

NISTIR 8280

**Ongoing Face Recognition
Vendor Test (FRVT)
Part 3: Demographic Effects**

**Annex 9 : Cross-age false match rates with application
photos**

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NIST
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1 Overview

This annex includes figures that shows false match rates across different age groups. Each page contains one figure corresponding to one algorithm. Each figure shows a set of heatmaps, each showing a matrix of values. The value in column j is the FMR obtained when images of persons in age group j are compared with images of other subjects in age group i .

2 Data

The images are the high quality portraits described in Annex 2. 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

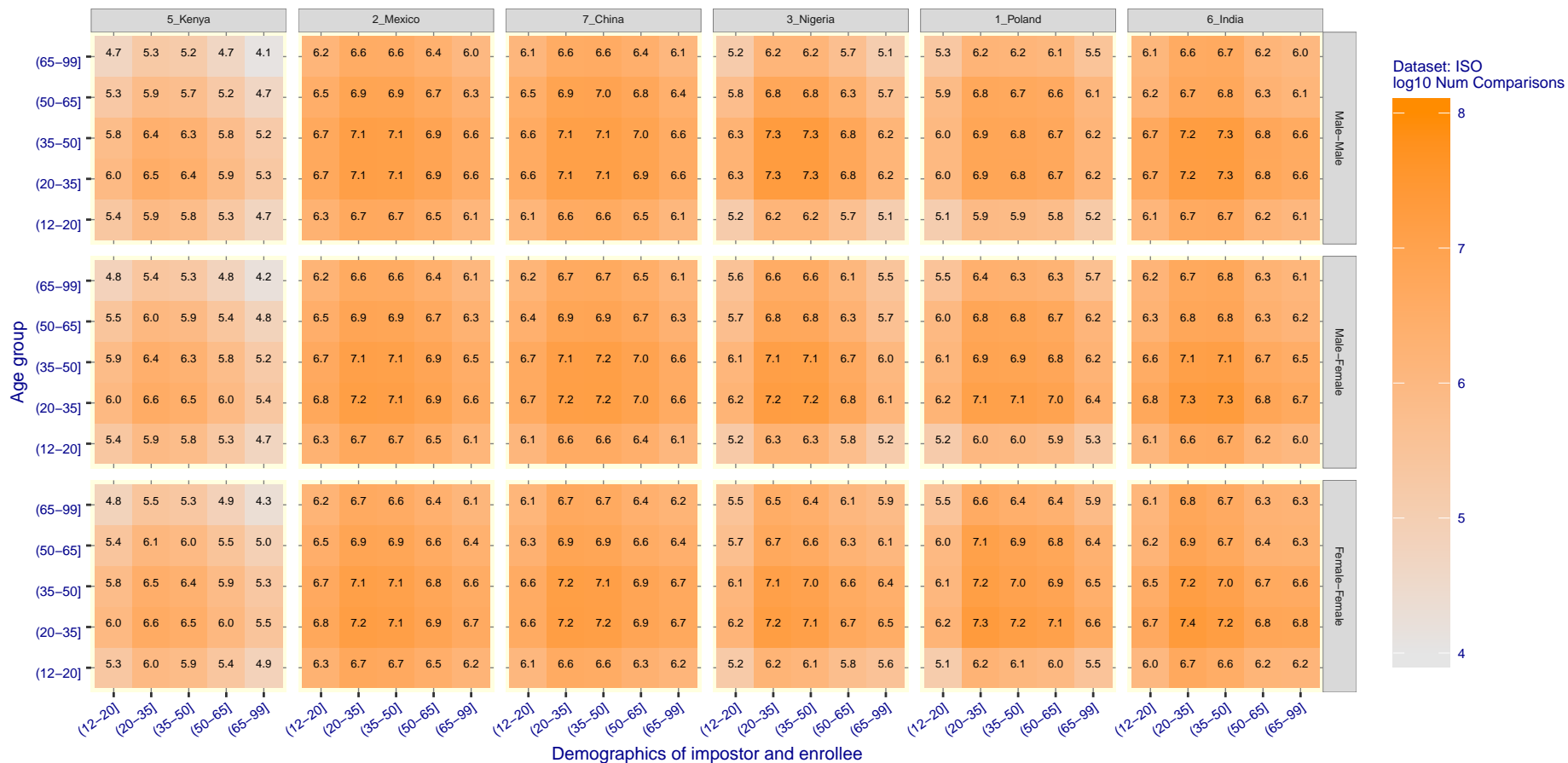
A false match is declared if the comparison score is equal to, or exceeds, a threshold. This same value applies to all comparisons in all cells. The threshold value could be any value germane to that comparison algorithm. The threshold value was taken from a different experiment in which mugshot impostor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

4 Plot

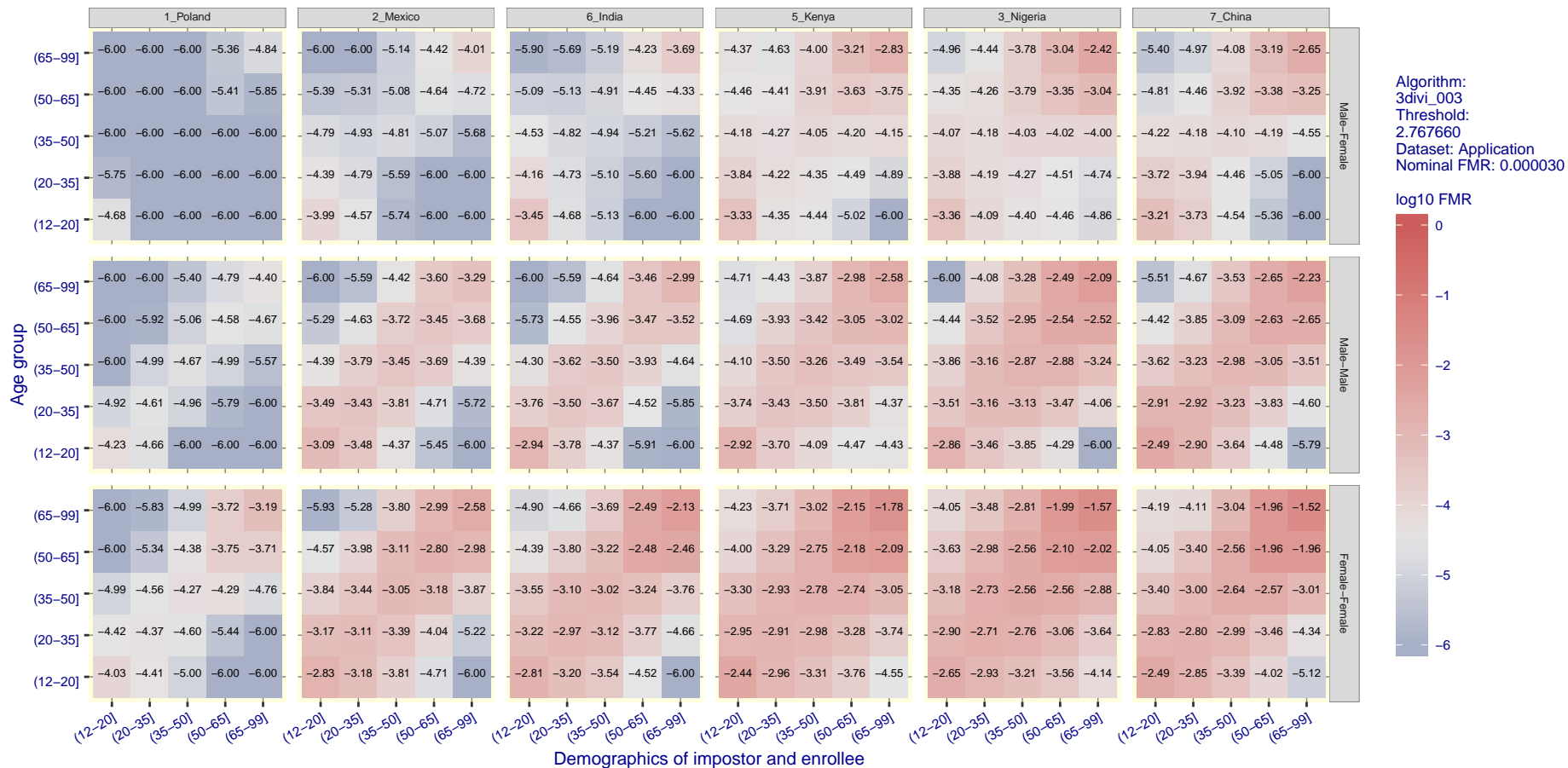
The plot shows cross-age false match rate as follows.

- ▷ 0 - The six columns shows for six countries selected to span global regions and because the dataset contains many images from those countries.
- ▷ 1 - In the top row, the various heatmaps correspond to comparison of women with women from the specific country.
- ▷ 2 - The bottom row likewise shows men with men false match rates.
- ▷ 3 - Any given cell restricts impostors to have the same sex and country of origin, and individuals from age group i and j drawn from the following list: (12 – 20], (20 – 35], (35 – 50], (50 – 65], and (65 – 99].
