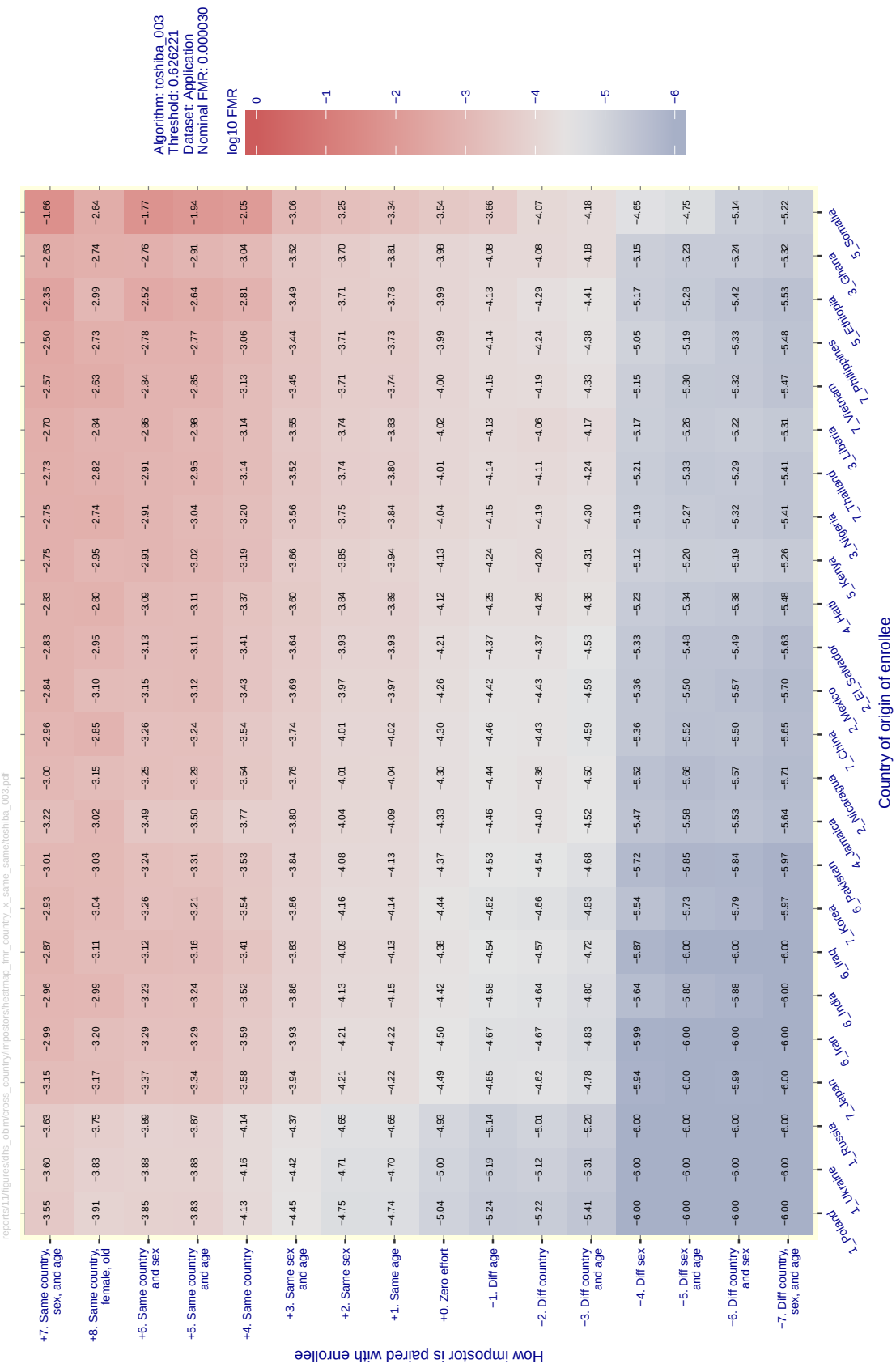


Figure 119: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

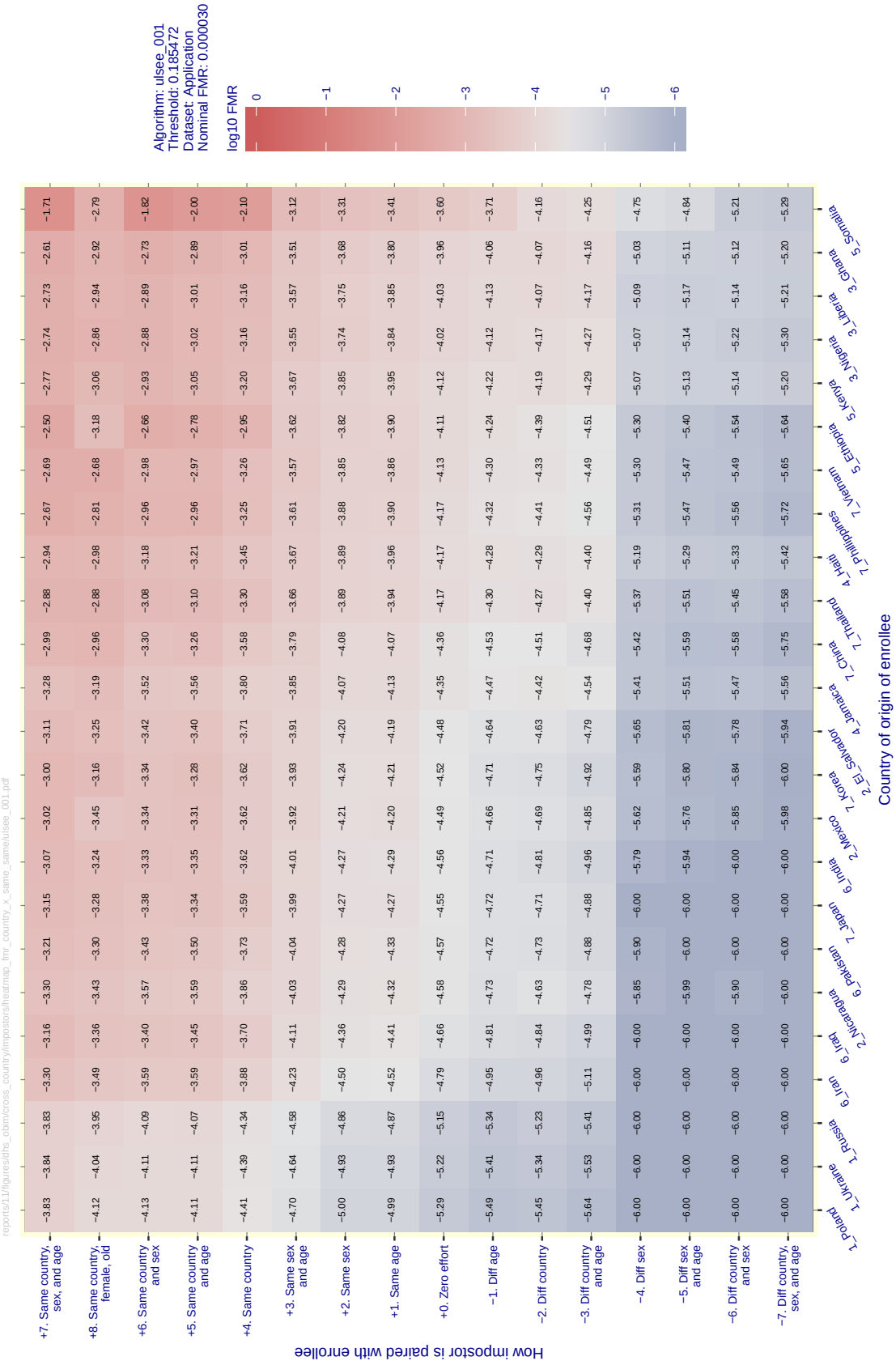
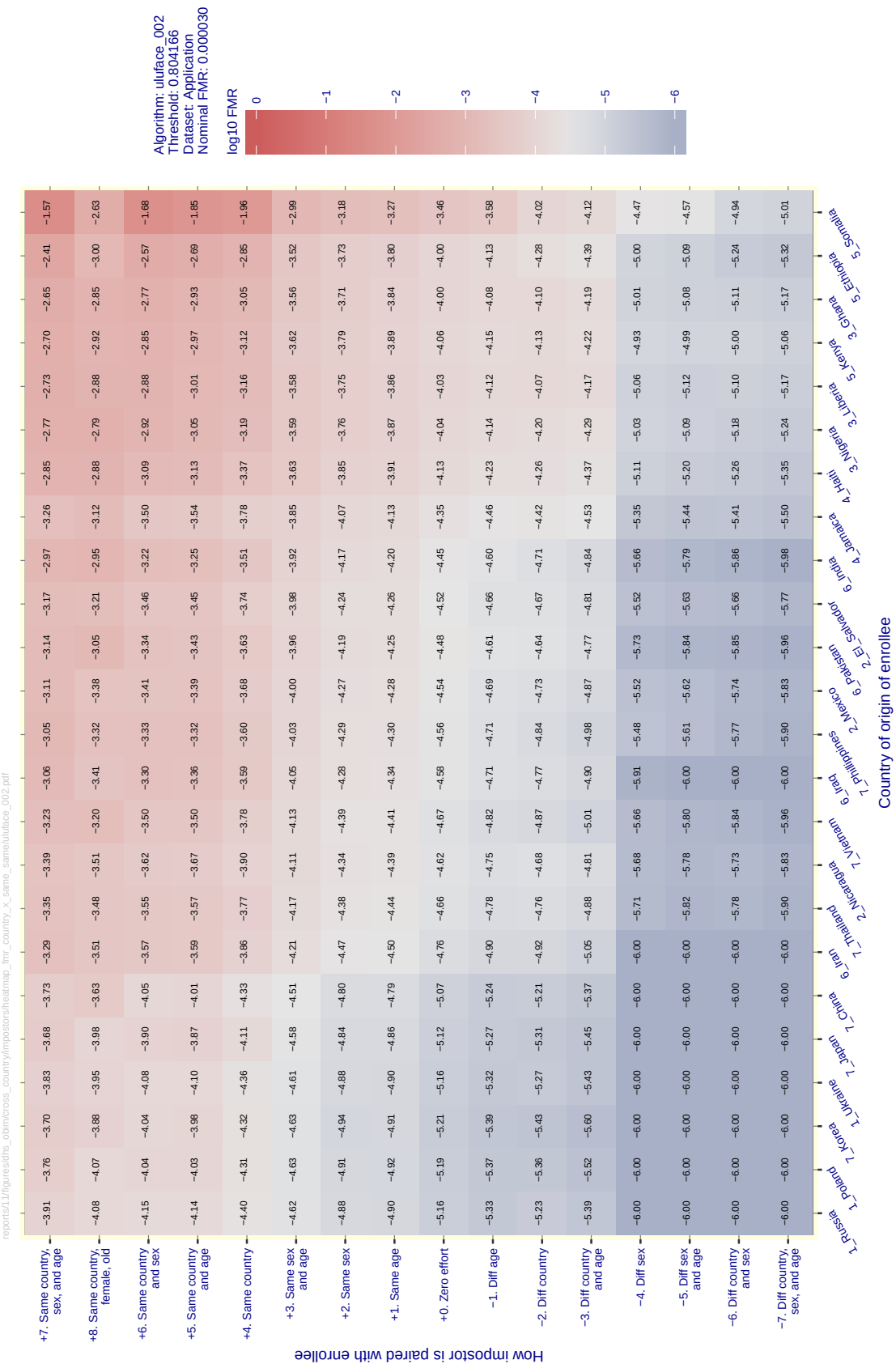


