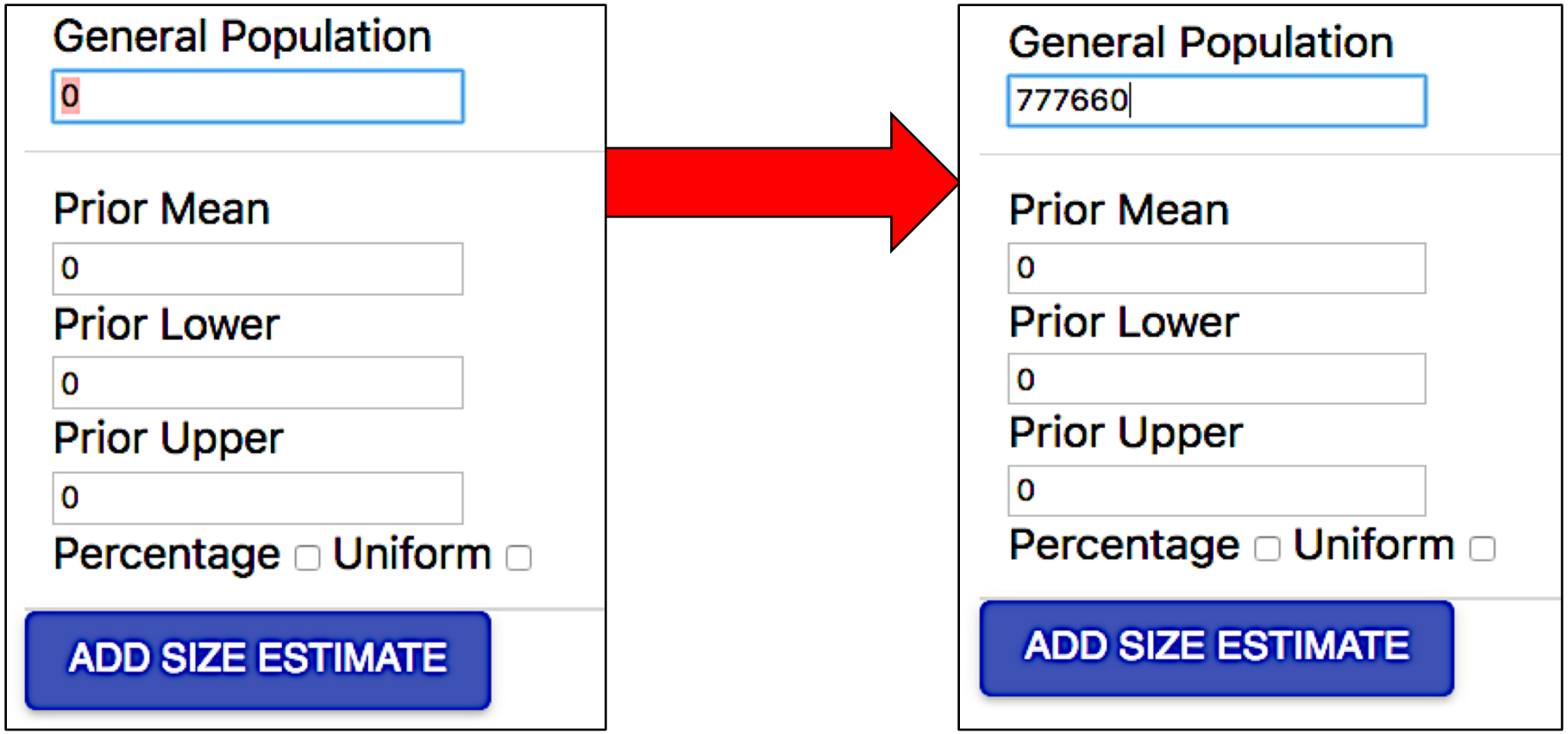
Using the Anchored Multiplier calculator to synthesize multiple population size estimates