- ▷ 4 - The countries are sorted left-to-right in increasing order of maximum FMR measured in the two panels (male-male, and female-female).
- ▷ 5 - The name of the algorithm is included in the legend.
- ▷ 6 - The threshold value and the nominal FMR value that it corresponds to, are likewise, recorded in the legend. The FMR is nominal in the sense that it was computed over impostor comparisons made in a separate, domestic, dataset (Annex 1).

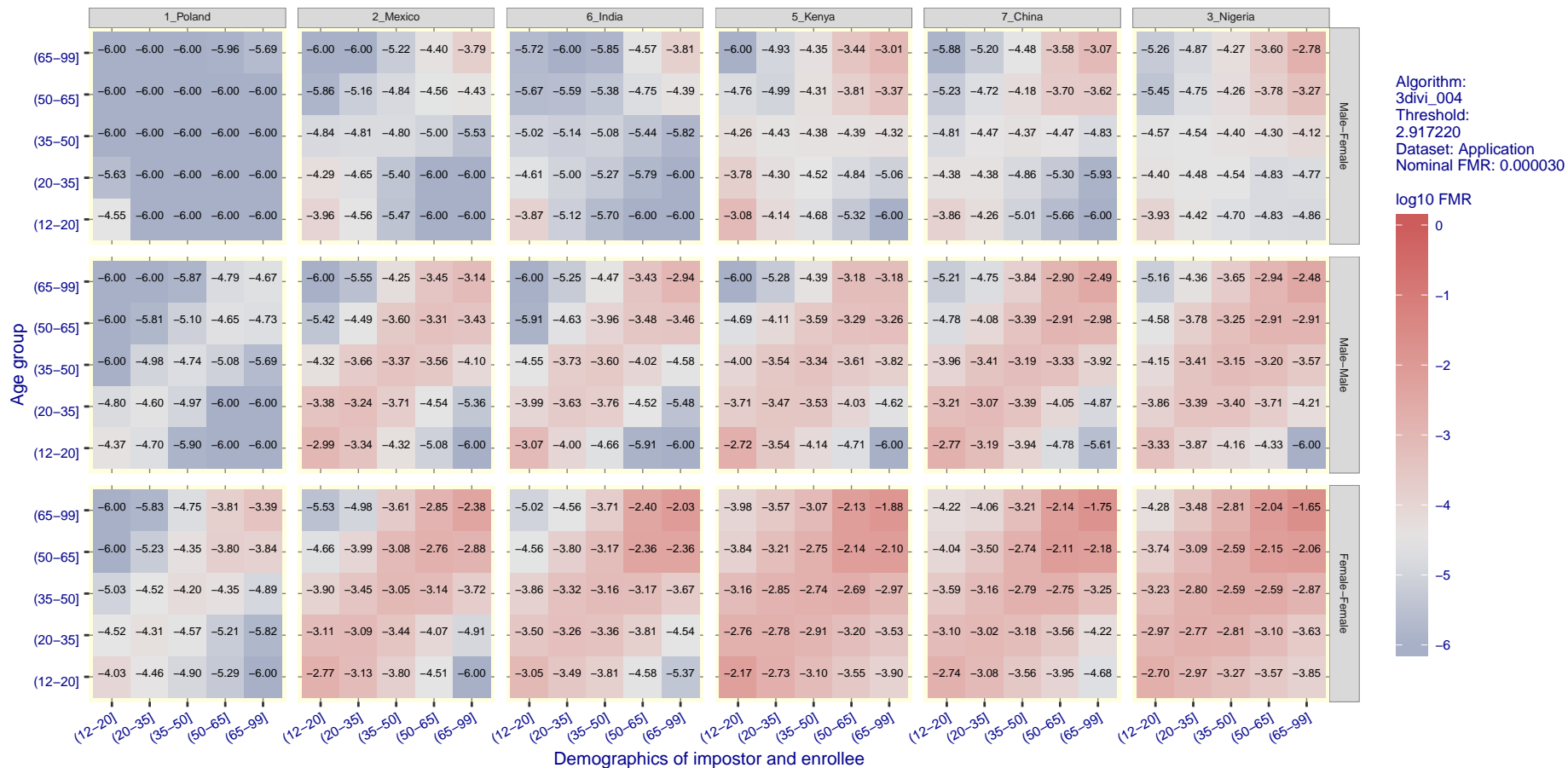
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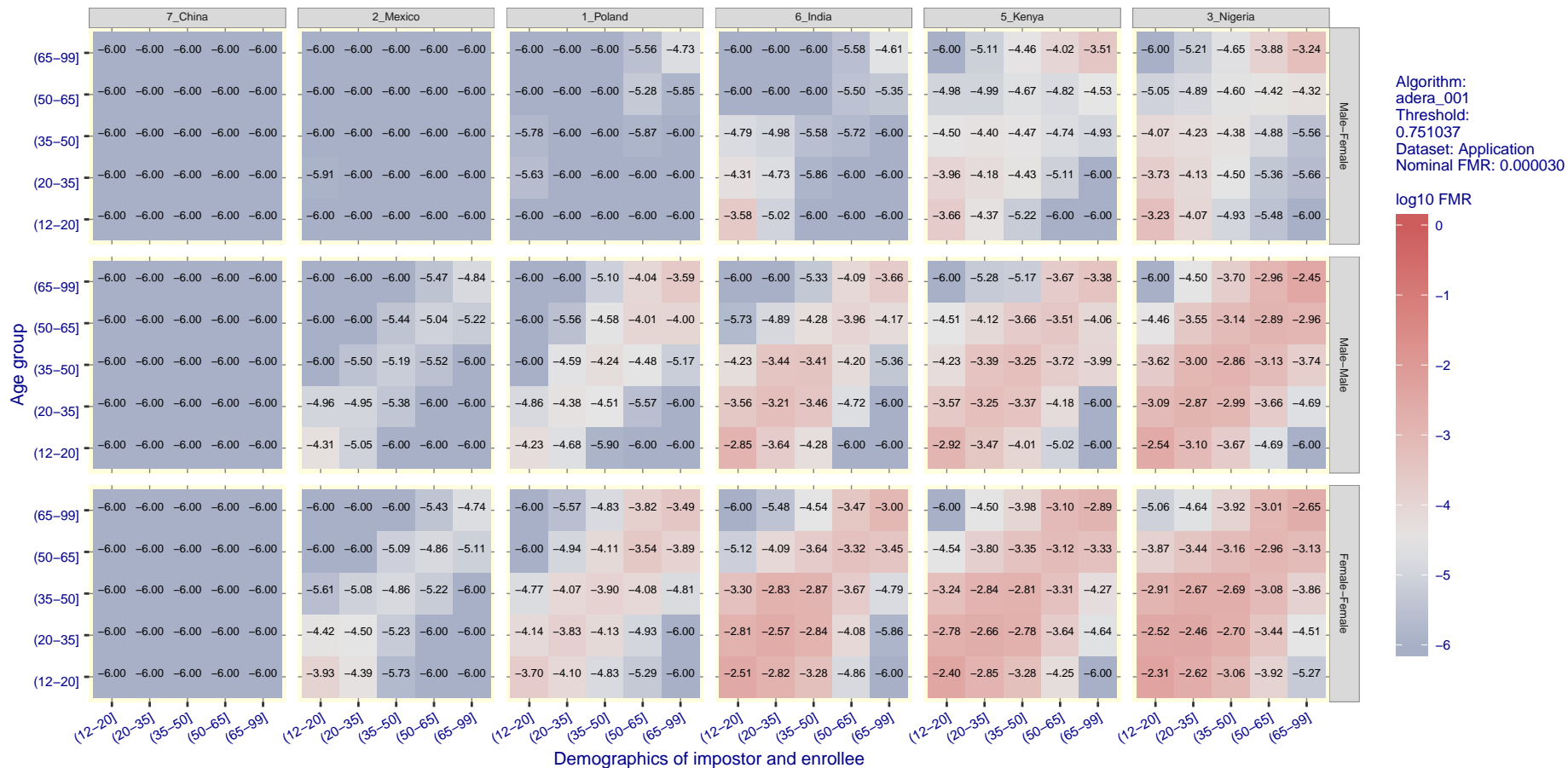
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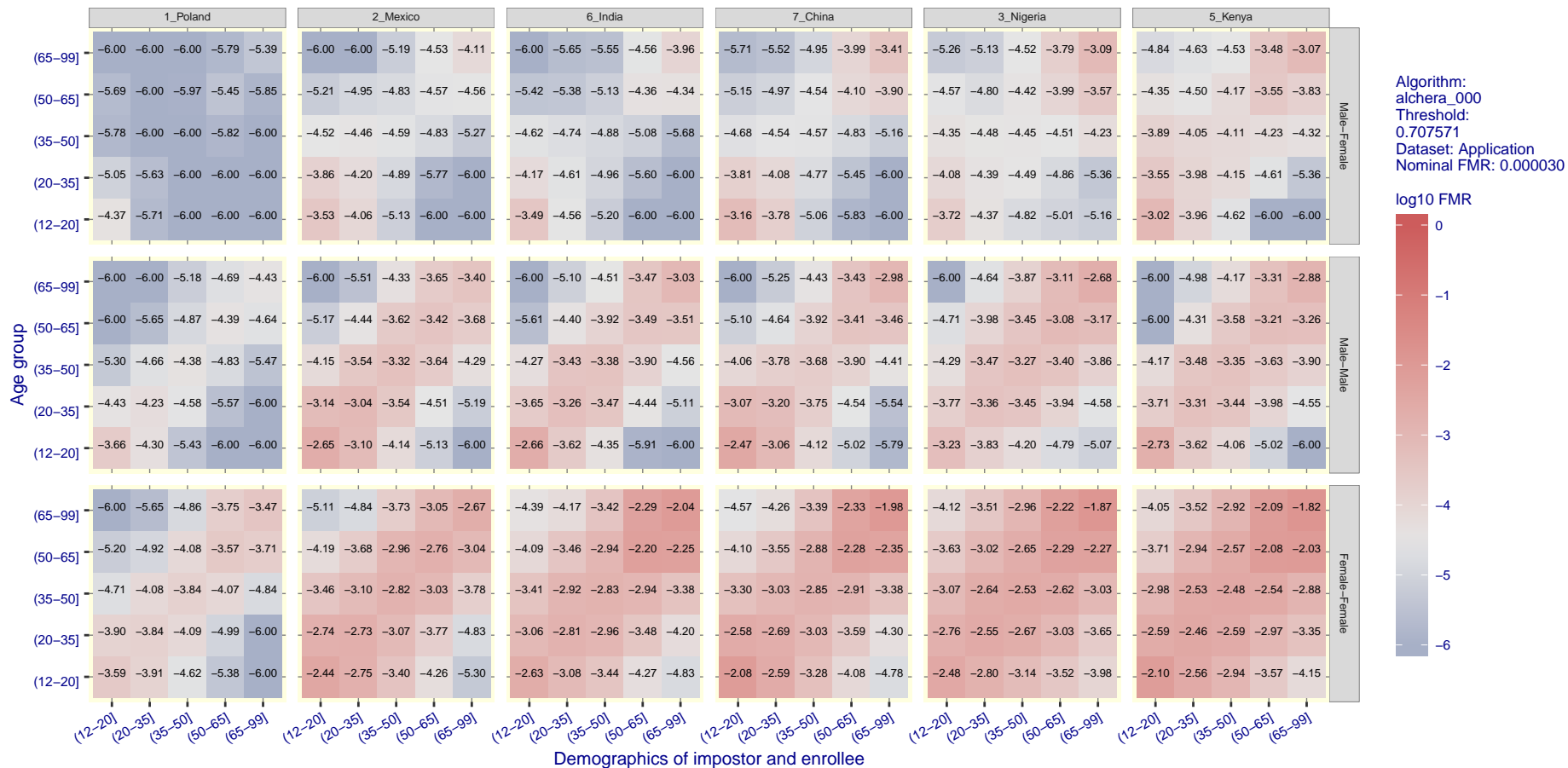
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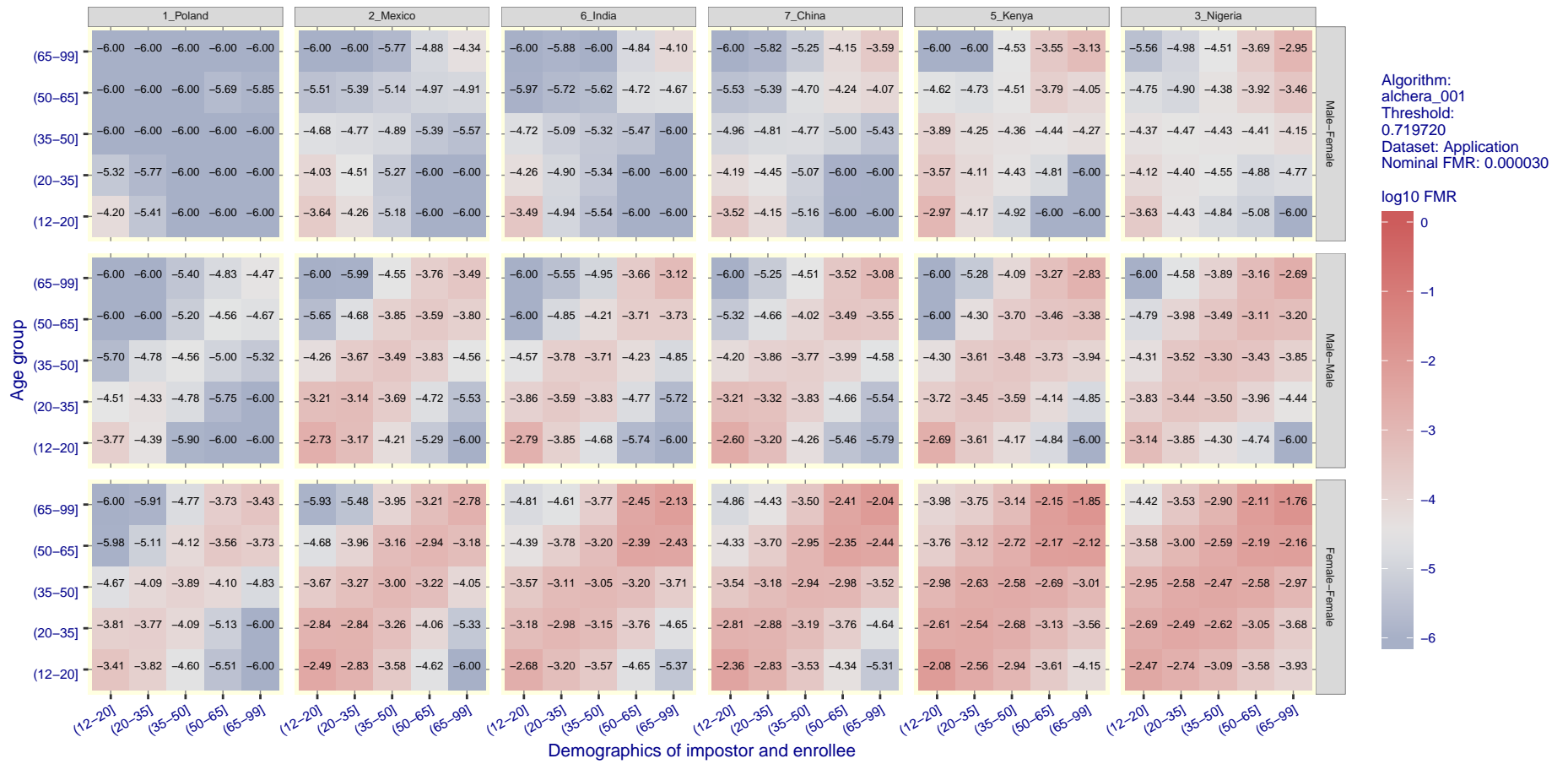
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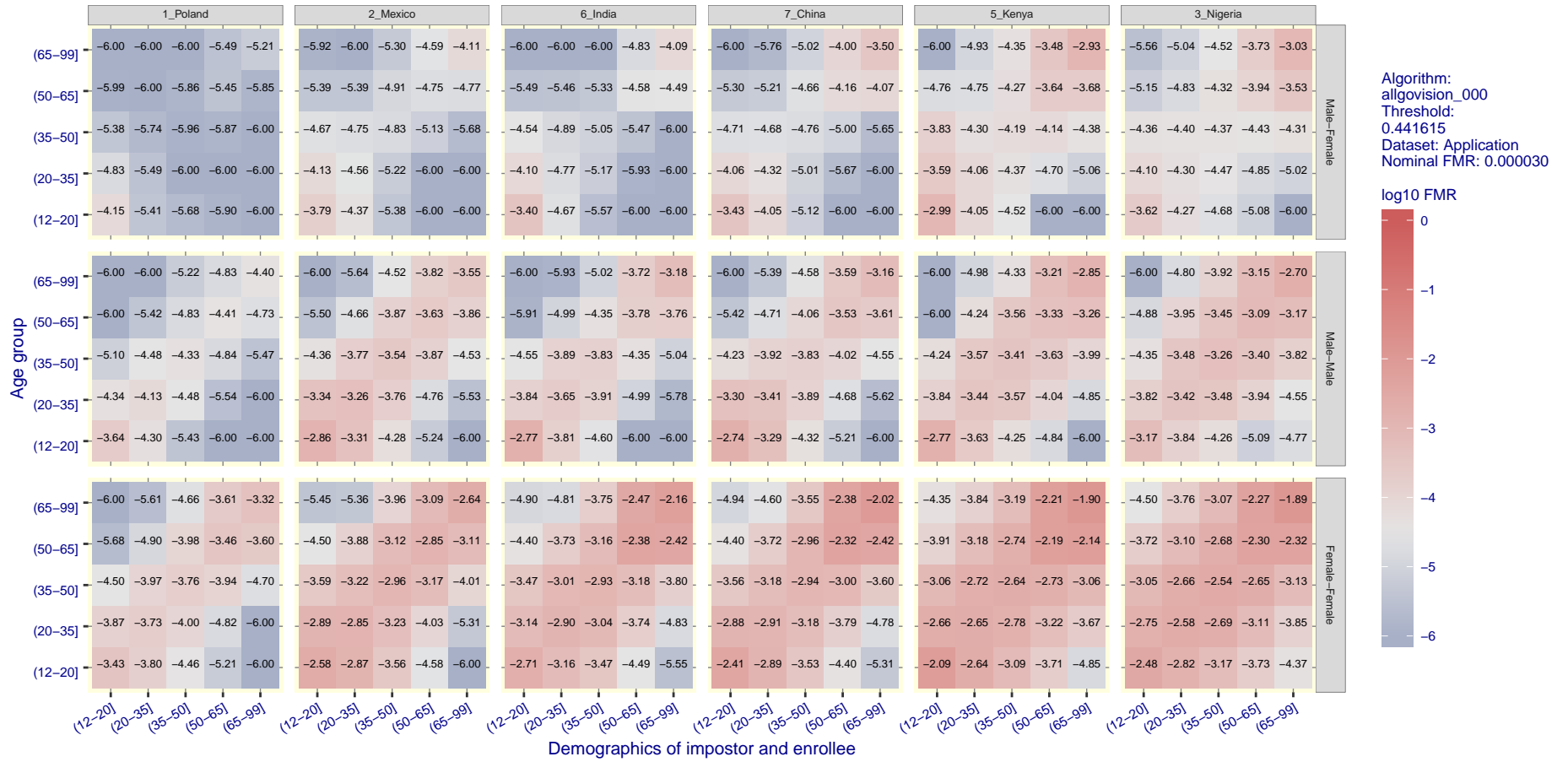
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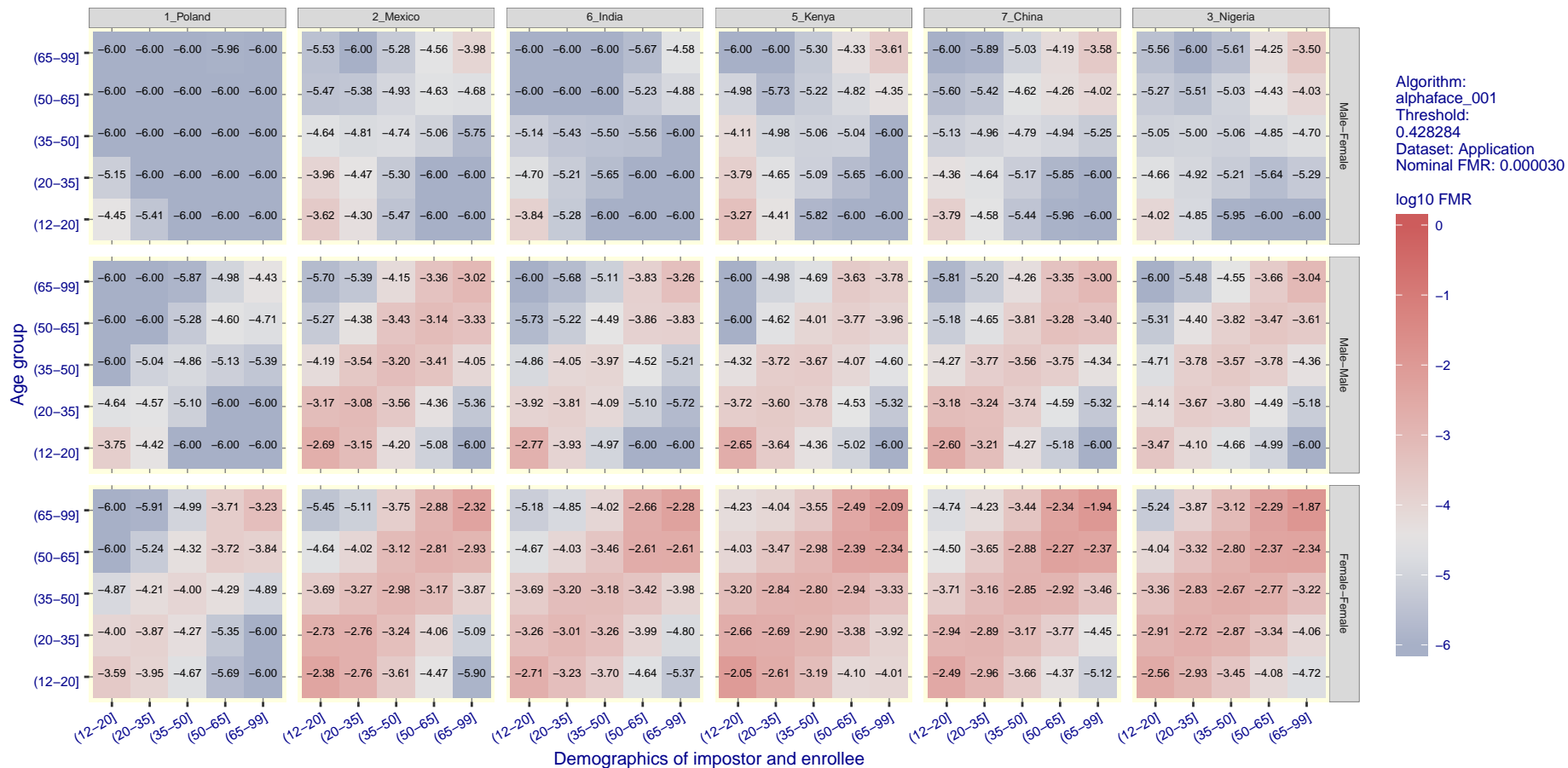
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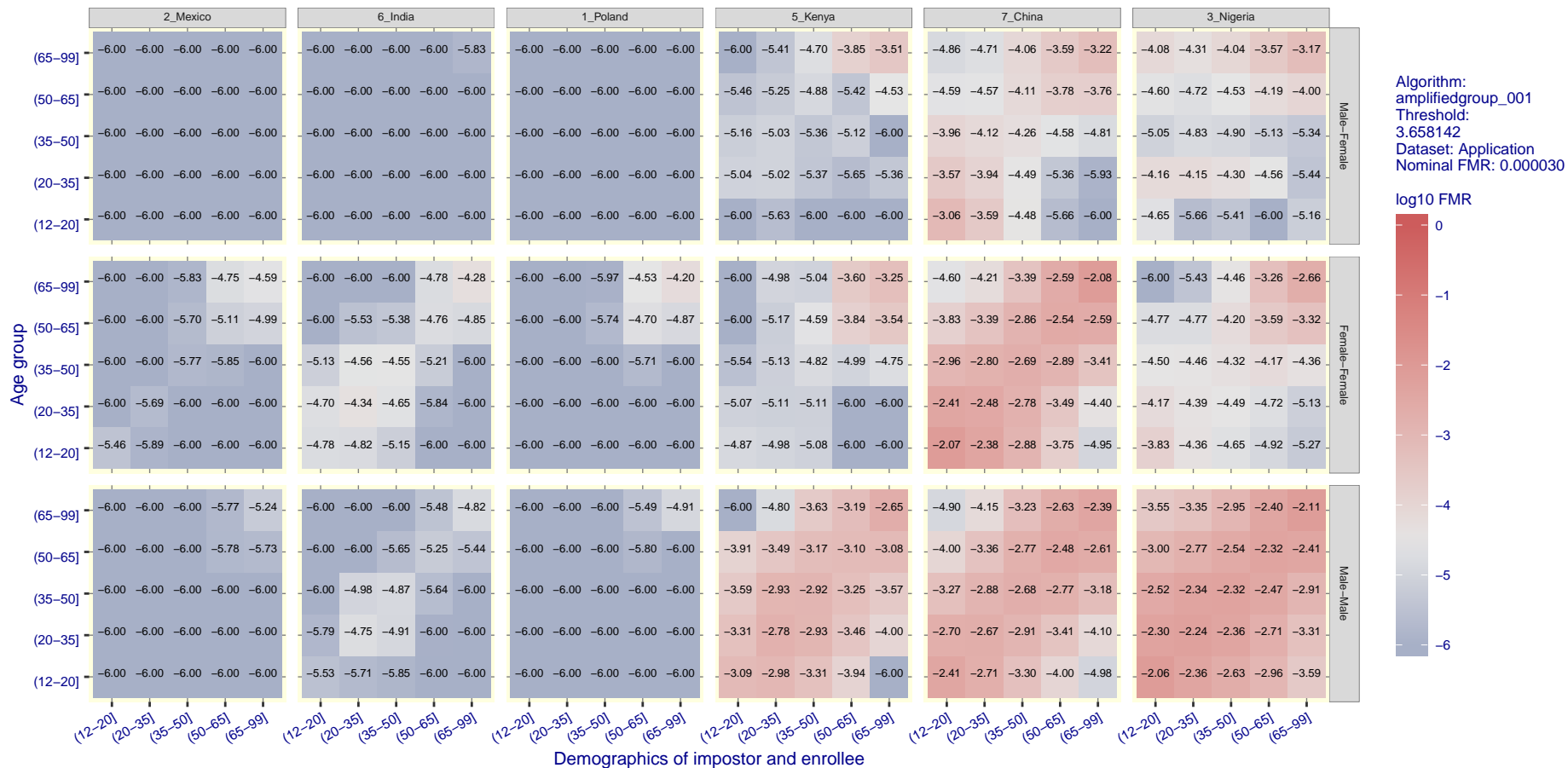
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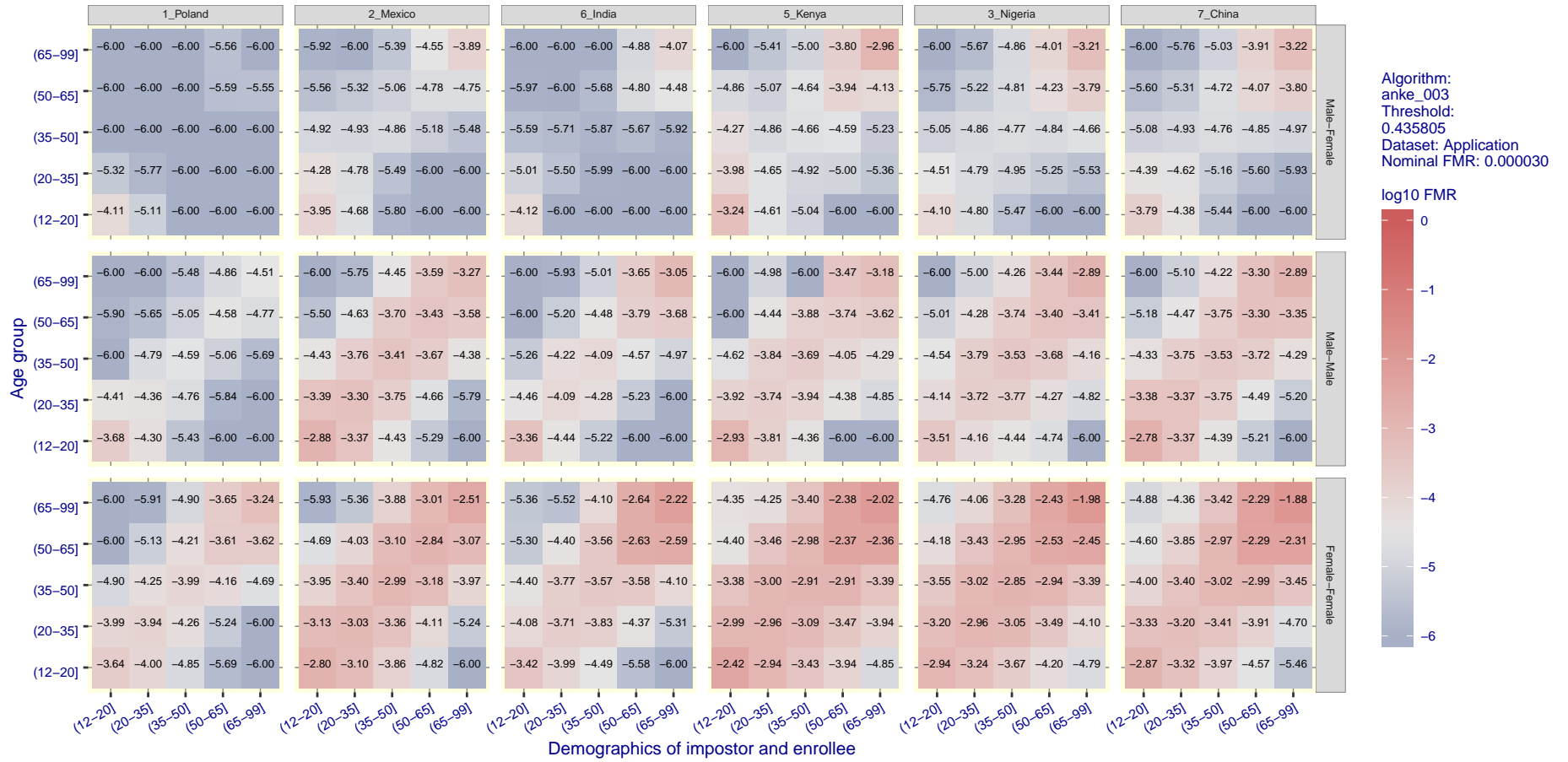
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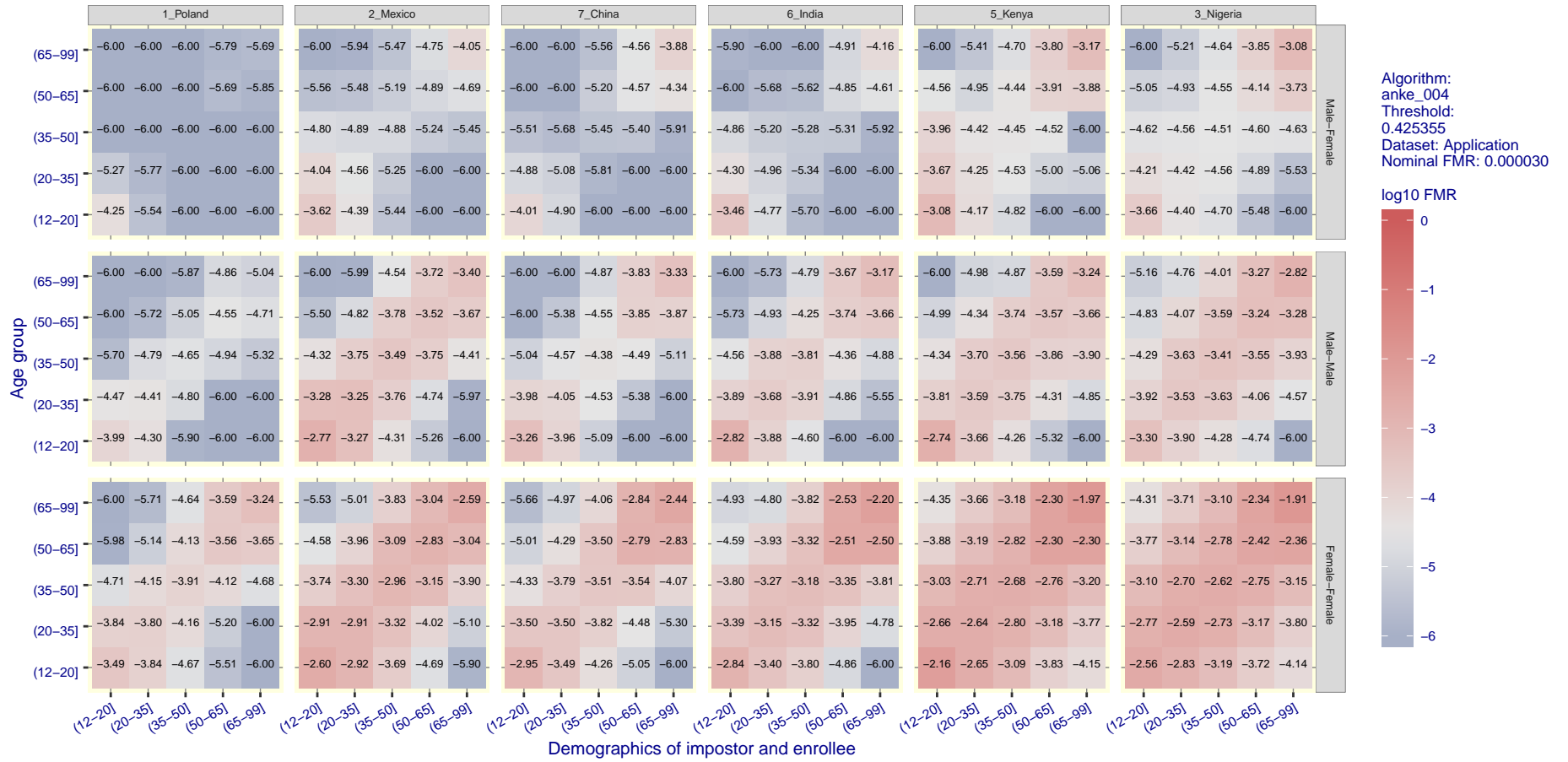
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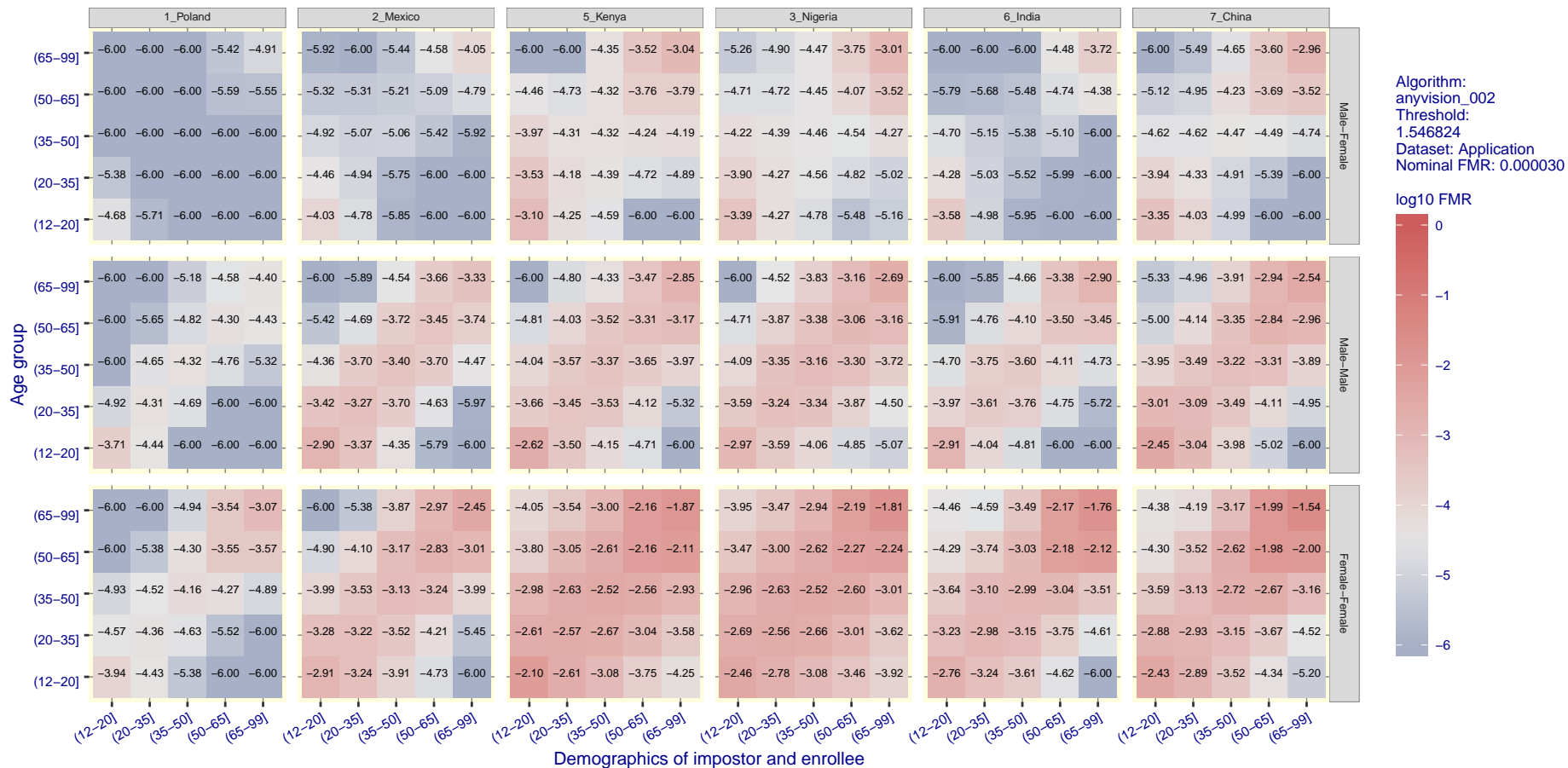
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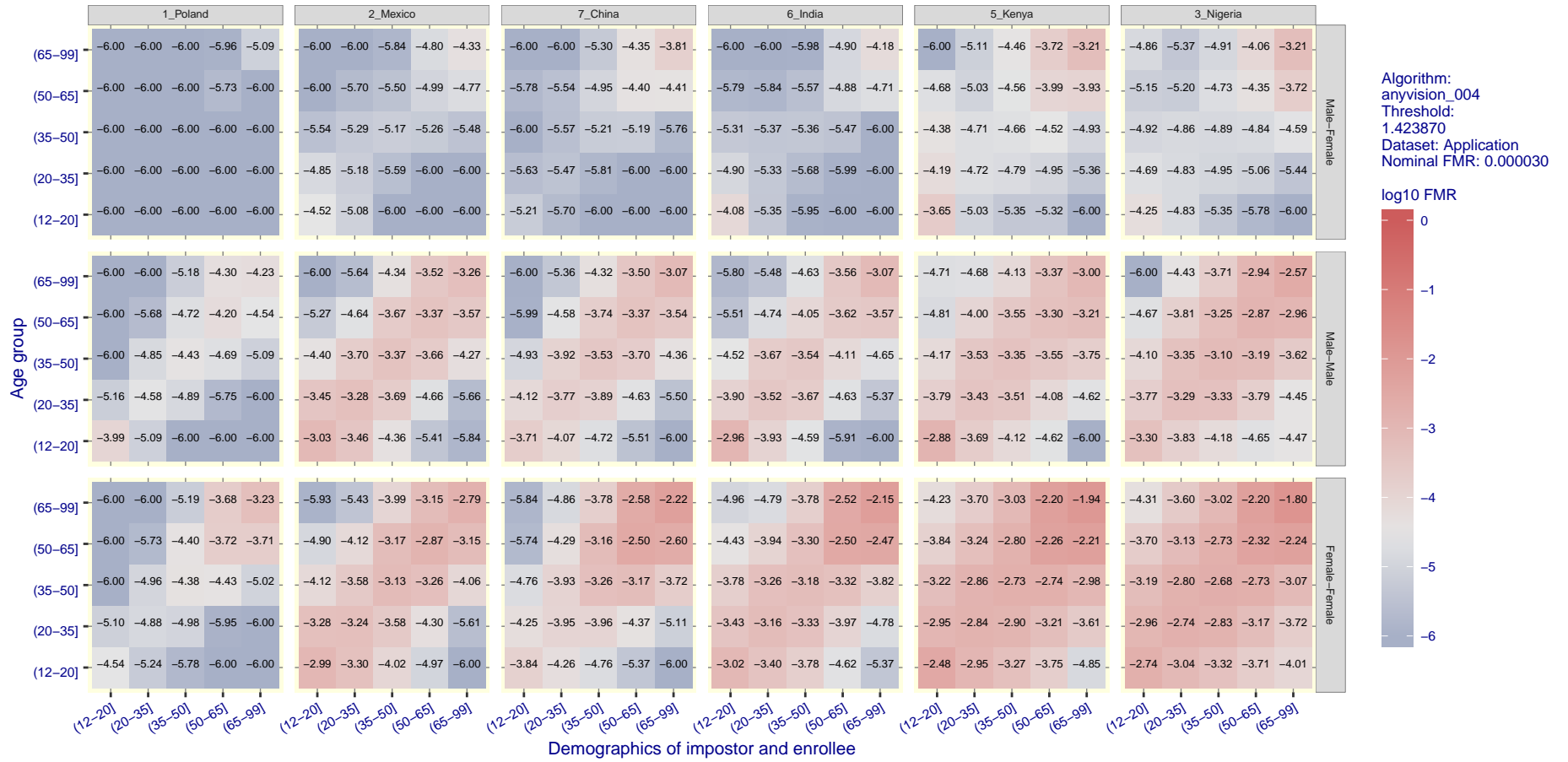
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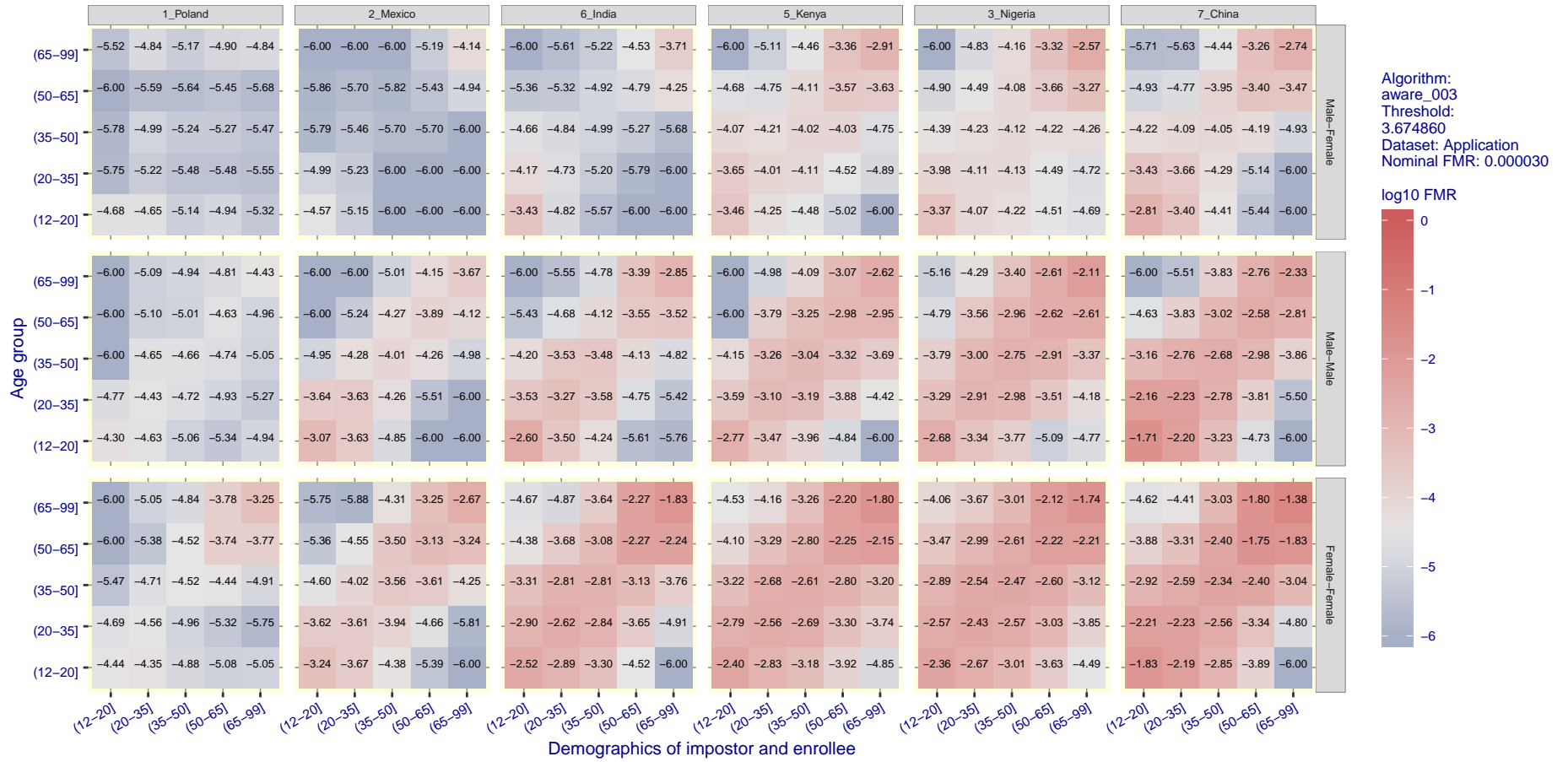
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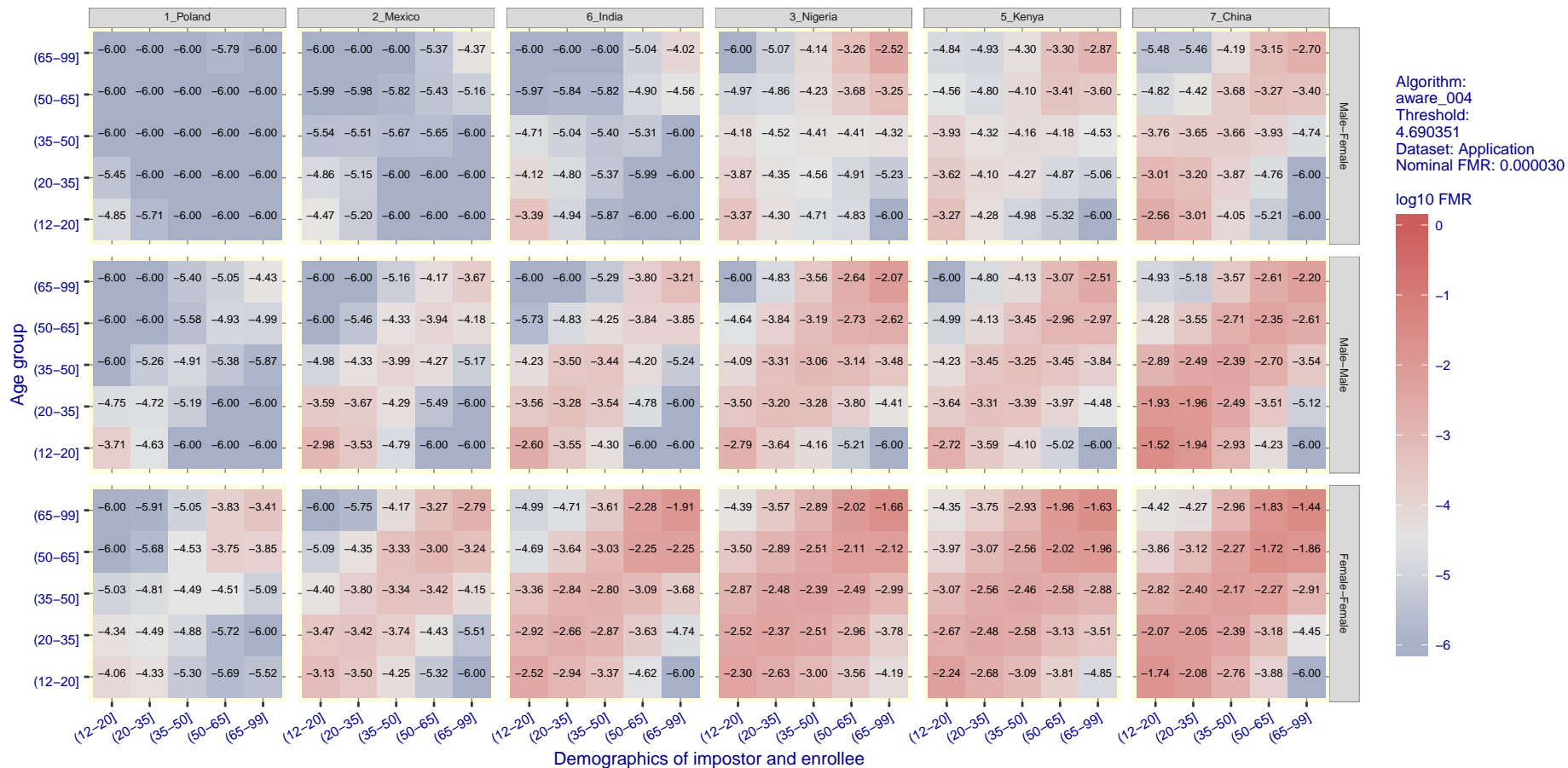
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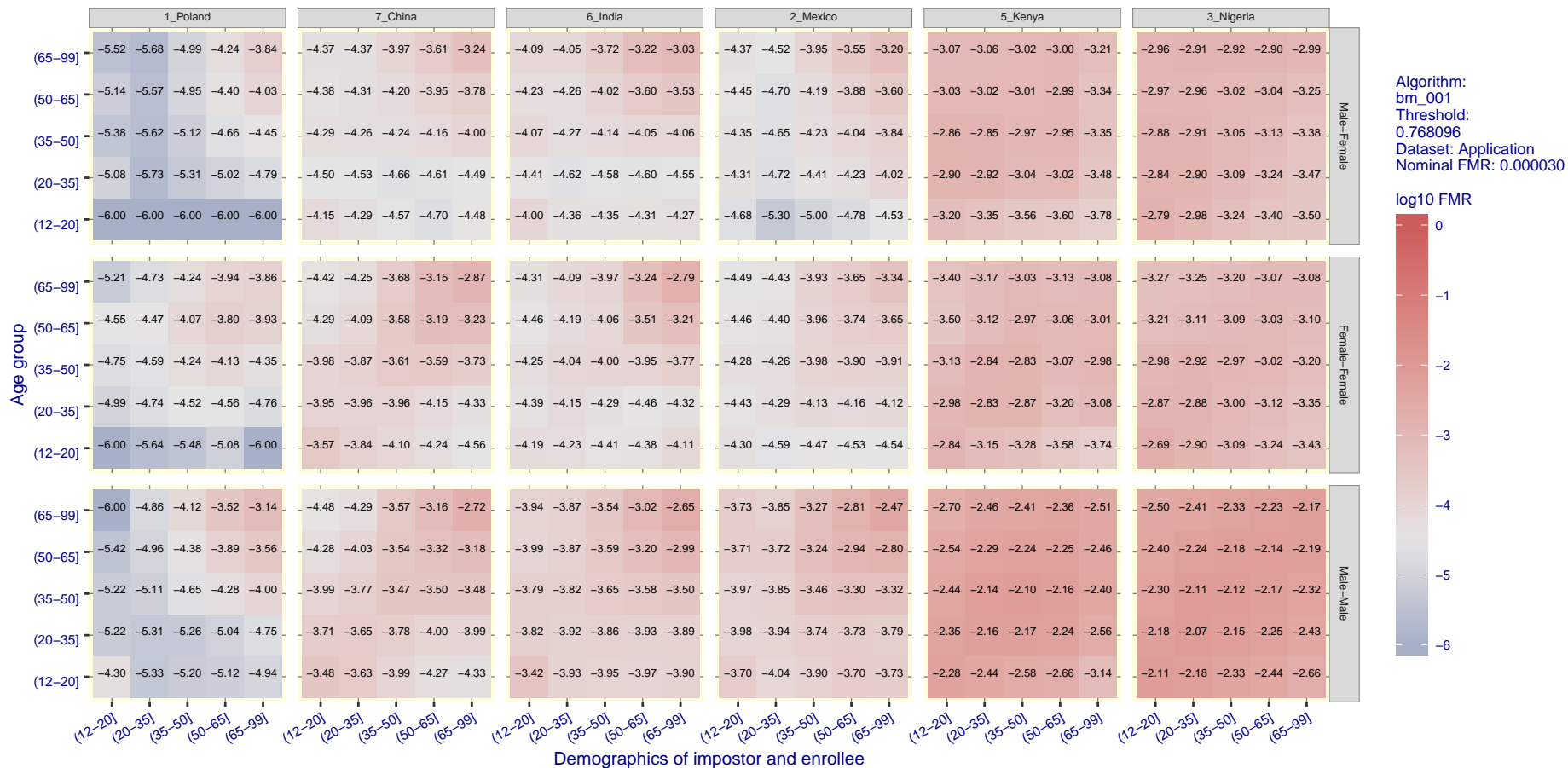
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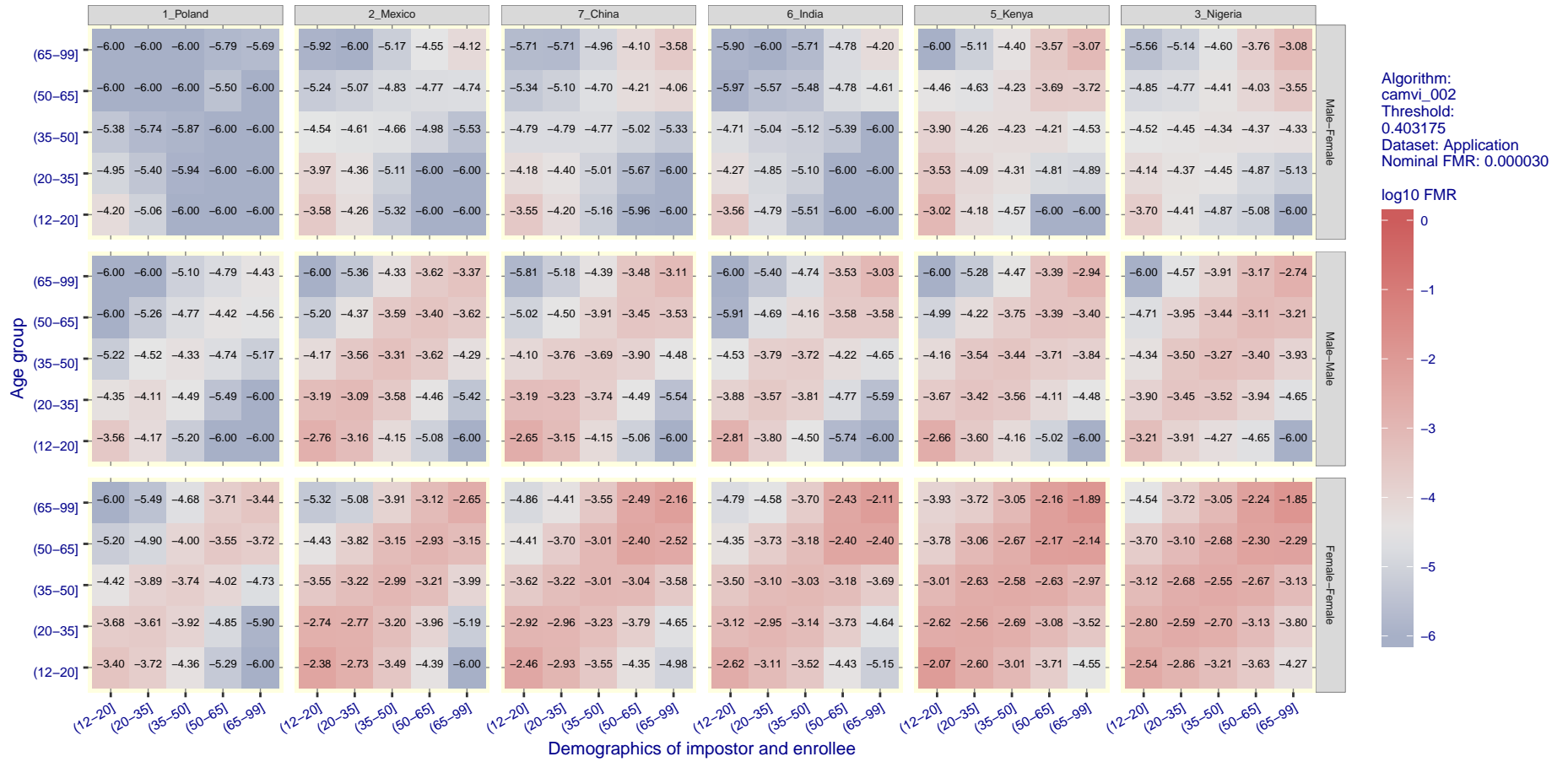
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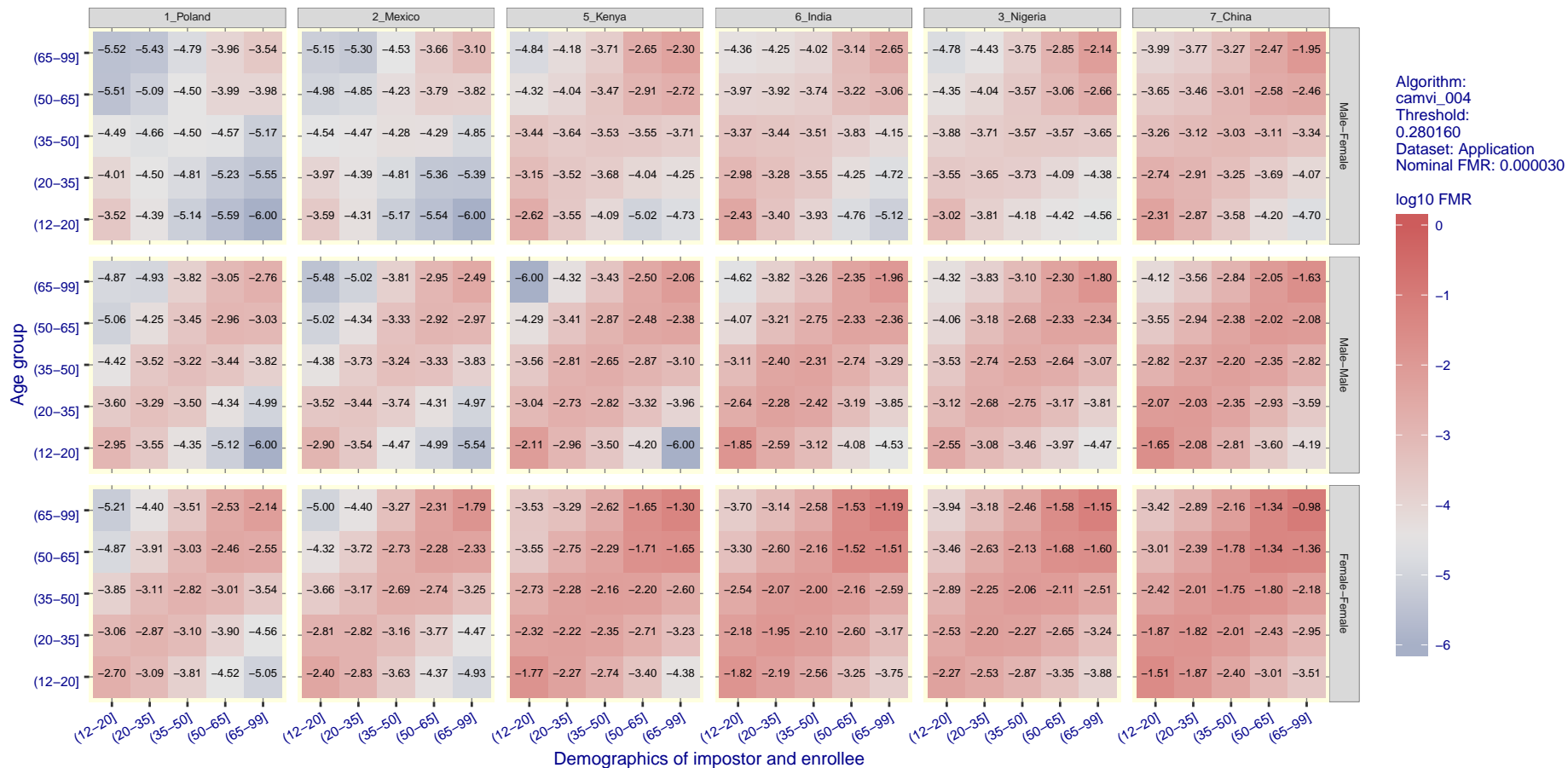
