Precision of Monte Carlo estimator of prior

In order to examine the precision of the Monte Carlo estimate of the prior probability of a grouping, $P(g|M)$, we performed multiple Monte Carlo estimates and compared with the exact probability. We assumed there were ten equally sized groups, and drew altogether ten pairs from these groups, where each pair was assigned probability $p_m = 0.8$. For numbers of Monte Carlo samples, $K$, equal to 10, 100, 1000 and 10000, we performed 100 estimations of $P(g|M)$ and drew histograms of the estimates and compared with the exact probability (red vertical line).