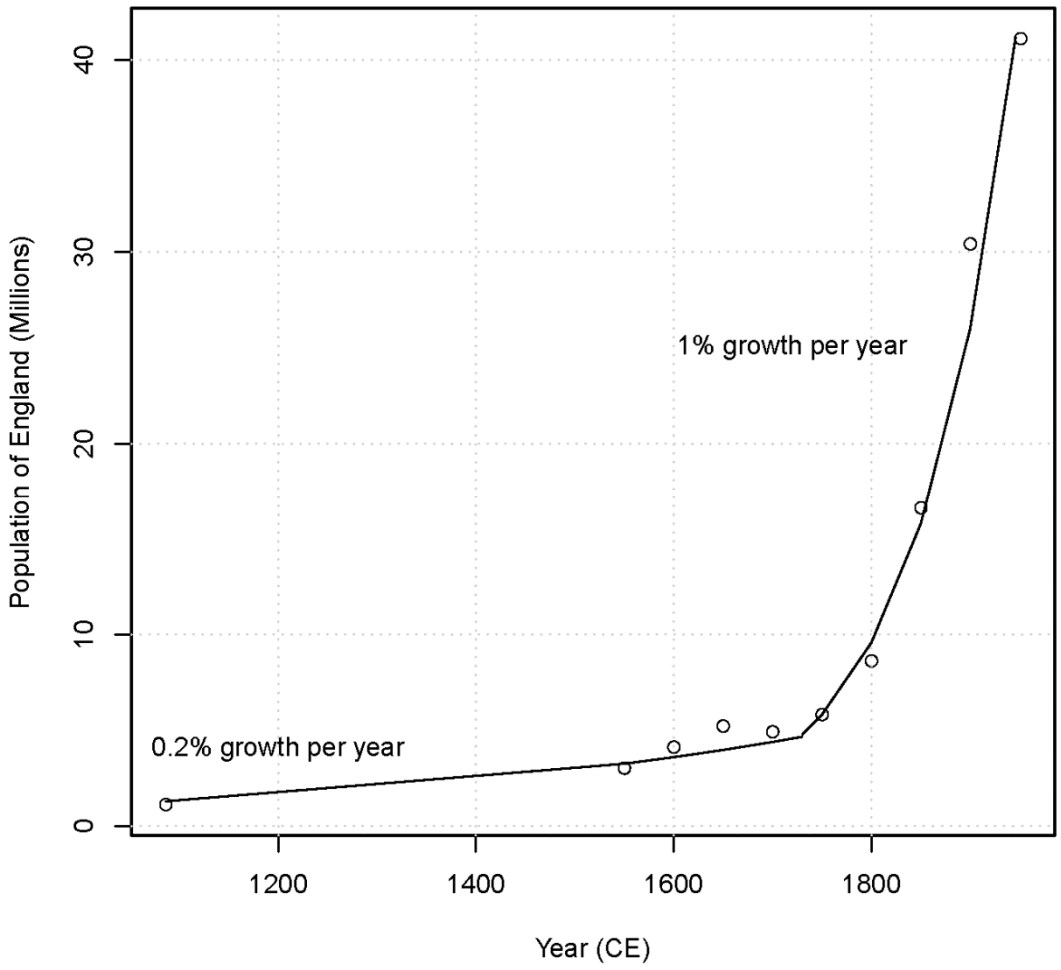

Figure S1 Recent census population size of England. Population figures from 1500 to 1900 are from Bacci [1] Table 1.1. Population estimate in 1086 is from the Domesday book, cited in Bacci [1], page 5. Population in 1951 is from the census of England and Wales; census report downloaded from http://www.visionofbritain.org.uk/text/chap_page.jsp?t_id=SRC_P&c_id=3&cpub_id=EW1951PRE. The value for Wales from Table C of the report was subtracted from the value for England and Wales to obtain the census value for England. The superimposed lines represent 0.2% growth per year (before 1730) and 1% growth per year (after 1730). Assuming a generation length of 25 years, this corresponds to 25% growth per generation in the 9 generations between 1730 and 1955, and 5% growth per generation in the previous generations.