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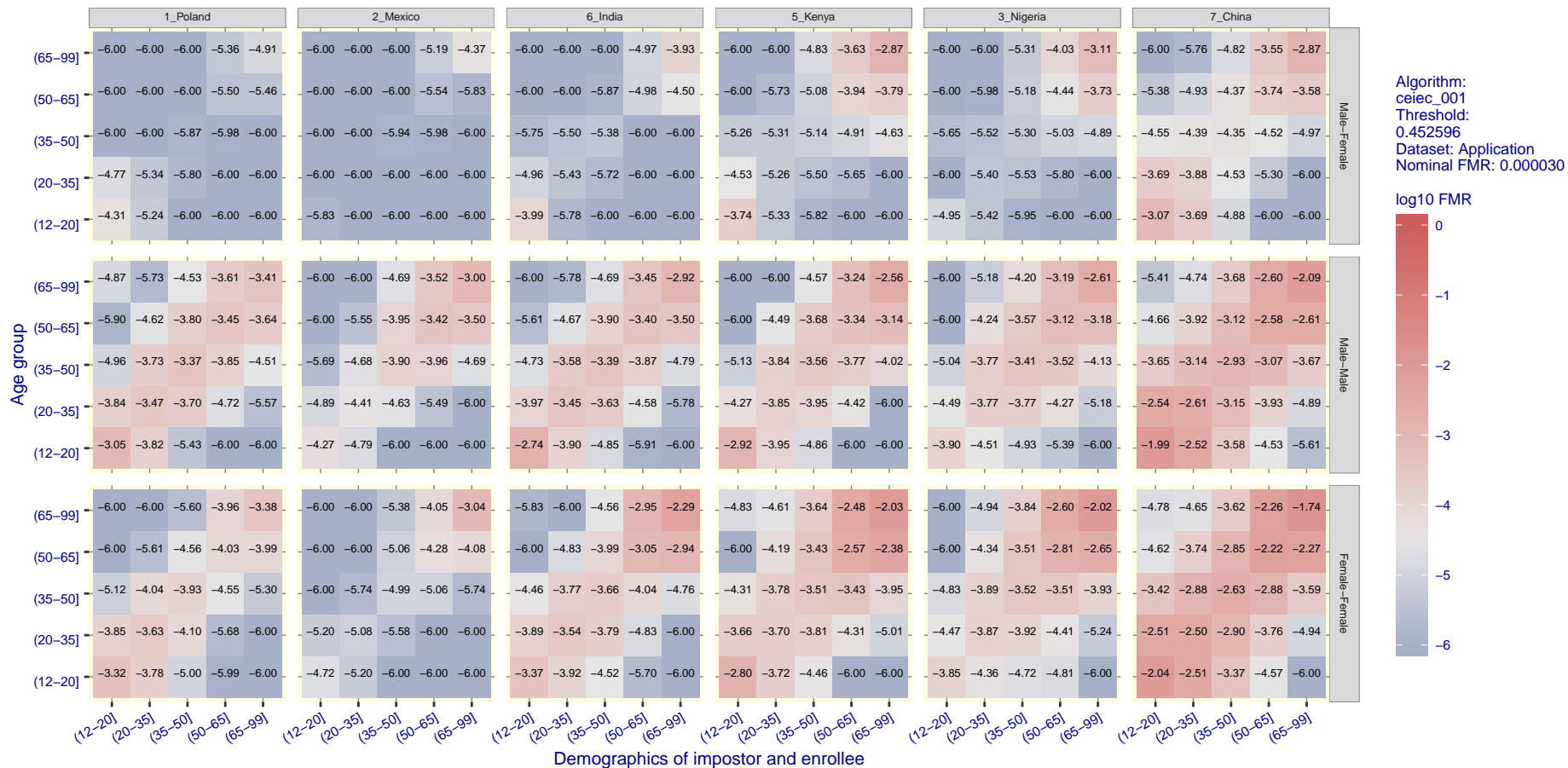
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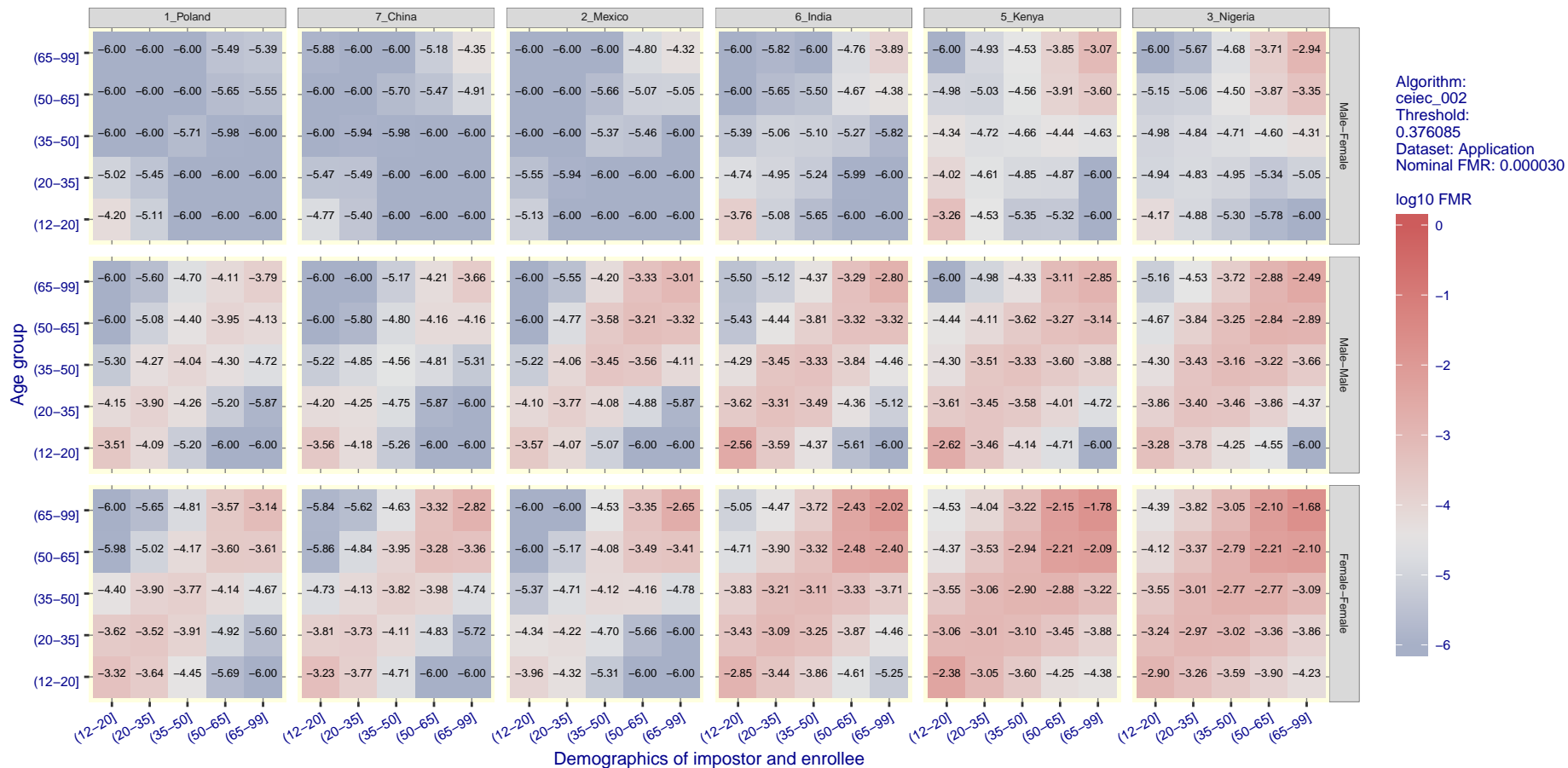
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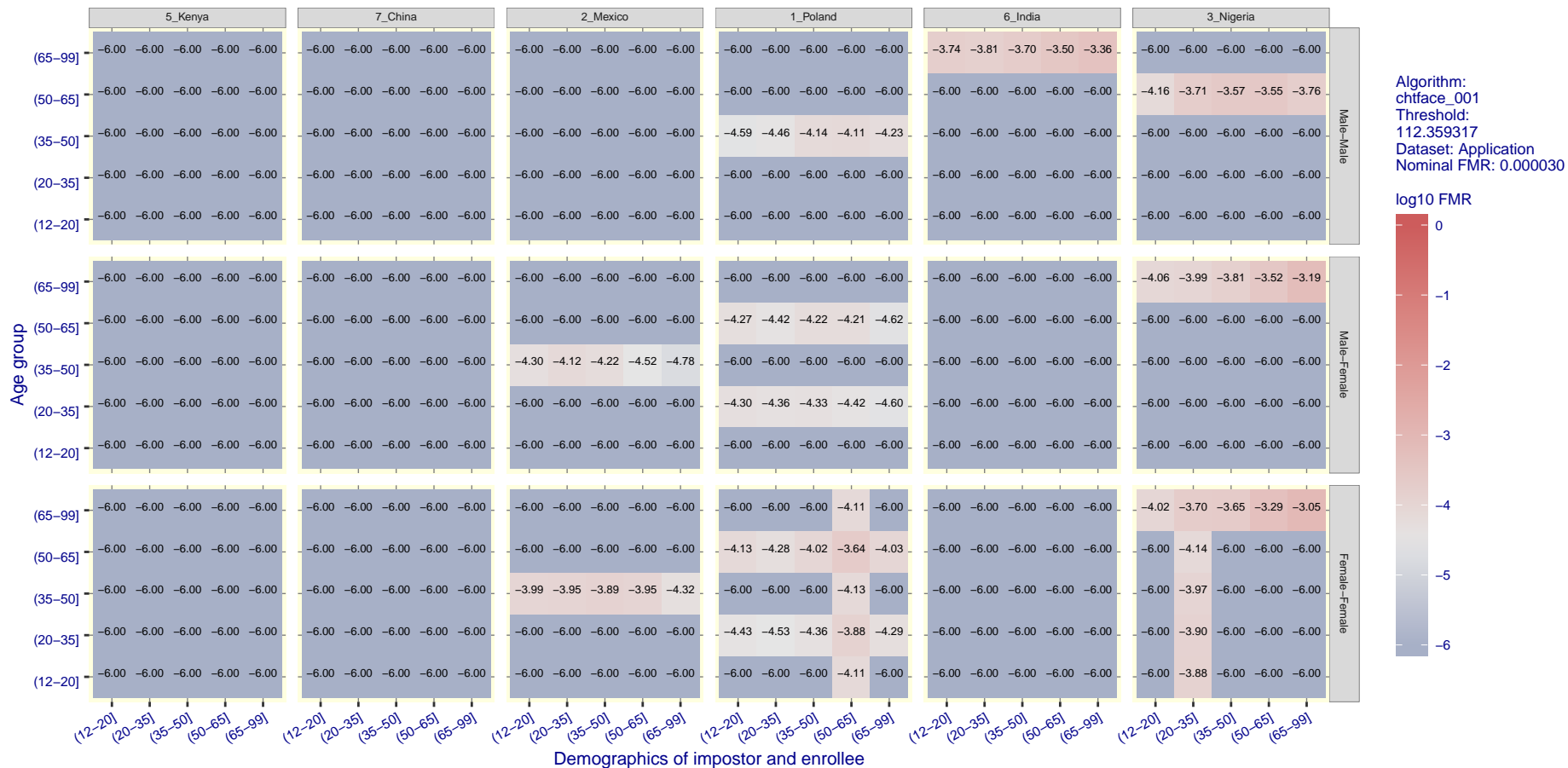
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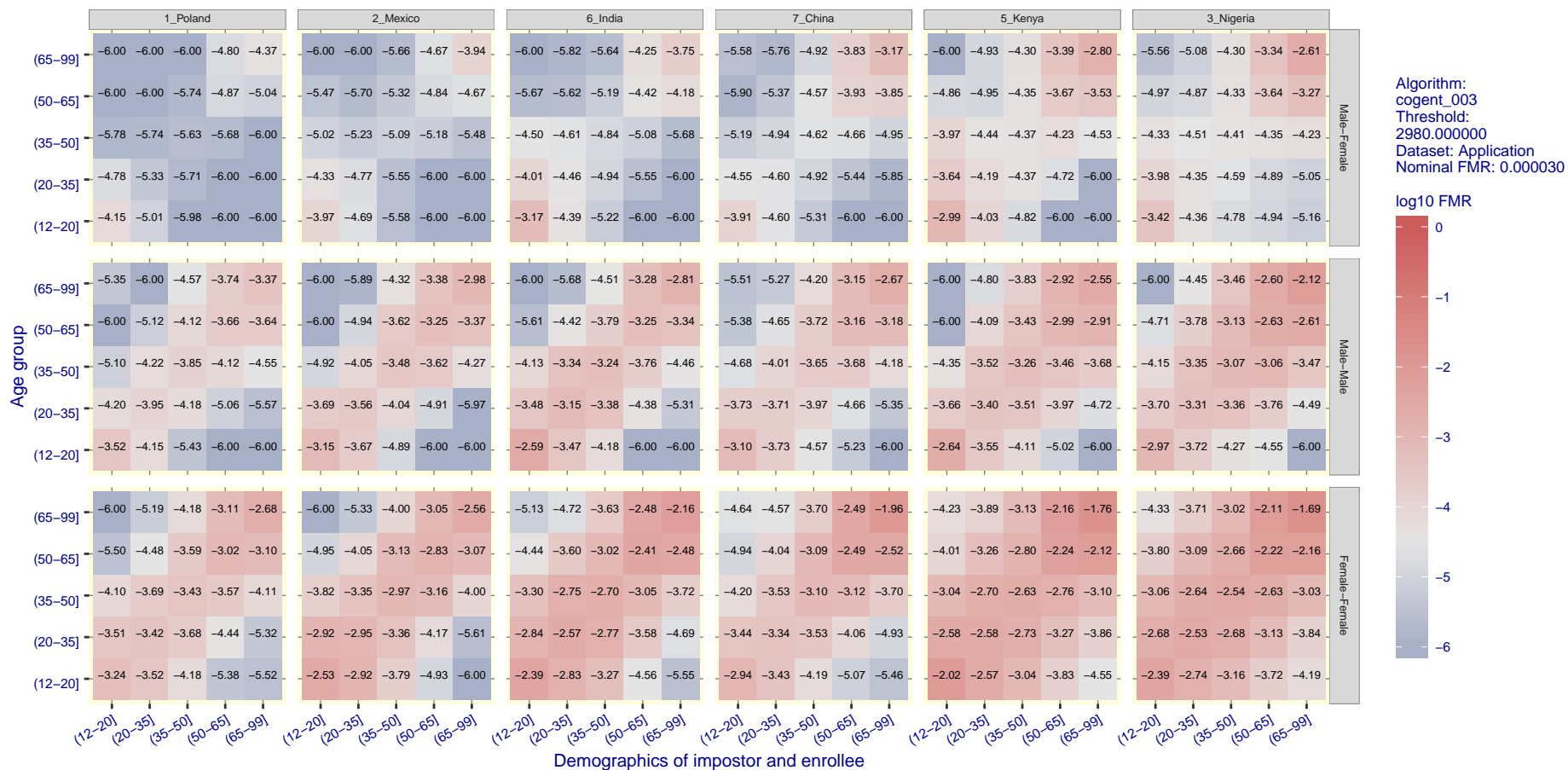
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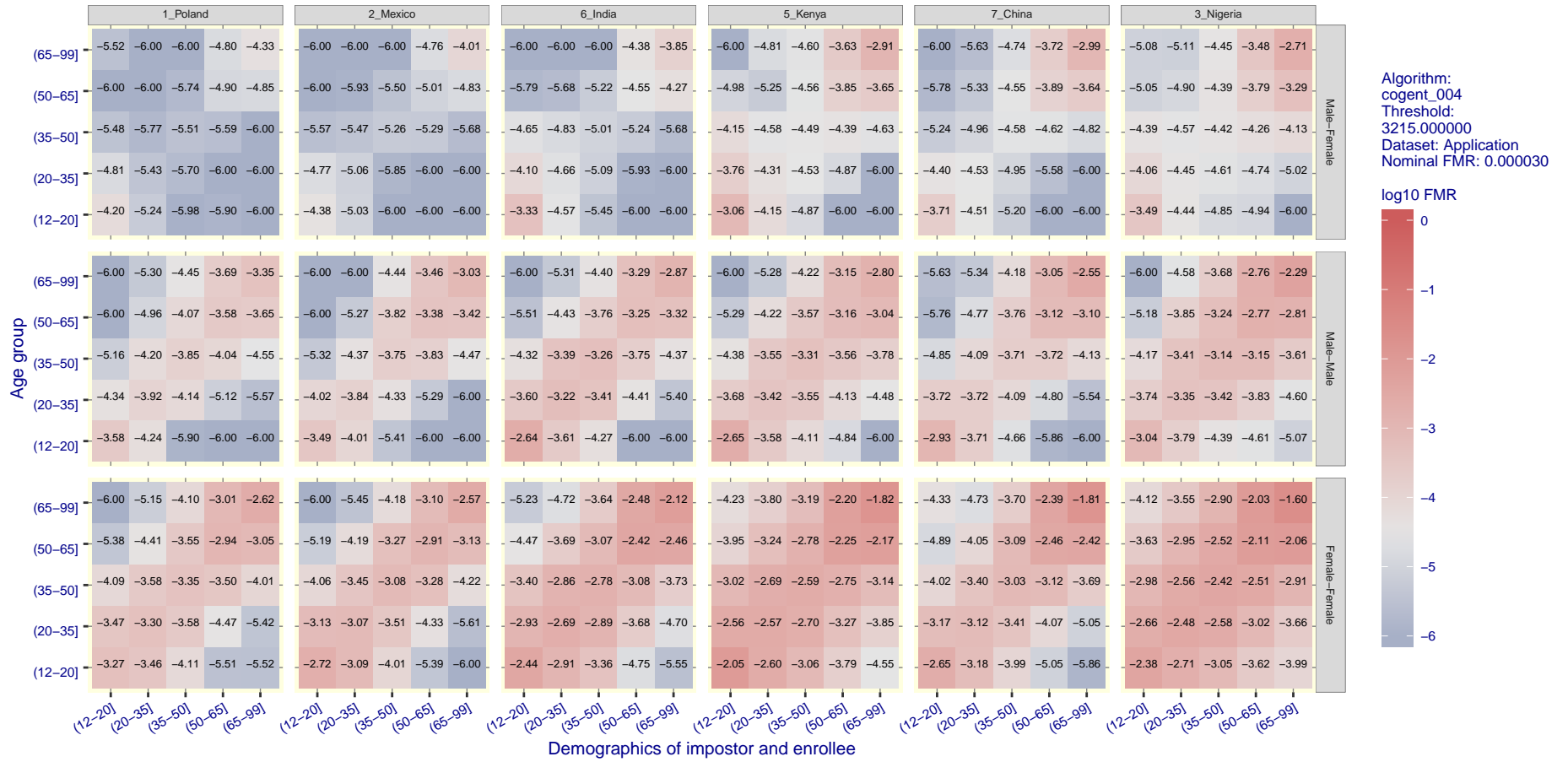
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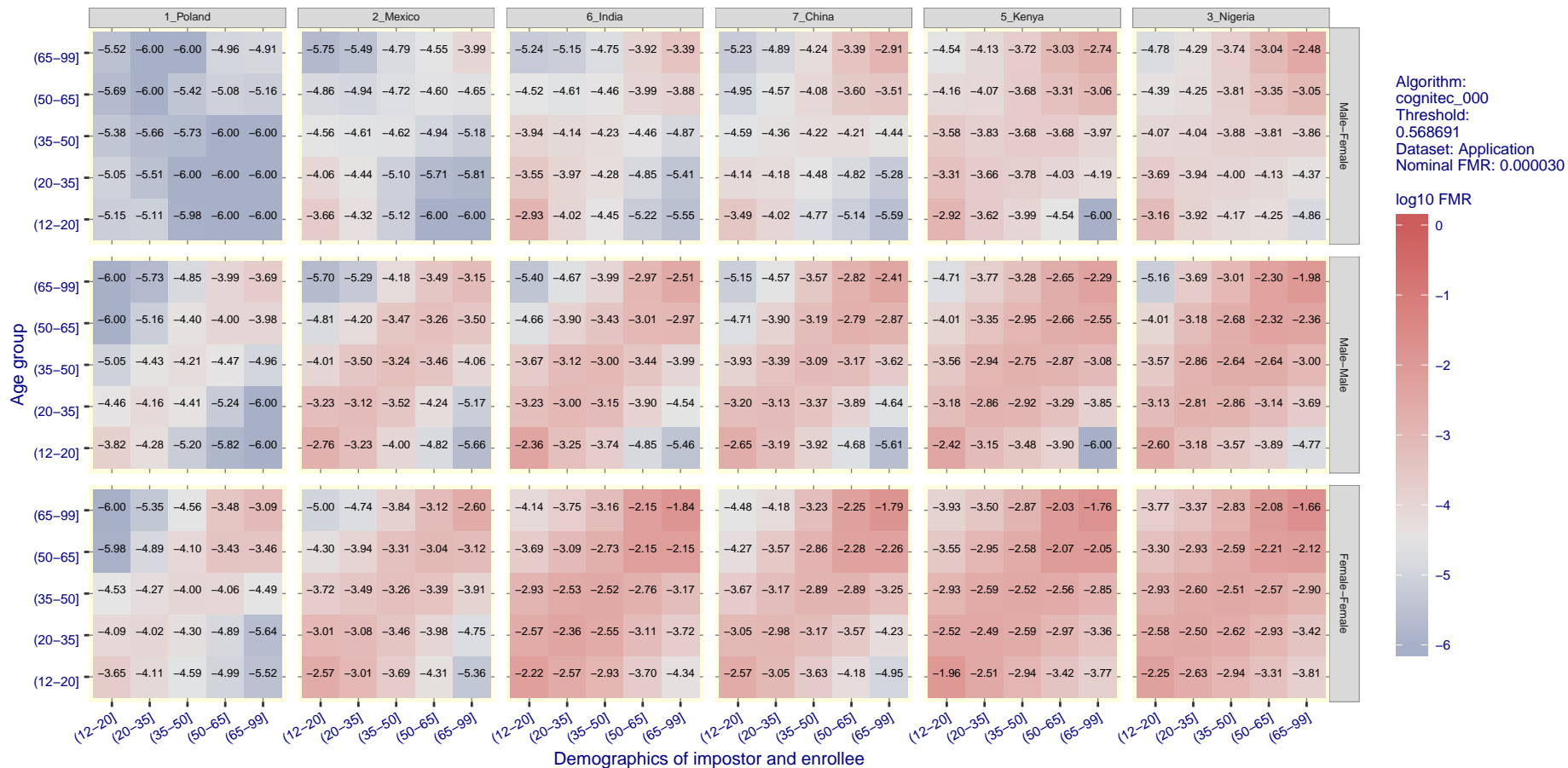
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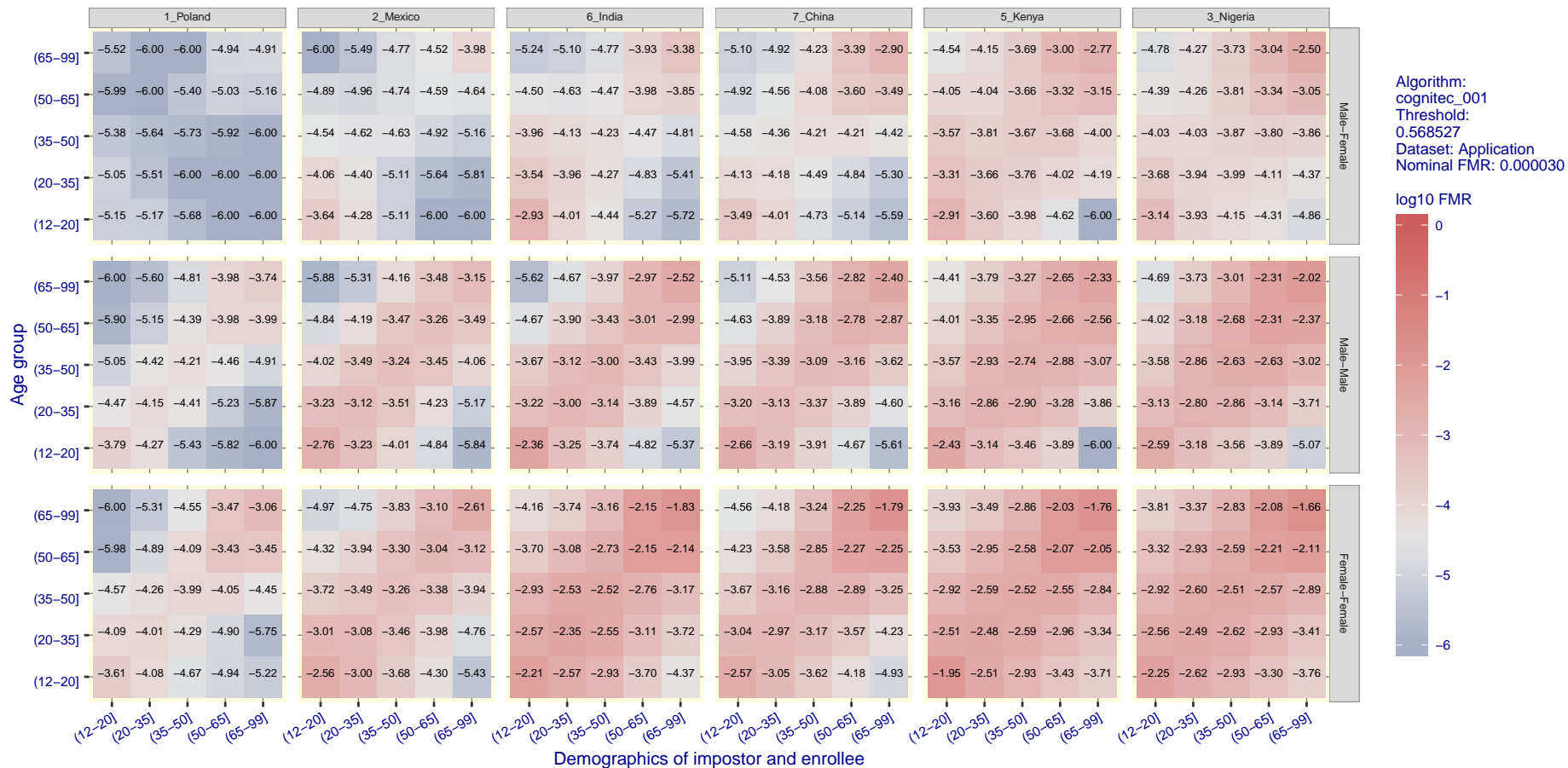
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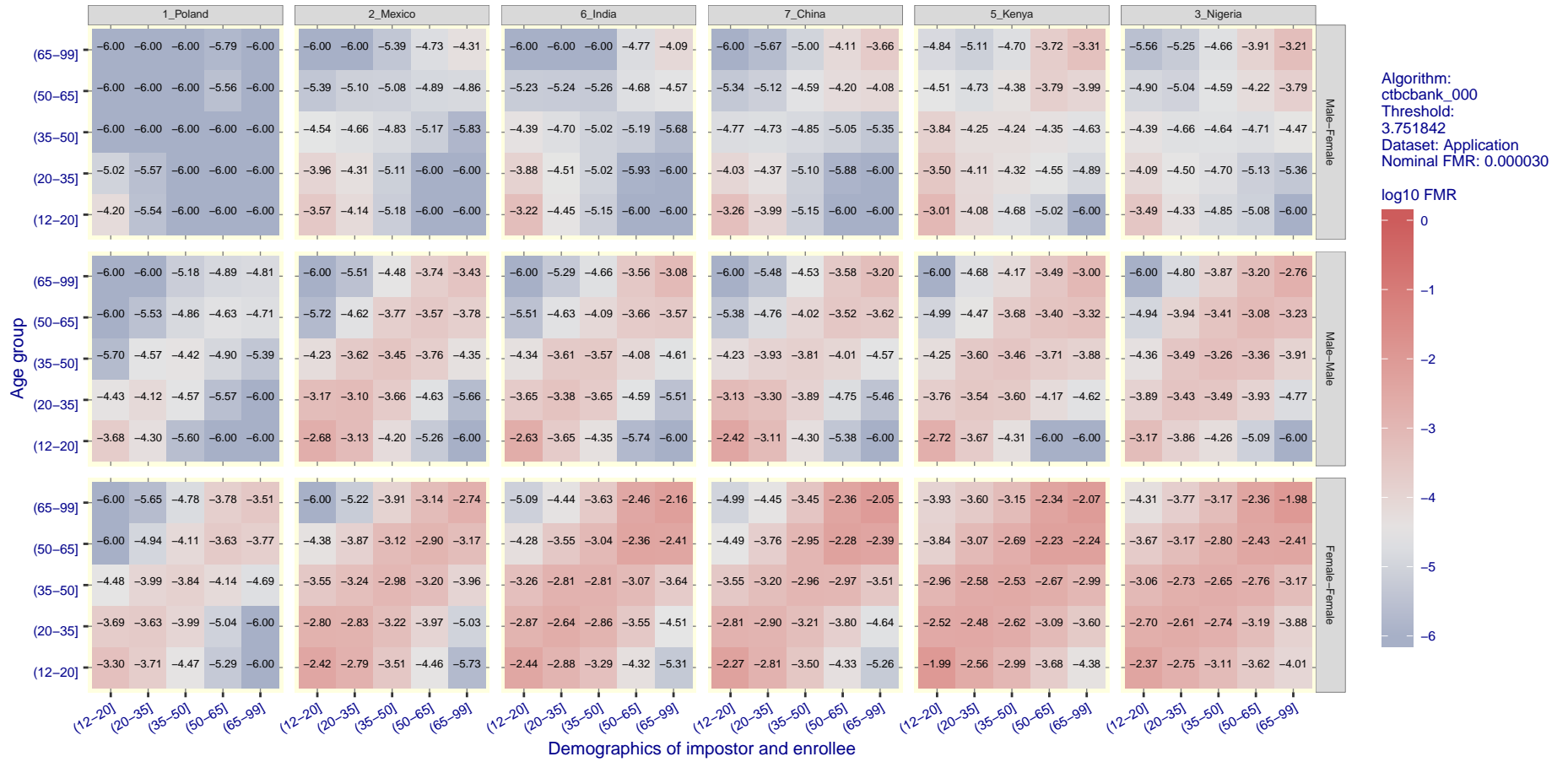
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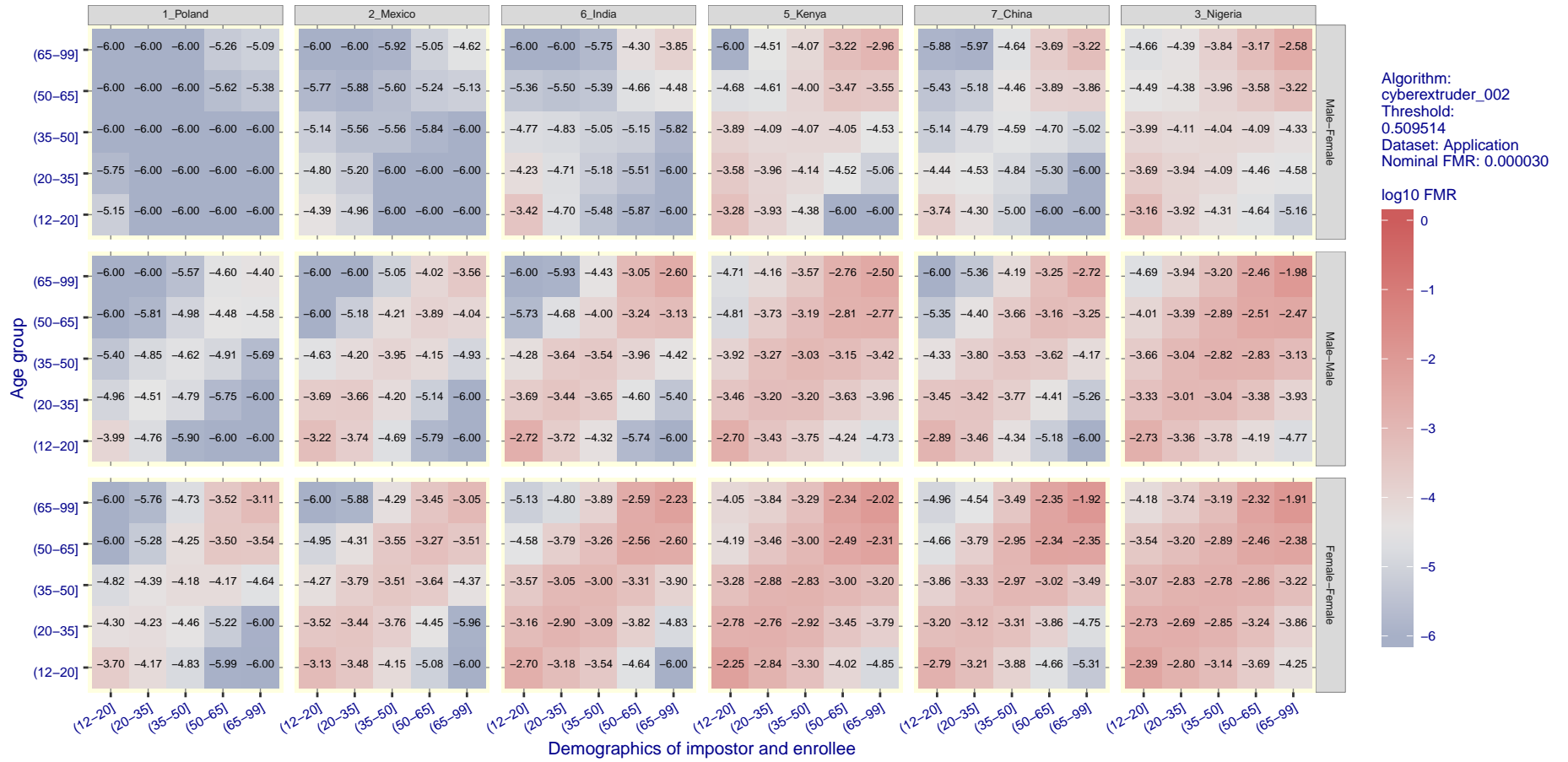
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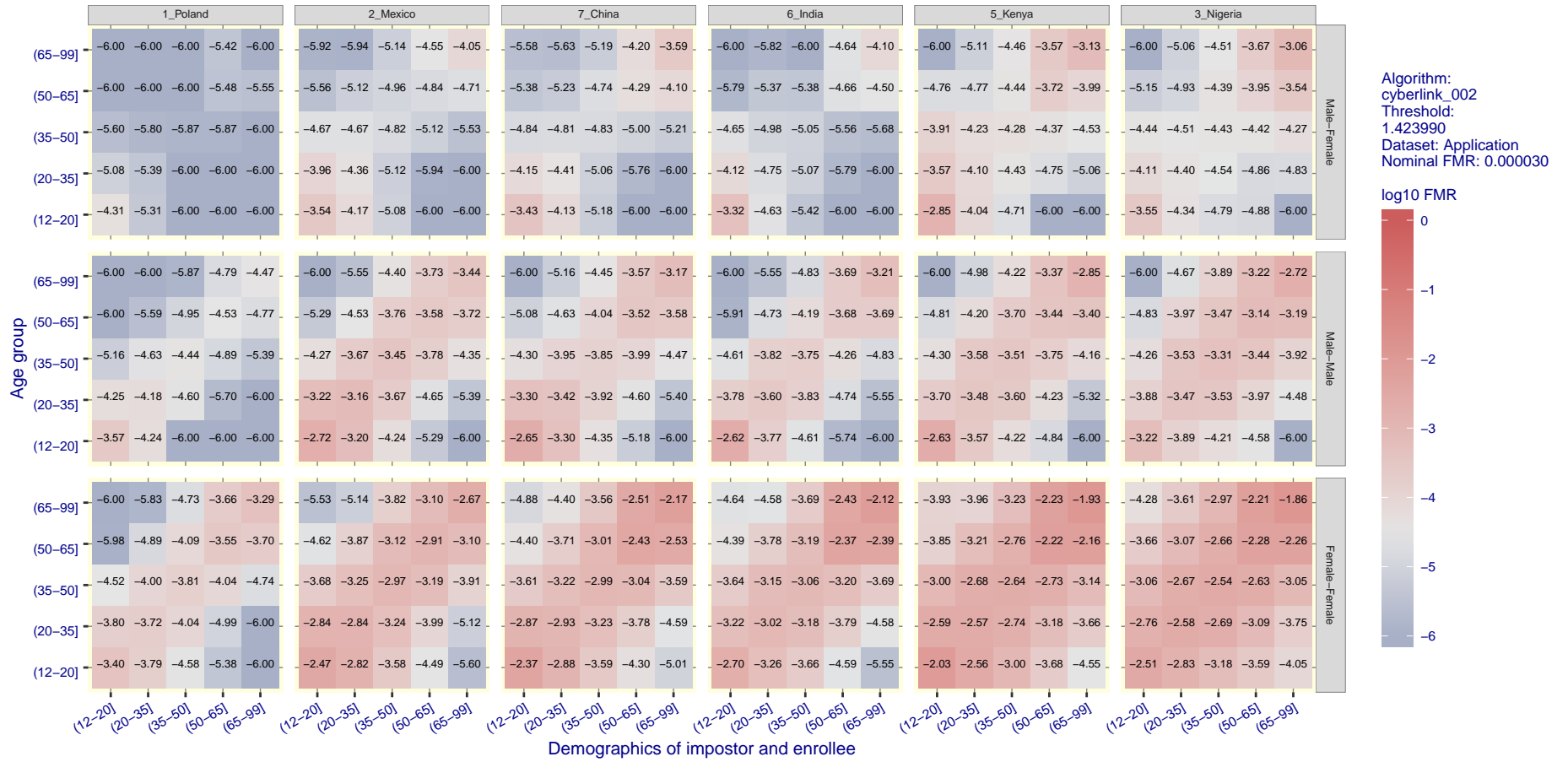
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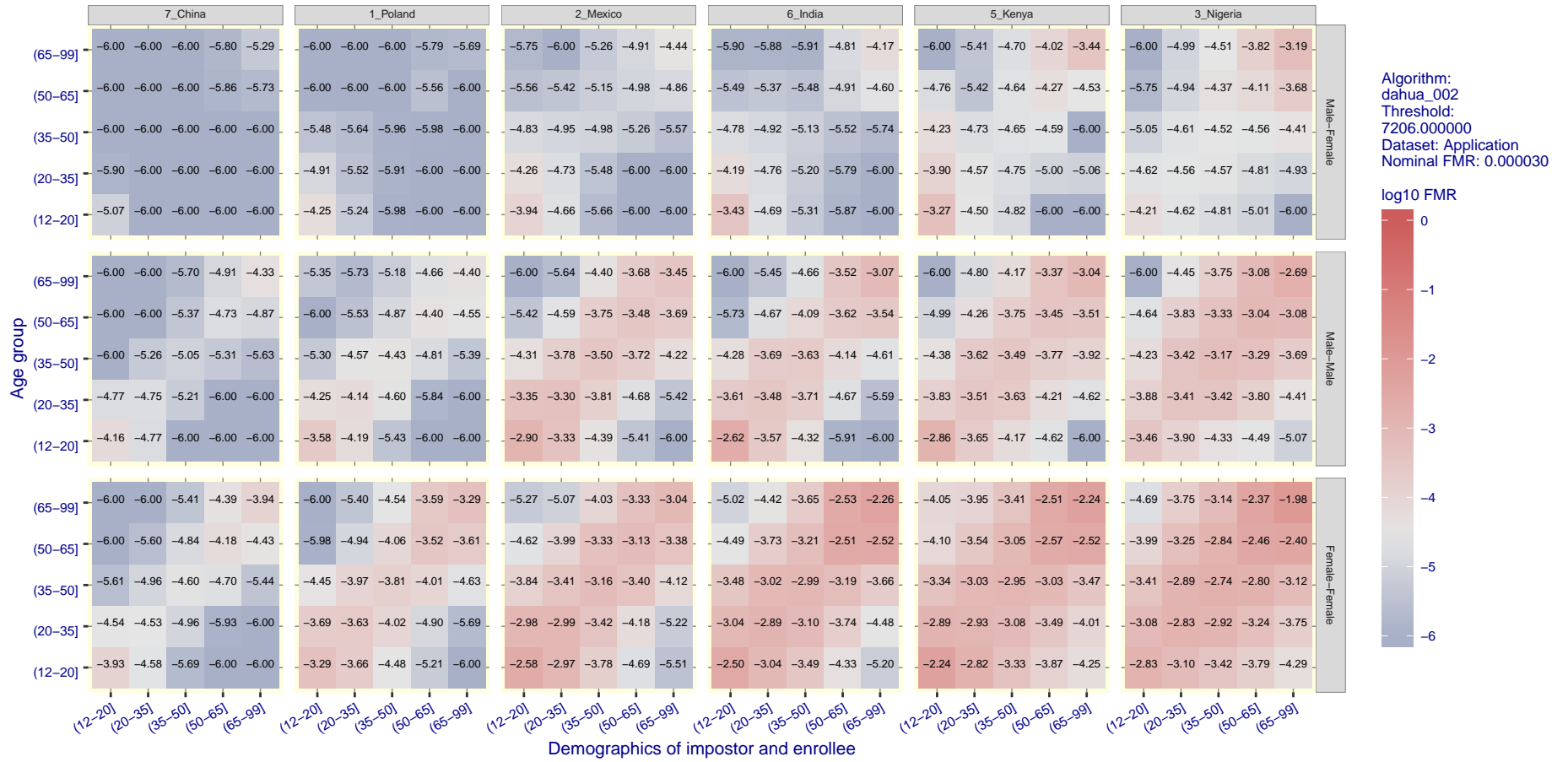
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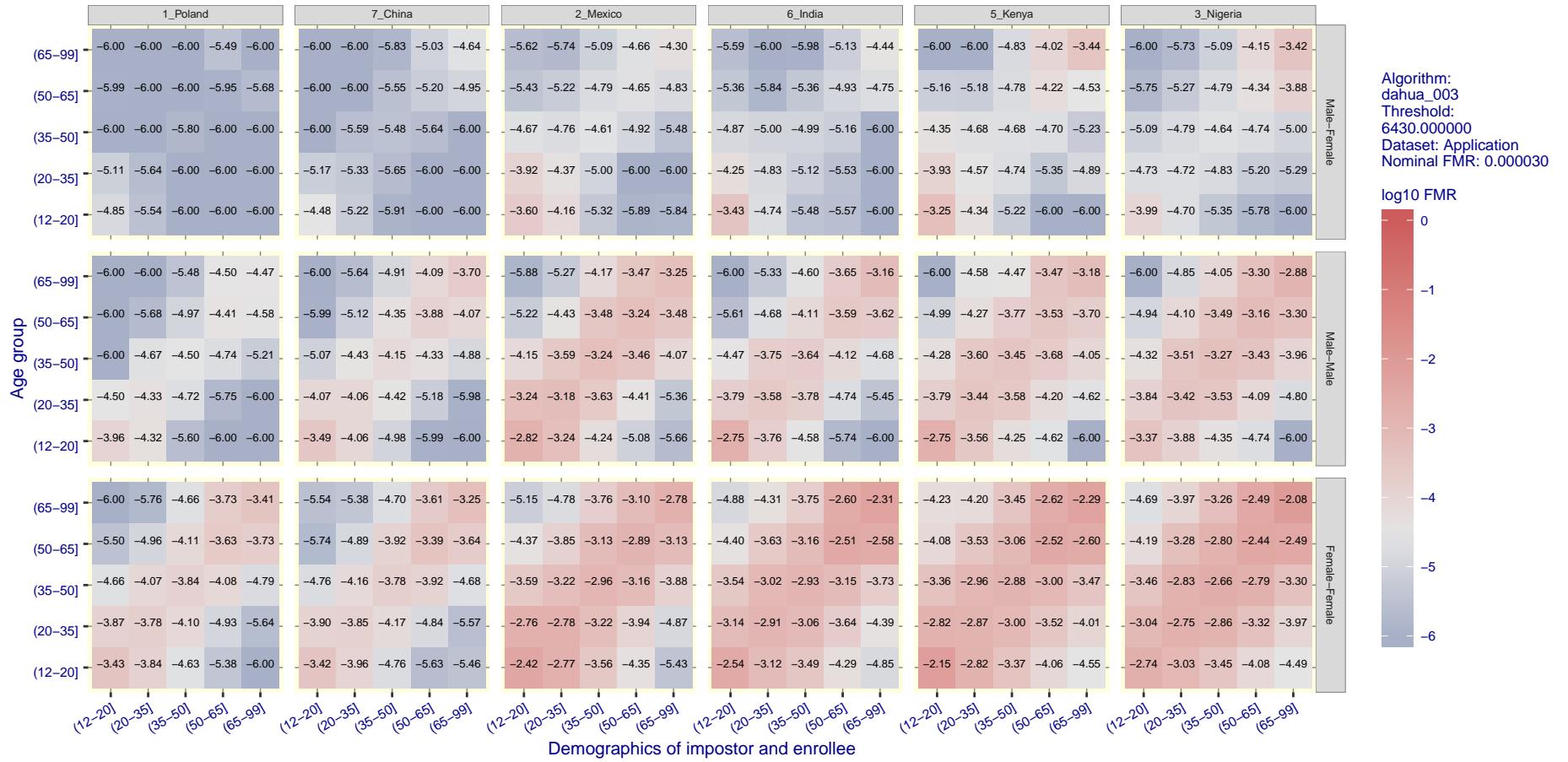
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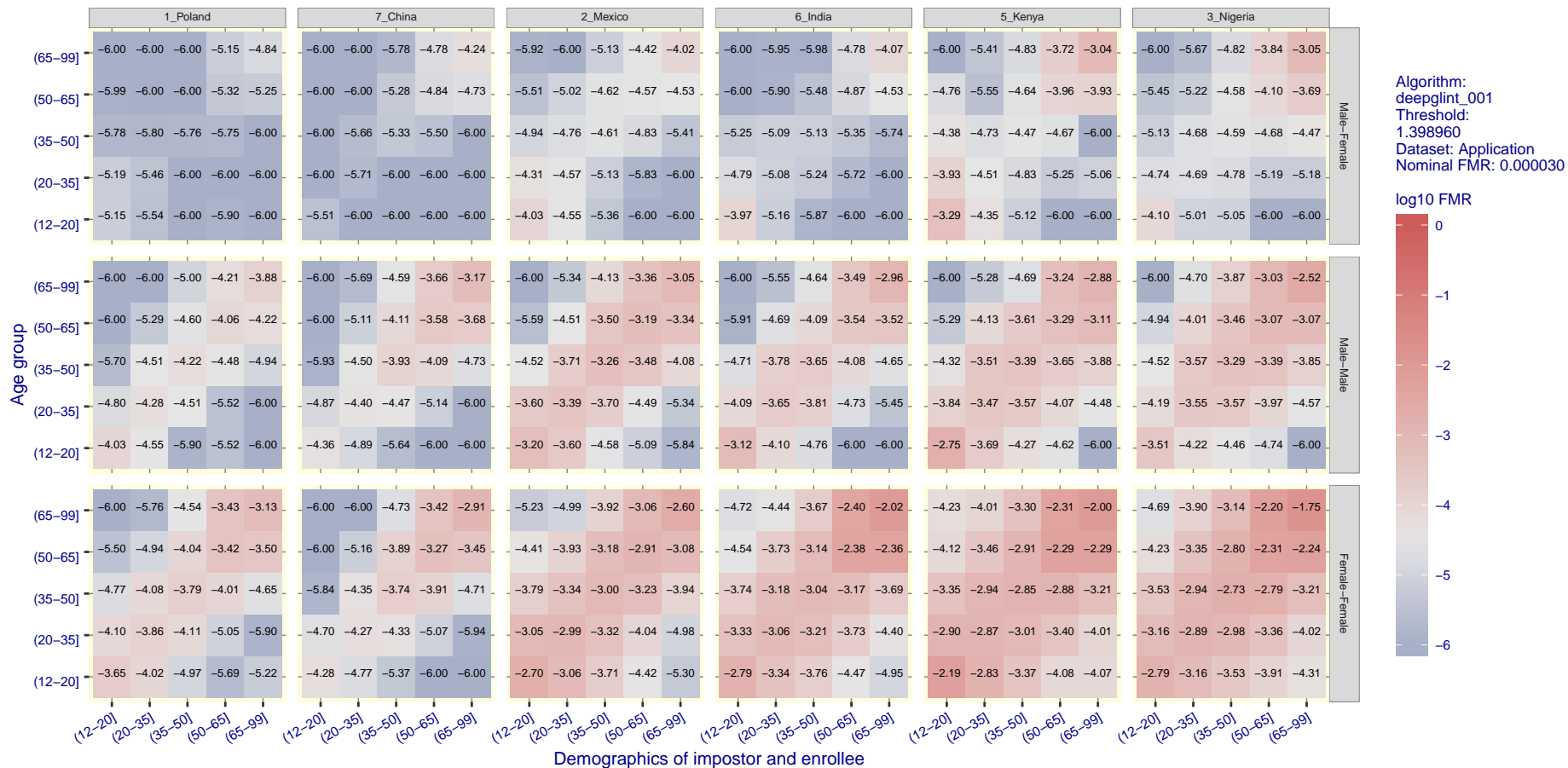
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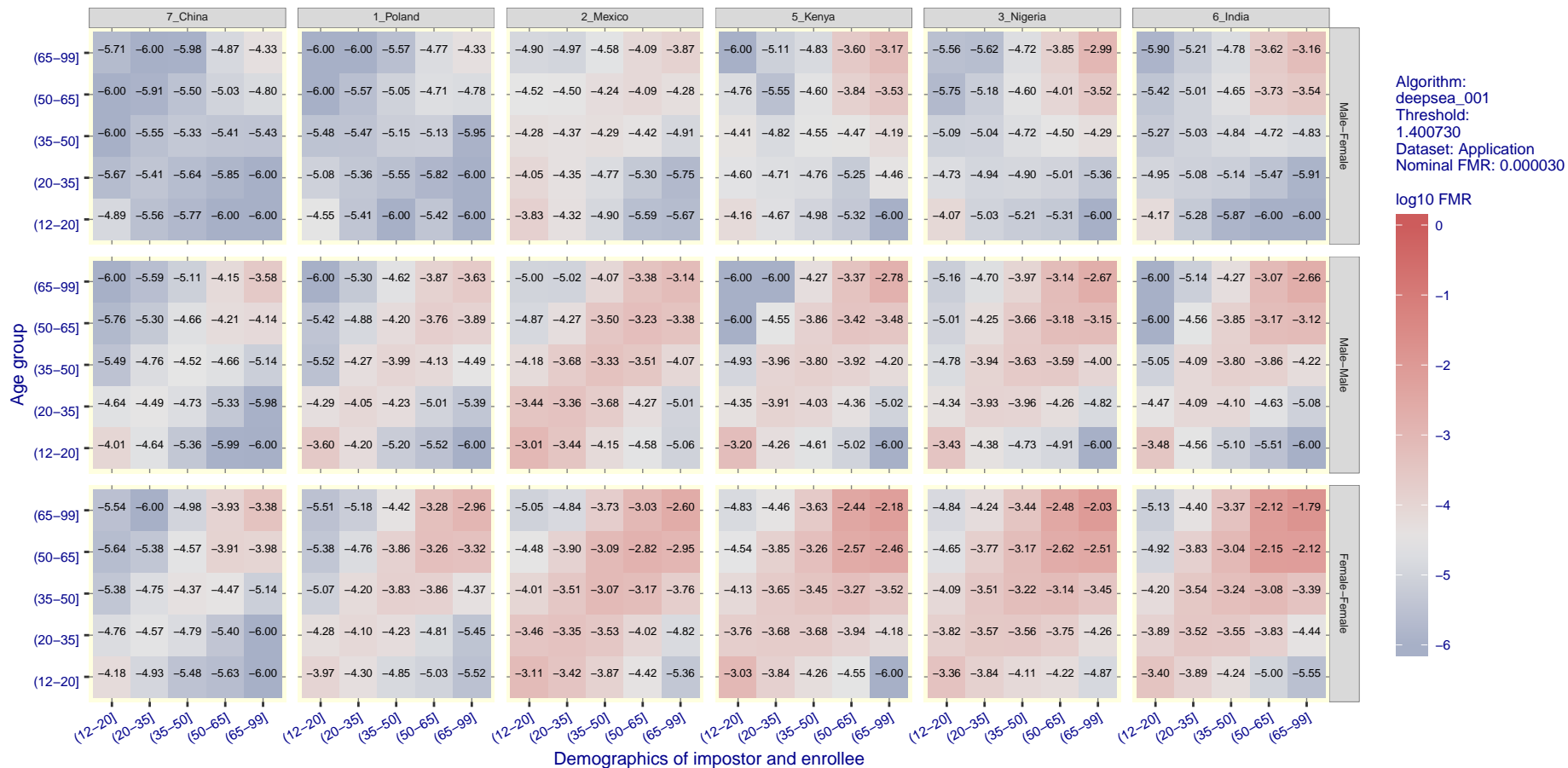
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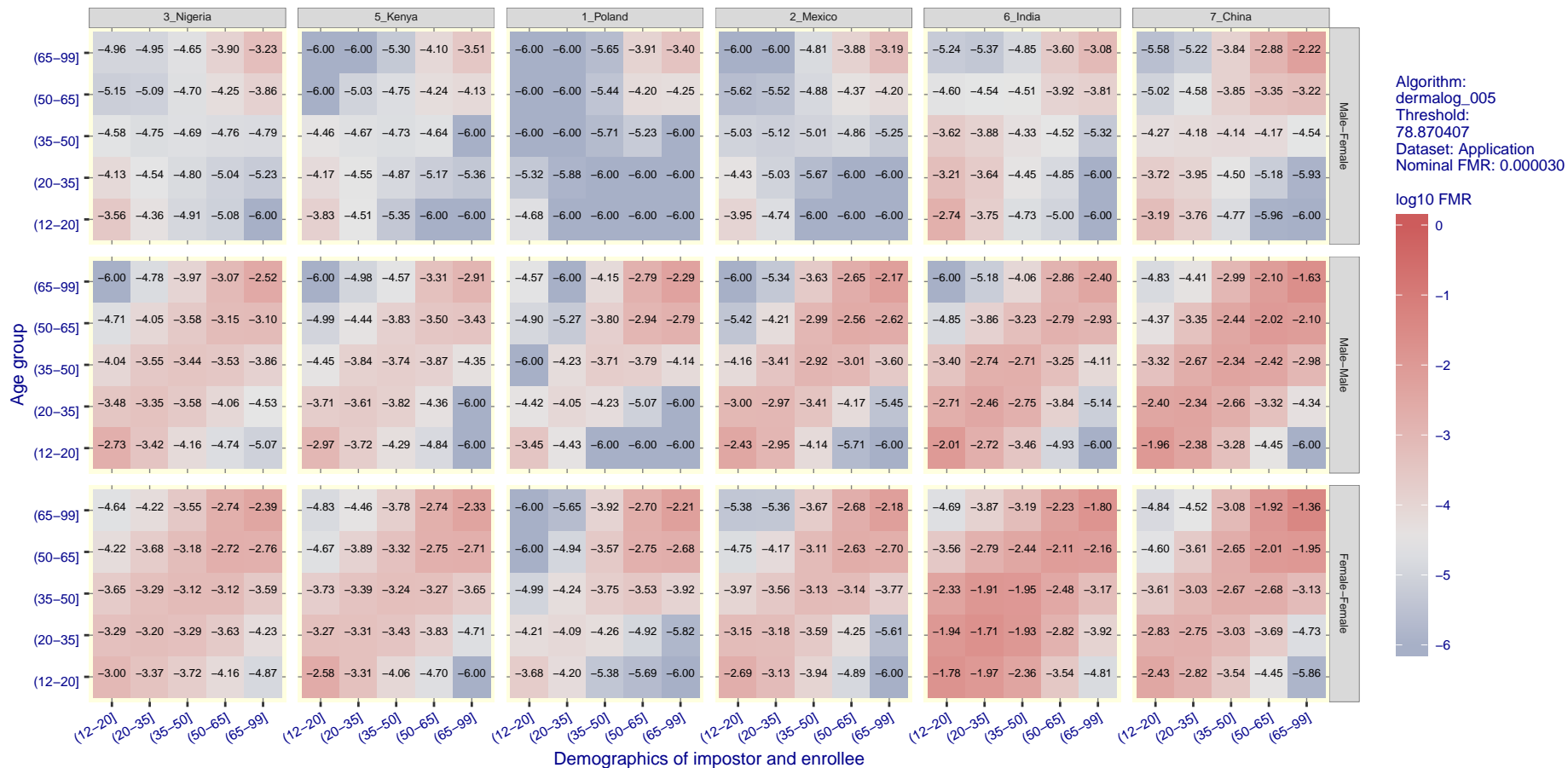
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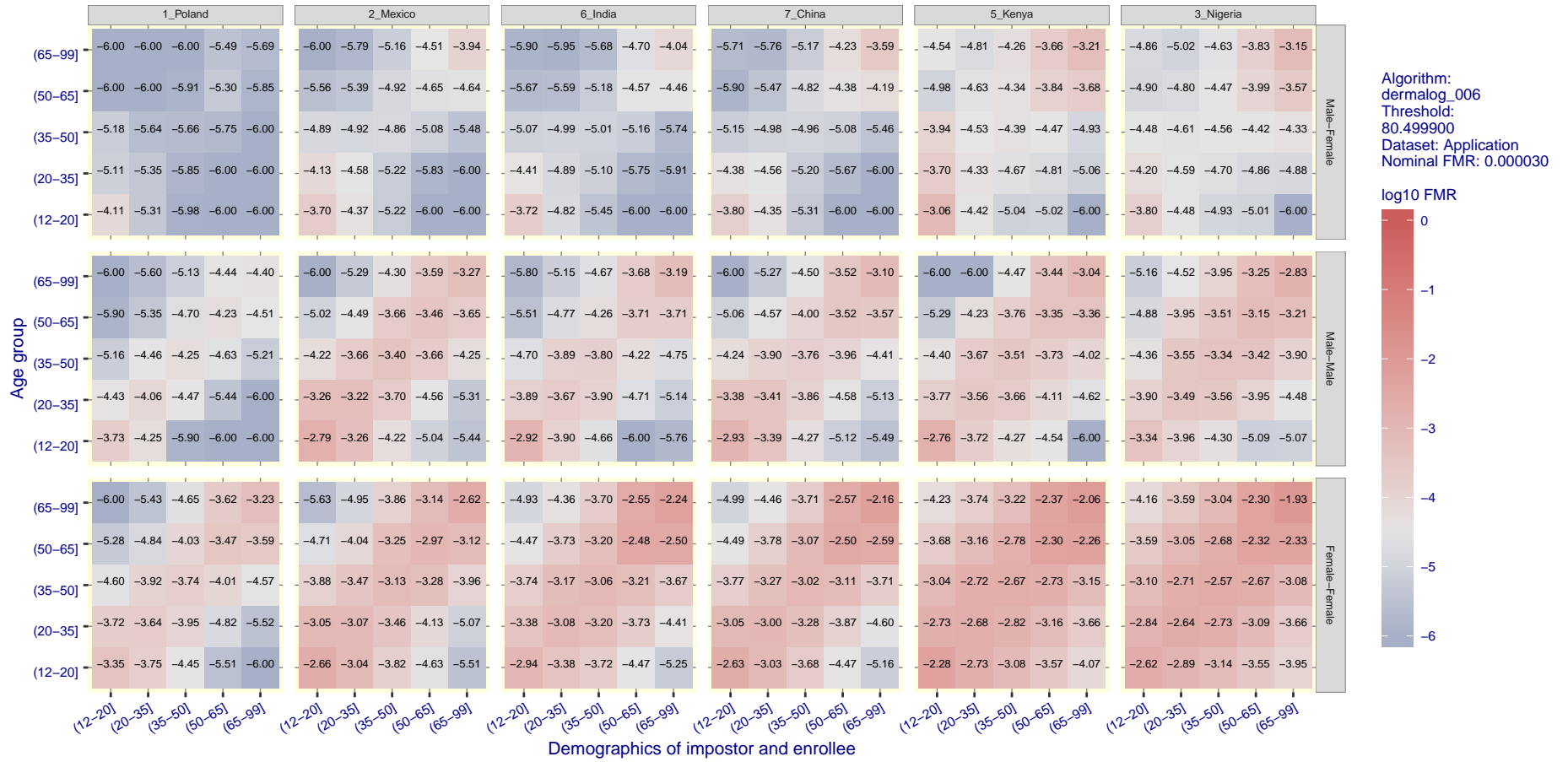
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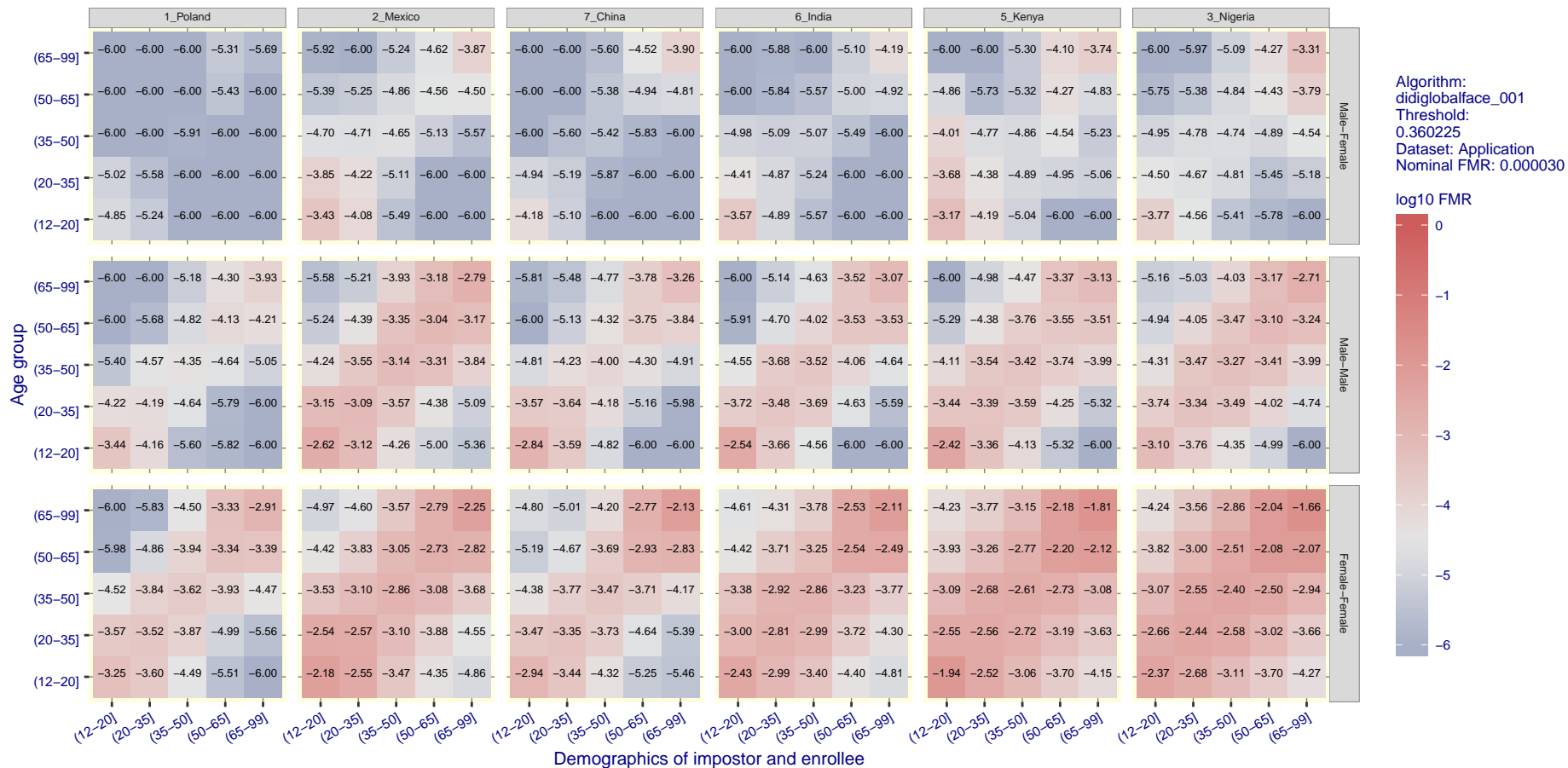
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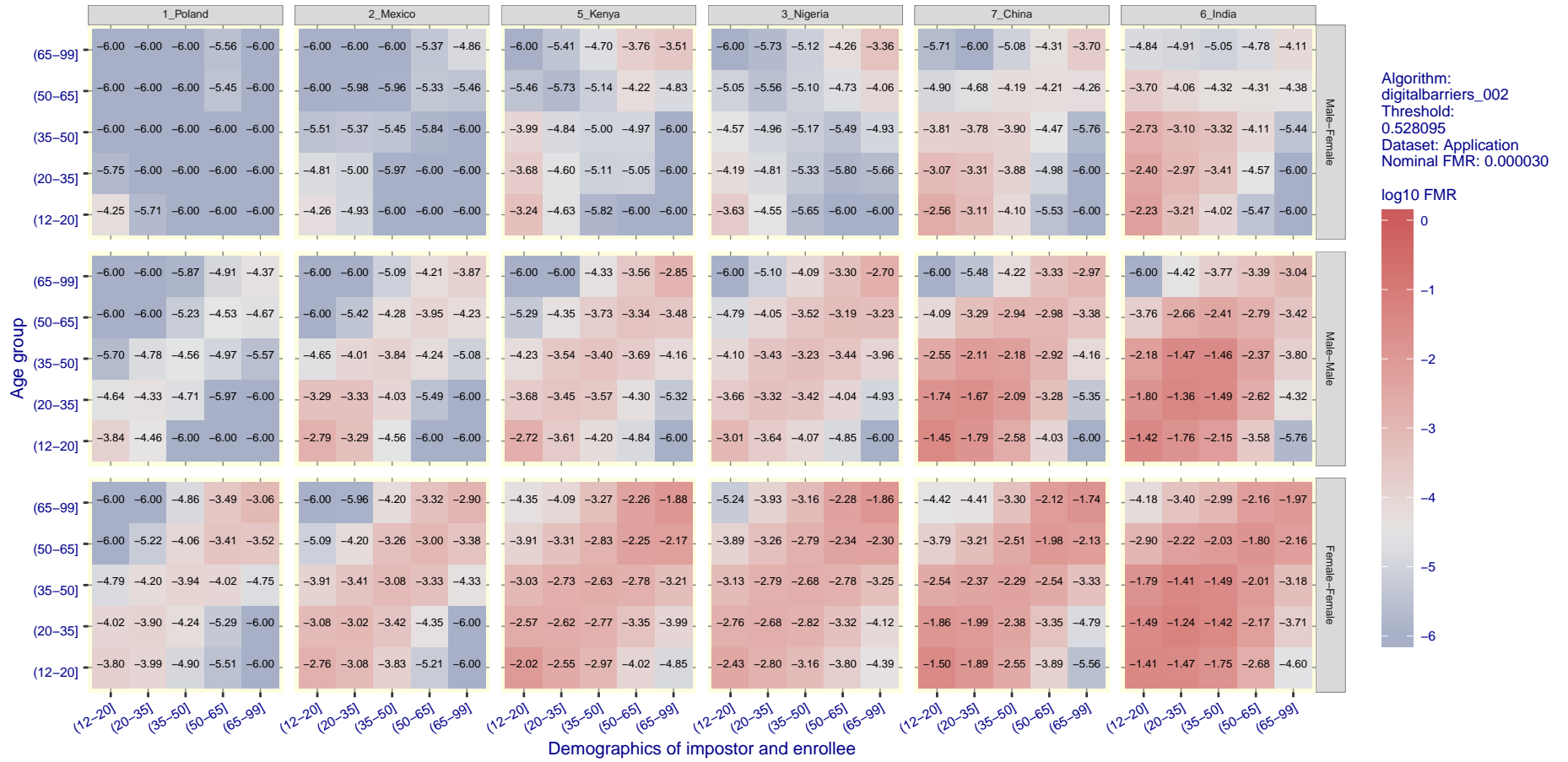
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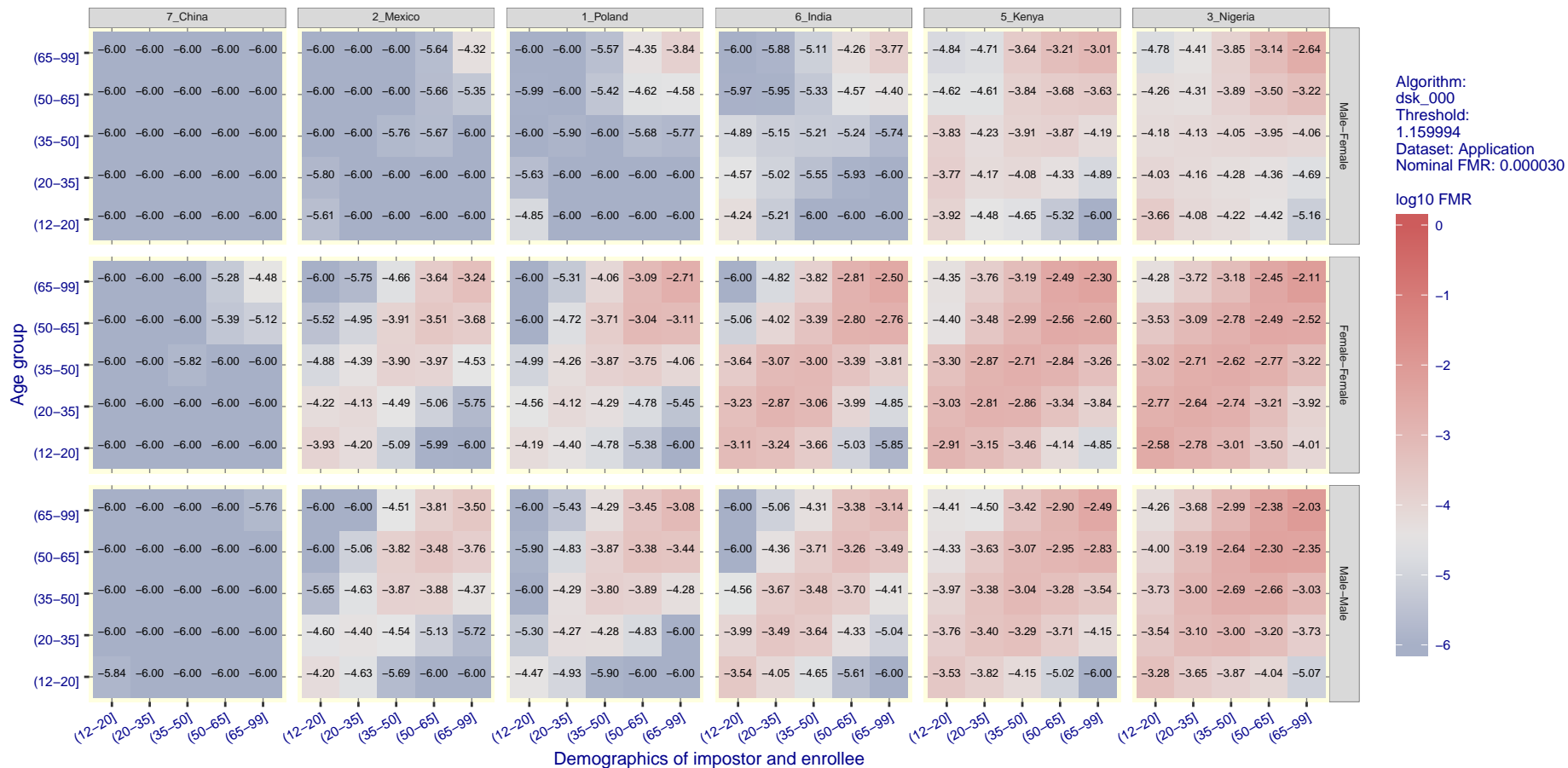
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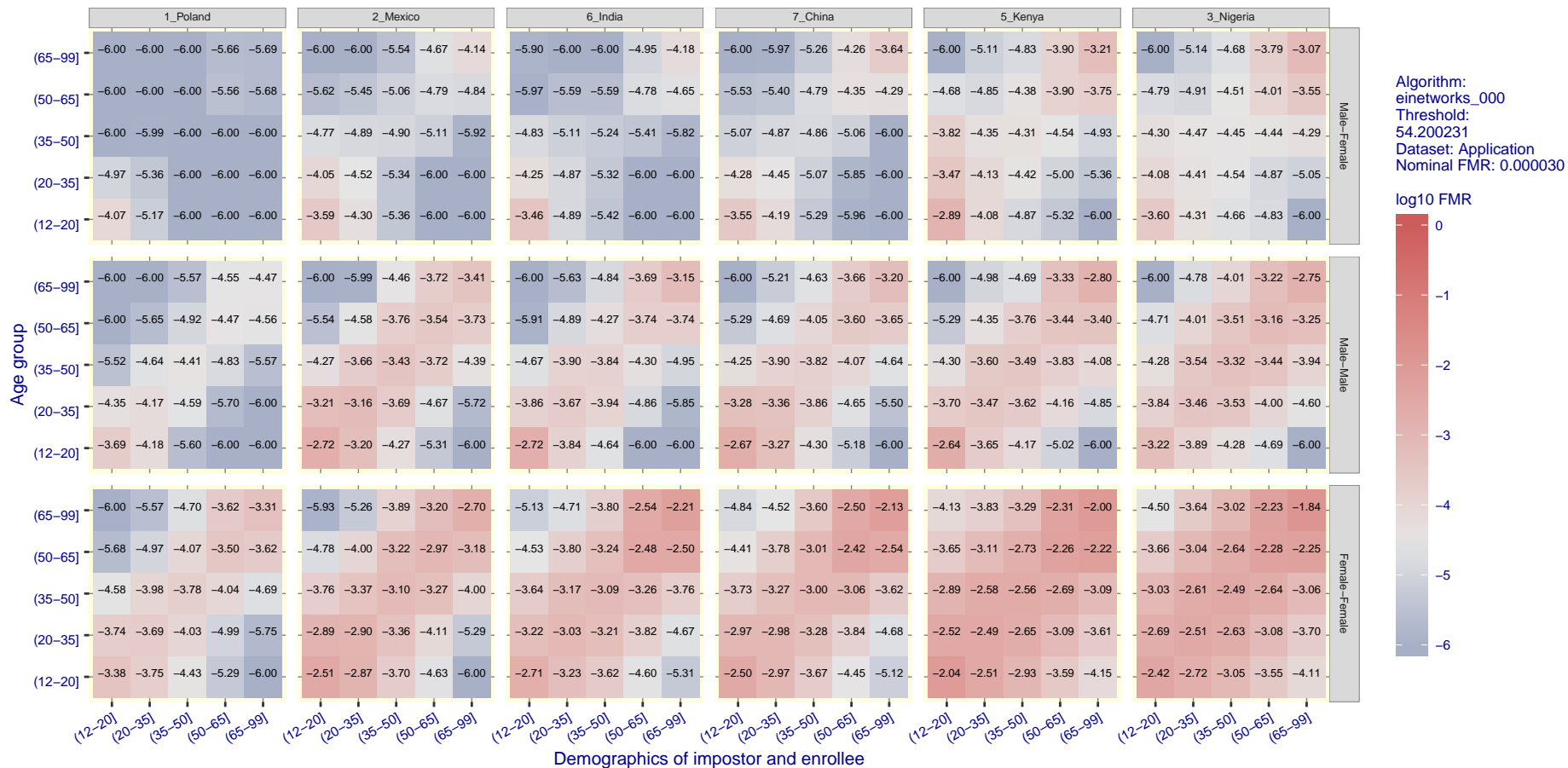
