

NISTIR 8280

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

Annex 5 : False match rates for demographically matched impostors

This document is an annex of NIST Interagency Report 8280:
<https://doi.org/10.6028/NIST.IR.8280>

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1 Overview

This annex includes figures that shows false match rates for impostors who have various levels of demographic similarity. Each page contains one figure corresponding to one algorithm.

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 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 red point in the plot shows the mean of false match rates over particular sets of demographic groups.

- ▷ The uppermost point corresponds to the mean over 240 FMR estimates, namely those comparing each of two sexes with each other, in each of five age-groups, and within each of 24 countries ($2 \times 5 \times 10 = 240$).
- ▷ The second point is as the first, but the average is over 480 FMR estimates that now includes different sex FMR estimates also.
- ▷ The third point is as the first, but now the average is over 1200 FMR estimates that additionally includes all cross-age group impostor.
- ▷ The fourth point is as the first, but now the average is over 2400 FMR estimates that additionally includes all cross-age and cross-sex impostor.
- ▷ The fifth point is the average over 5760 FMR estimates that includes 24^2 cross-country comparisons within each sex and age group.
- ▷ The sixth point is as the fifth, but the average is over 11520 FMR estimates now including different sex FMR estimates also.
- ▷ The seventh point is as the fifth, but the average is over 28880 FMR estimates now including five different within-age FMR estimates also.
- ▷ The eighth point is the average over 57600 FMR estimates reflecting within- and between-group estimates for 24 countries, 5 age groups and 2 sexes ($24^2 \cdot 5^2 \cdot 2^2$).

The lines through each point extend from the 5-th percentile to the 95-th percentile of the FMR estimates listed above.

This publication is available free of charge from: <https://doi.org/10.6028/NIST.IR.8280>