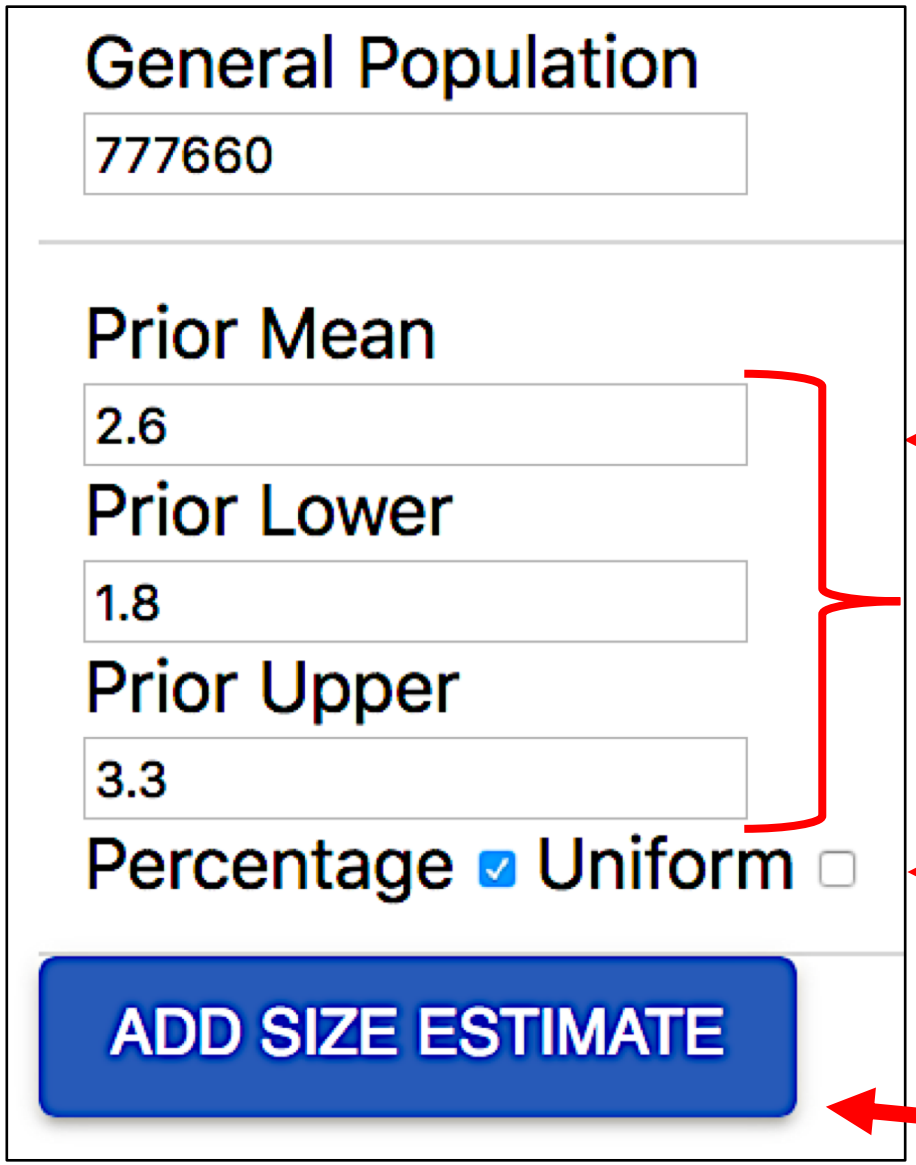
Paul Wesson, PhD

Institute for Global Health Sciences

University of California, San Francisco

Begin by entering a value in the field under “General Population” to specify the size of the general population for which your target population is a subset. For example, if you are estimating the number of female sex workers in City X, your general population size may be the number of adult females in City X.





Specify the Prior. Priors are estimates external to the data in your study. They can come from the literature, estimates from stakeholders, or estimates from previous studies.

Point estimates (e.g., Mean), Lower bound estimates and Upper bound estimates can be given as either percentages of the general population or as raw counts. If data is entered as a percentage, be sure to click the box next to "Percentage".

Click the box next to "Uniform " if you have limited prior information and wish to use a uniform distribution as your prior. Then only enter a value for "Prior Lower" and "Prior Upper". This will assign equal weight to all values spanning this range.