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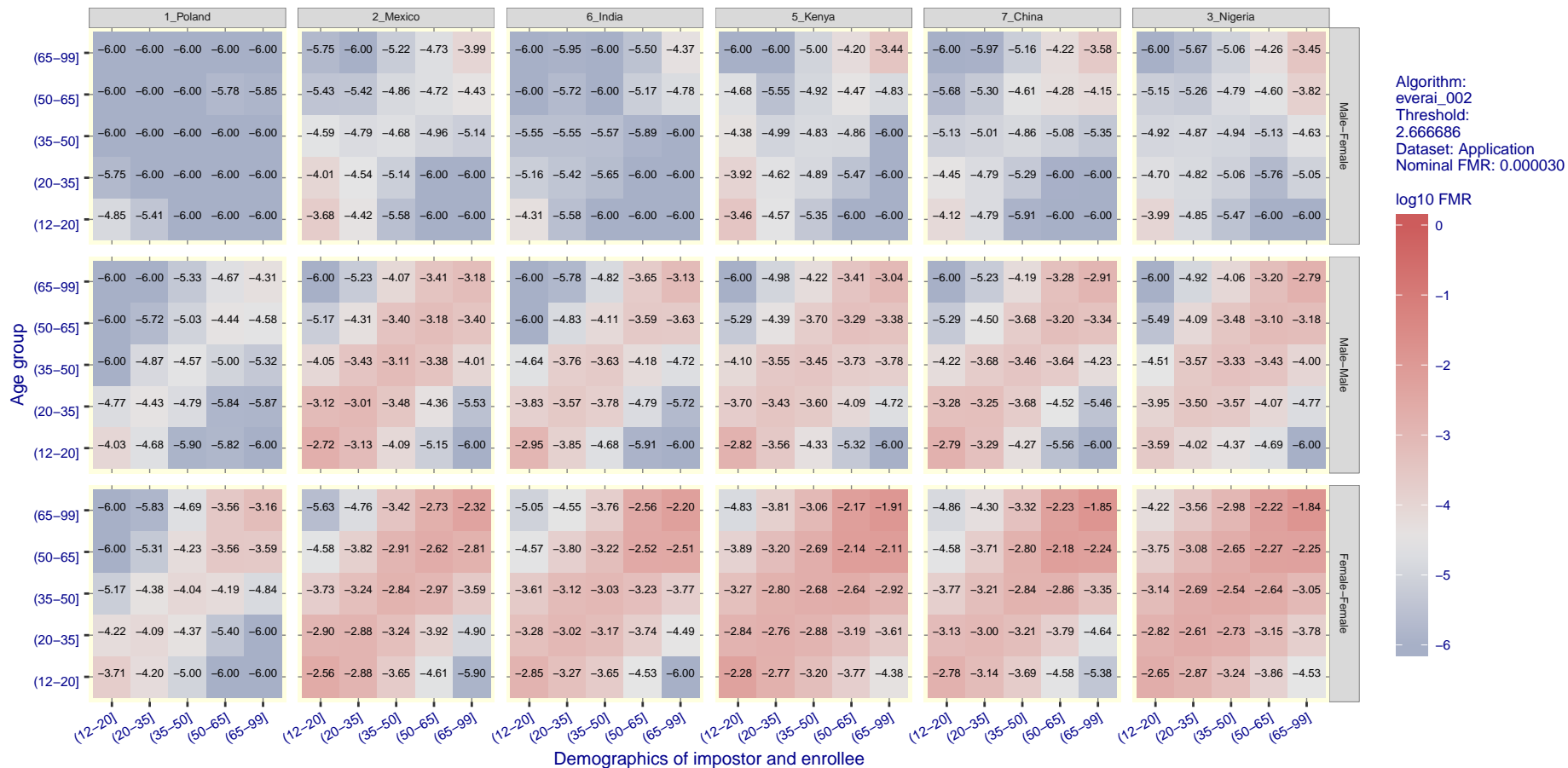
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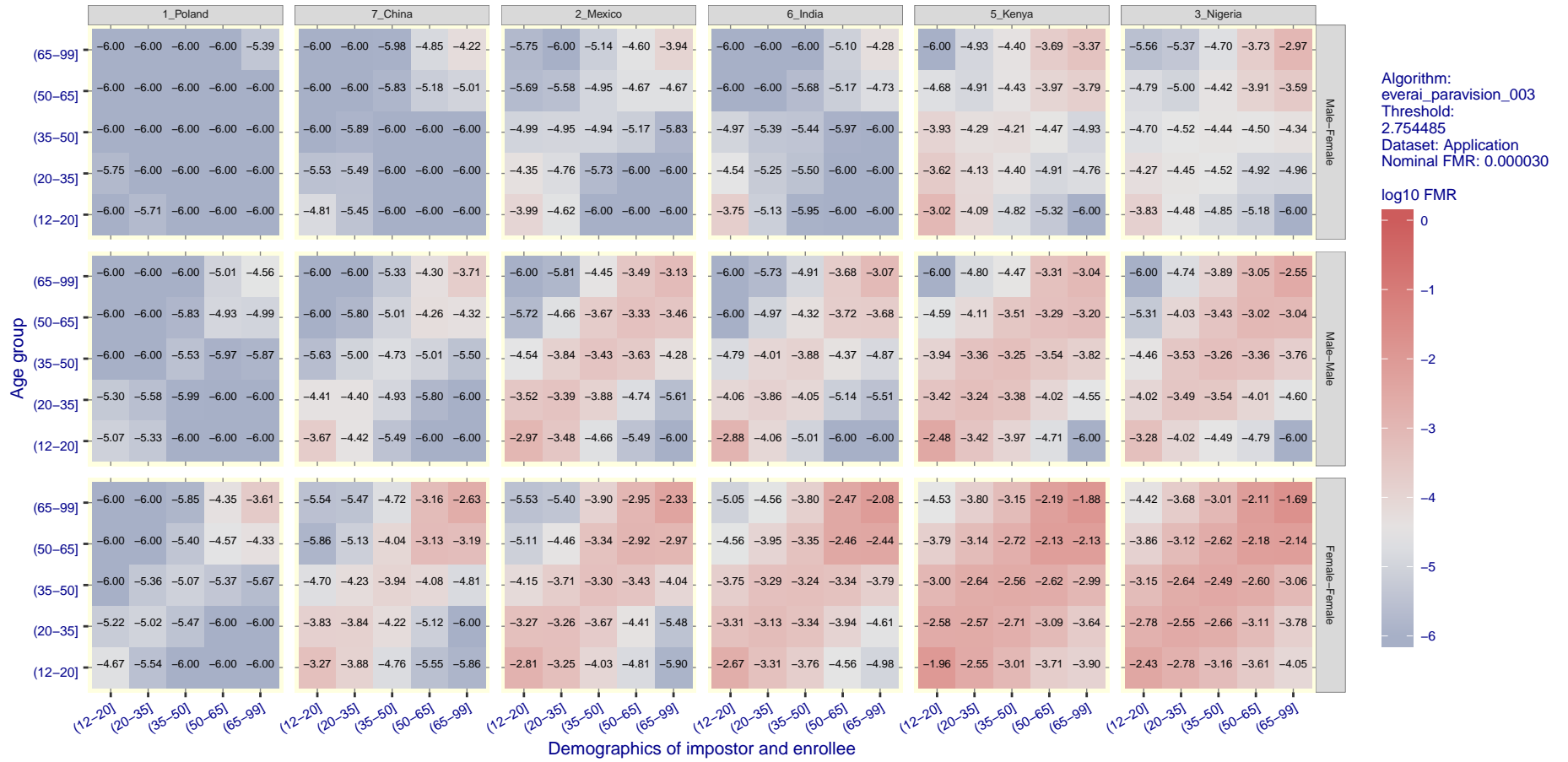
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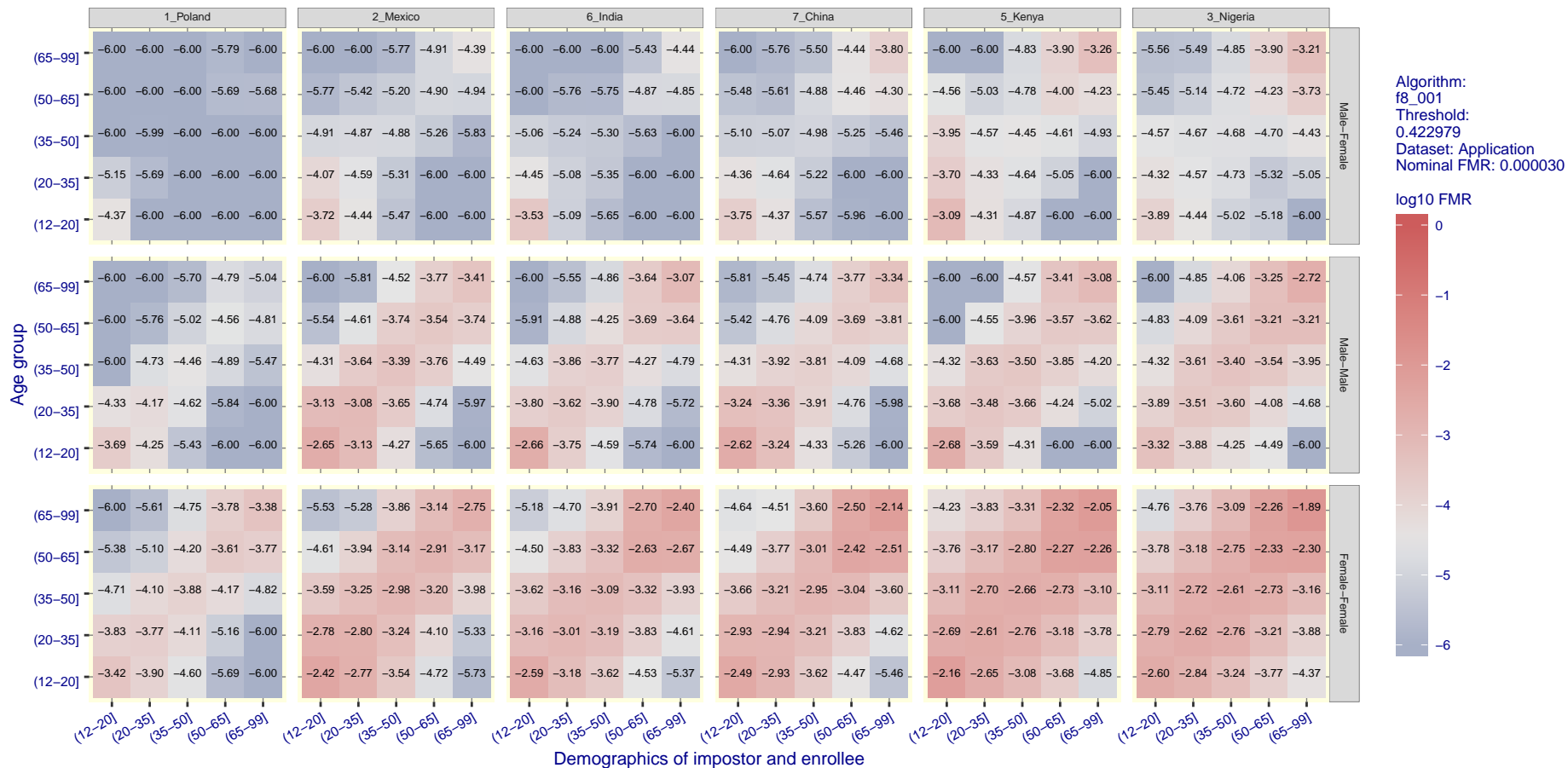
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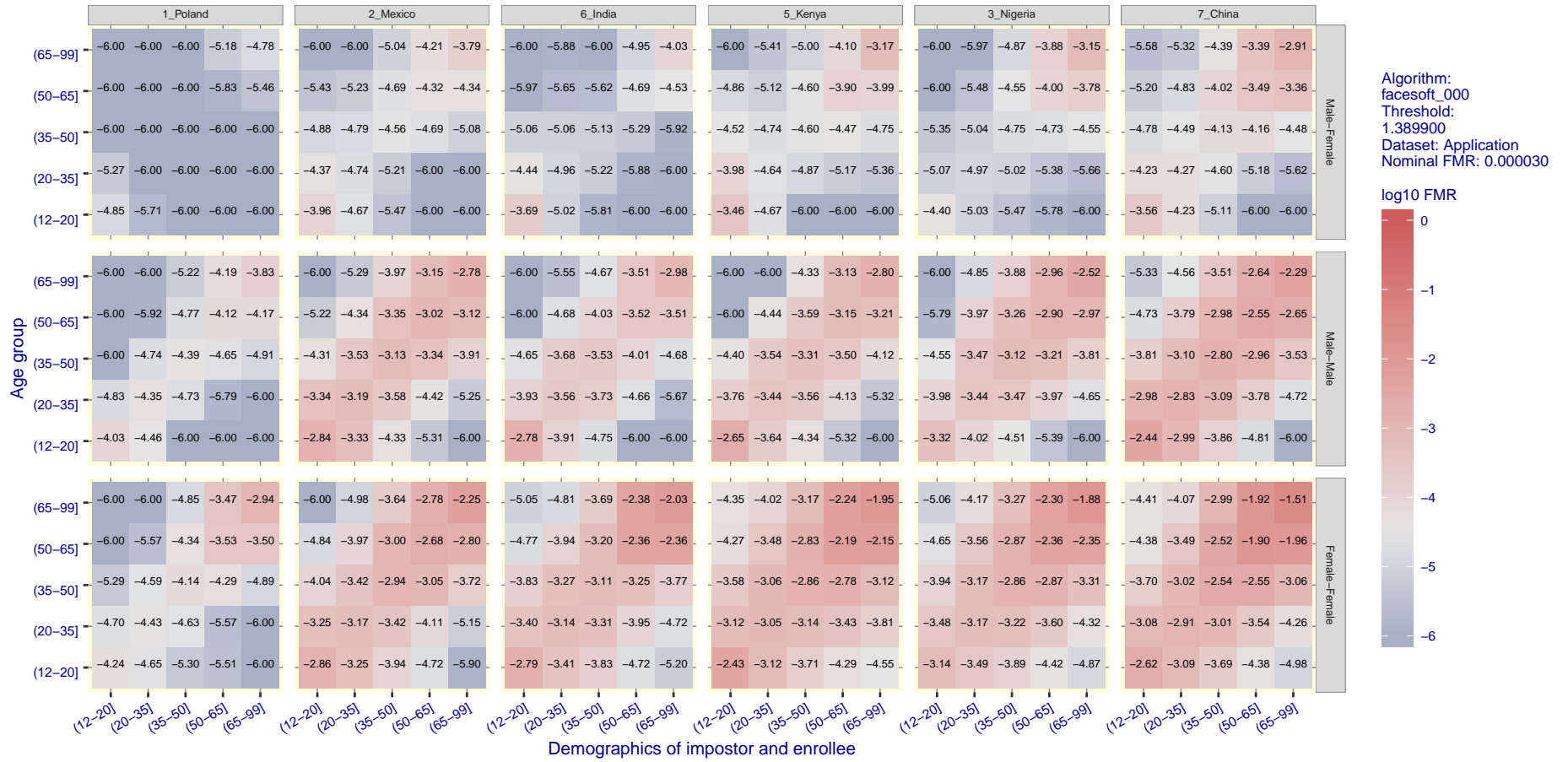
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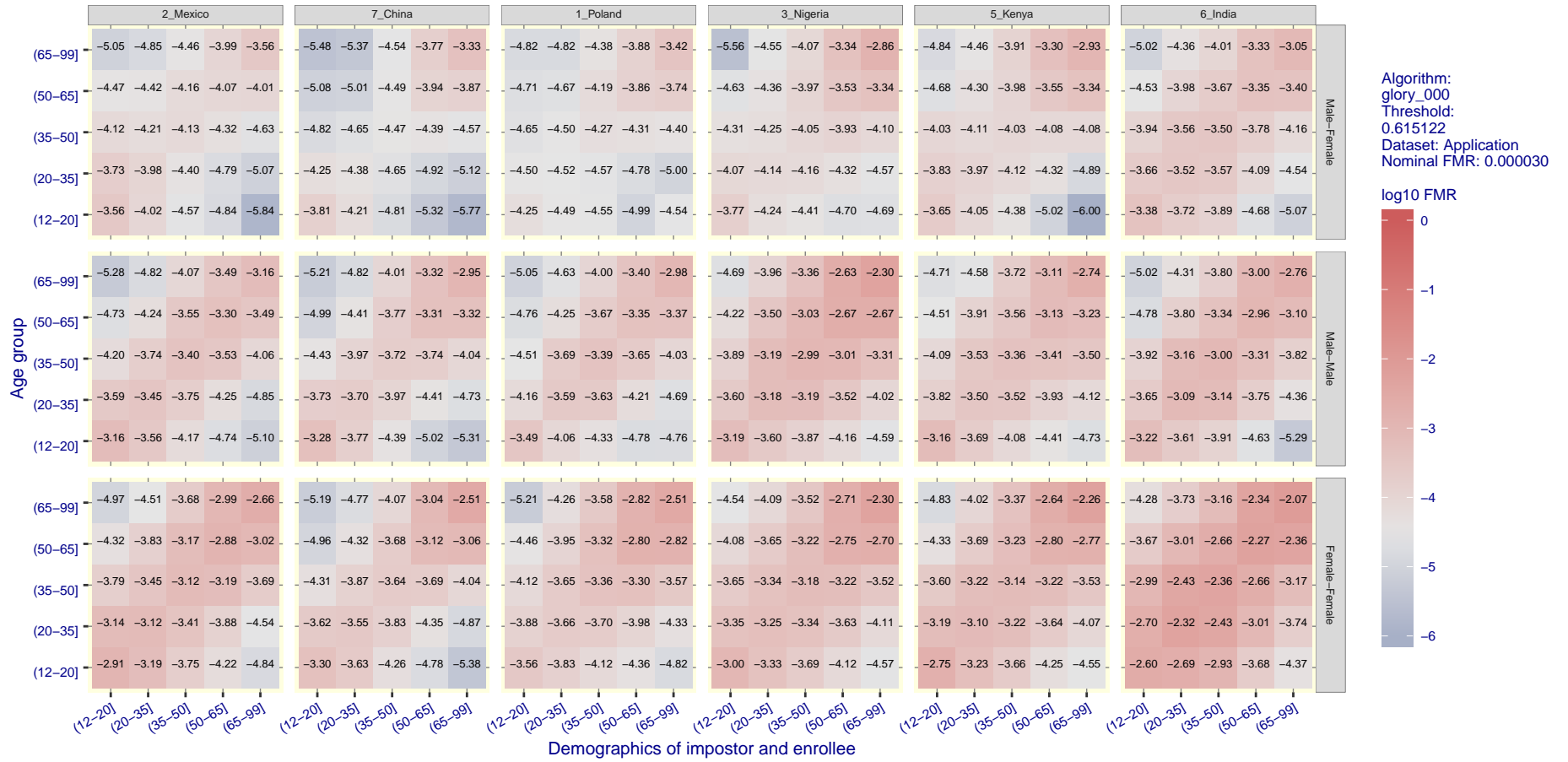
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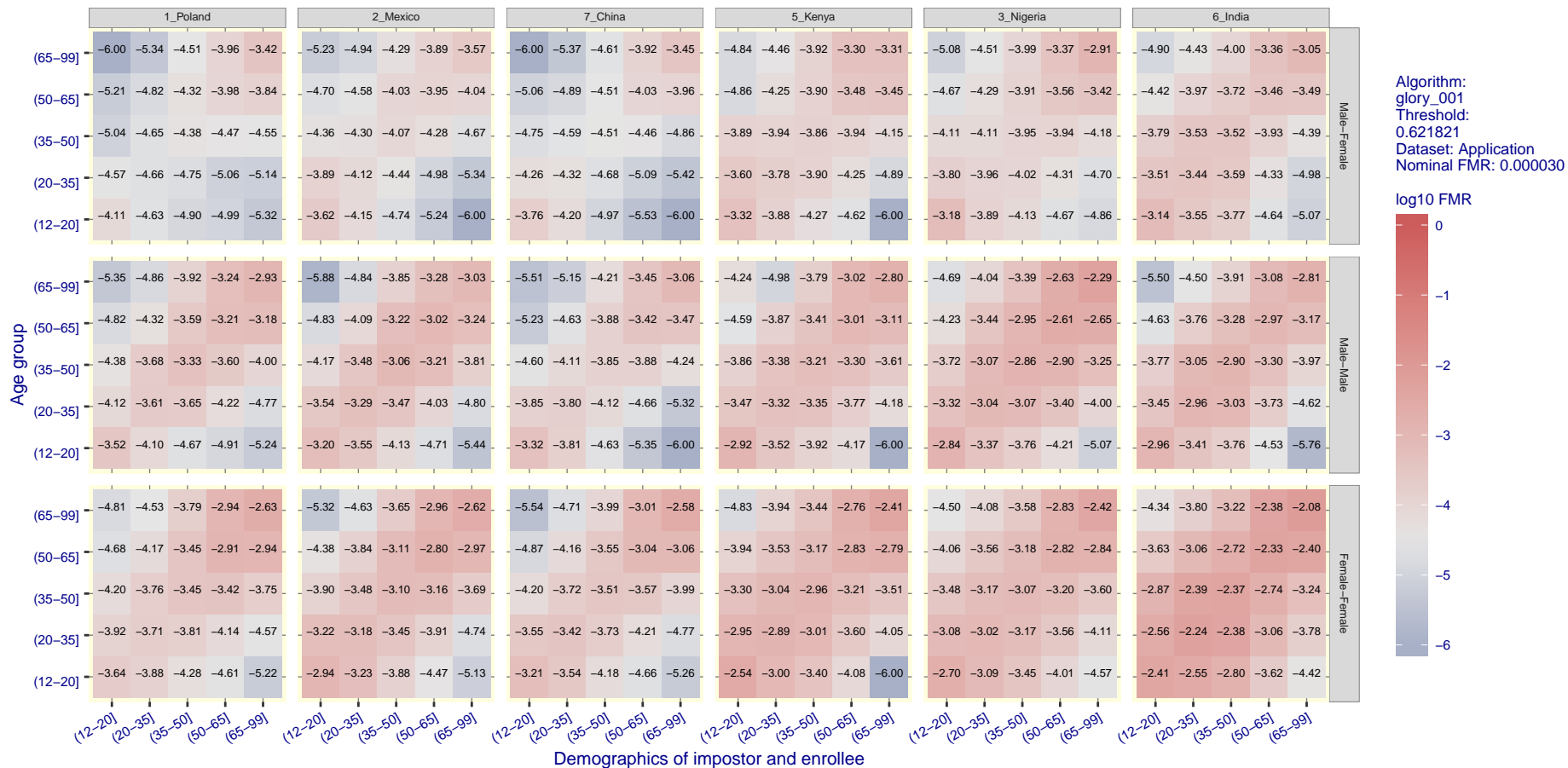
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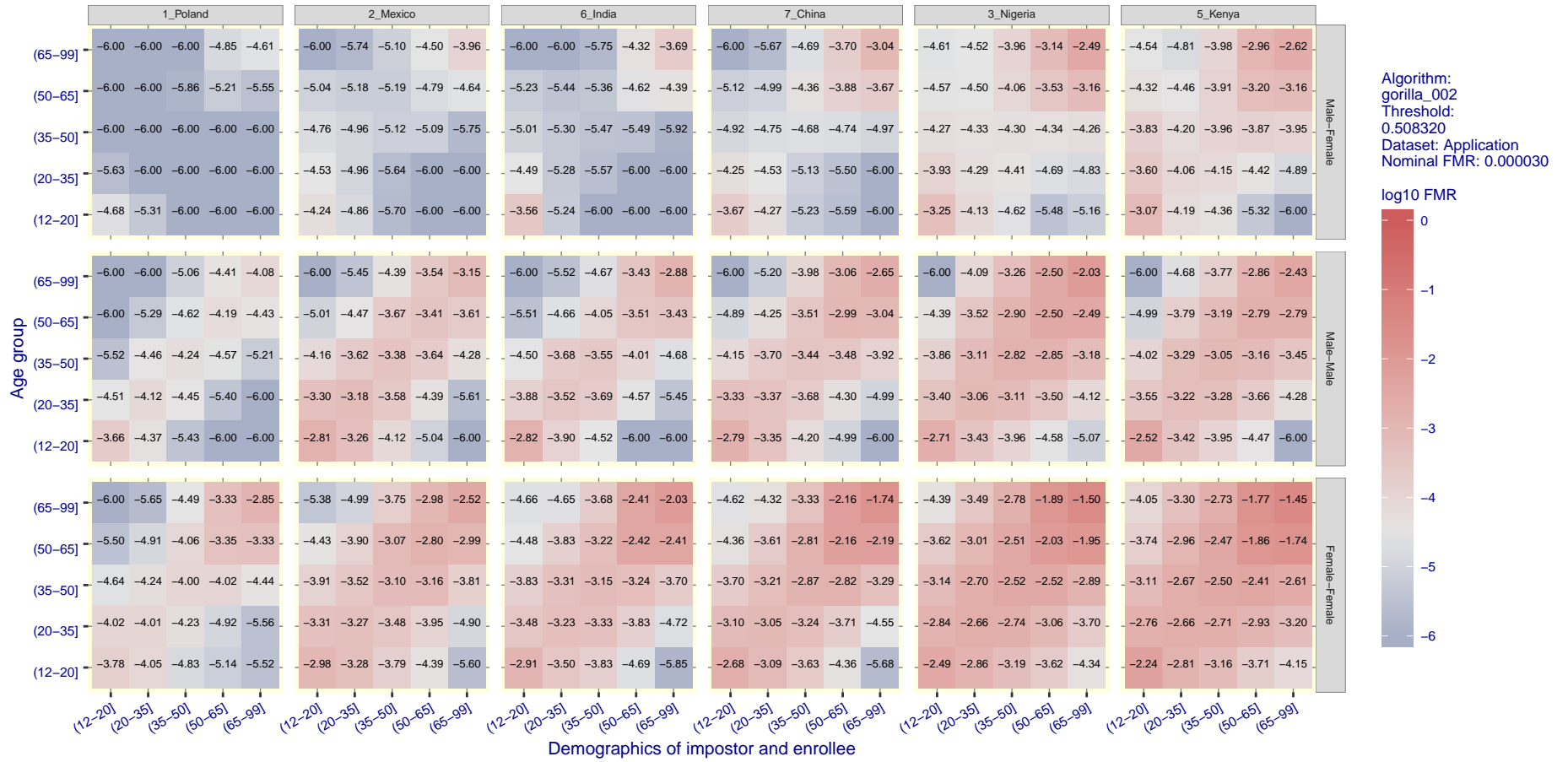
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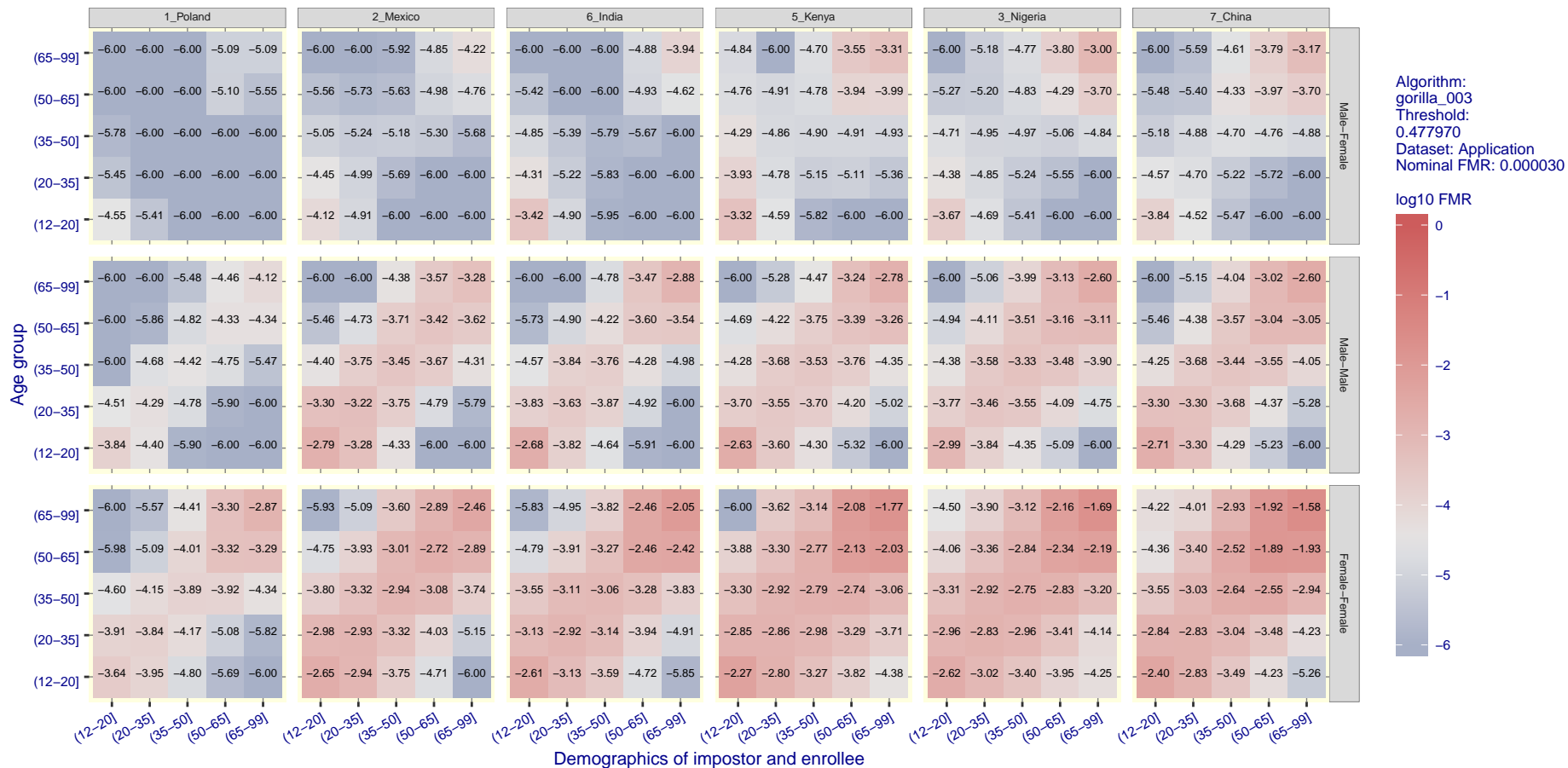
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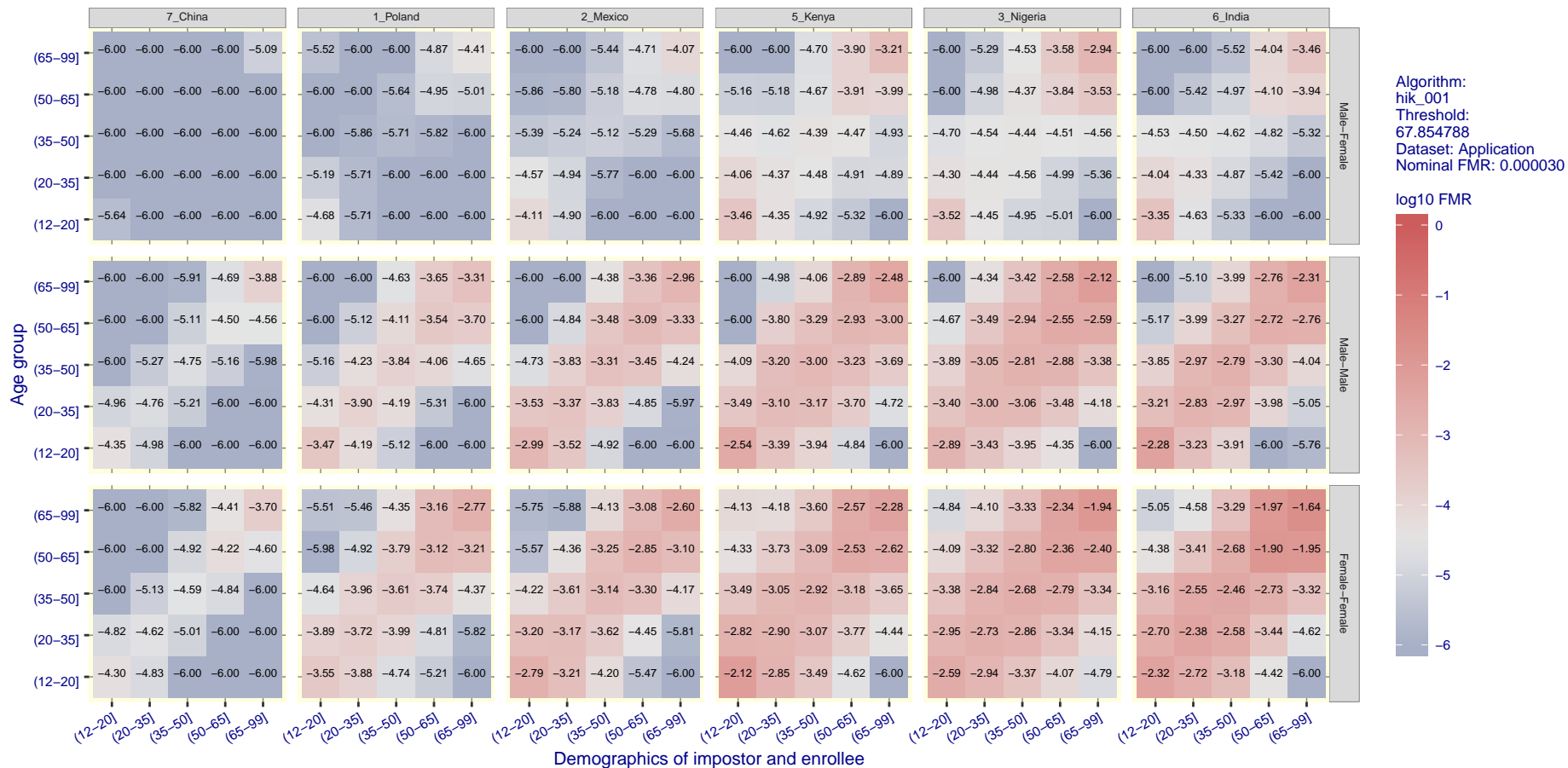
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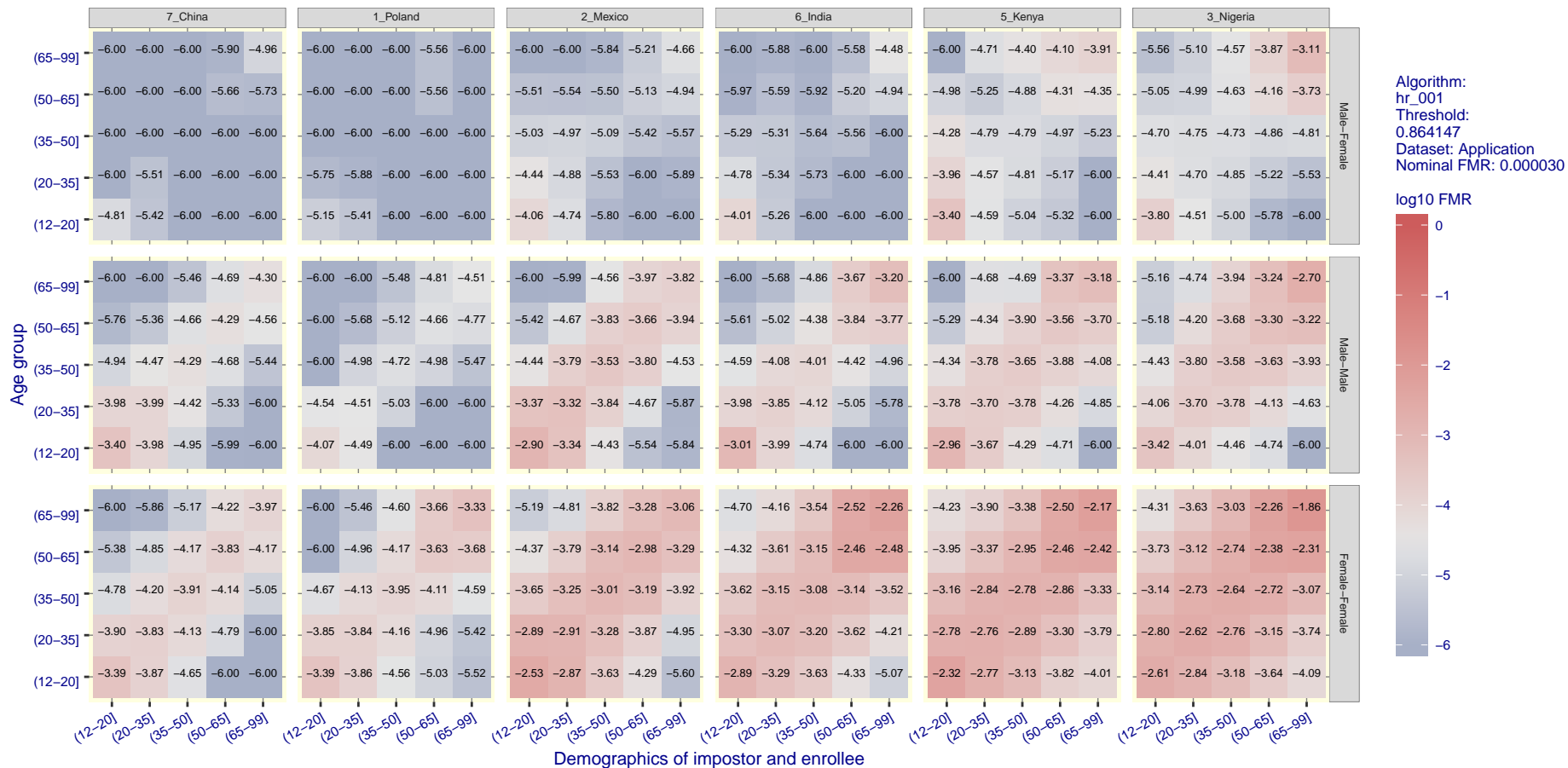
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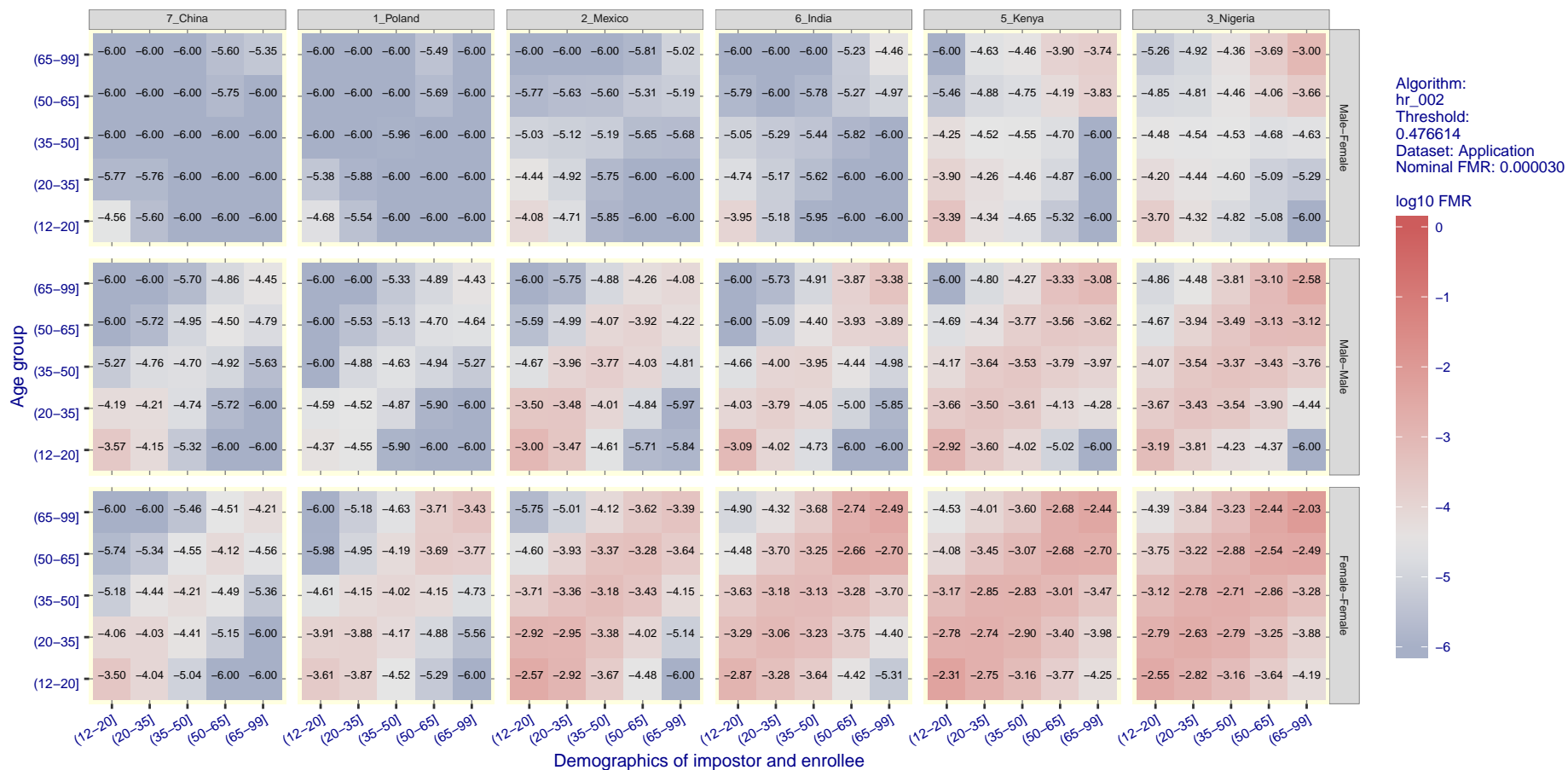
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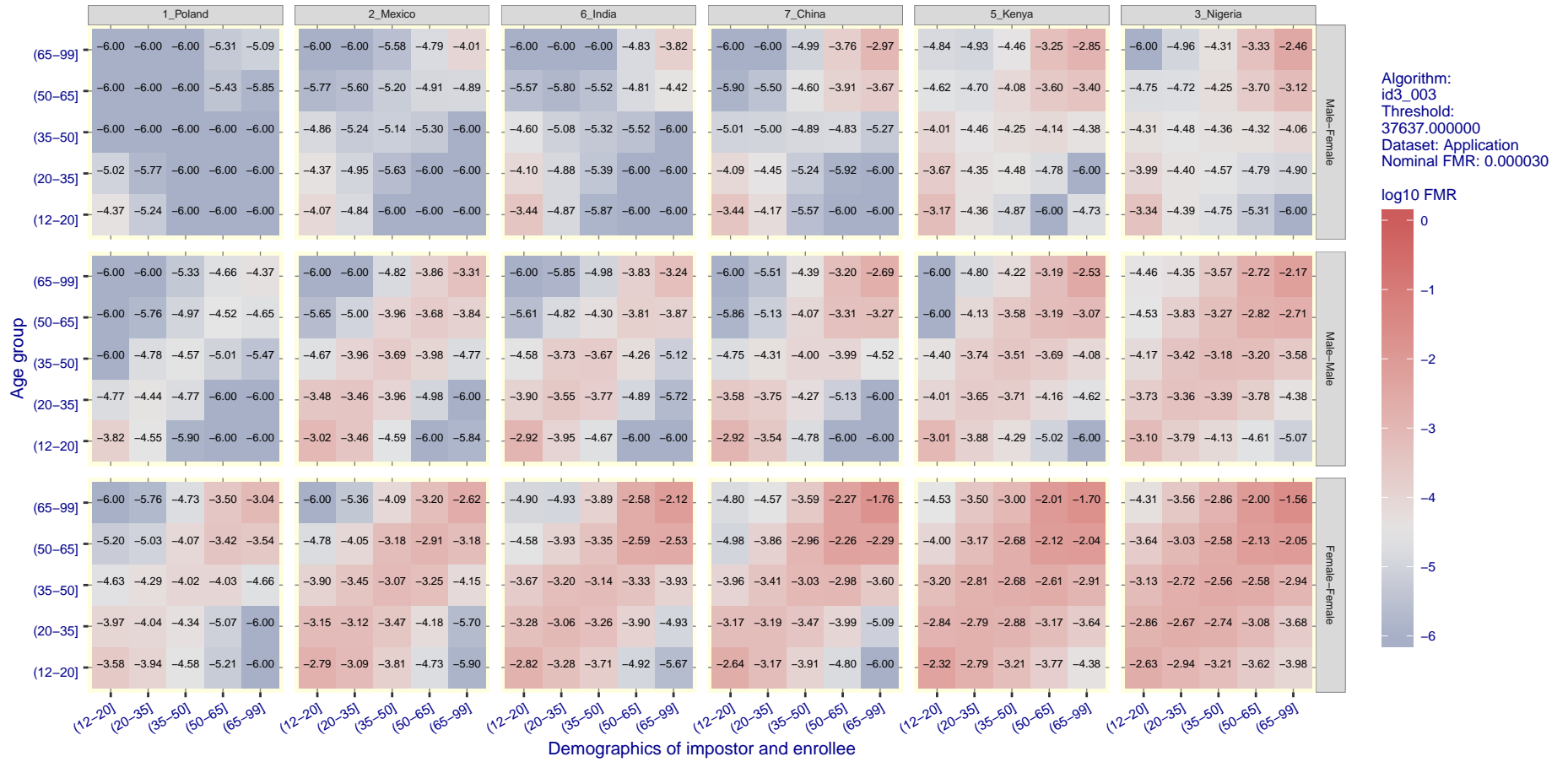
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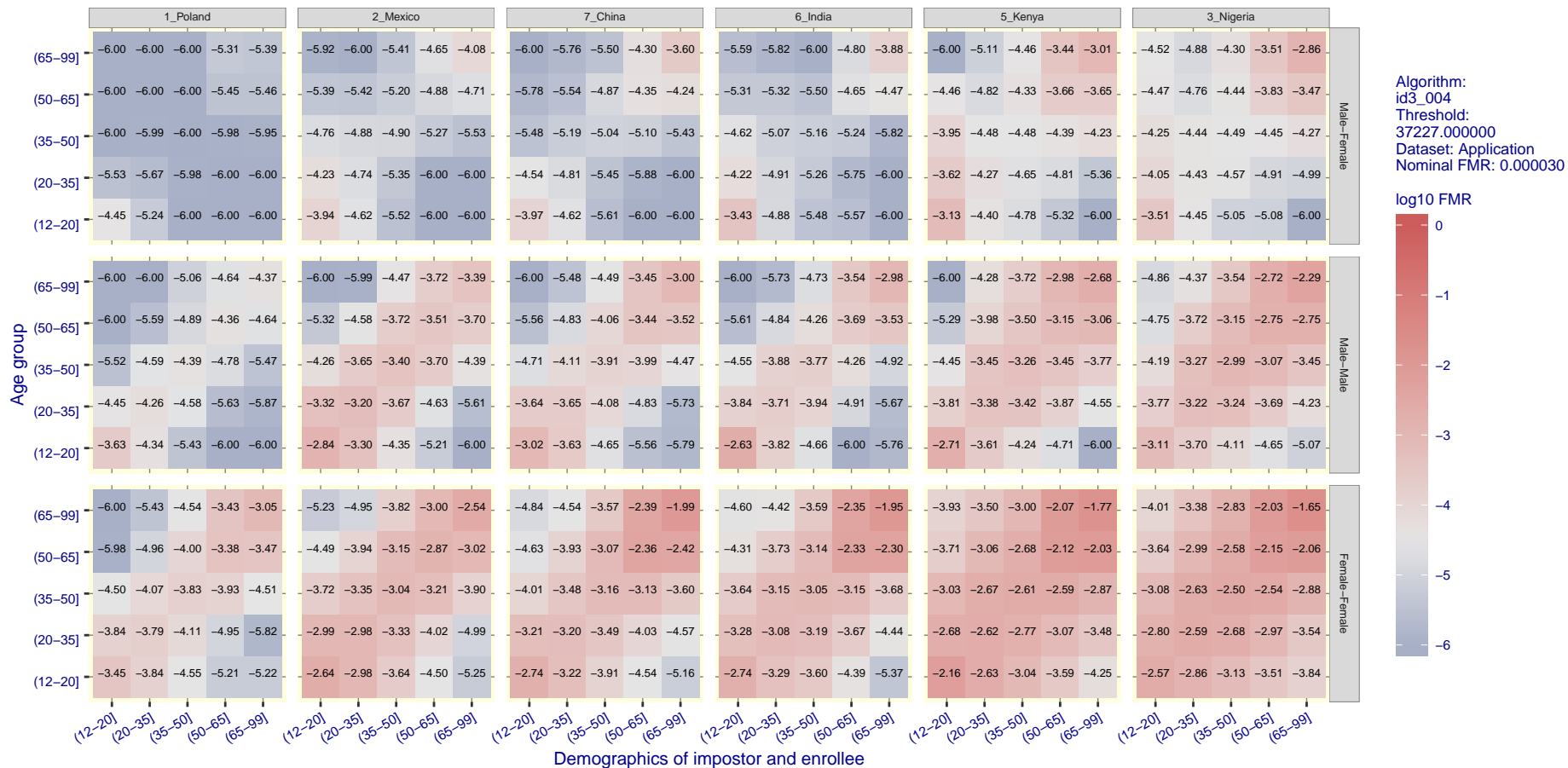
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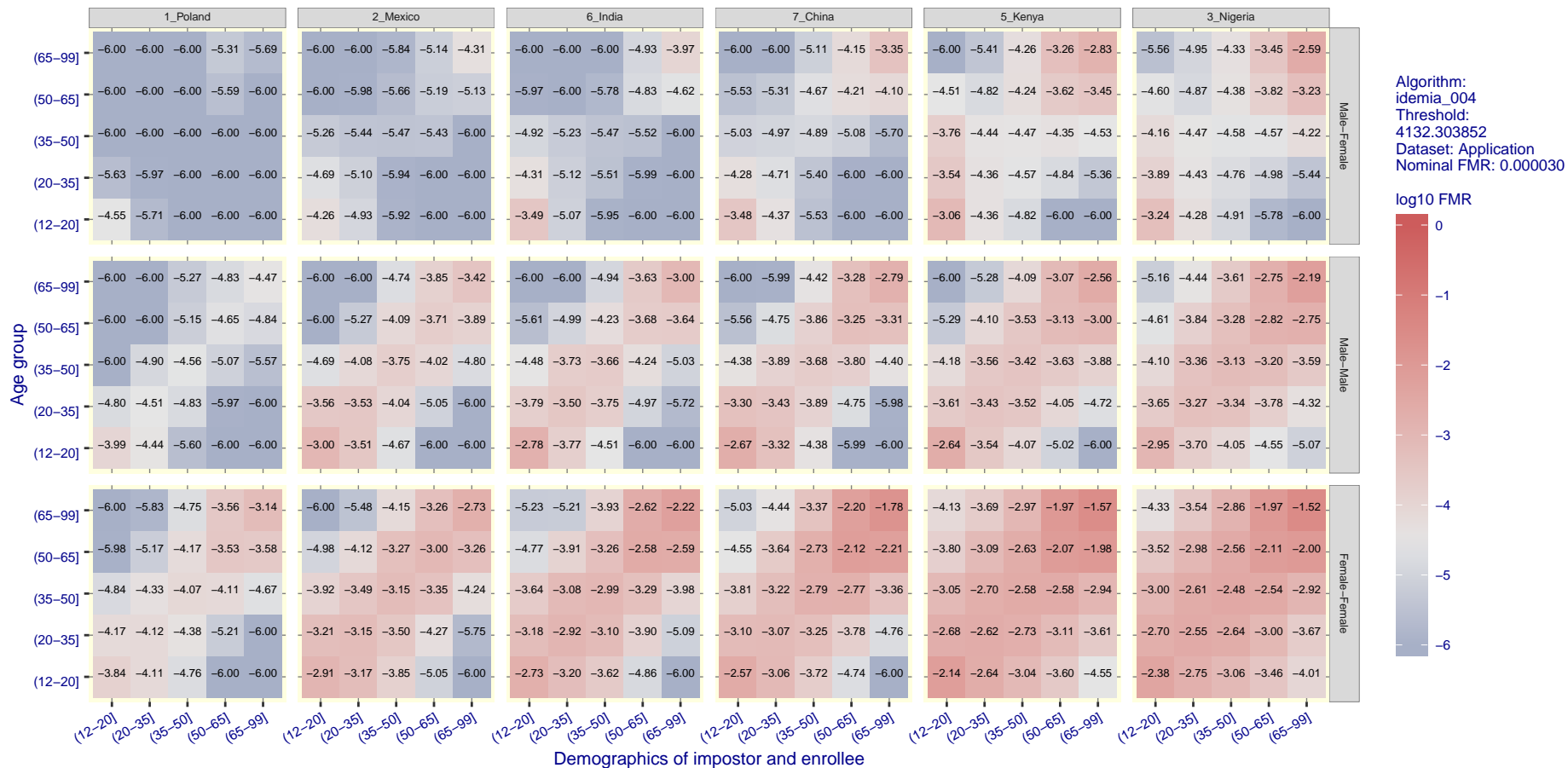
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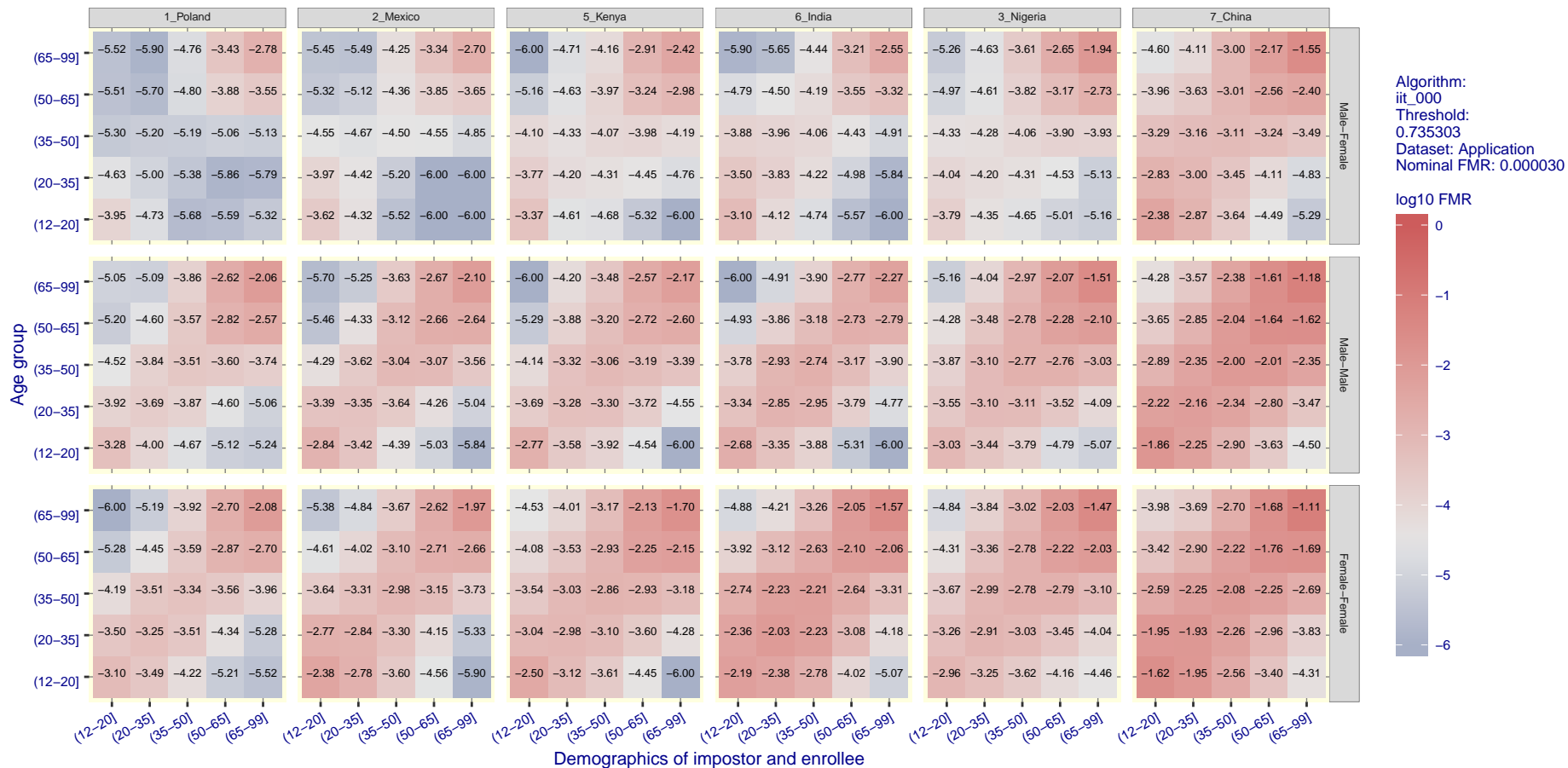
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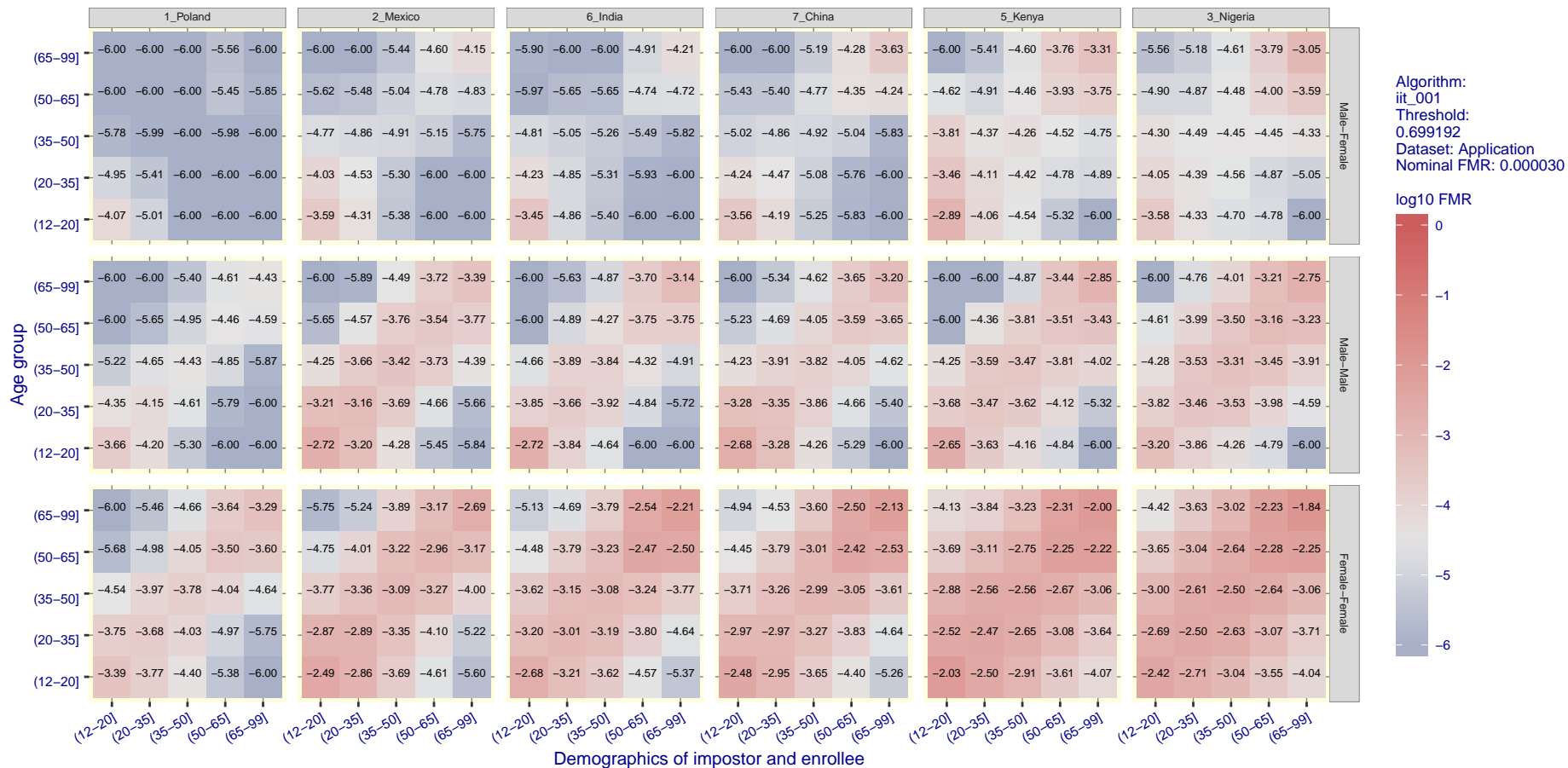
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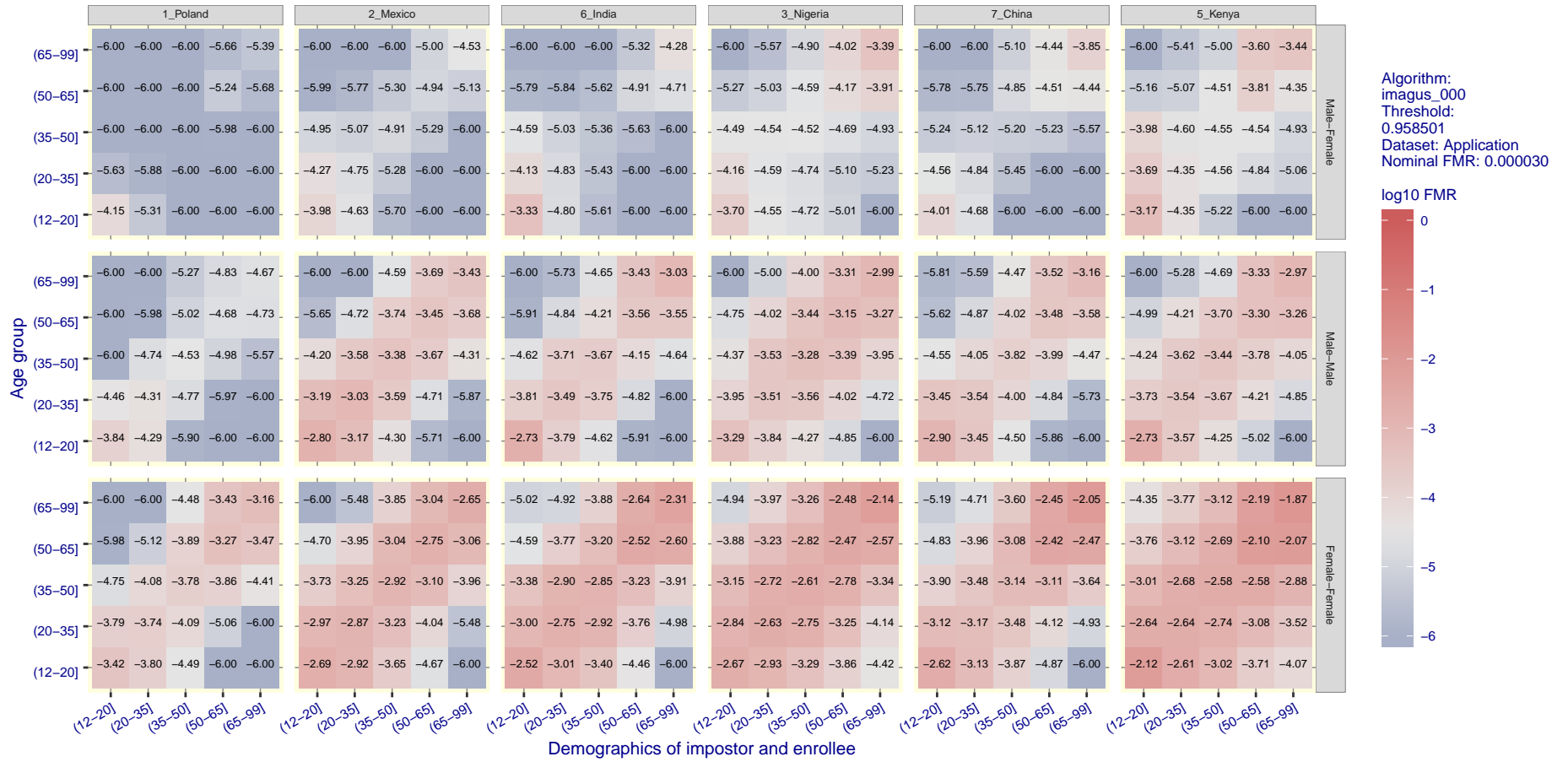
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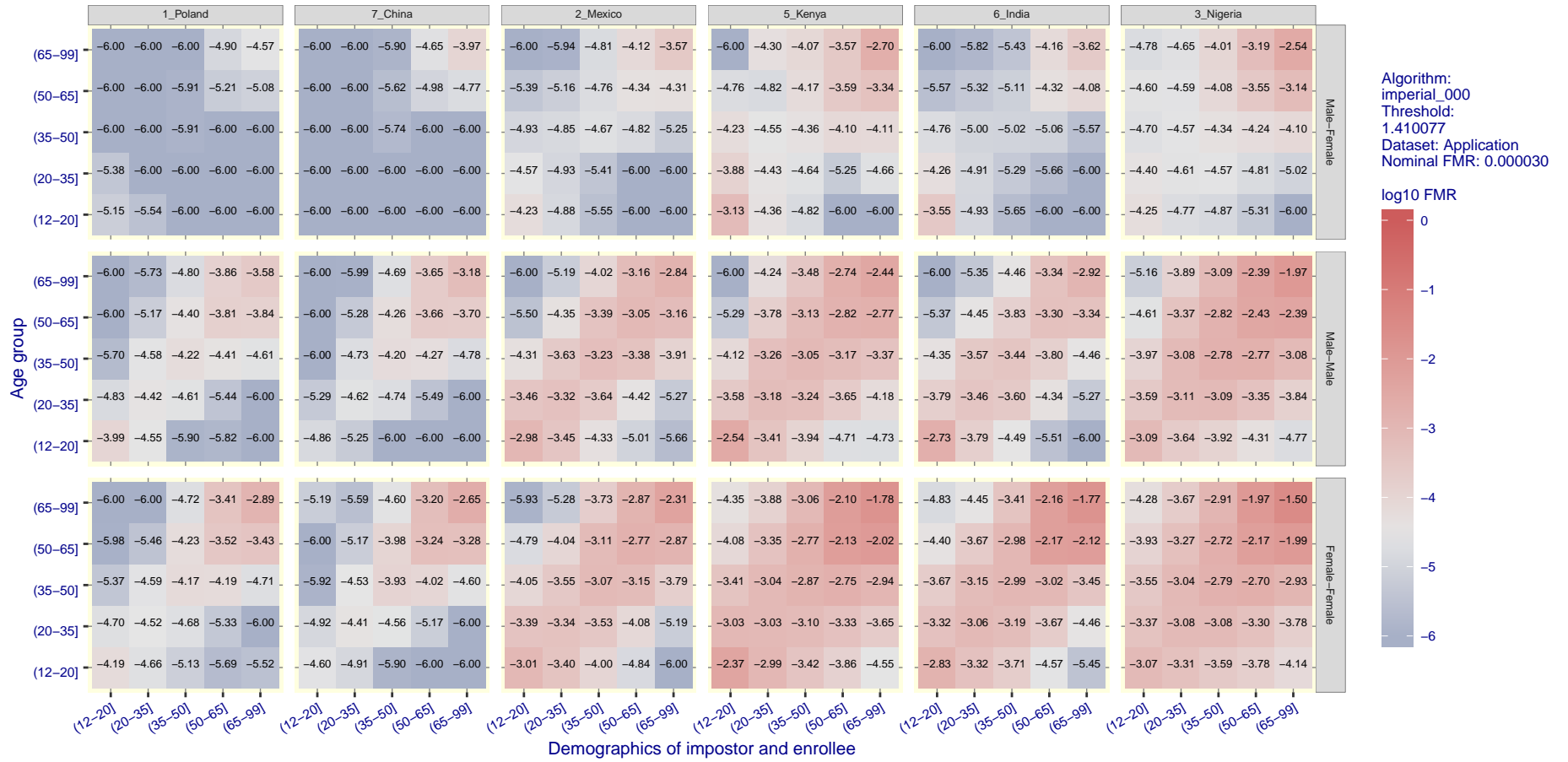
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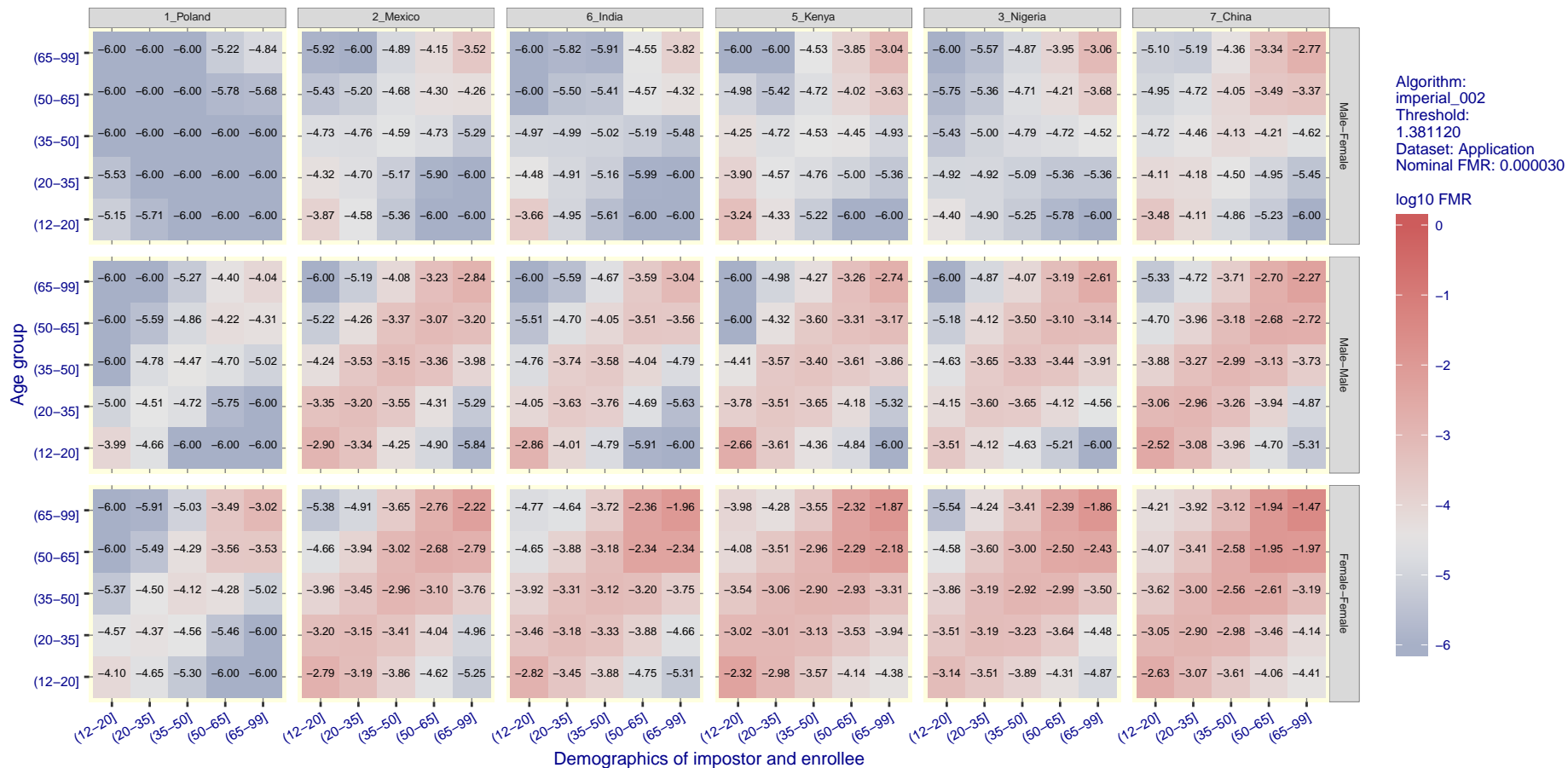
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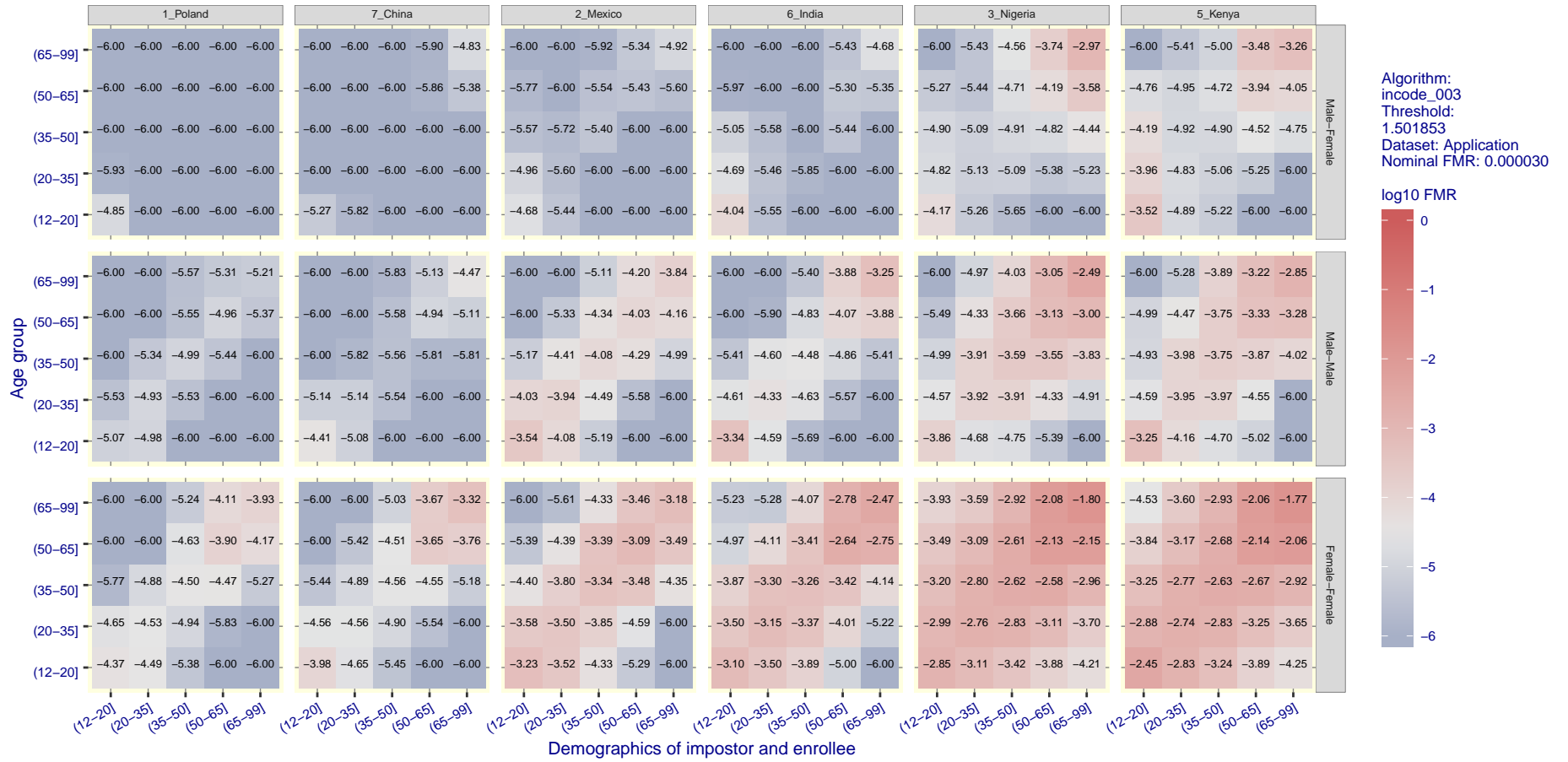
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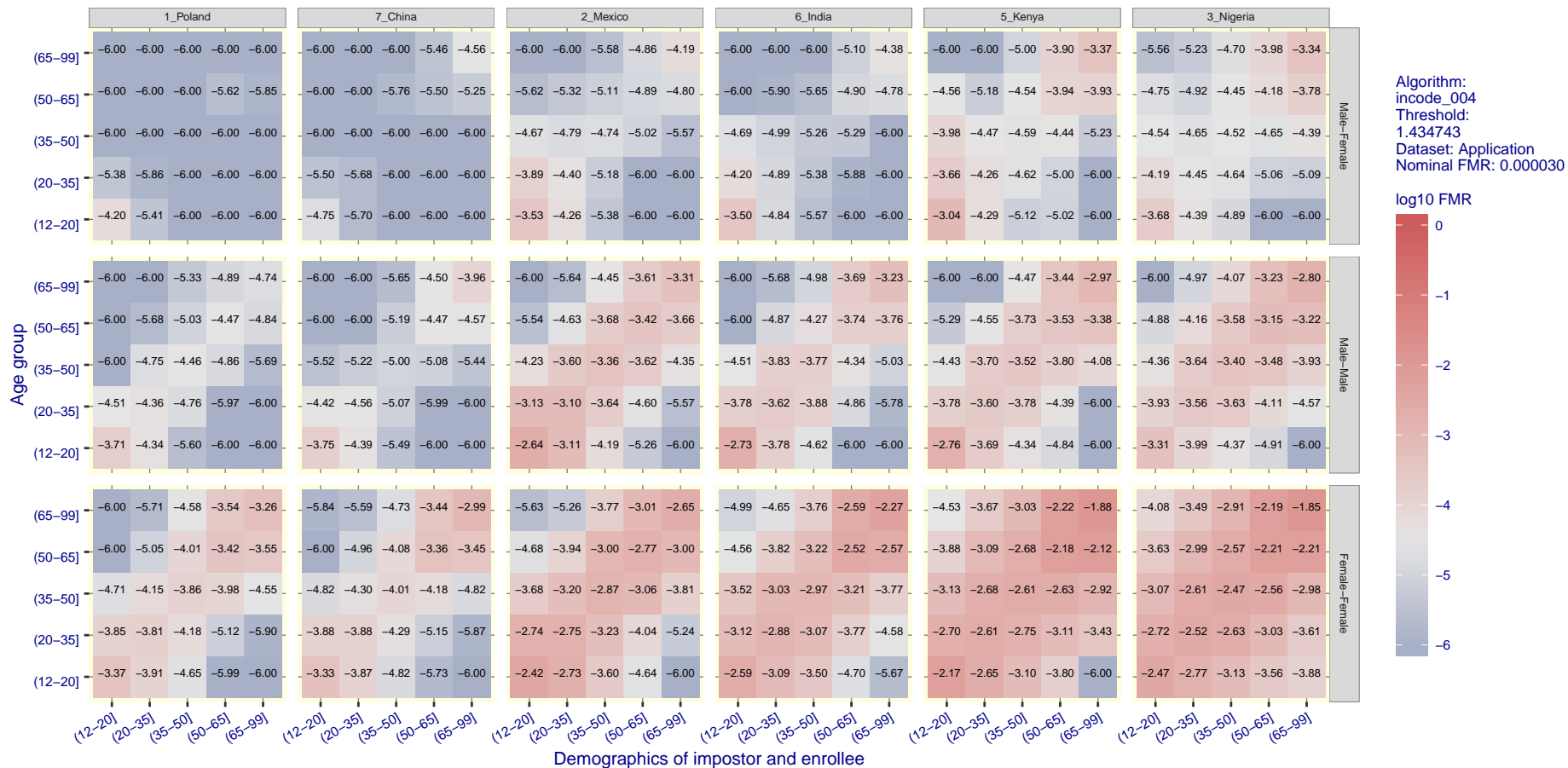