Figure 120: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*



reports/11/figures/ths_obim/cross_country/impostors/heatmap_fmr_country_x_same_same/uluface_002.pdf

Figure 121: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

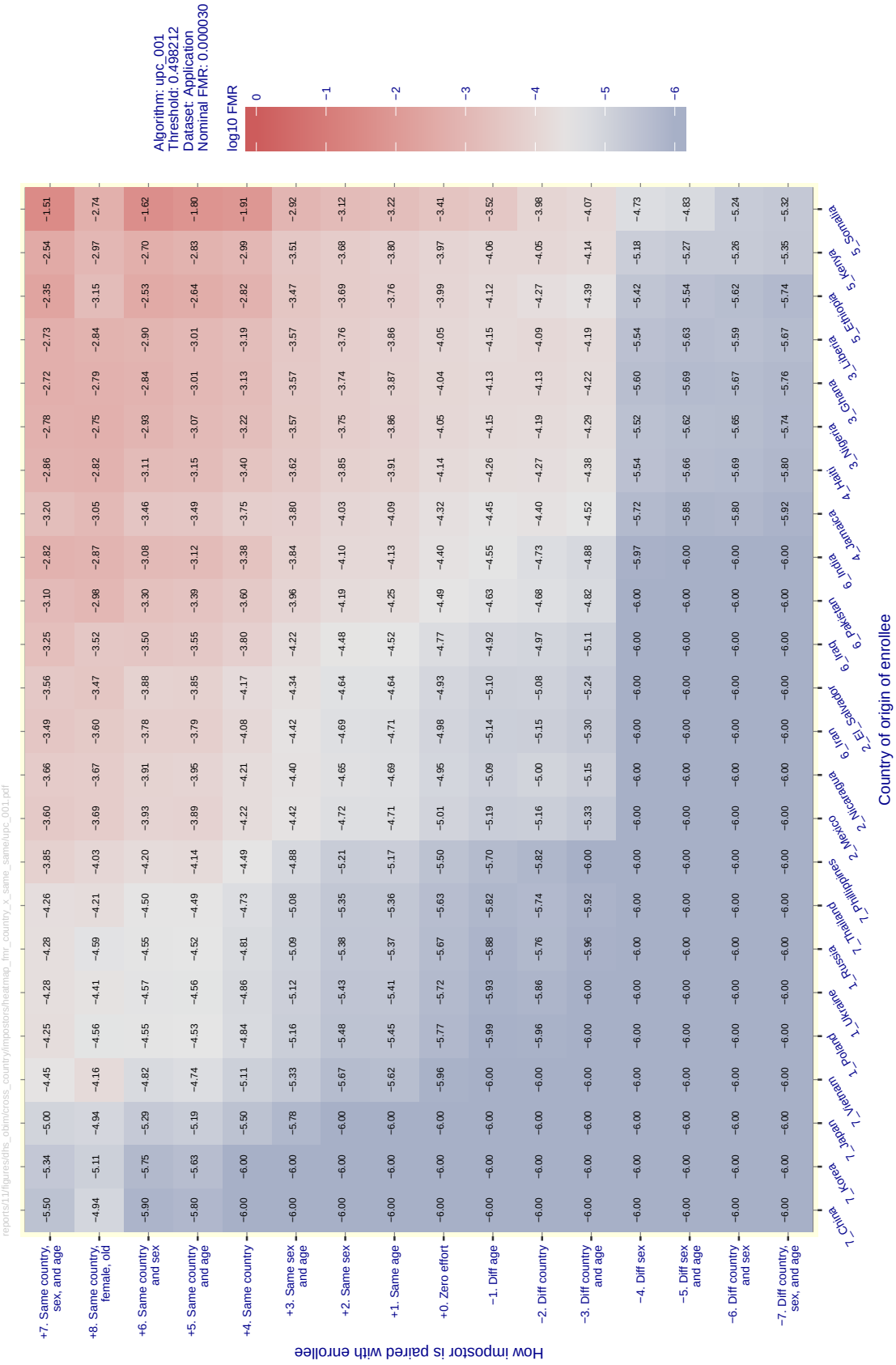


Figure 122: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