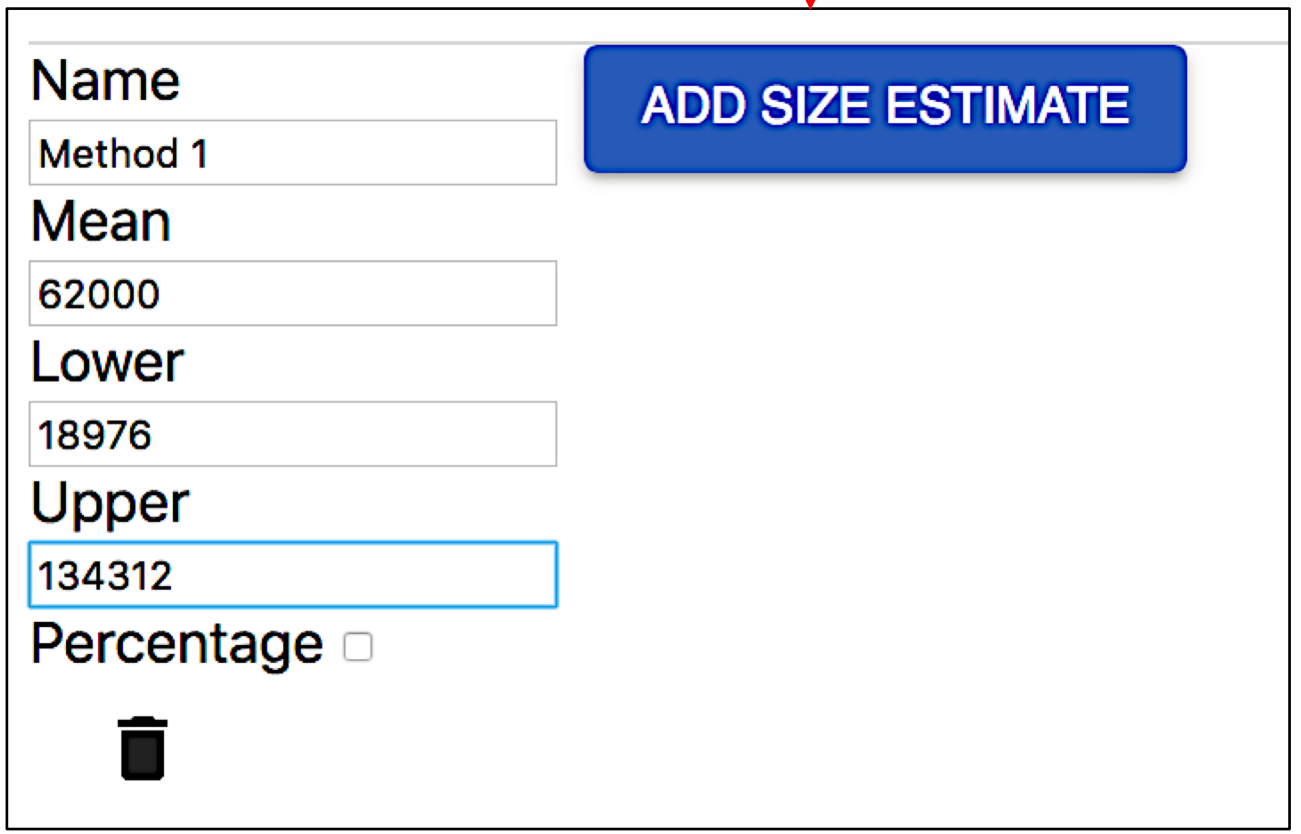
Click "ADD SIZE ESTIMATE" when done entering the Prior information.

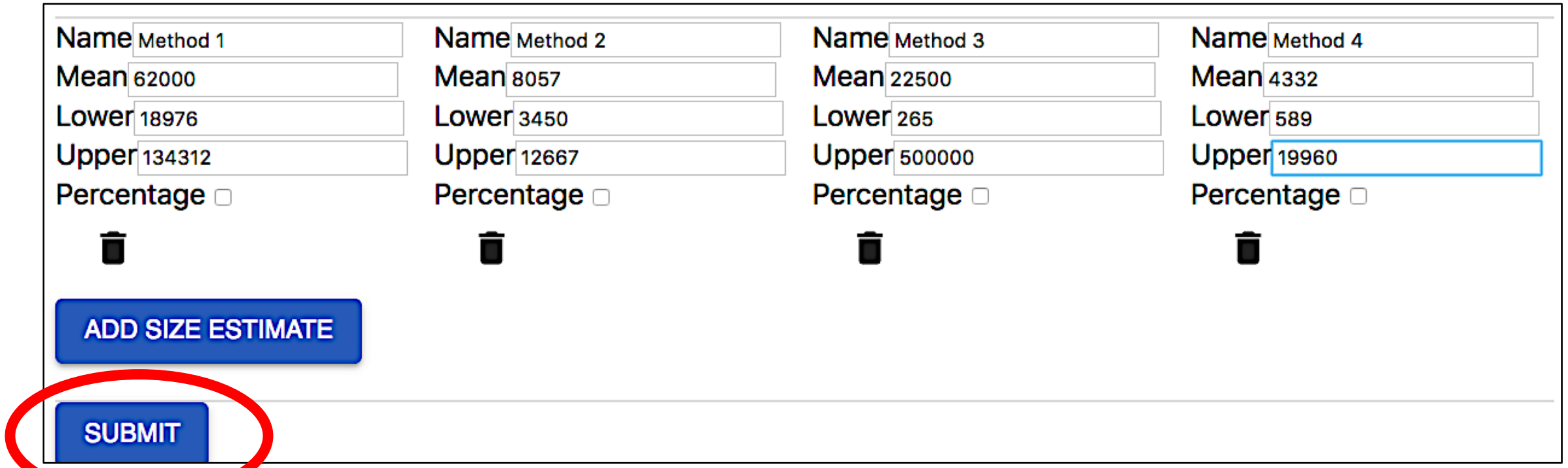
Enter population size estimates from your study on this screen. You will enter each one separately.