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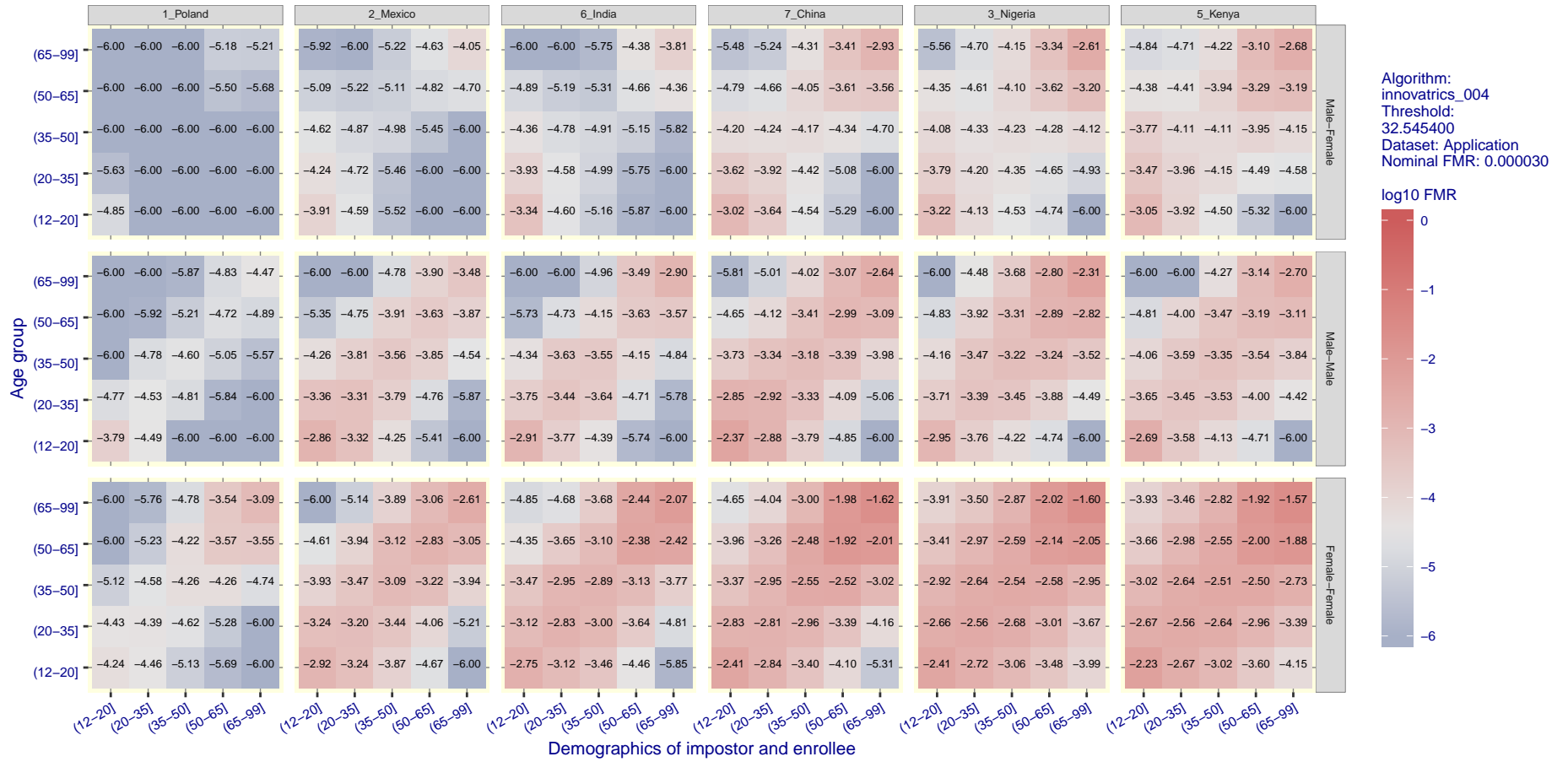
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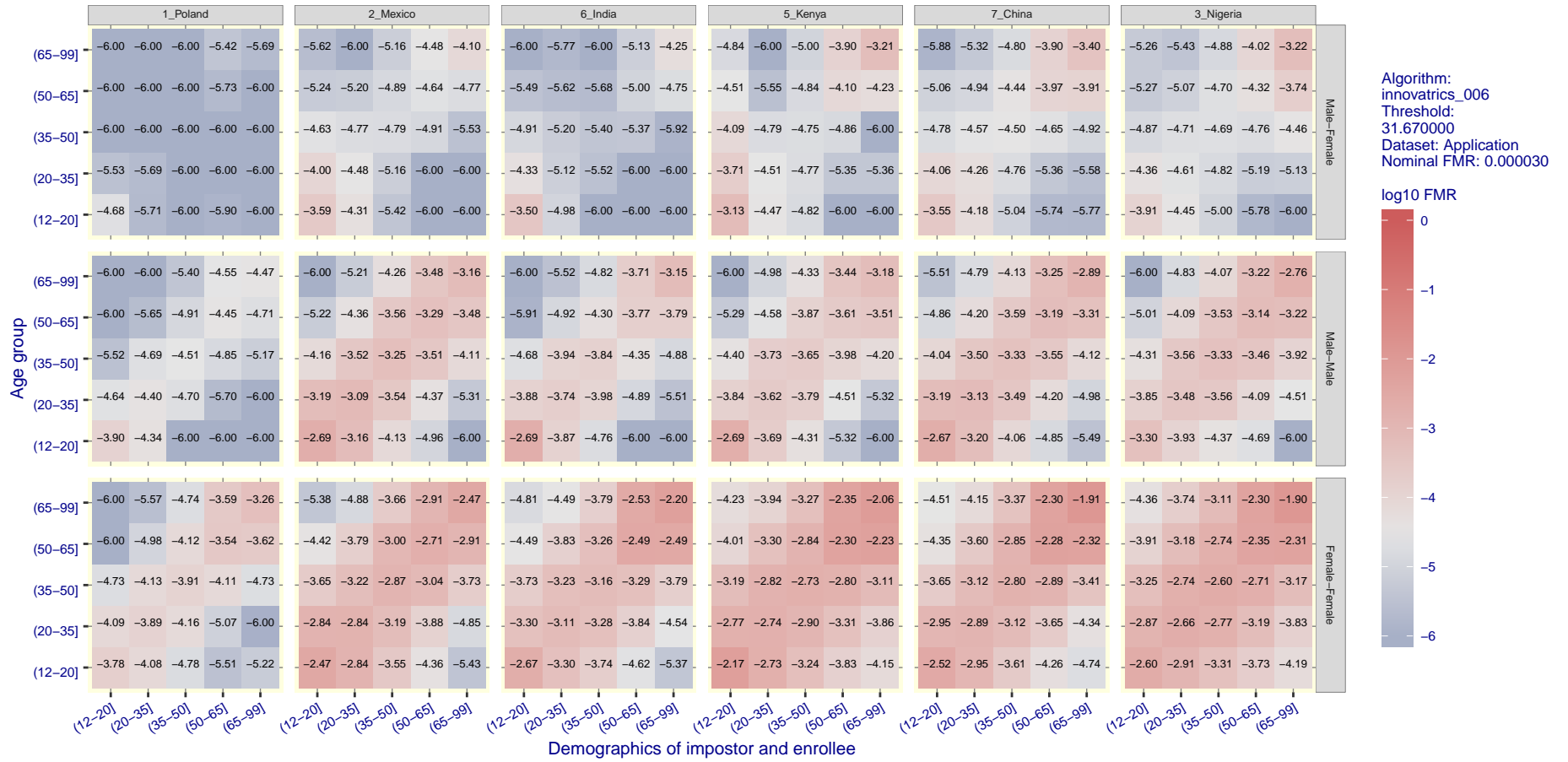
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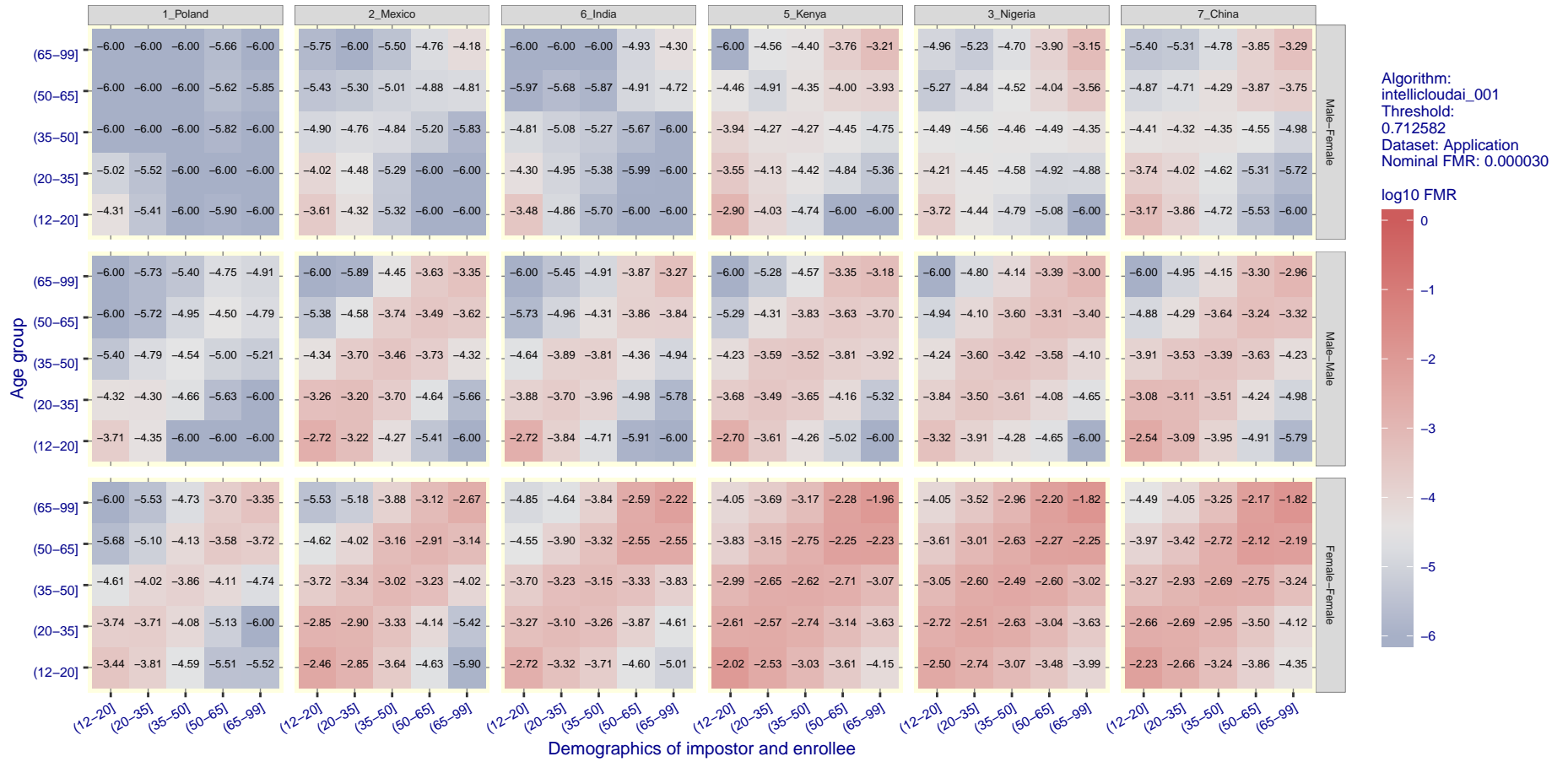
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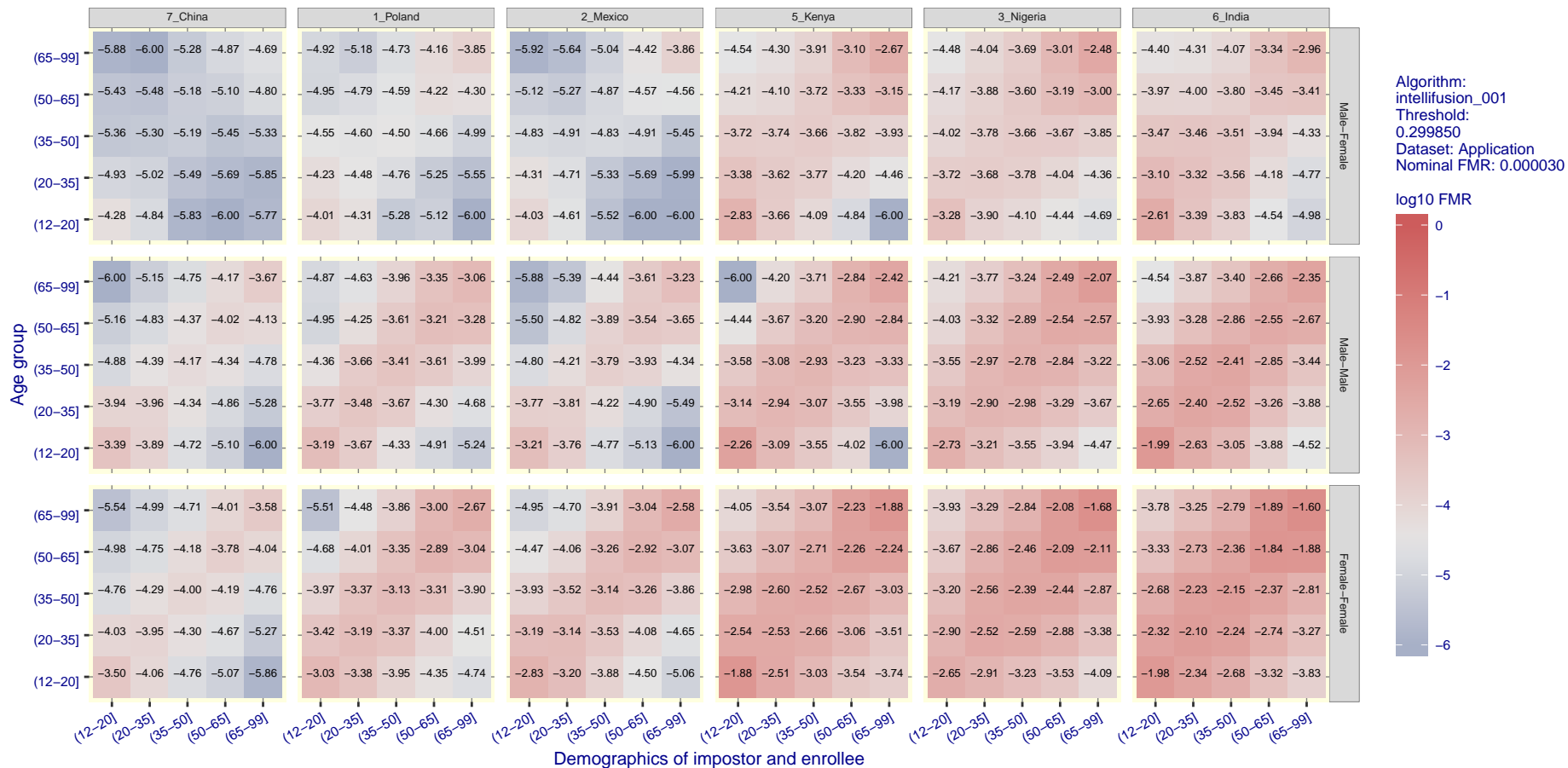
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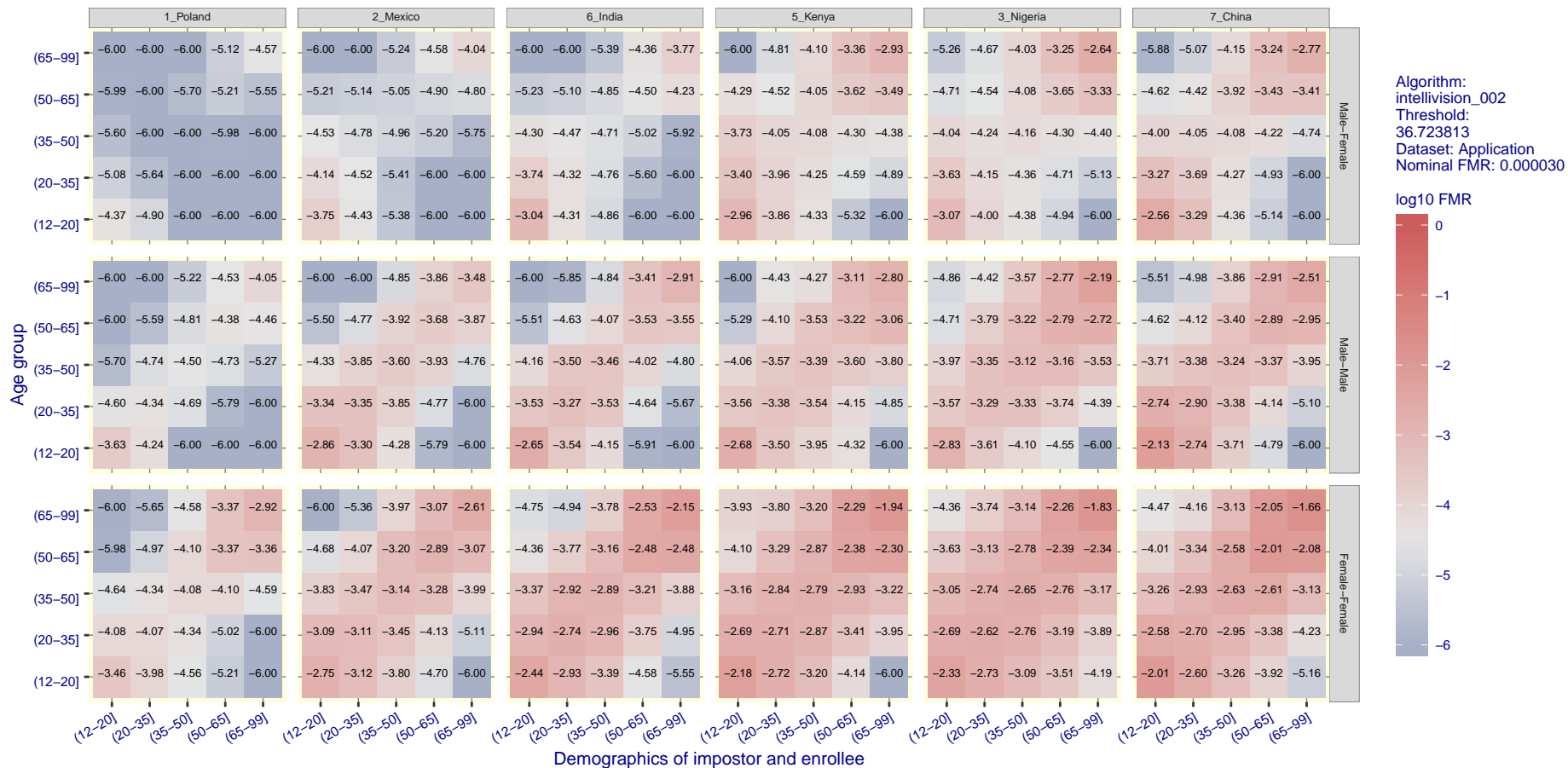
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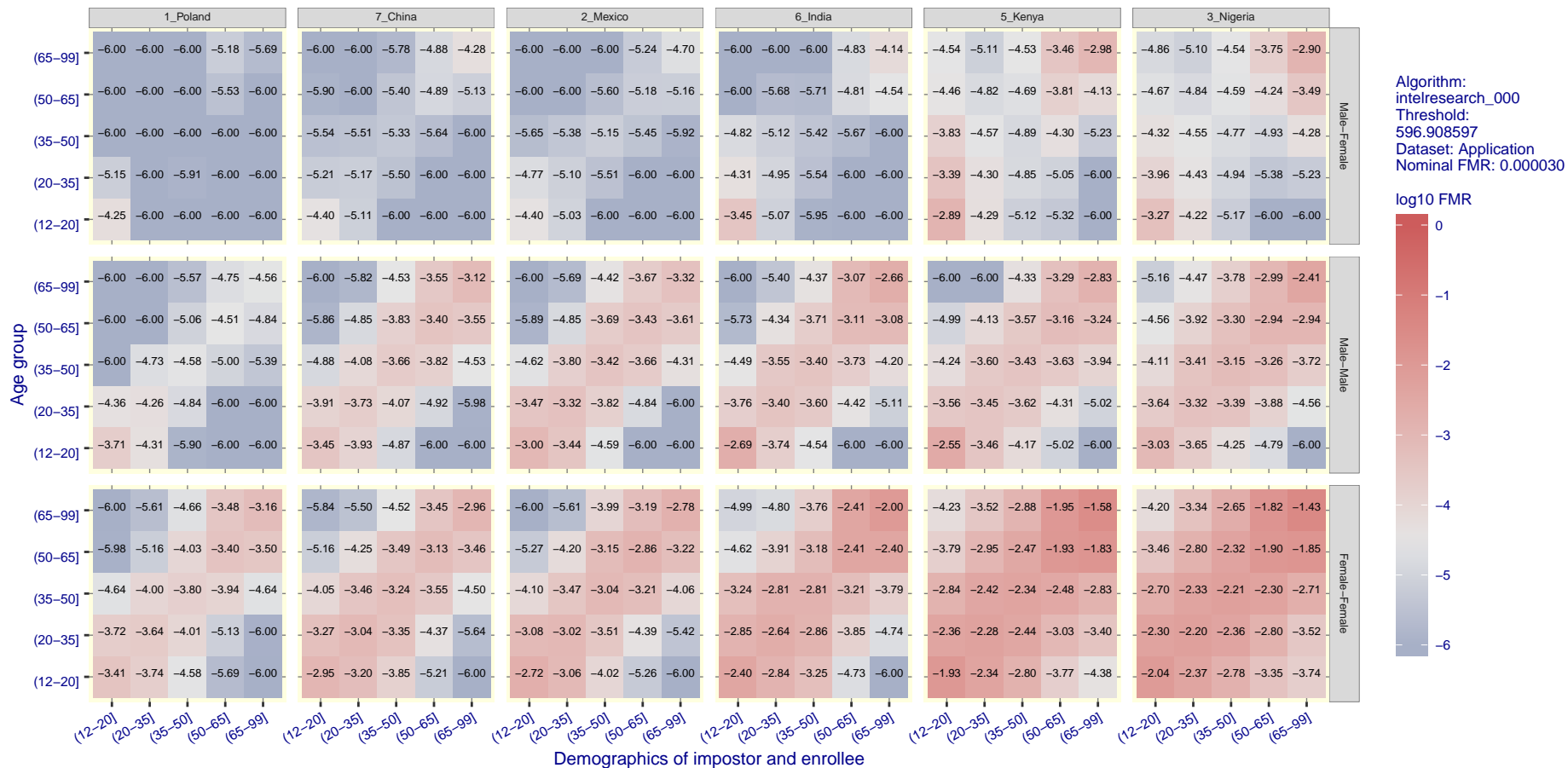
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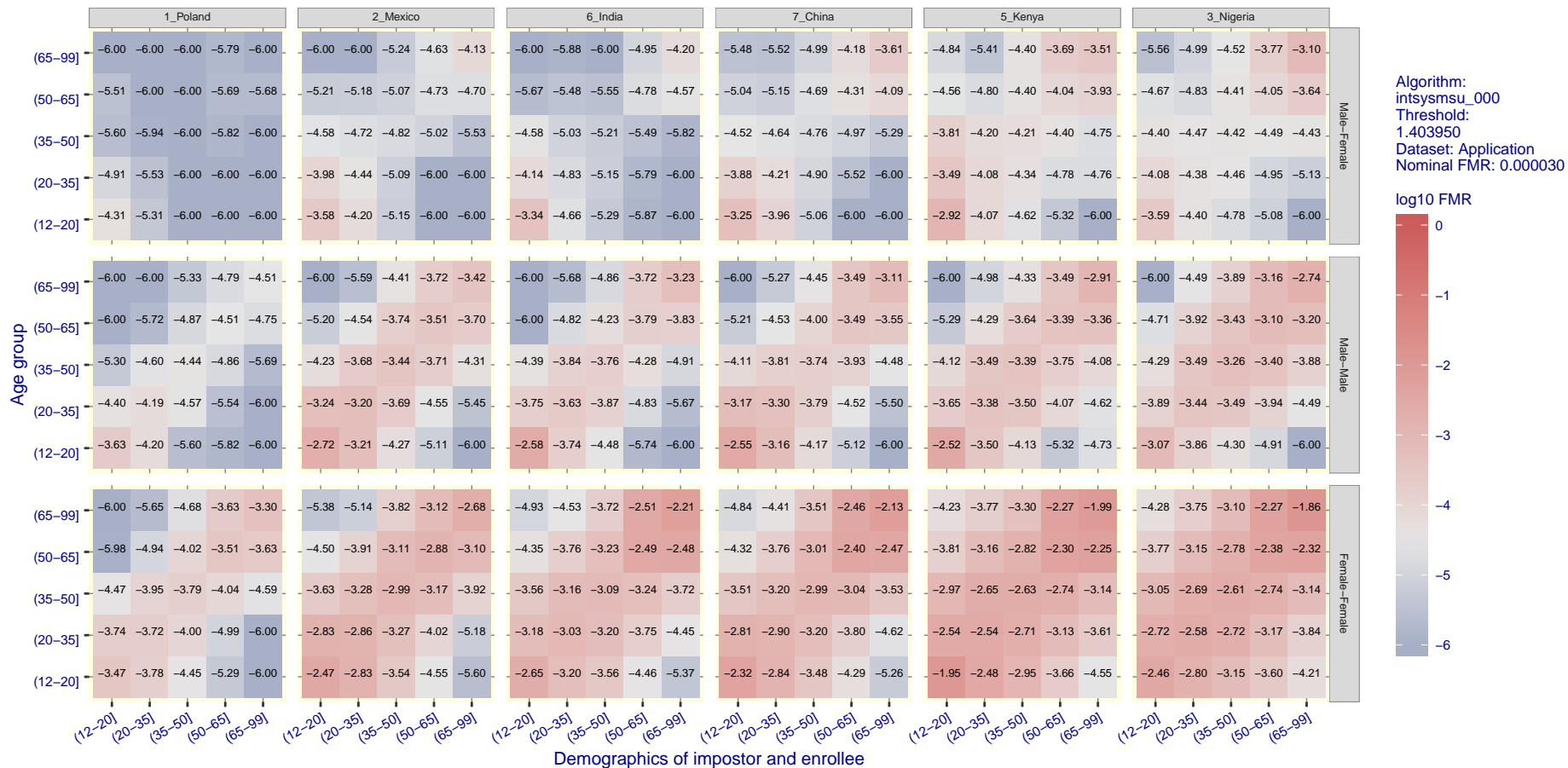
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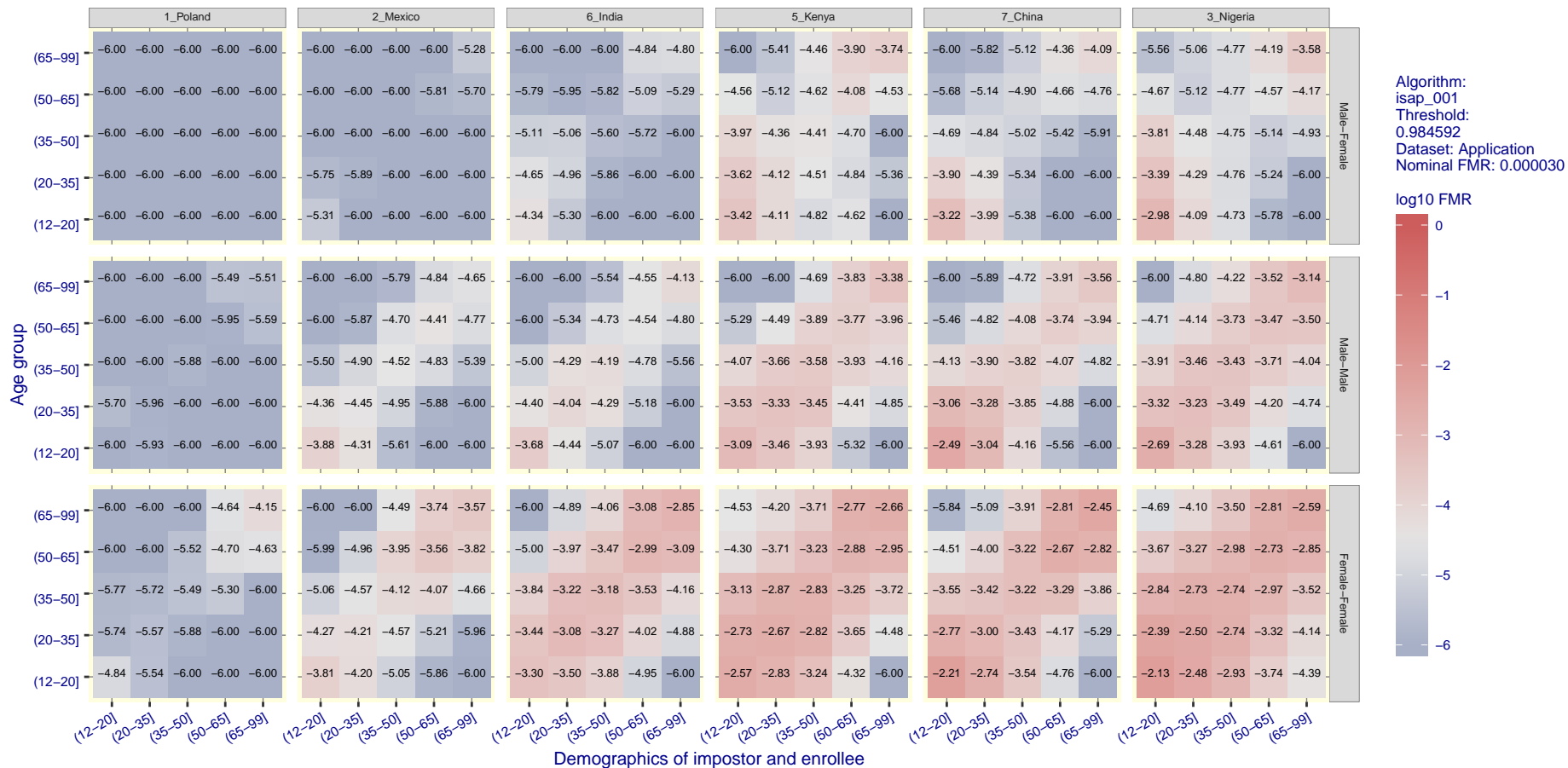
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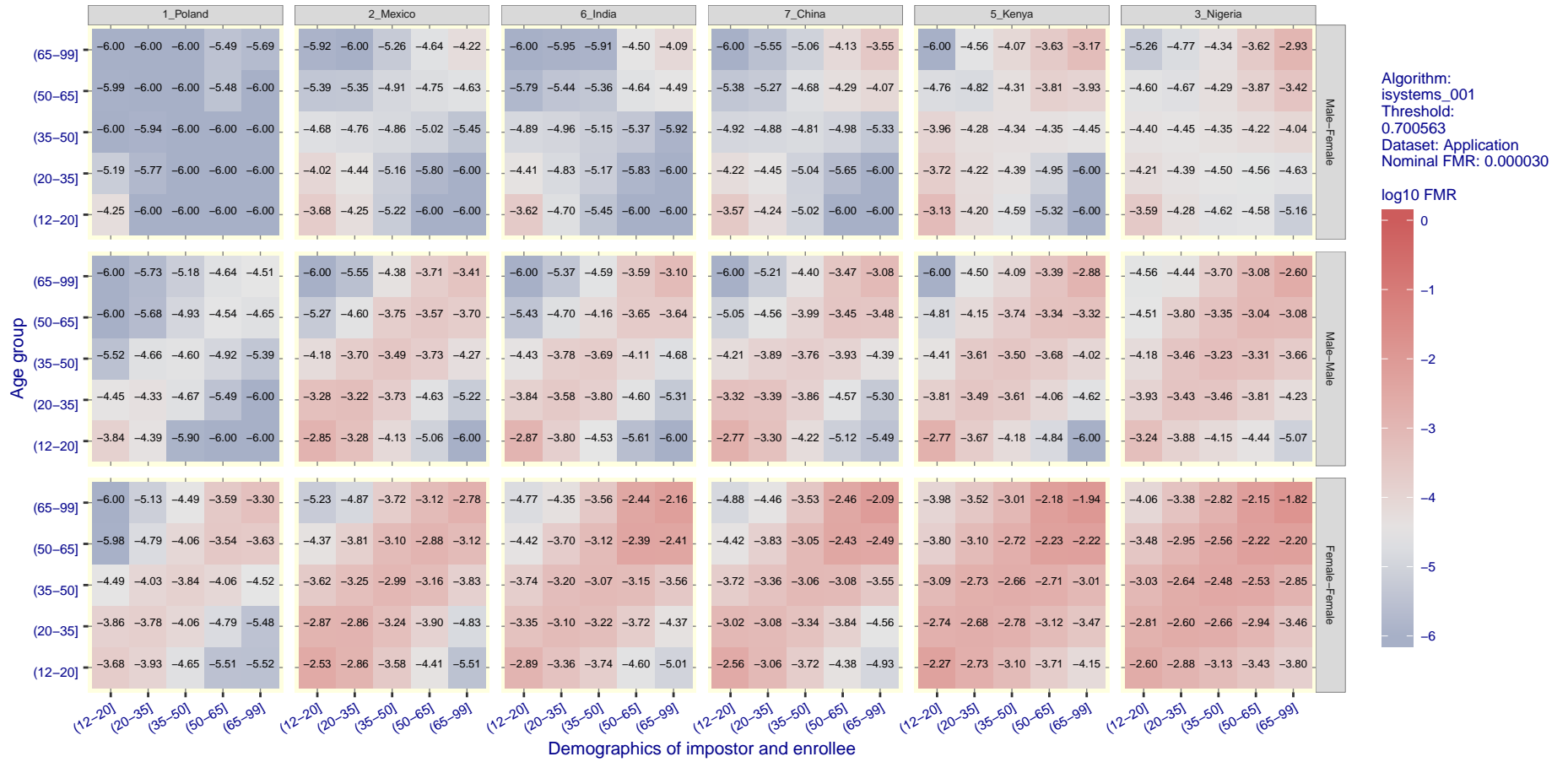
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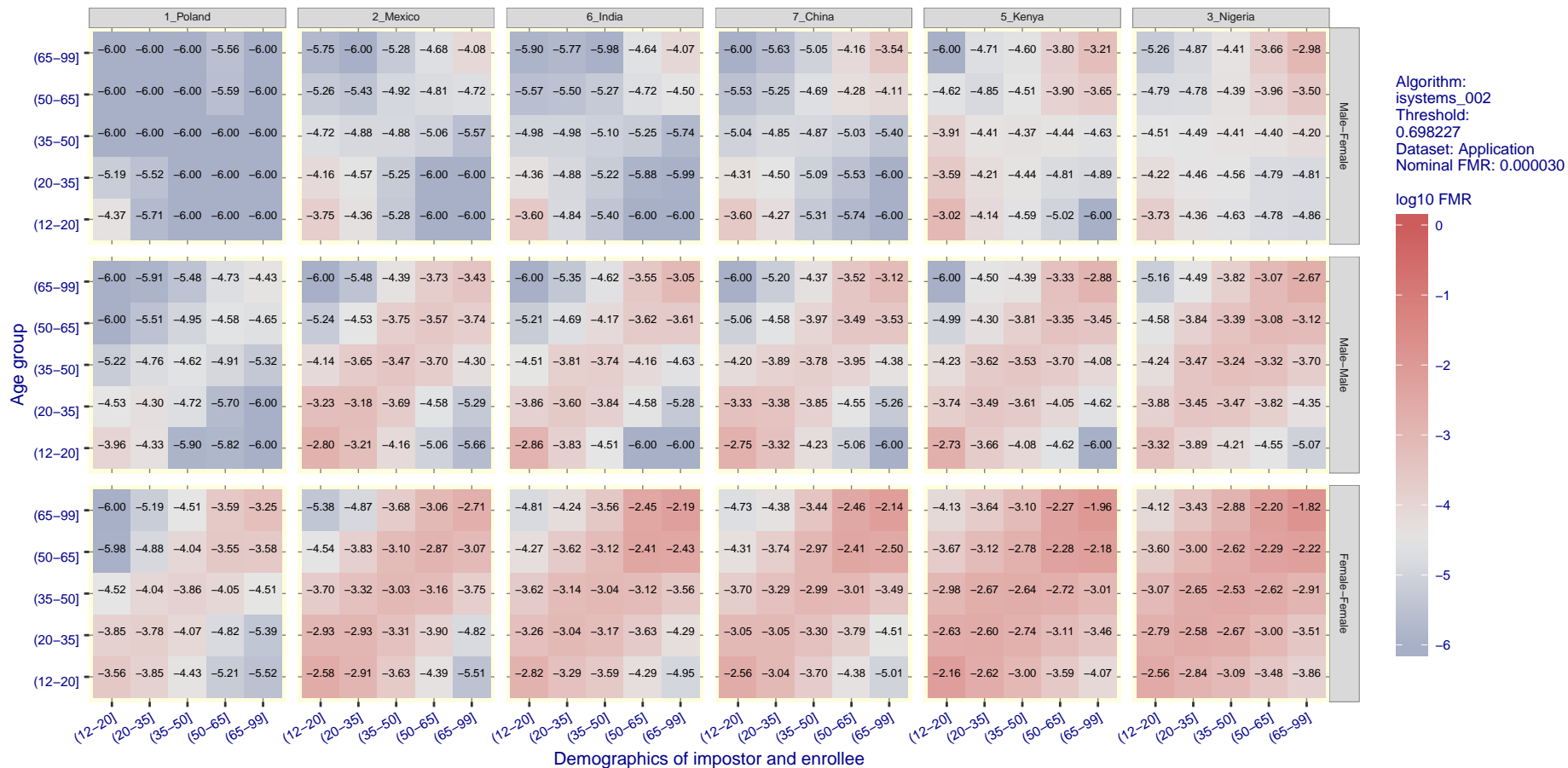
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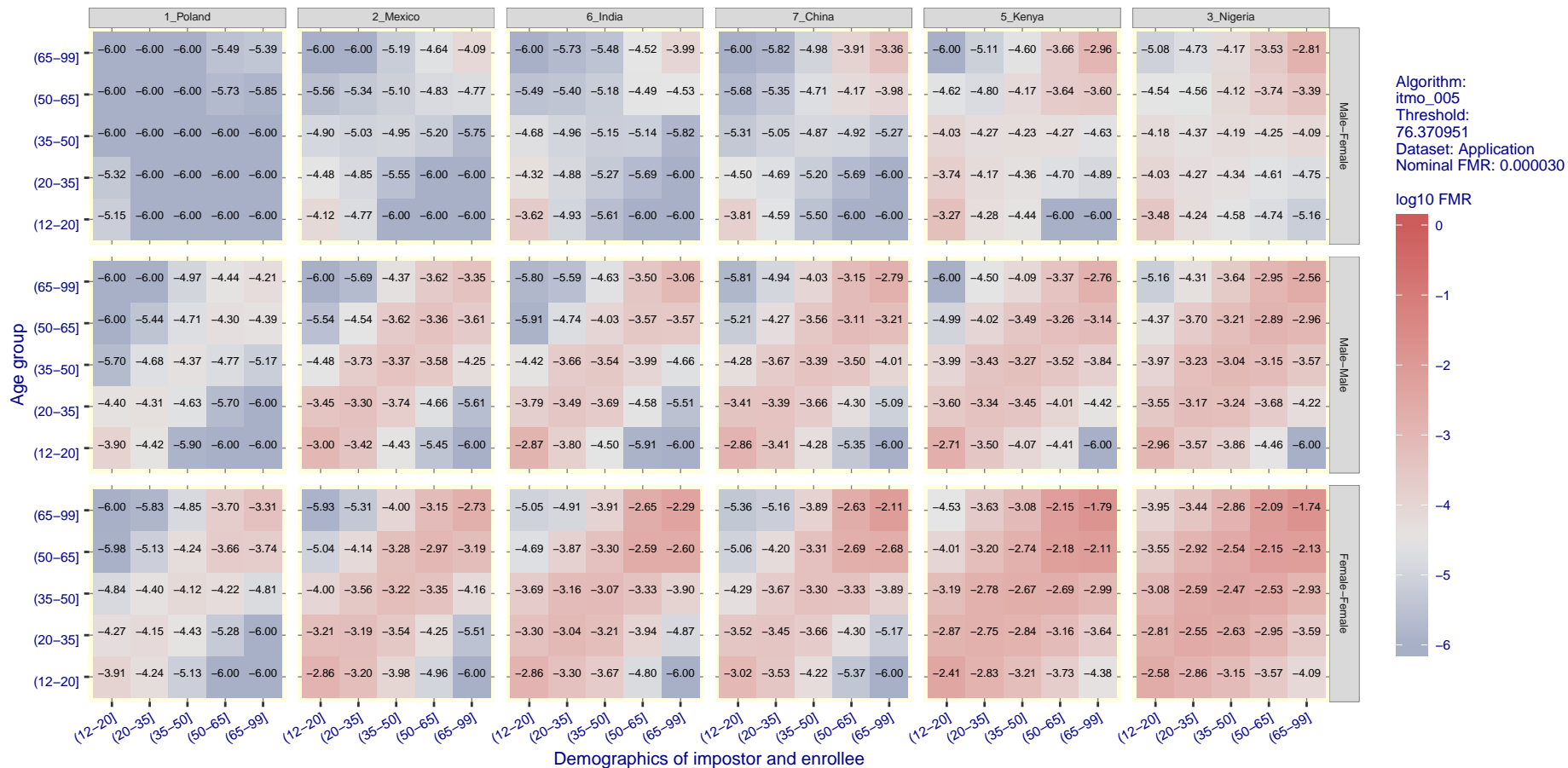
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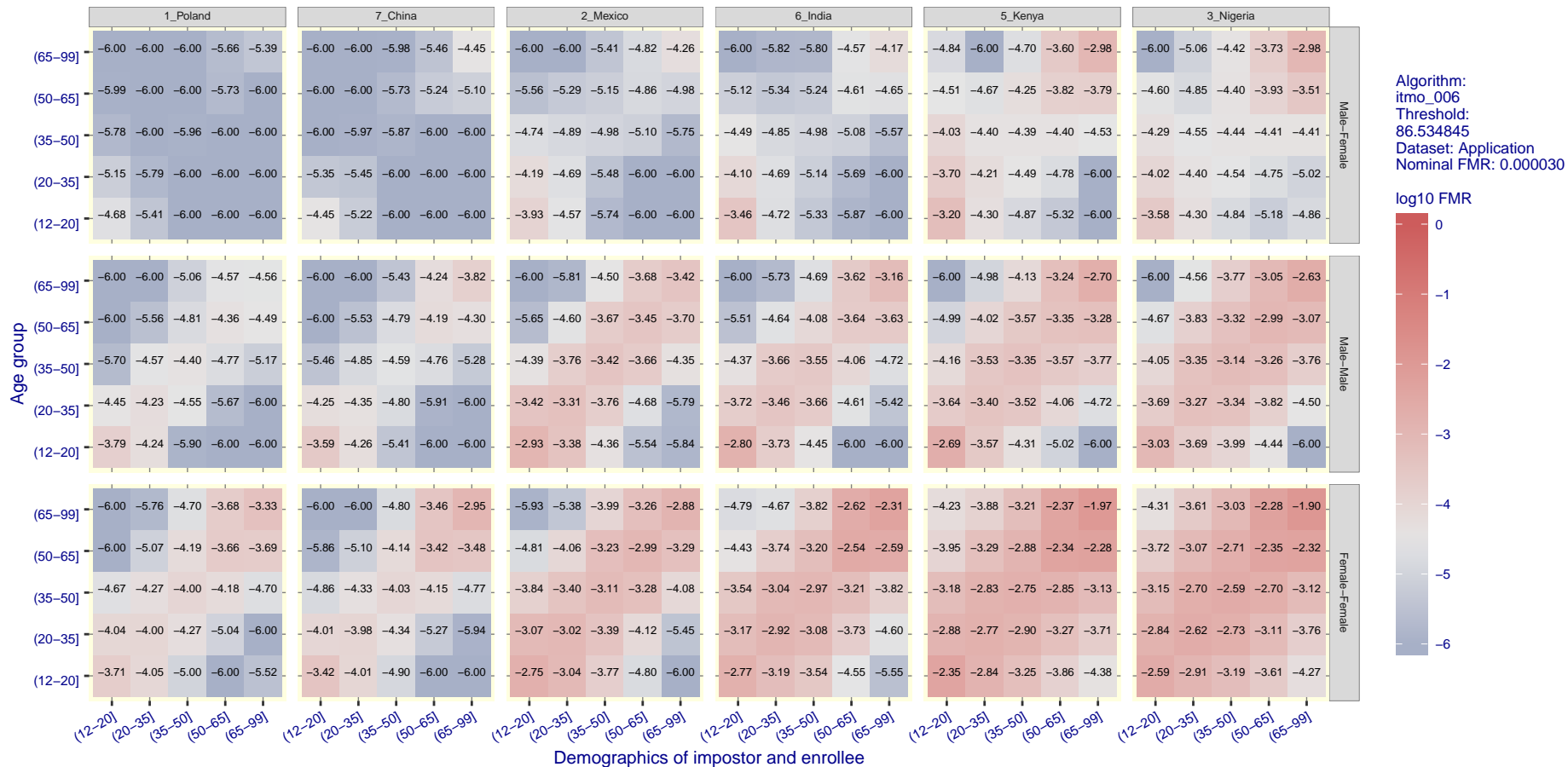
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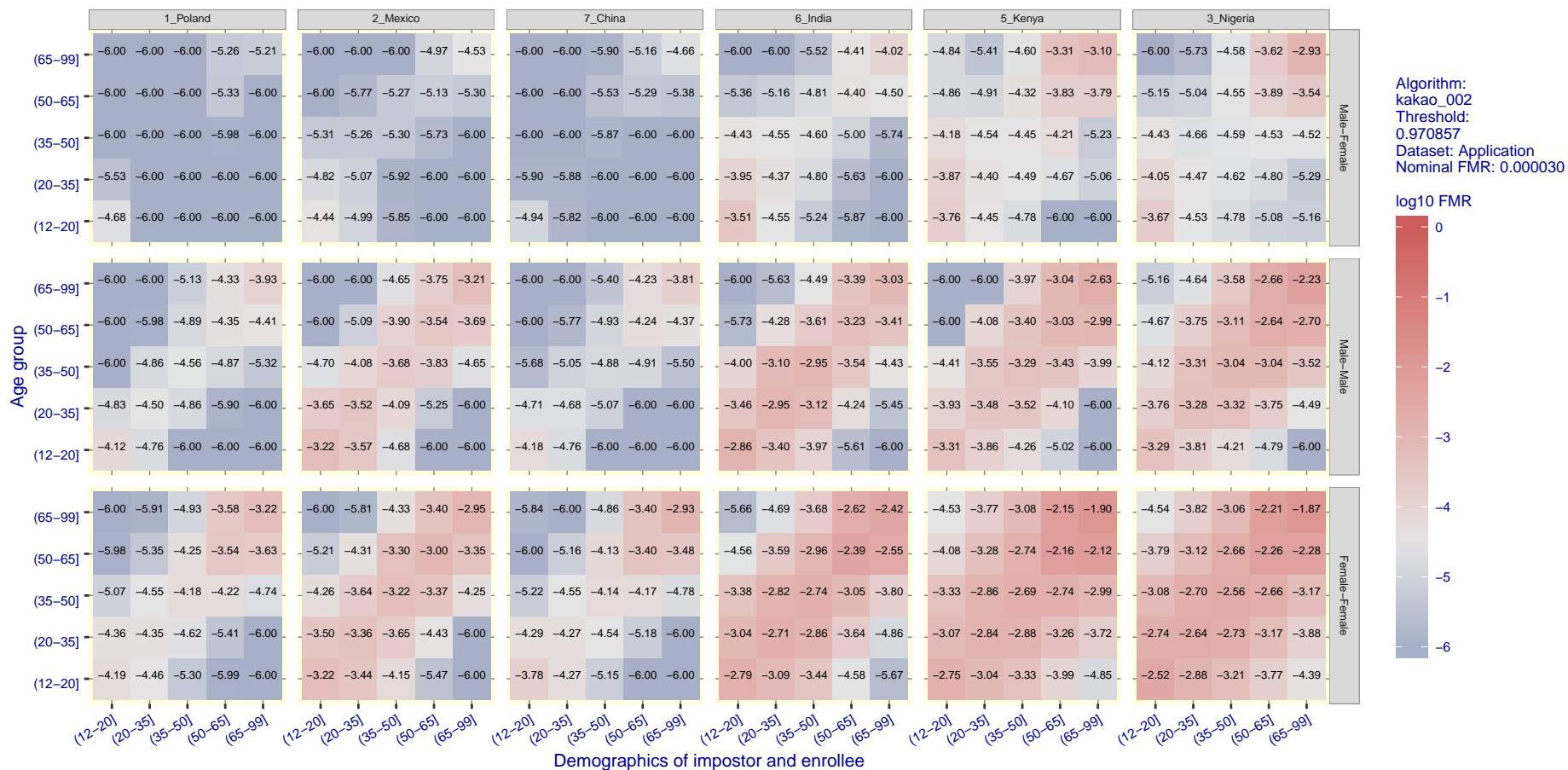
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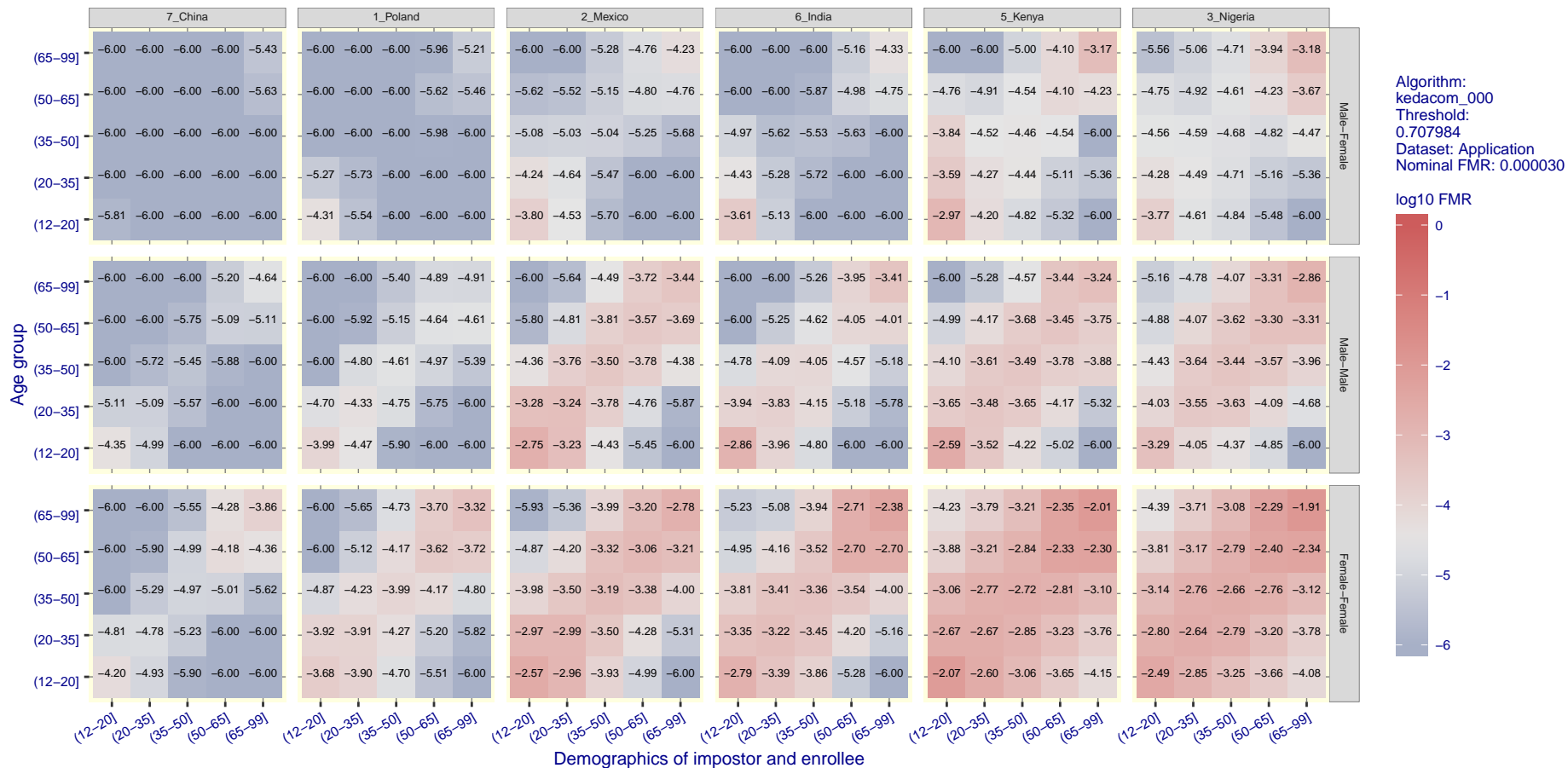
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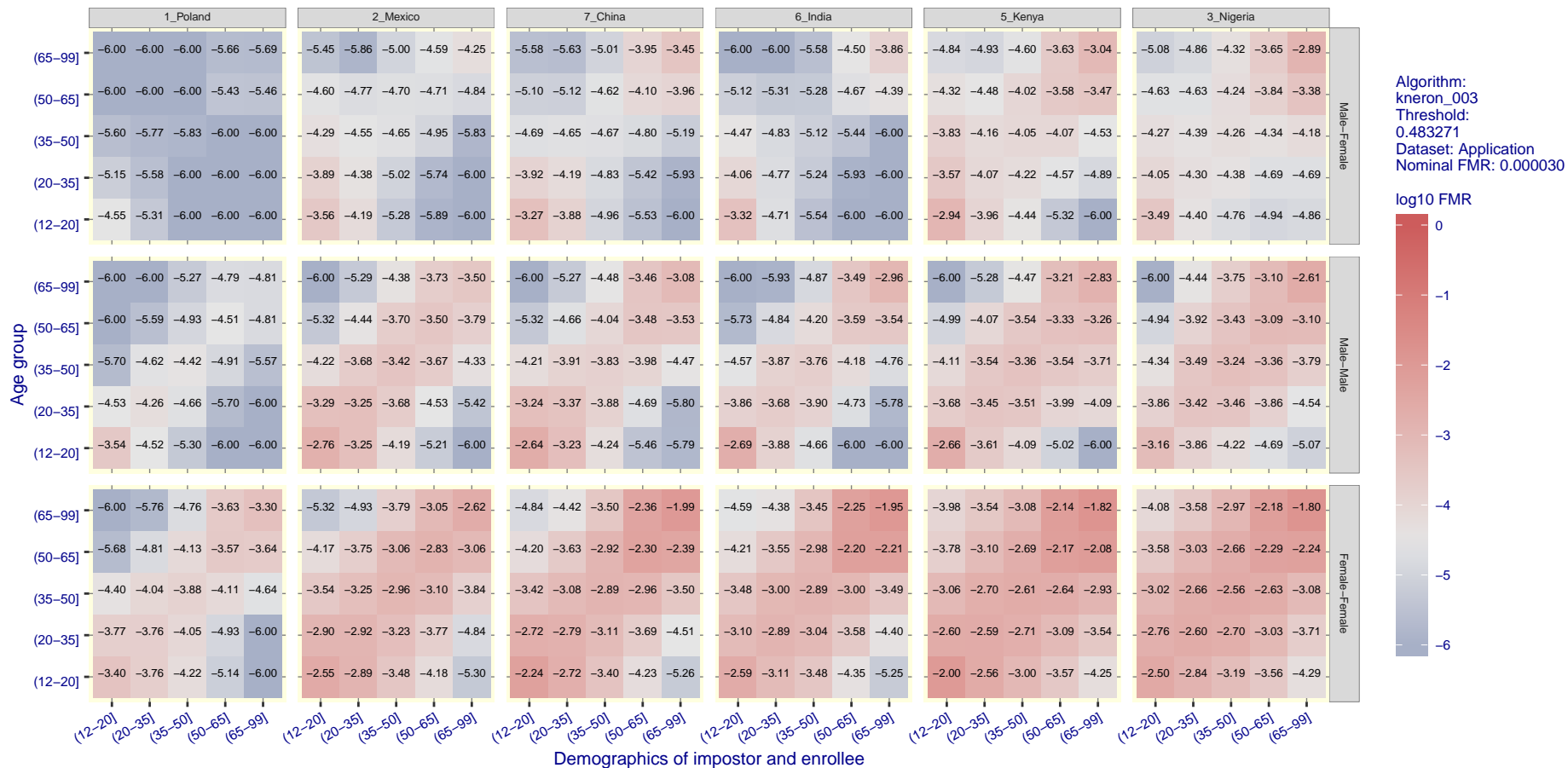
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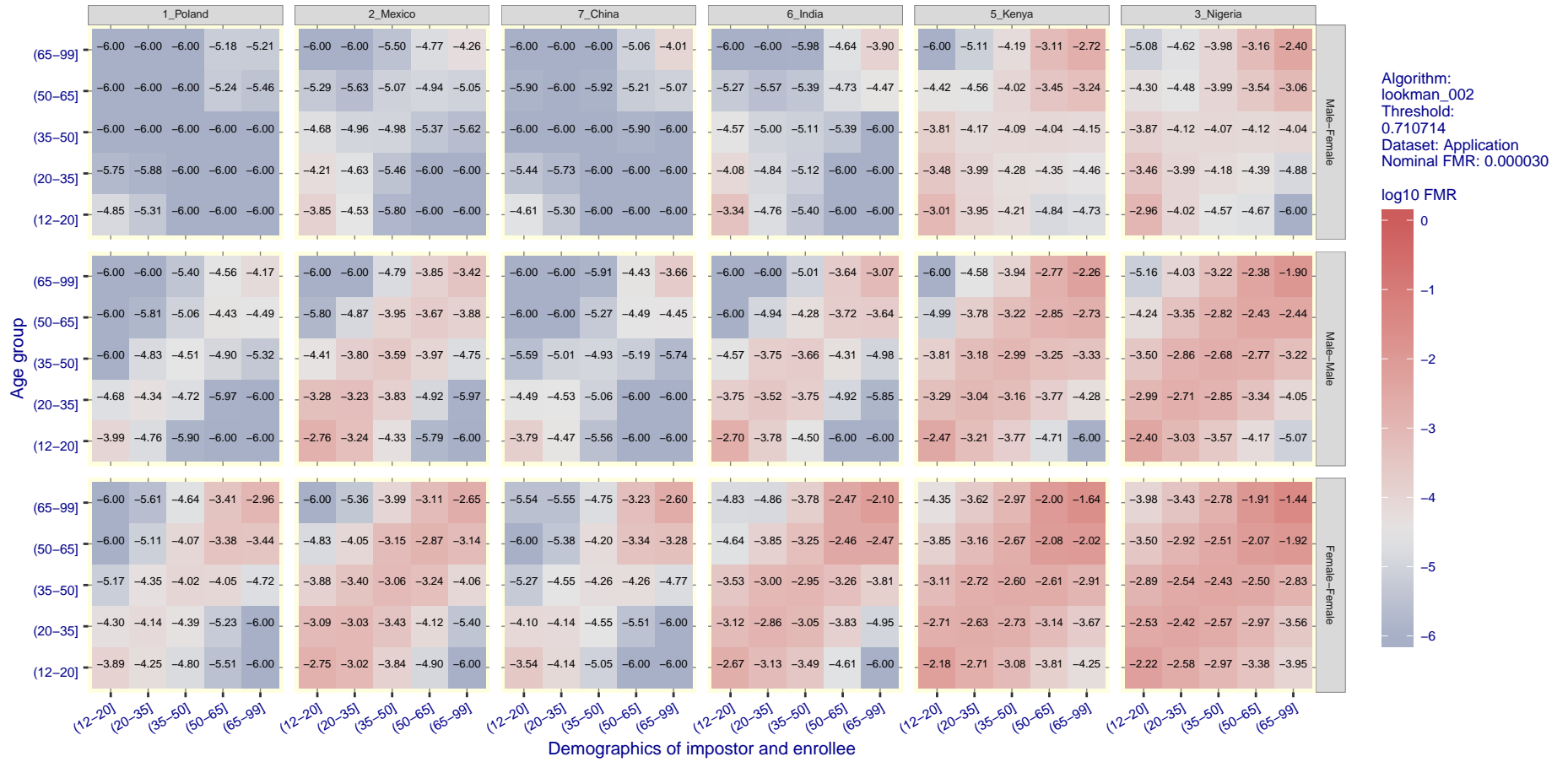
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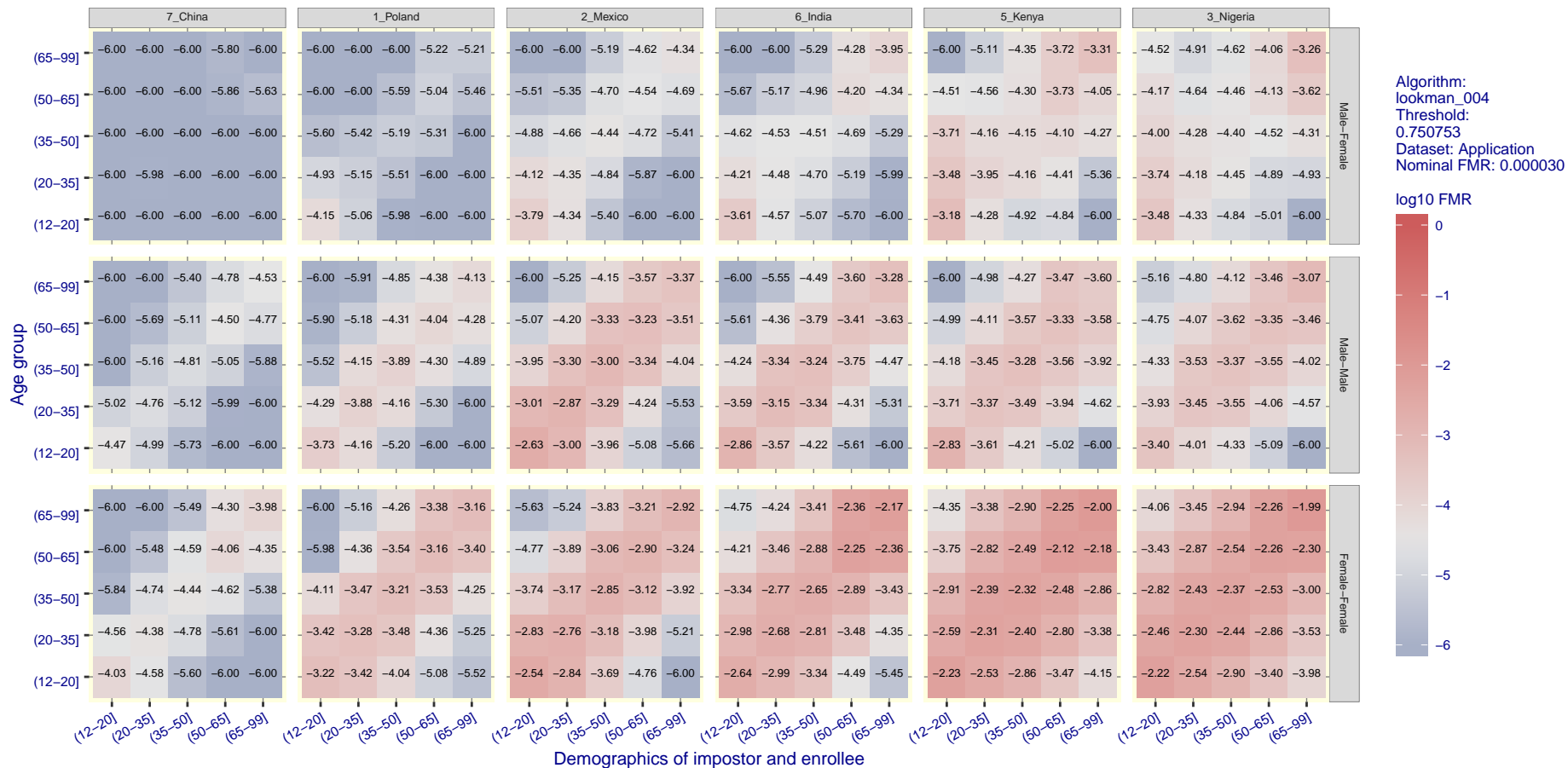
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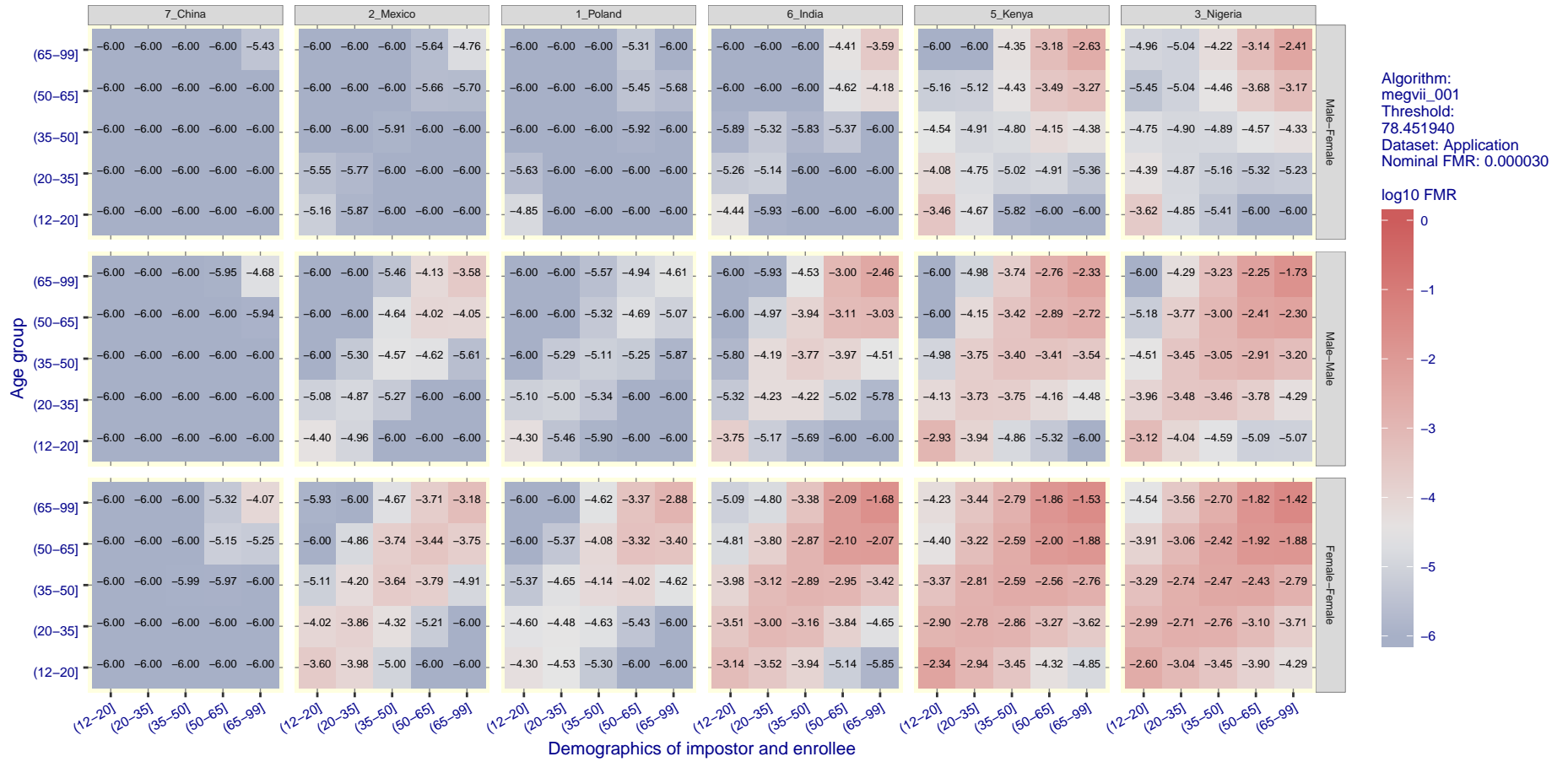
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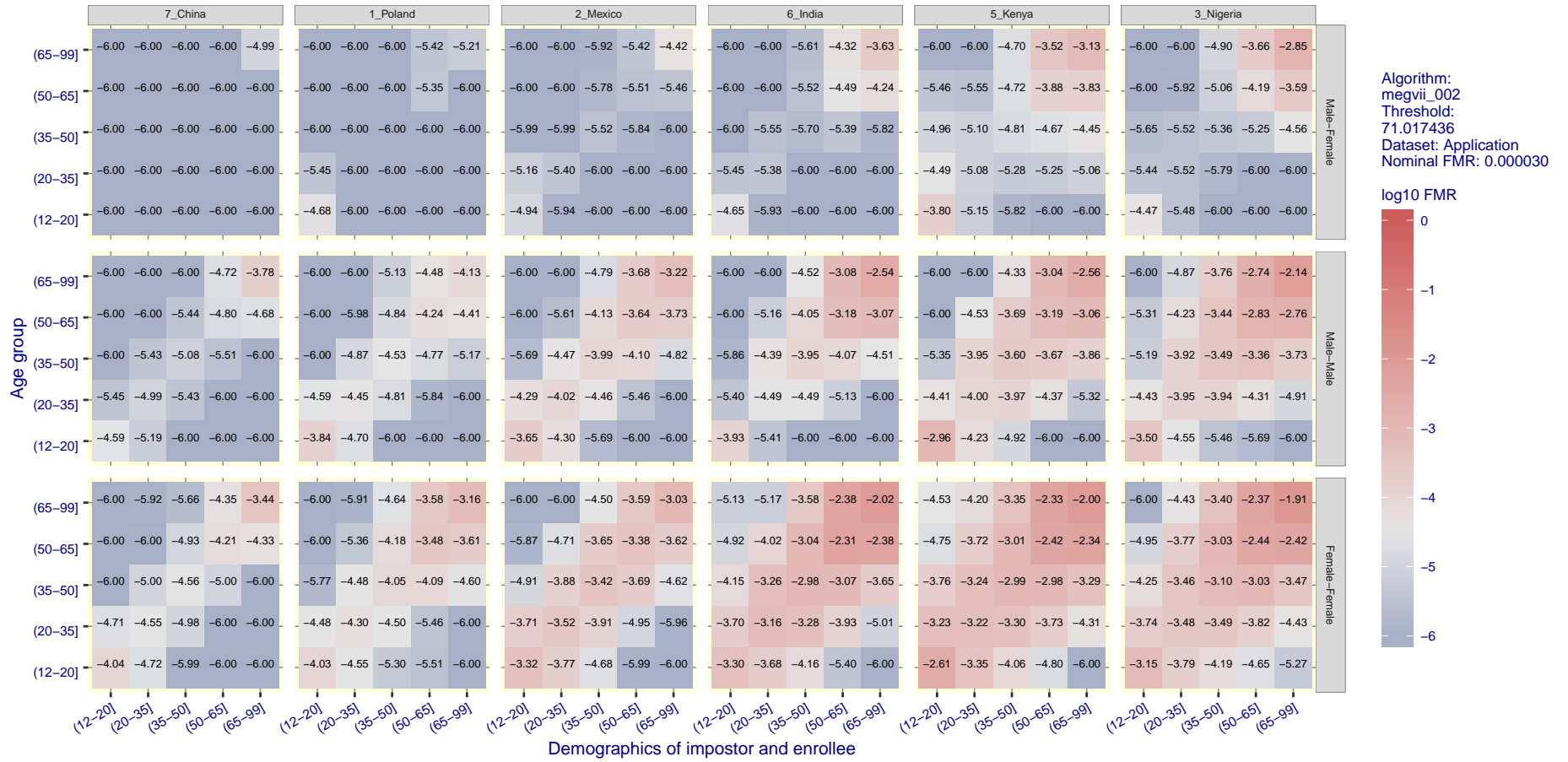
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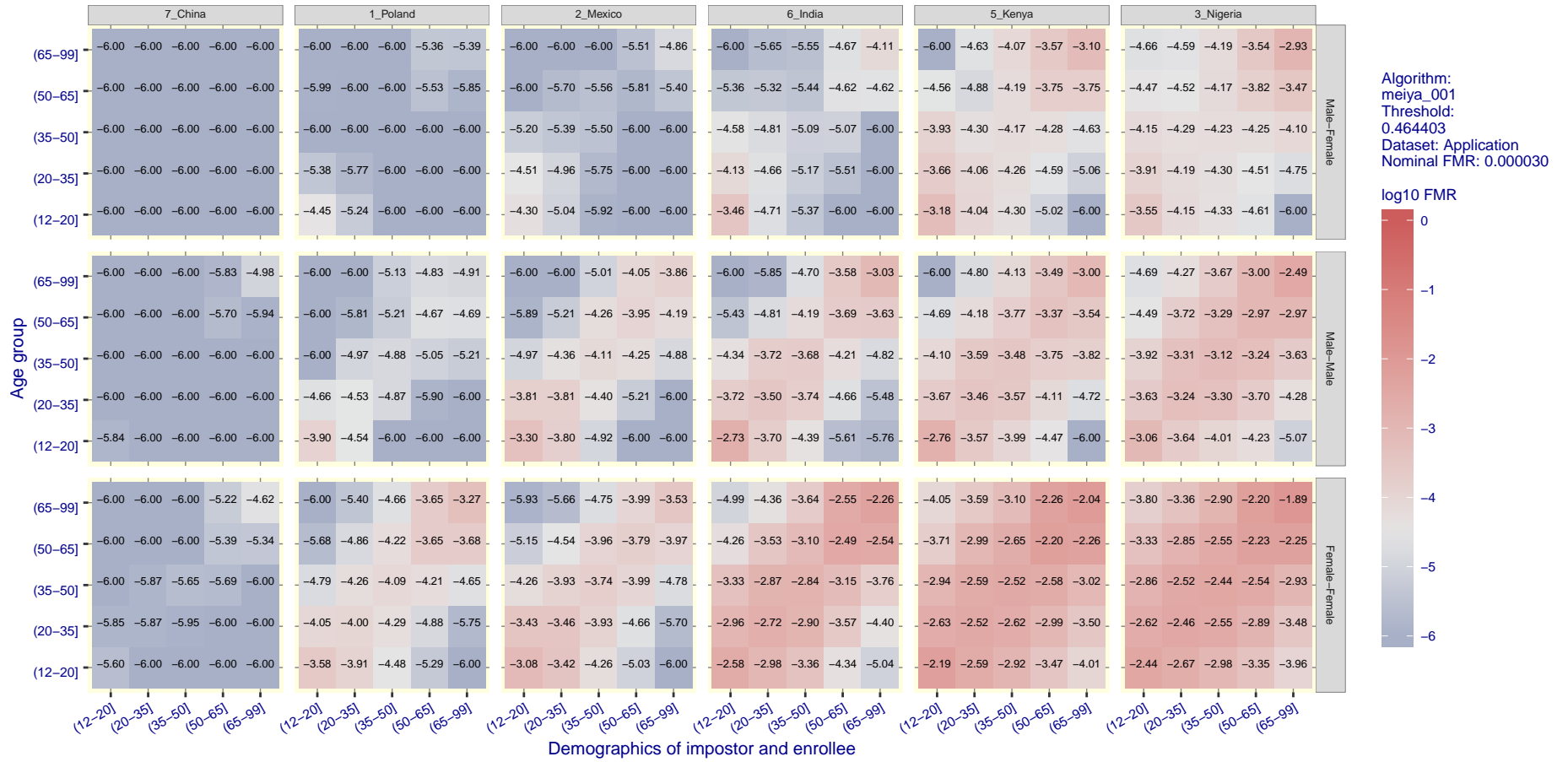