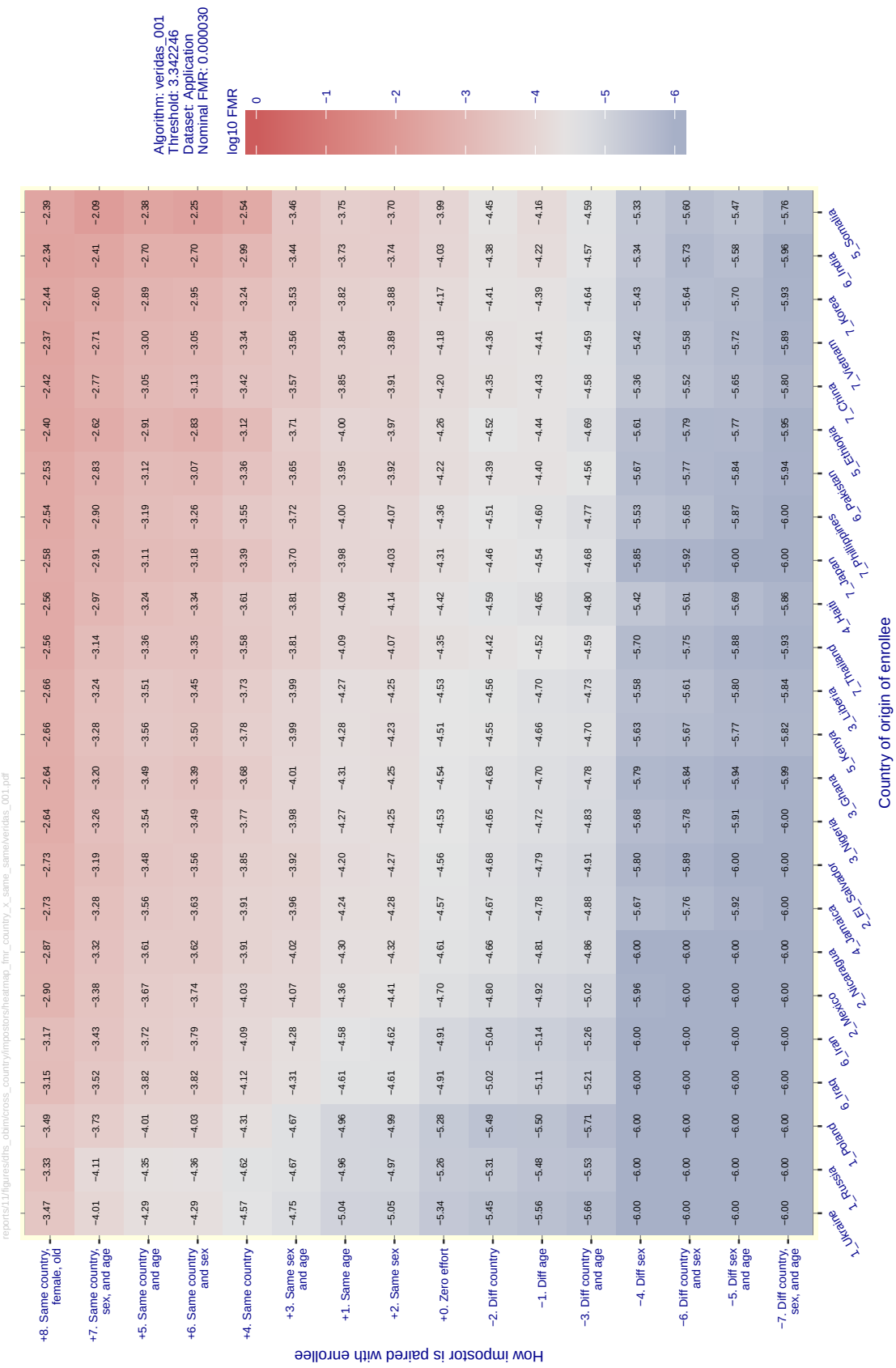


Figure 123: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

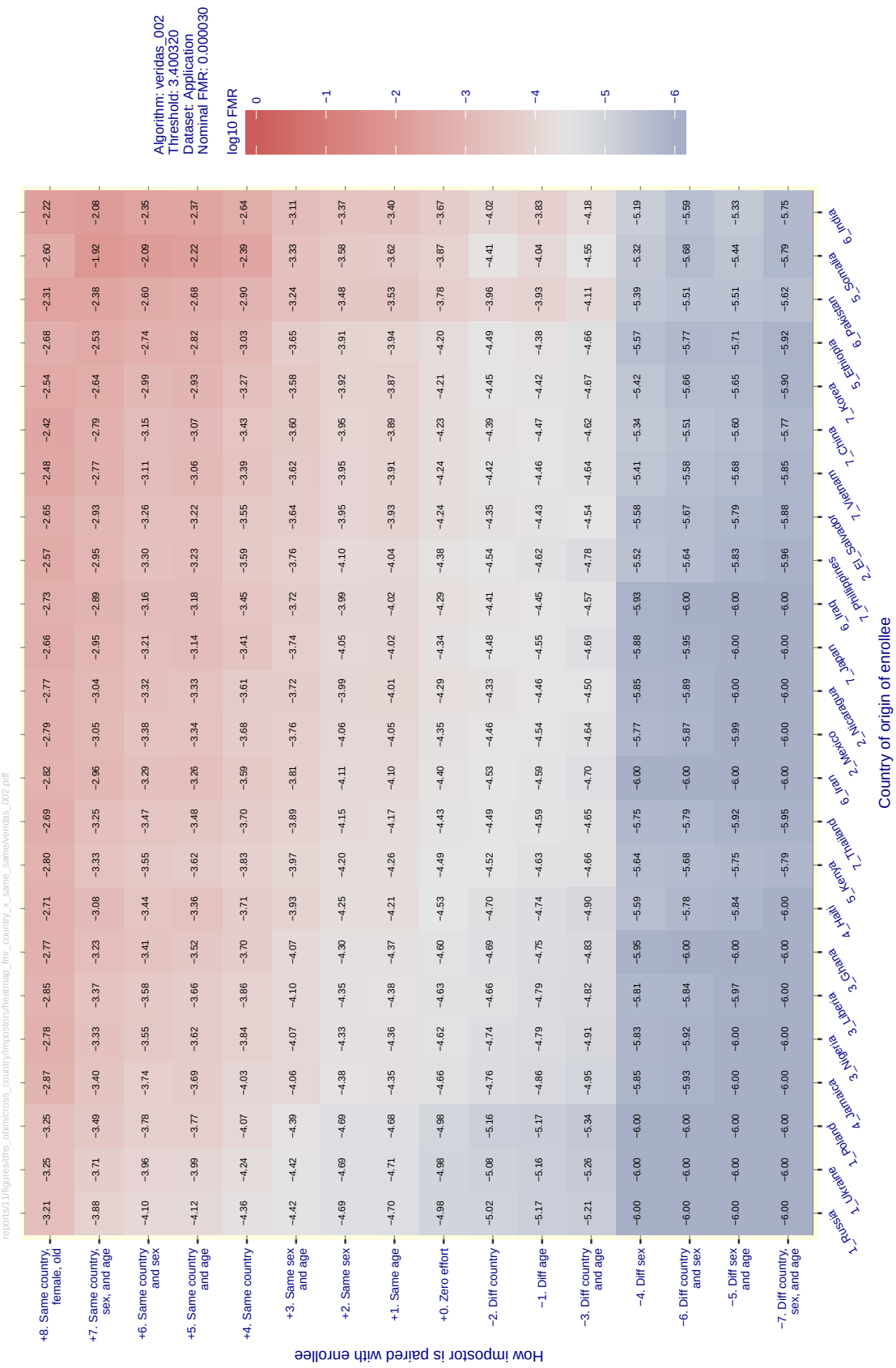


Figure 124: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

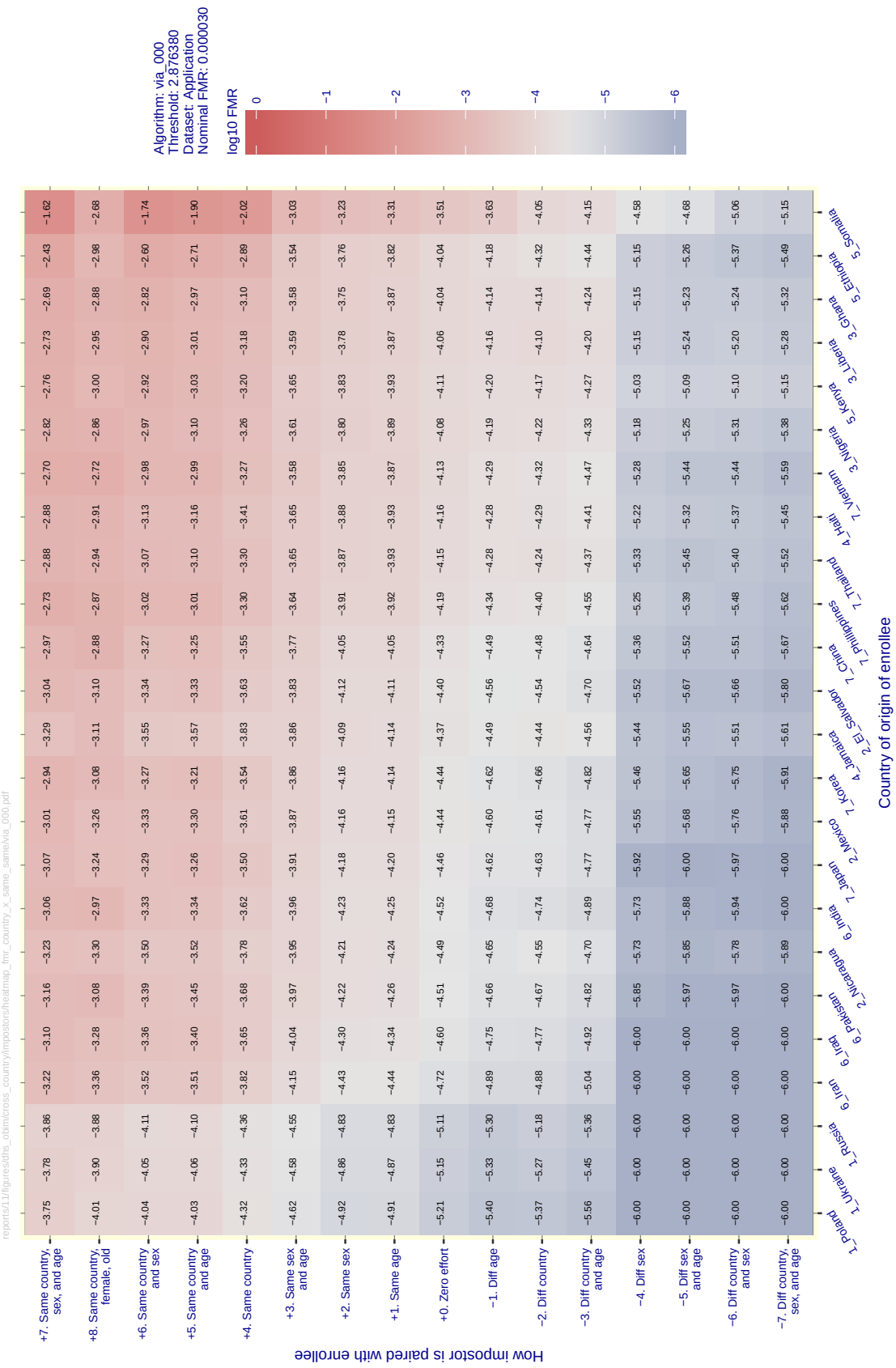


Figure 125: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