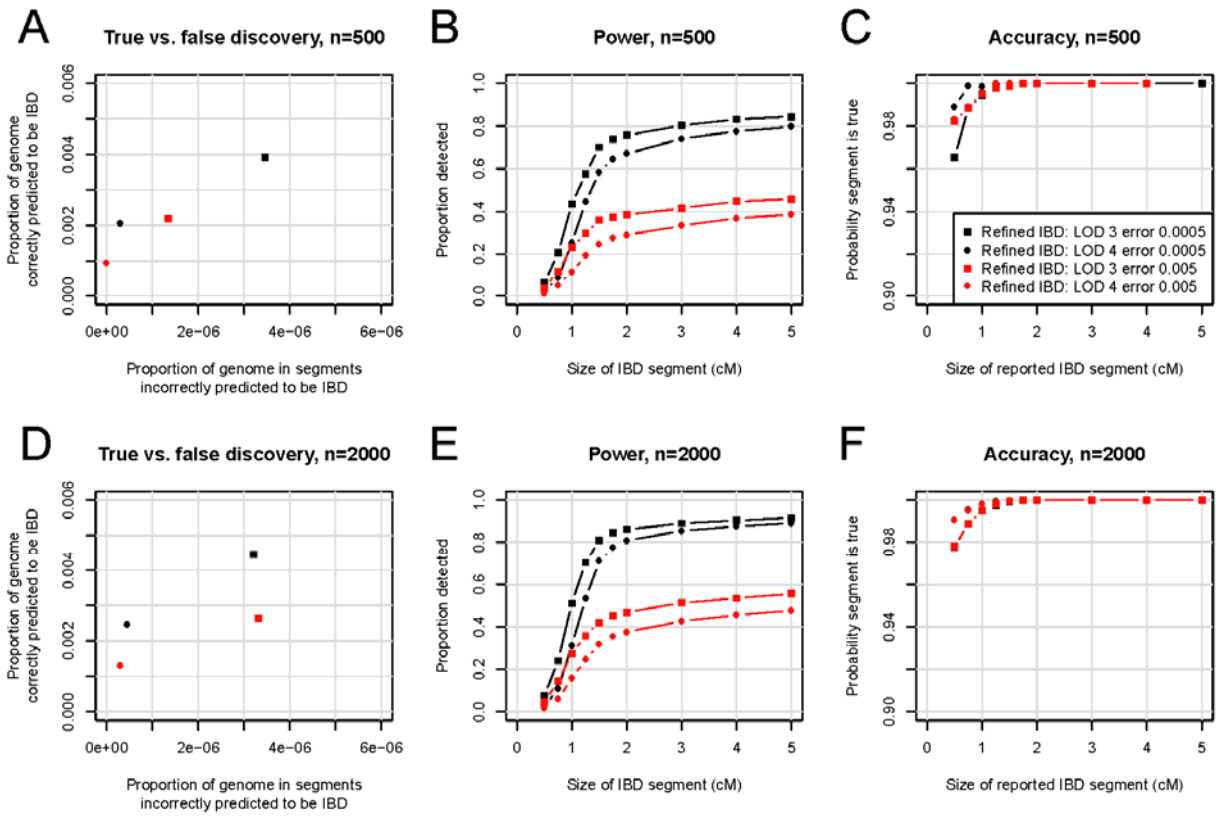

Figure S2 Effect of genotype error on detection of IBD with Refined IBD. Genotype error was added at rate 0.0005 (black; results same as those in main text) and 0.005 (red). Parts A-C of the figure are for a sample size of 500 individuals, while parts D-F are for 2000 individuals. Parts A and D show true versus false discovery. False discovery (x-axis) is measured by the average proportion of the genome that, for a pair of individuals, is in detected IBD segments that are determined to be false. Here falsely detected IBD segments are segments for which at most 25% of the detected segment is true IBD as determined from the simulated phase-known sequence data. True discovery (y-axis) is measured by the average proportion of the region that, for a pair of individuals, is in detected IBD that is also true IBD. Any part of a detected IBD segment that is not part of a true IBD segment is not included in this measure. Parts B and E show power to detect IBD as a function of the underlying size of the true IBD segment. The average proportion of the segment that is detected is shown on the y-axis. Undetected segments (proportion 0) are included in this measure. Parts C and F measure the accuracy of detected segments of a given reported size. The y-axis gives the probability that a reported segment is true, which is defined here as the probability that at least 50% of the segment is true IBD.

Literature Cited

1. Bacci ML (2000) The population of Europe. Oxford: Blackwell.