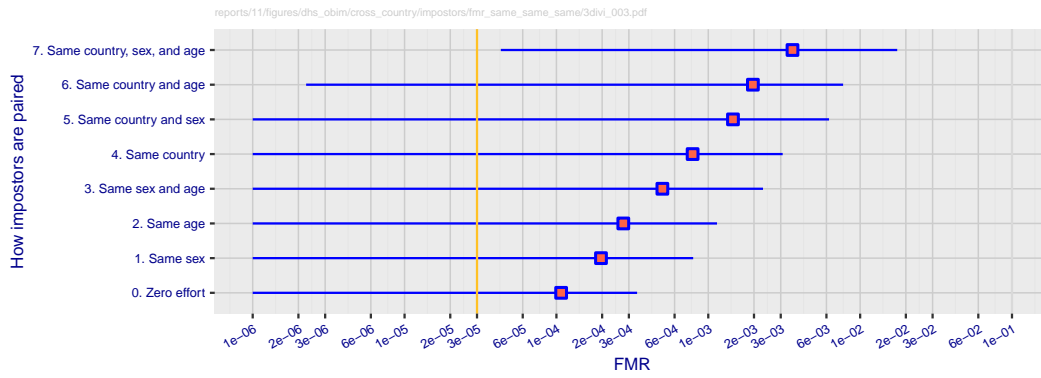


Figure 1: FMR for increasing matched covariates, 3divi-003

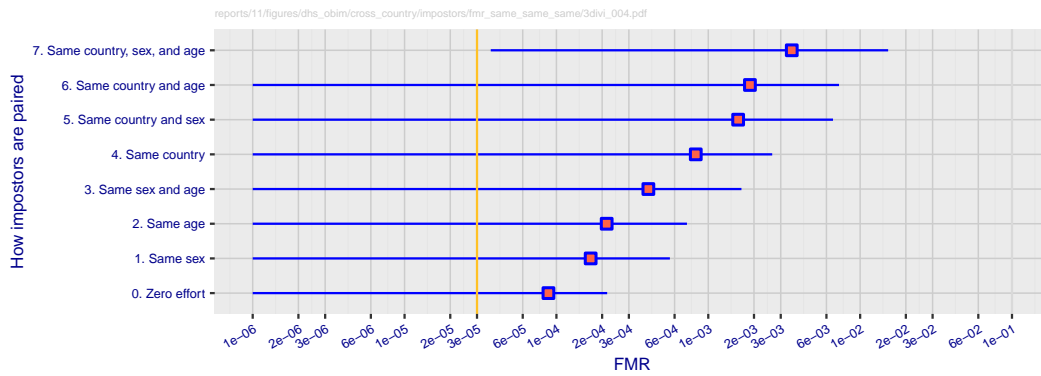


Figure 2: FMR for increasing matched covariates, 3divi-004

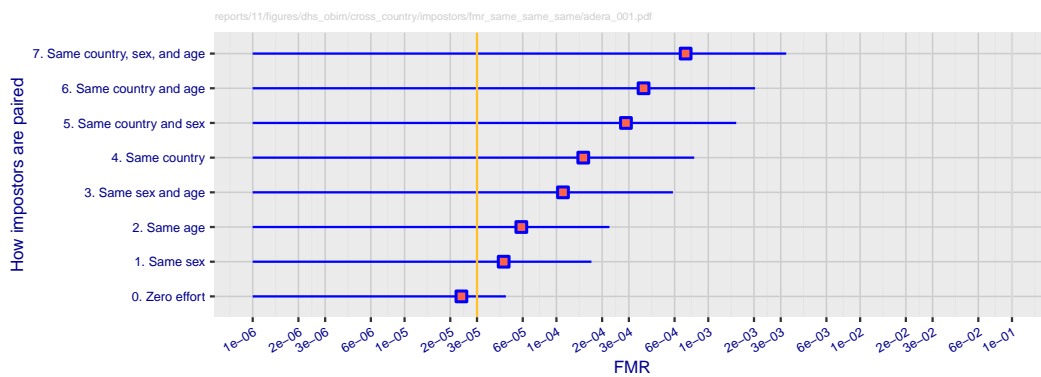


Figure 3: FMR for increasing matched covariates, adera-001

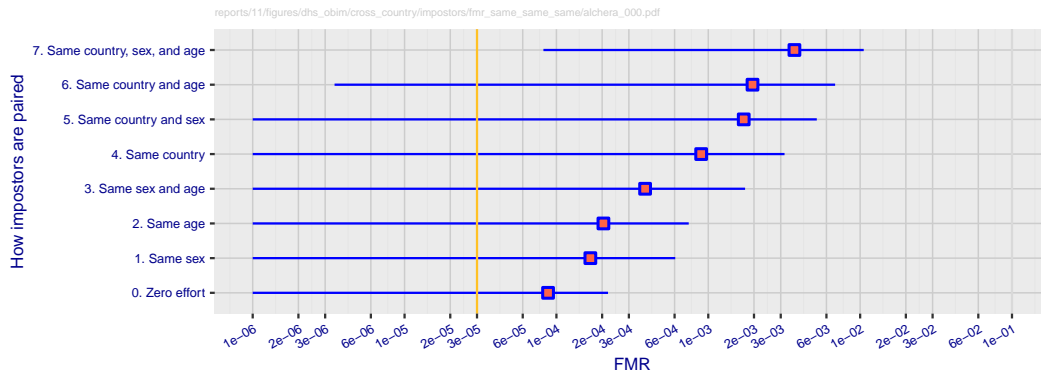


Figure 4: FMR for increasing matched covariates, alchera-000

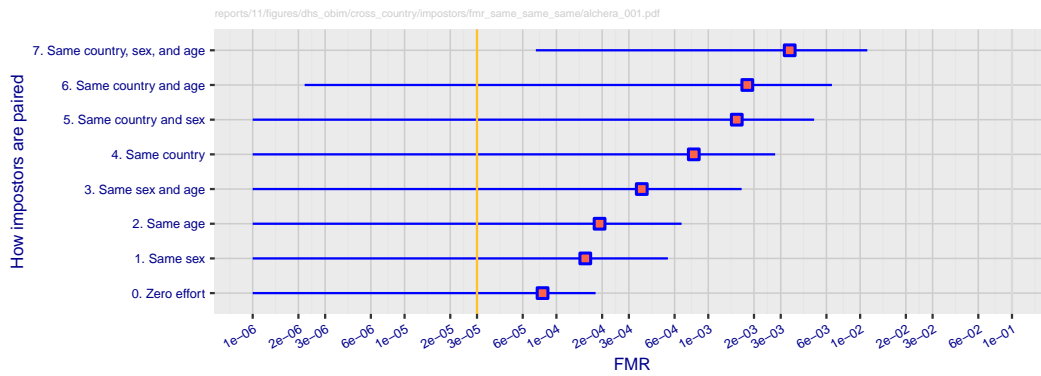


Figure 5: FMR for increasing matched covariates, alchera-001

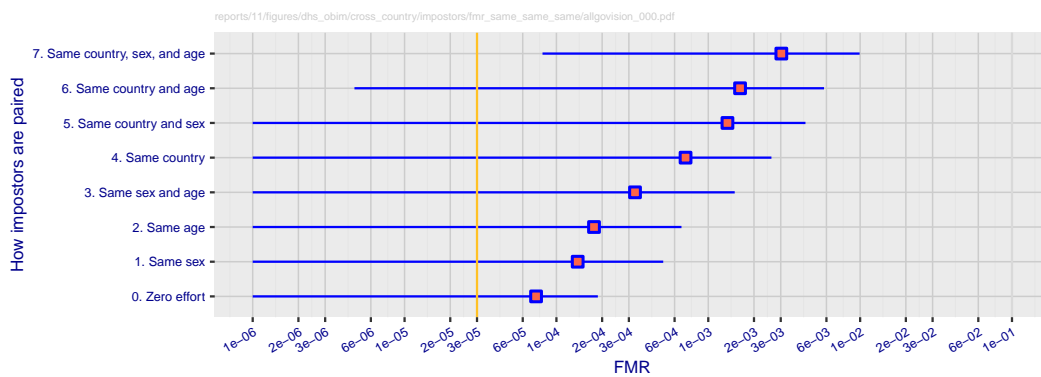


Figure 6: FMR for increasing matched covariates, allgovision-000

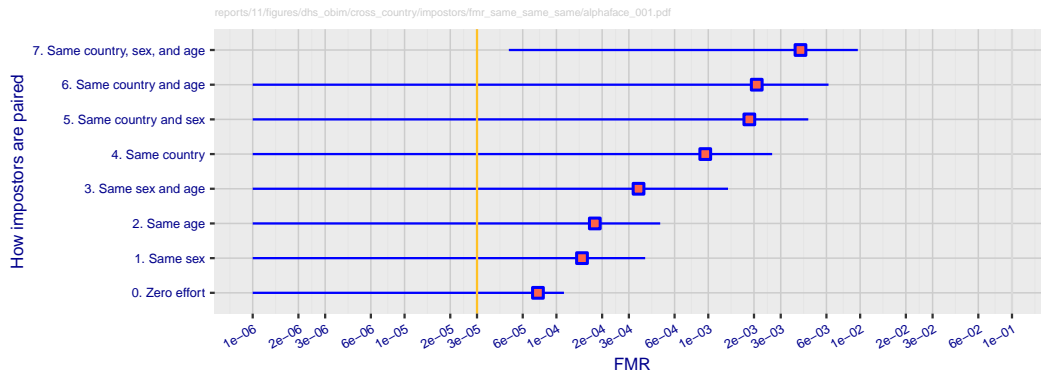


Figure 7: FMR for increasing matched covariates, alphaface-001

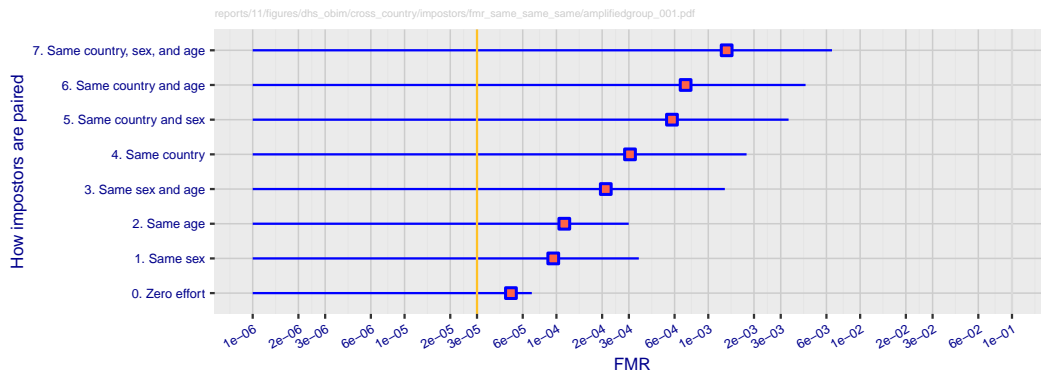


Figure 8: FMR for increasing matched covariates, amplifiedgroup-001

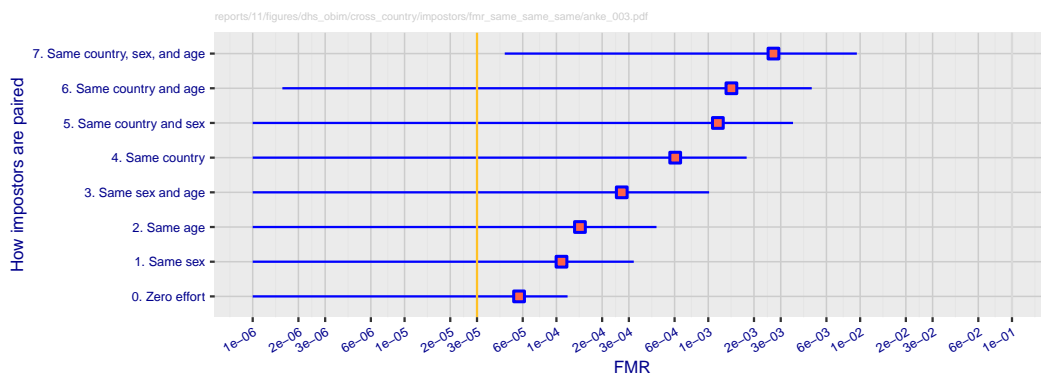


Figure 9: FMR for increasing matched covariates, anke-003

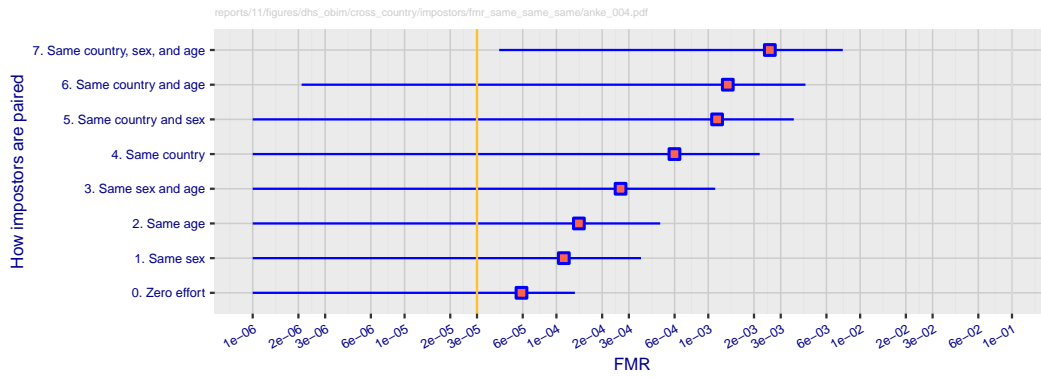


Figure 10: FMR for increasing matched covariates, anke-004

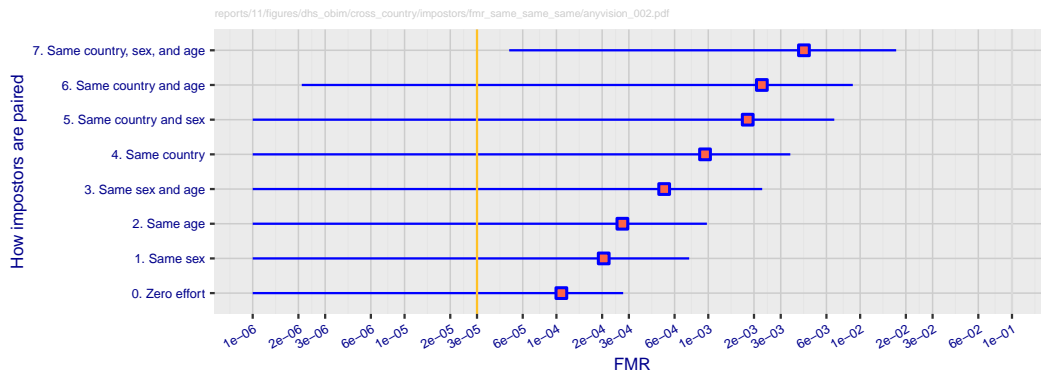


Figure 11: FMR for increasing matched covariates, anyvision-002

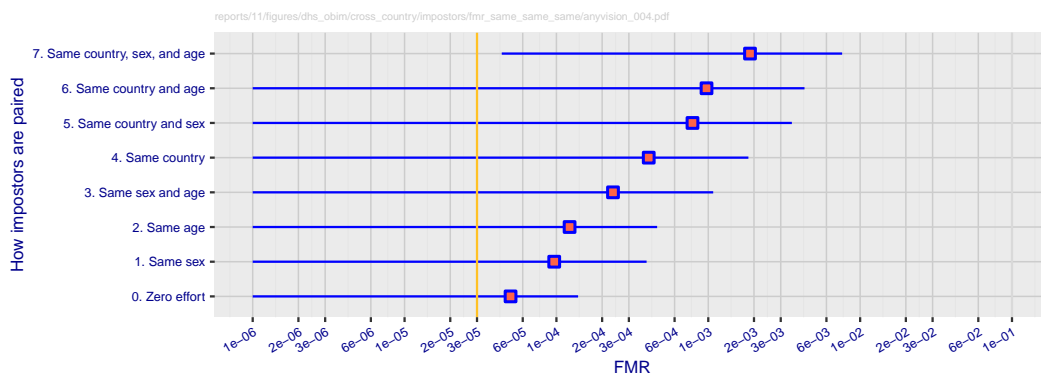


Figure 12: FMR for increasing matched covariates, anyvision-004

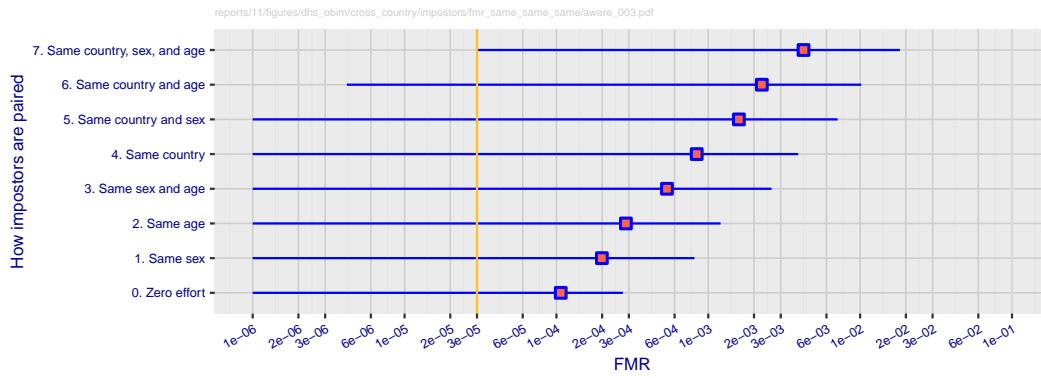


Figure 13: FMR for increasing matched covariates, aware-003

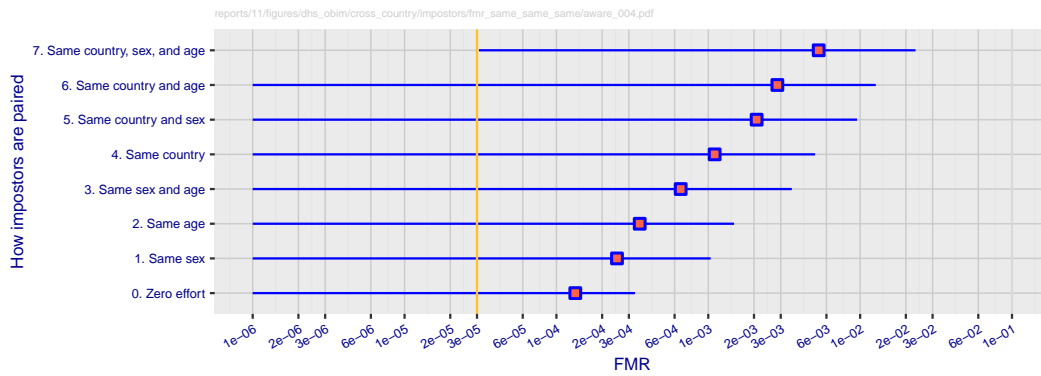


Figure 14: FMR for increasing matched covariates, aware-004

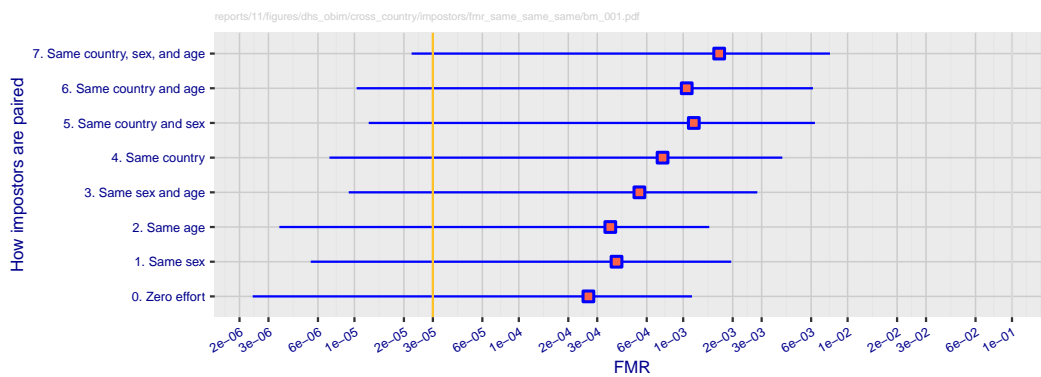


Figure 15: FMR for increasing matched covariates, bm-001

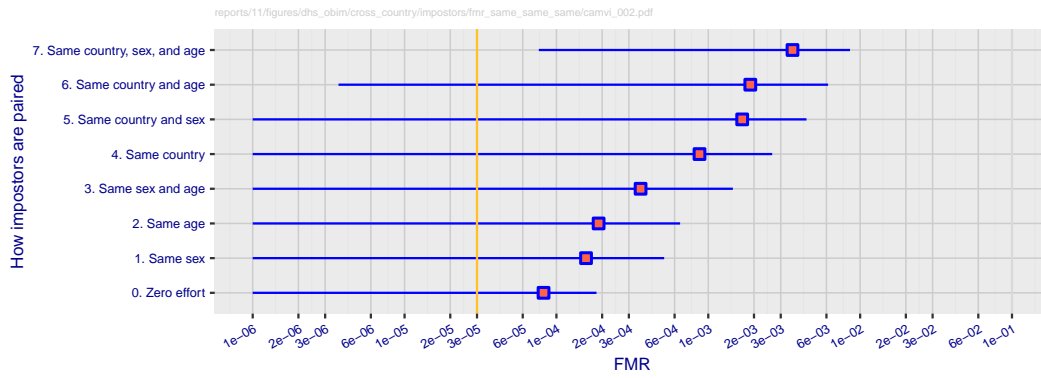


Figure 16: FMR for increasing matched covariates, camvi-002

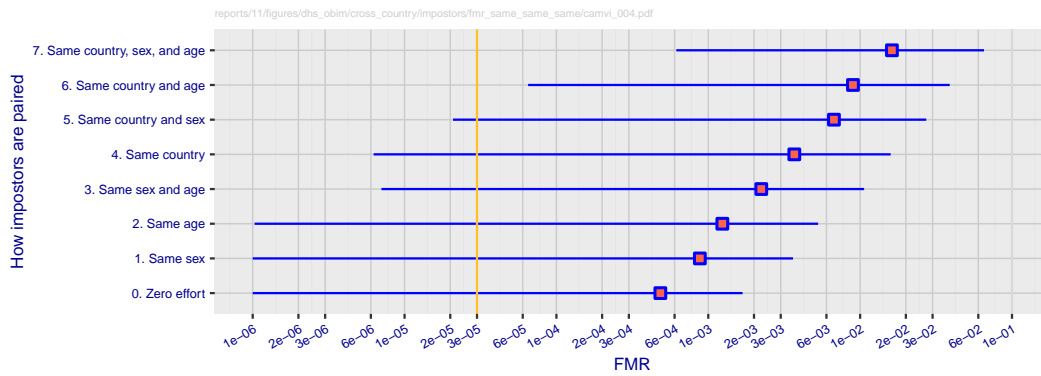


Figure 17: FMR for increasing matched covariates, camvi-004

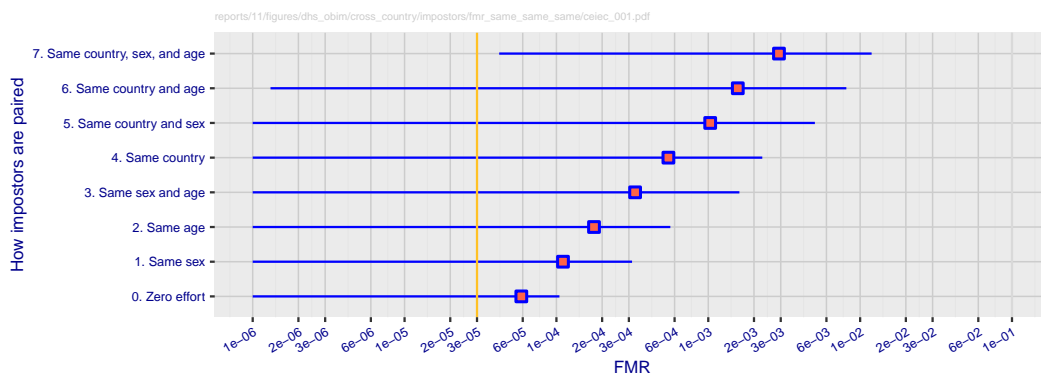


Figure 18: FMR for increasing matched covariates, ceiec-001

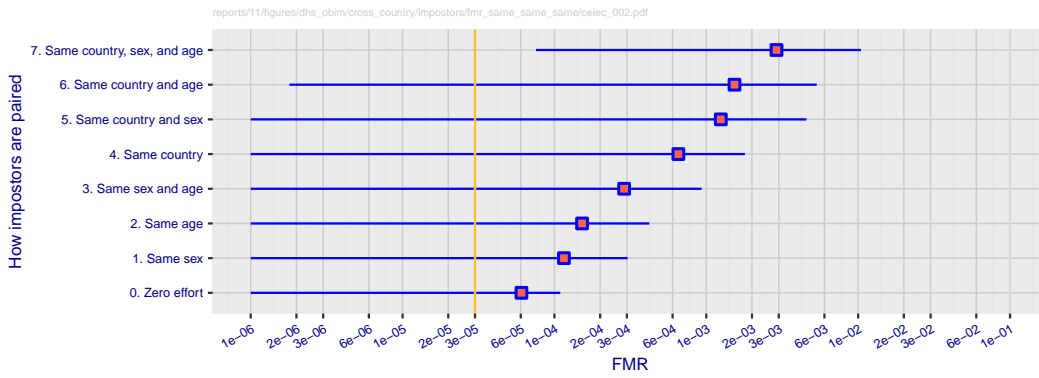


Figure 19: FMR for increasing matched covariates, ceiec-002

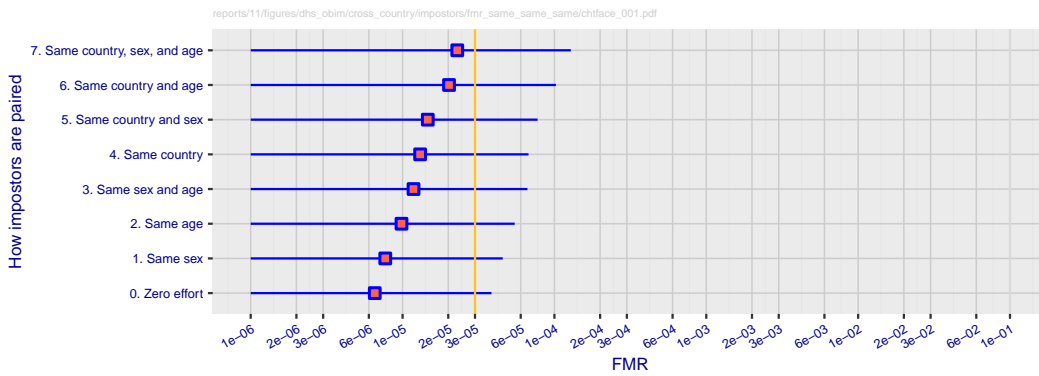


Figure 20: FMR for increasing matched covariates, chtface-001