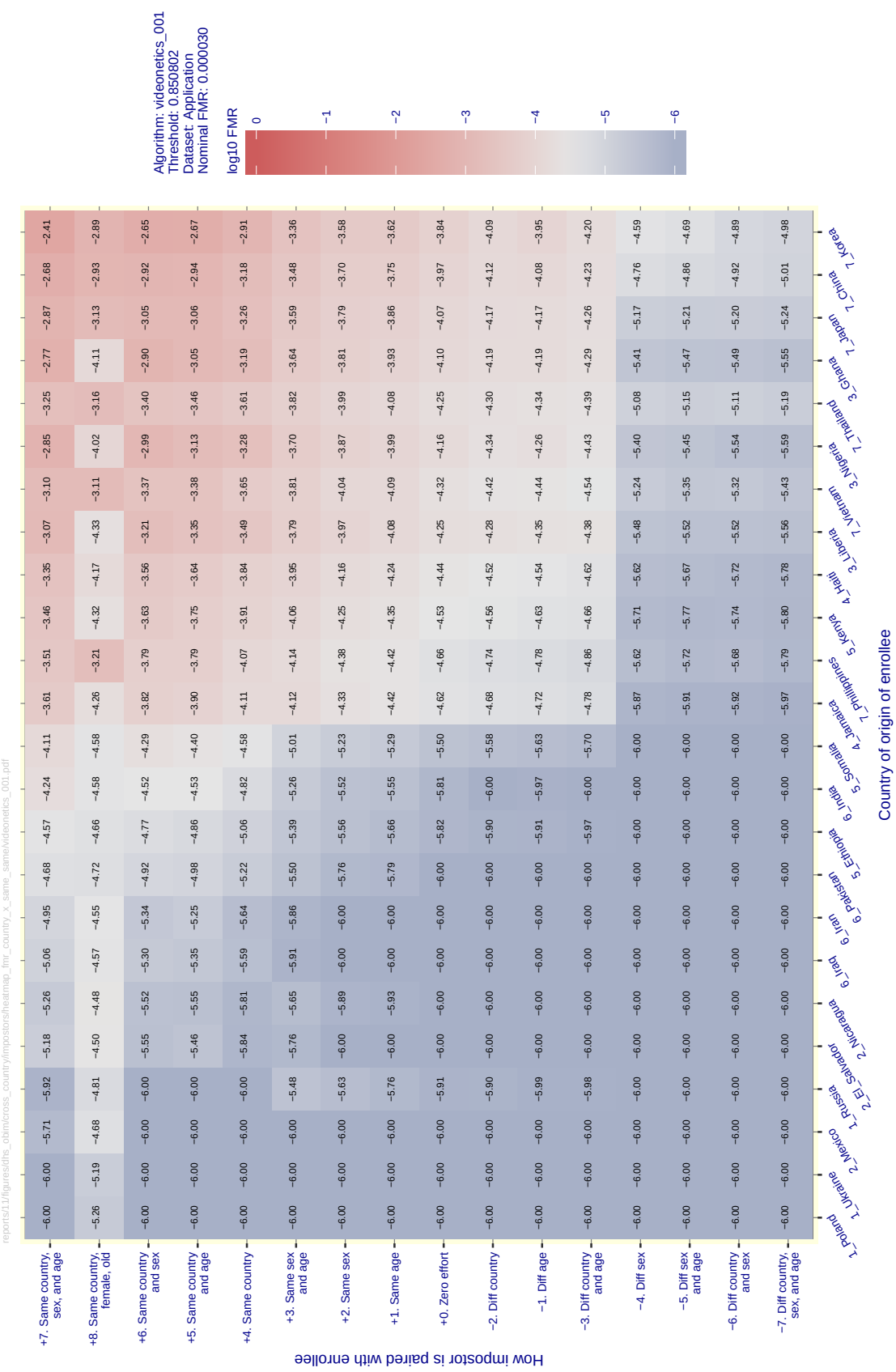


Figure 126: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

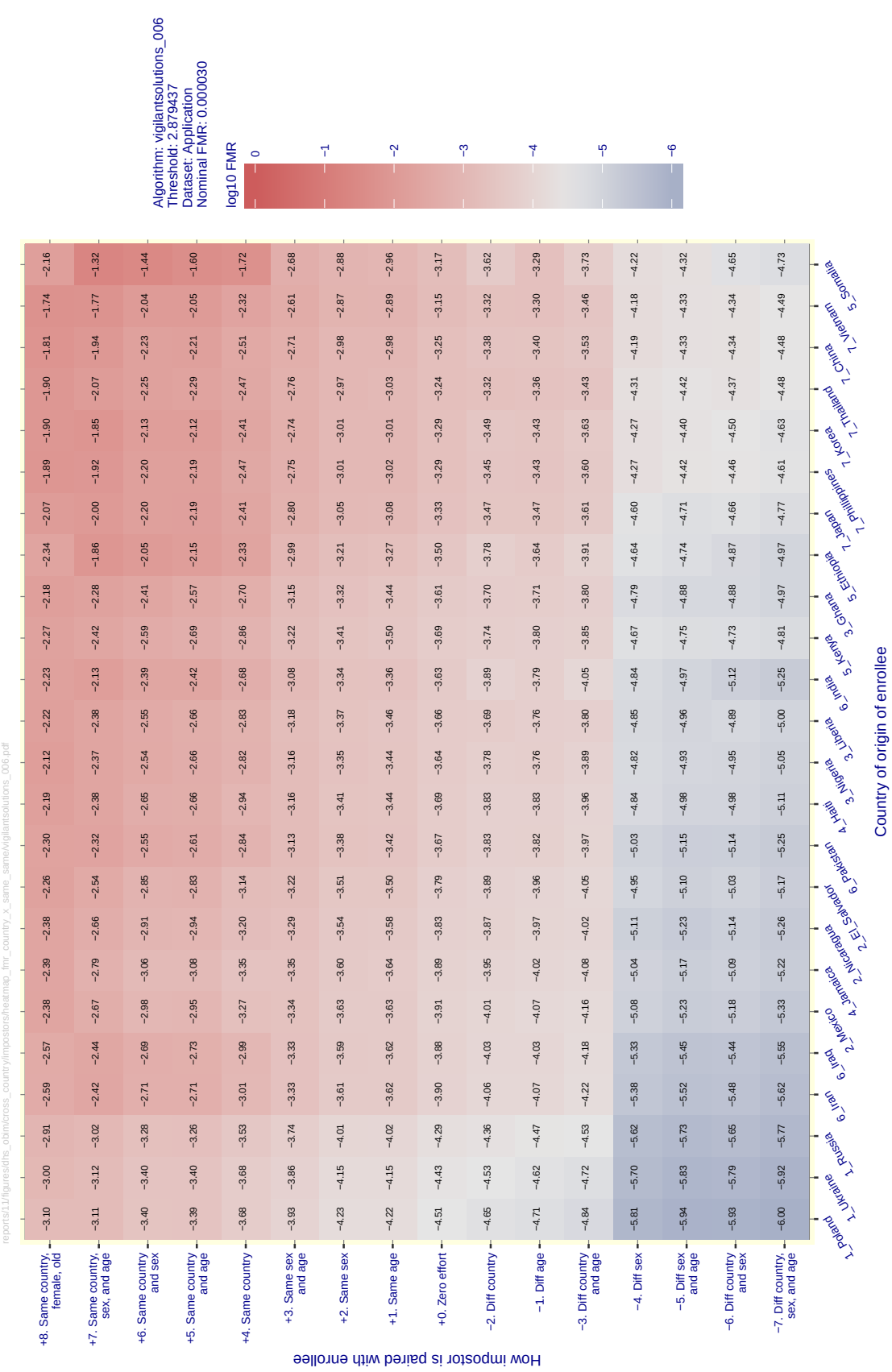


Figure 127: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

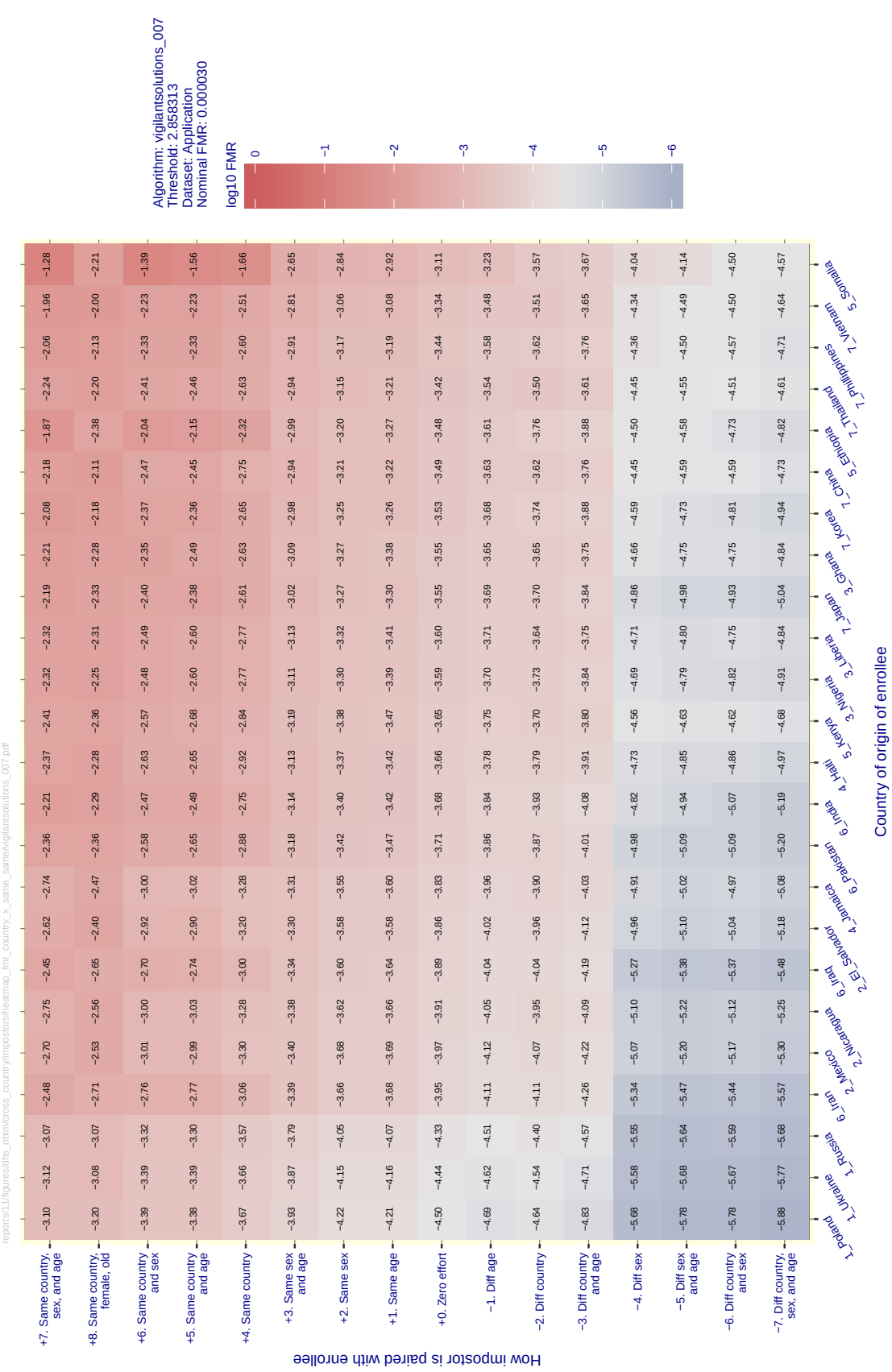


Figure 128: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

