What is claimed is:

1. A method of predicting relatedness in a human population, comprising:

establishing a first population dataset;

performing a burn-in period of a specified length of years to establish a second population dataset from the first population dataset; and

performing simulations on the second population dataset, including one or more of:

(a) moving individuals in the second population dataset to an age pool in accordance with the age of the individuals;

(b) choosing pairs of a single man and a single woman being more distantly related than first-cousins at random from single men and single women in the second population dataset and letting them marry at specified marriage by age parameters, wherein pairs are chosen until a number of marriages is reached as specified by marriage rate parameters;

(c) divorcing married couples at a specified divorce rate, wherein married couples are chosen at random from the second population dataset and marked as single upon divorce;

(d) choosing pairs of a single man and a single woman or married couples at random from the second population dataset in a specified ratio and allow them to reproduce according to specified fertility rates until a target number of successful conceptions is reached, wherein parents are restricted to being more distantly related than first cousins, and wherein all individuals in the second population dataset are limited to having one child per year;

(e) allowing individuals in the second population dataset to pass away at a specified death rate and at specified mortality by age parameters;

(f) allowing individuals to migrate to and from the second population dataset, whereby the population's age and sex distributions and the proportion of married fertile aged individuals in the second population dataset are maintained;

(g) allowing individuals to move within the second population dataset, whereby individuals from a sub-population are selected at random and assigned at random to another sub-population if present until a specified move rate between sub-populations is achieved;

(h) repeating one or more of (a) to (g) reiteratively at one year intervals for a pre-determined number of years, wherein one or more of (a) to (g) are applied to the population dataset resulting from the previous reiteration to generate a final population dataset predicting relatedness in the human population.

2. The method of claim 1, further comprising selecting the human population for genetic analysis based on the final population dataset.

3. The method of claim 2, wherein the genetic analysis includes pedigree reconstruction, phasing compound heterozygous mutations or detecting de novo mutations.

4. The method according to claim 1, wherein the human population includes multiple human populations and generating the final population data set includes generating a final population dataset for each of the multiple human populations, and further comprising selecting one of the multiple human populations for genetic analysis based on the final population datasets.

5. The method of claim 1, wherein establishing the first population dataset further comprises specifying a number of sub-populations and sizes.

6. The method of claim 5, wherein establishing the first population dataset further comprises assigning ages to individuals in the first population dataset between zero and a maximum age of fertility.

7. The method of claim 5, wherein the maximum age of fertility is 49 years.

8. The method of any one of claims 1 to 7, wherein performing the burn-in phase further comprises keeping numbers of births and deaths of individuals in the second population dataset equal and the rate of net migration of individuals zero.

9. The method of claim 8, wherein performing the burn-in phase further comprises:

moving individuals in the second population dataset from a juvenile pool to a mating pool as individuals age above a minimum age of fertility;

moving individuals from the mating pool to an aged pool as individuals age above a maximum age of fertility; and

removing individuals from all age pools if the individuals emigrate or pass away.

10. The method of claim 9, wherein the minimum age of fertility is 15 years and wherein the maximum age of fertility is 49 years.

11. The method of using the prediction model of any one of claim 1 to 10, wherein ascertaining individuals is performed at random.

12. The method of using the prediction model of any one of claims 1 to 10, wherein ascertaining individuals is performed in a clustered fashion.

13. The method of claims 11 or 12, wherein ascertaining individuals further includes gathering relatedness data and relevant statistics about ascertained individuals including first- or second-degree relationships among ascertained individuals, or both.

14. The method of claim 1, wherein the specified number of years is 120 years.

15. A system for predicting relatedness in a human population, comprising:

a data processor; a memory coupled with the data processor; and a program stored in the memory, the program including instructions capable of being executed by the data processor, wherein the program:

establishes a first population dataset;

performs a burn-in period of a specified length of years to establish a second population dataset from the first population dataset; and

performs simulations on the second population dataset, including one or more of:

(a) moving individuals in the second population dataset to an age pool in accordance with the age of the individuals;

(b) choosing pairs of a single man and a single woman being more distantly related than first-cousins at random from single men and single women in the second population dataset and letting them marry at specified marriage by age parameters, wherein pairs are chosen until a number of marriages is reached as specified by marriage rate parameters;

(c) divorcing married couples at a specified divorce rate, wherein married couples are chosen at random from the second population dataset and marked as single upon divorce;

(d) choosing pairs of a single man and a single woman or married couples at random from the second population dataset in a specified ratio and allow them to reproduce according to specified fertility rates until a target number of successful conceptions is reached, wherein parents are restricted to being more distantly related than first cousins, and wherein all individuals in the second population dataset are limited to having one child per year;

(e) allowing individuals in the second population dataset to pass away at a specified death rate and at specified mortality by age parameters;

(f) allowing individuals to migrate to and from the second population dataset, whereby the population's age and sex distributions and the proportion of married fertile aged individuals in the second population dataset are maintained;

(g) allowing individuals to move within the second population dataset, whereby individuals from a sub-population are selected at random and assigned at random to another sub-population if present until a specified move rate between sub-populations is achieved;

(h) repeating one or more of (a) to (g) reiteratively at one year intervals for a pre-determined number of years, wherein one or more of (a) to (g) are applied to the population dataset resulting from the previous reiteration to generate a final population dataset predicting relatedness in the human population.

16. The system of claim 15, further comprising selecting the human population for genetic analysis based on the final population dataset.

17. The system of claim 16, wherein the genetic analysis includes pedigree reconstruction, phasing compound heterozygous mutations or detecting de novo mutations.