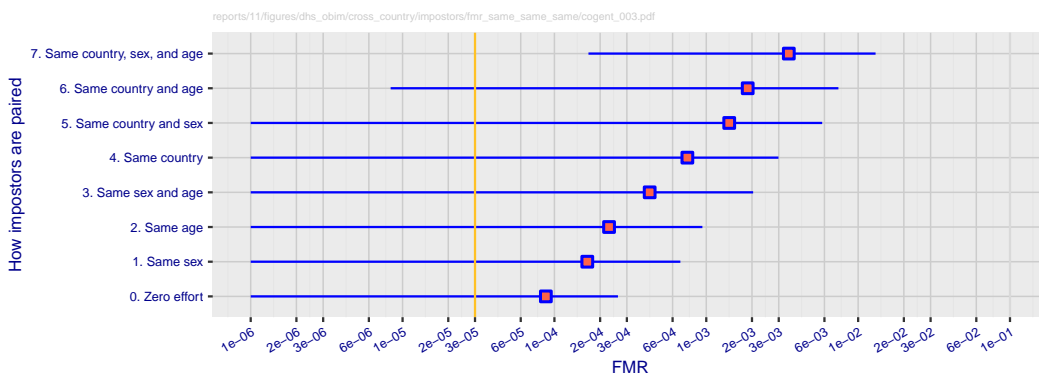


Figure 21: FMR for increasing matched covariates, cogent-003

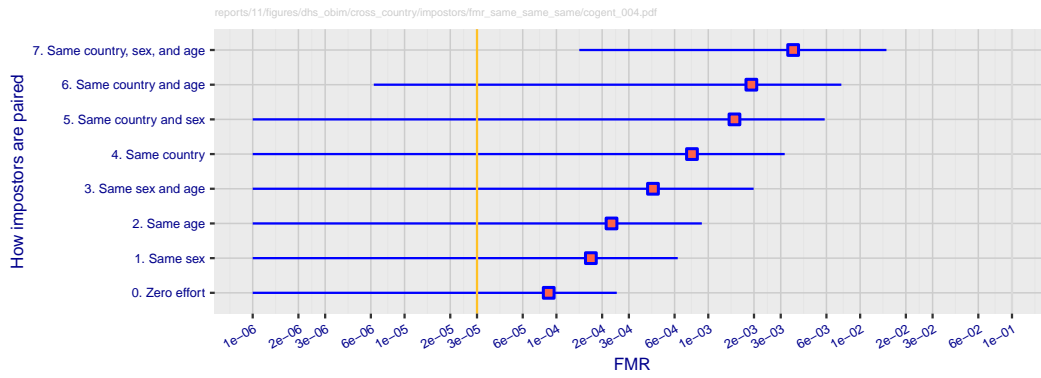


Figure 22: FMR for increasing matched covariates, cogent-004

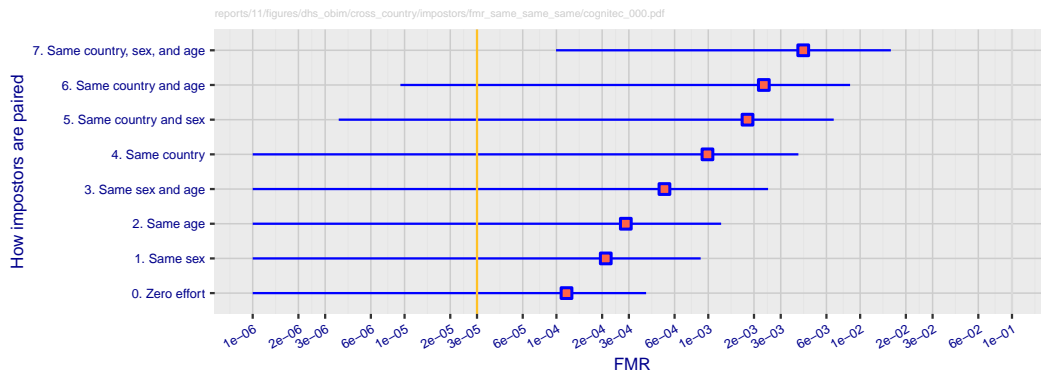


Figure 23: FMR for increasing matched covariates, cognitec-000

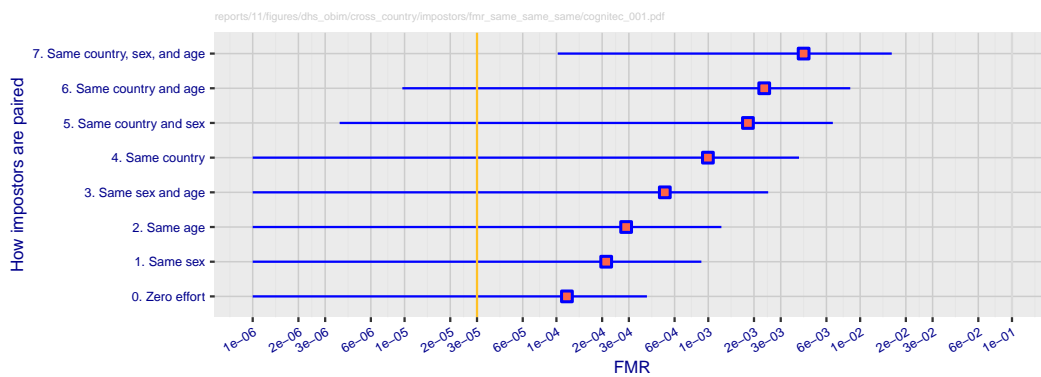


Figure 24: FMR for increasing matched covariates, cognitec-001

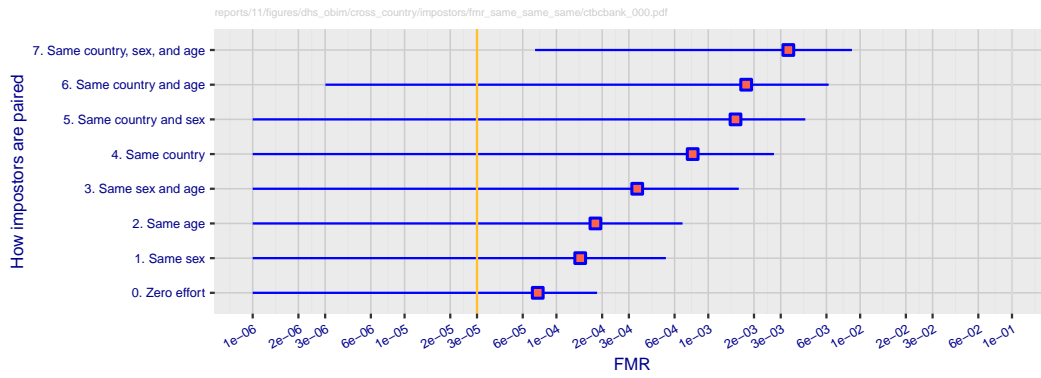


Figure 25: FMR for increasing matched covariates, ctcbank-000

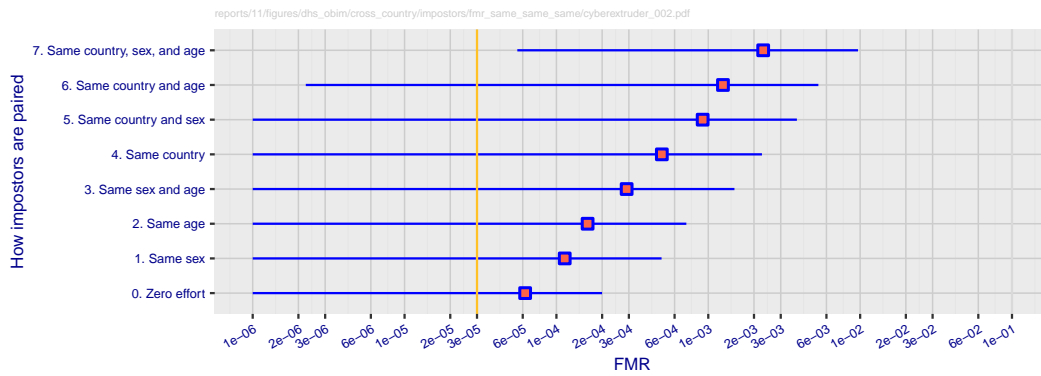


Figure 26: FMR for increasing matched covariates, cyberextruder-002

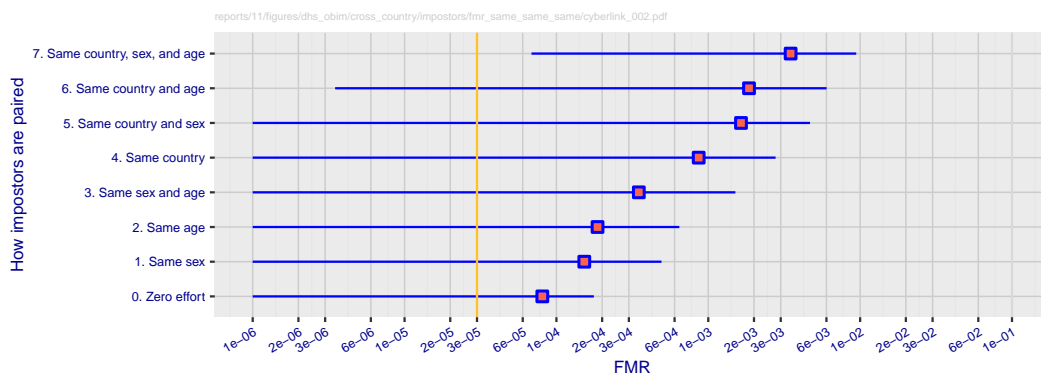


Figure 27: FMR for increasing matched covariates, cyberlink-002

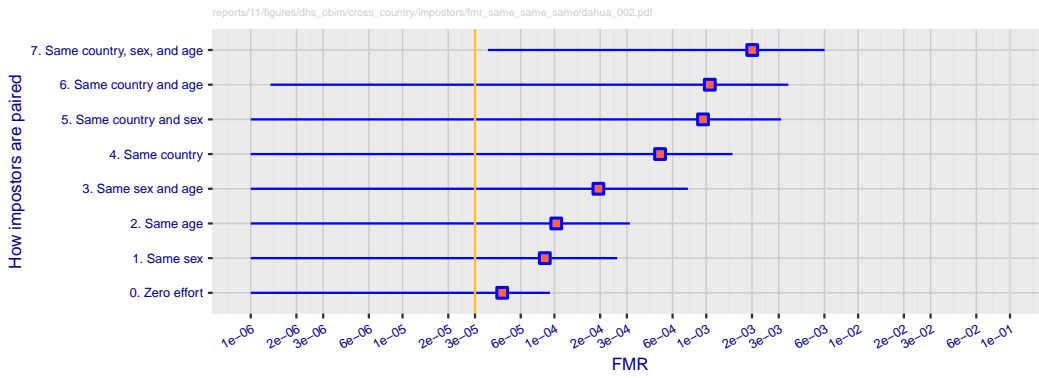


Figure 28: FMR for increasing matched covariates, dahua-002

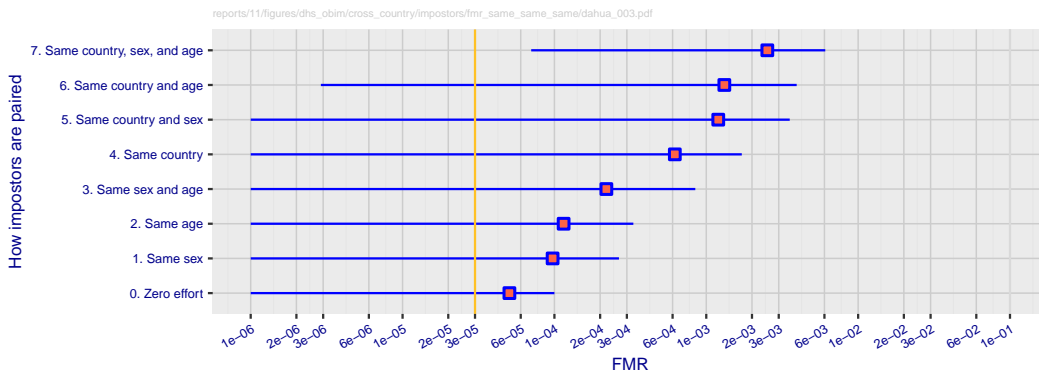


Figure 29: FMR for increasing matched covariates, dahua-003

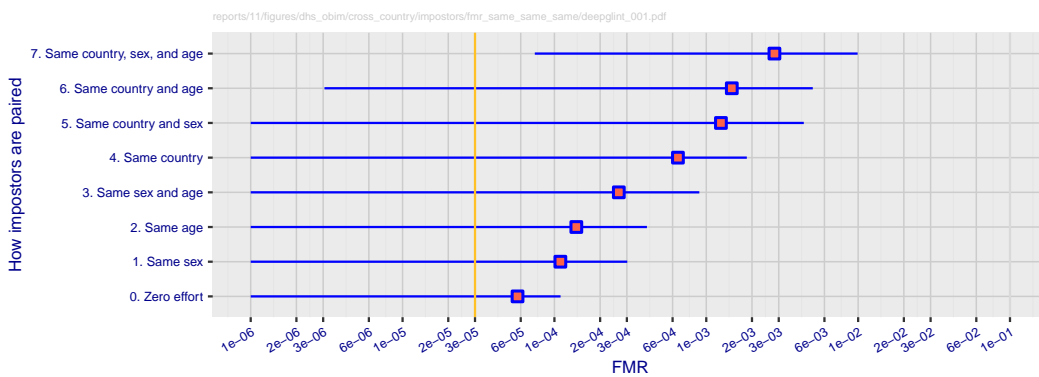


Figure 30: FMR for increasing matched covariates, deepglint-001

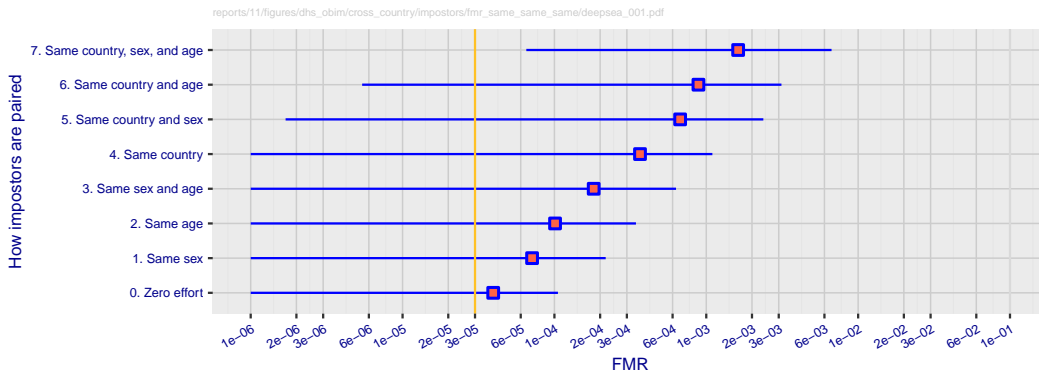


Figure 31: FMR for increasing matched covariates, deepsea-001

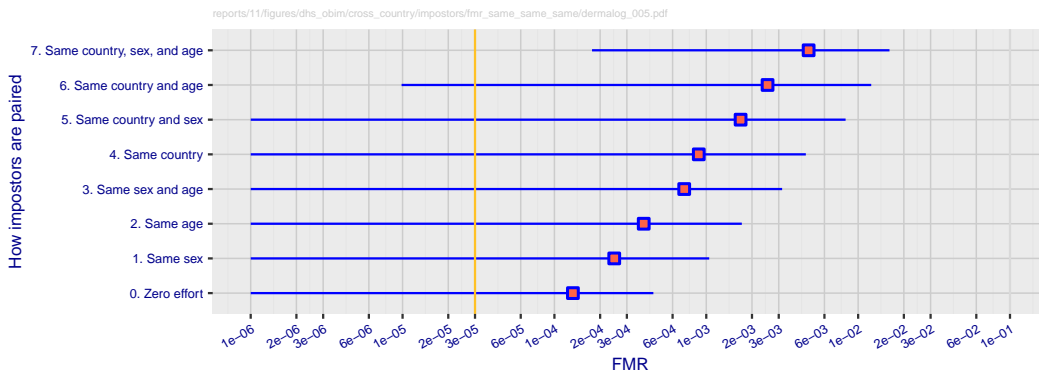


Figure 32: FMR for increasing matched covariates, dermalog-005

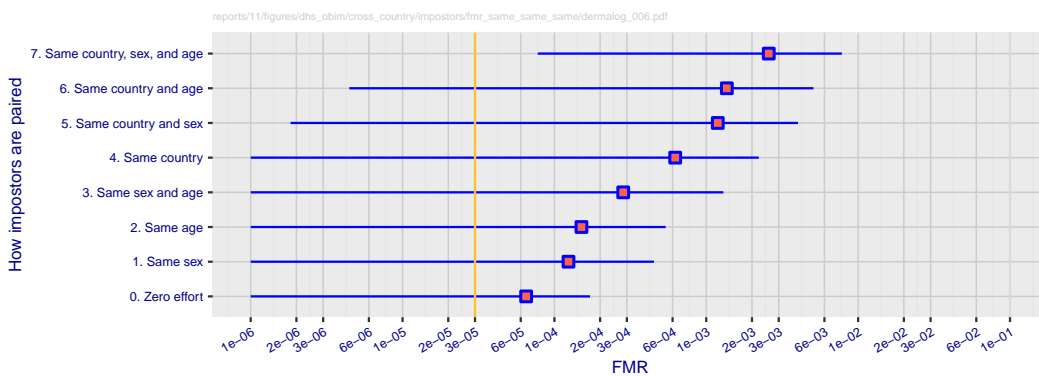


Figure 33: FMR for increasing matched covariates, dermalog-006

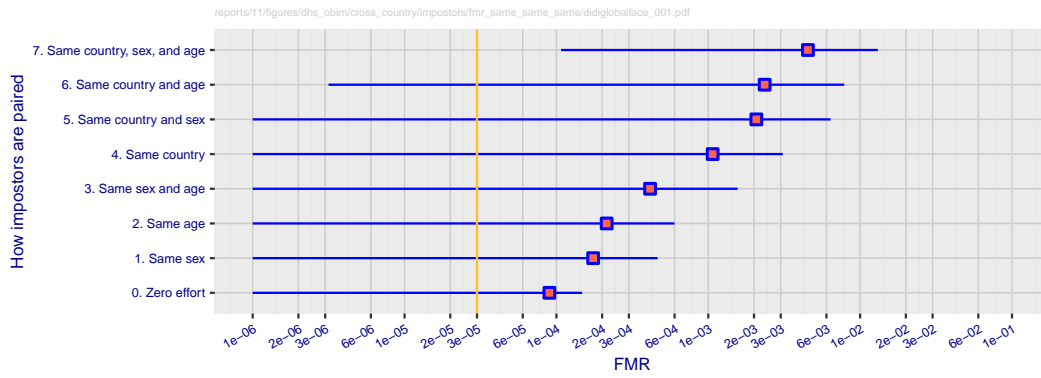


Figure 34: FMR for increasing matched covariates, didiglobalface-001

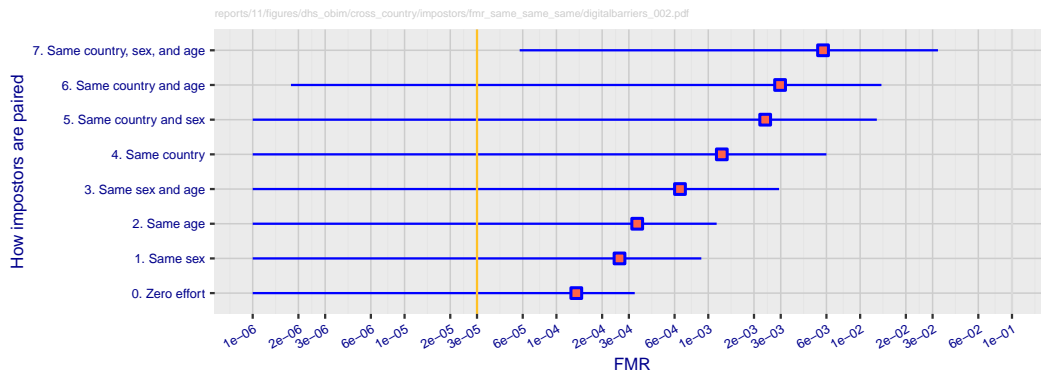


Figure 35: FMR for increasing matched covariates, digitalbarriers-002

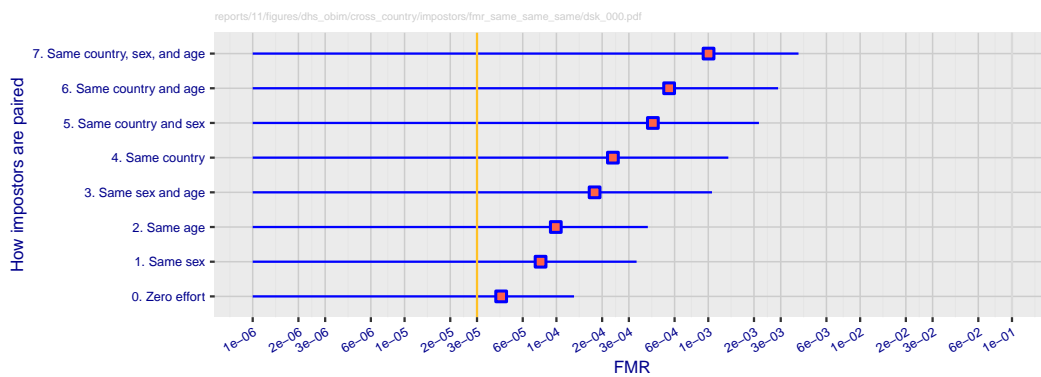


Figure 36: FMR for increasing matched covariates, dsk-000

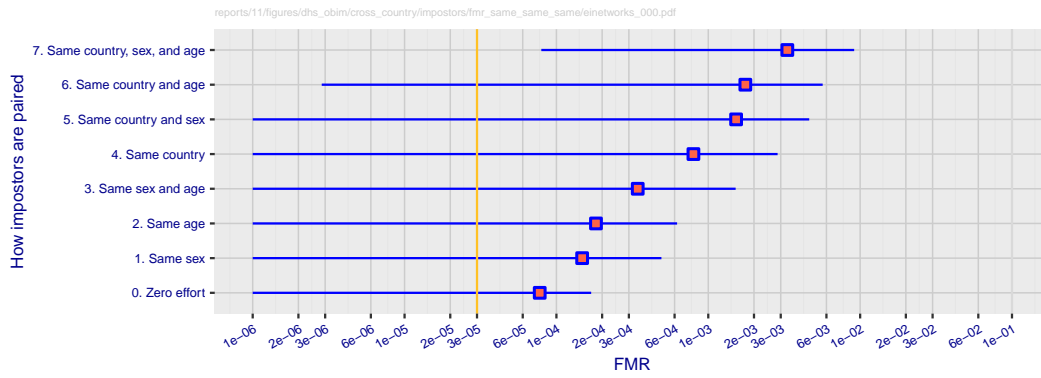


Figure 37: FMR for increasing matched covariates, einetworks-000

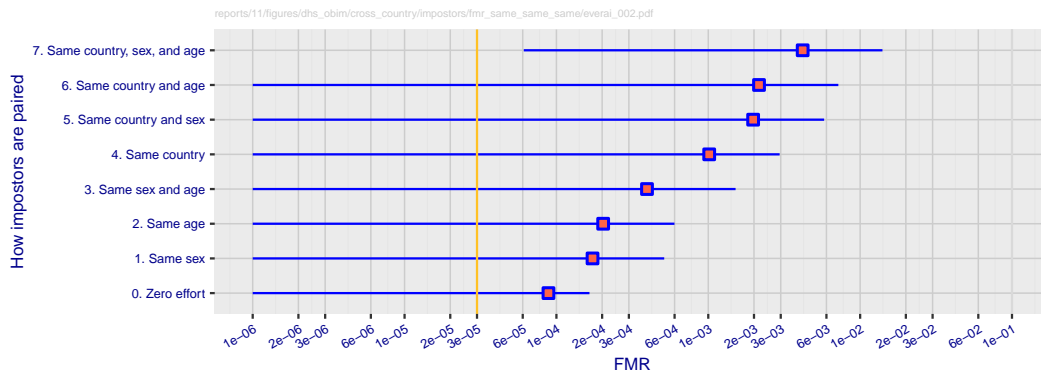


Figure 38: FMR for increasing matched covariates, everai-002

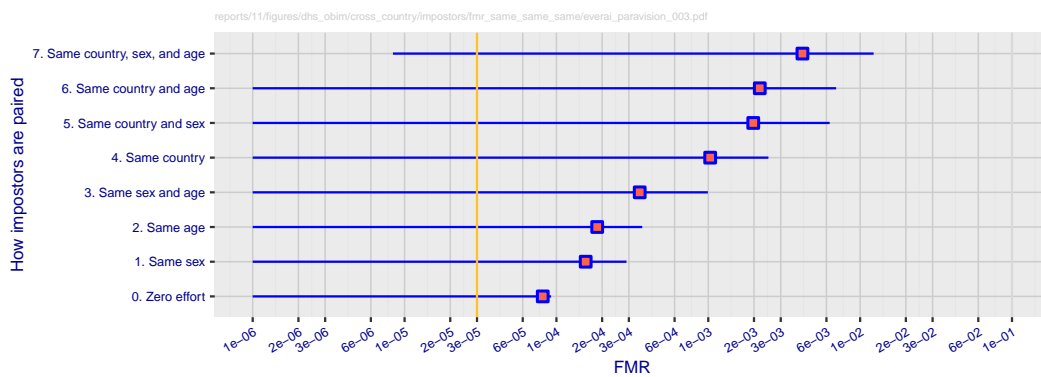


Figure 39: FMR for increasing matched covariates, everai-paravision-003

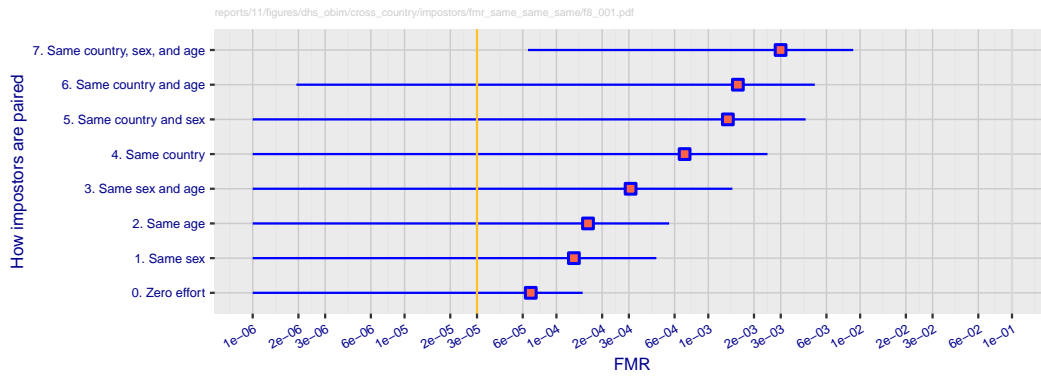