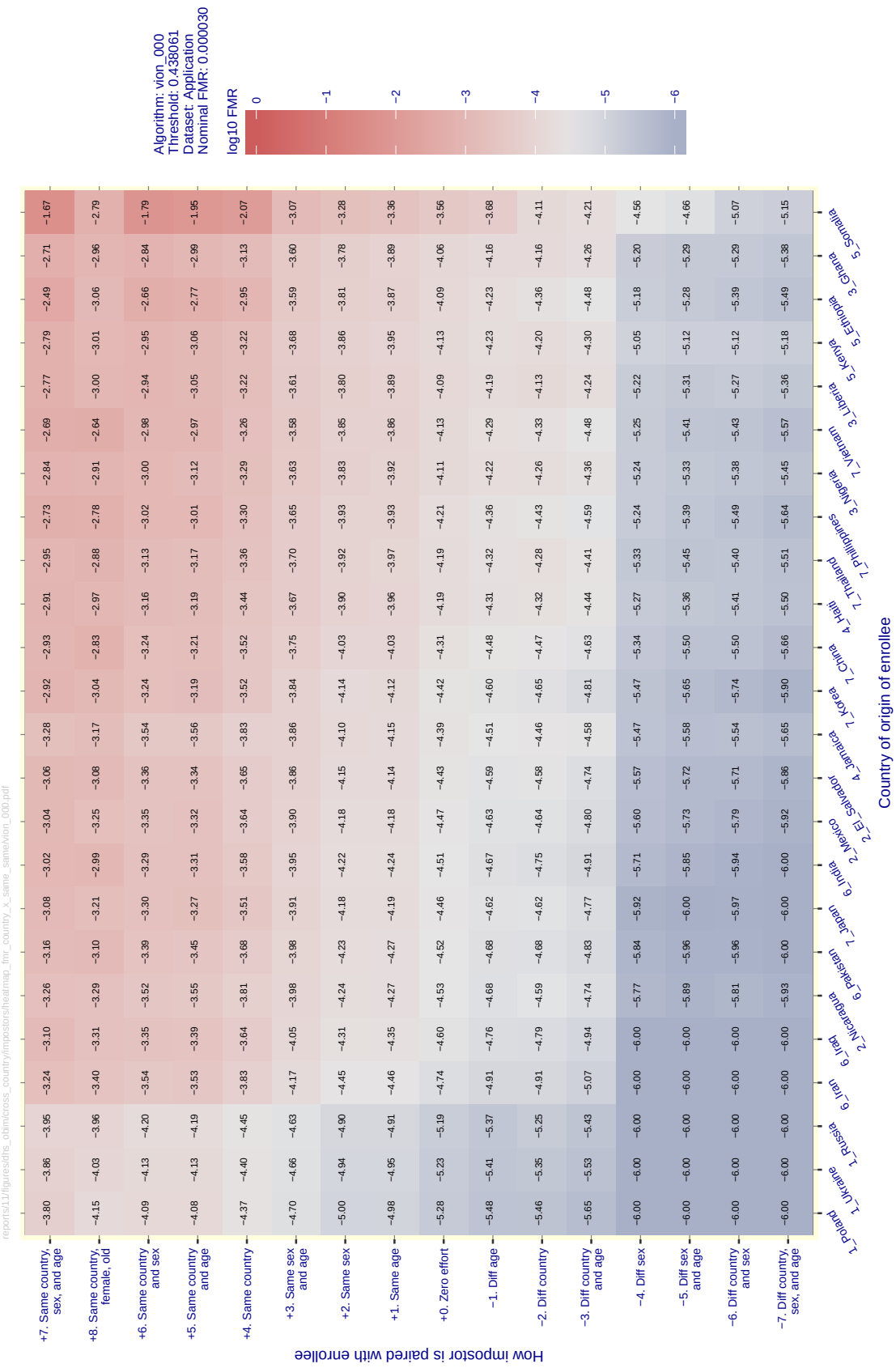


Figure 129: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

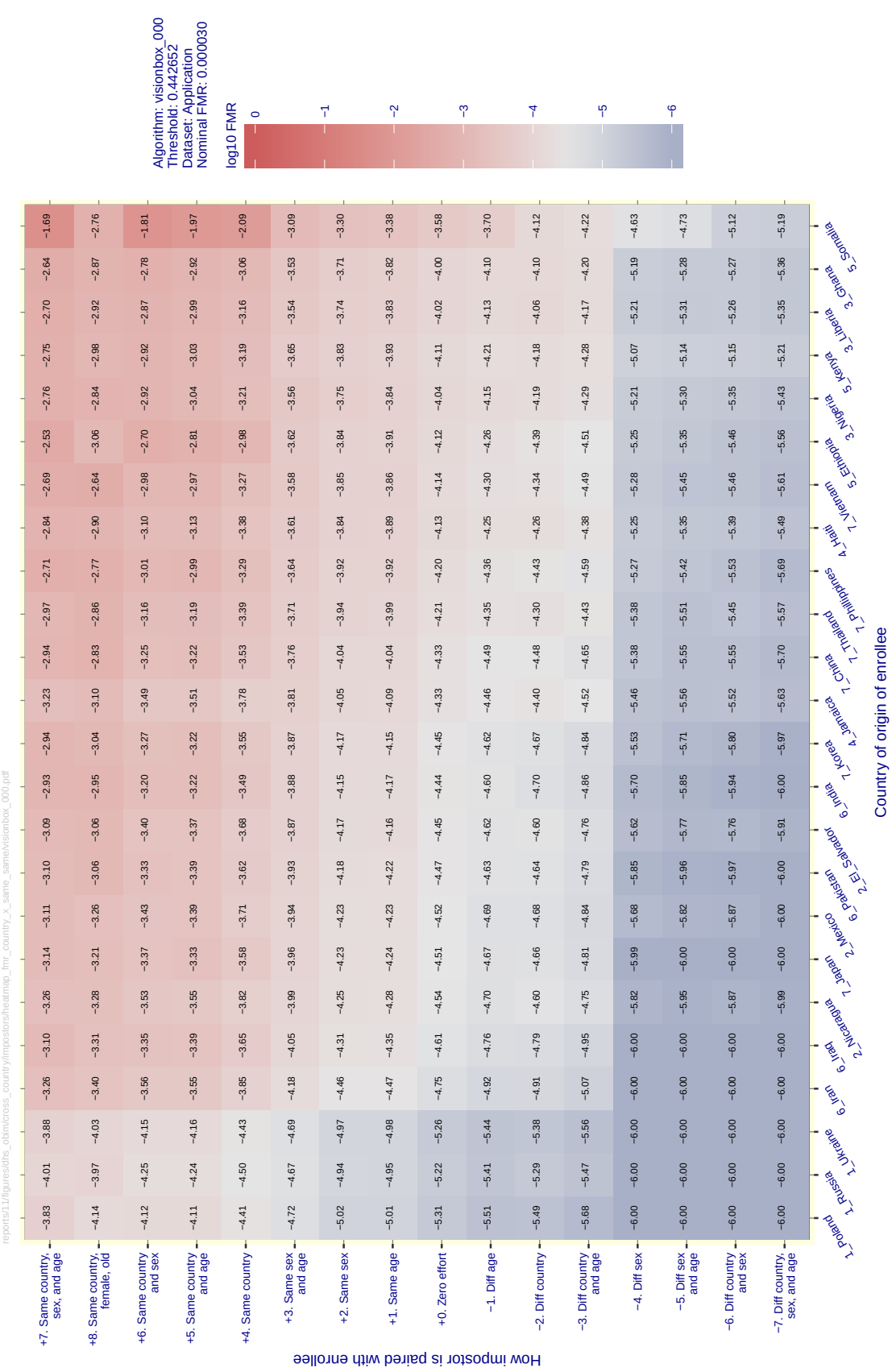


Figure 130: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

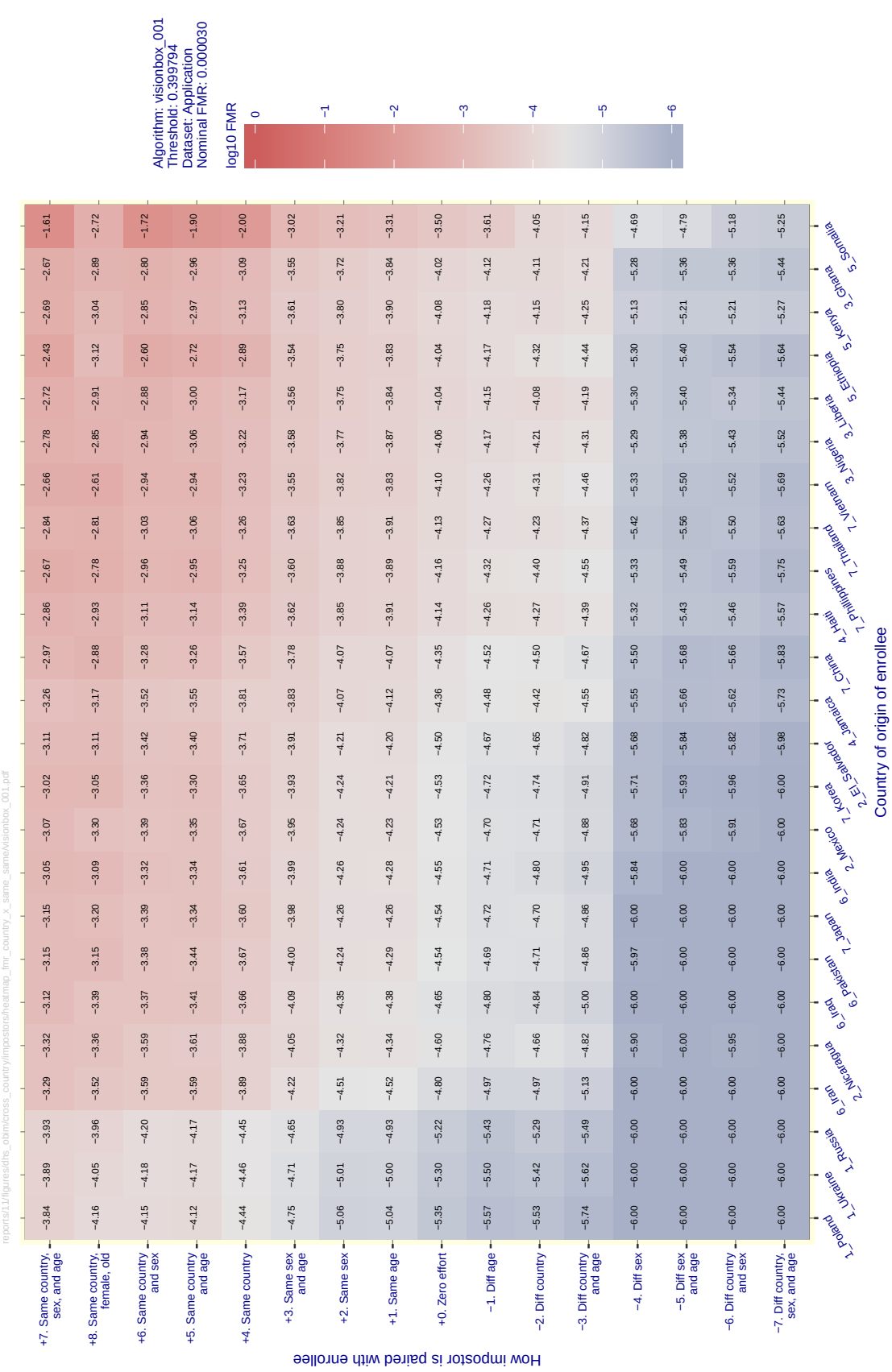


Figure 131: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