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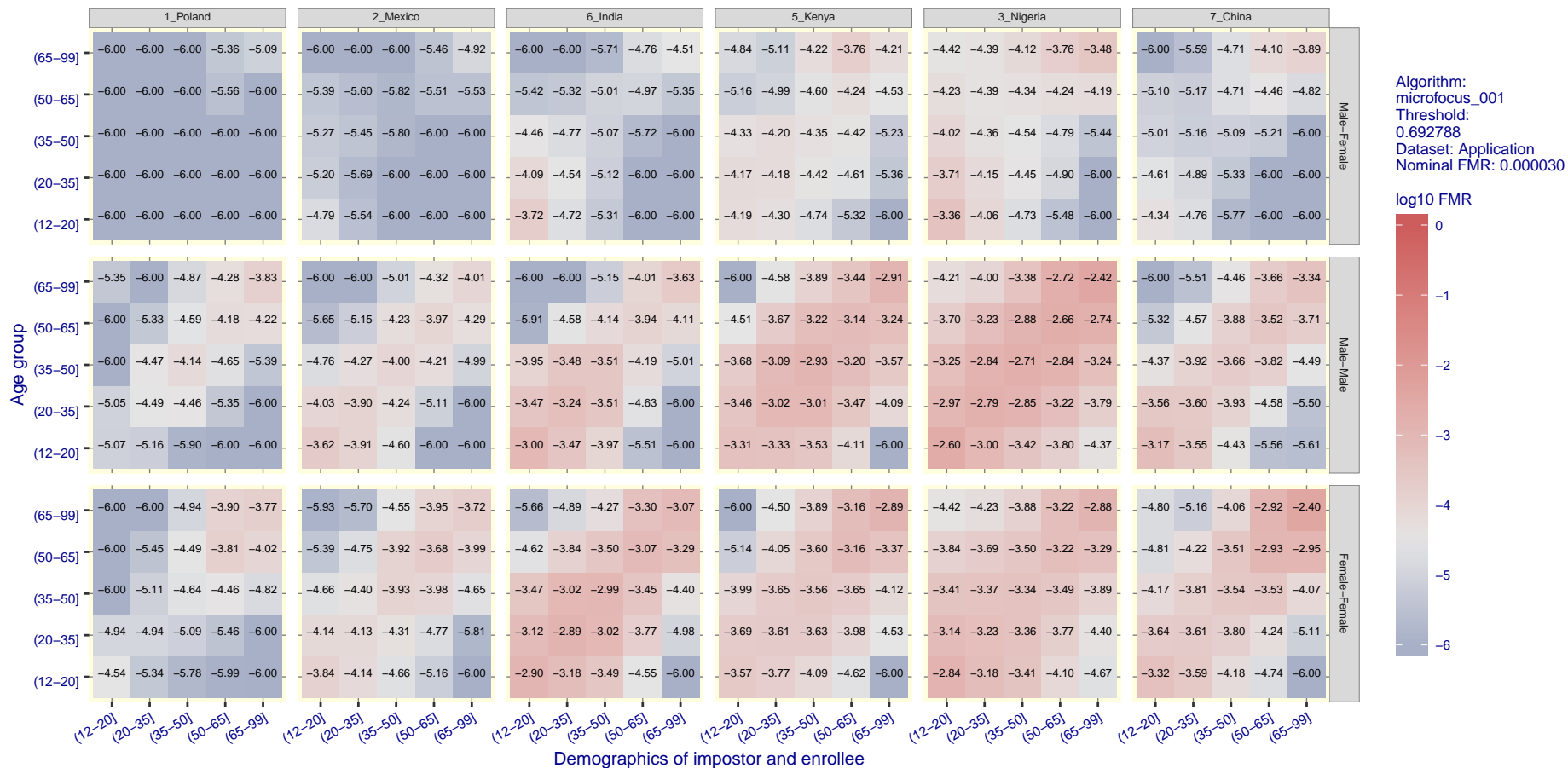
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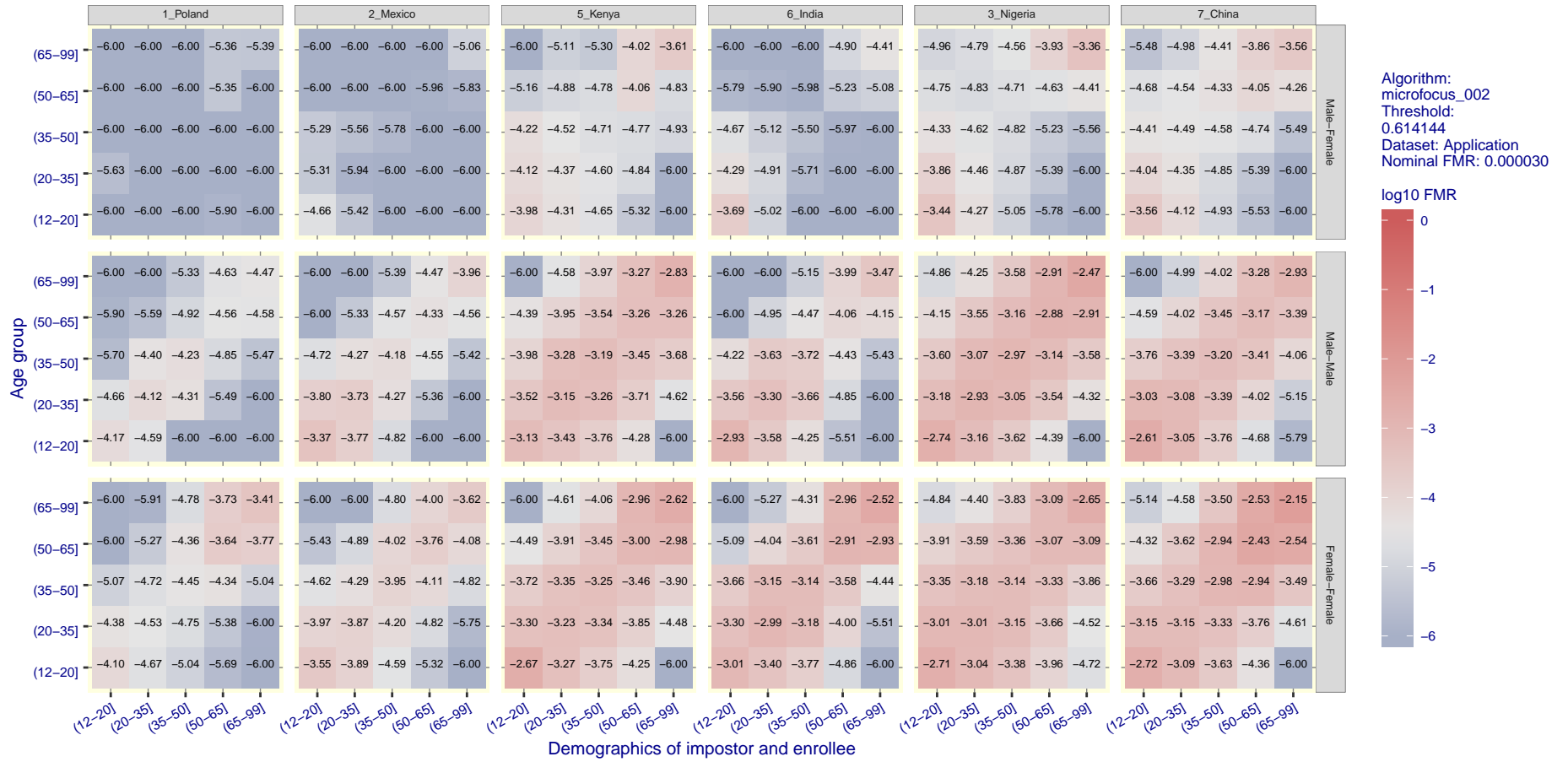
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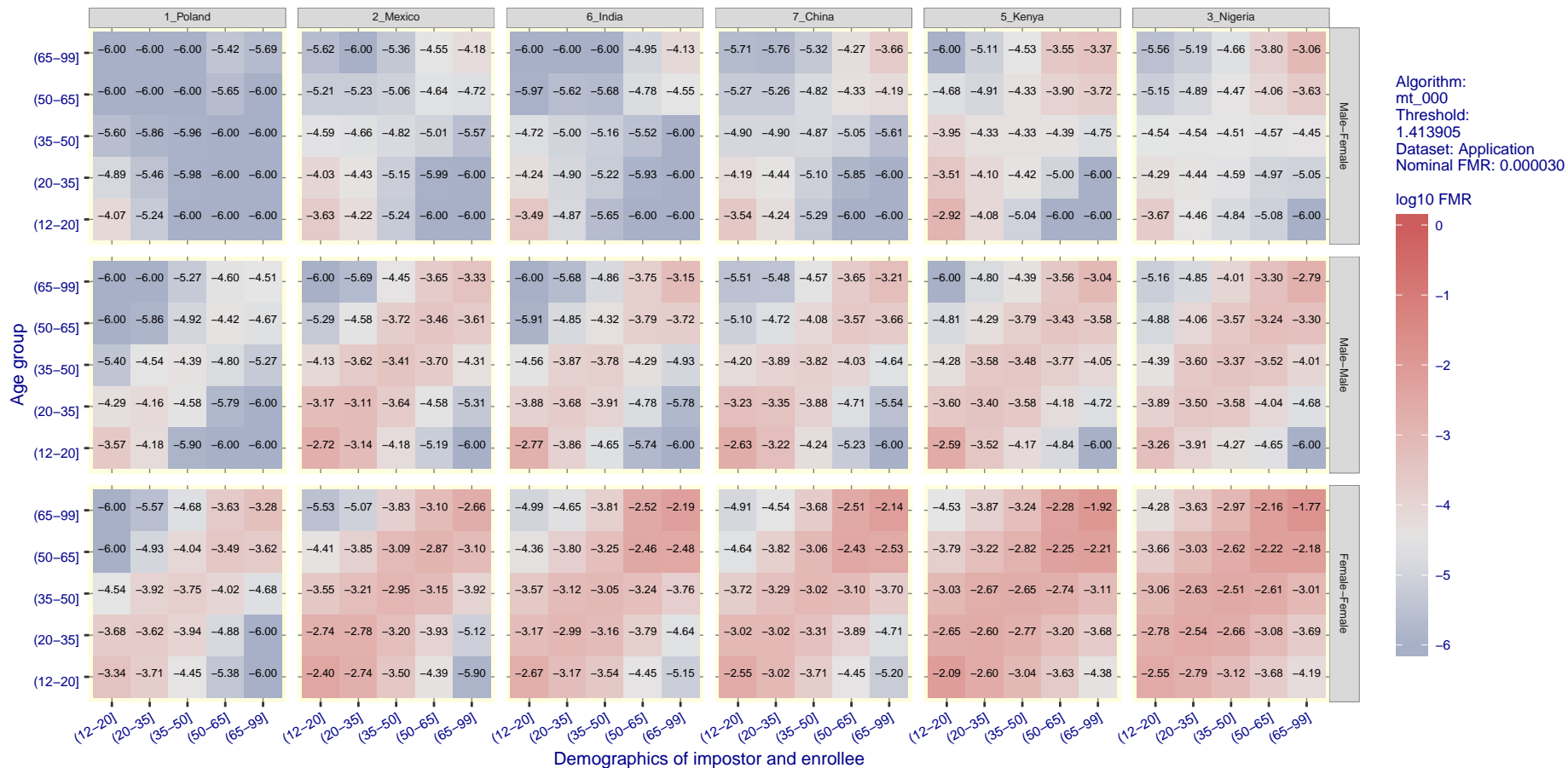
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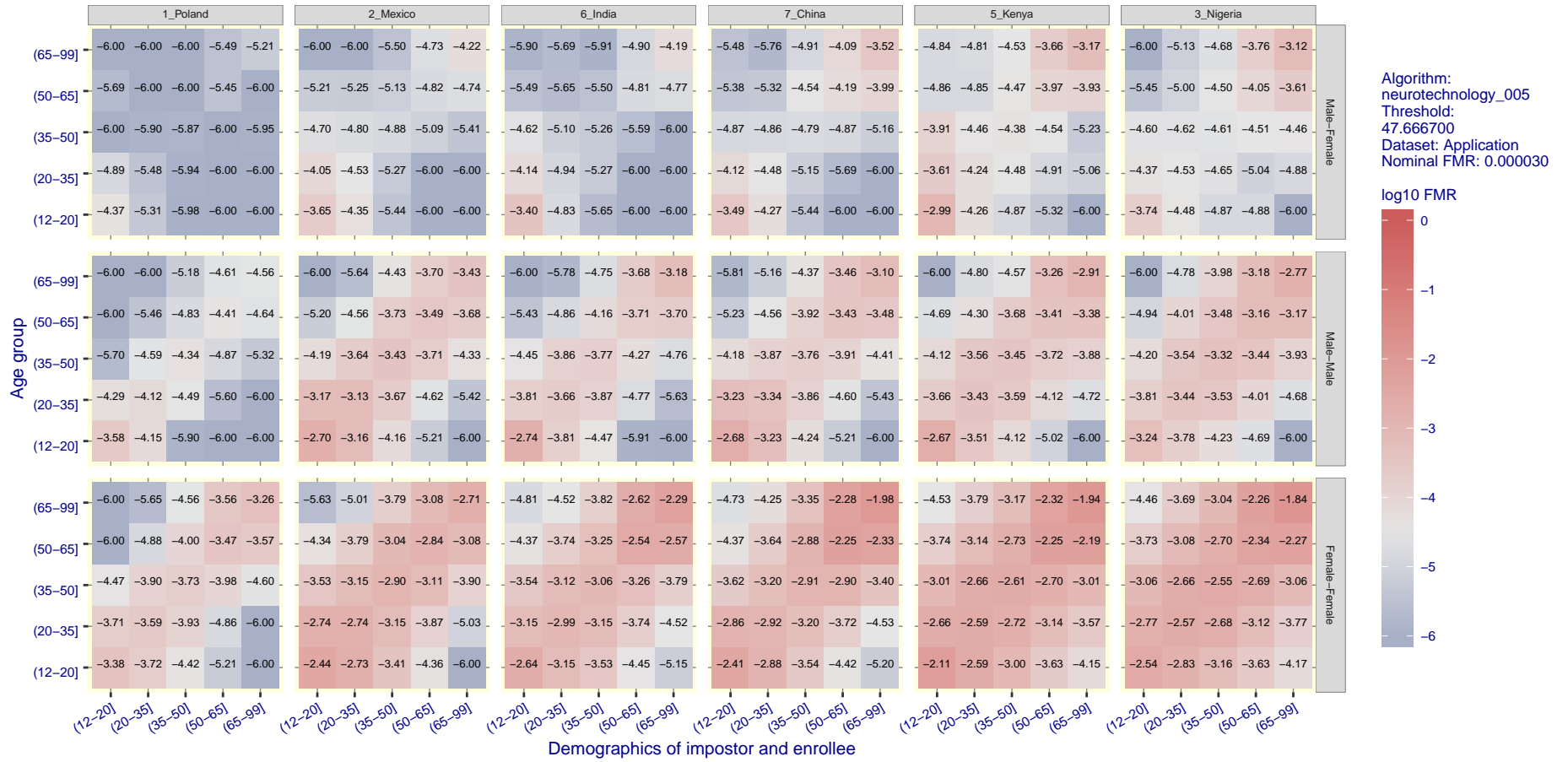
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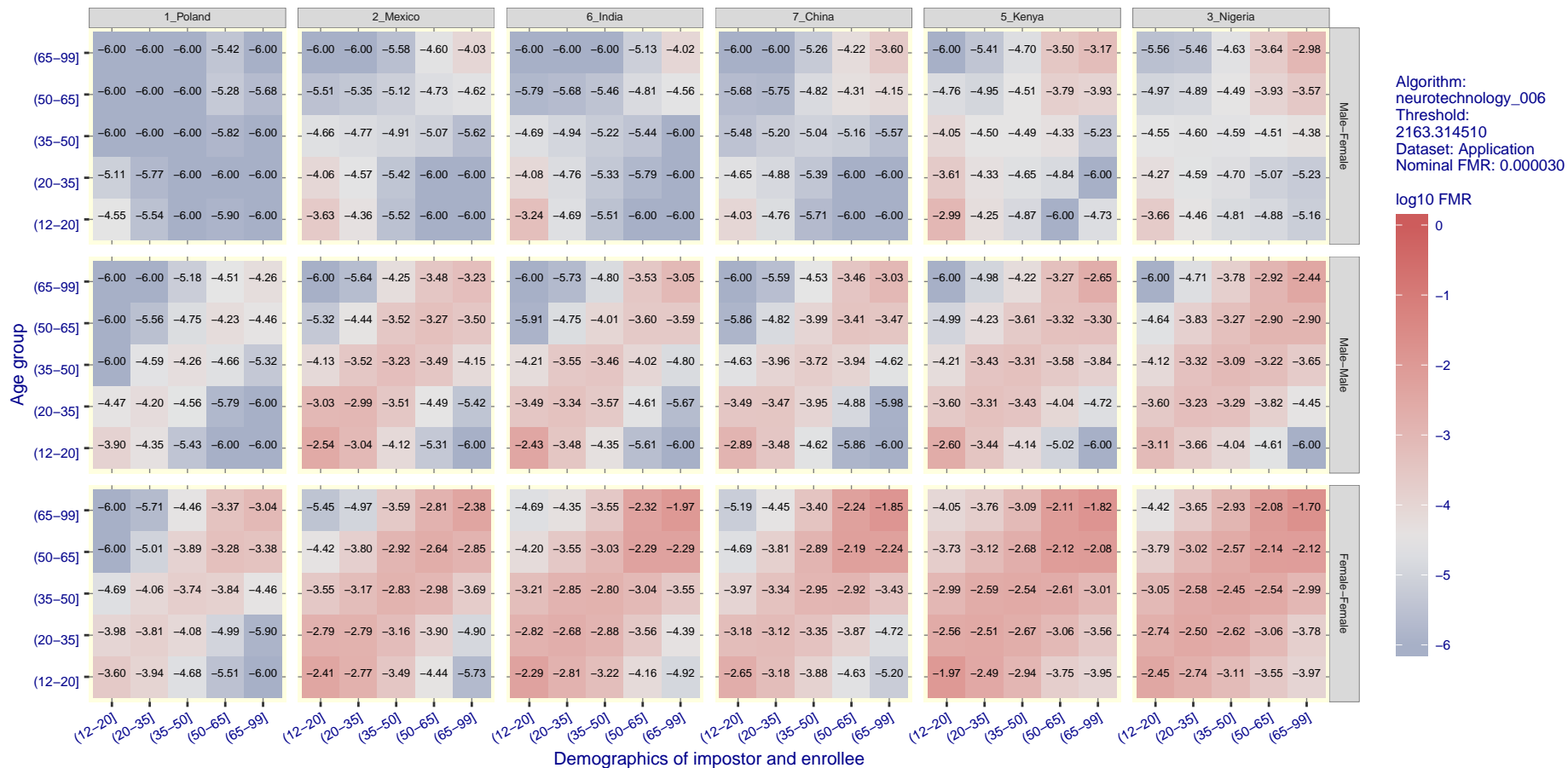
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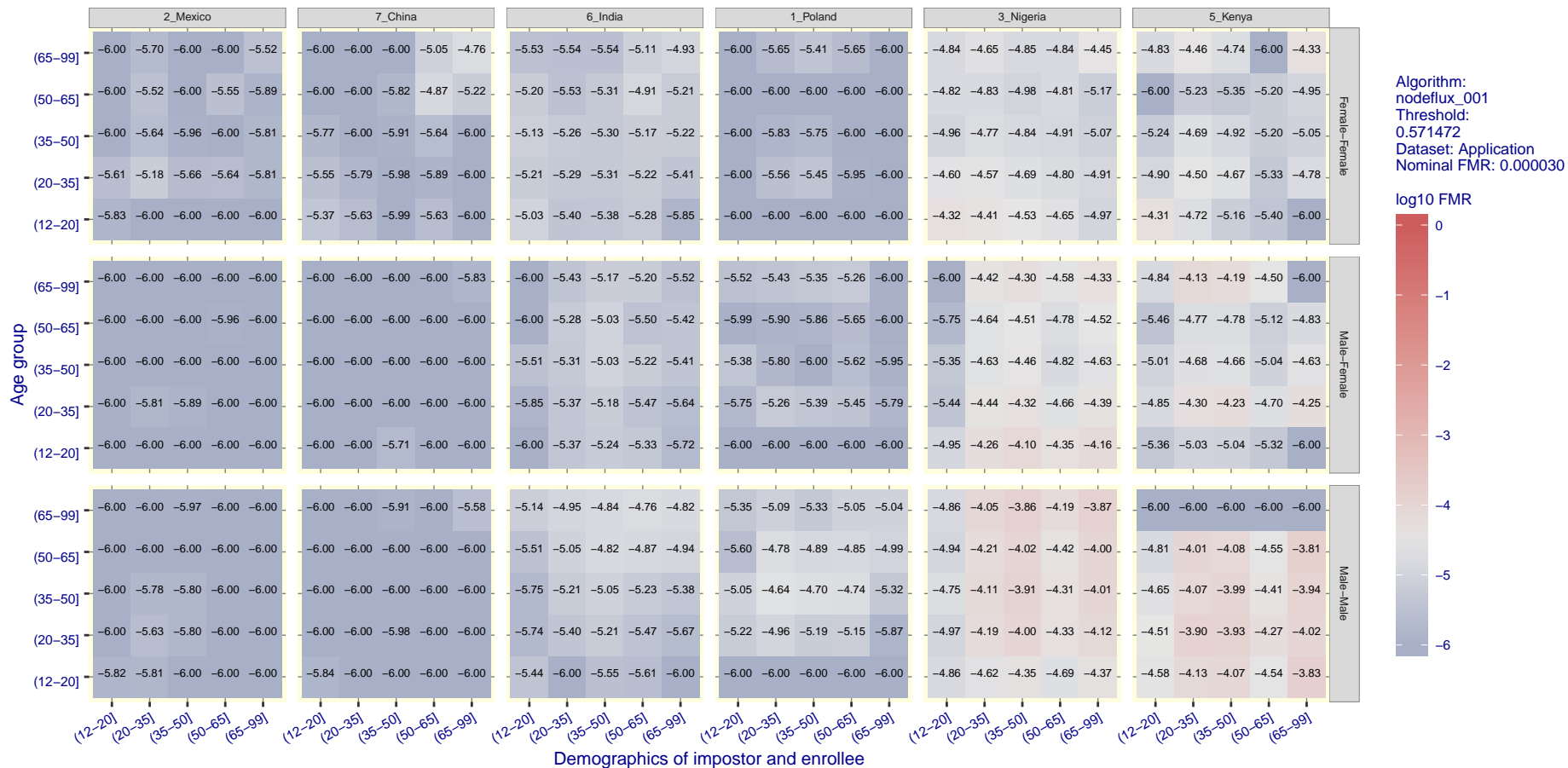
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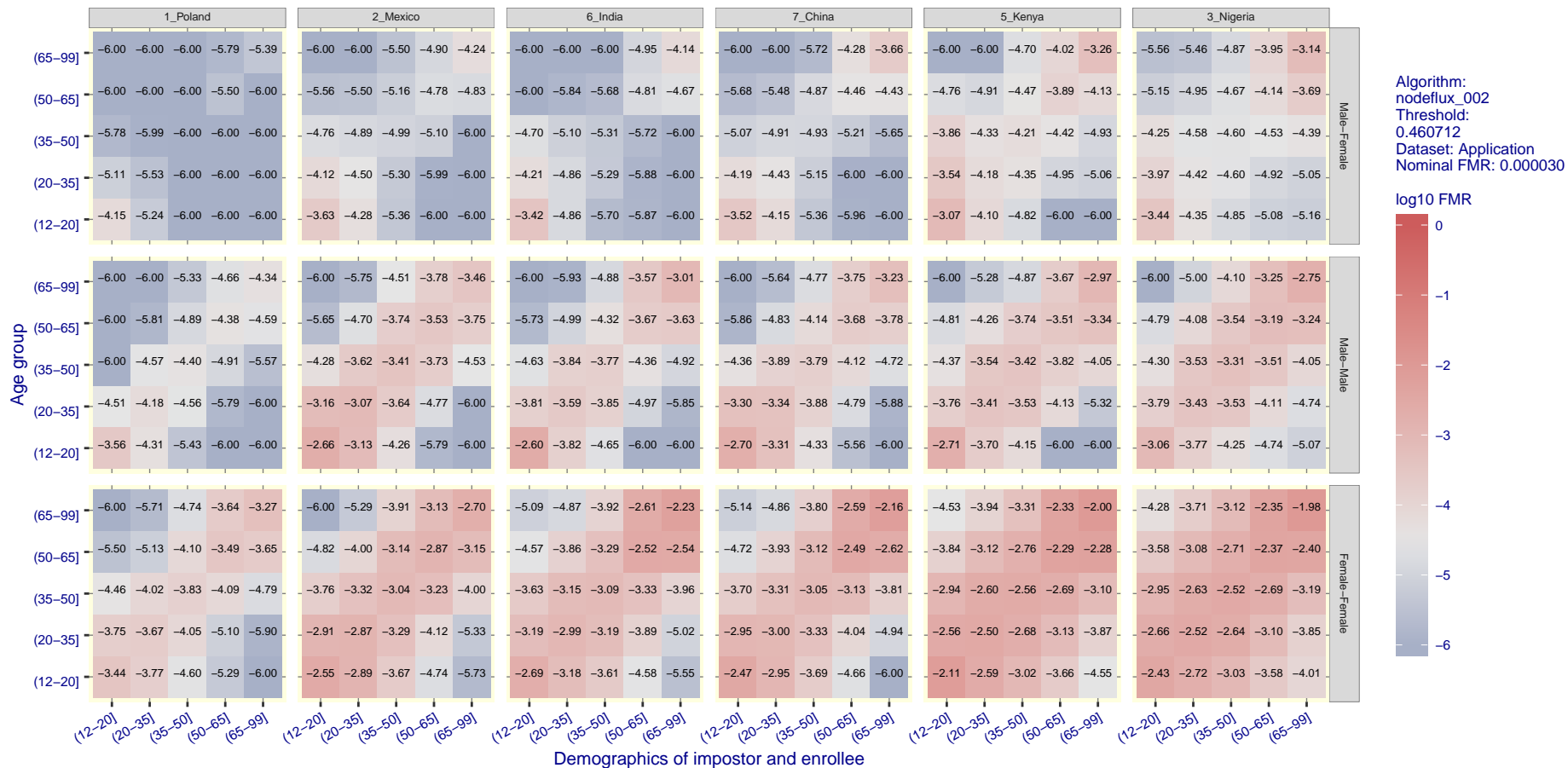
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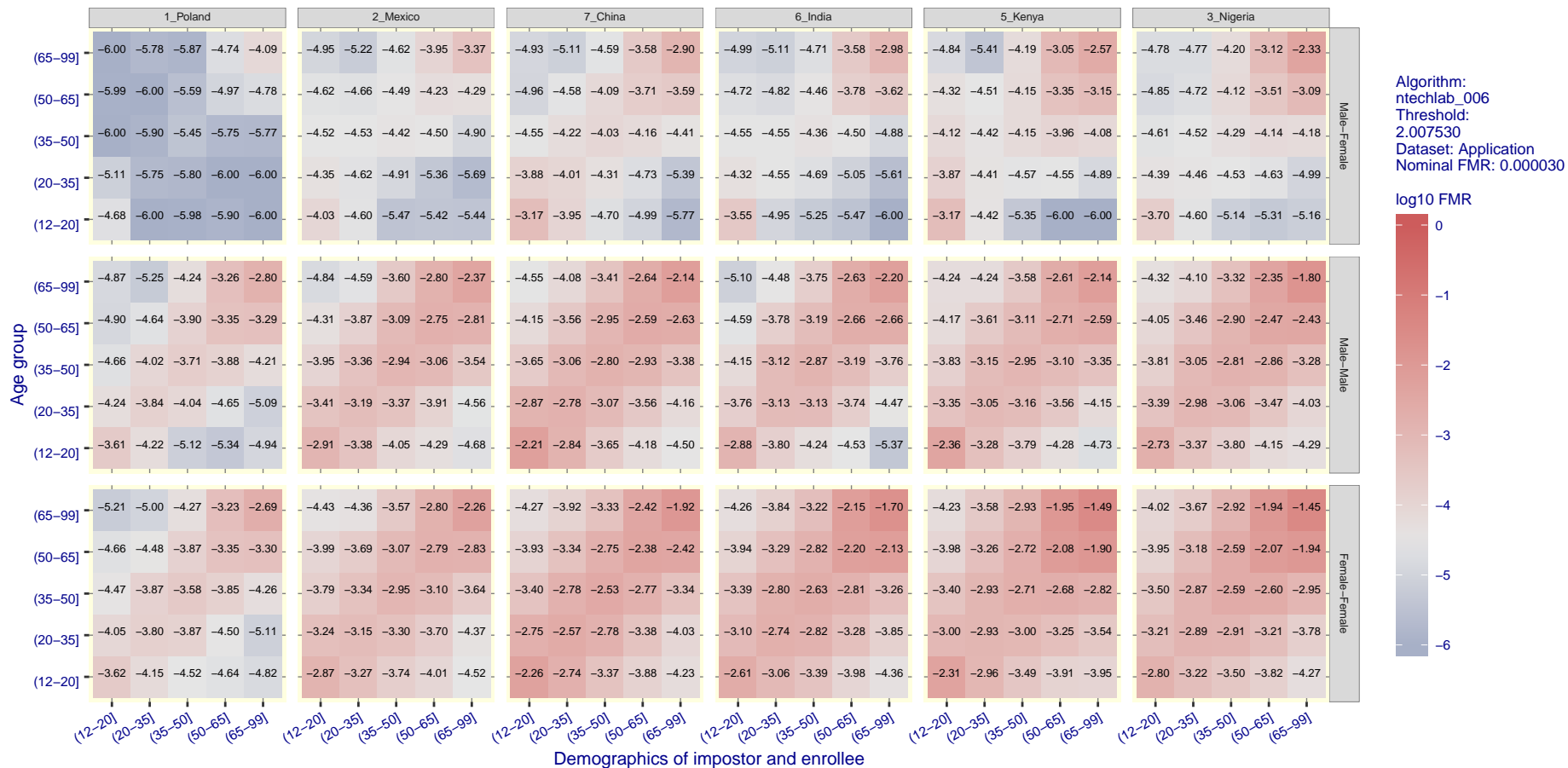


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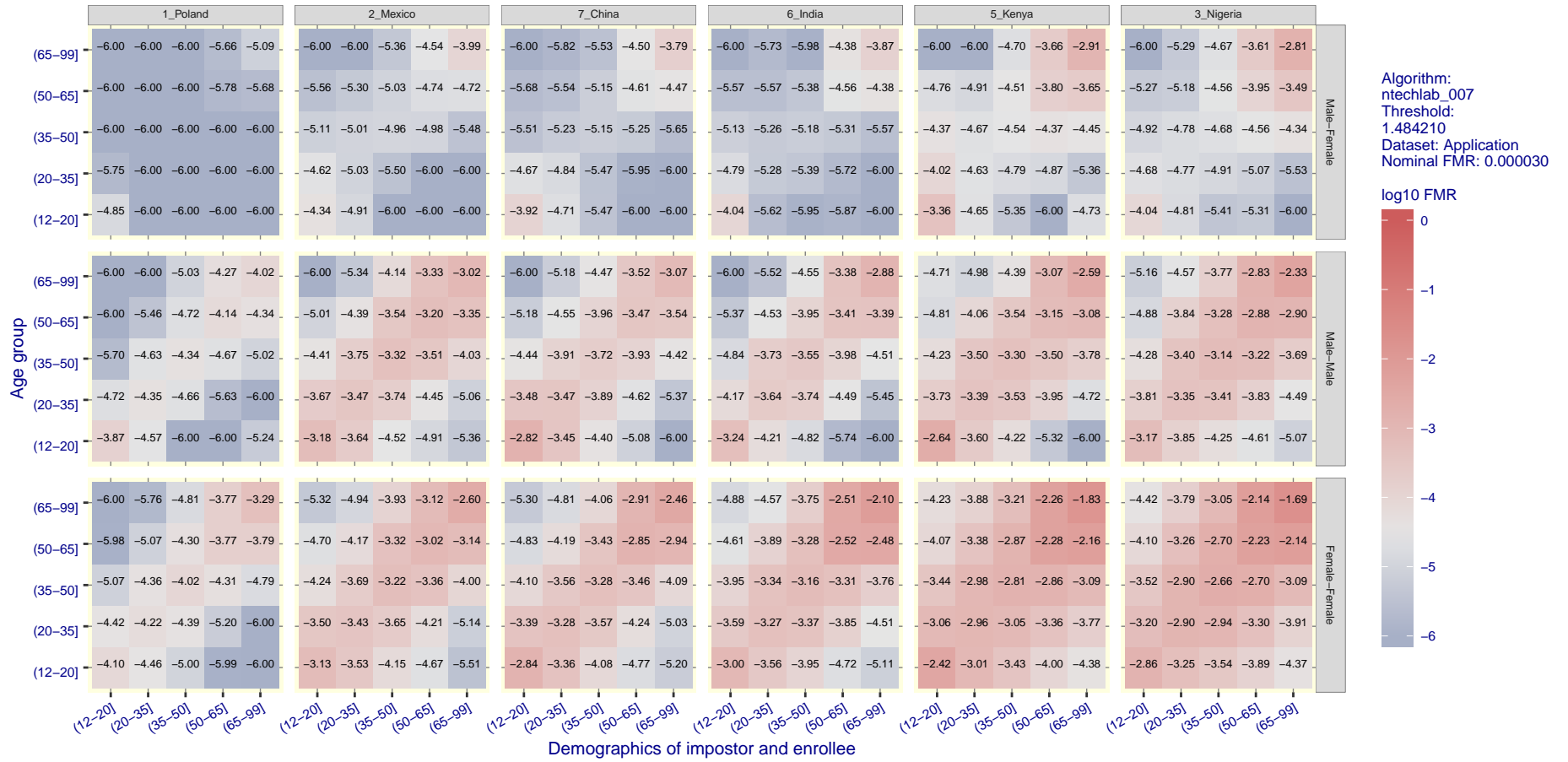


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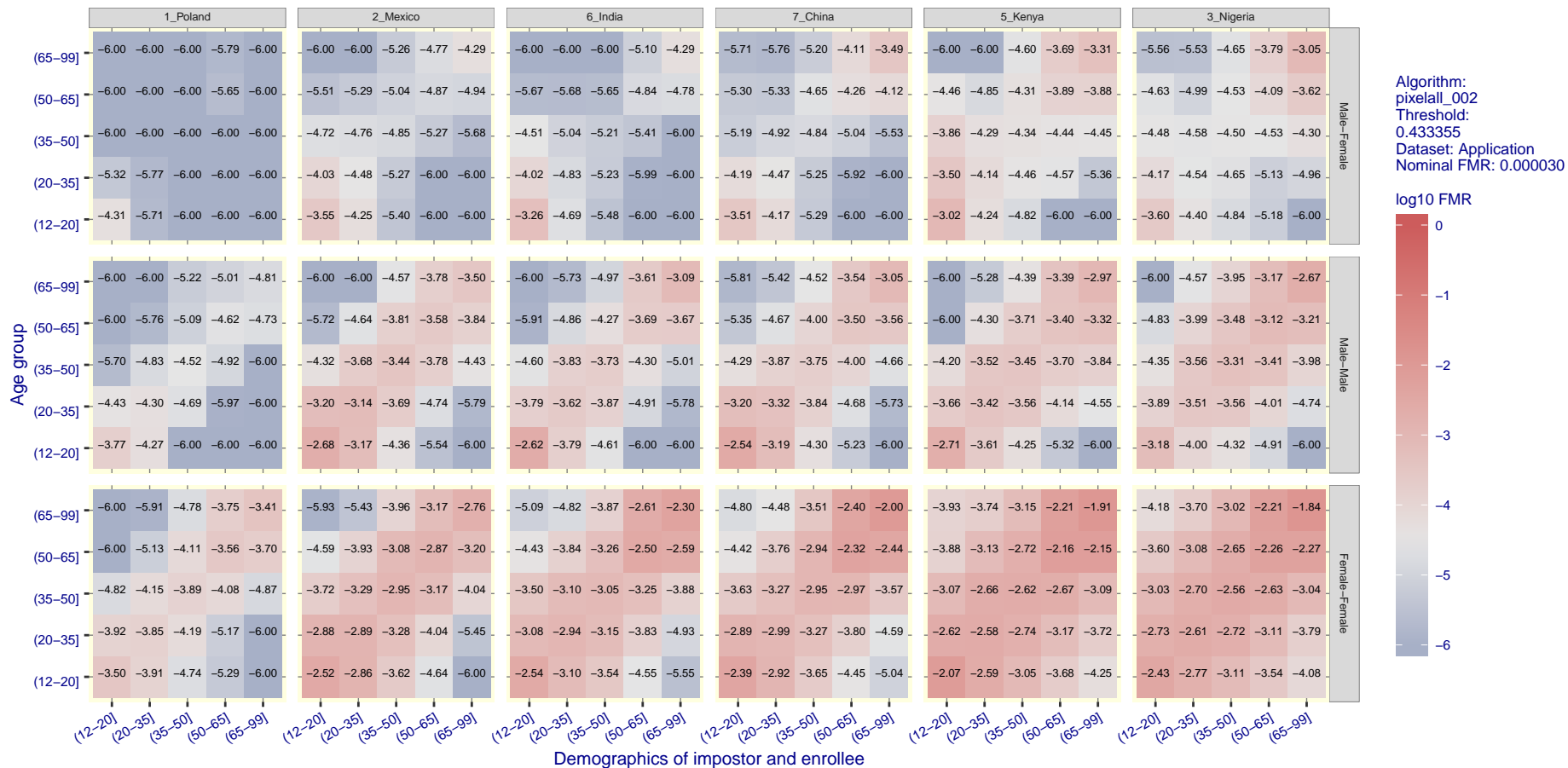
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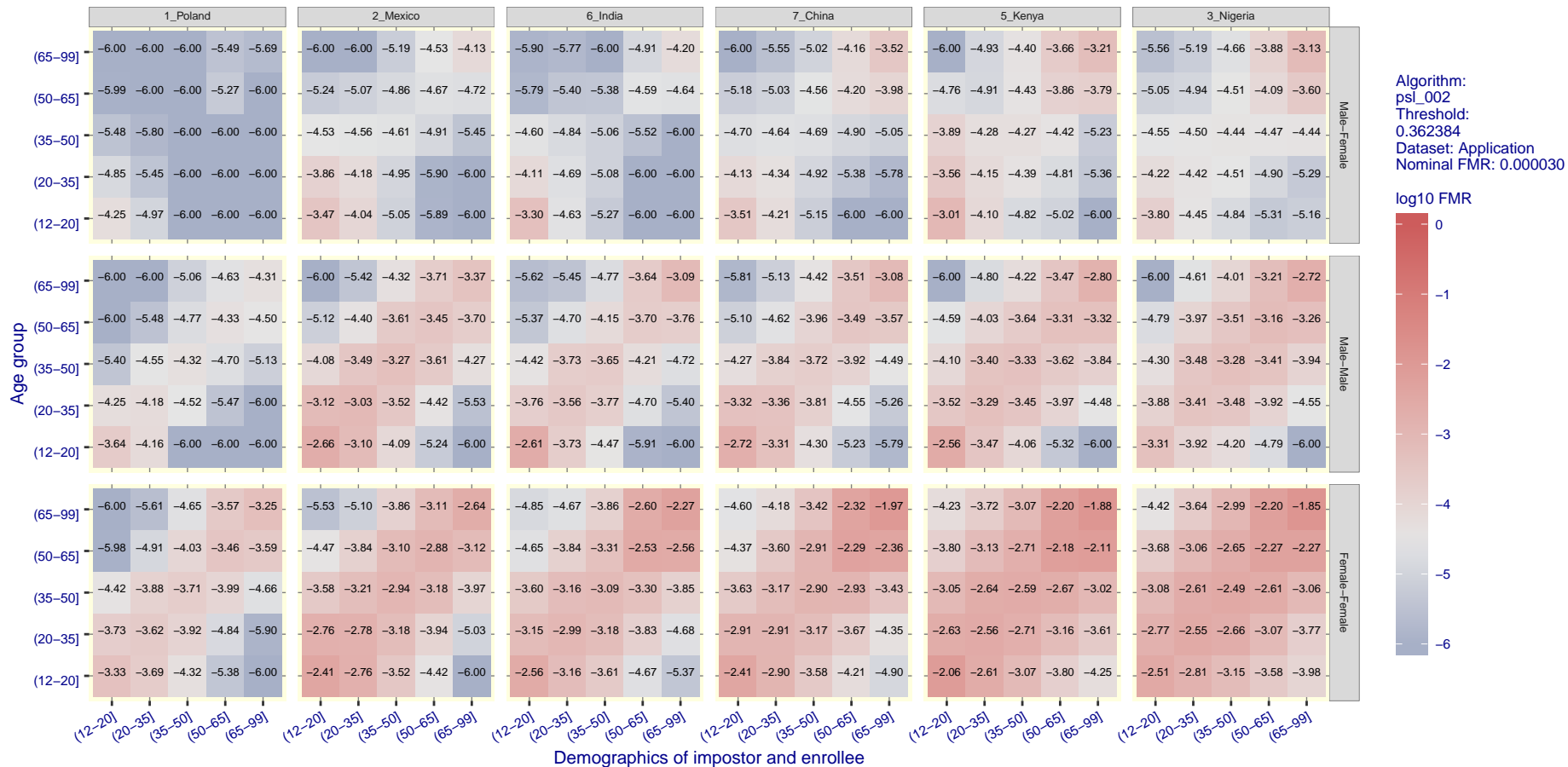
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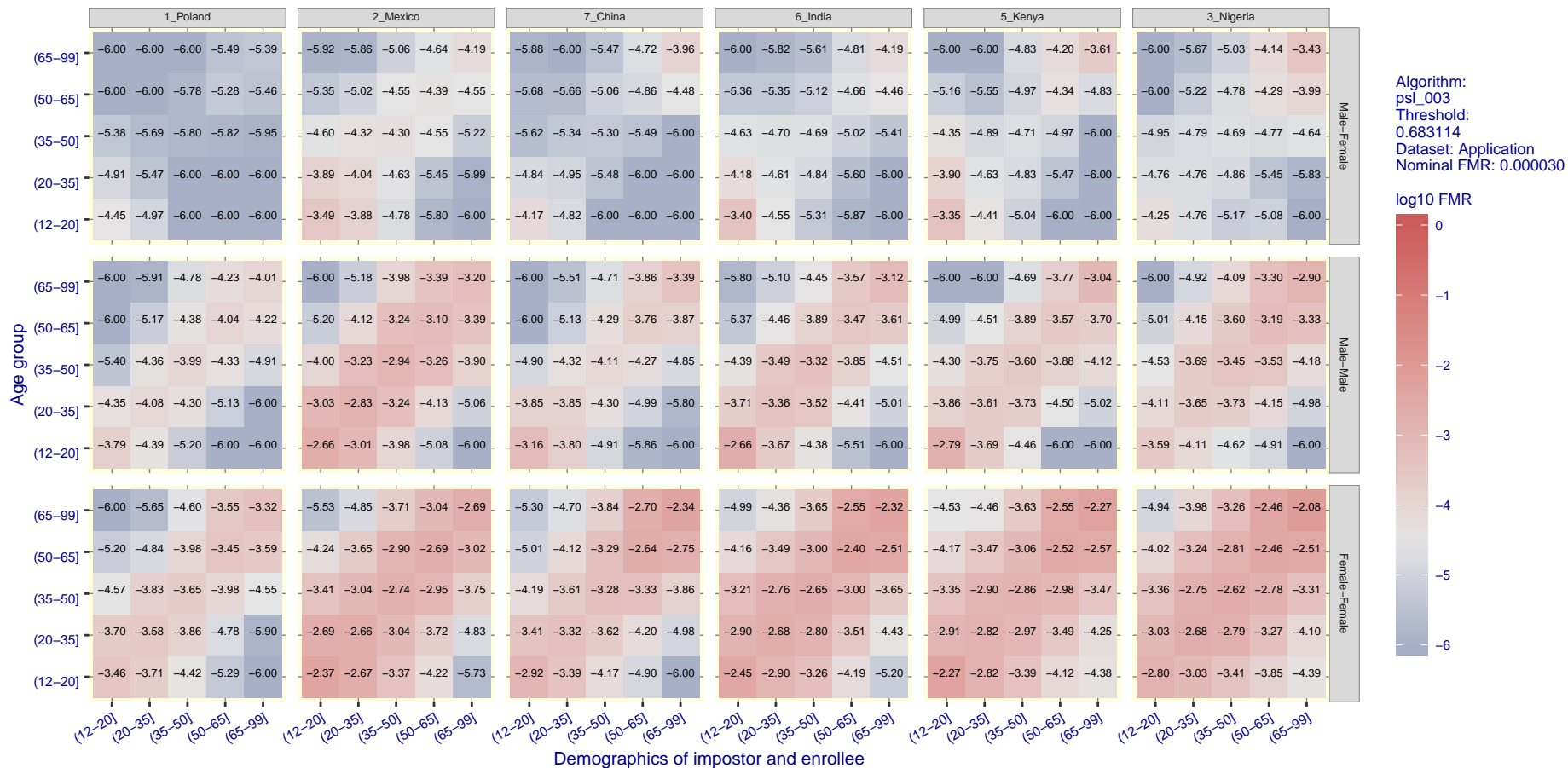
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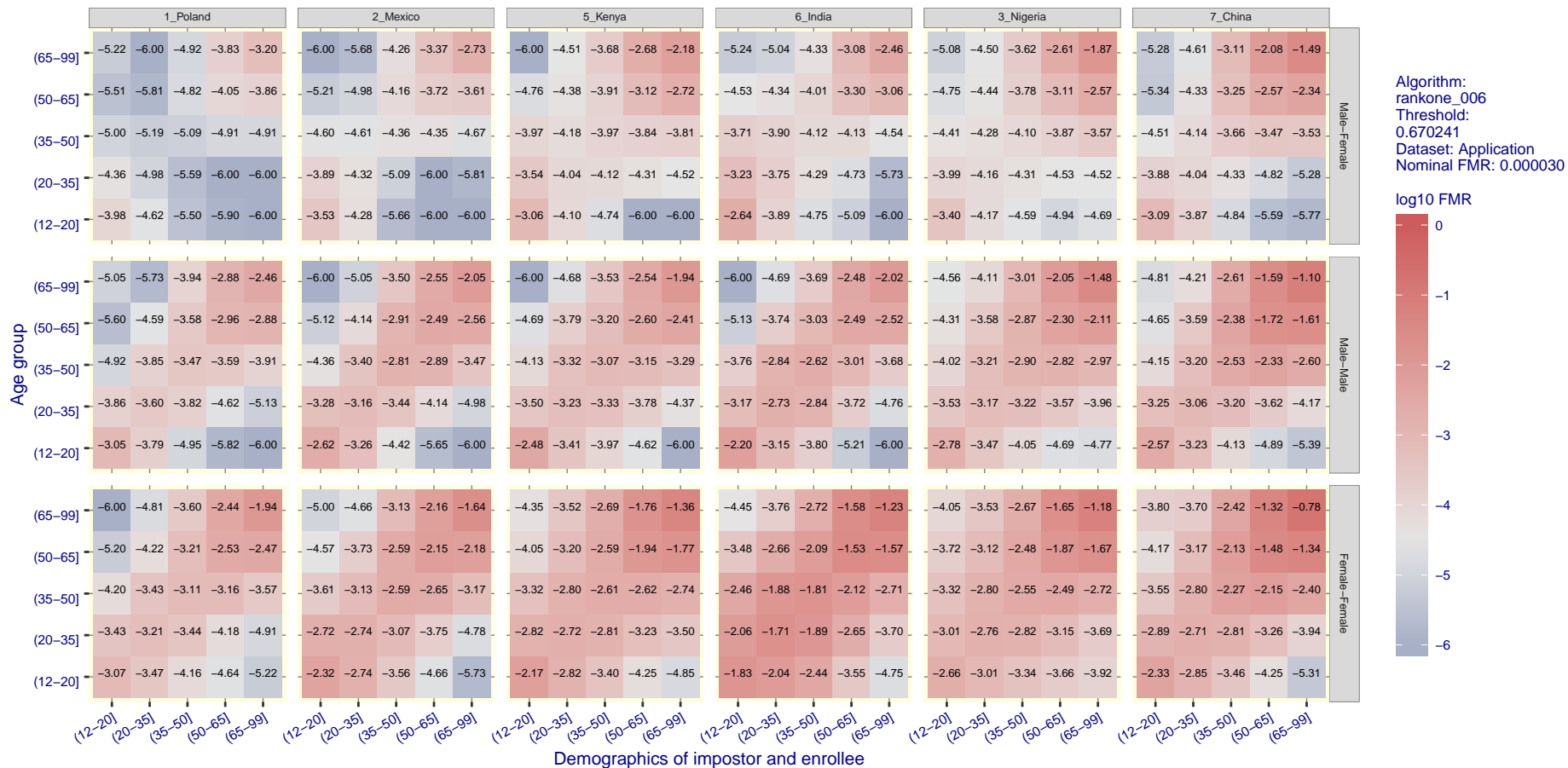
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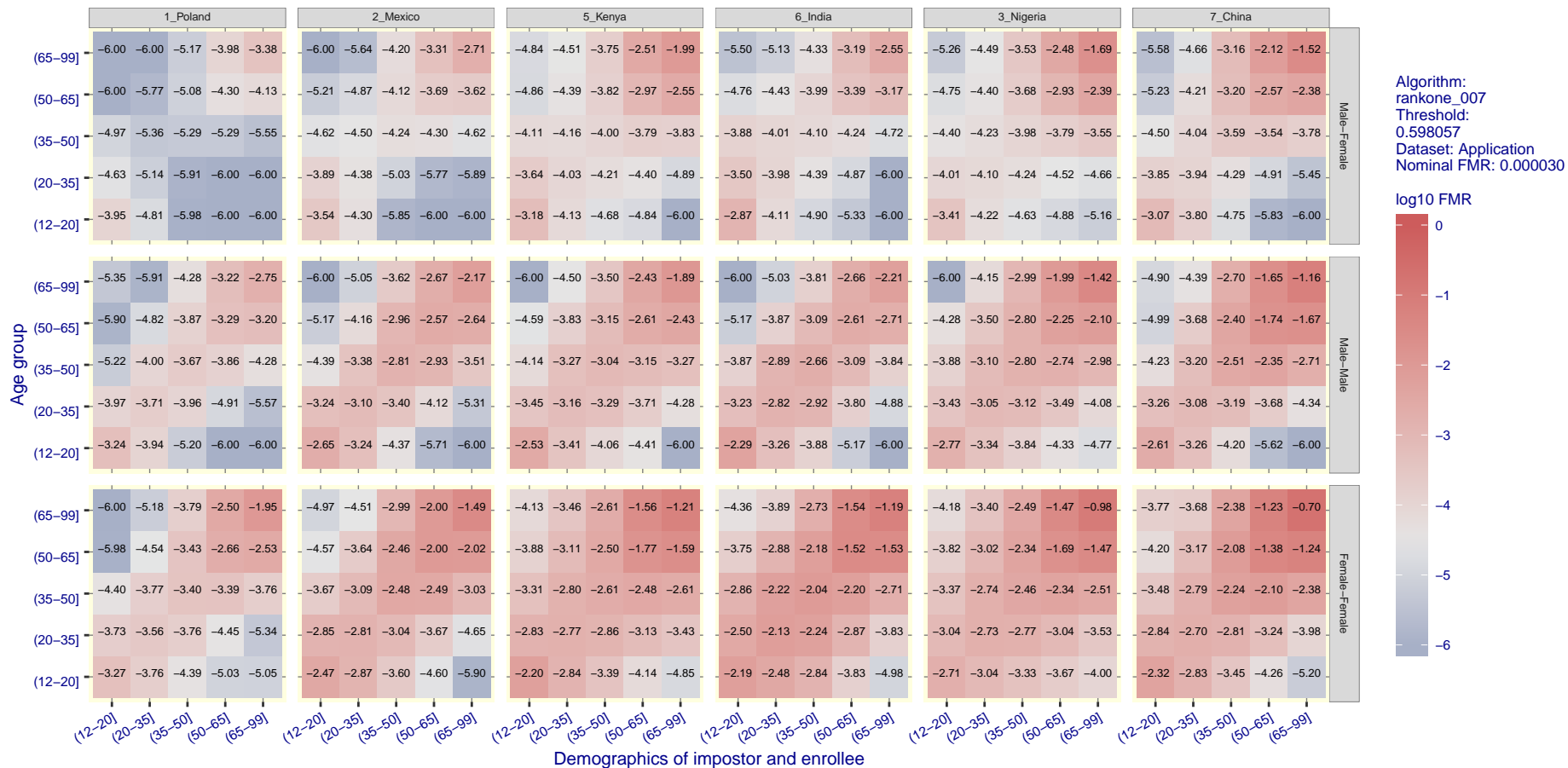
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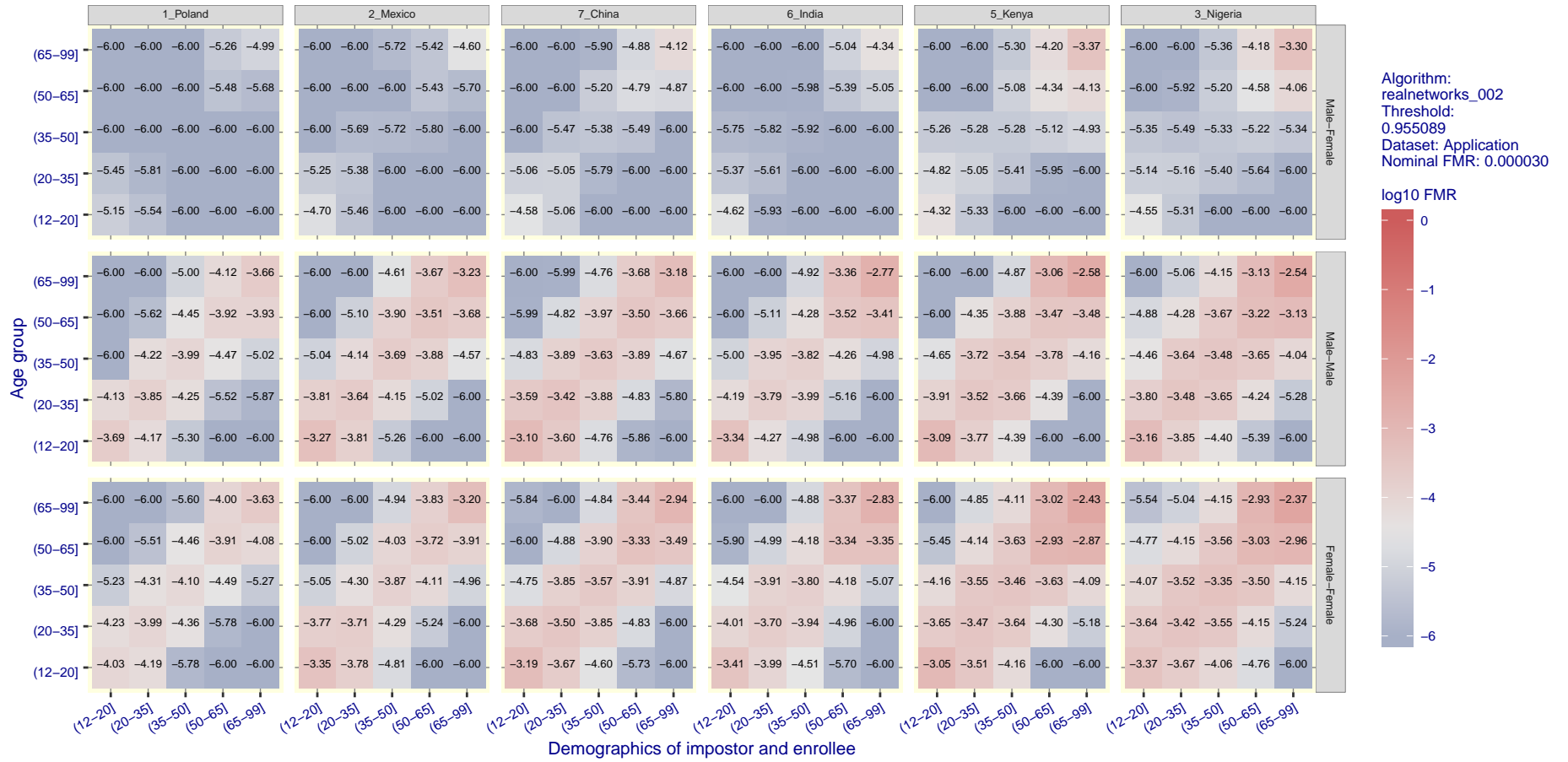
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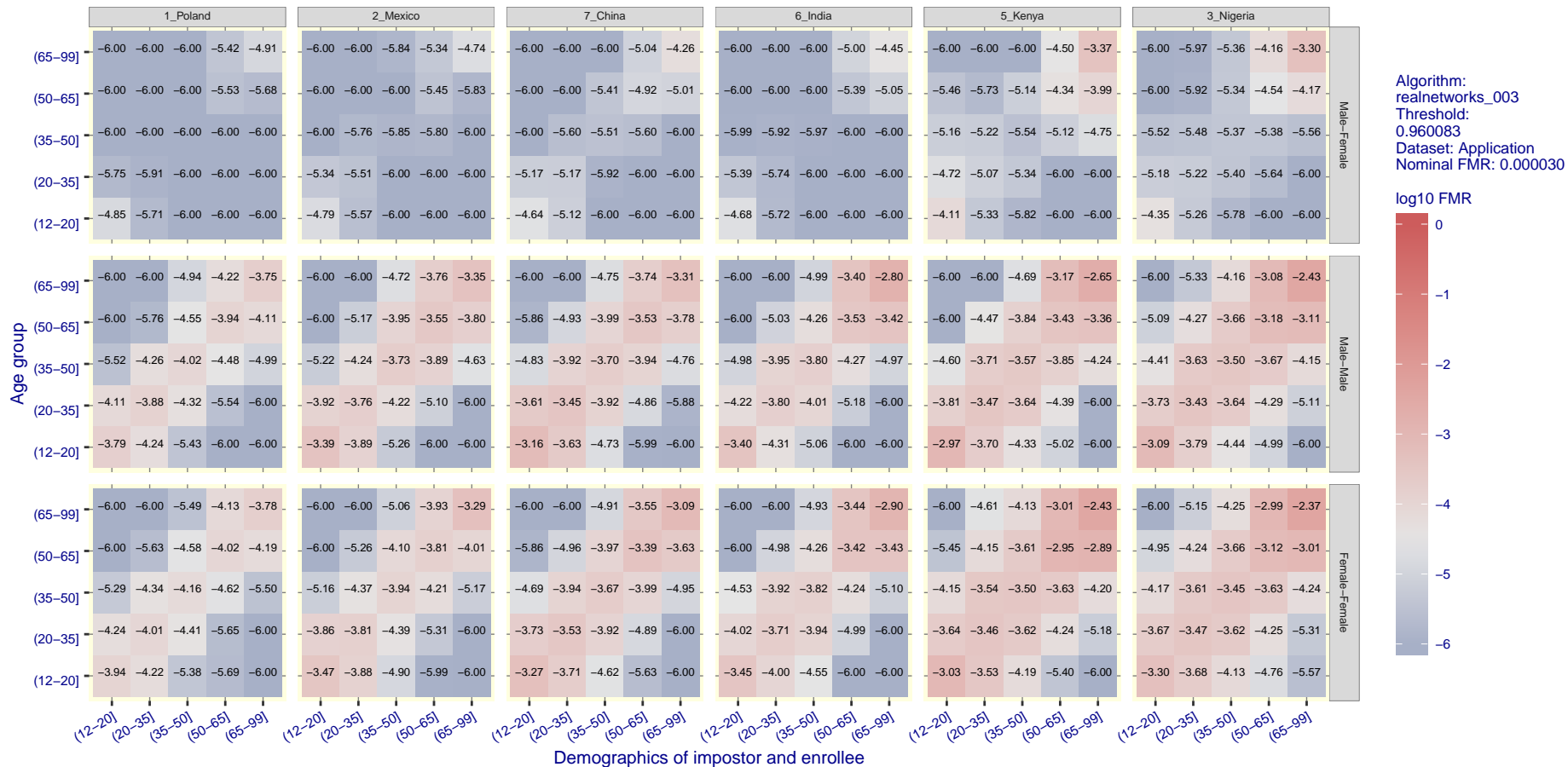
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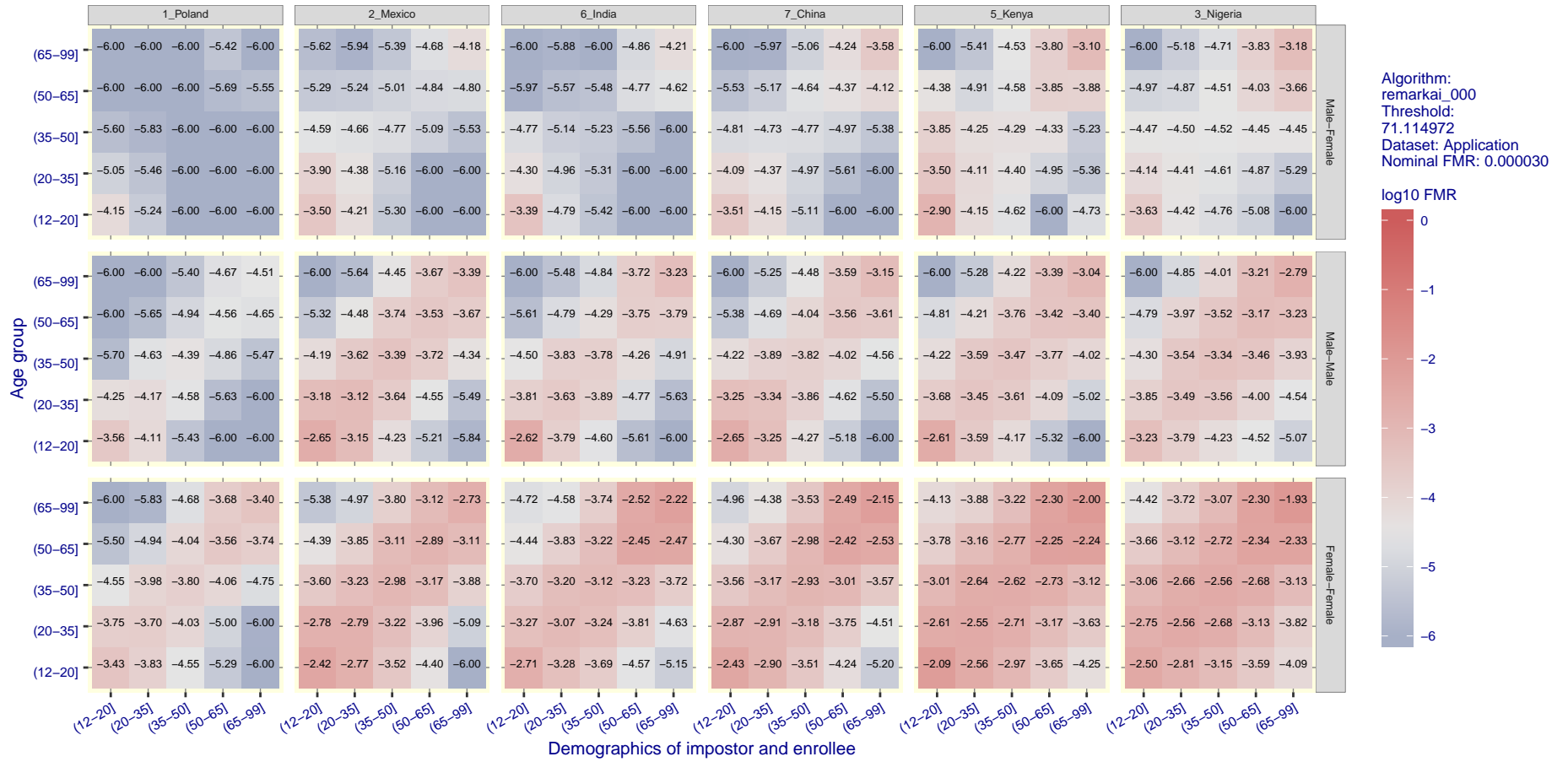
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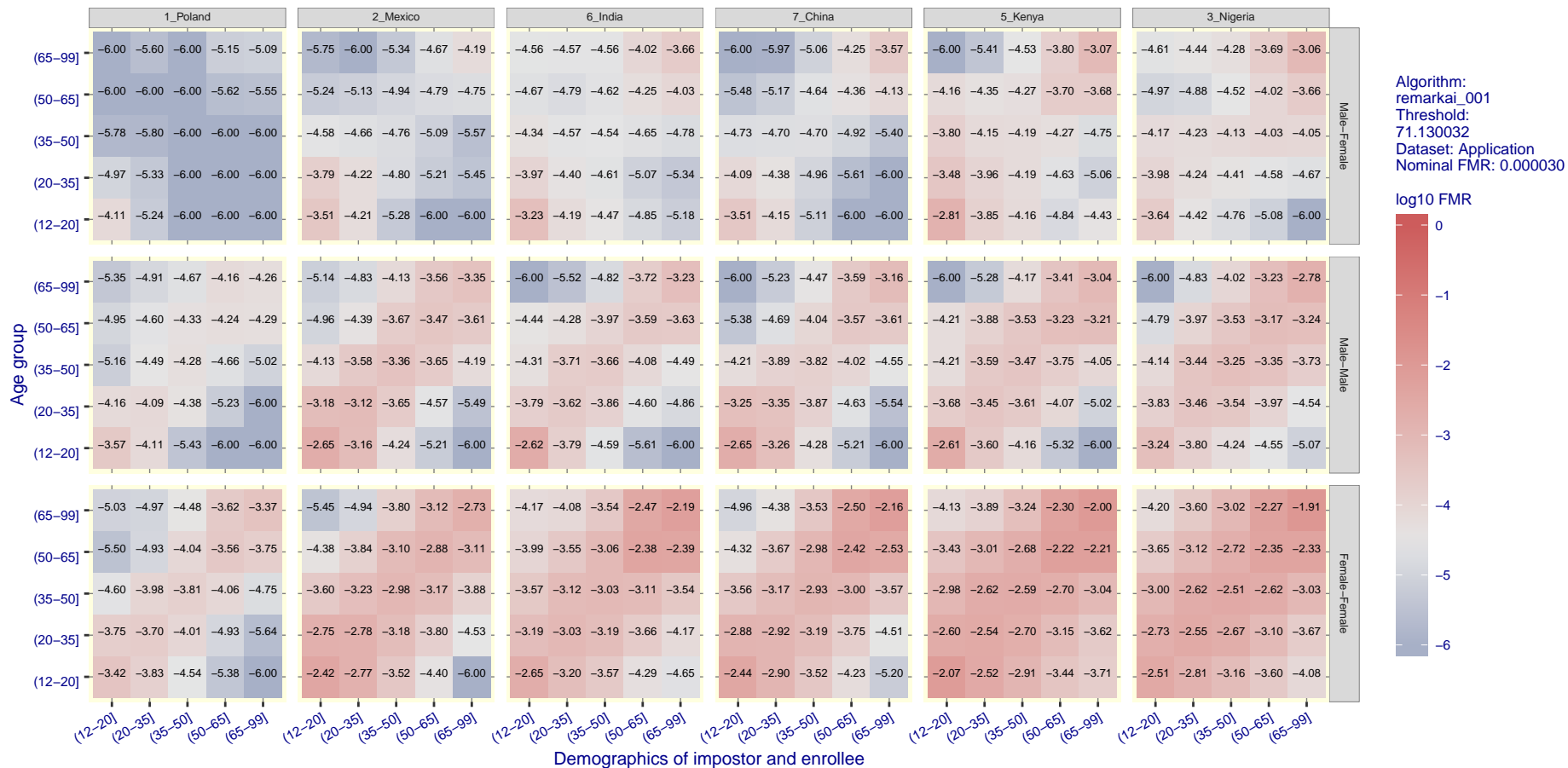
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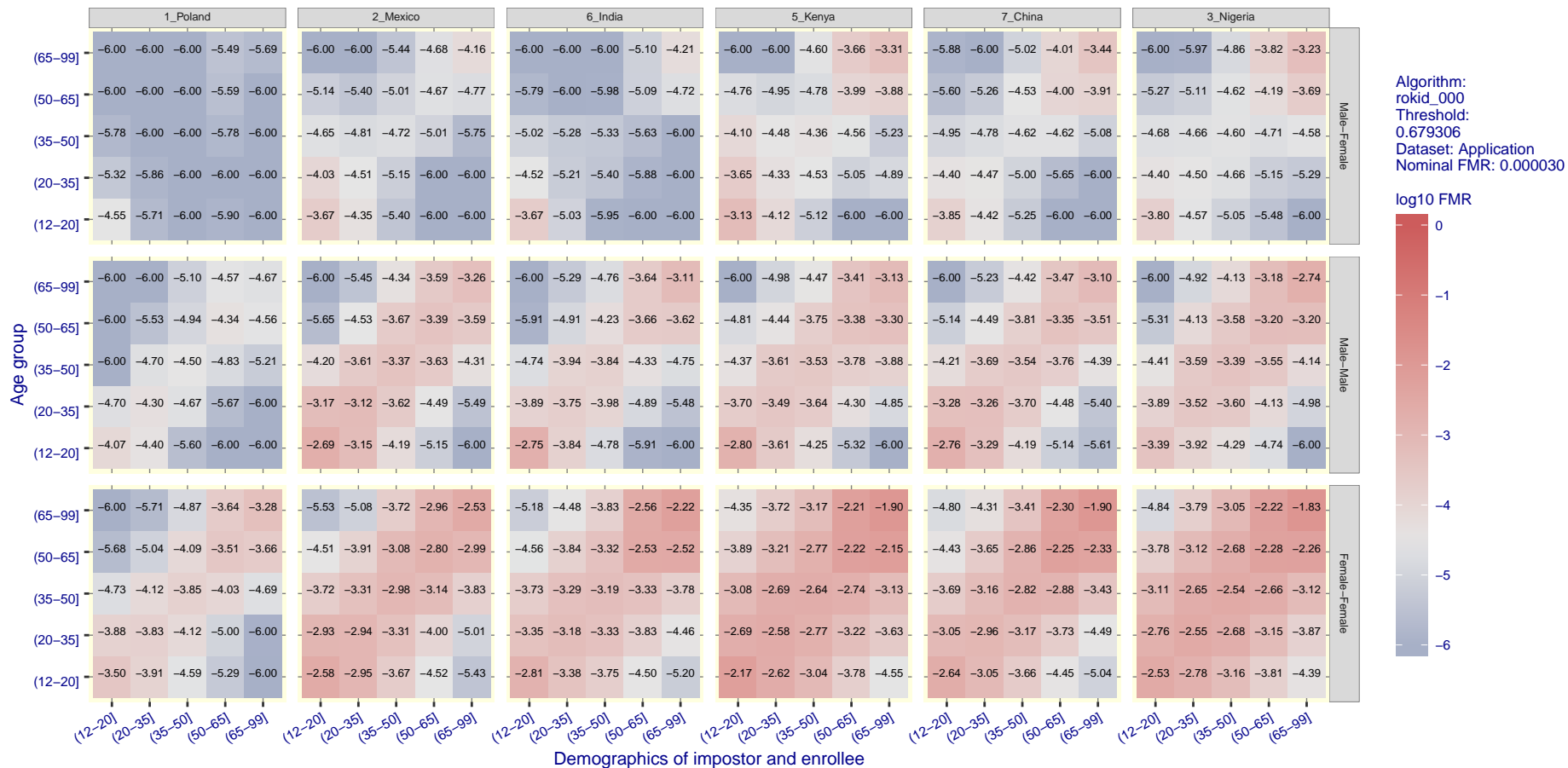
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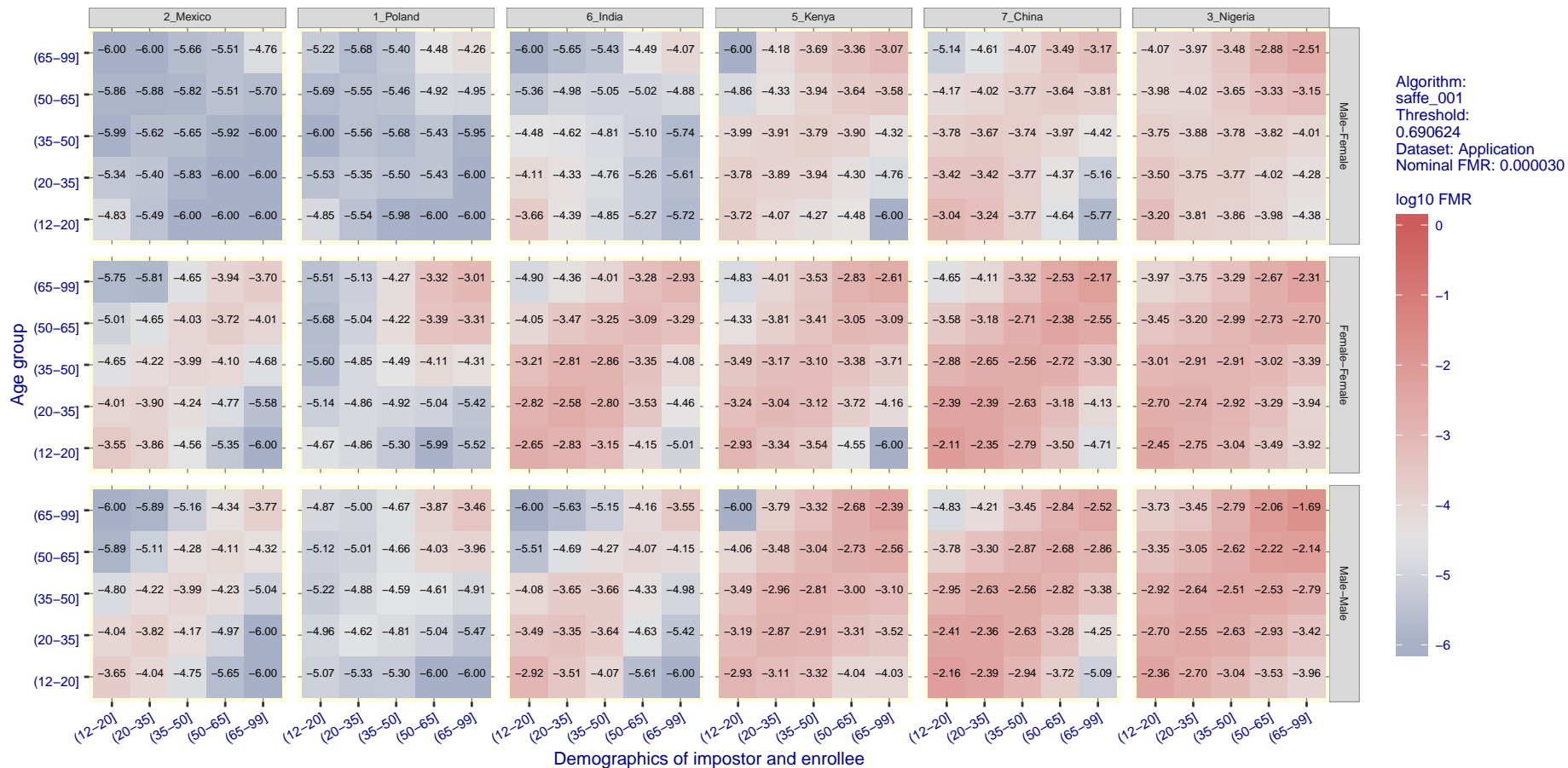