Figure 40: FMR for increasing matched covariates, f8-001

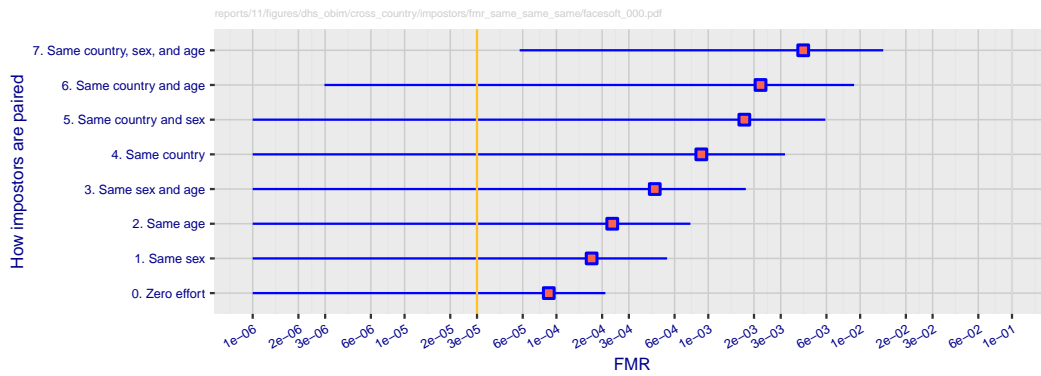


Figure 41: FMR for increasing matched covariates, facesoft-000

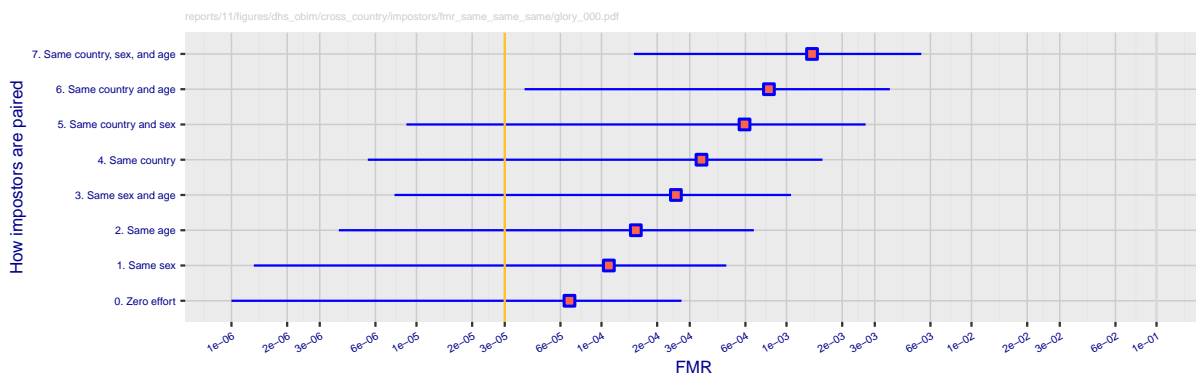


Figure 42: FMR for increasing matched covariates, glory-000

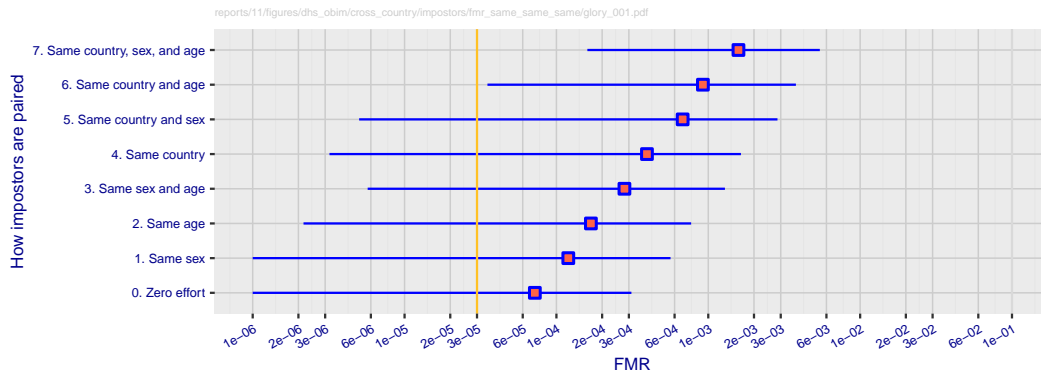


Figure 43: FMR for increasing matched covariates, glory-001

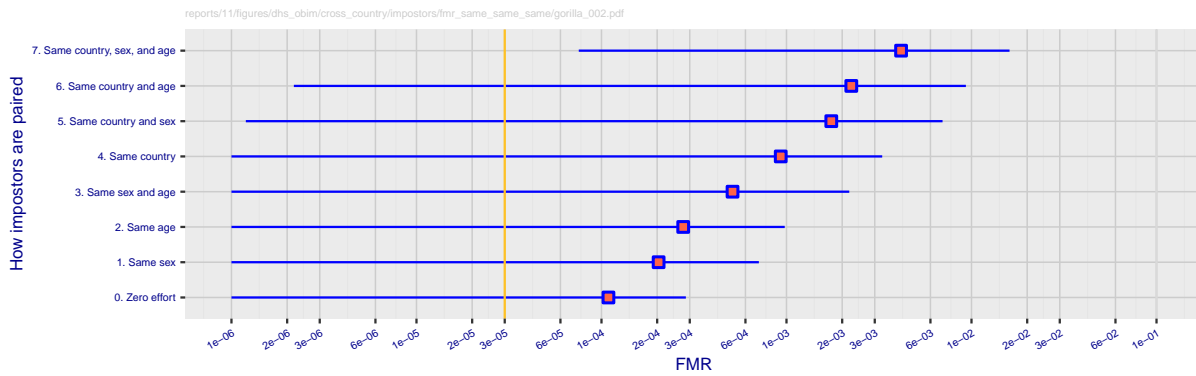


Figure 44: FMR for increasing matched covariates, gorilla-002

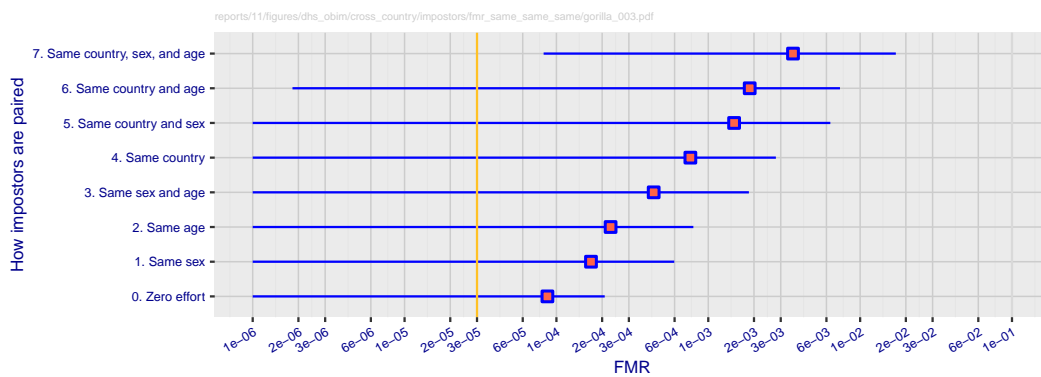


Figure 45: FMR for increasing matched covariates, gorilla-003

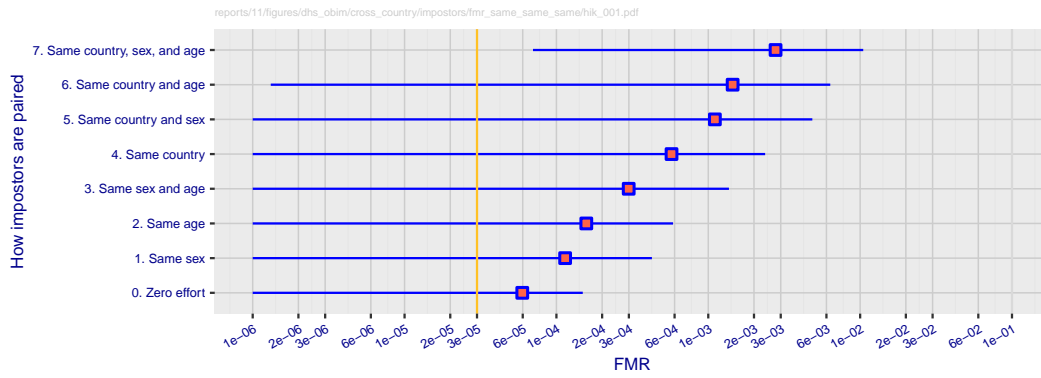


Figure 46: FMR for increasing matched covariates, hik-001

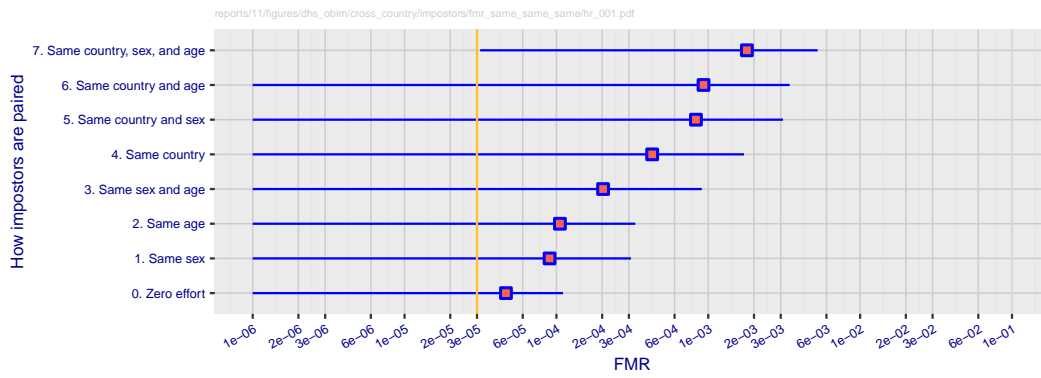


Figure 47: FMR for increasing matched covariates, hr-001

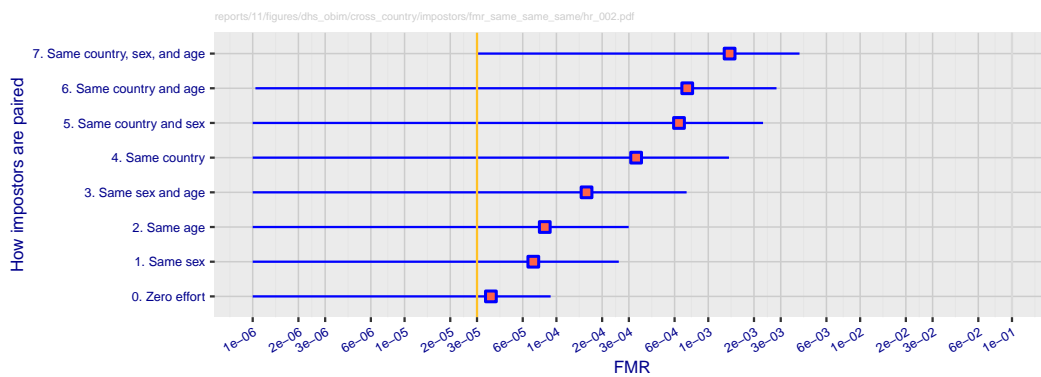


Figure 48: FMR for increasing matched covariates, hr-002

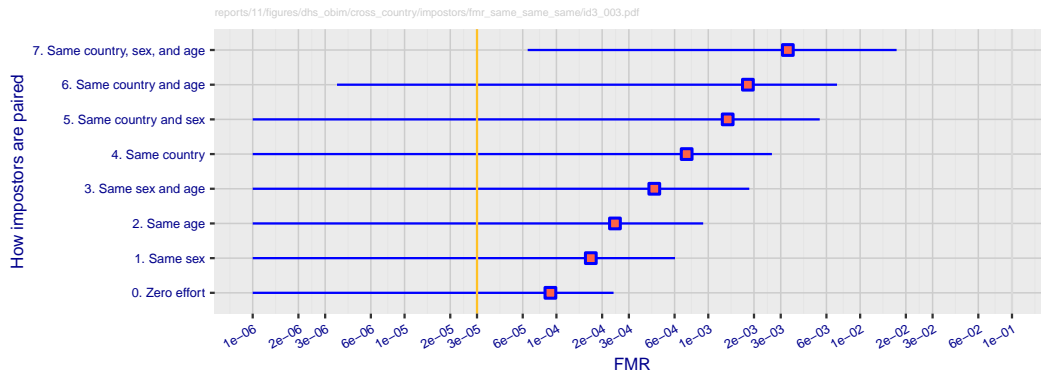


Figure 49: FMR for increasing matched covariates, id3-003

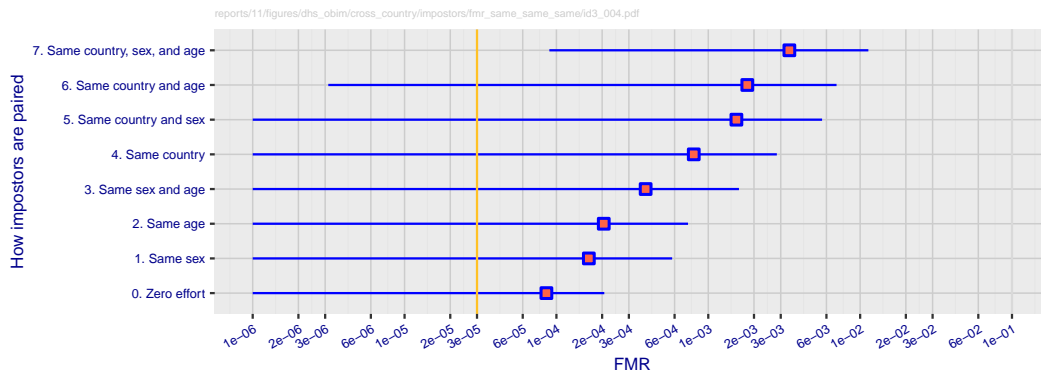


Figure 50: FMR for increasing matched covariates, id3-004

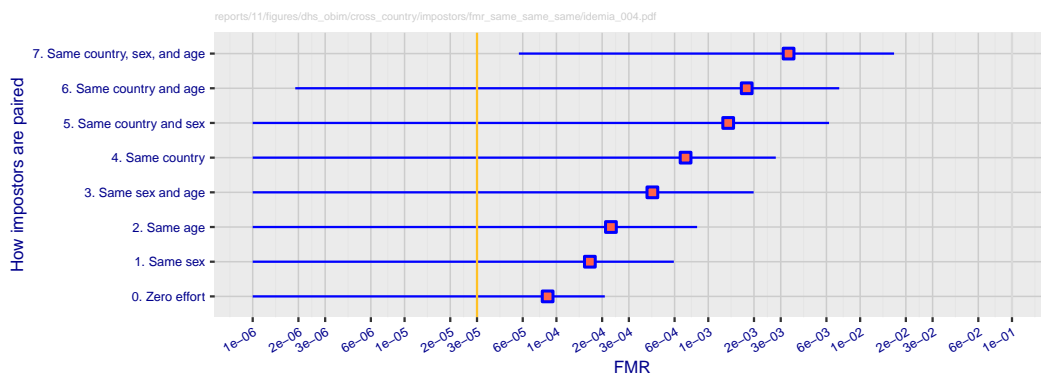


Figure 51: FMR for increasing matched covariates, idemia-004

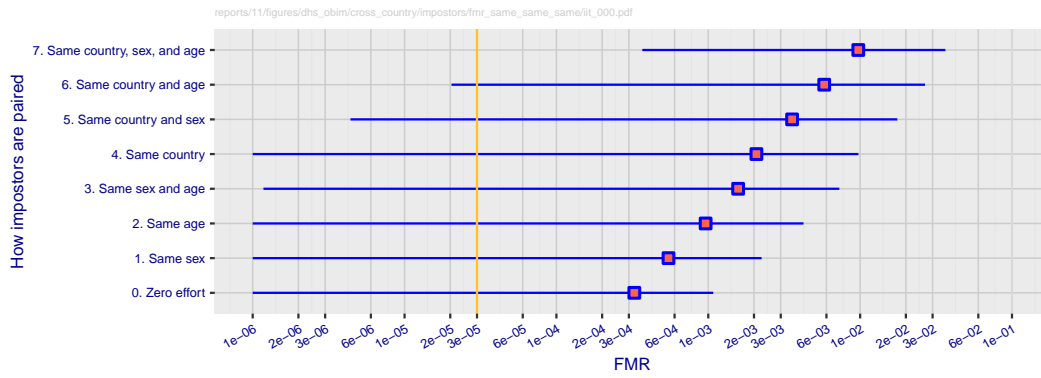


Figure 52: FMR for increasing matched covariates, iit-000

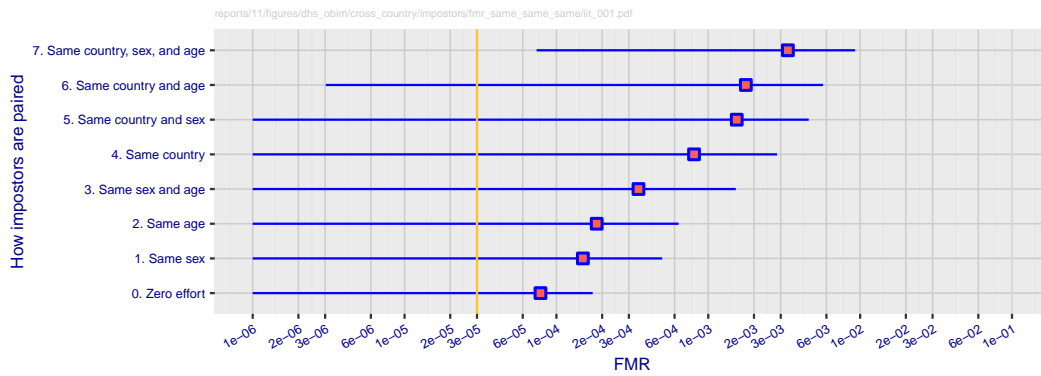


Figure 53: FMR for increasing matched covariates, iit-001

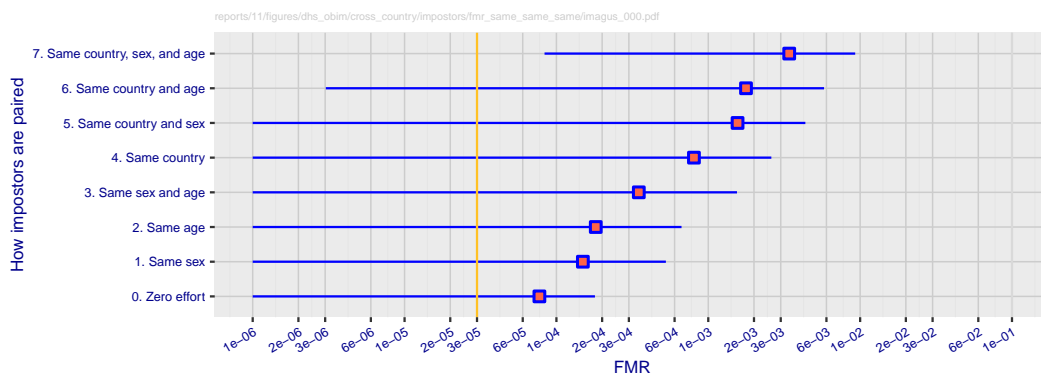


Figure 54: FMR for increasing matched covariates, imagus-000

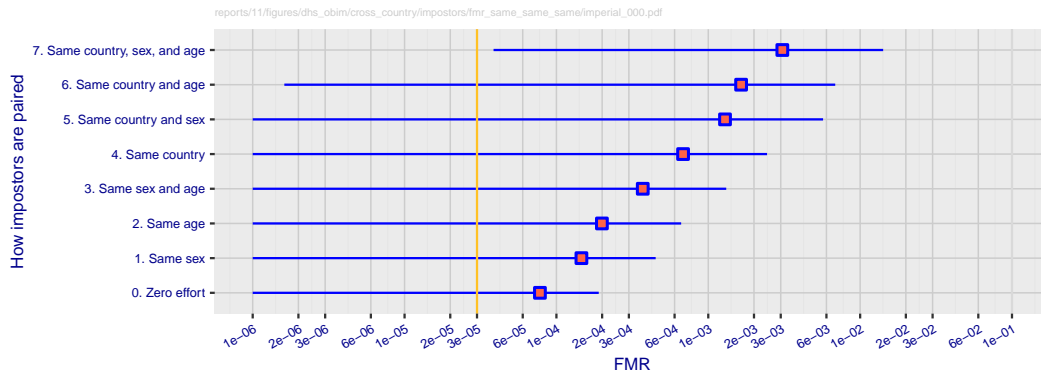


Figure 55: FMR for increasing matched covariates, imperial-000

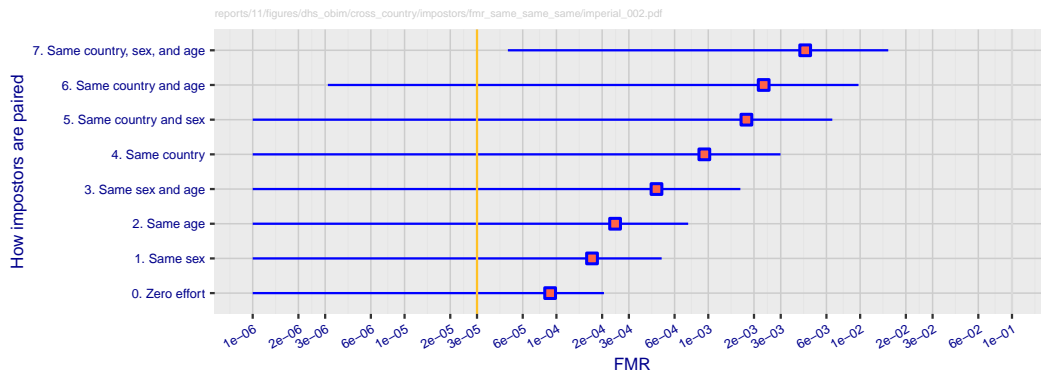


Figure 56: FMR for increasing matched covariates, imperial-002

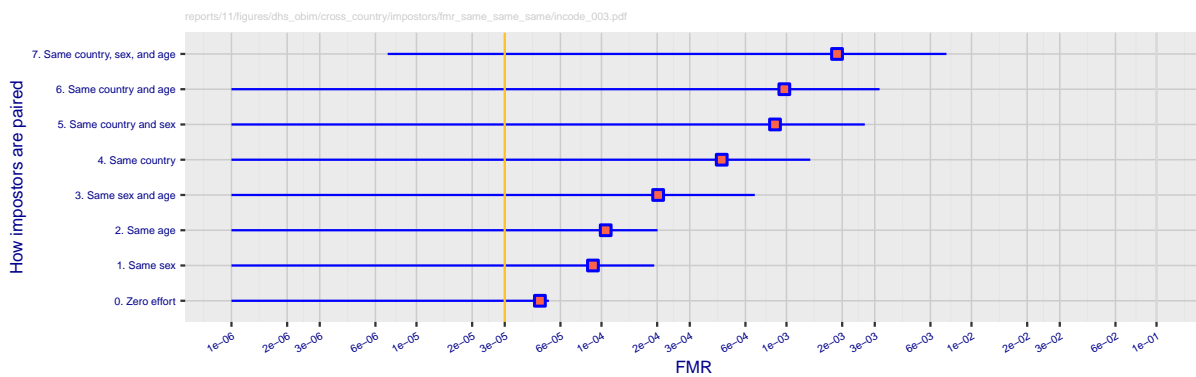


Figure 57: FMR for increasing matched covariates, incode-003

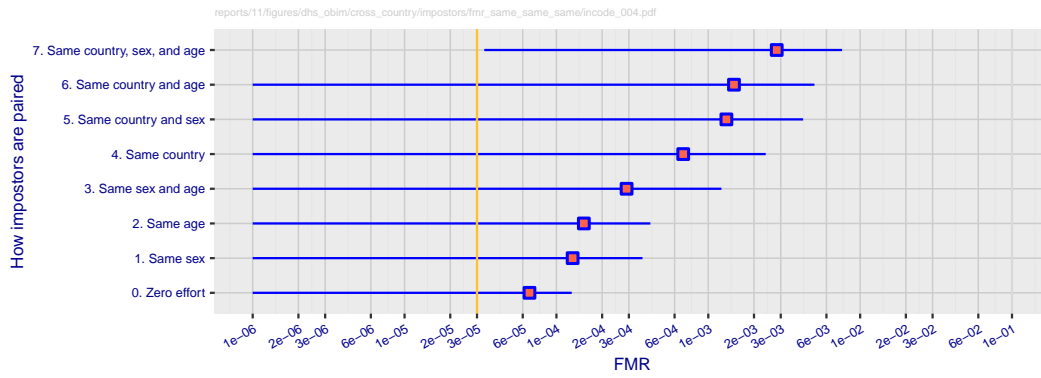


Figure 58: FMR for increasing matched covariates, incode-004

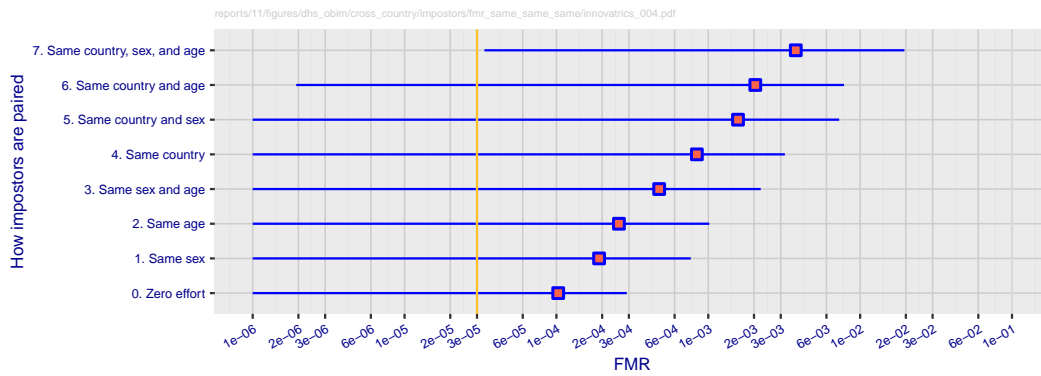


Figure 59: FMR for increasing matched covariates, innovatrics-004

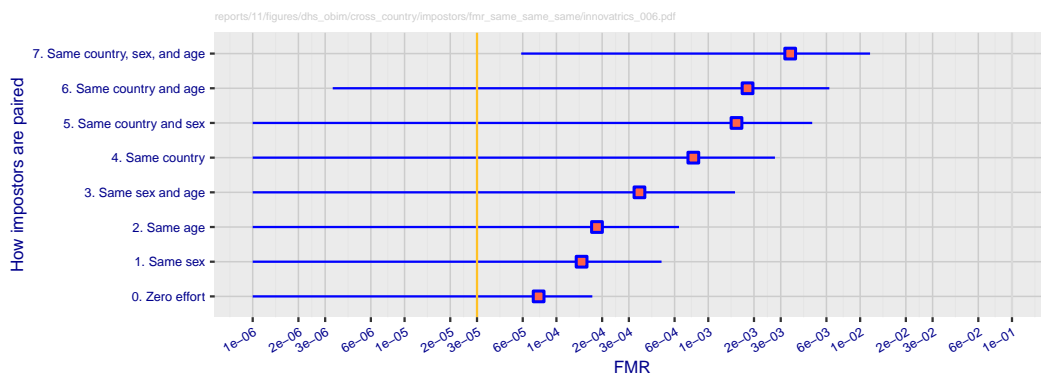