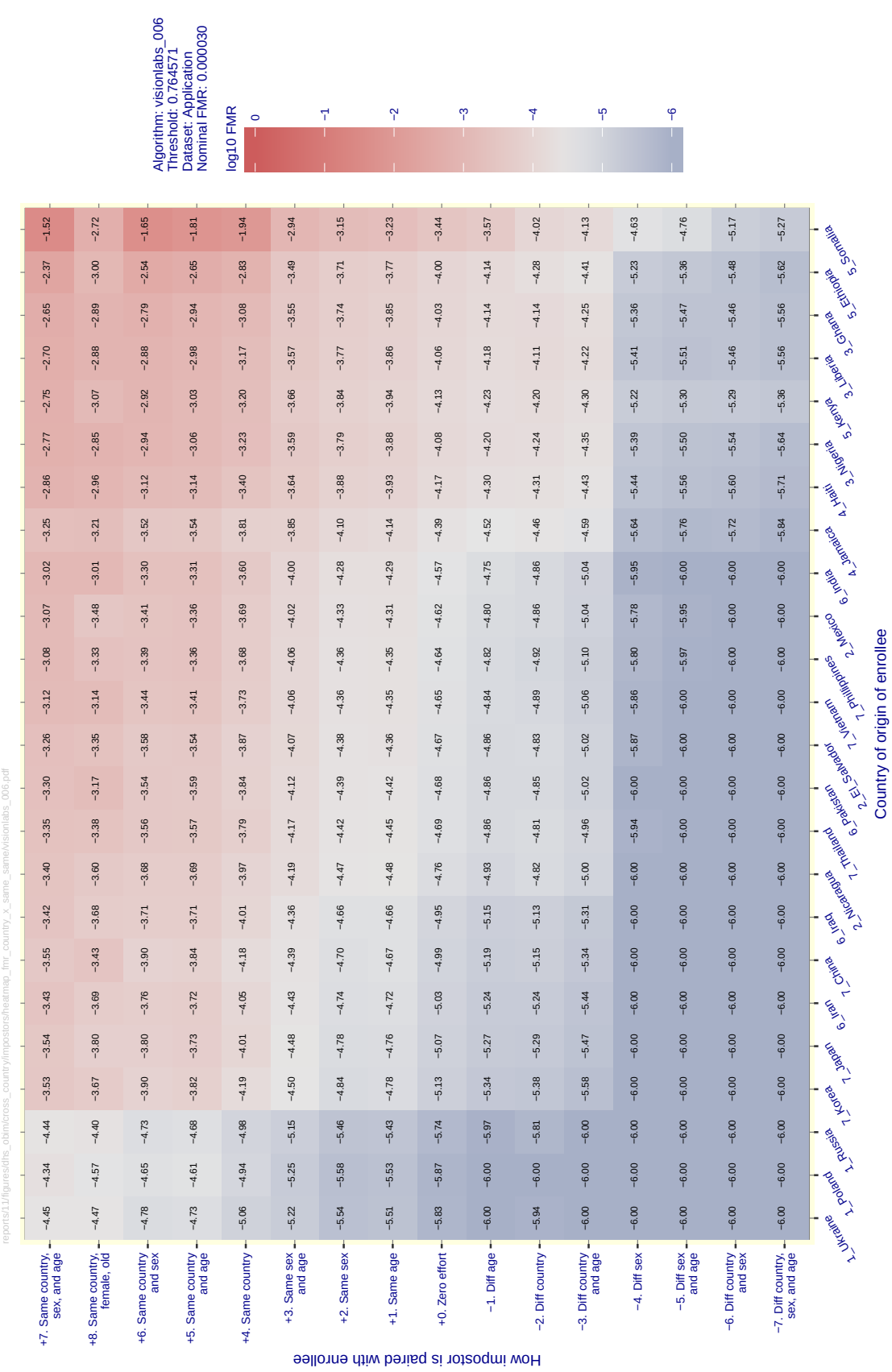


Figure 132: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

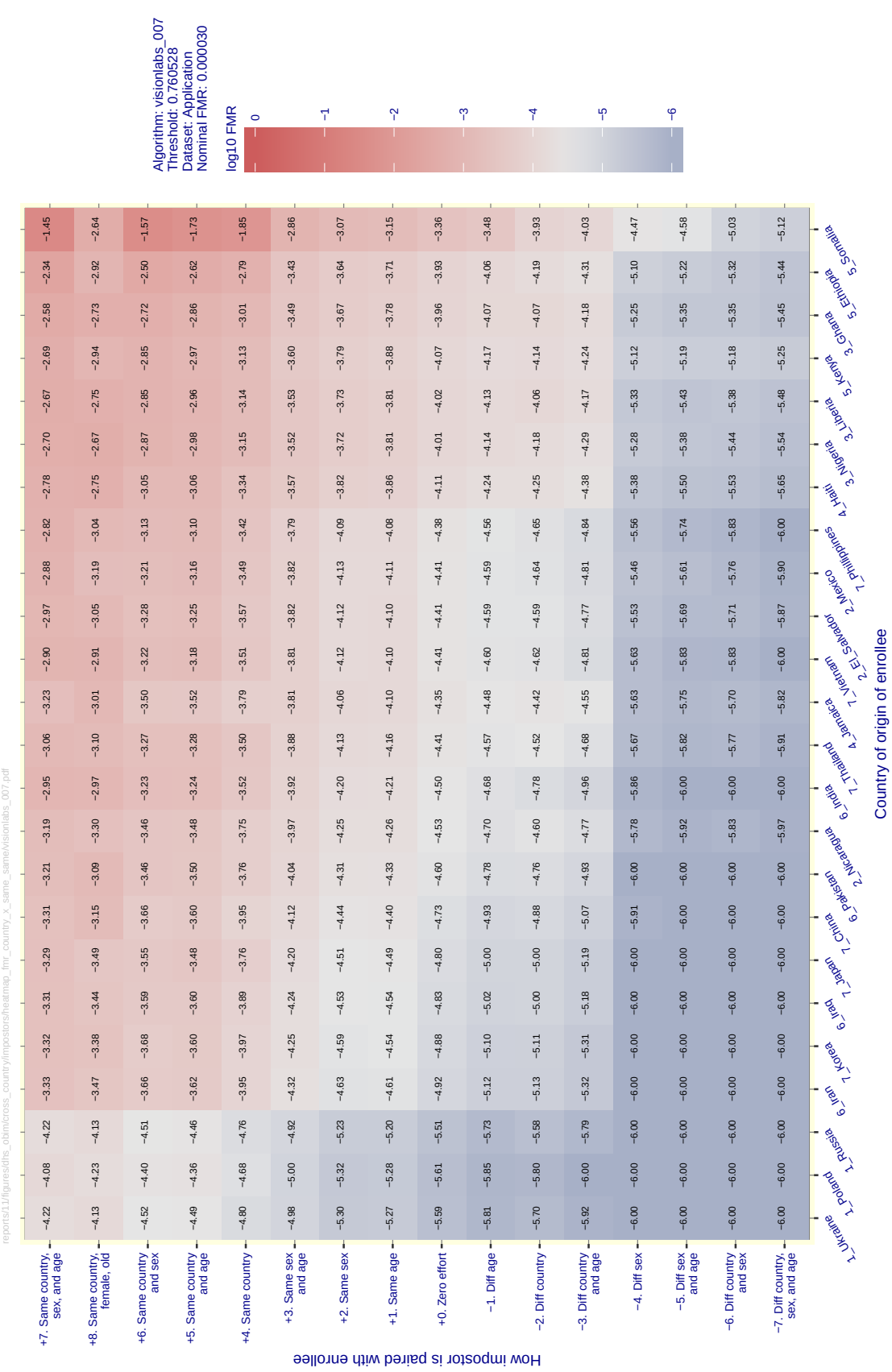


Figure 133: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

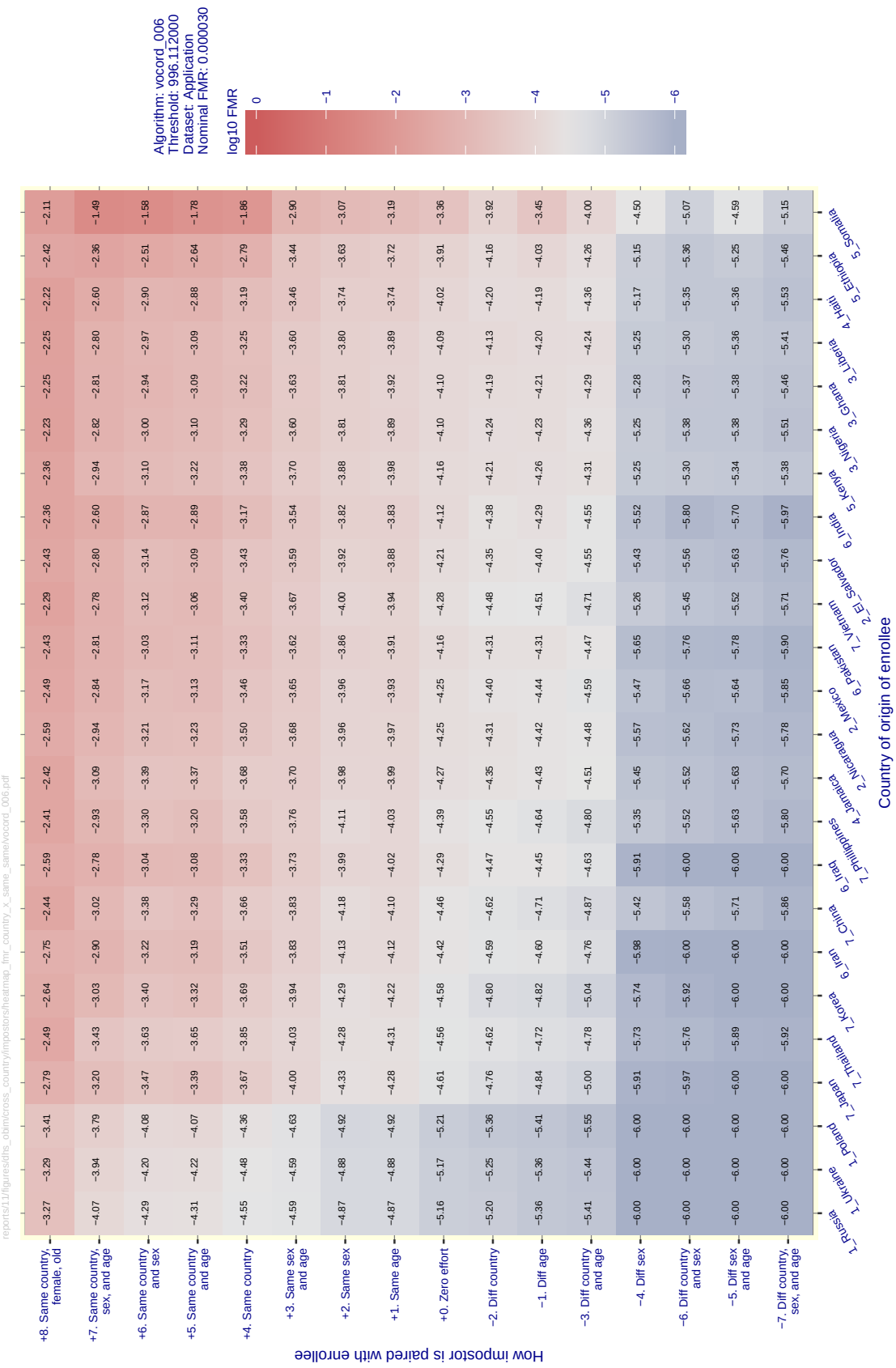
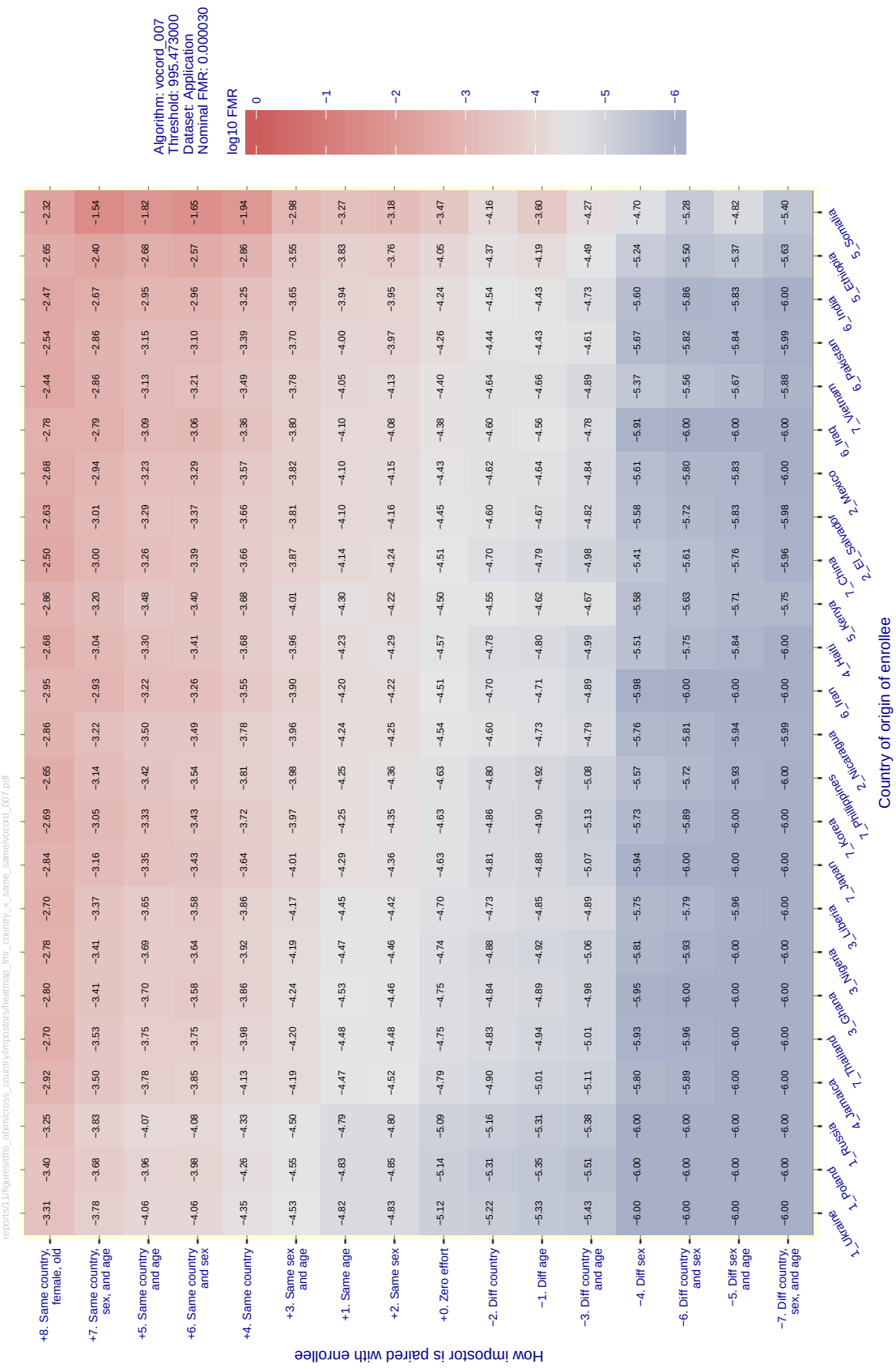
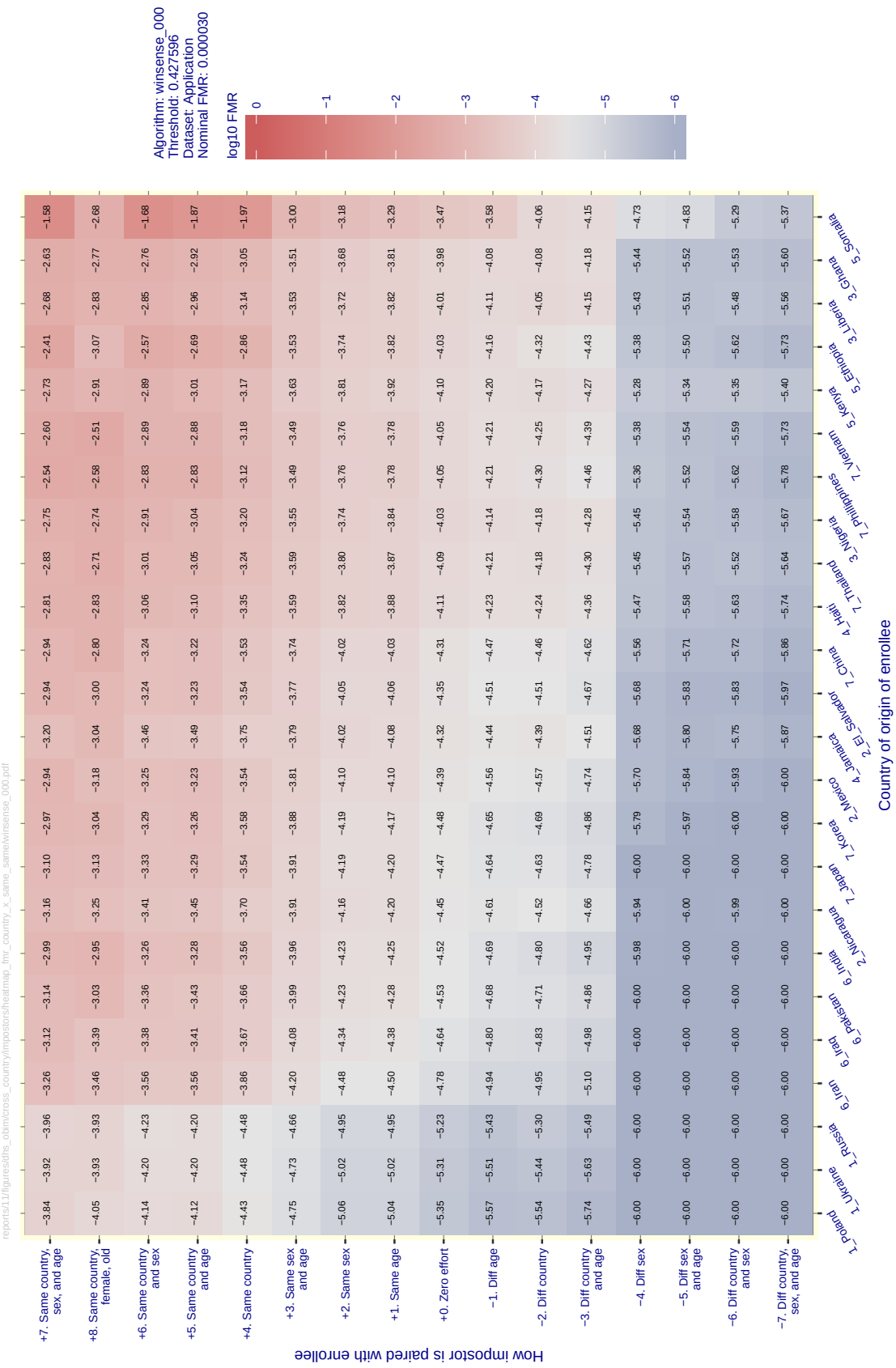