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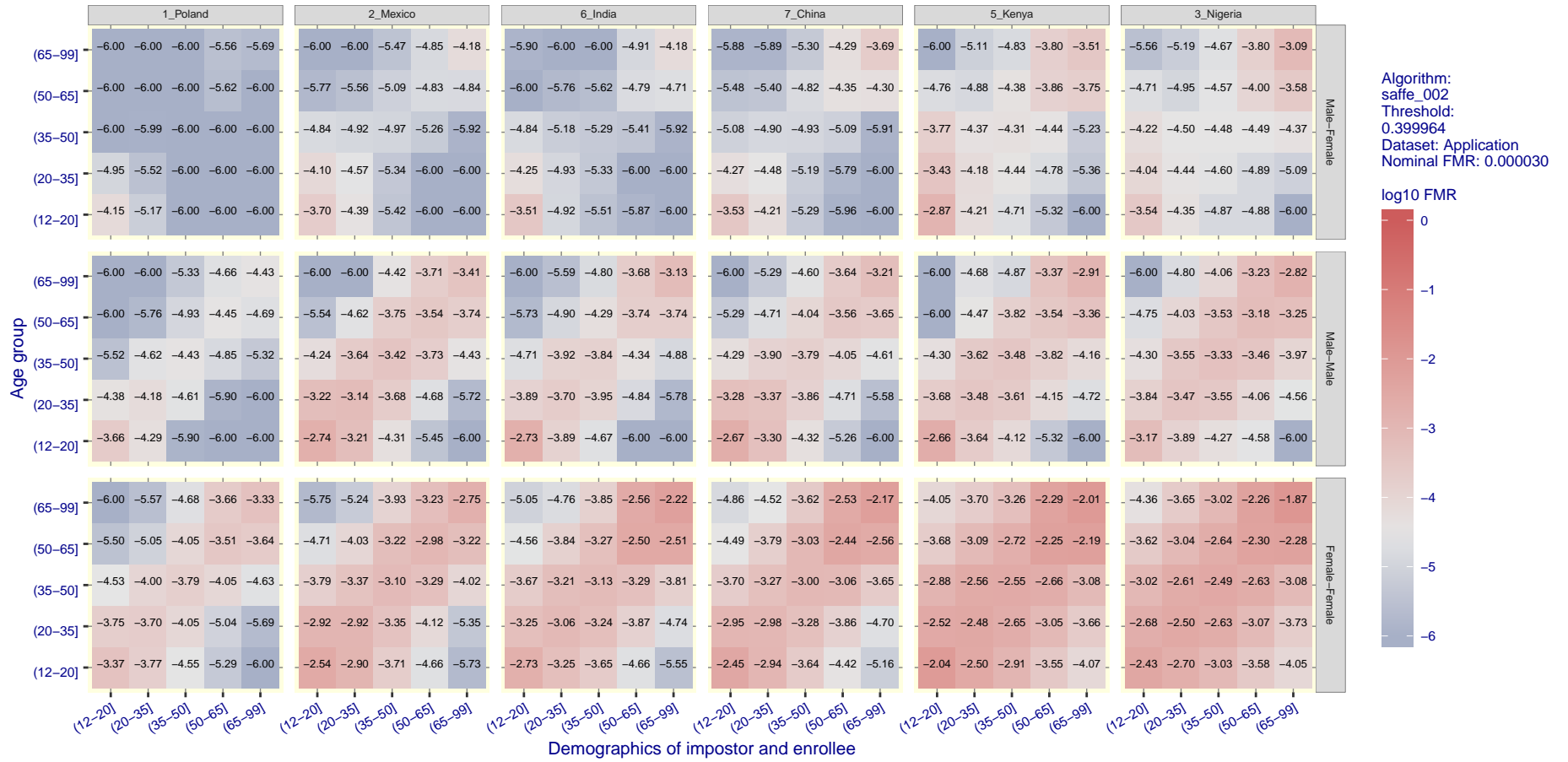
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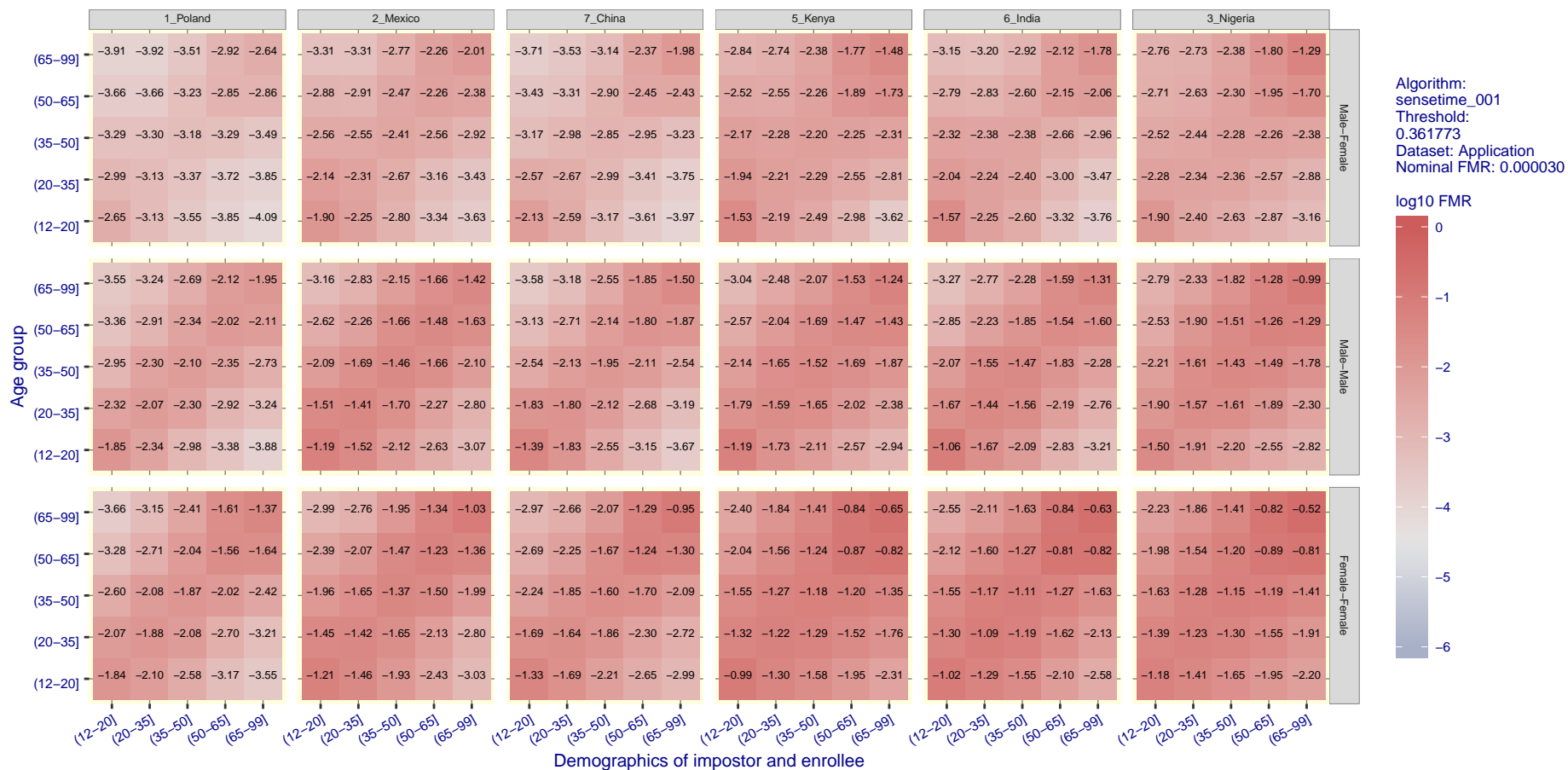
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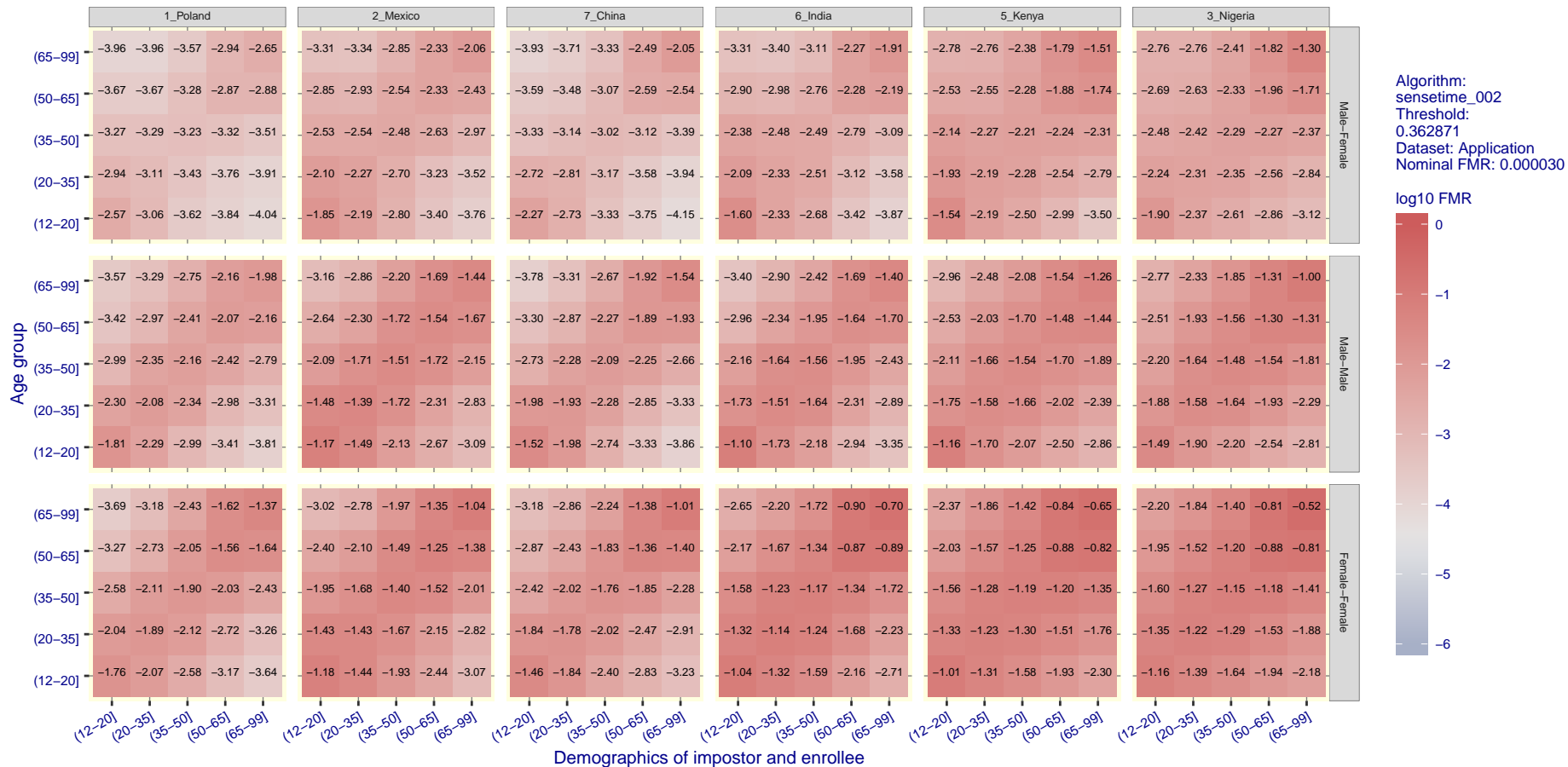
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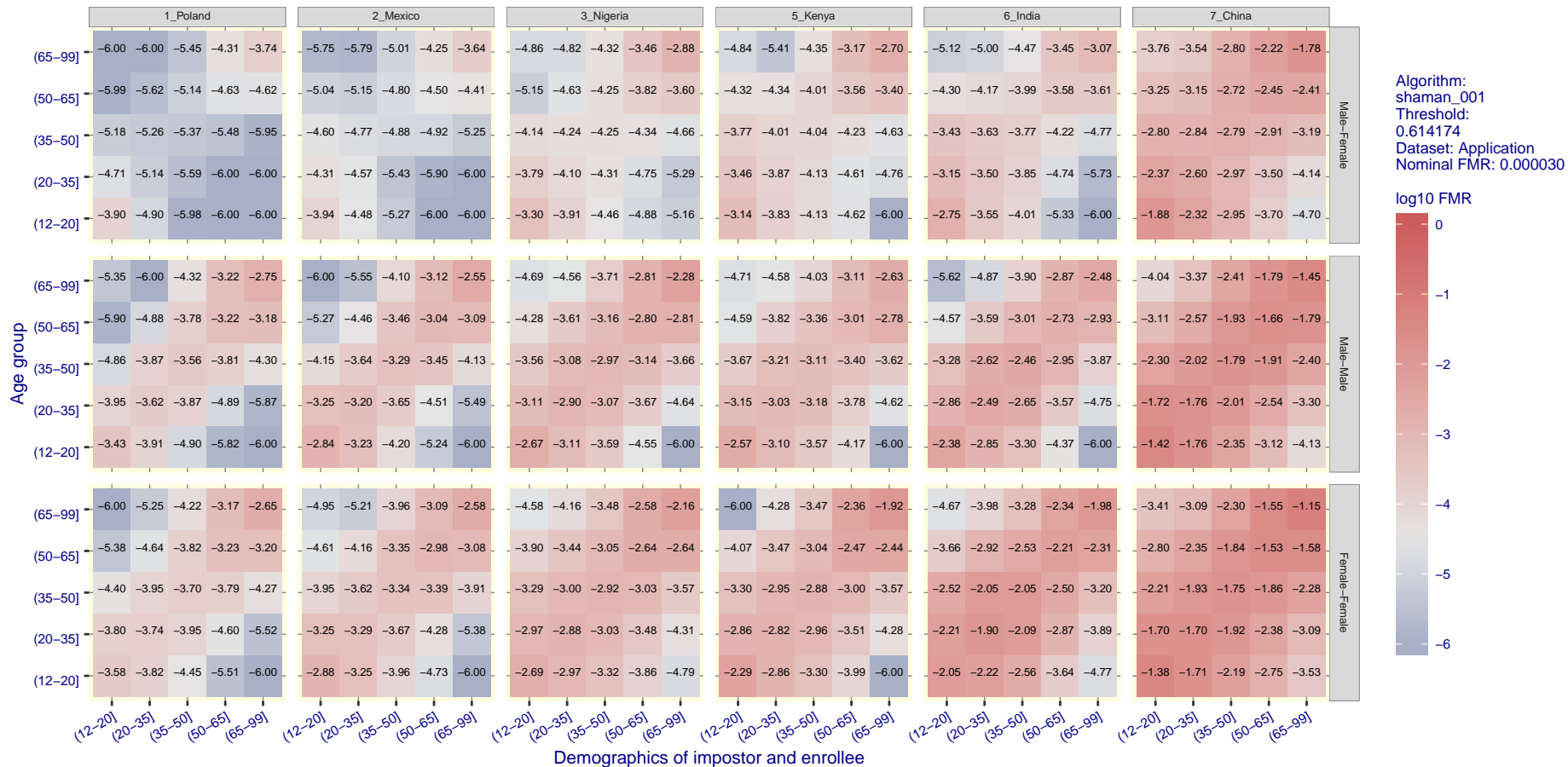
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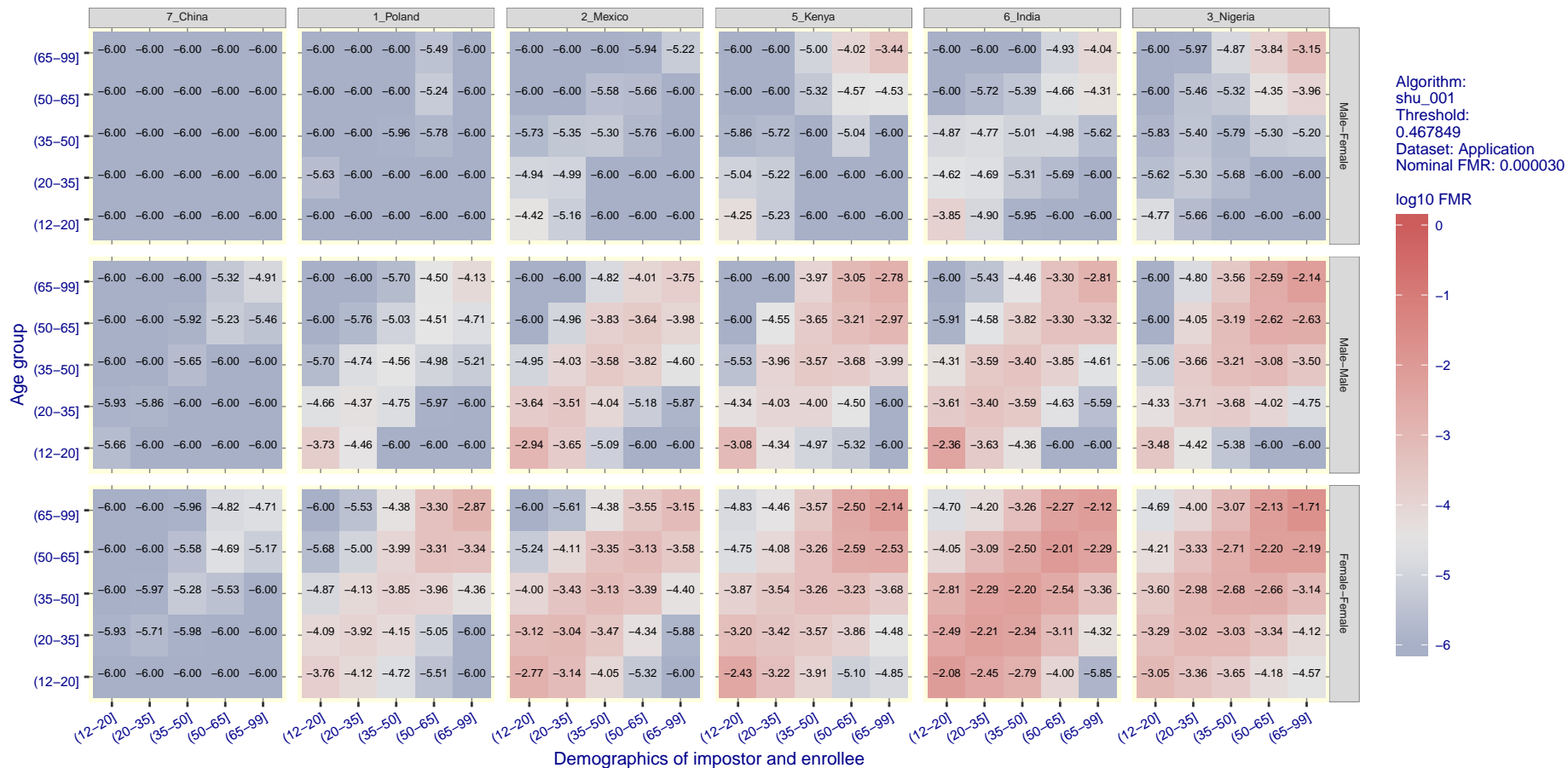
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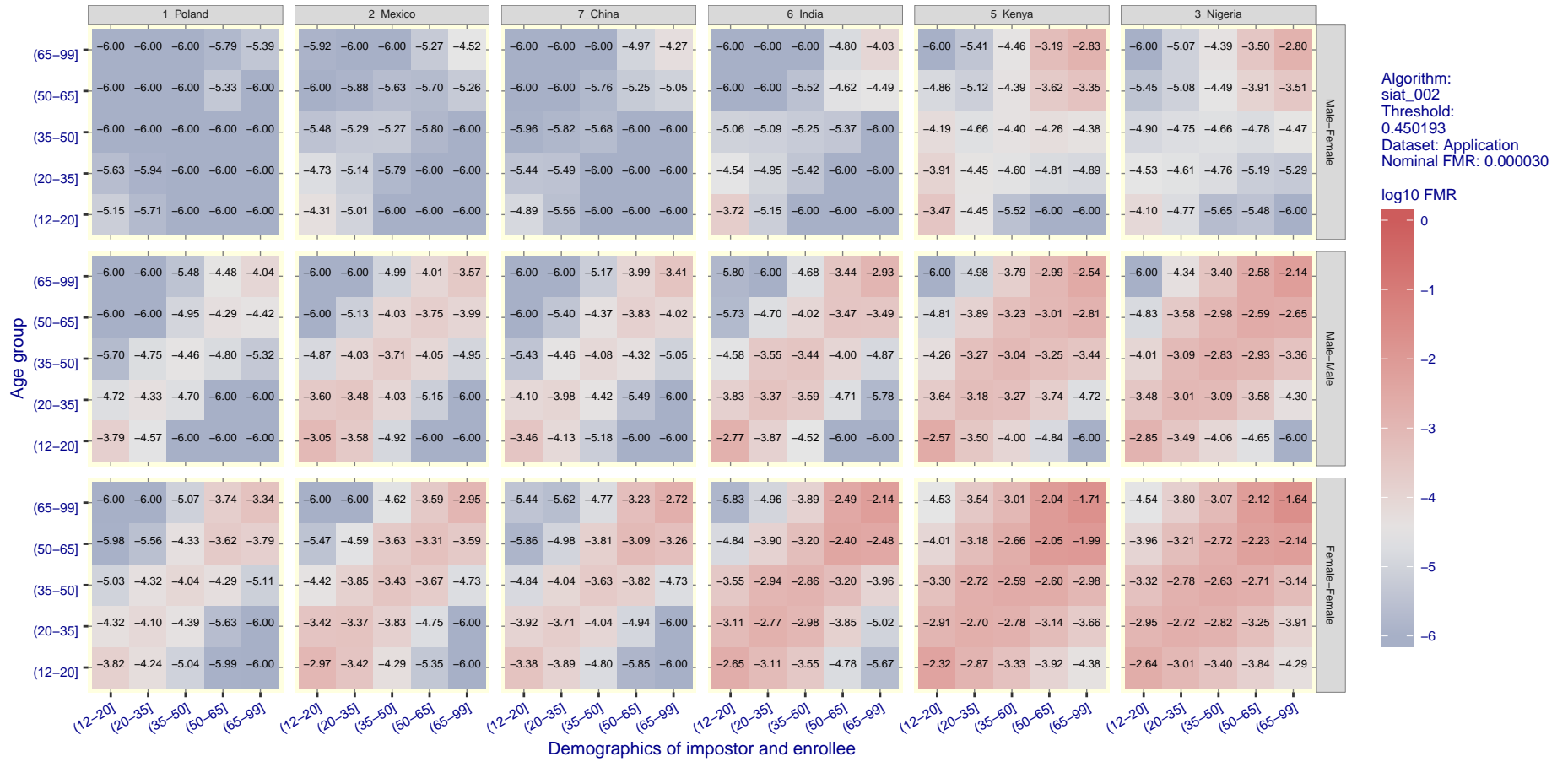
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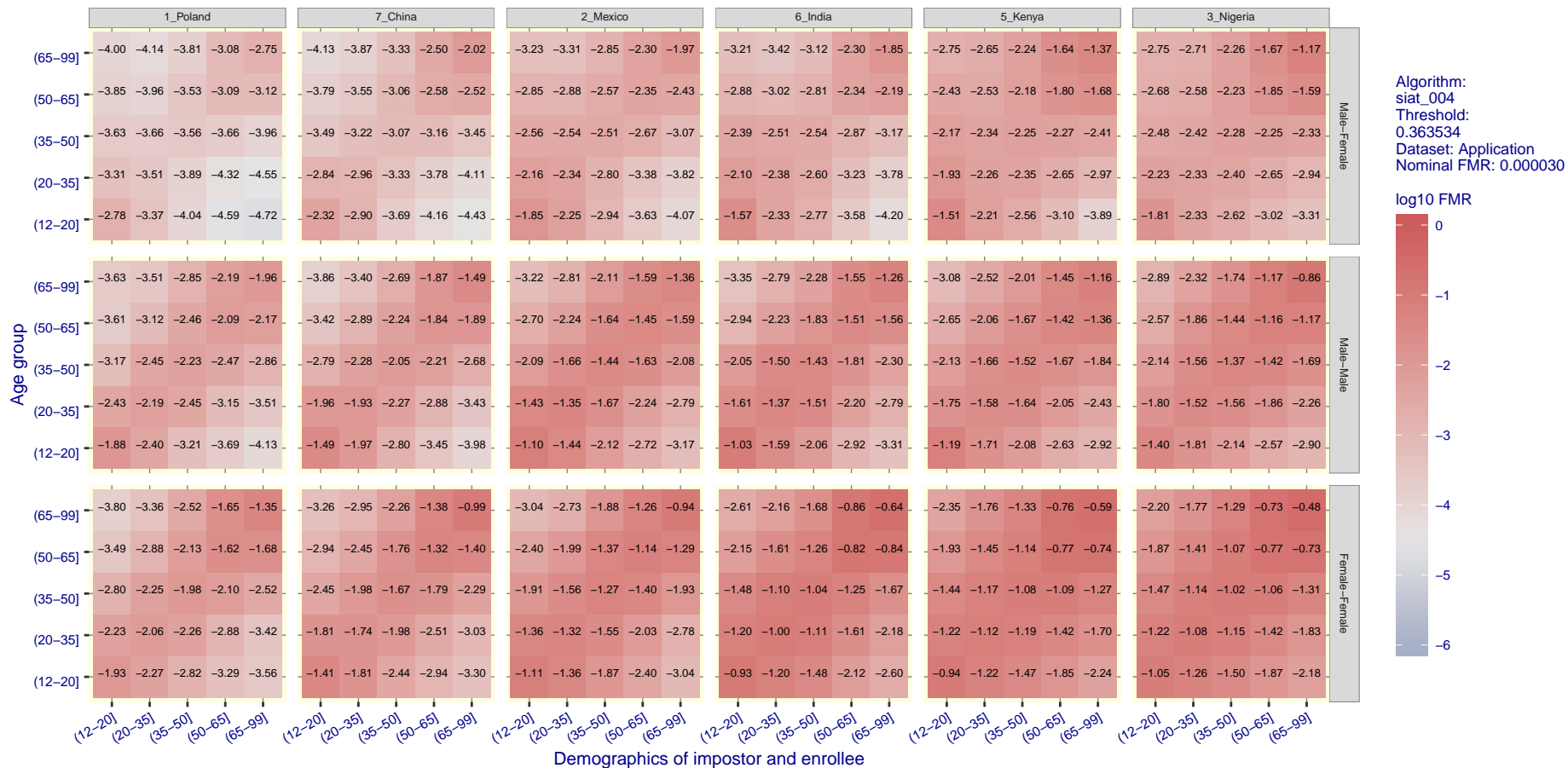
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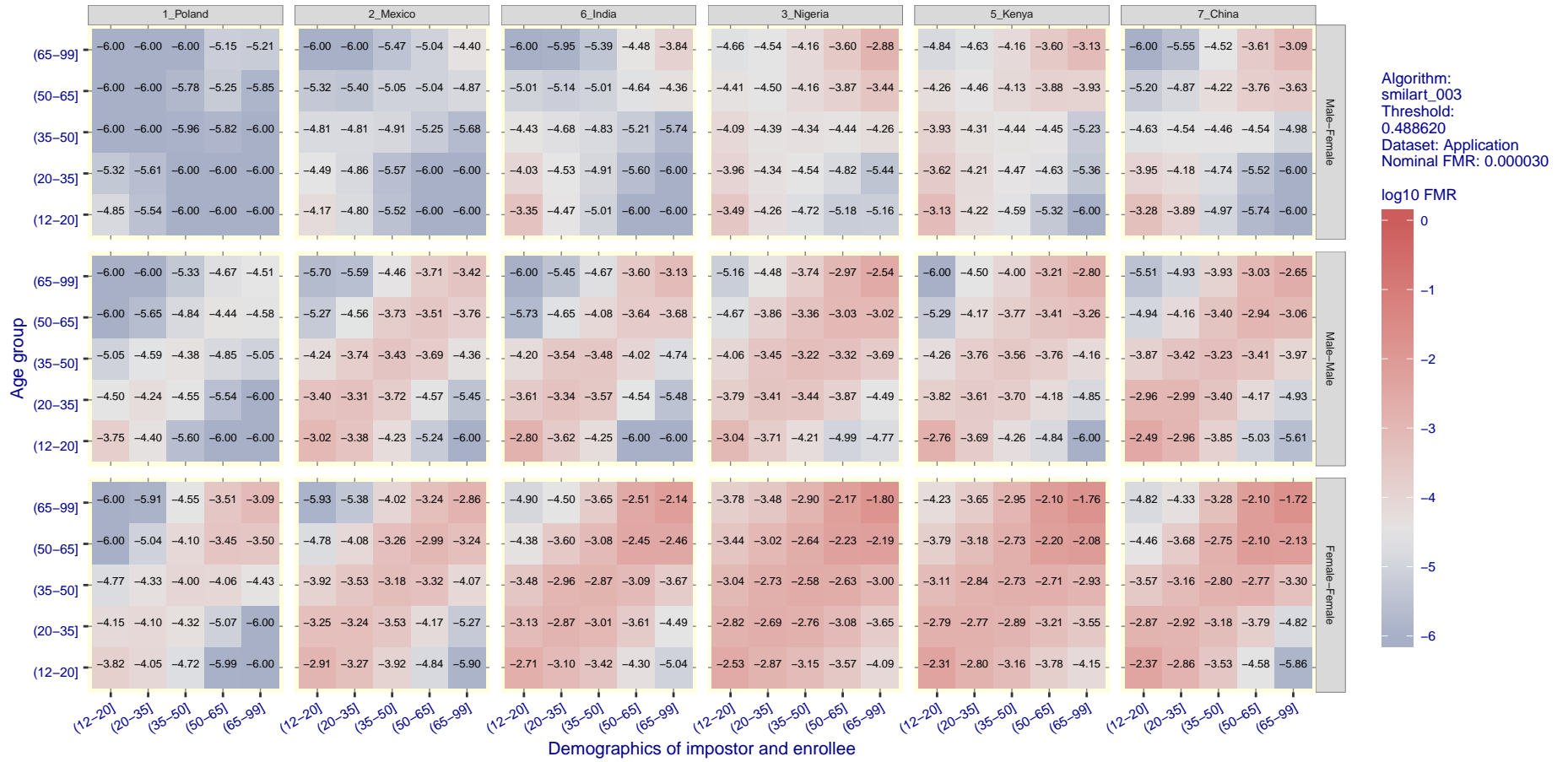
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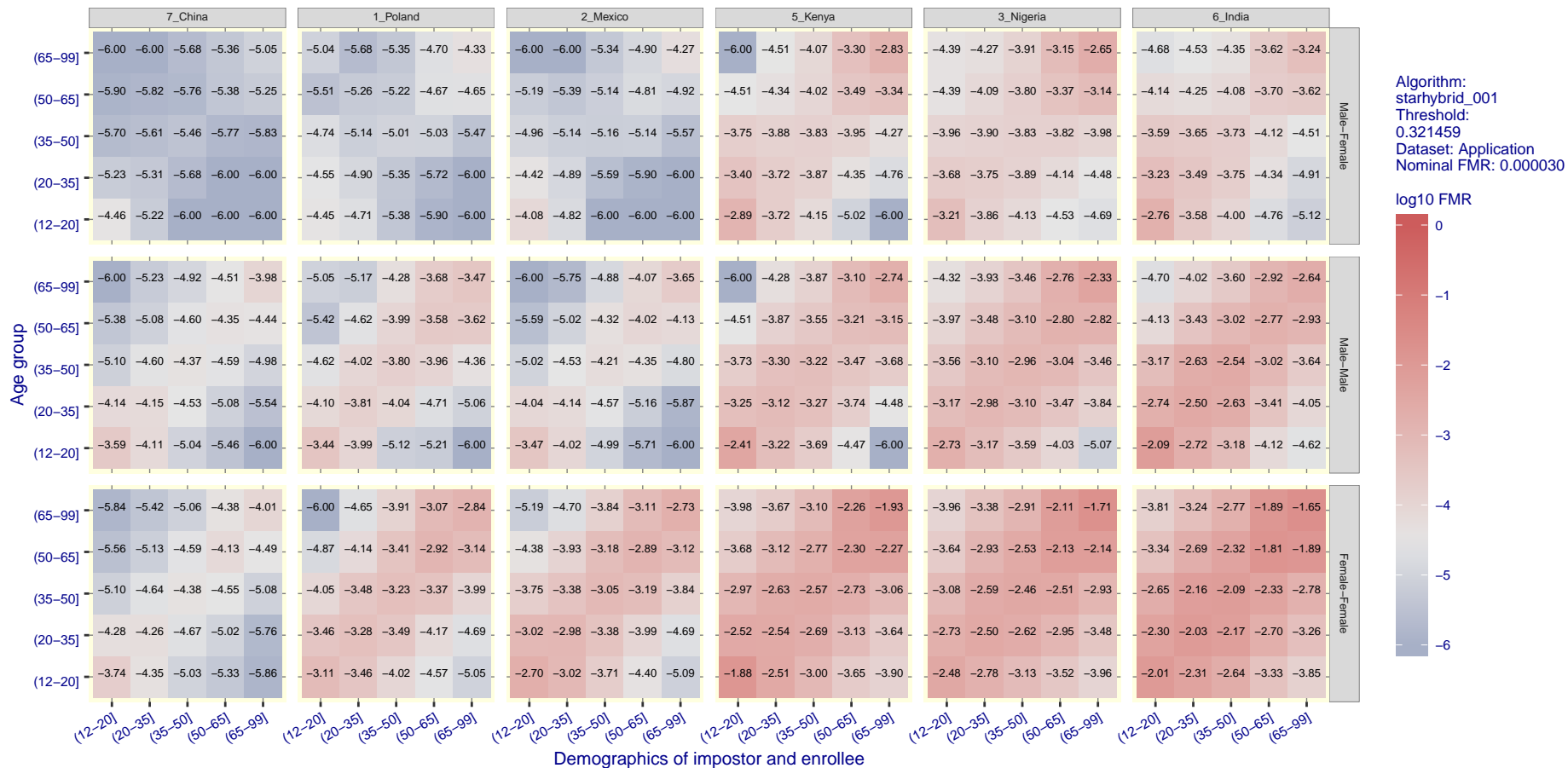
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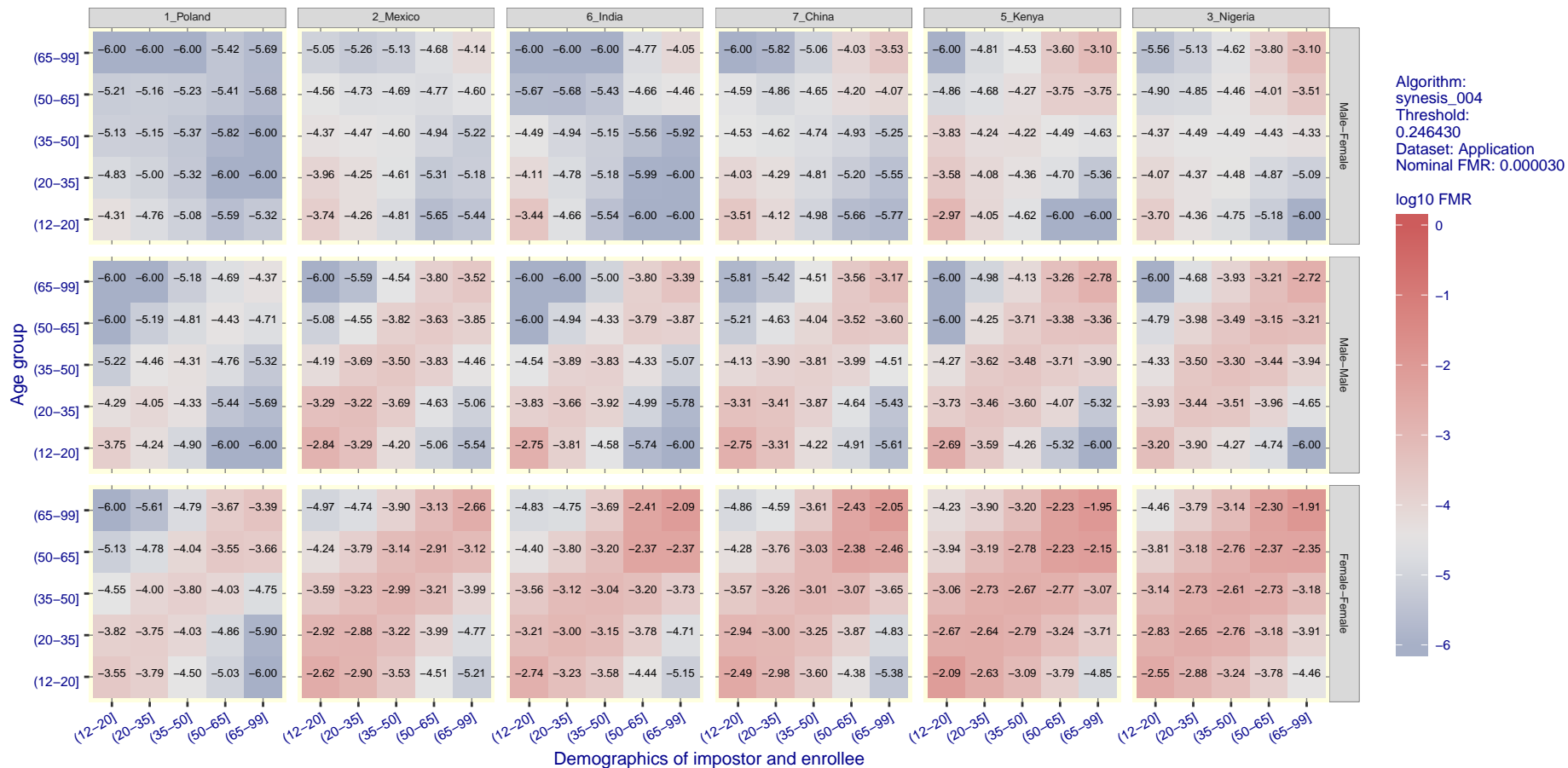
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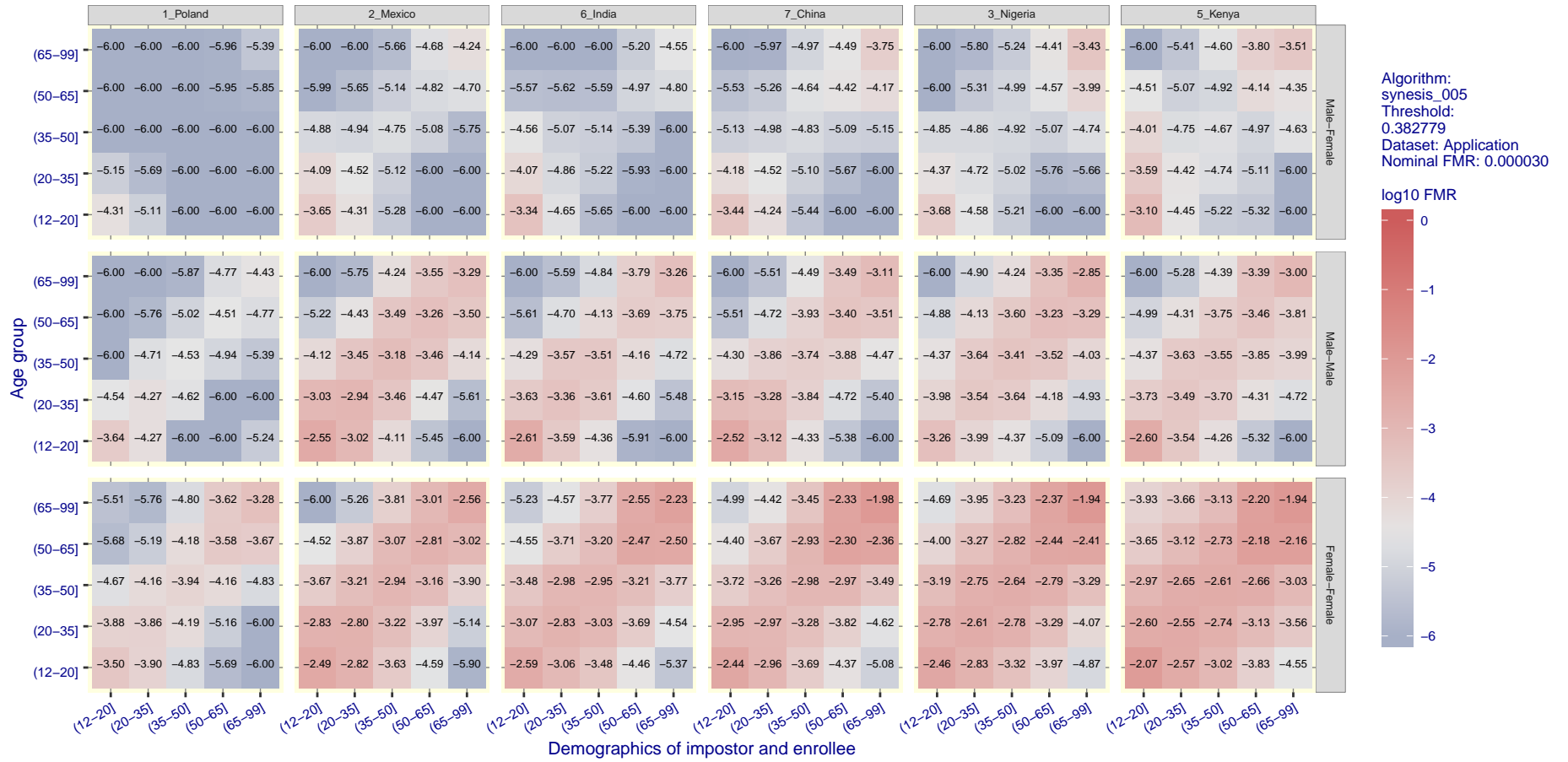
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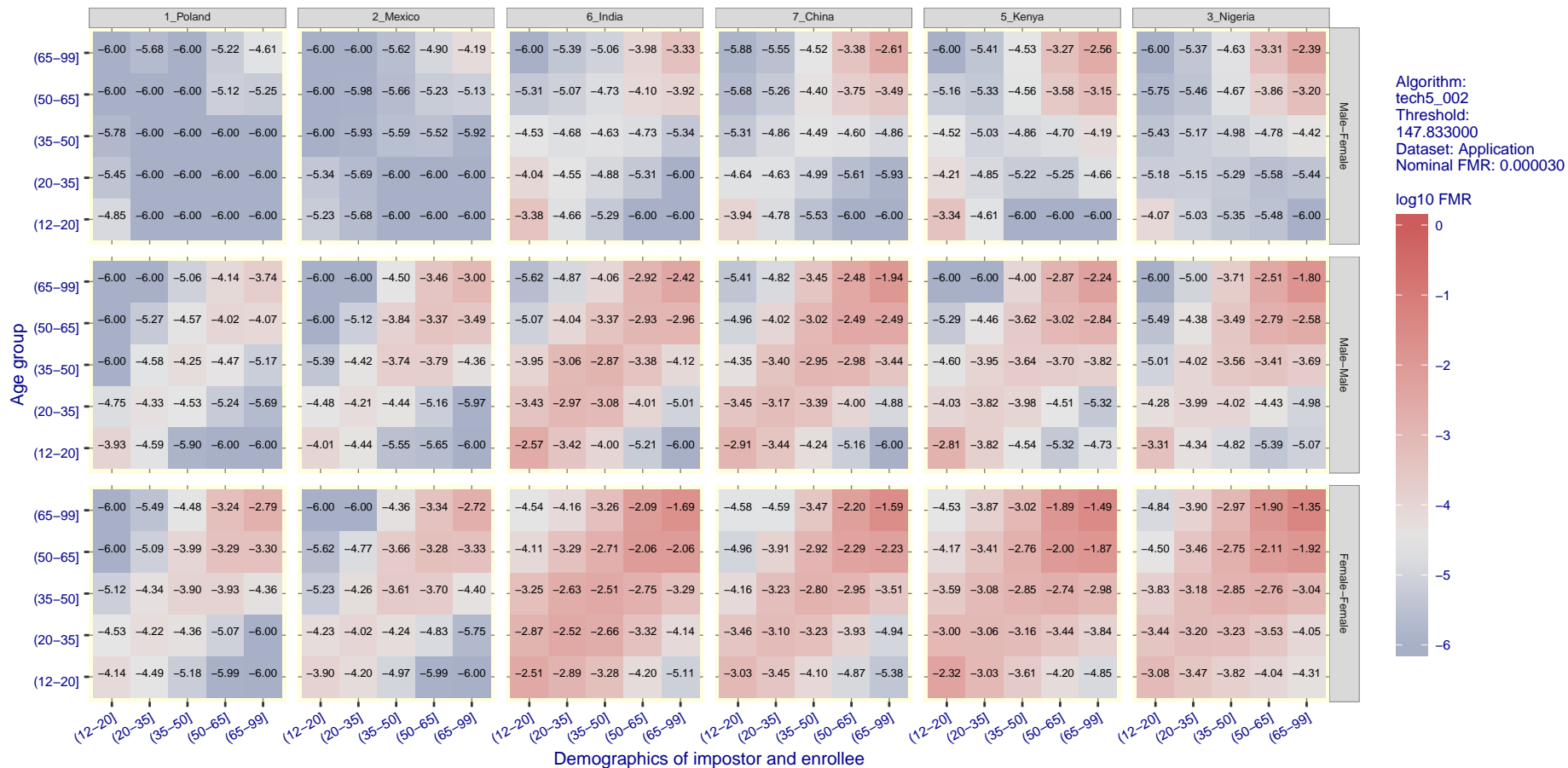
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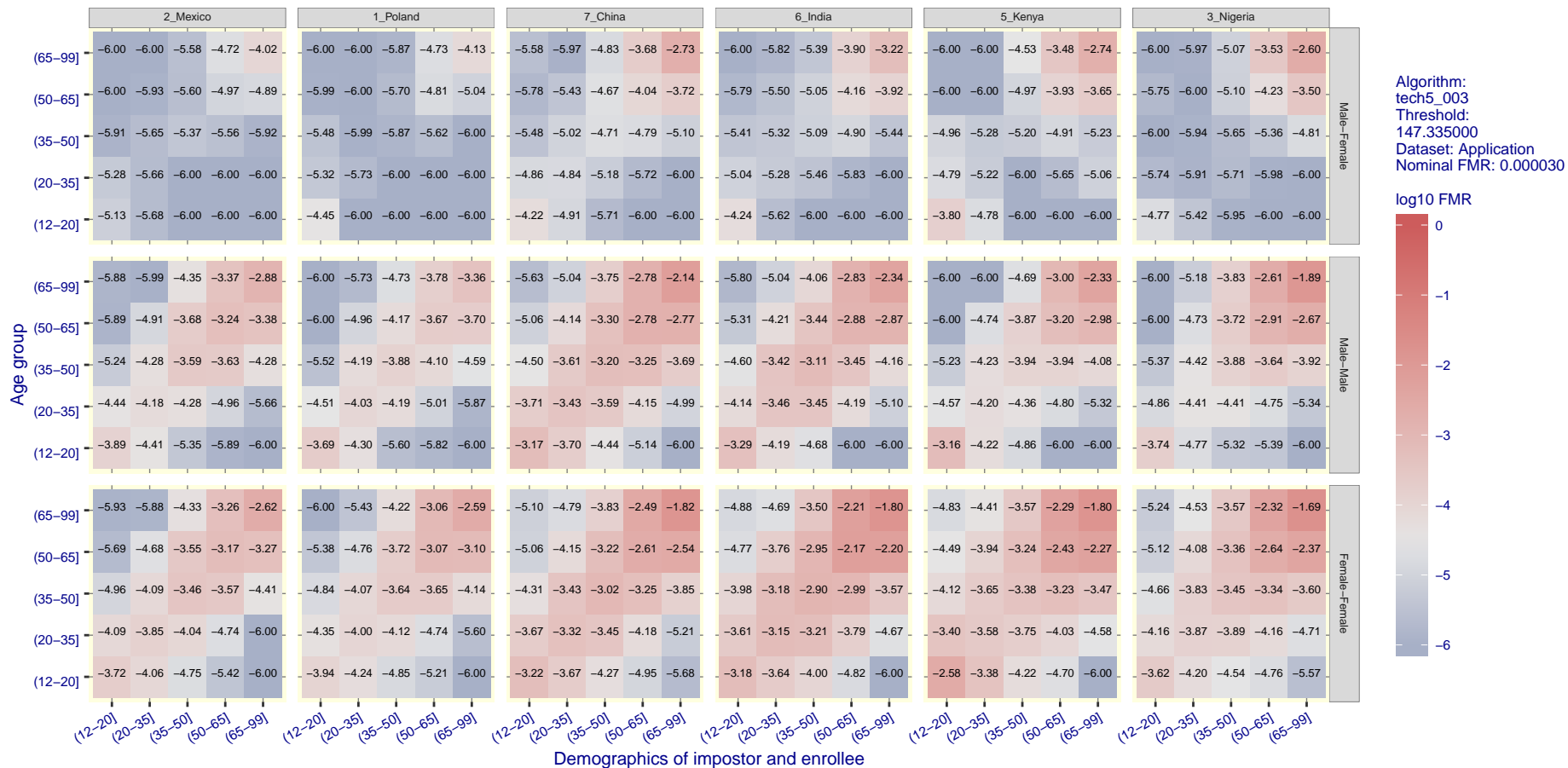
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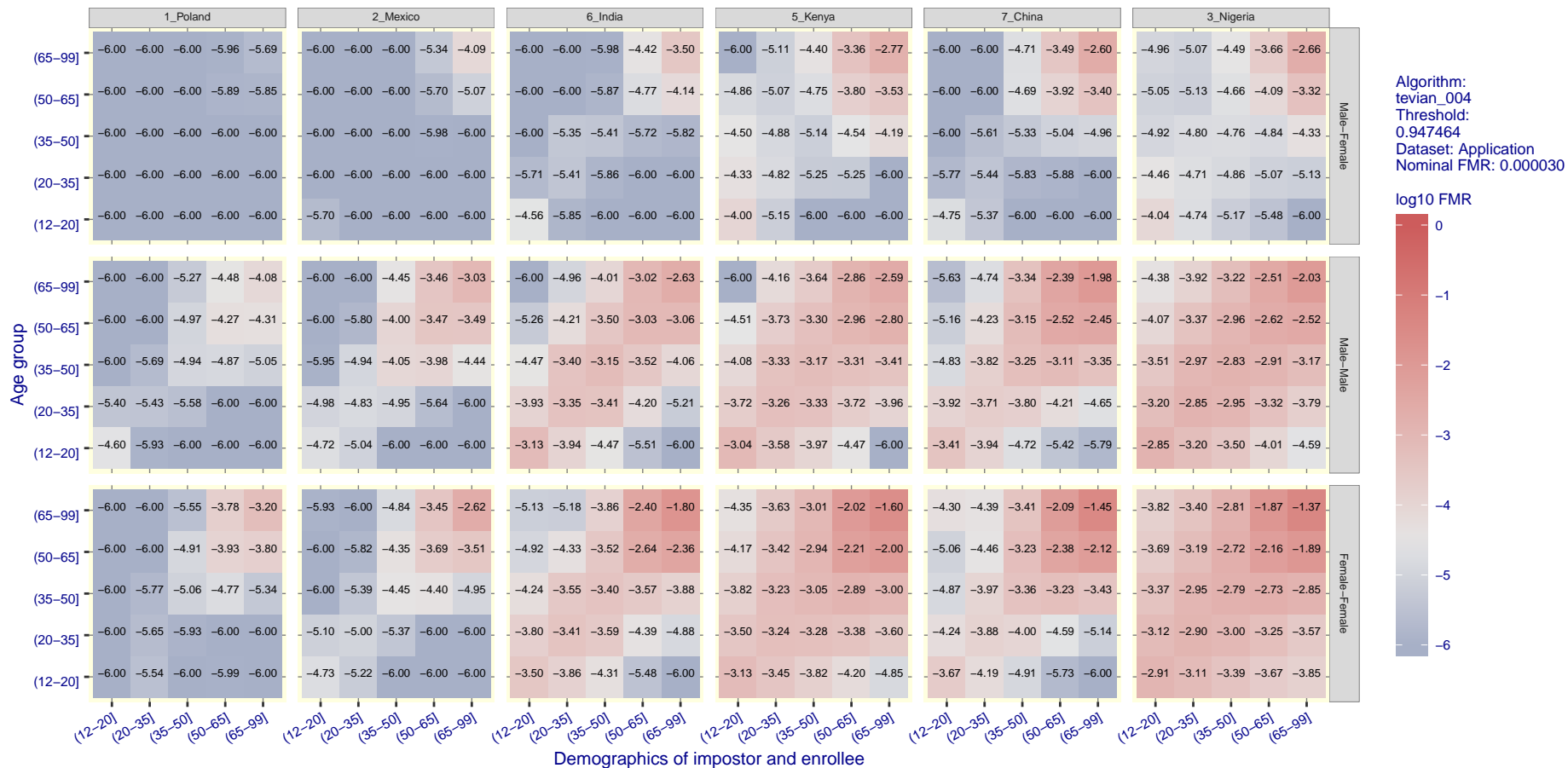
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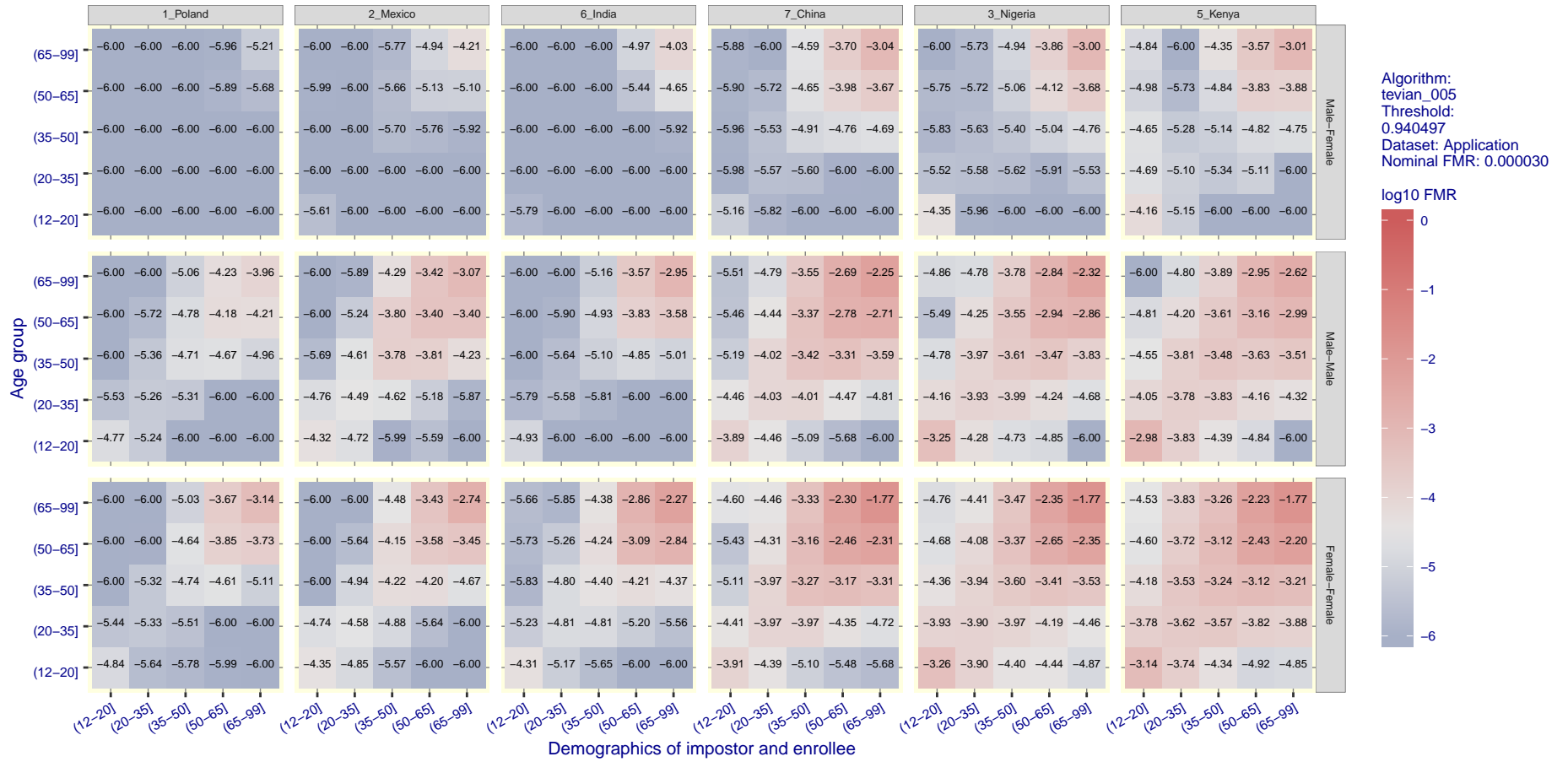
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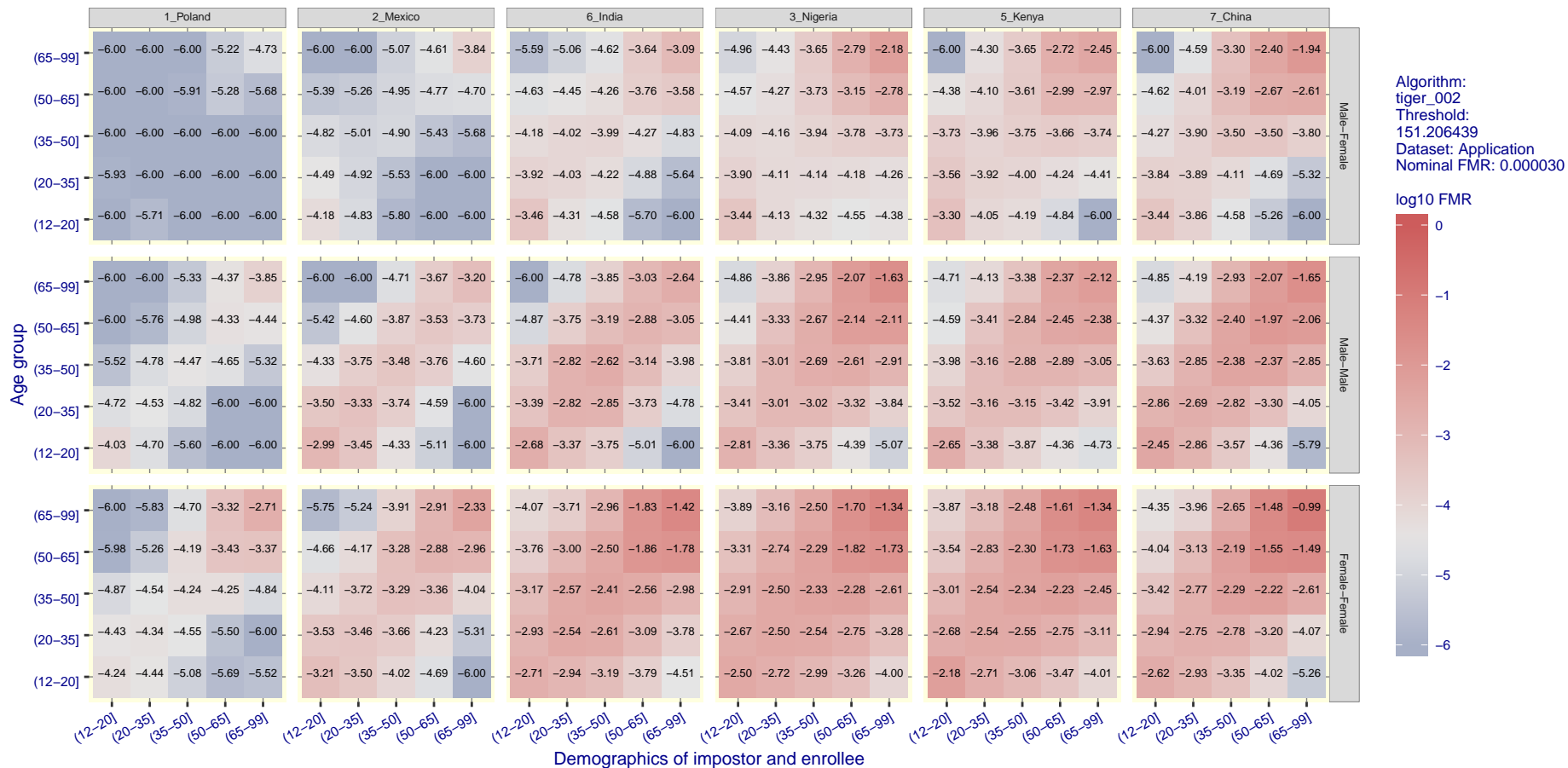
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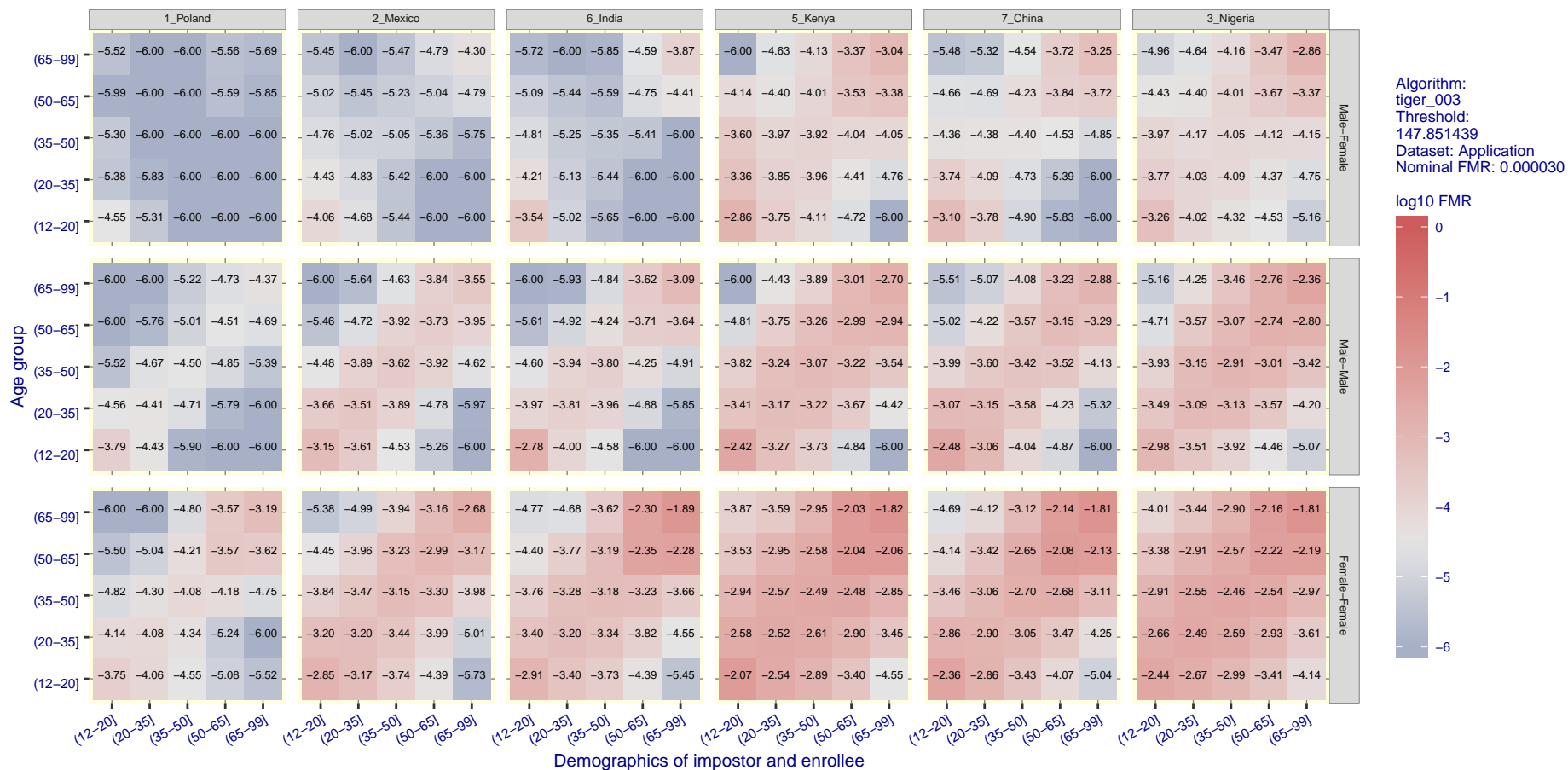
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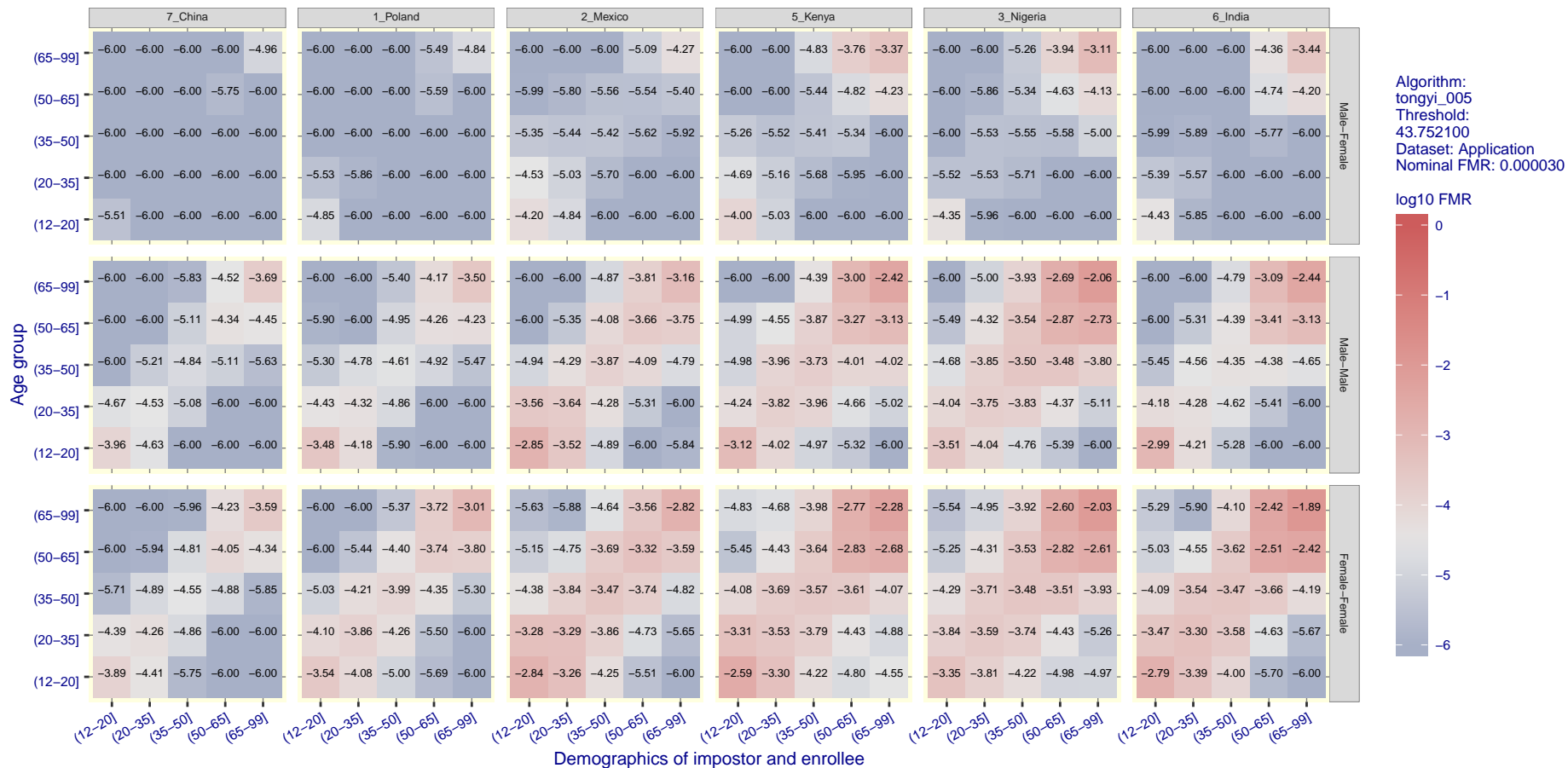
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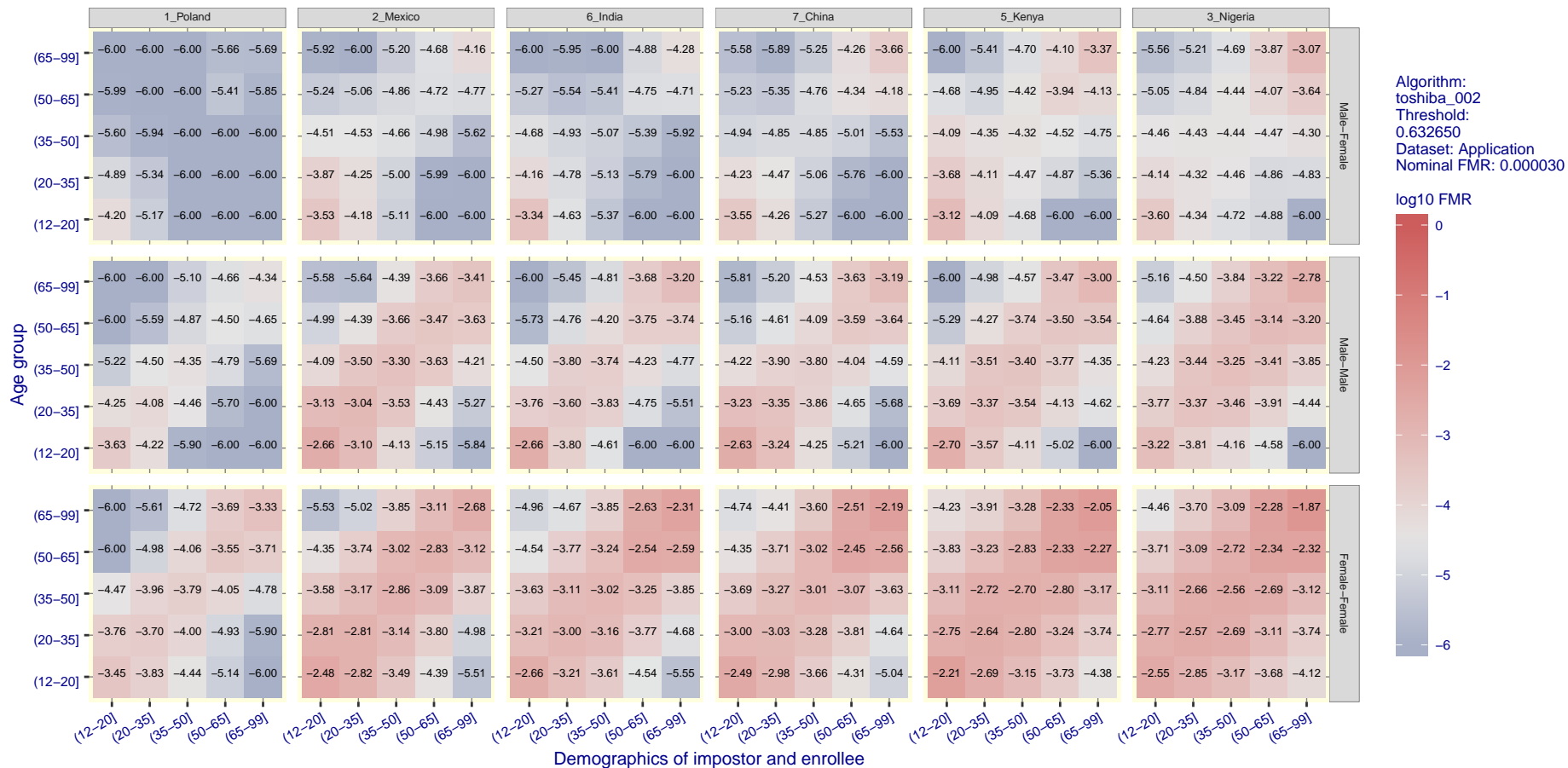
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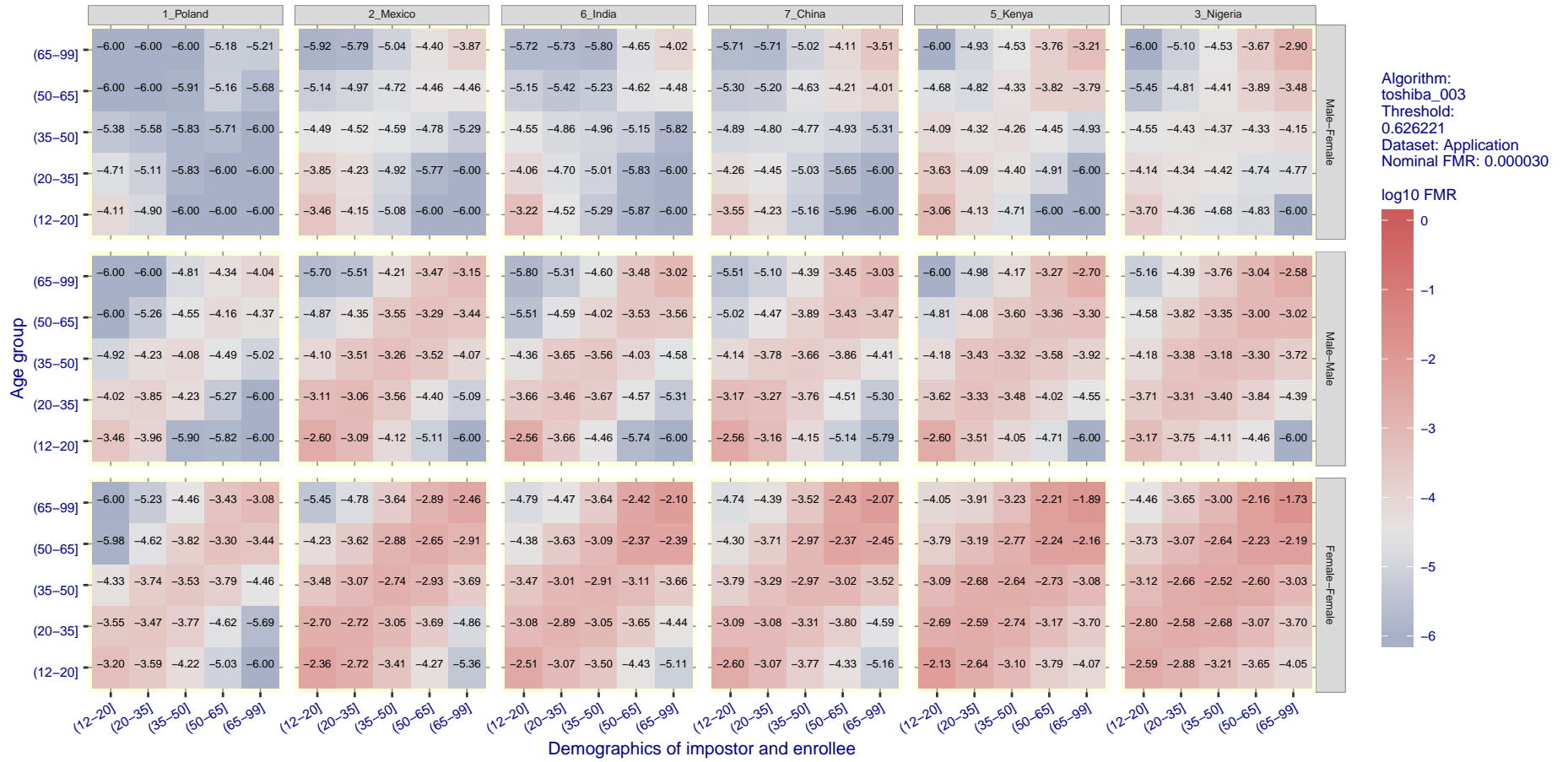