Figure 60: FMR for increasing matched covariates, innovatrics-006

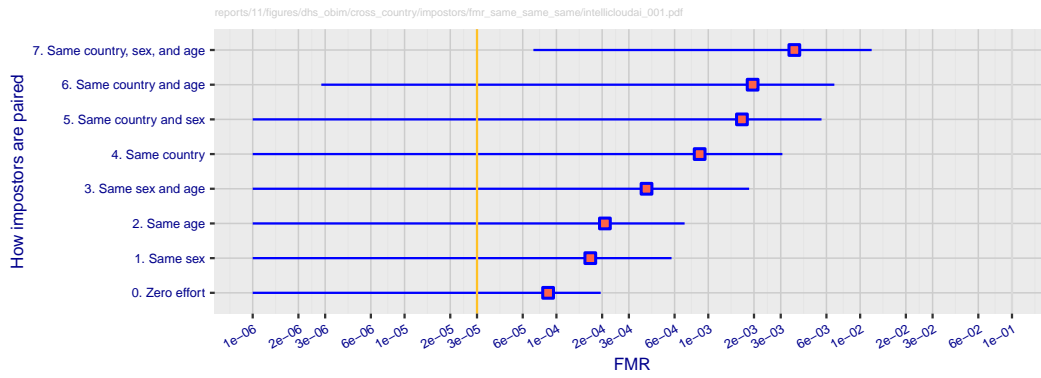


Figure 61: FMR for increasing matched covariates, intellicloudai-001

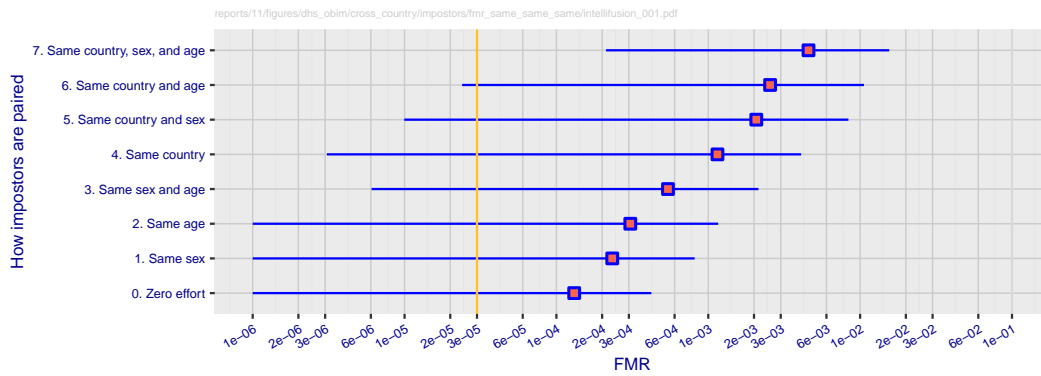


Figure 62: FMR for increasing matched covariates, intellifusion-001

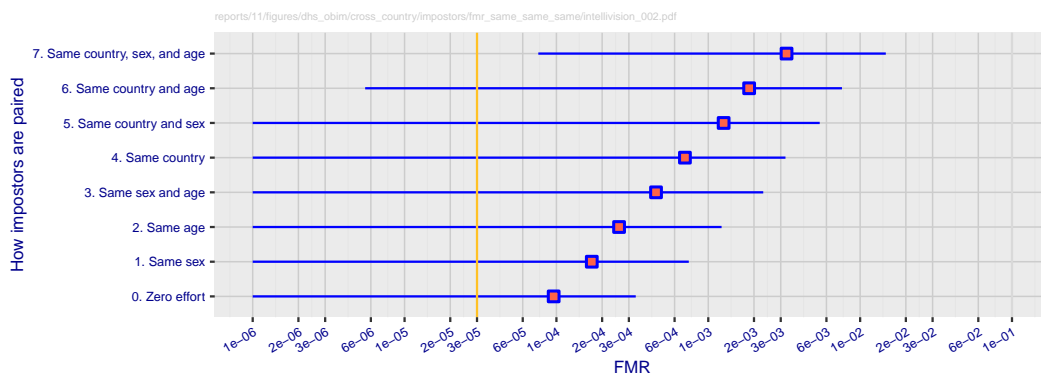


Figure 63: FMR for increasing matched covariates, intellivision-002

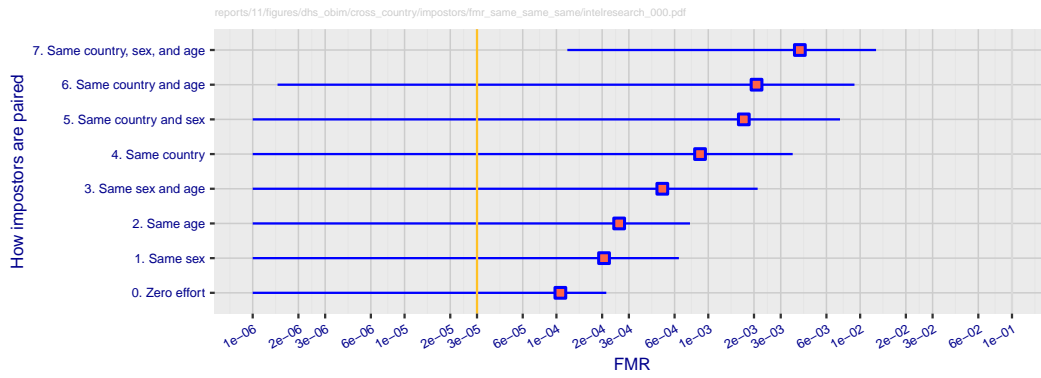


Figure 64: FMR for increasing matched covariates, intelresearch-000

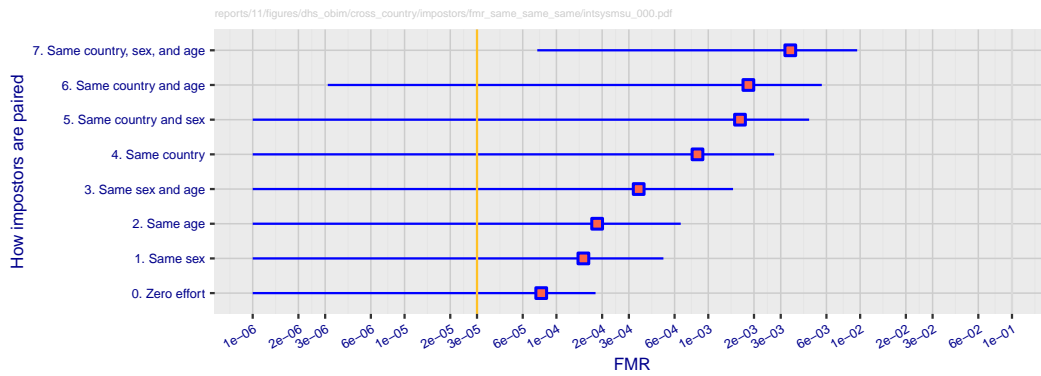


Figure 65: FMR for increasing matched covariates, intsysmsu-000

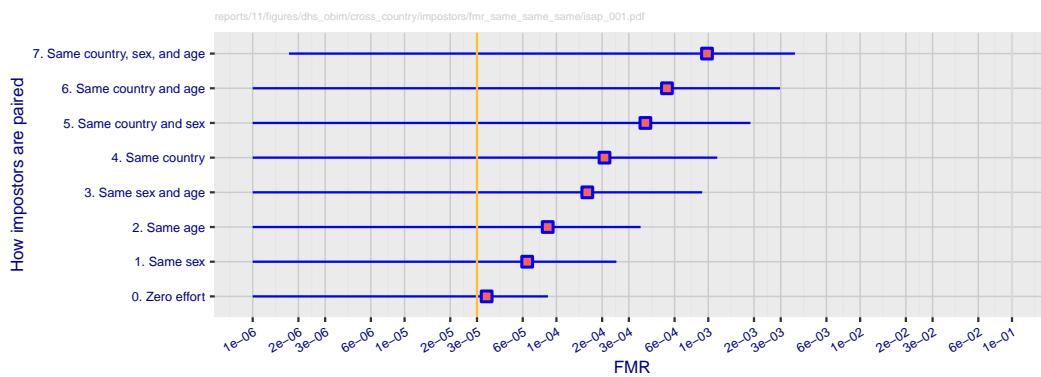


Figure 66: FMR for increasing matched covariates, isap-001

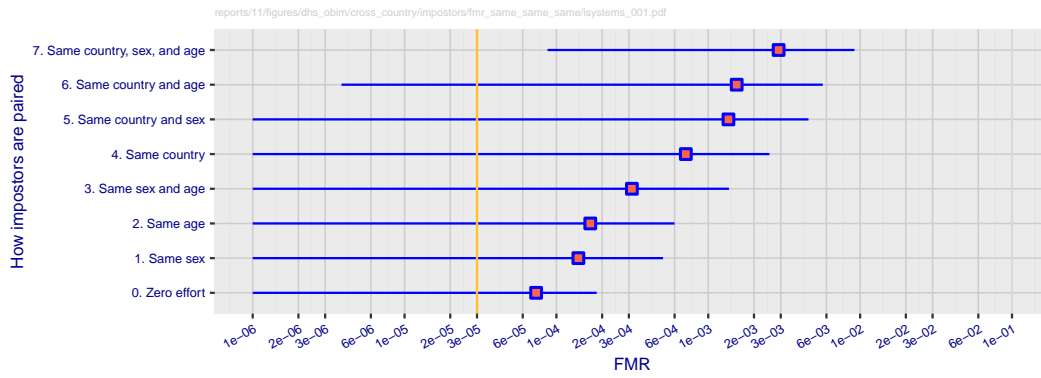


Figure 67: FMR for increasing matched covariates, isystems-001

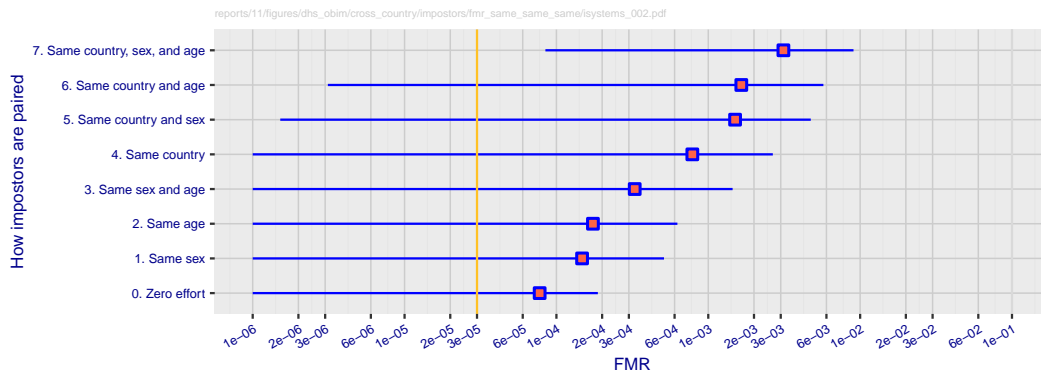


Figure 68: FMR for increasing matched covariates, isystems-002

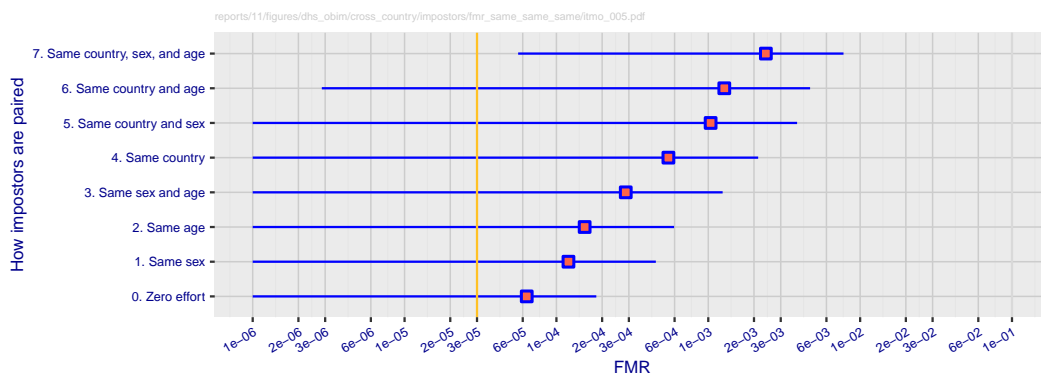


Figure 69: FMR for increasing matched covariates, itmo-005

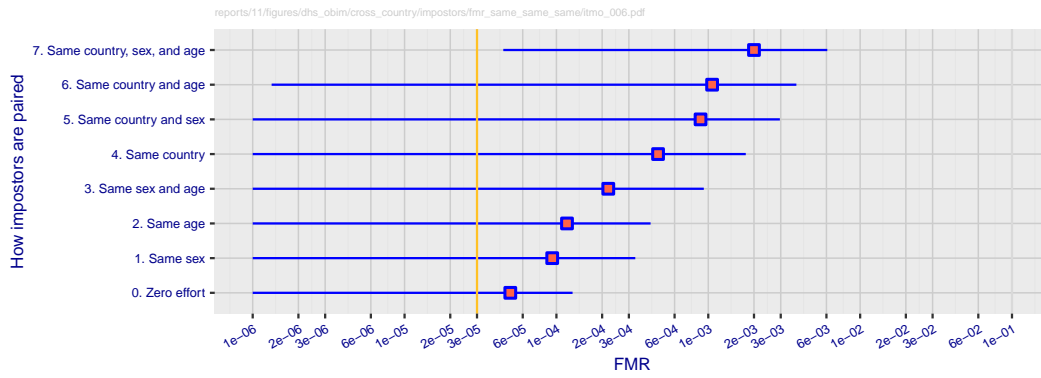


Figure 70: FMR for increasing matched covariates, itmo-006

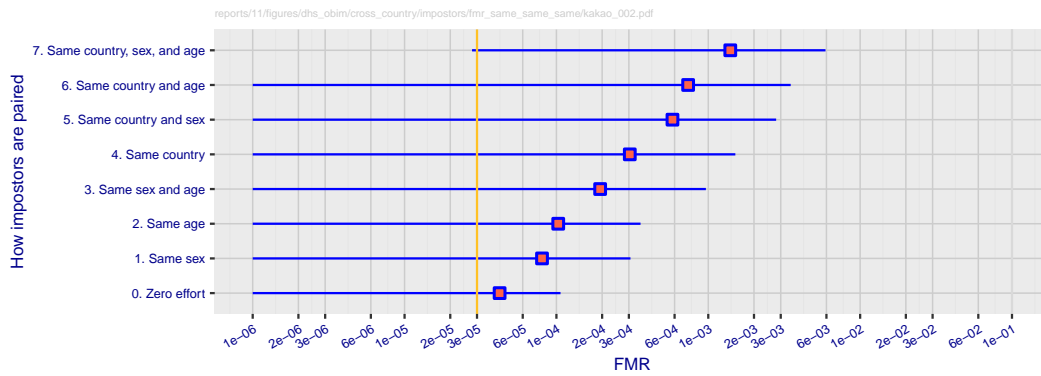


Figure 71: FMR for increasing matched covariates, kakao-002

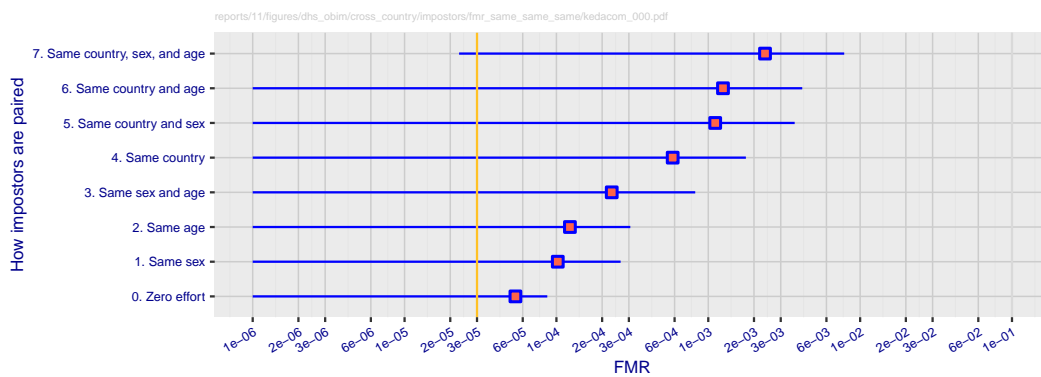


Figure 72: FMR for increasing matched covariates, kedacom-000

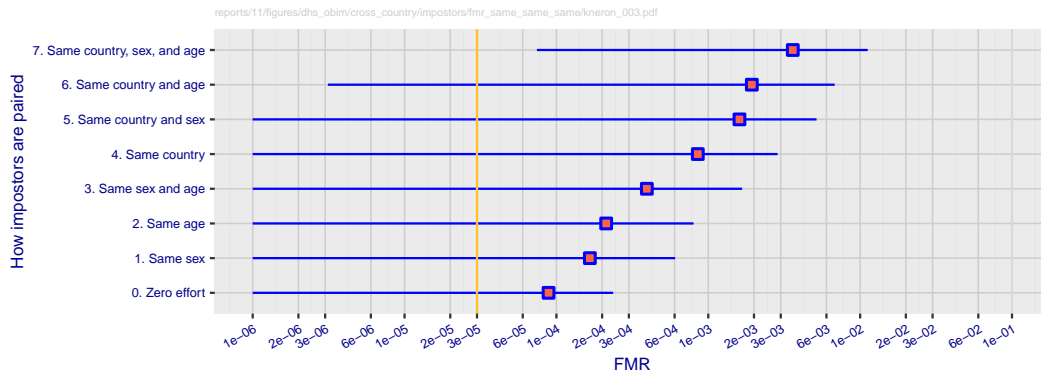


Figure 73: FMR for increasing matched covariates, kneron-003

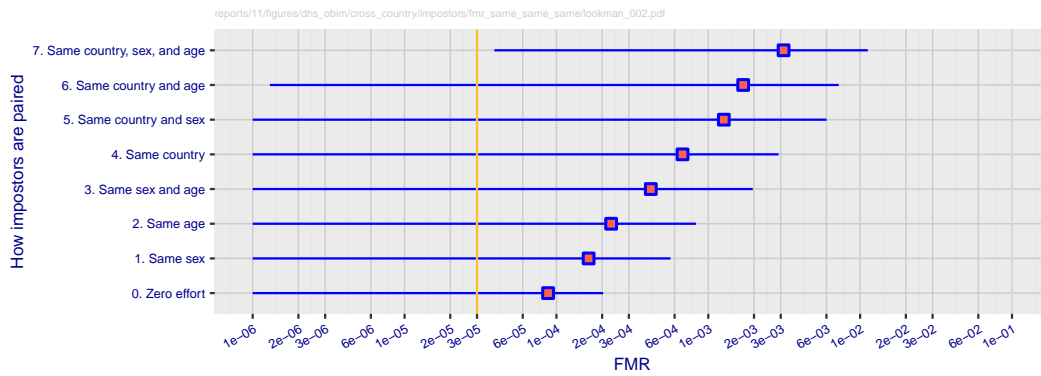


Figure 74: FMR for increasing matched covariates, lookman-002

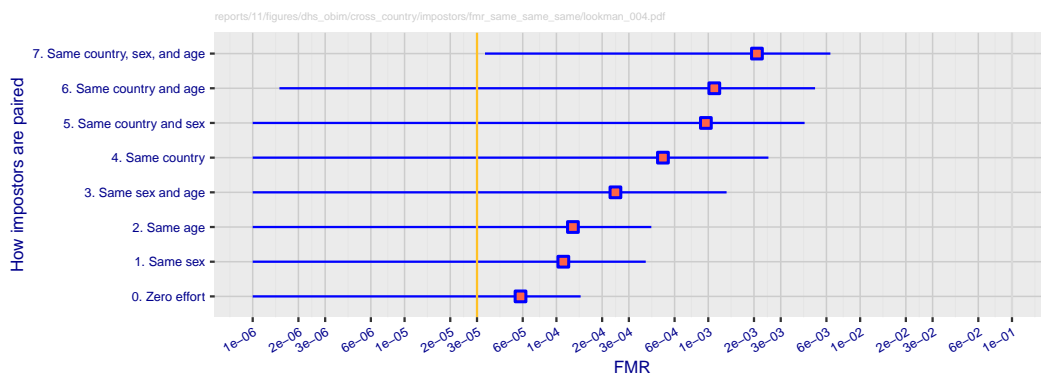


Figure 75: FMR for increasing matched covariates, lookman-004

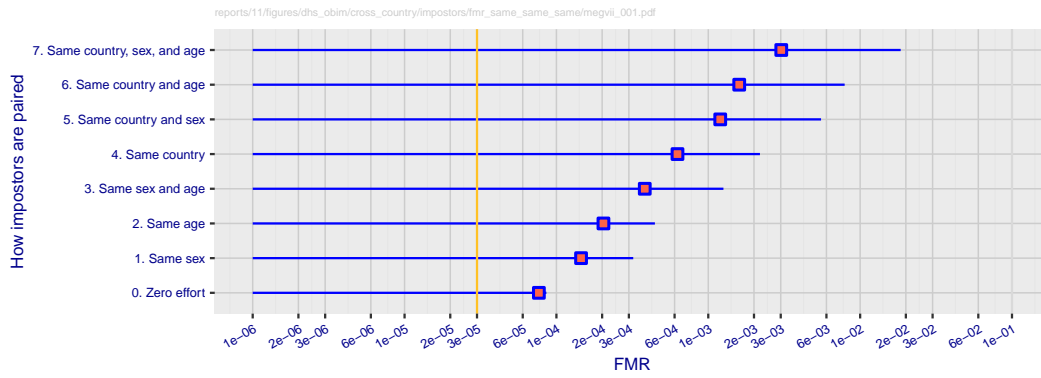


Figure 76: FMR for increasing matched covariates, megvii-001

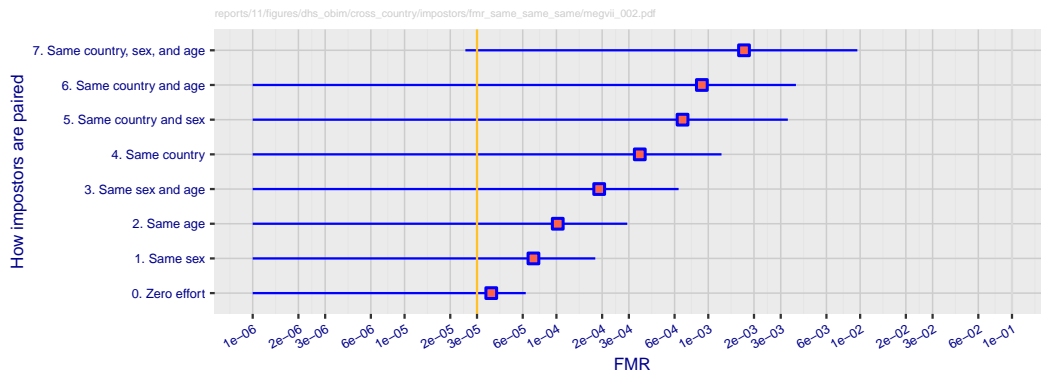


Figure 77: FMR for increasing matched covariates, megvii-002

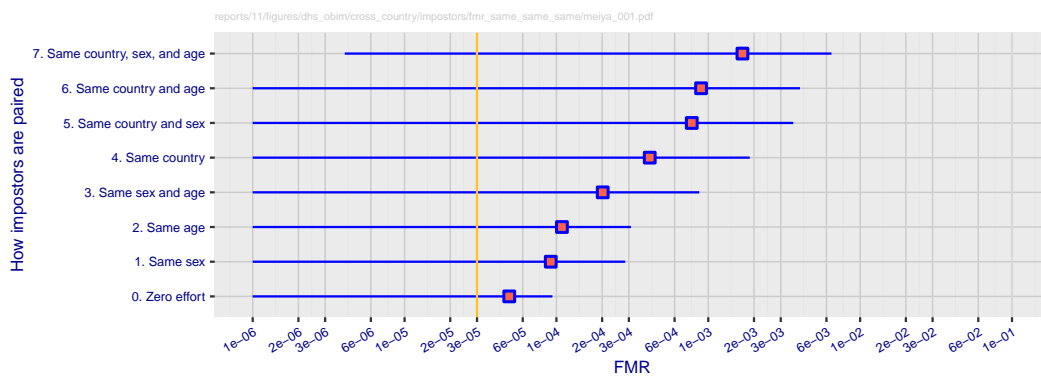


Figure 78: FMR for increasing matched covariates, meiya-001

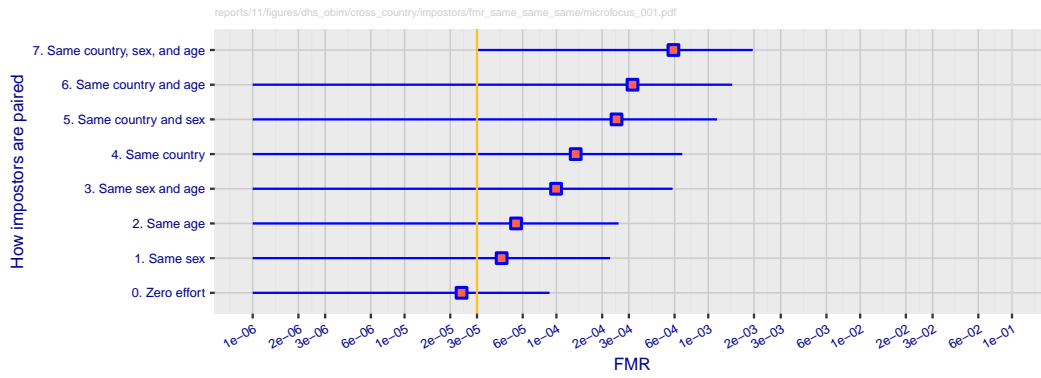


Figure 79: FMR for increasing matched covariates, microfocus-001