Figure 134: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*



reports/11/figures/dhs_obim/cross_country/impostors/heatmap_fmr_country_x_same_same/vocord_007.pdf

Figure 135: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.



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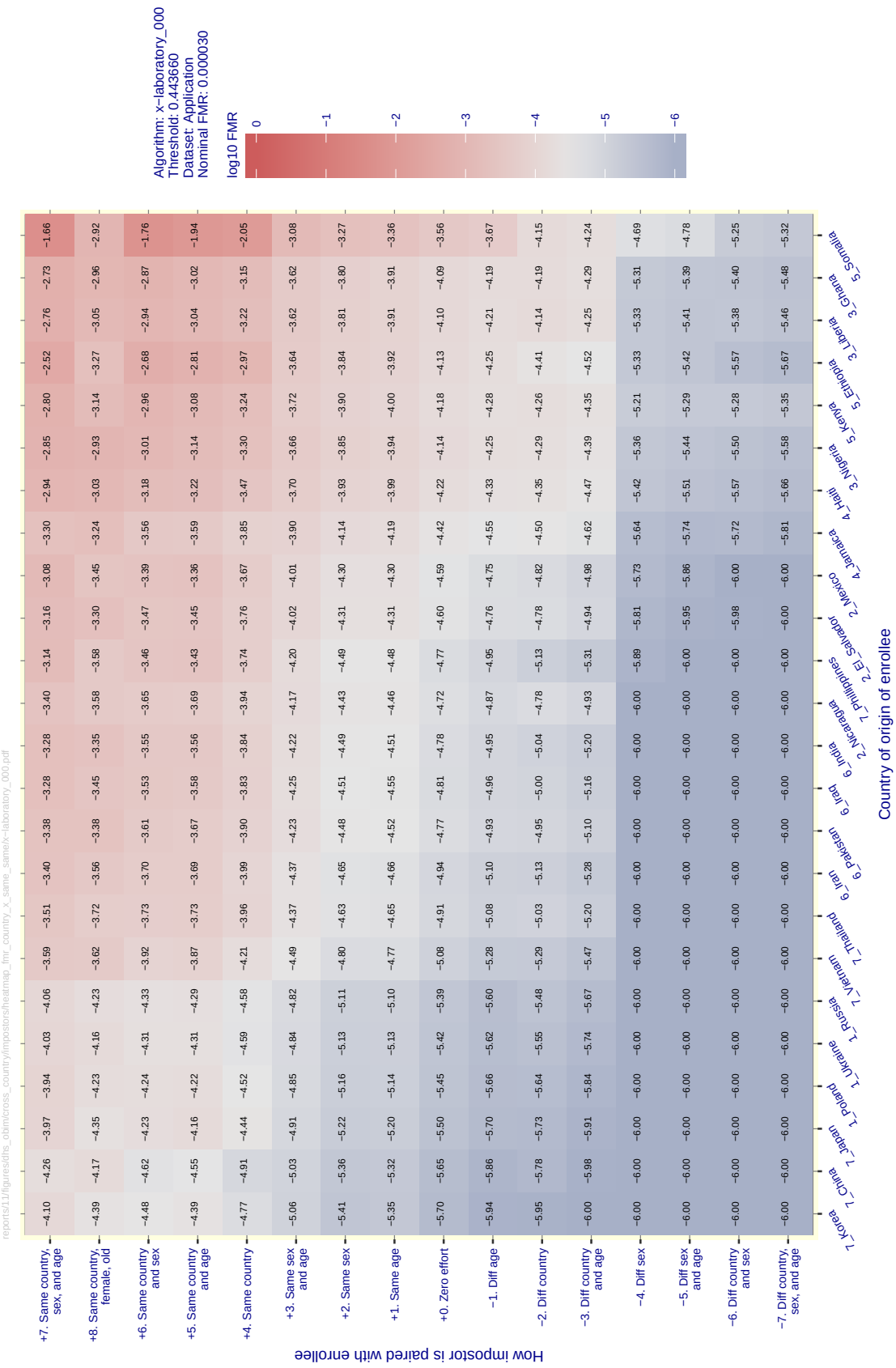

