**AUC for Fisher's Exact Test and the Beta-Binomial Model** MIMOSA: constrained 1.00 MIMOSA: unconstrained true 8000 0.98 0.96 AUC  $\stackrel{\text{(x)}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}{\overset{(x)}}}{\overset{(x)}}}{\overset{(x)}}}{\overset{(x)}}{\overset{(x)}}$ 0.94 2000 0.92 Fisher's Exact Test MIMOSA: constrained 0.90 0 MIMOSA: unconstrained 10000 20000 30000 50000 75000 150000 0.0000 0.0005 0.0010 0.0015 1e+05 Number of Events Fisher MIMOSA: constrained MIMOSA: unconstrained Fisher MIMOSA: constrained MIMOSA: unconstrained 1.0 0.4 8.0 0.3 0.6 sensitivity True FDR 0.4 0.2 0.2 -0.0 0.2 0.8 0.1 0.0 0.4 0.2 0.4 0.6 1.0 0.3 1 – specificity Nominal FDR