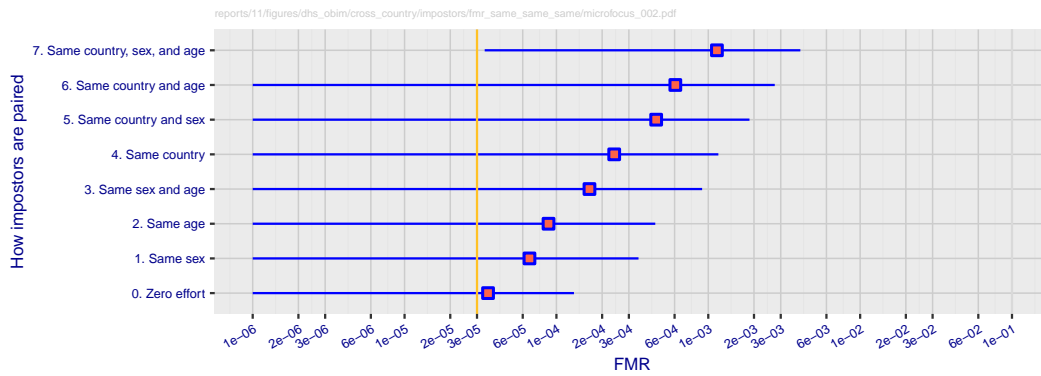


Figure 80: FMR for increasing matched covariates, microfocus-002

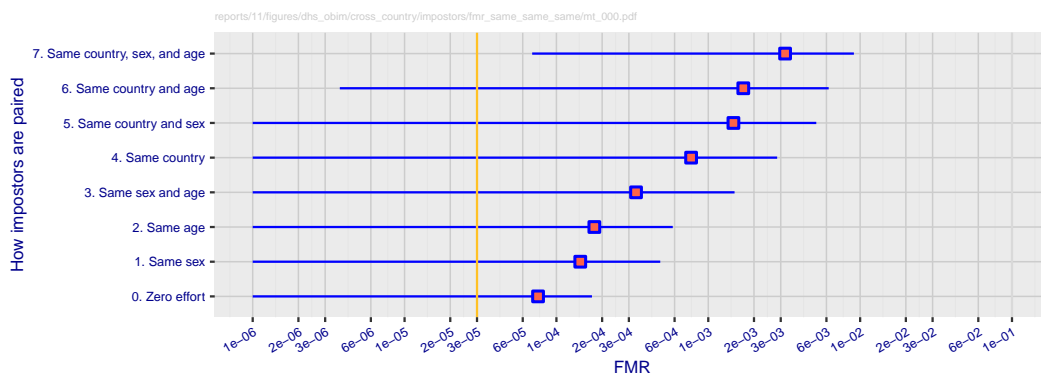


Figure 81: FMR for increasing matched covariates, mt-000

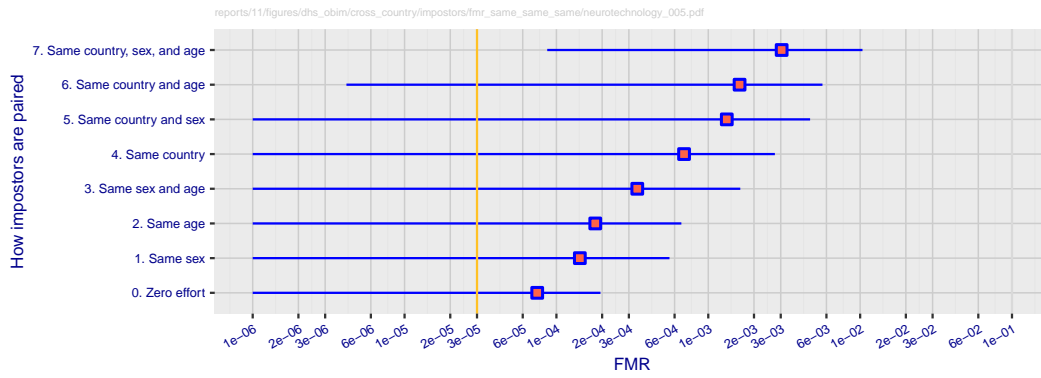


Figure 82: FMR for increasing matched covariates, neurotechnology-005

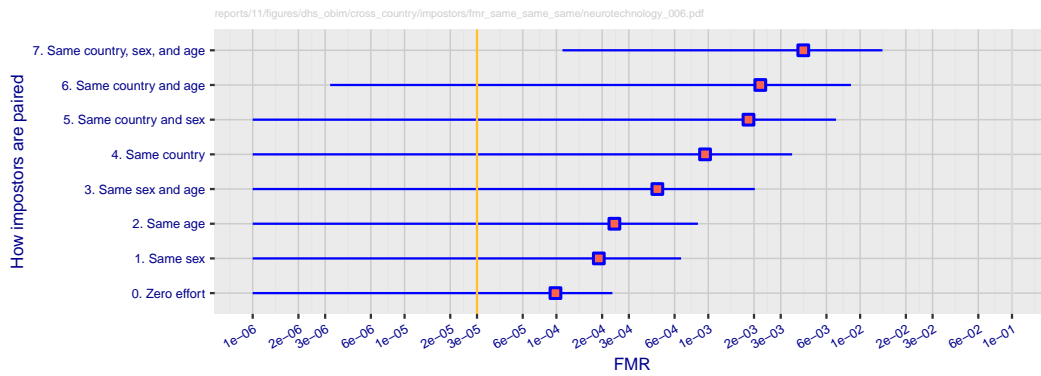


Figure 83: FMR for increasing matched covariates, neurotechnology-006

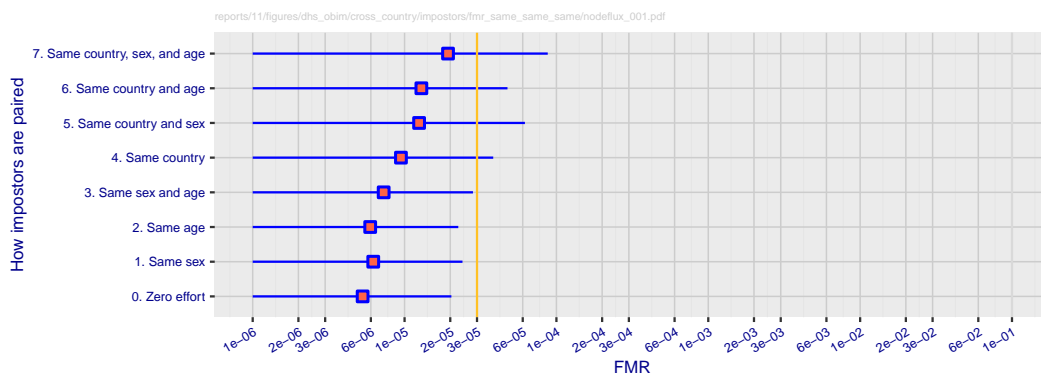


Figure 84: FMR for increasing matched covariates, nodeflux-001

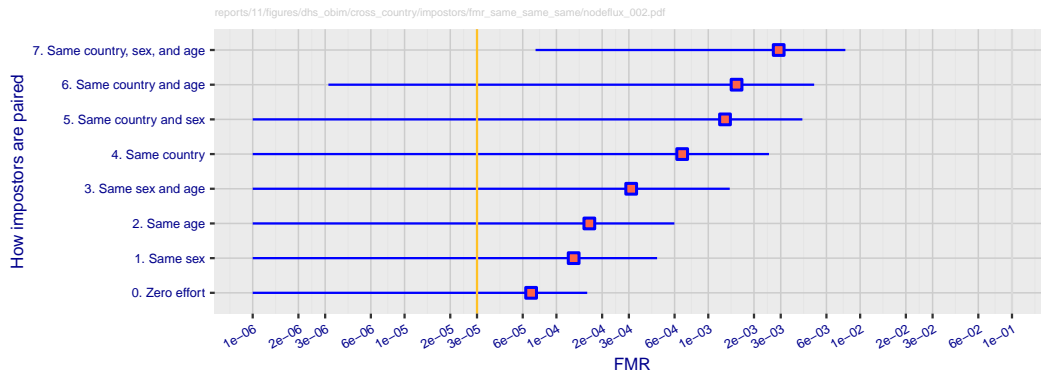


Figure 85: FMR for increasing matched covariates, nodeflux-002

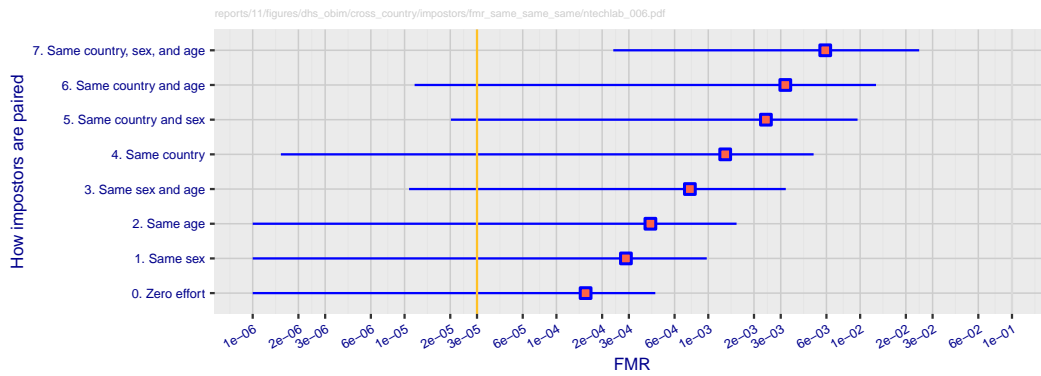


Figure 86: FMR for increasing matched covariates, ntechlab-006

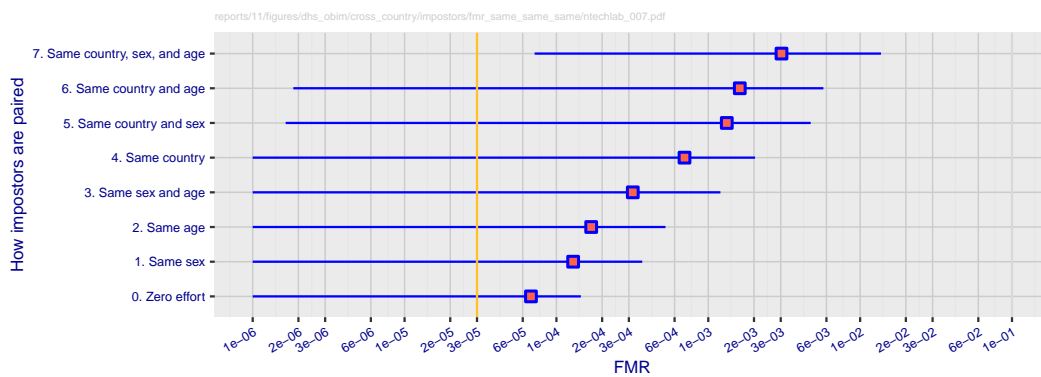


Figure 87: FMR for increasing matched covariates, ntechlab-007

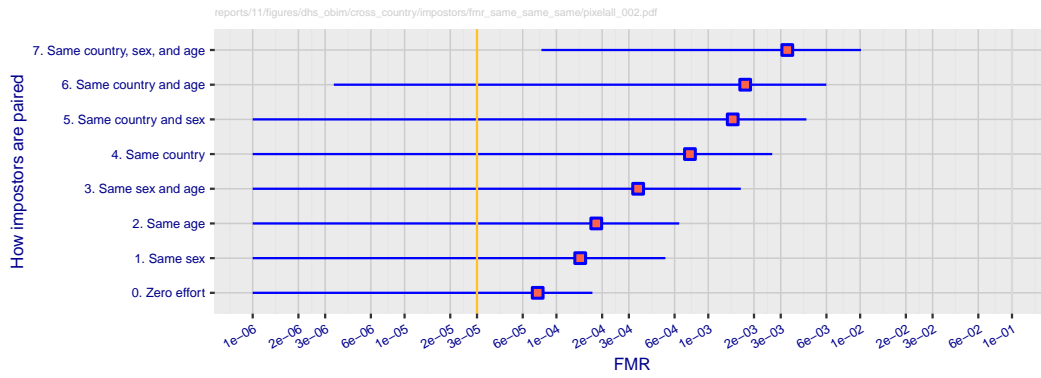


Figure 88: FMR for increasing matched covariates, pixelall-002

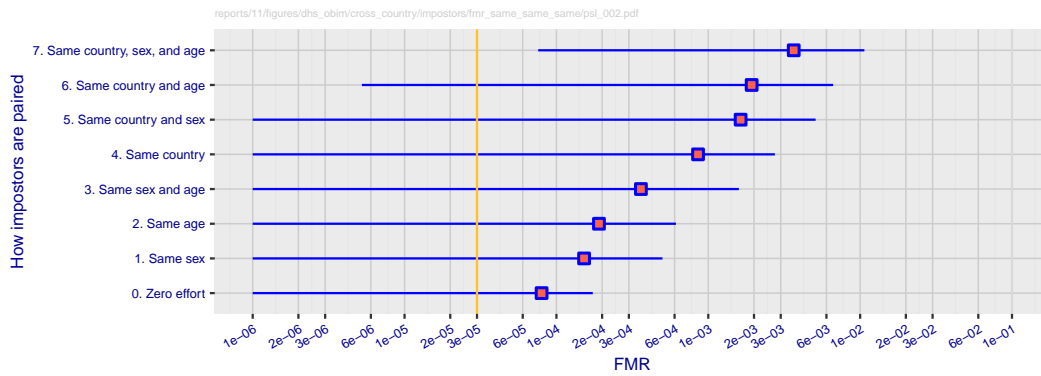


Figure 89: FMR for increasing matched covariates, psl-002

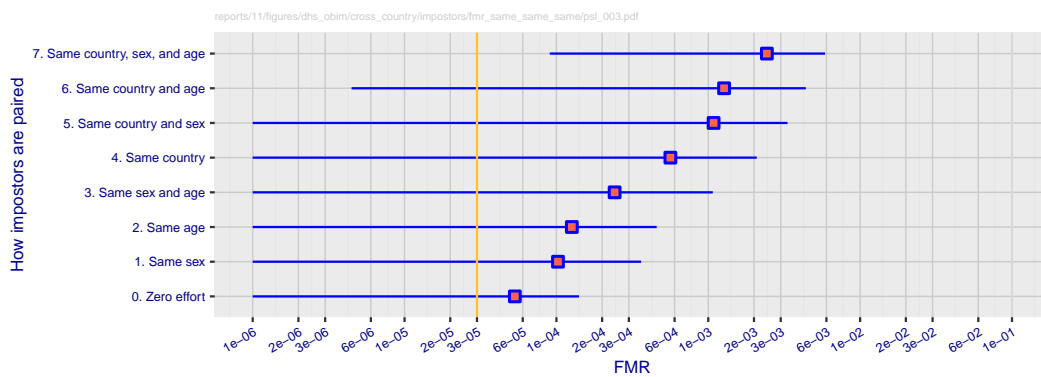


Figure 90: FMR for increasing matched covariates, psl-003

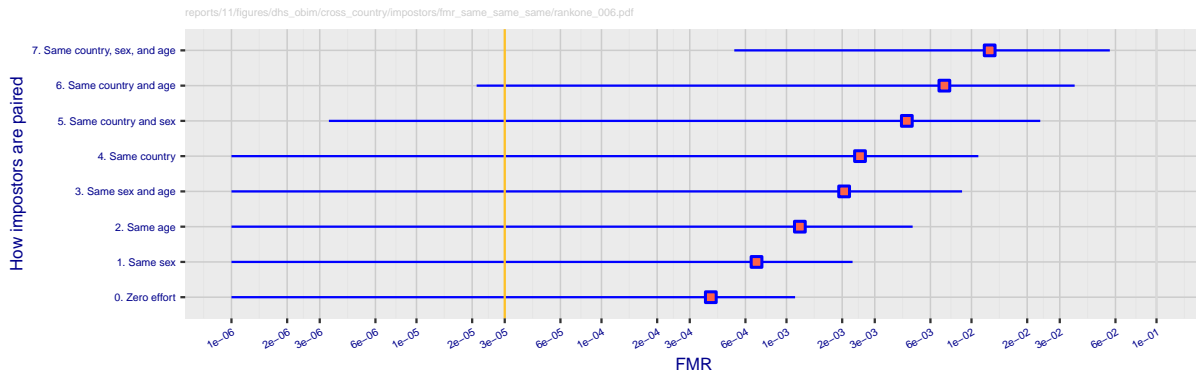


Figure 91: FMR for increasing matched covariates, rankone-006

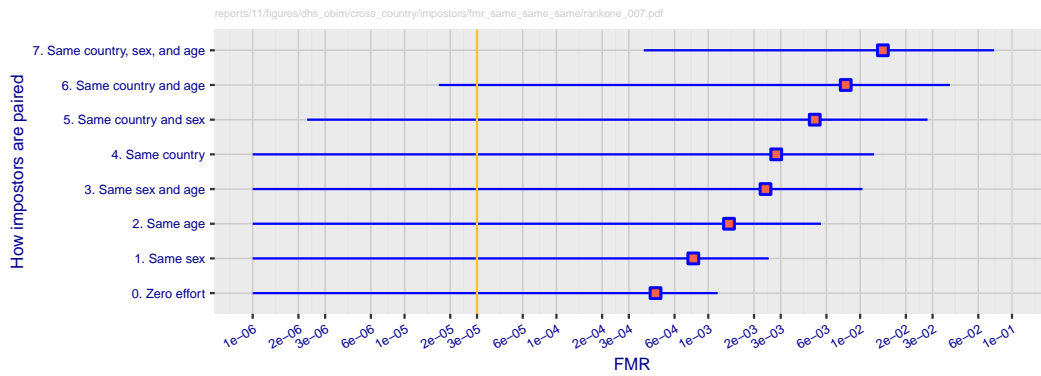


Figure 92: FMR for increasing matched covariates, rankone-007

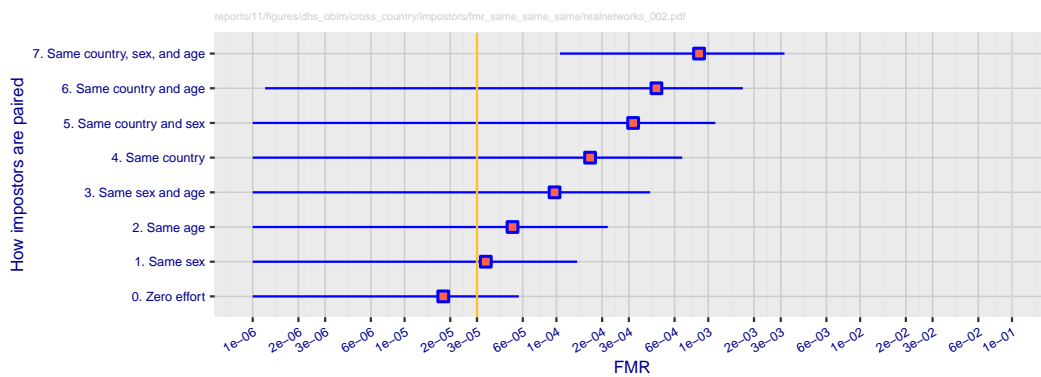


Figure 93: FMR for increasing matched covariates, realnetworks-002

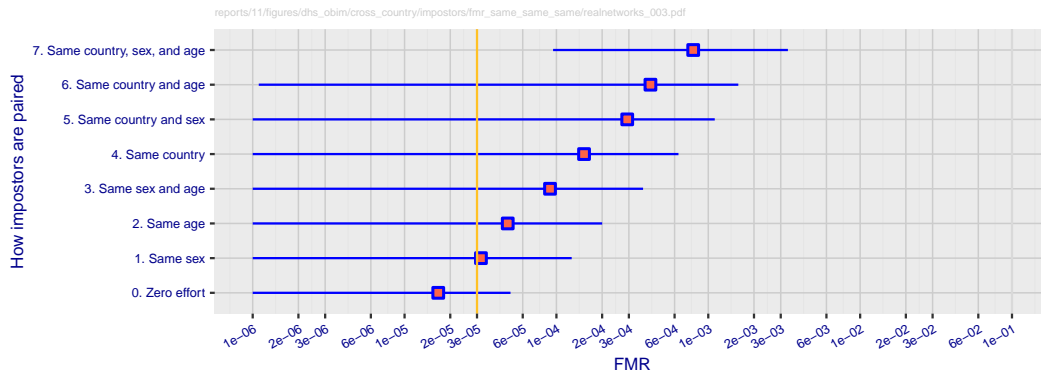


Figure 94: FMR for increasing matched covariates, realnetworks-003

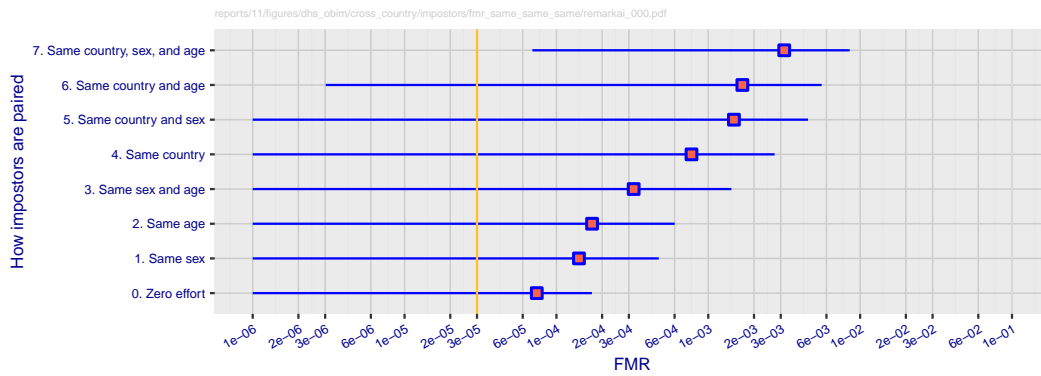


Figure 95: FMR for increasing matched covariates, remarkai-000

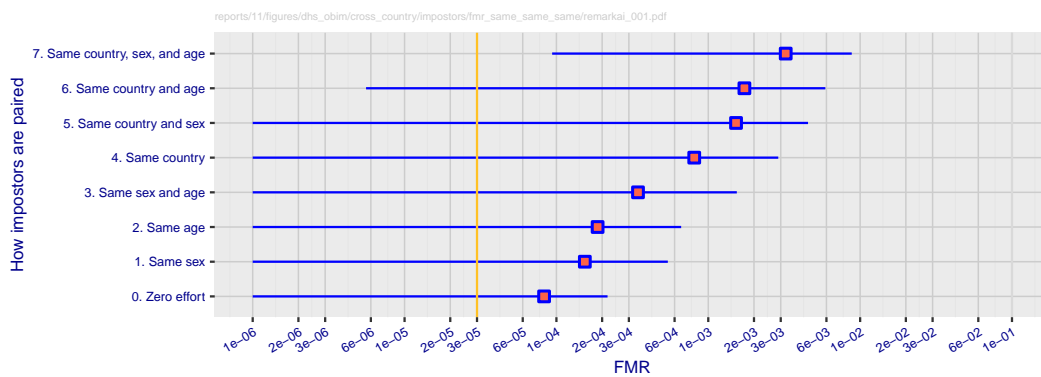


Figure 96: FMR for increasing matched covariates, remarkai-001

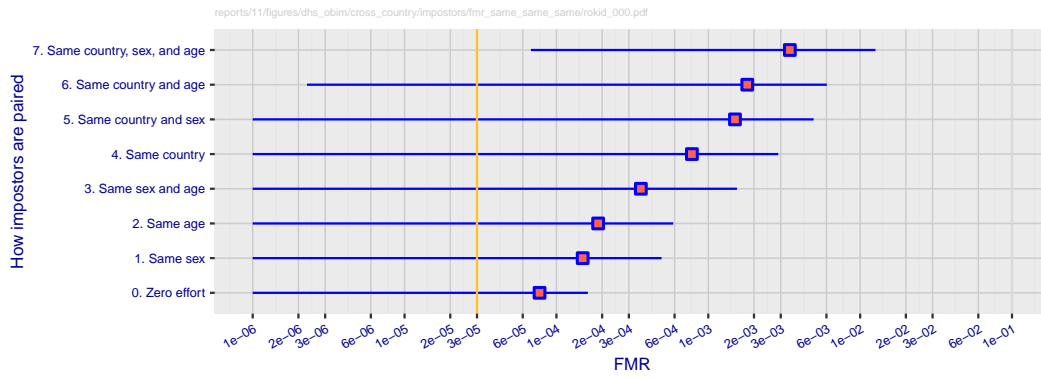


Figure 97: FMR for increasing matched covariates, rokid-000

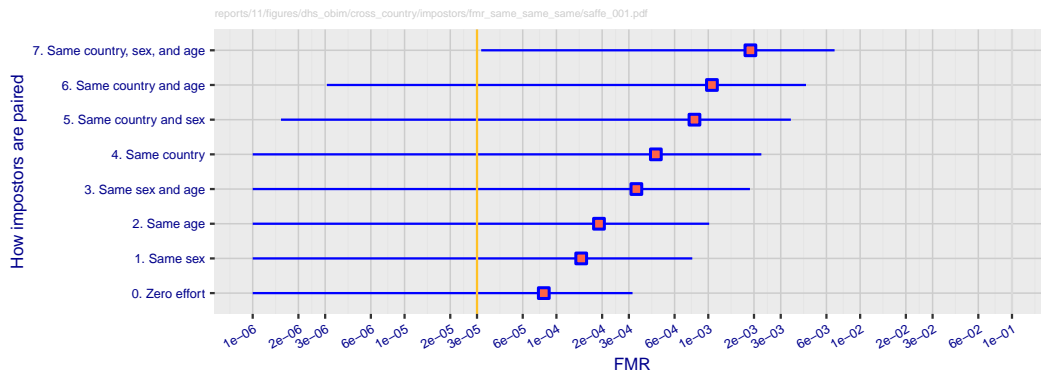


Figure 98: FMR for increasing matched covariates, saffe-001

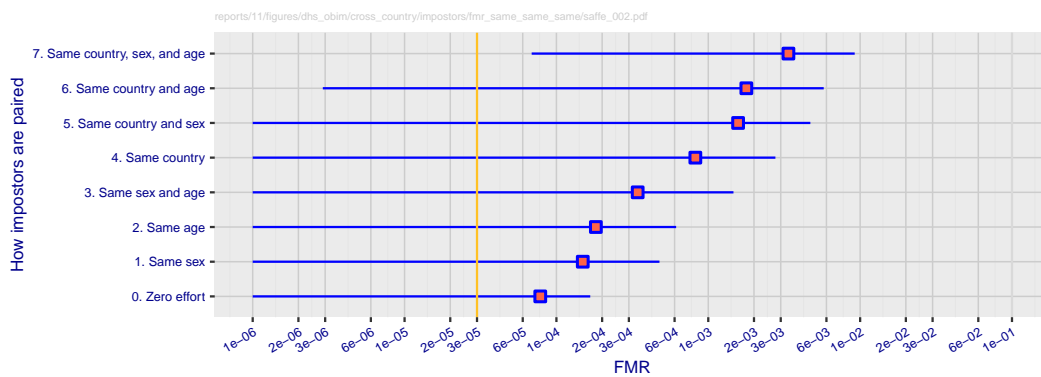


Figure 99: FMR for increasing matched covariates, saffe-002