Figure 137: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.

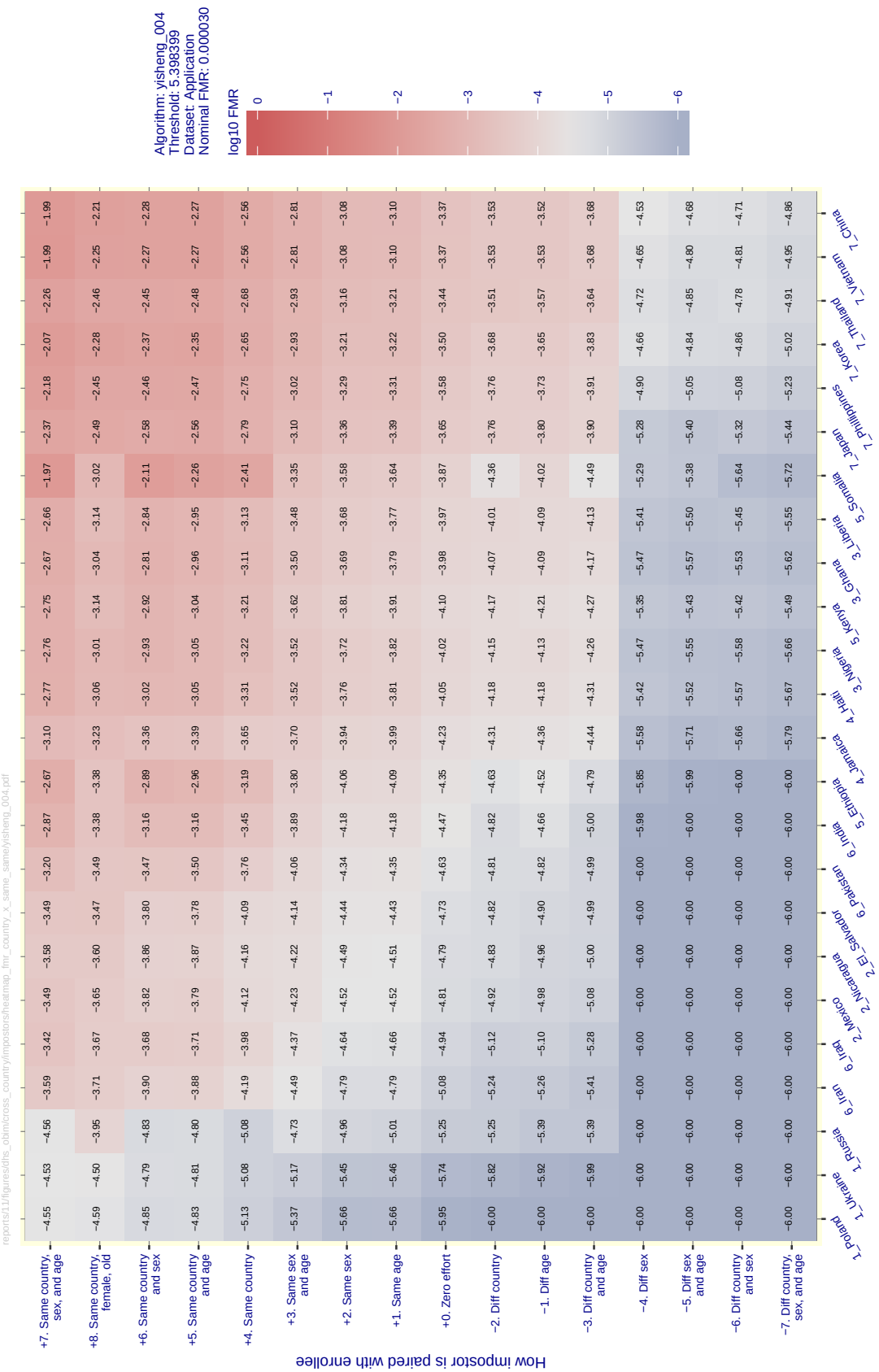

Figure 138: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}$(FMR) *with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.*

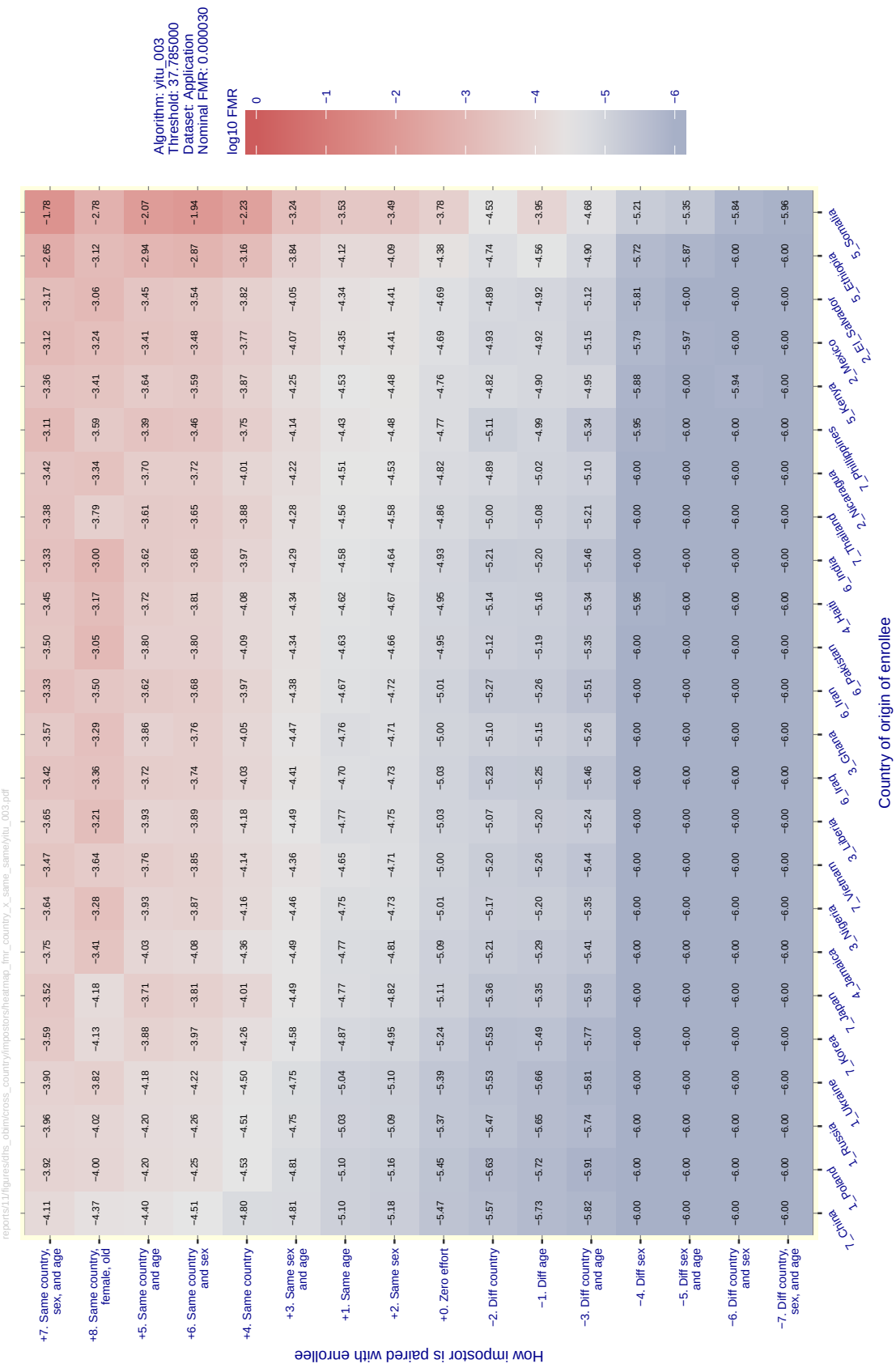

Figure 139: The heatmap shows FMR for each country-of-birth, when the impostor comparisons are drawn from increasingly demographically-matched individuals. Each cell depicts FMR on a logarithmic scale. The text value is $\log_{10}(\text{FMR})$ with large negative values encoding superior false match rates. The center row ("0. Zero effort") row compares individuals without regard to demographics. Rows above that pair imposters more closely until, in the second row, the imposters are of the same sex, age and country of origin. The top row corresponds to one particular demographic often associated with the highest FMR values. The rows below center pair for increasingly unlikely impostor pairings. For example "-5. Diff sex and age" shows FMR for impostors of different sex and age group. The countries appear in order of increasing mean FMR.