18. The system according to claim 15, wherein the human population includes multiple human populations and generating the final population data set includes generating a final population dataset for each of the multiple human populations, and further comprising selecting one of the multiple human populations for genetic analysis based on the final population datasets.

19. The system of claim 15, wherein establishing the first population dataset further comprises specifying a number of sub-populations and sizes.

20. The system of claim 19, wherein establishing the first population dataset further comprises assigning ages to individuals in the first population dataset between zero and a maximum age of fertility.

21. The system of claim 19, wherein the maximum age of fertility is 49 years.

22. The system of any one of claims 15 to21, wherein performing the burn-in phase further comprises keeping numbers of births and deaths of individuals in the second population dataset equal and the rate of net migration of individuals zero.

23. The system of claim 22, wherein performing the burn-in phase further comprises:

moving individuals in the second population dataset from a juvenile pool to a mating pool as individuals age above a minimum age of fertility;

moving individuals from the mating pool to an aged pool as individuals age above a maximum age of fertility; and

removing individuals from all age pools if the individuals emigrate or pass away.

24. The system of claim 23, wherein the minimum age of fertility is 15 years and wherein the maximum age of fertility is 49 years.

25. The system of using the prediction model of any one of claim 15 to 24, wherein ascertaining individuals is performed at random.

26. The system of using the prediction model of any one of claims 15 to 24, wherein ascertaining individuals is performed in a clustered fashion.

27. The system of claims 25 or 26, wherein ascertaining individuals further includes gathering relatedness data and relevant statistics about ascertained individuals including first- or second-degree relationships among ascertained individuals, or both.

28. The system of claim 15, wherein the specified number of years is 120 years.

29. A non-transitory computer implemented method of determining relatedness in a human population, comprising:

using a data processor for establishing a first population dataset;

using the data processor for performing a burn-in period of a specified length of years to establish a second population dataset from the first population dataset; and

using the data processor for performing simulations on the second population dataset, including one or more of:

(a) moving individuals in the second population dataset to an age pool in accordance with the age of the individuals;

(b) choosing pairs of a single man and a single woman being more distantly related than first-cousins at random from single men and single women in the second population dataset and letting them marry at specified marriage by age parameters, wherein pairs are chosen until a number of marriages is reached as specified by marriage rate parameters;

(c) divorcing married couples at a specified divorce rate, wherein married couples are chosen at random from the second population dataset and marked as single upon divorce;

(d) choosing pairs of a single man and a single woman or married couples at random from the second population dataset in a specified ratio and allow them to reproduce according to specified fertility rates until a target number of successful conceptions is reached, wherein parents are

restricted to being more distantly related than first cousins, and wherein all individuals in the second population dataset are limited to having one child per year;

(e) allowing individuals in the second population dataset to pass away at a specified death rate and at specified mortality by age parameters;

(f) allowing individuals to migrate to and from the second population dataset, whereby the population's age and sex distributions and the proportion of married fertile aged individuals in the second population dataset are maintained;

(g) allowing individuals to move within the second population dataset, whereby individuals from a sub-population are selected at random and assigned at random to another sub-population if present until a specified move rate between sub-populations is achieved;

(h) repeating one or more of (a) to (g) reiteratively at one year intervals for a pre-determined number of years, wherein one or more of (a) to (g) are applied to the population dataset resulting from the previous reiteration to generate a final population dataset predicting relatedness in the human population.

30. The non-transitory computer implemented method of claim 29, further comprising selecting the human population for genetic analysis based on the final population dataset.

31. The system of claim 30, wherein the genetic analysis includes pedigree reconstruction, phasing compound heterozygous mutations or detecting de novo mutations.

32. The non-transitory computer implemented method of claim 29, wherein the human population includes multiple human populations and generating the final population data set includes generating a final population dataset for each of the multiple human populations, and further comprising selecting one of the multiple human populations for genetic analysis based on the final population datasets.

33. The non-transitory computer implemented method of claim 29, wherein establishing the first population dataset further comprises specifying a number of sub-populations and sizes.

34. The non-transitory computer implemented method of claim 33, wherein establishing the first population dataset further comprises assigning ages to individuals in the first population dataset between zero and a maximum age of fertility.

35. The non-transitory computer implemented method of claim 34, wherein the maximum age of fertility is 49 years.

36. The non-transitory computer implemented method of any one of claims 29 to 35, wherein performing the burn-in phase further comprises keeping numbers of births and deaths of individuals in the second population dataset equal and the rate of net migration of individuals zero.

37. The non-transitory computer implemented method of claim 36, wherein performing the burn-in phase further comprises:

moving individuals in the second population dataset from a juvenile pool to a mating pool as individuals age above a minimum age of fertility;

moving individuals from the mating pool to an aged pool as individuals age above a maximum age of fertility; and

removing individuals from all age pools if the individuals emigrate or pass away.

38. The non-transitory computer implemented method of claim 37, wherein the minimum age of fertility is 15 years and wherein the maximum age of fertility is 49 years.

39. The non-transitory computer implemented method of any one of claim 29 to 38, wherein ascertaining individuals is performed at random.

40. The non-transitory computer implemented method of any one of claims 29 to 38, wherein ascertaining individuals is performed in a clustered fashion.

41 The non-transitory computer implemented method of claims 39 or 40, wherein ascertaining individuals further includes gathering relatedness data and relevant statistics about ascertained

individuals including first- or second-degree relationships among ascertained individuals, or both.

42. The non-transitory computer implemented method of claim 29, wherein the specified number of years is 120 years.