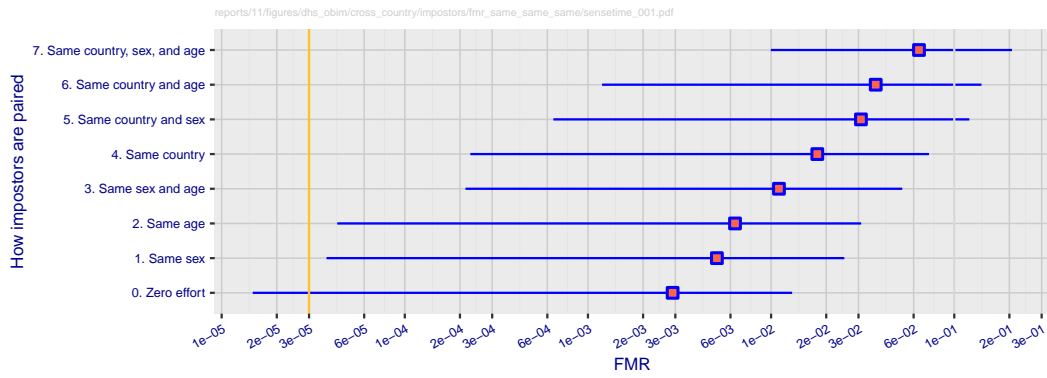


Figure 100: FMR for increasing matched covariates, sensetime-001

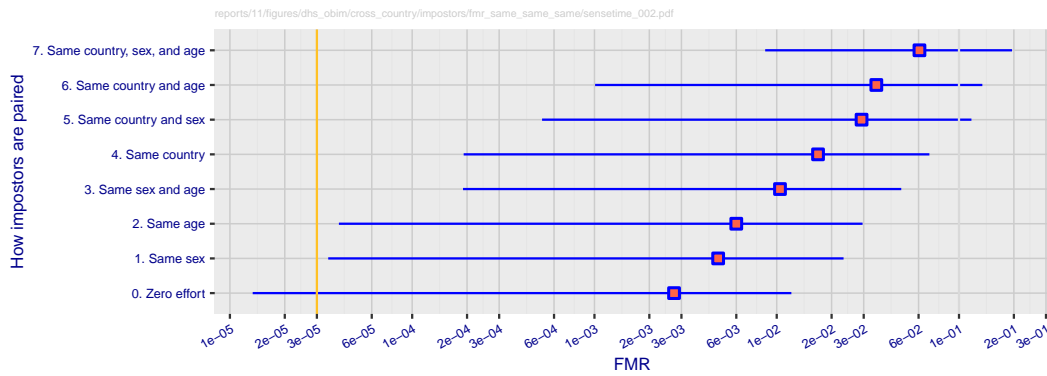


Figure 101: FMR for increasing matched covariates, sensetime-002

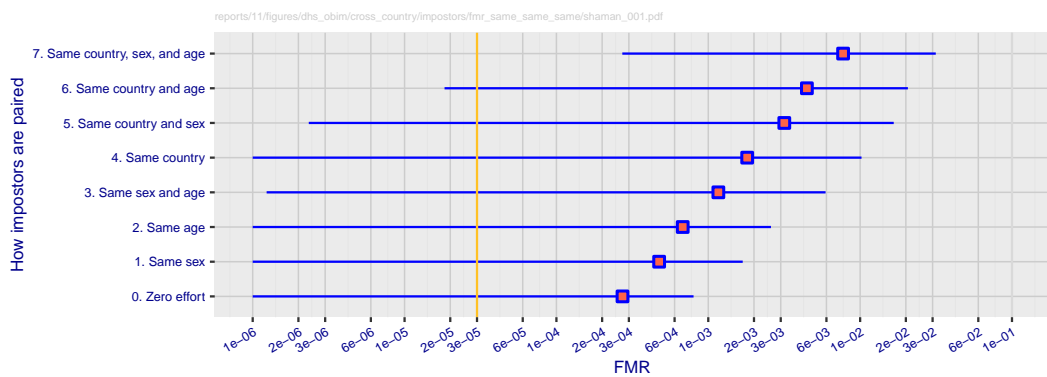


Figure 102: FMR for increasing matched covariates, shaman-001

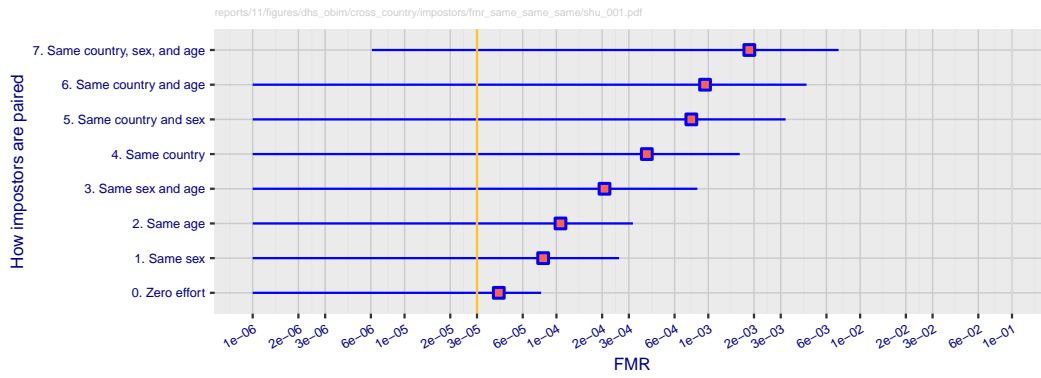


Figure 103: FMR for increasing matched covariates, shu-001

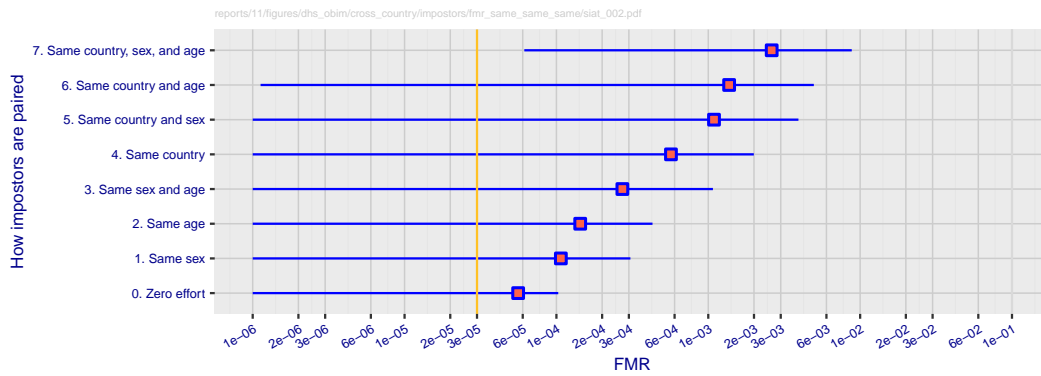


Figure 104: FMR for increasing matched covariates, siat-002

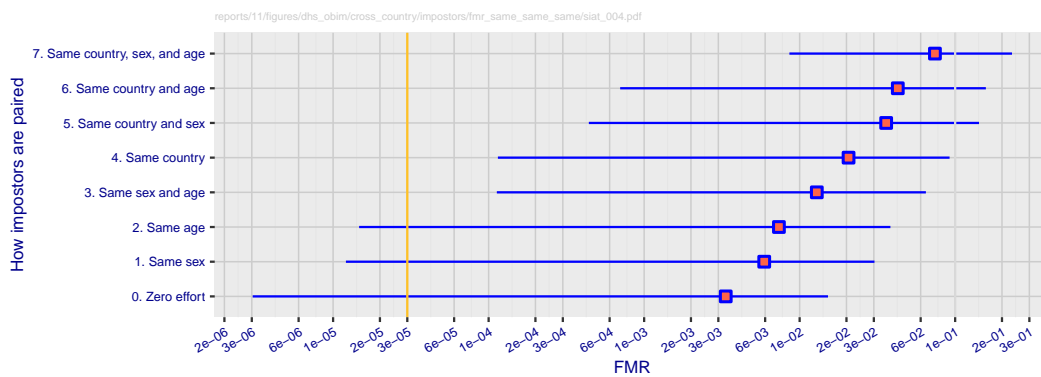


Figure 105: FMR for increasing matched covariates, siat-004

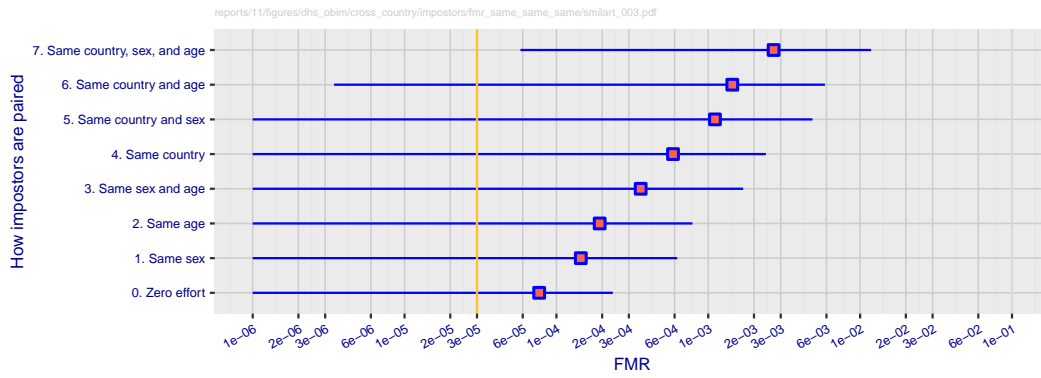


Figure 106: FMR for increasing matched covariates, smilart-003

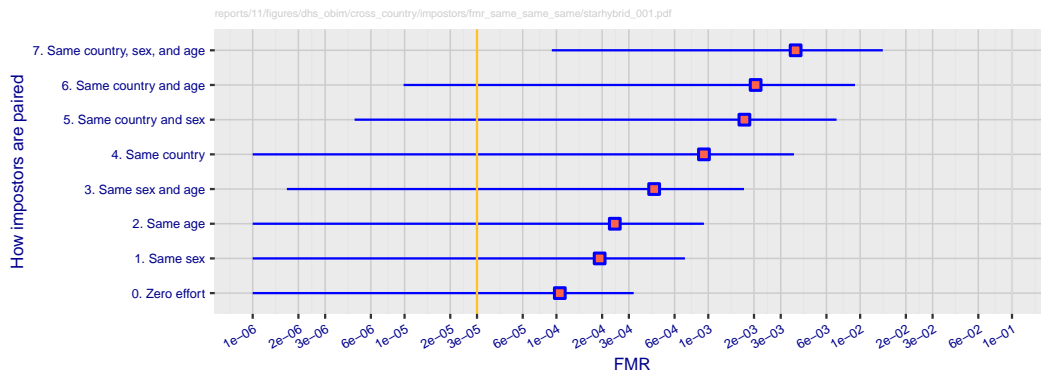


Figure 107: FMR for increasing matched covariates, starhybrid-001

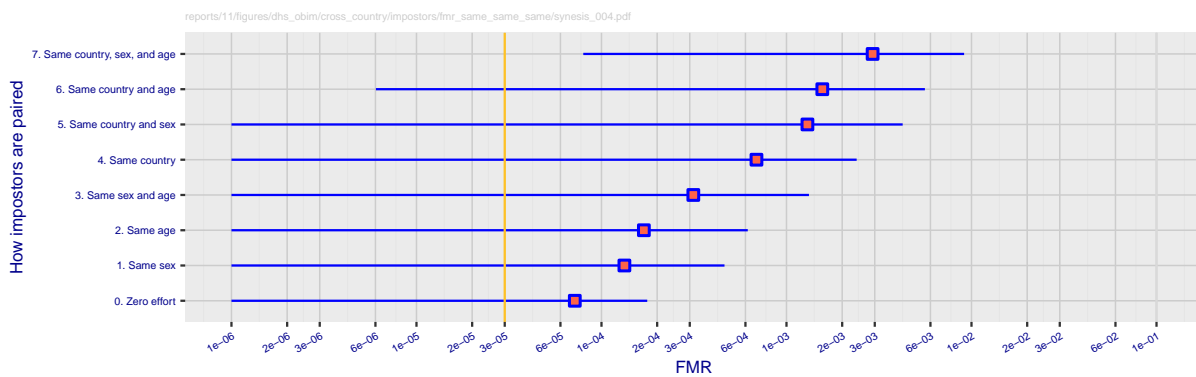


Figure 108: FMR for increasing matched covariates, synesis-004

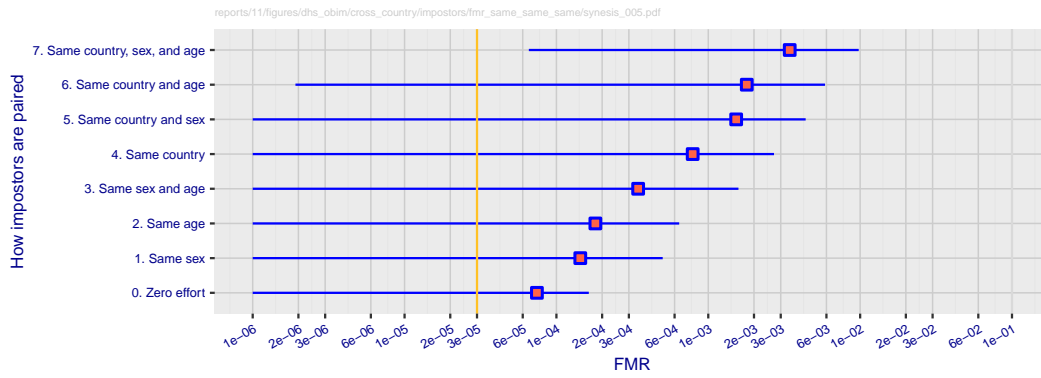


Figure 109: FMR for increasing matched covariates, synesis-005

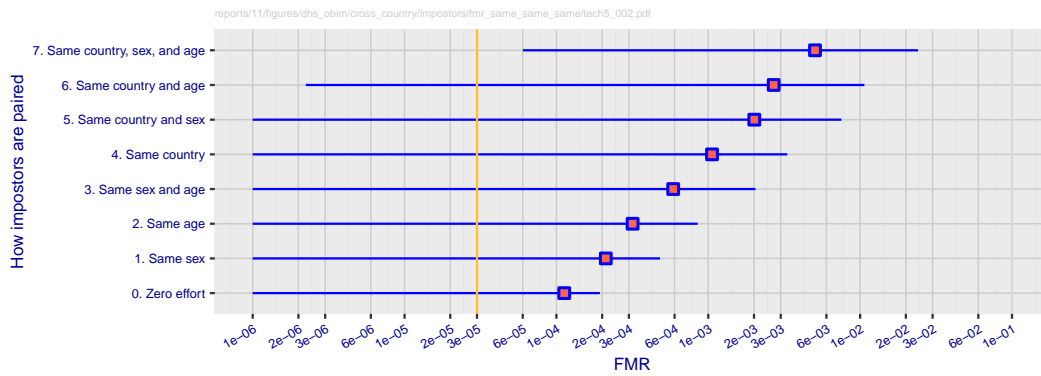


Figure 110: FMR for increasing matched covariates, tech5-002

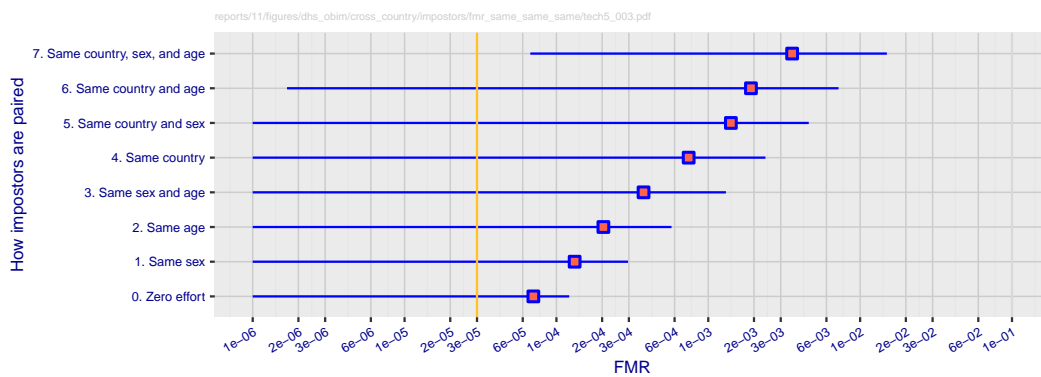


Figure 111: FMR for increasing matched covariates, tech5-003

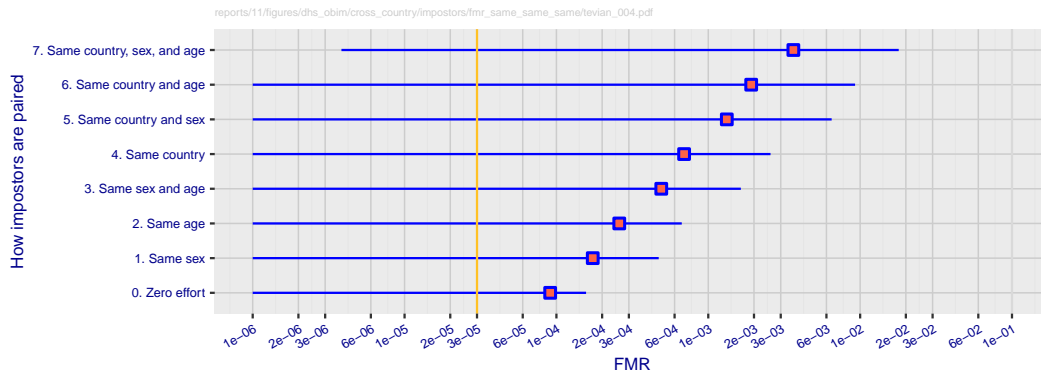


Figure 112: FMR for increasing matched covariates, tevia-004

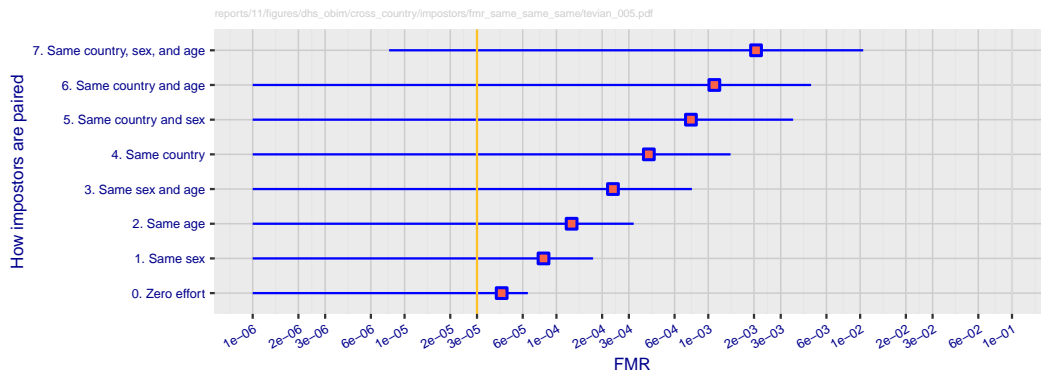


Figure 113: FMR for increasing matched covariates, tevia-005

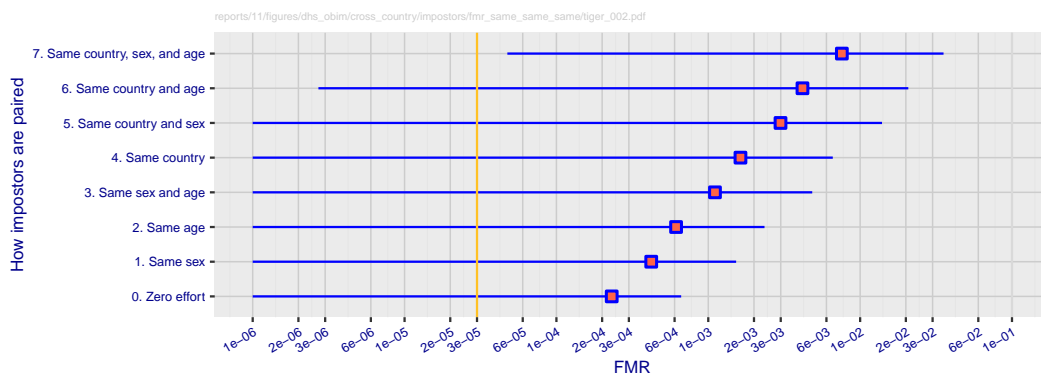


Figure 114: FMR for increasing matched covariates, tiger-002

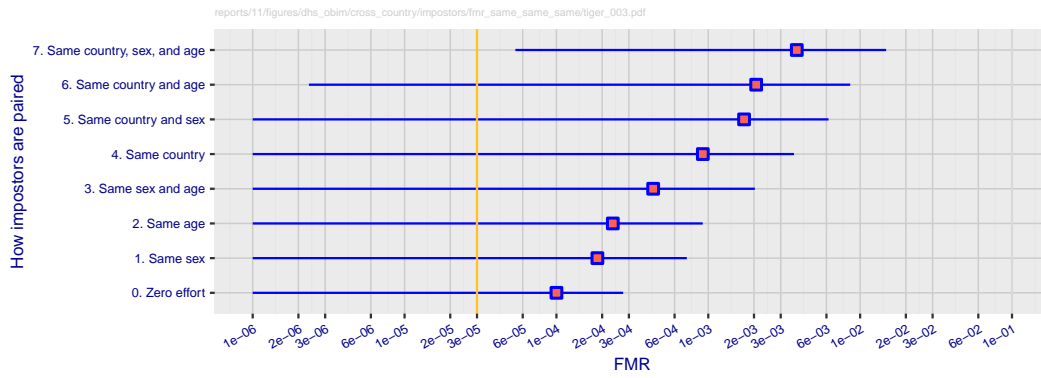


Figure 115: FMR for increasing matched covariates, tiger-003

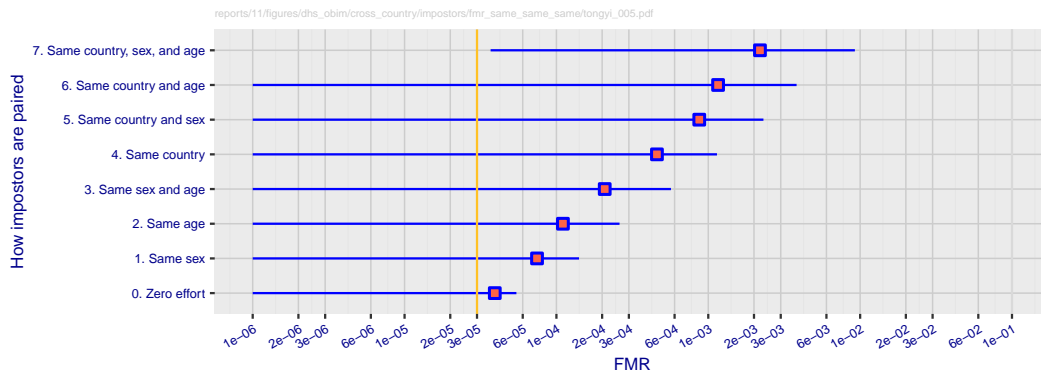


Figure 116: FMR for increasing matched covariates, tongyi-005

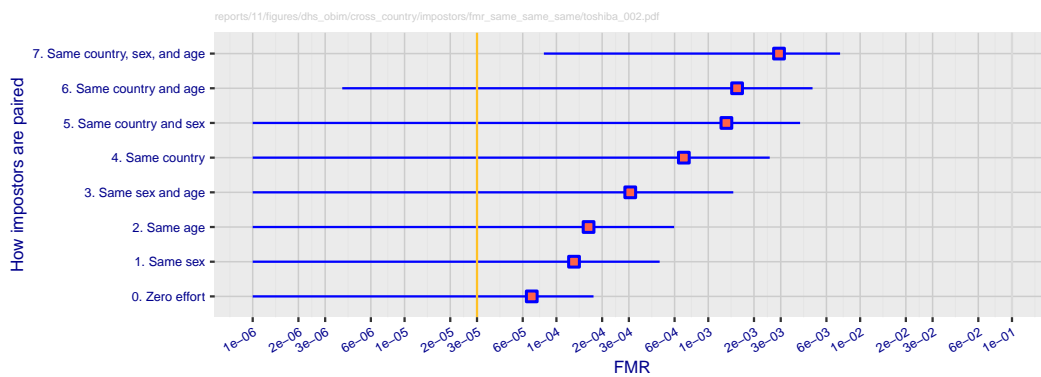


Figure 117: FMR for increasing matched covariates, toshiba-002

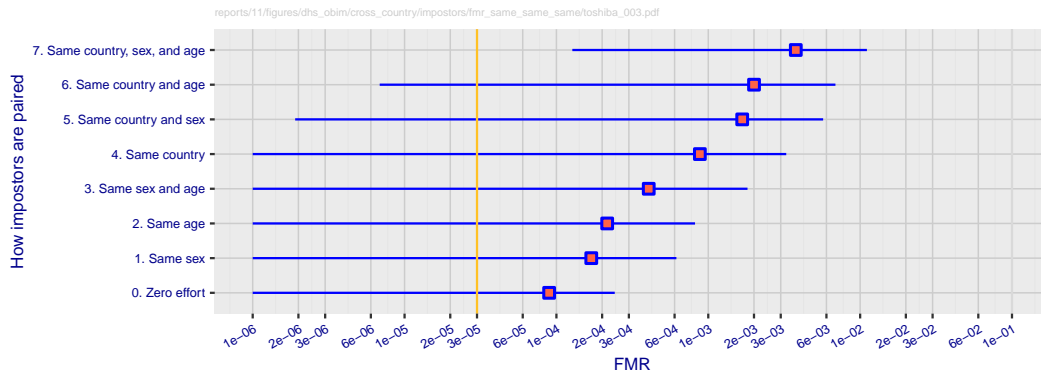


Figure 118: FMR for increasing matched covariates, toshiba-003

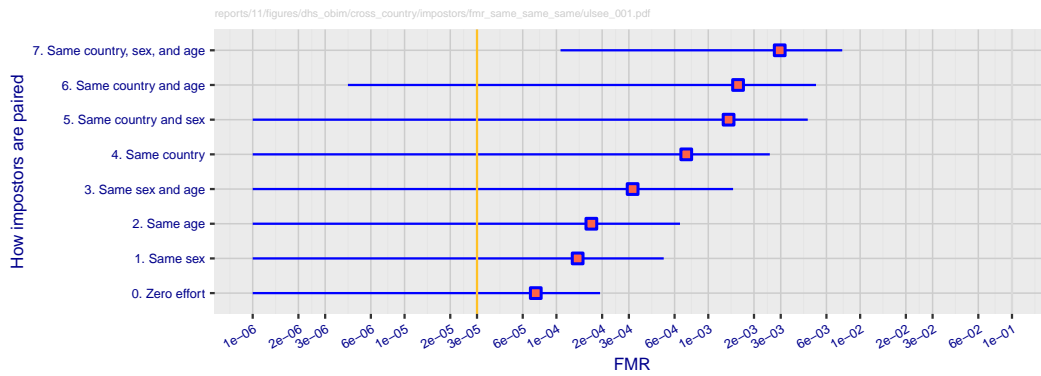