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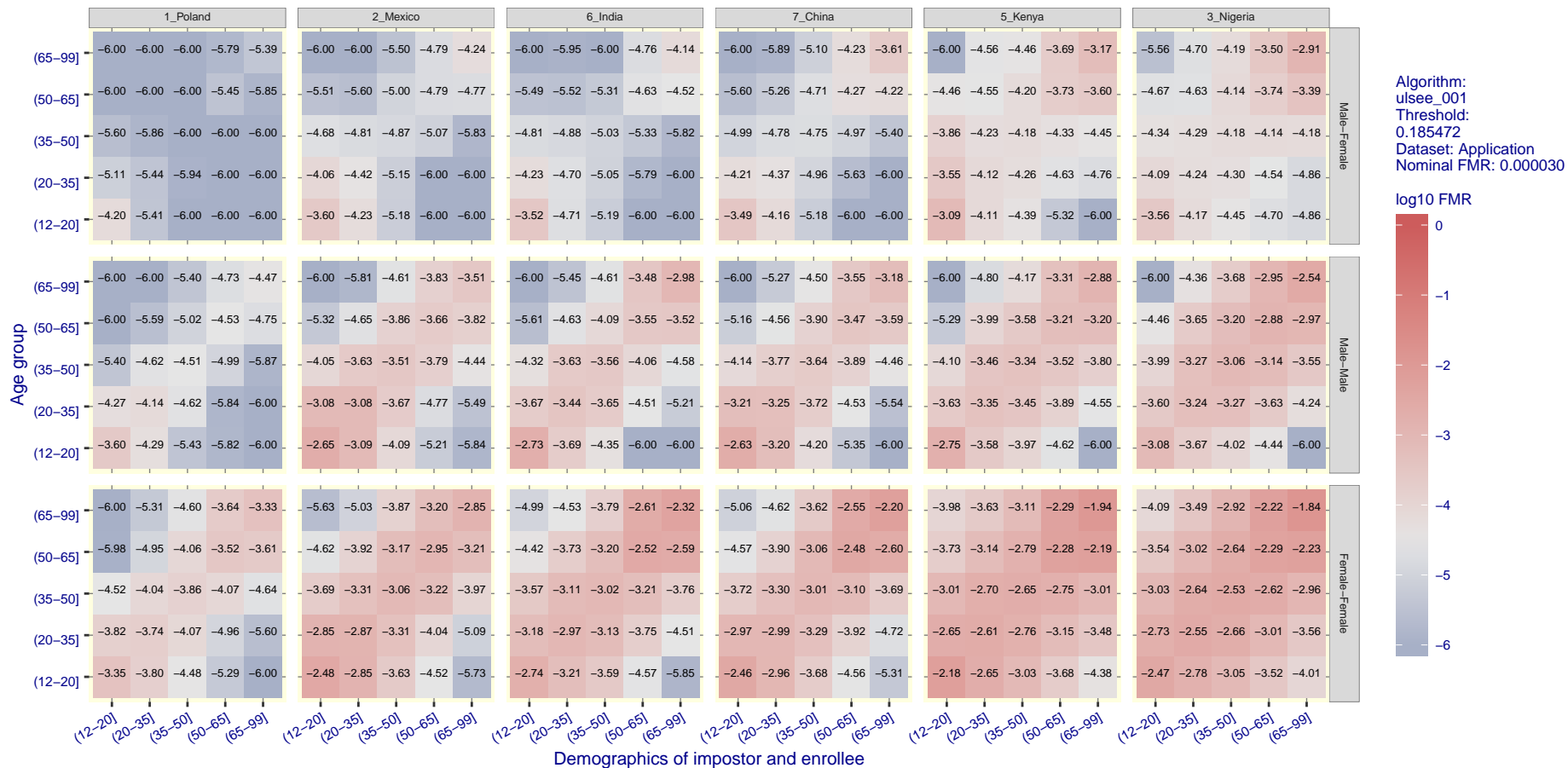
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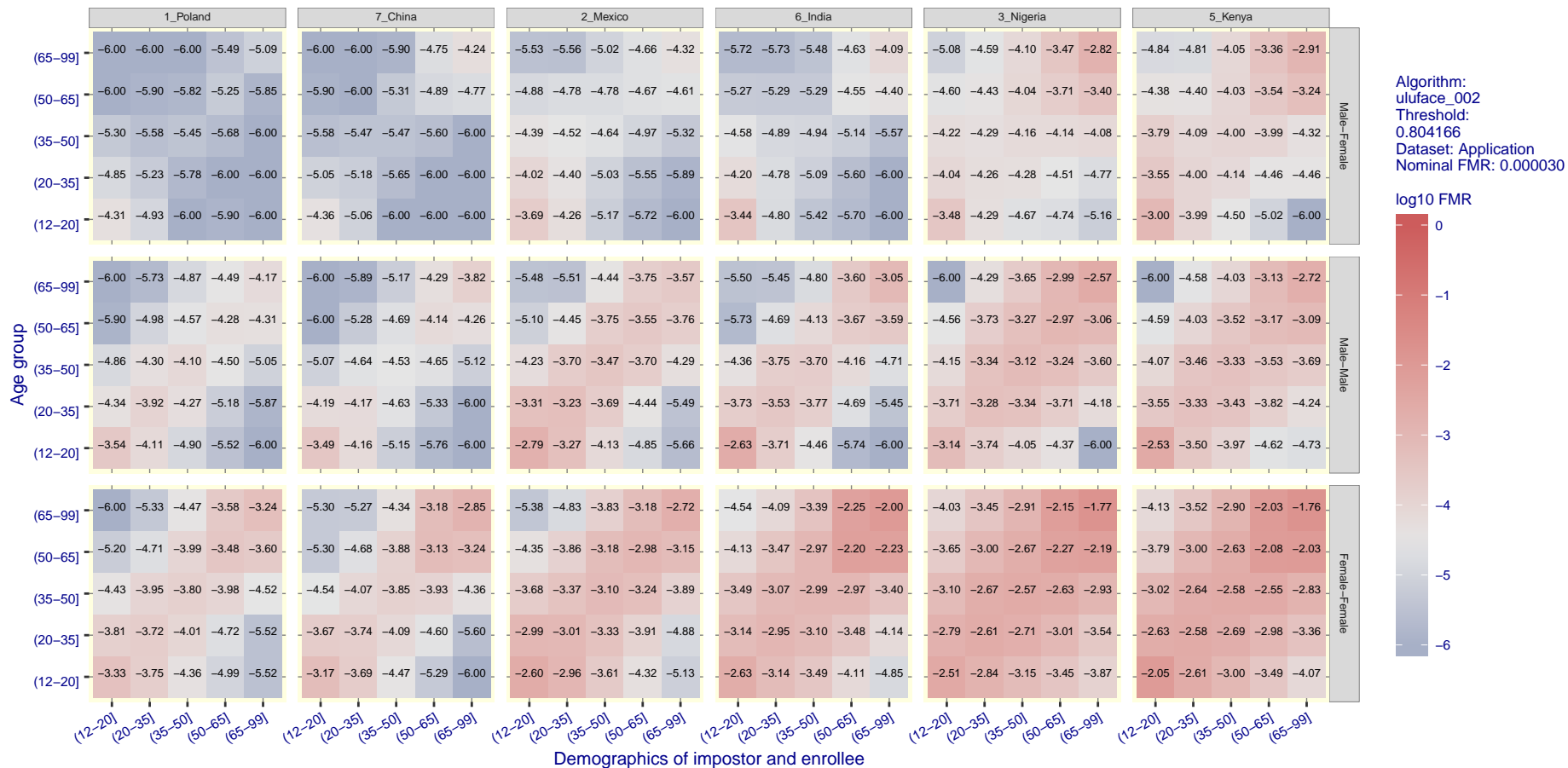
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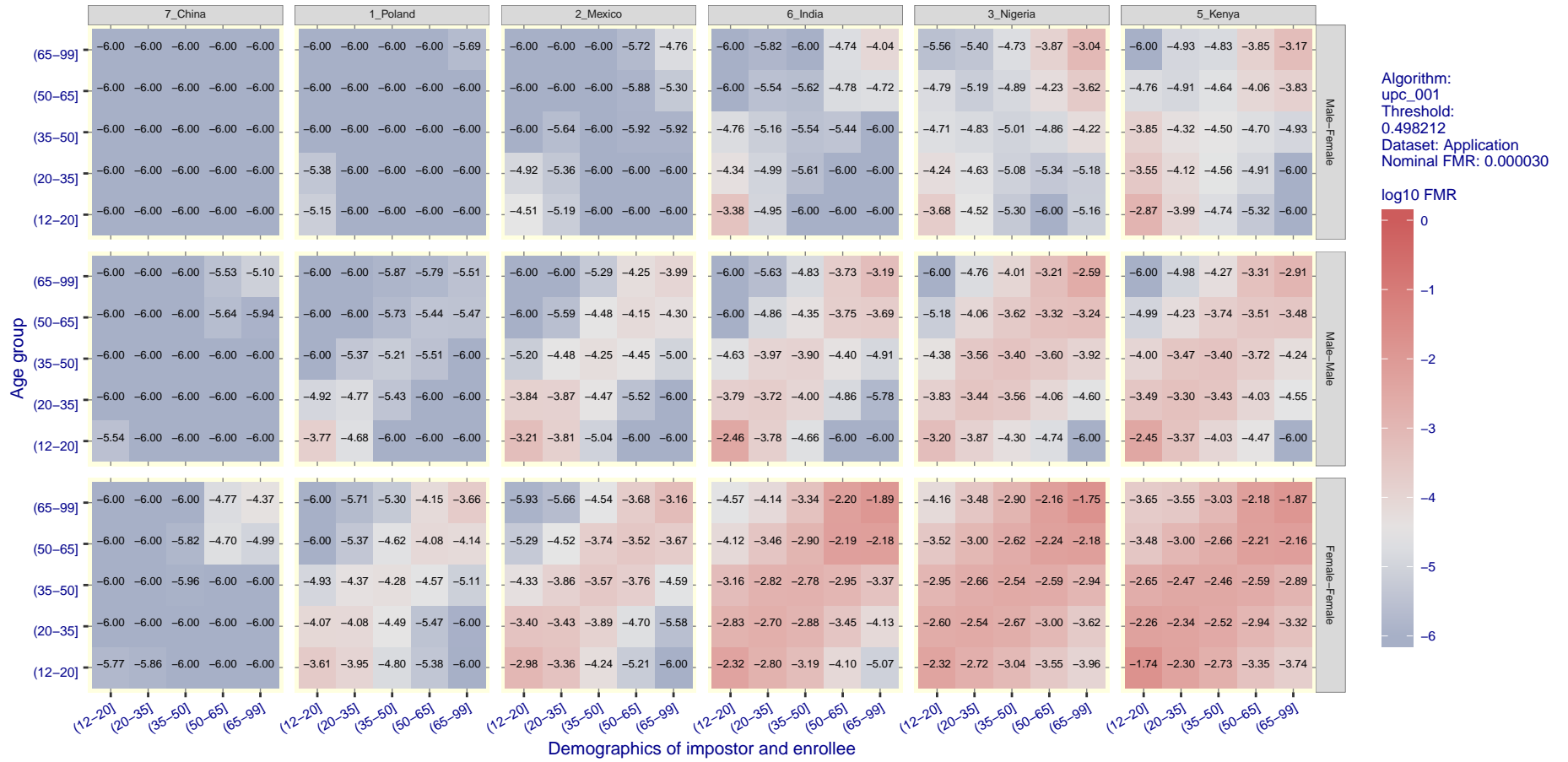
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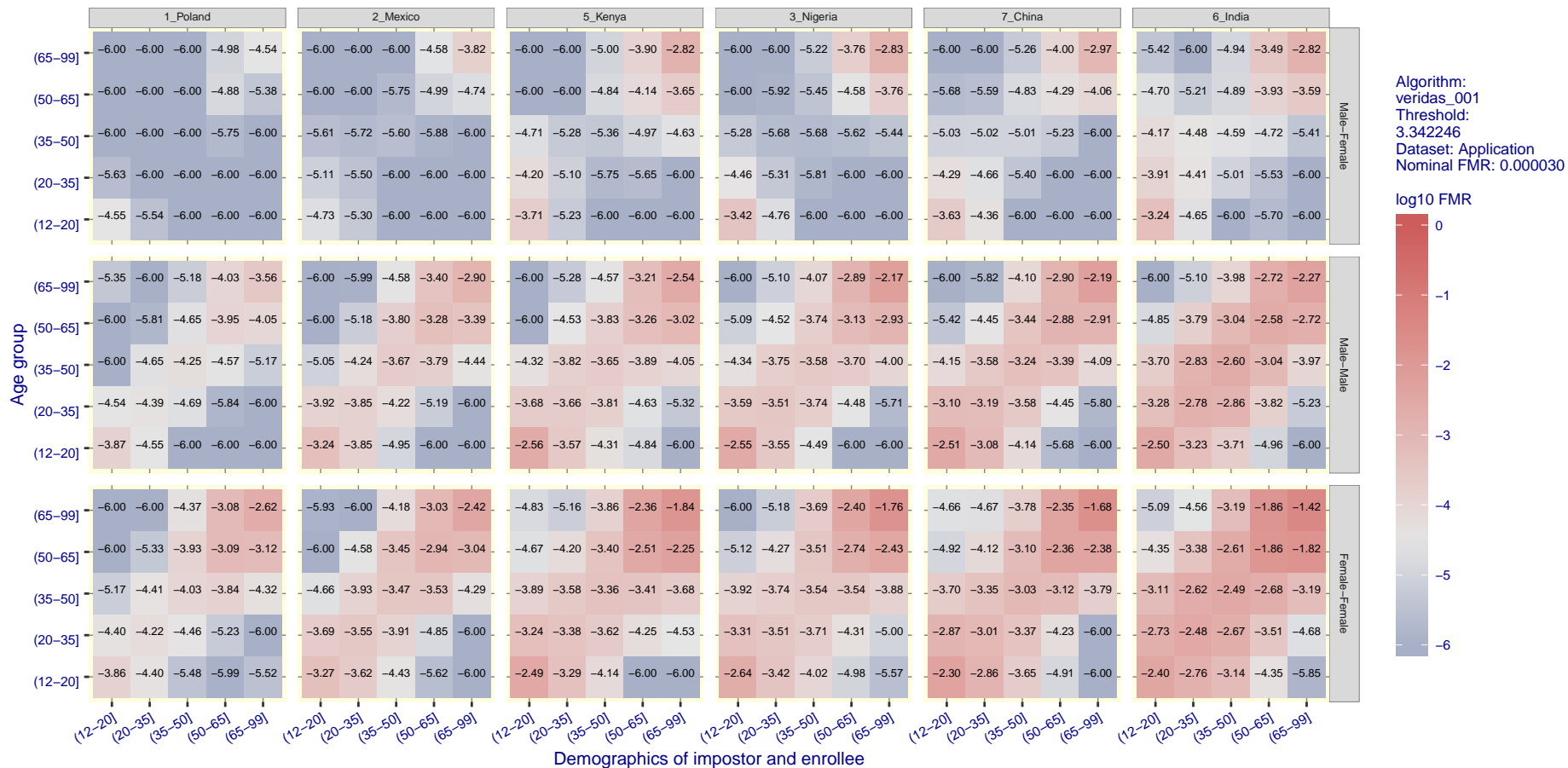
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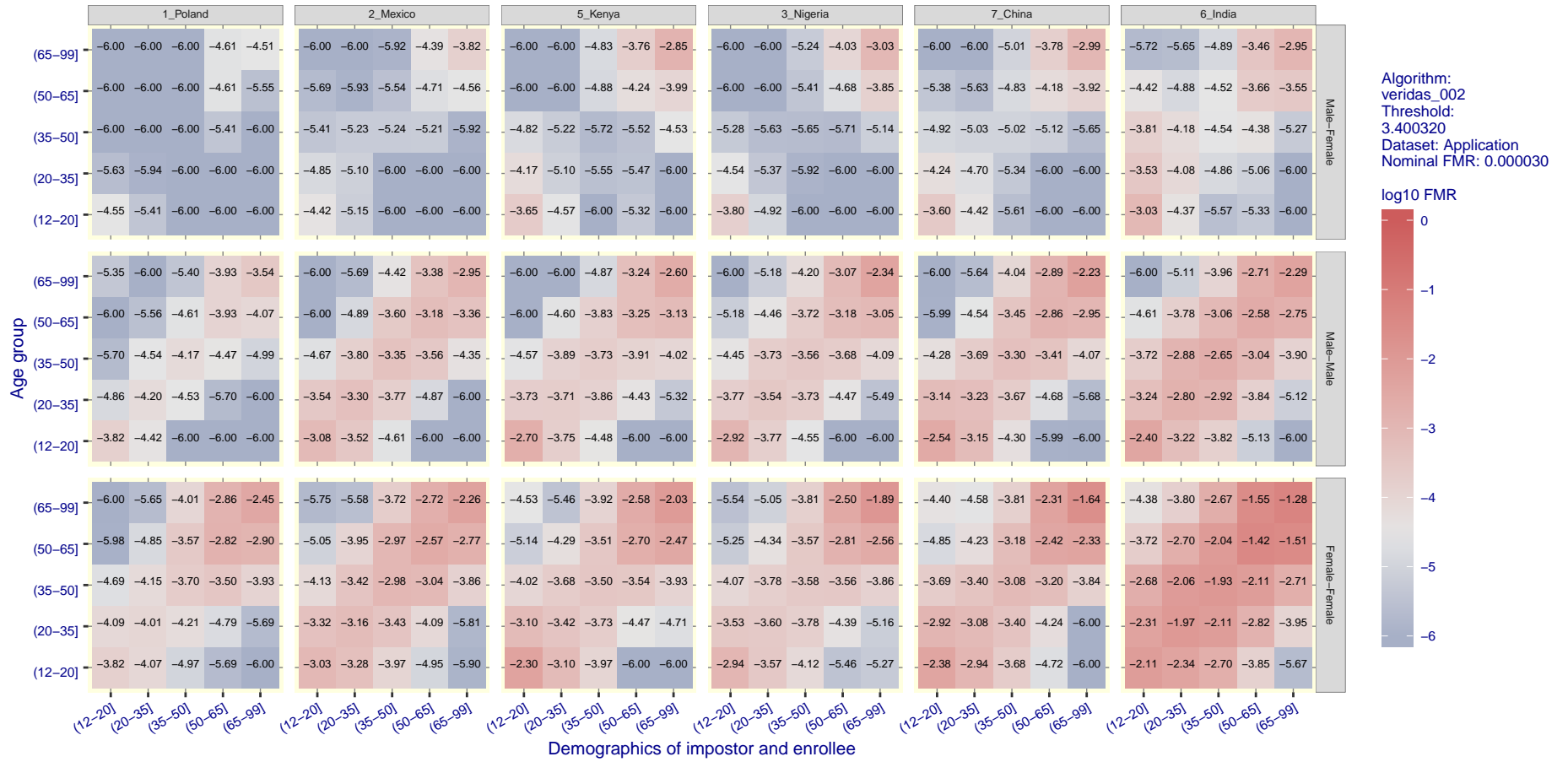
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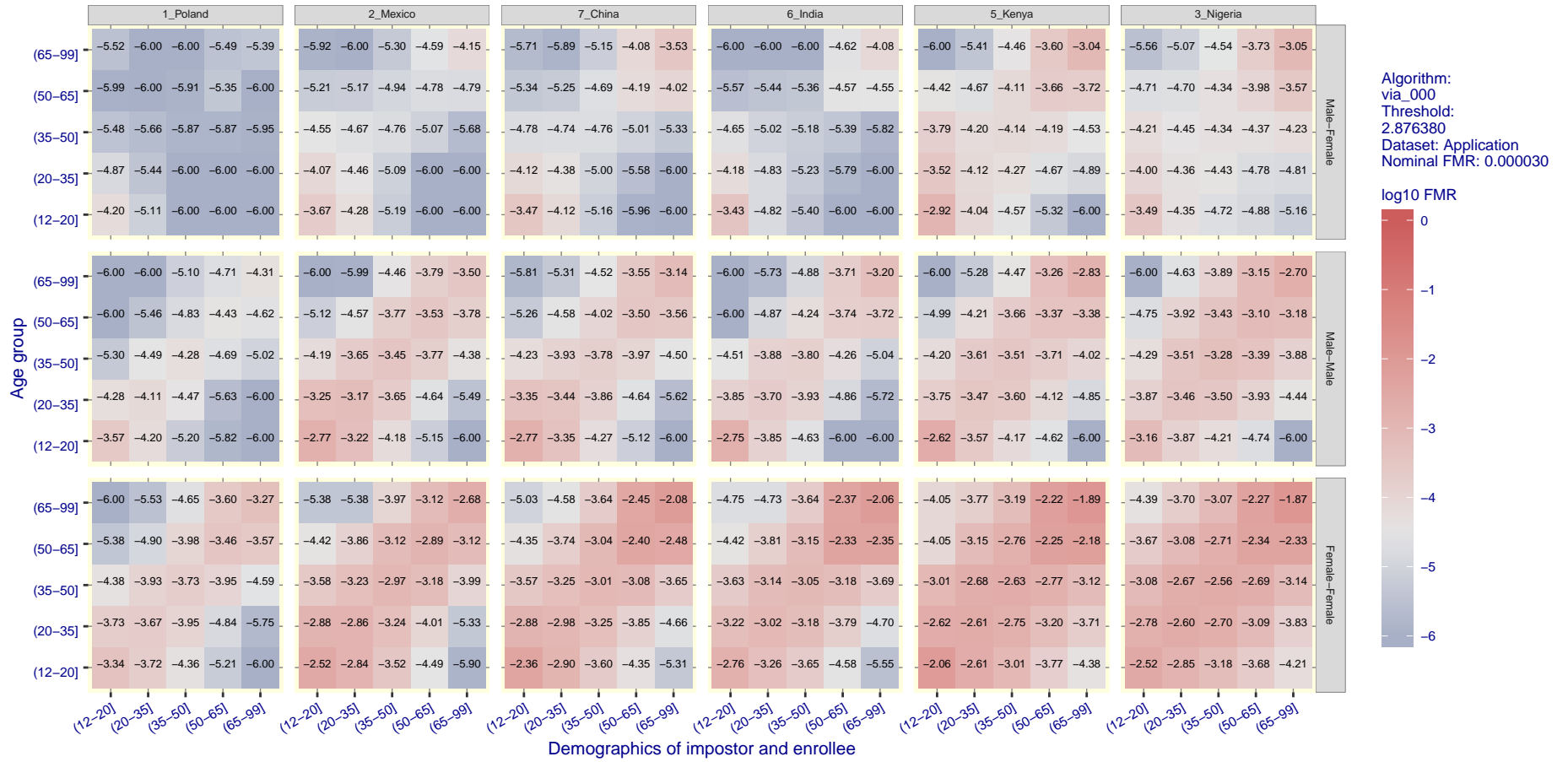
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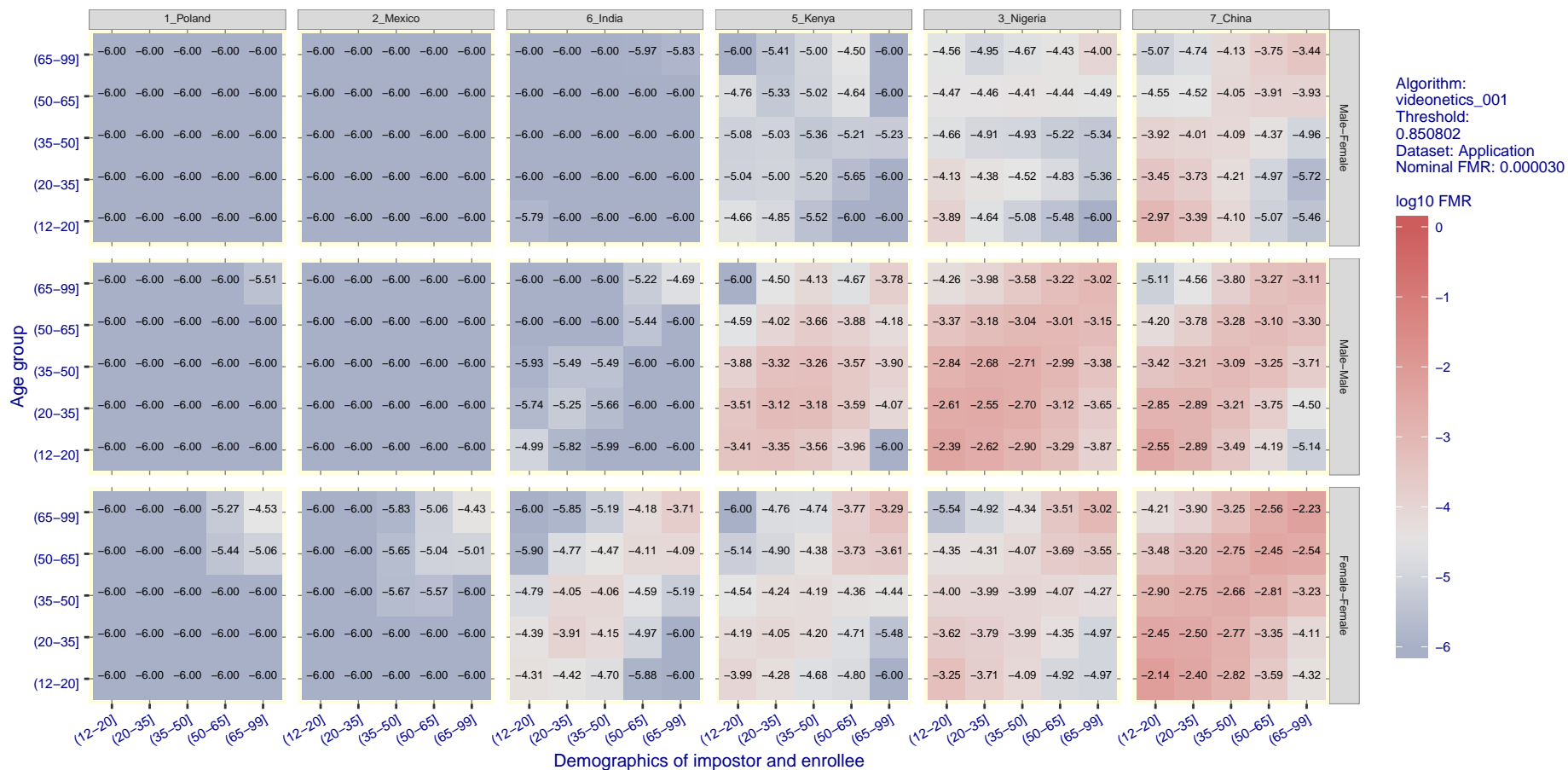
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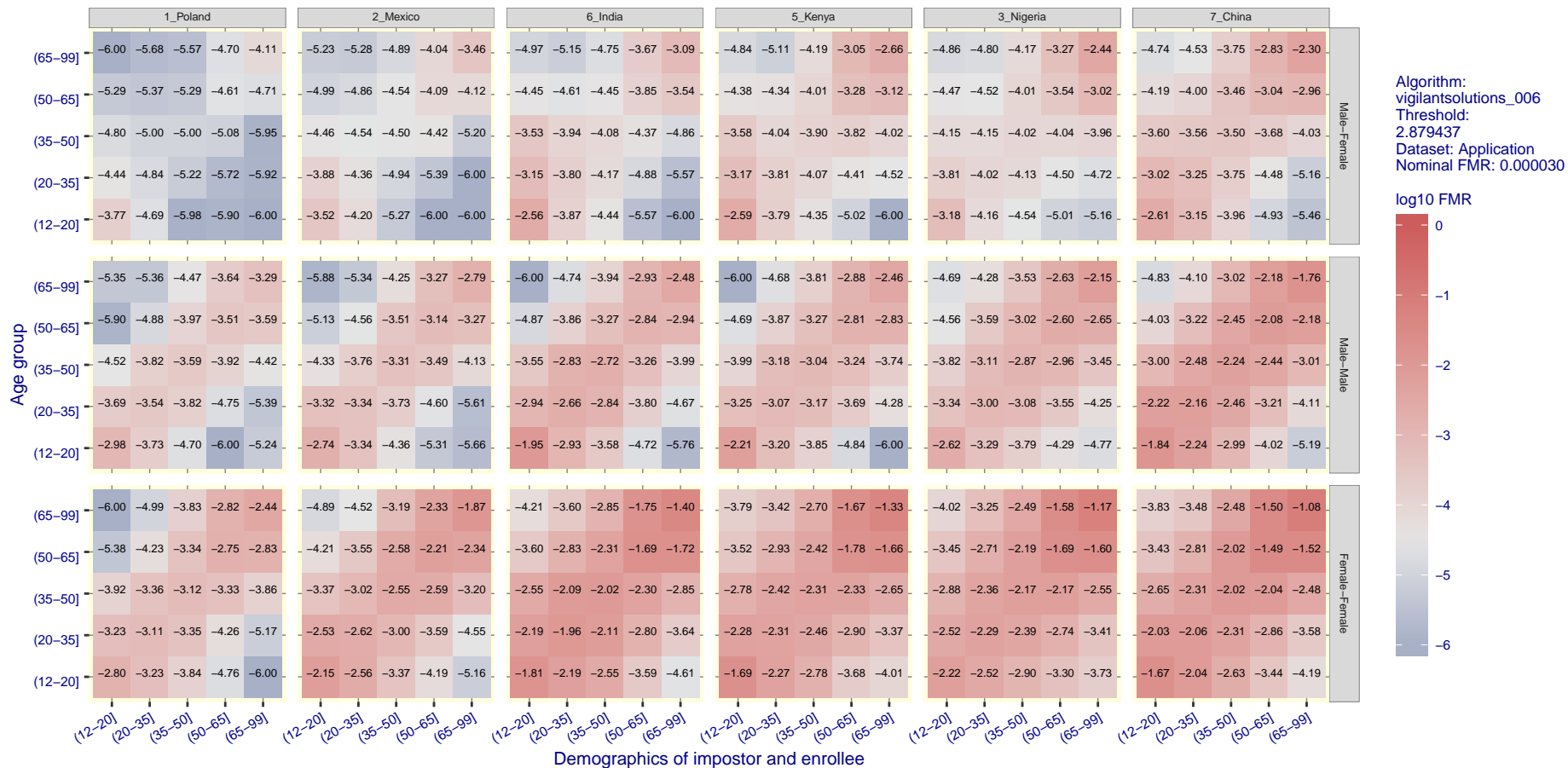
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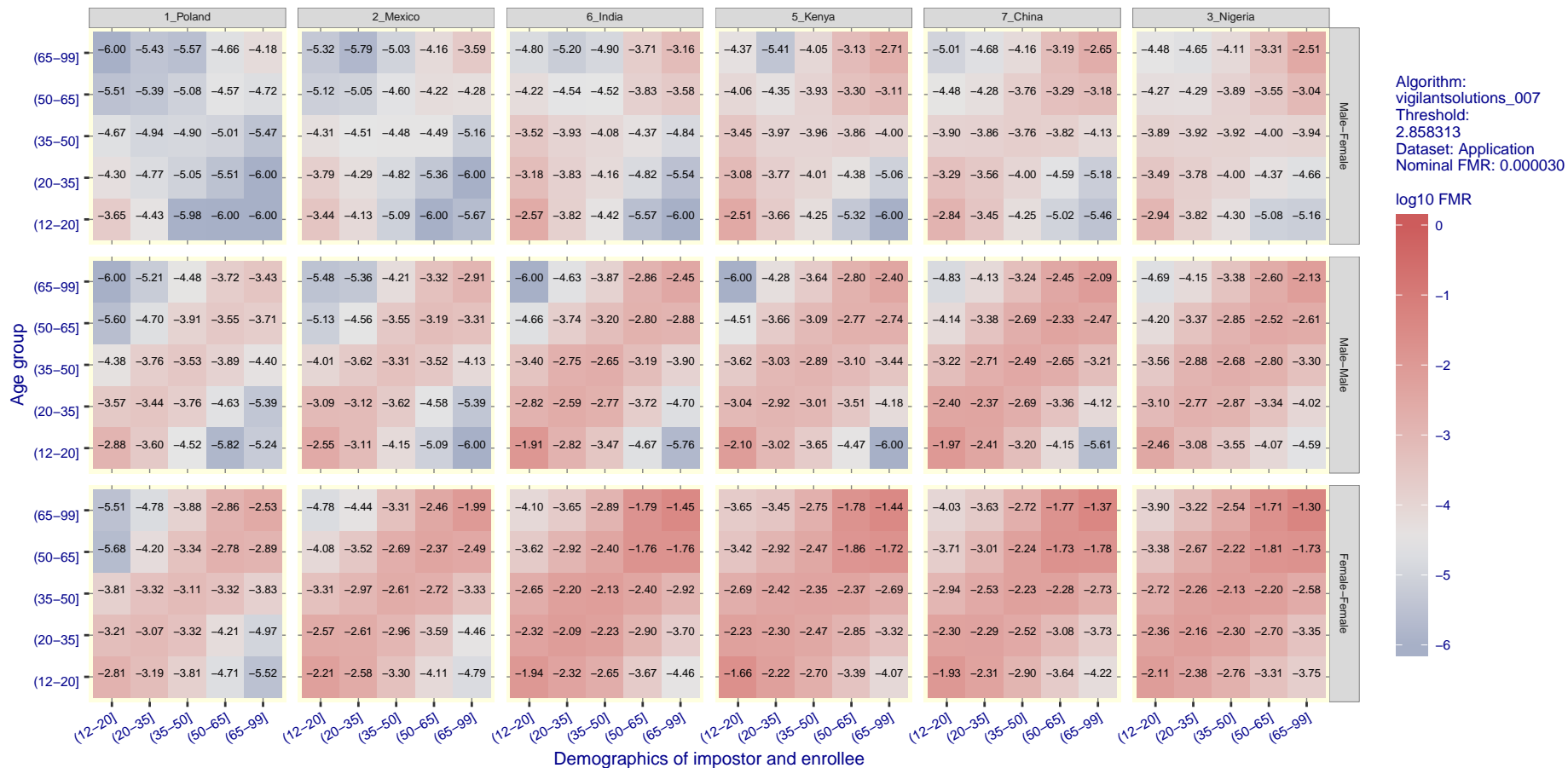
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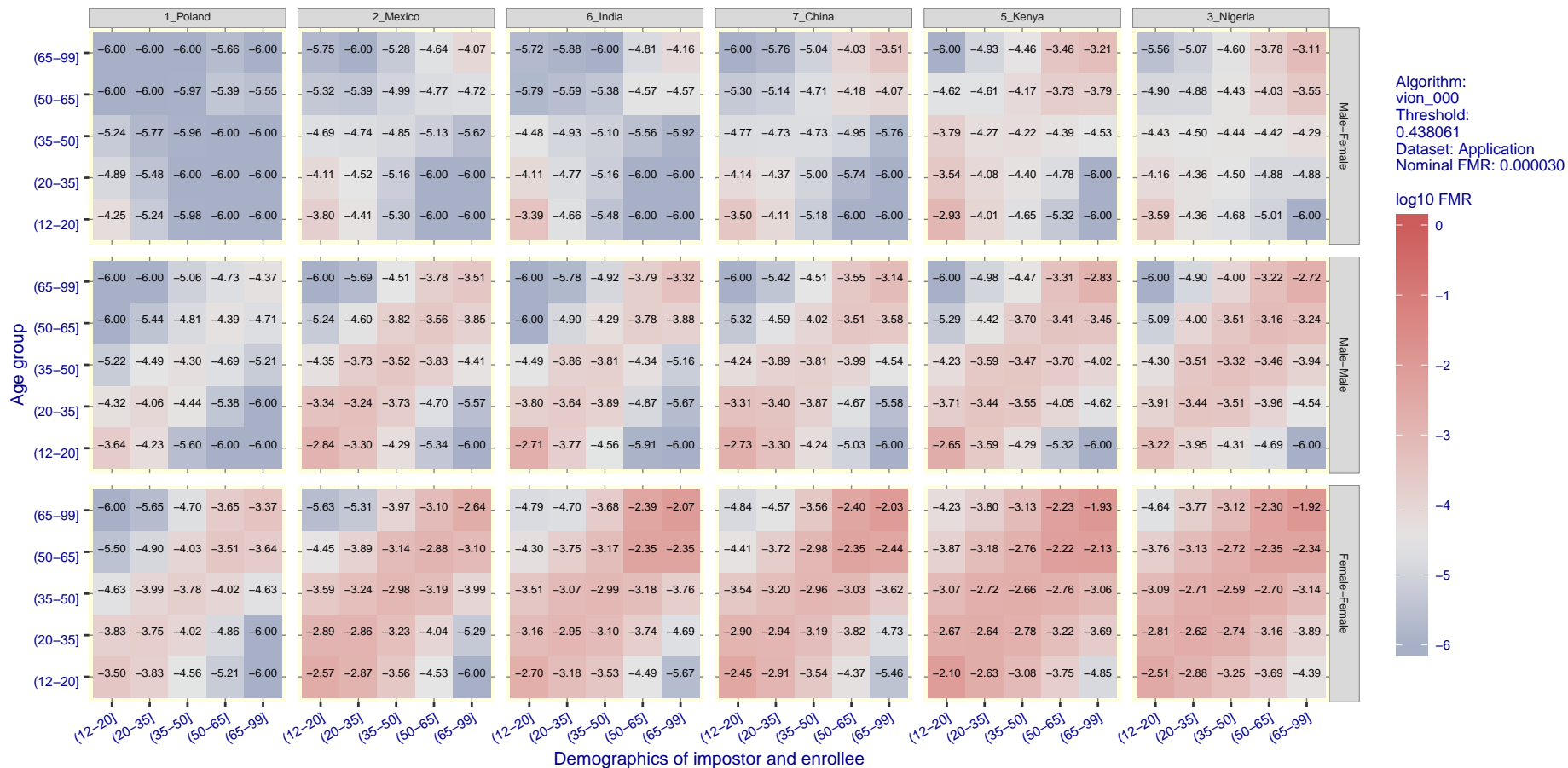
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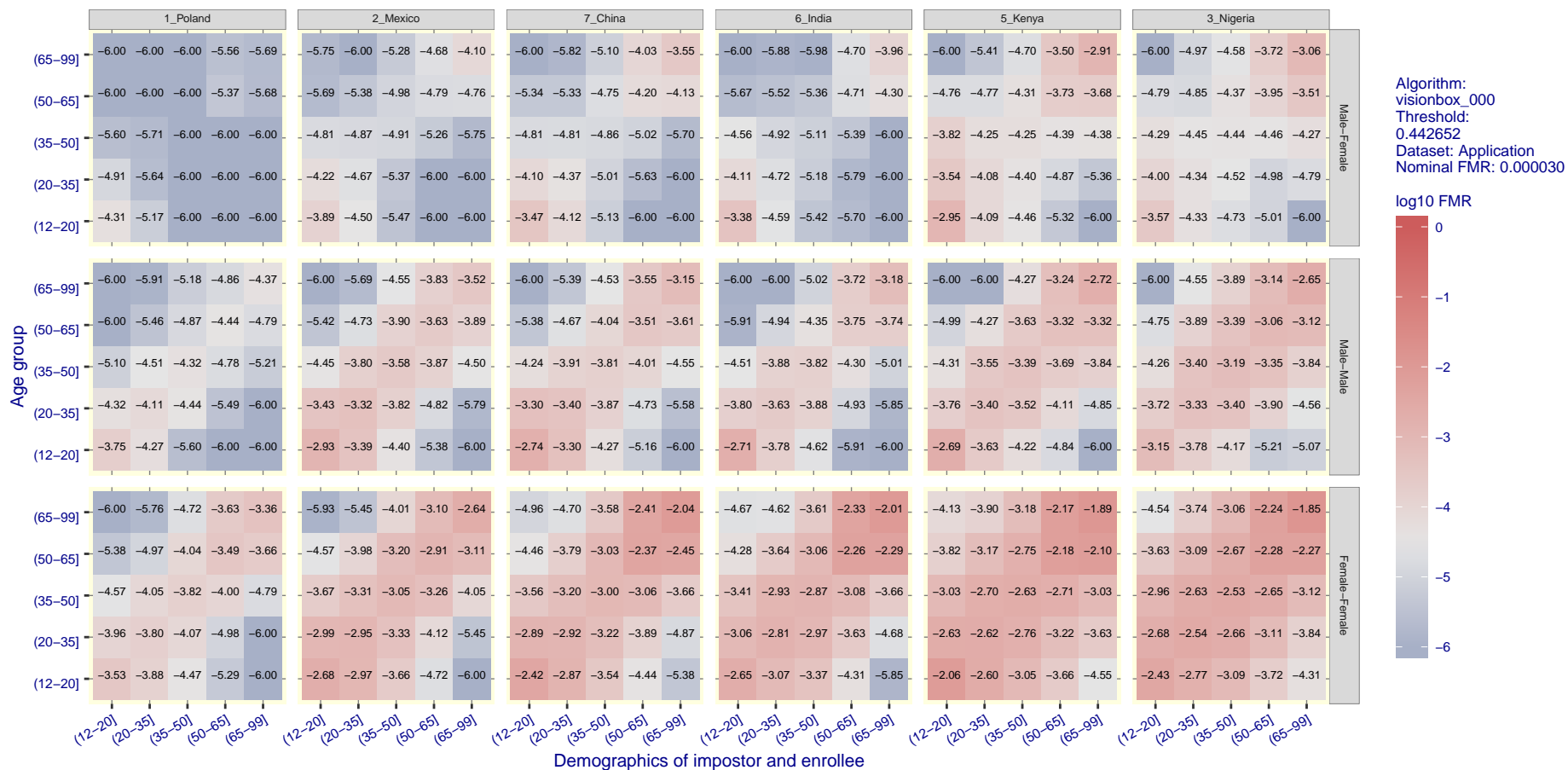
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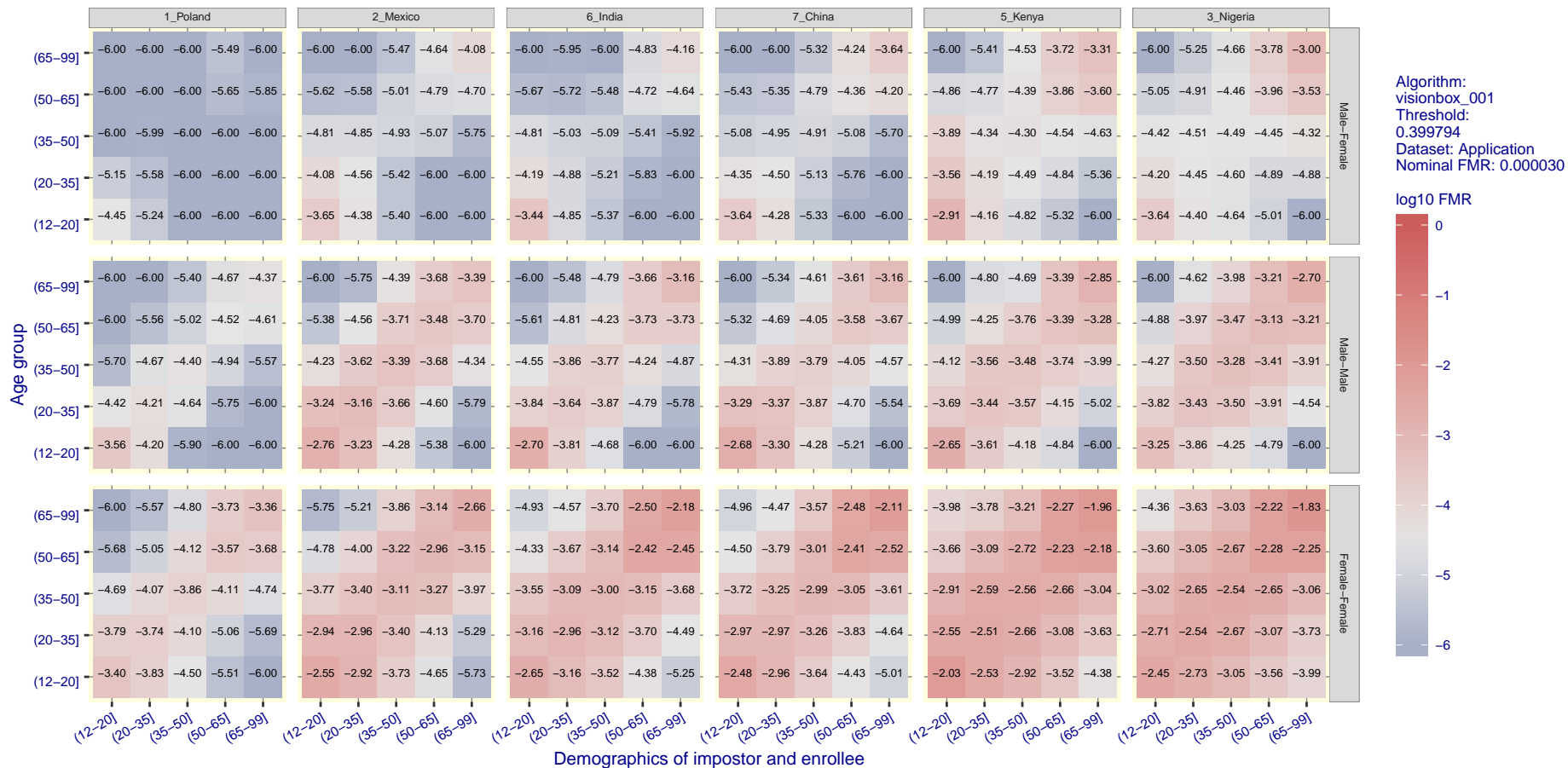
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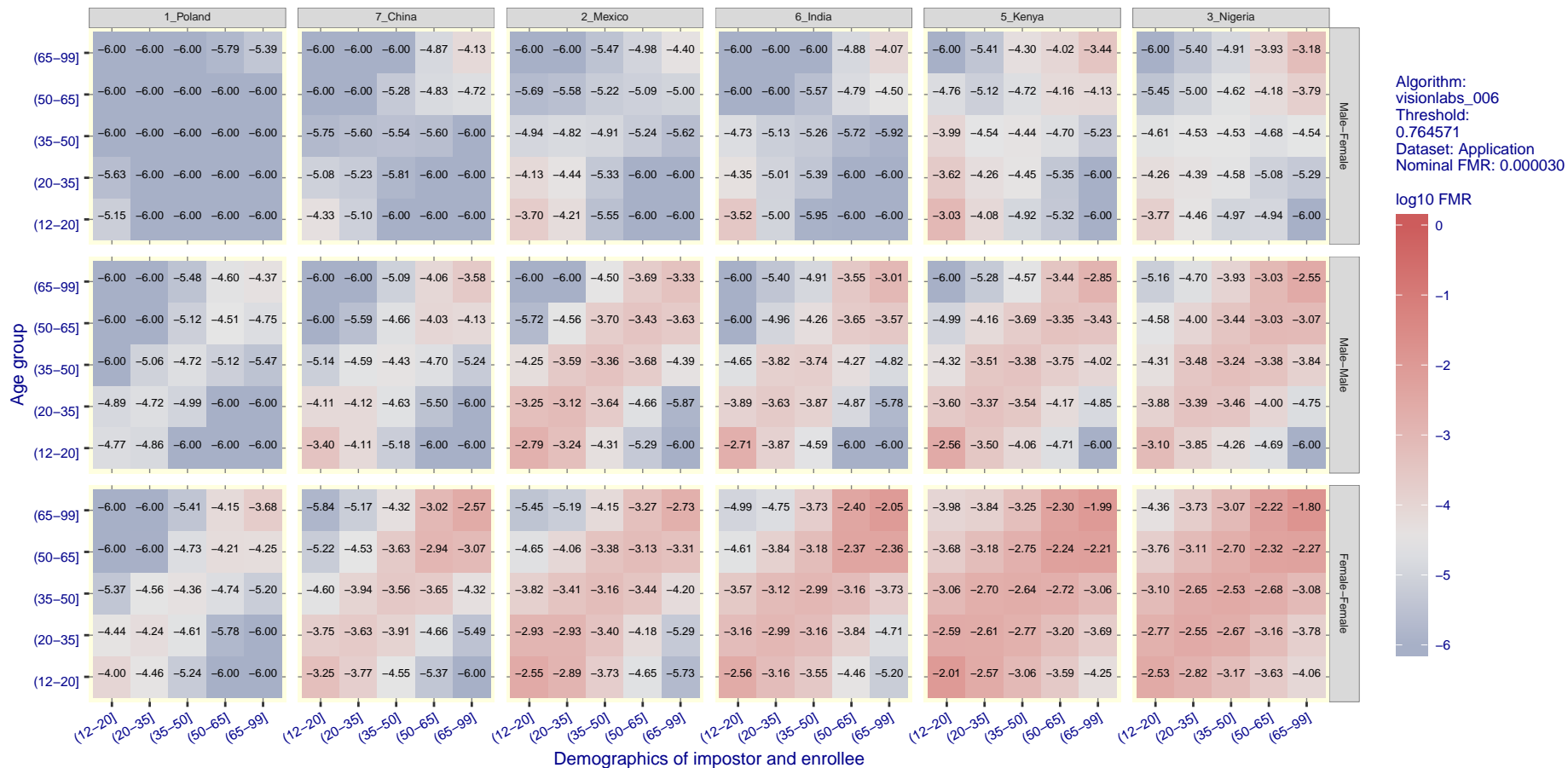
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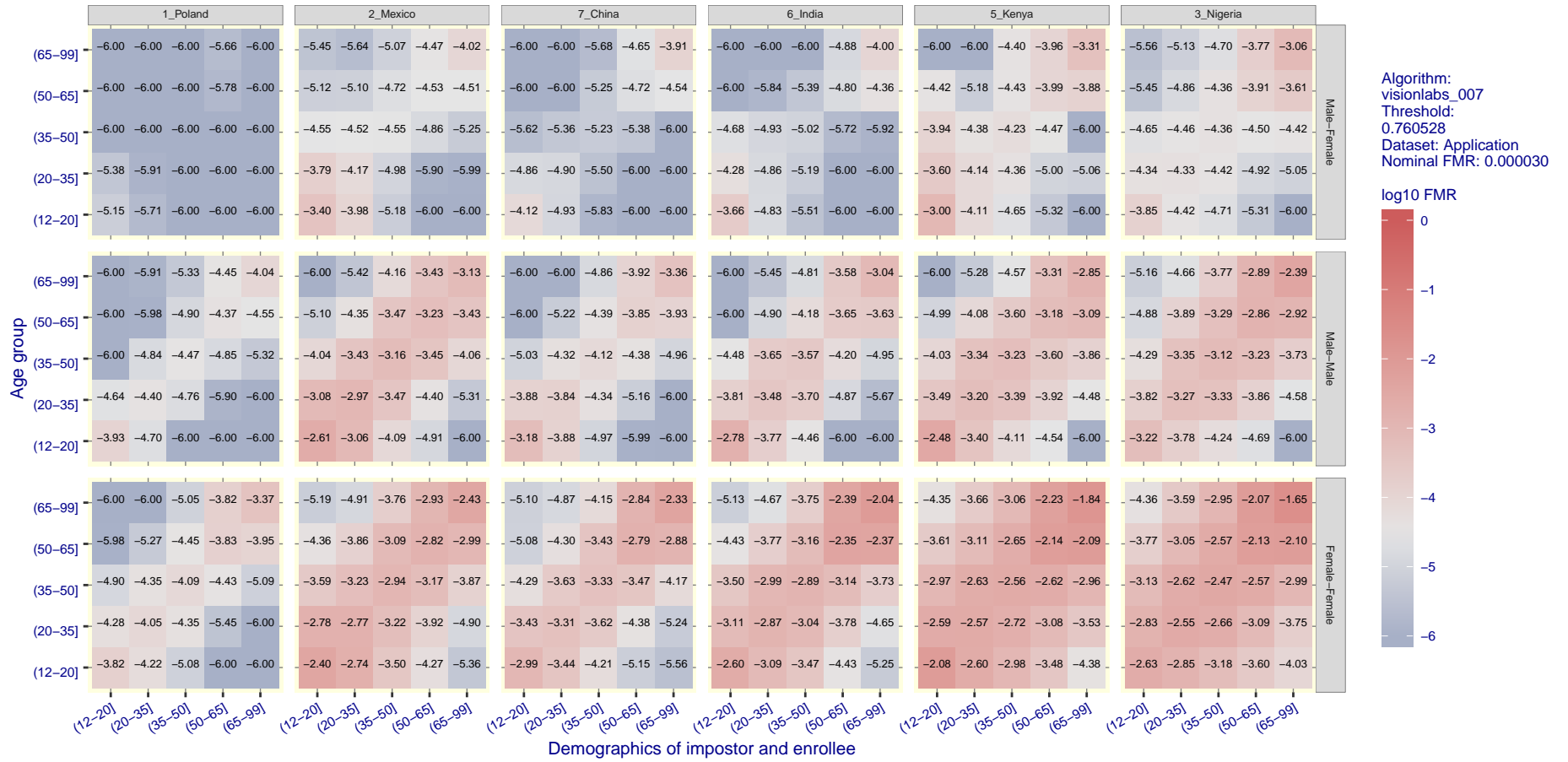
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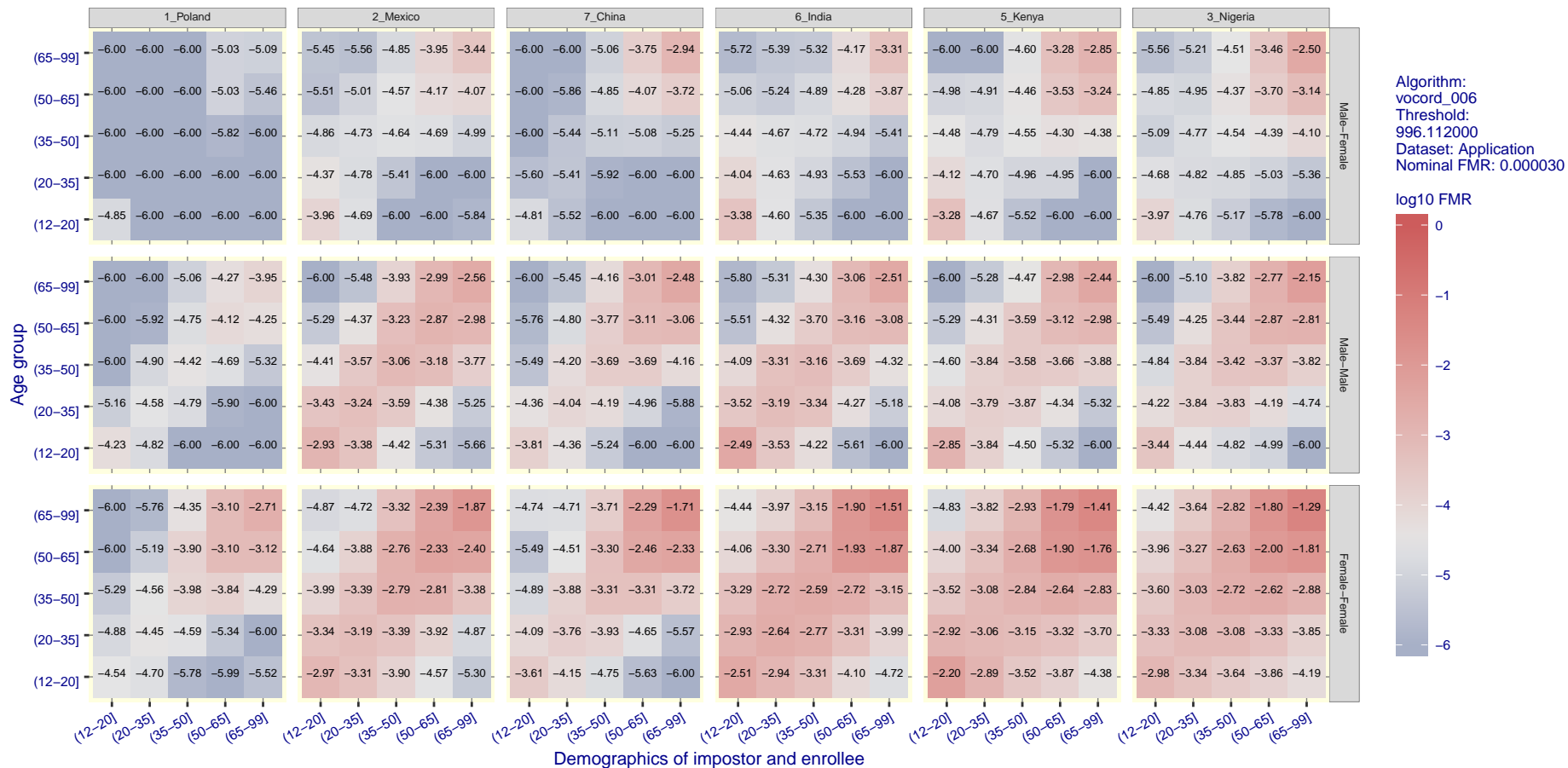
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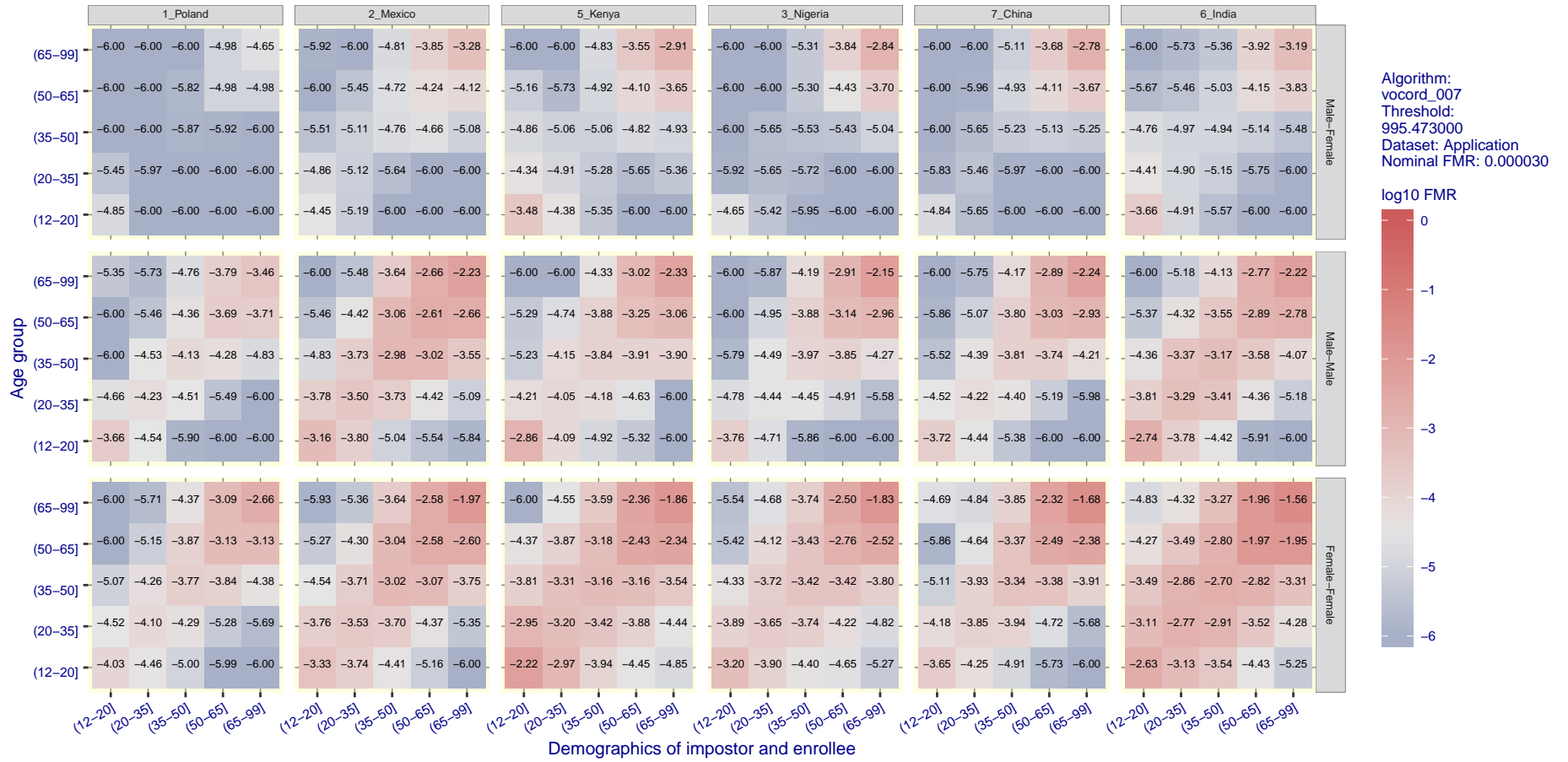
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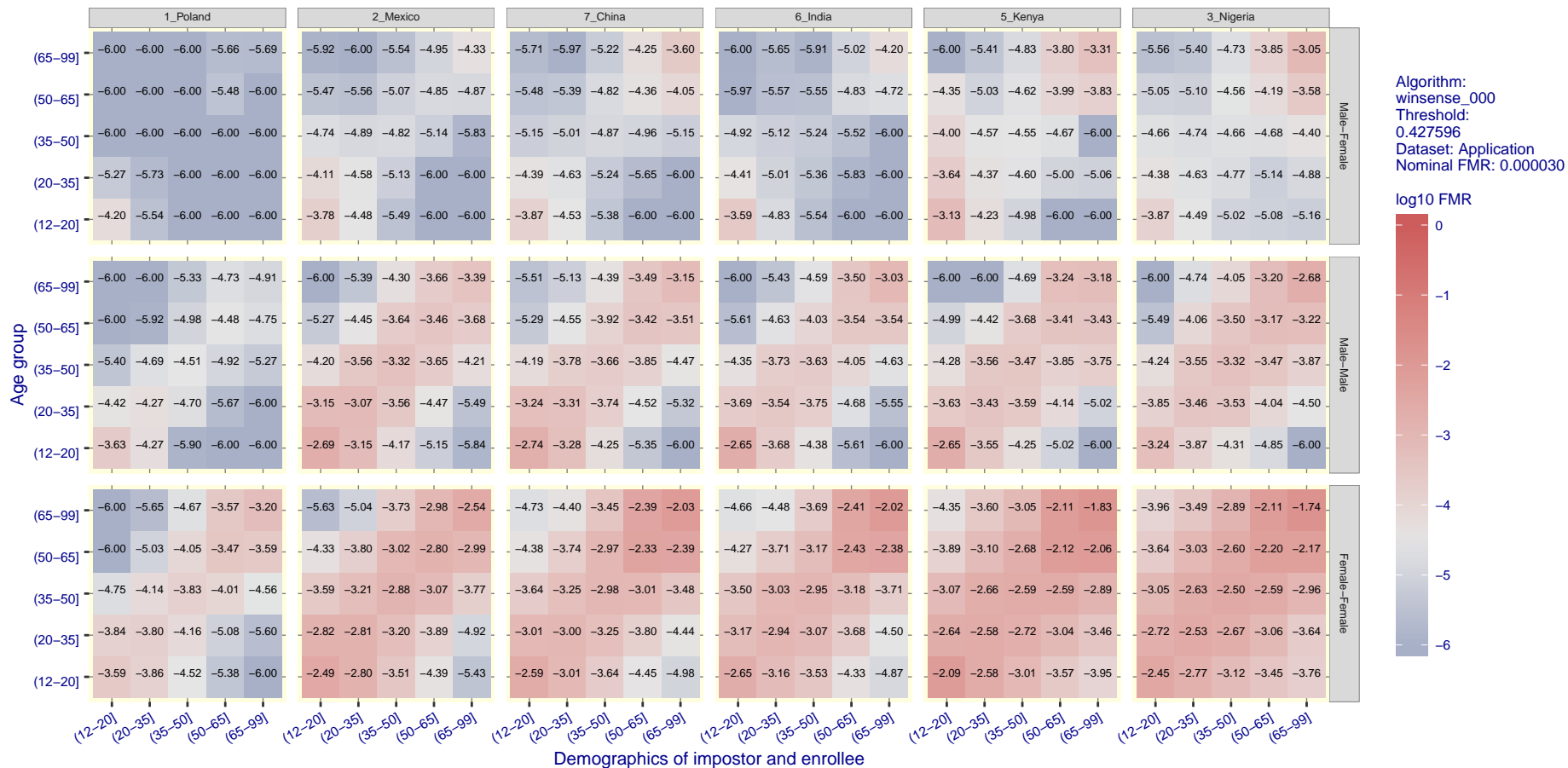
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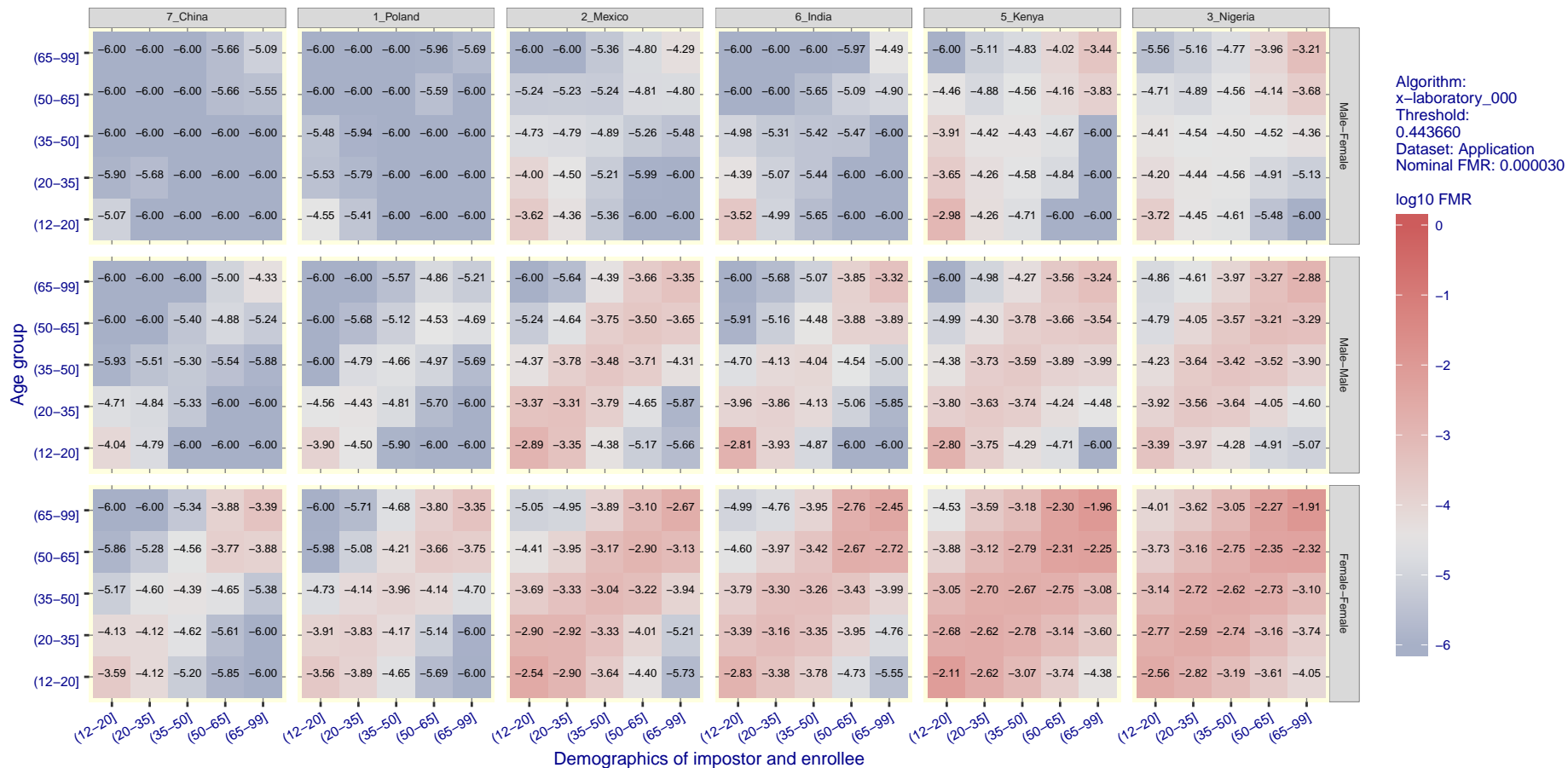
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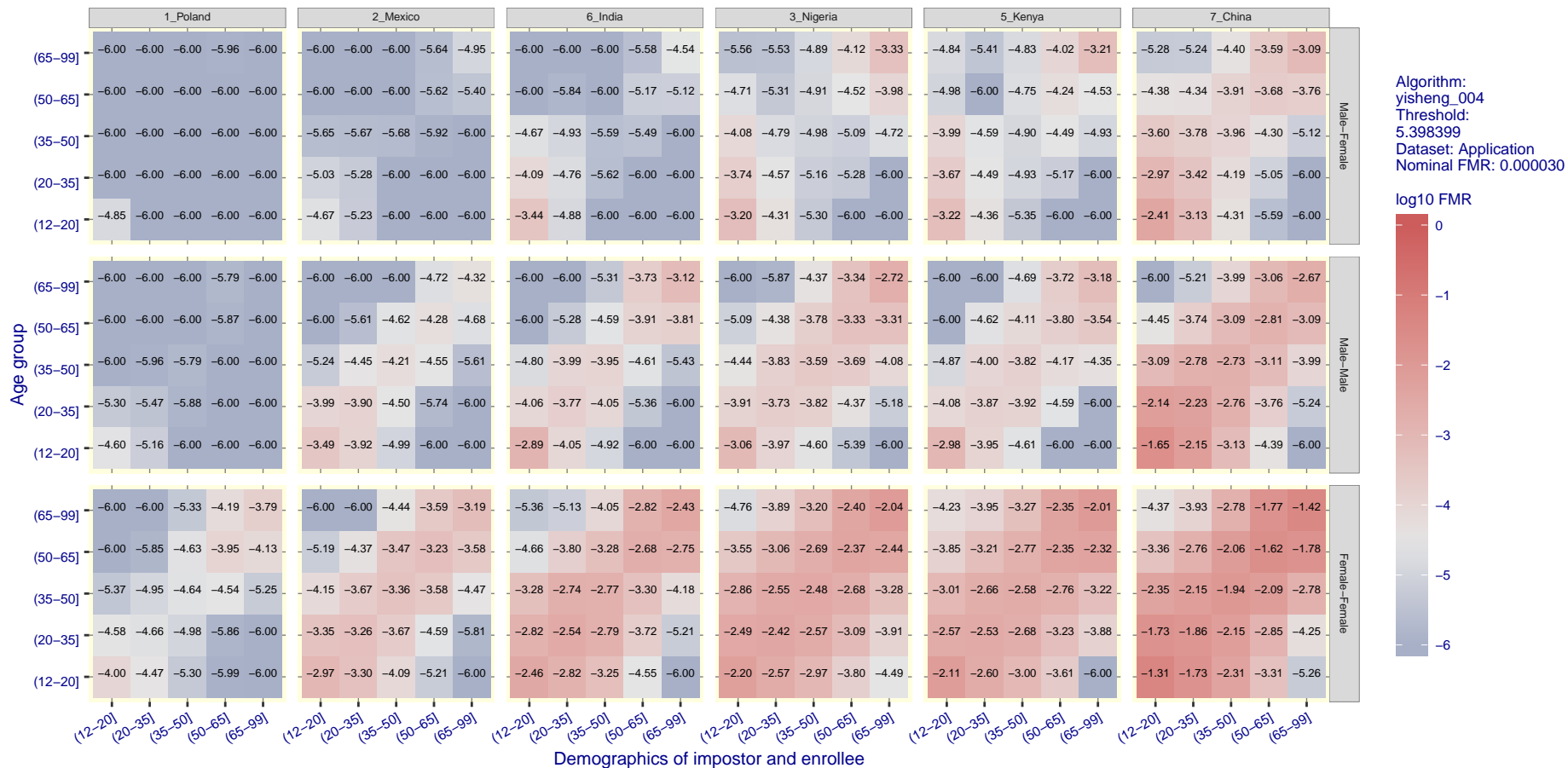
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