Figure 119: FMR for increasing matched covariates, ulsee-001

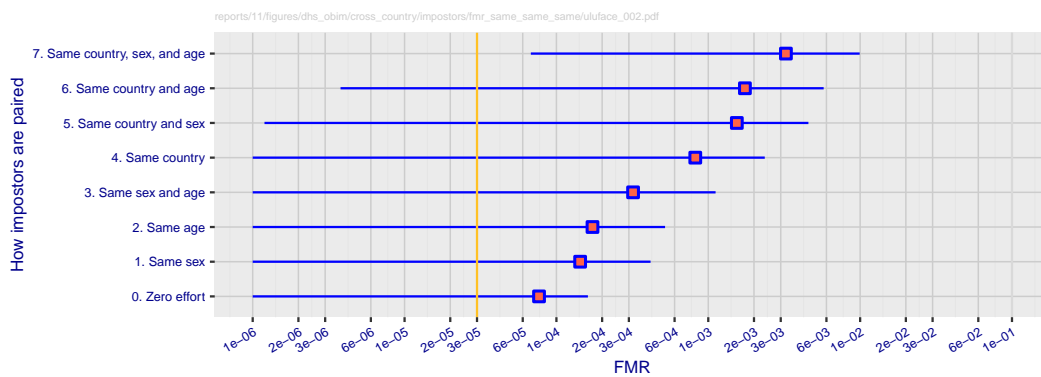


Figure 120: FMR for increasing matched covariates, uluface-002

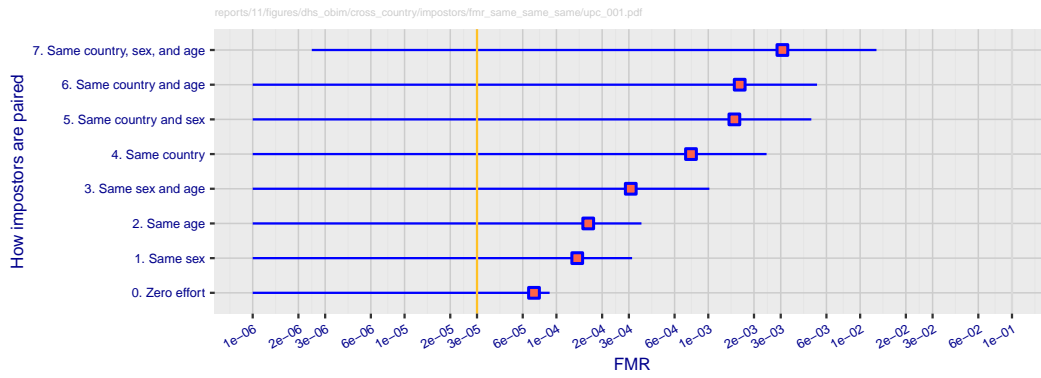


Figure 121: FMR for increasing matched covariates, upc-001

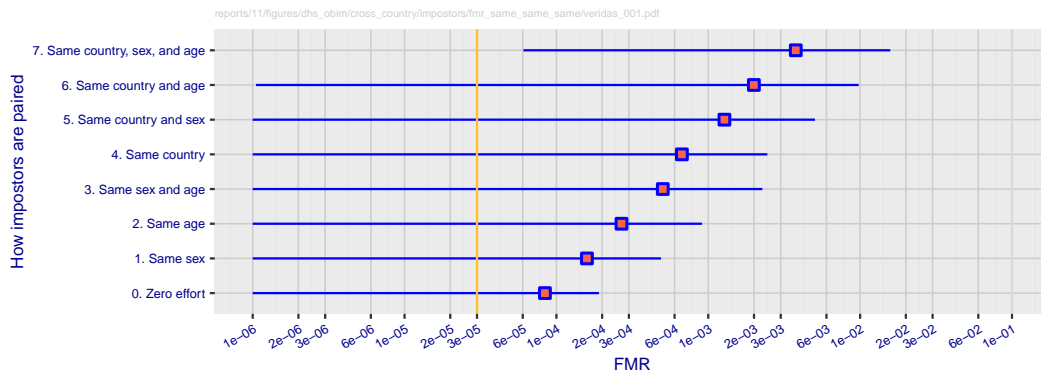


Figure 122: FMR for increasing matched covariates, veridas-001

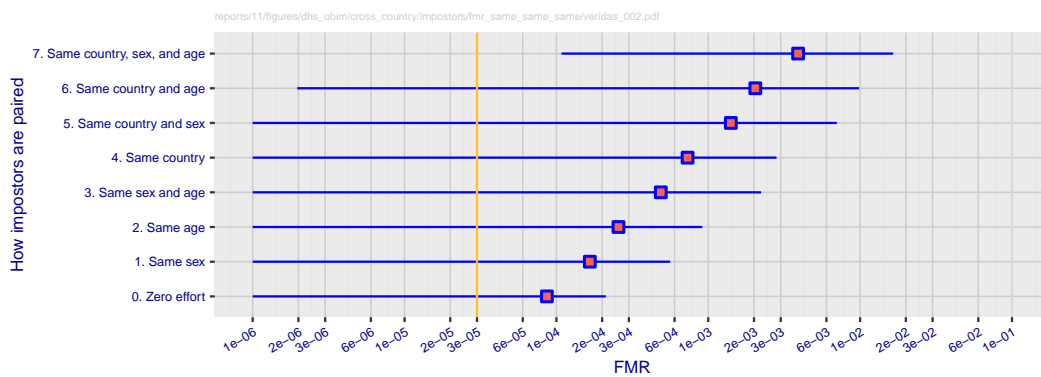


Figure 123: FMR for increasing matched covariates, veridas-002

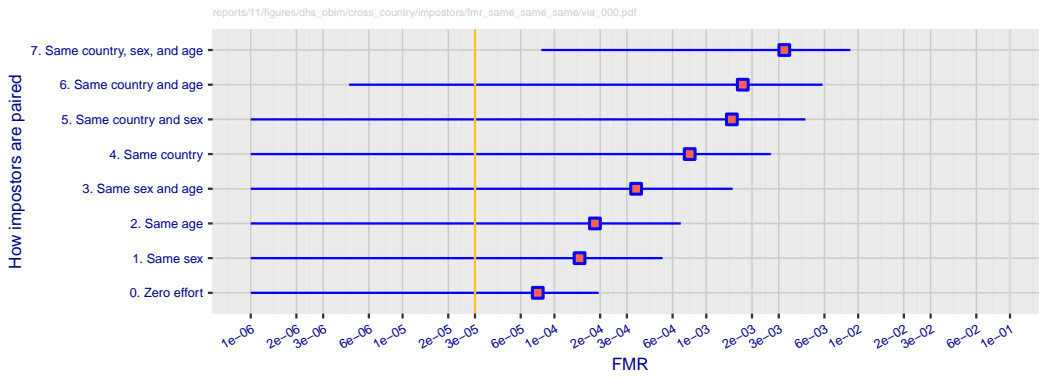


Figure 124: FMR for increasing matched covariates, via-000

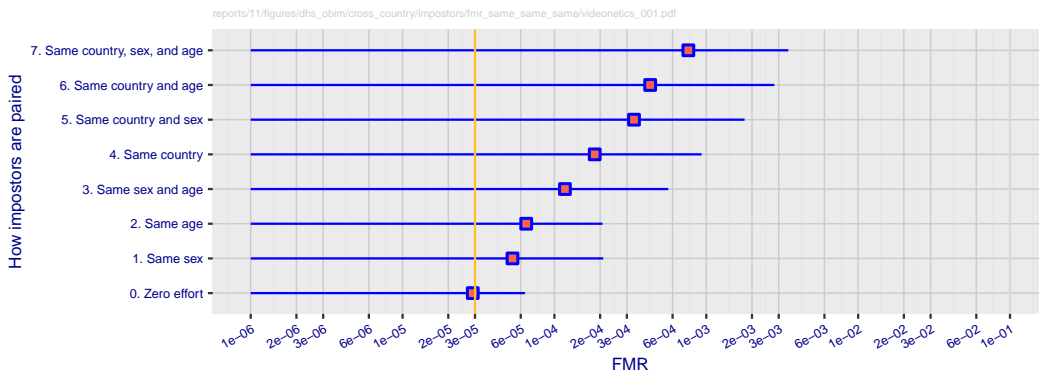


Figure 125: FMR for increasing matched covariates, videonetics-001

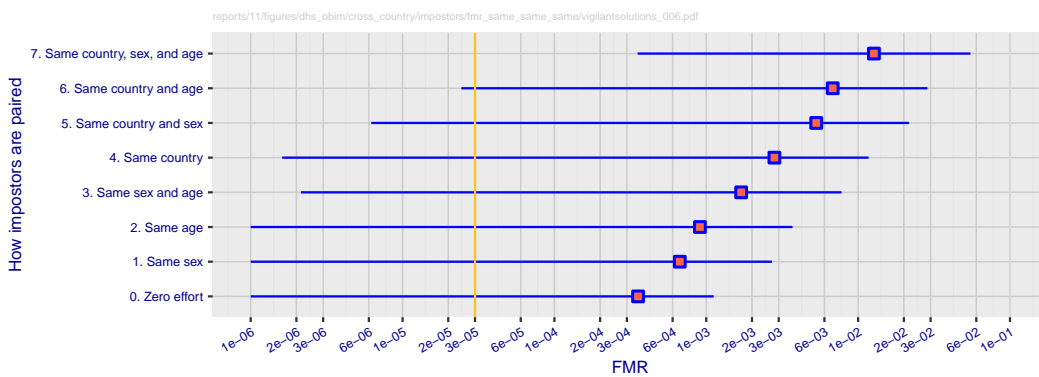


Figure 126: FMR for increasing matched covariates, vigilantsolutions-006

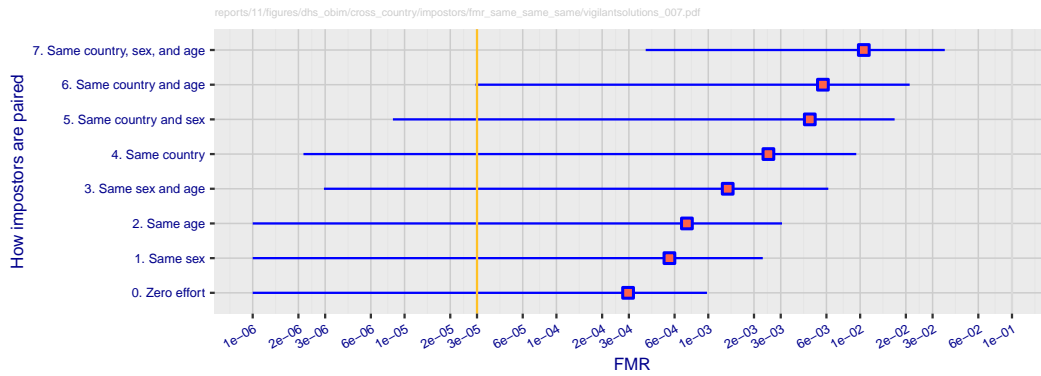


Figure 127: FMR for increasing matched covariates, vigilantsolutions-007

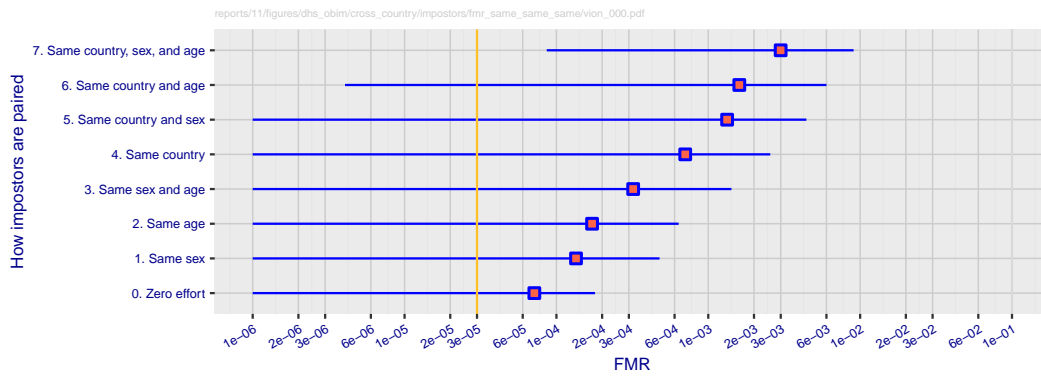


Figure 128: FMR for increasing matched covariates, vion-000

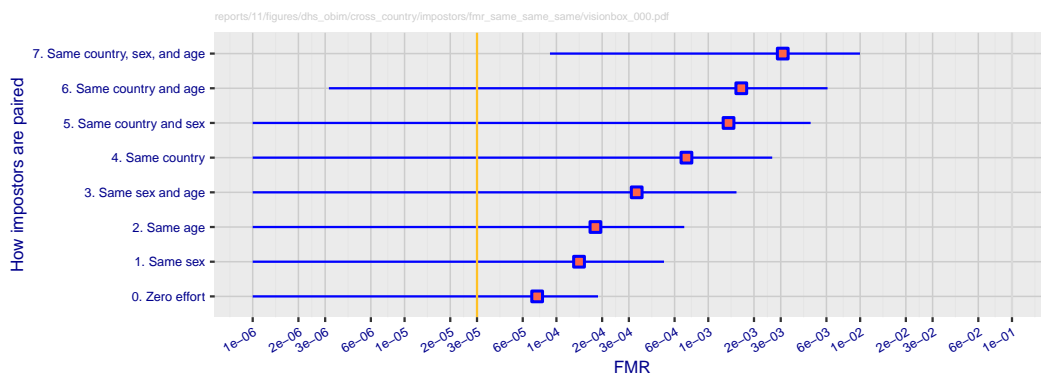


Figure 129: FMR for increasing matched covariates, visionbox-000

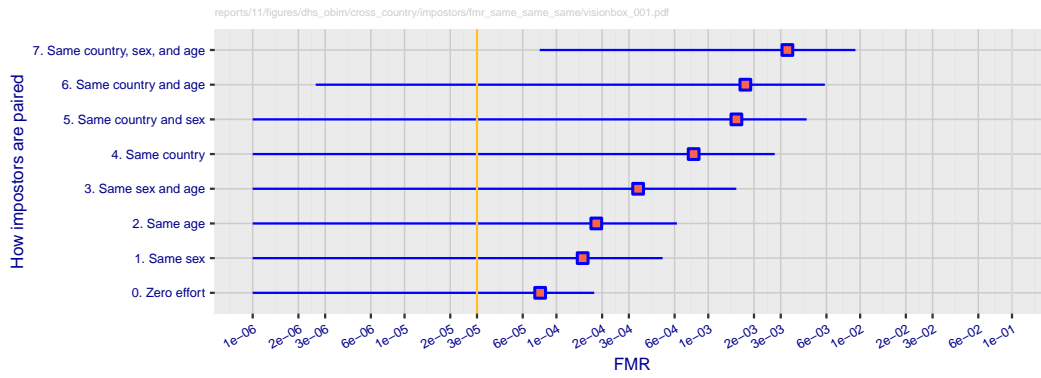


Figure 130: FMR for increasing matched covariates, visionbox-001

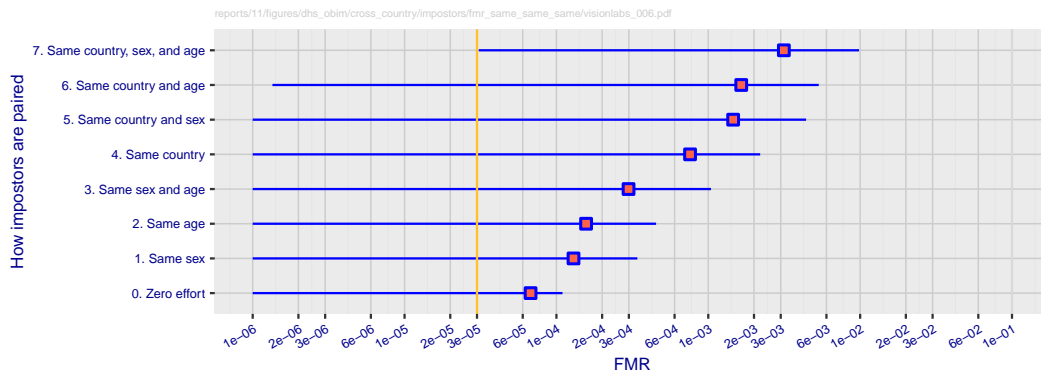


Figure 131: FMR for increasing matched covariates, visionlabs-006

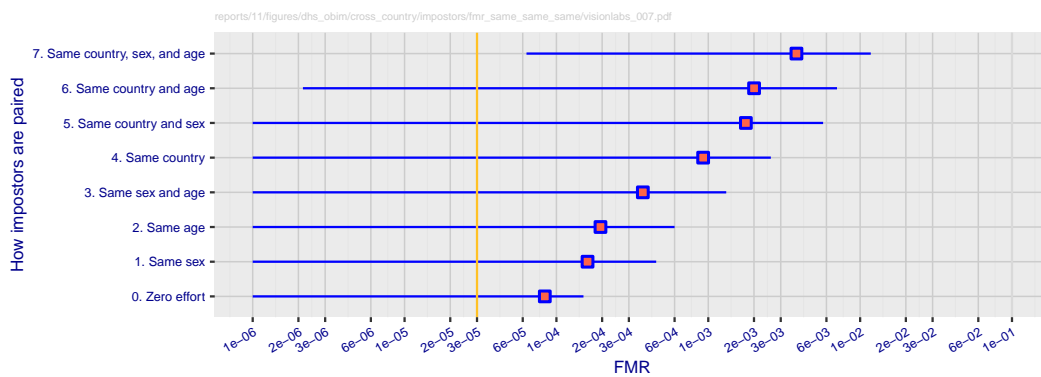


Figure 132: FMR for increasing matched covariates, visionlabs-007

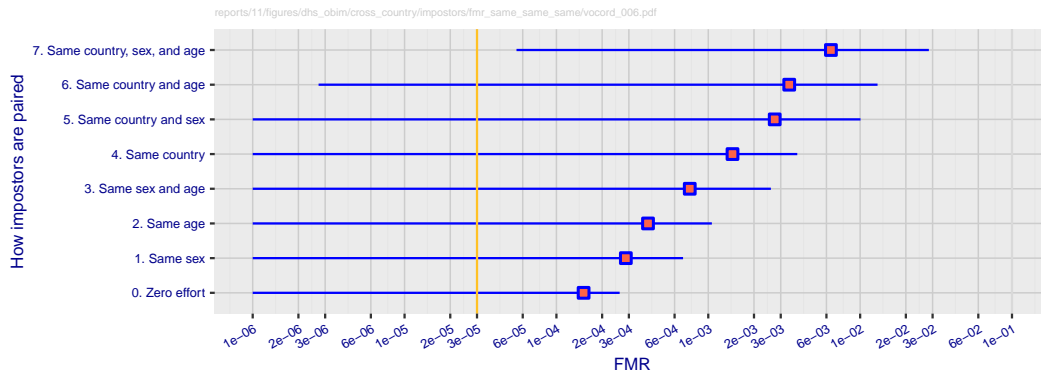


Figure 133: FMR for increasing matched covariates, vocord-006

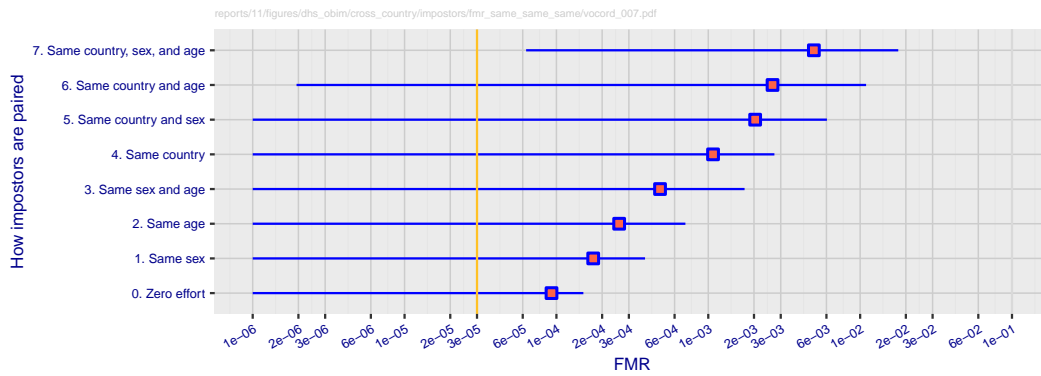


Figure 134: FMR for increasing matched covariates, vocord-007

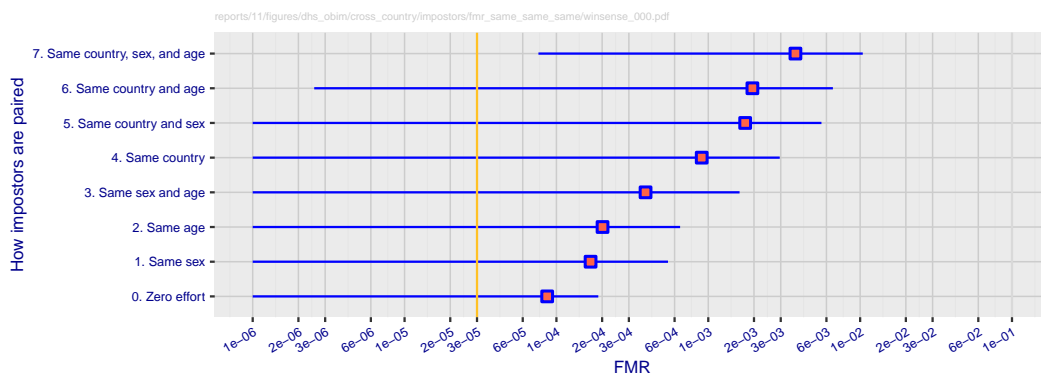


Figure 135: FMR for increasing matched covariates, winsense-000

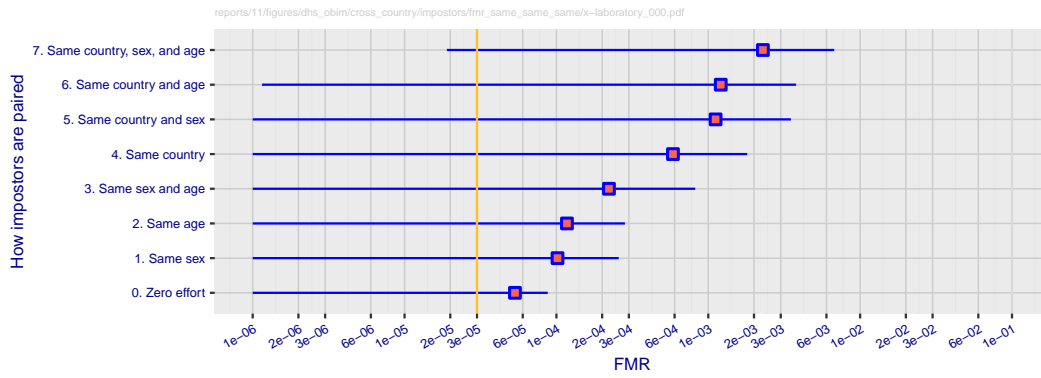


Figure 136: FMR for increasing matched covariates, x-laboratory-000

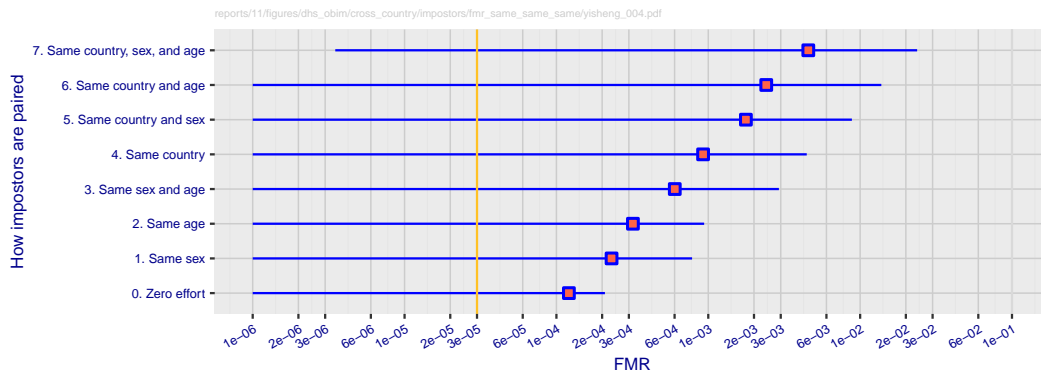


Figure 137: FMR for increasing matched covariates, yisheng-004

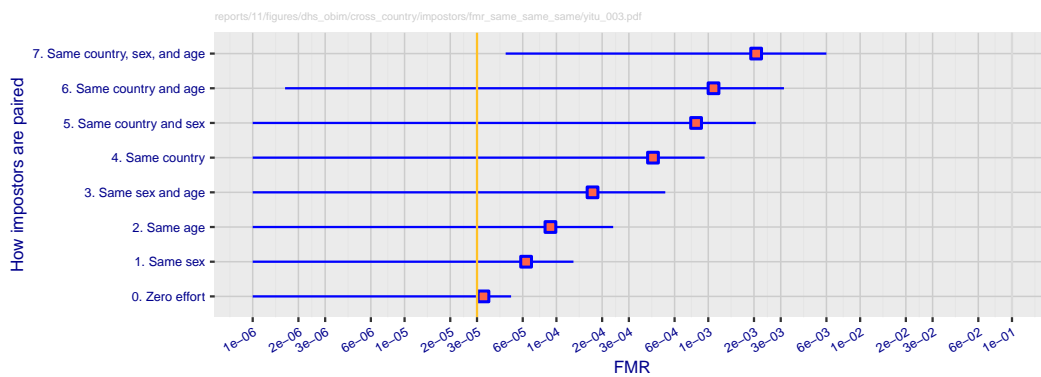


Figure 138: FMR for increasing matched covariates, yitu-003