(3) When done, click “ADD SIZE ESTIMATE” to continue to add population size estimates.

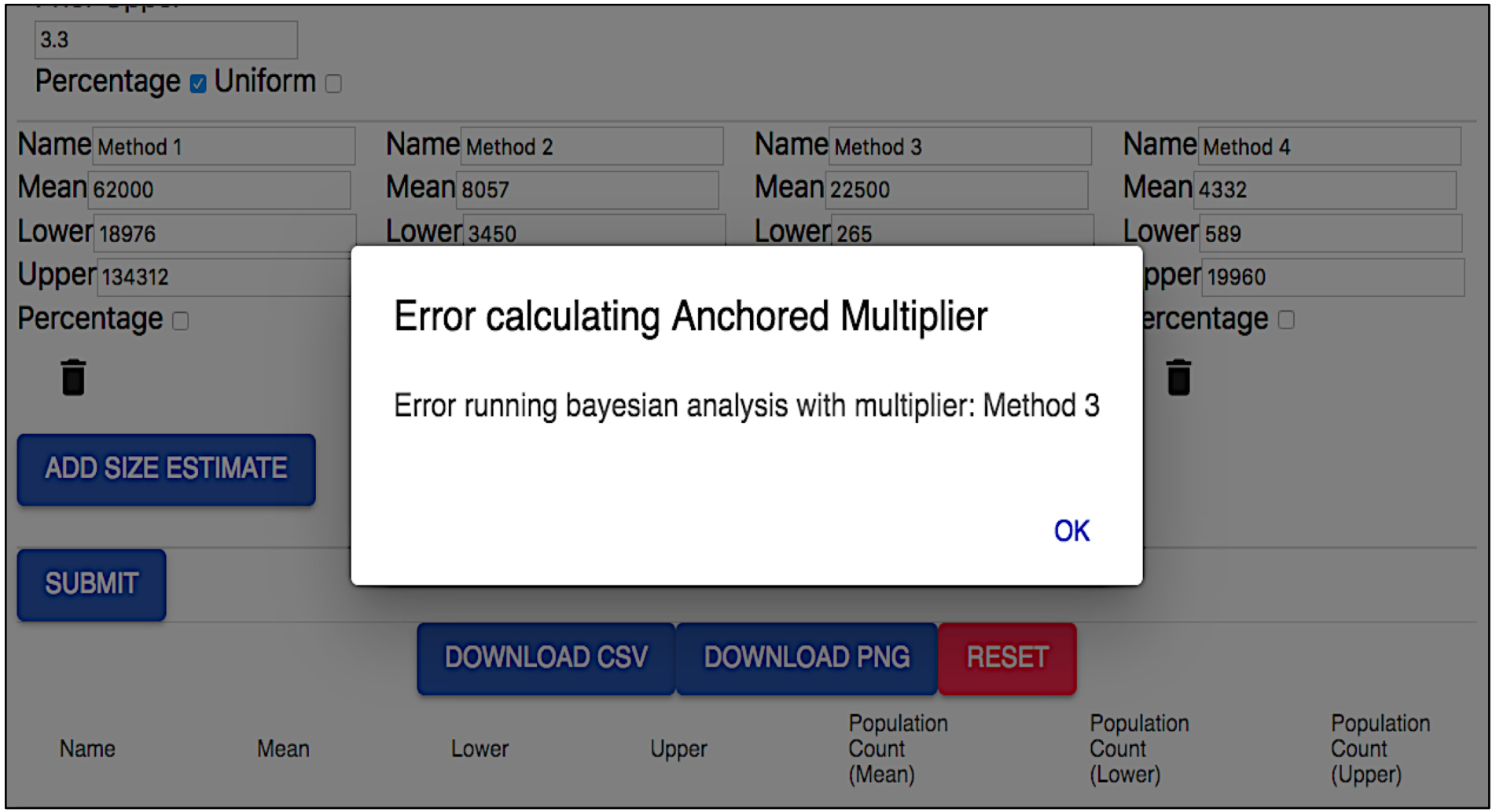
(1) Use this field to enter the name of the method used to calculate the population size estimate (e.g., Service multiplier) or the data source (e.g., Surveillance data).

(2) If the data is entered in the form of a population percentage, click the box next to “Percentage”. If the data is entered in the form of a population count, leave this box unchecked.

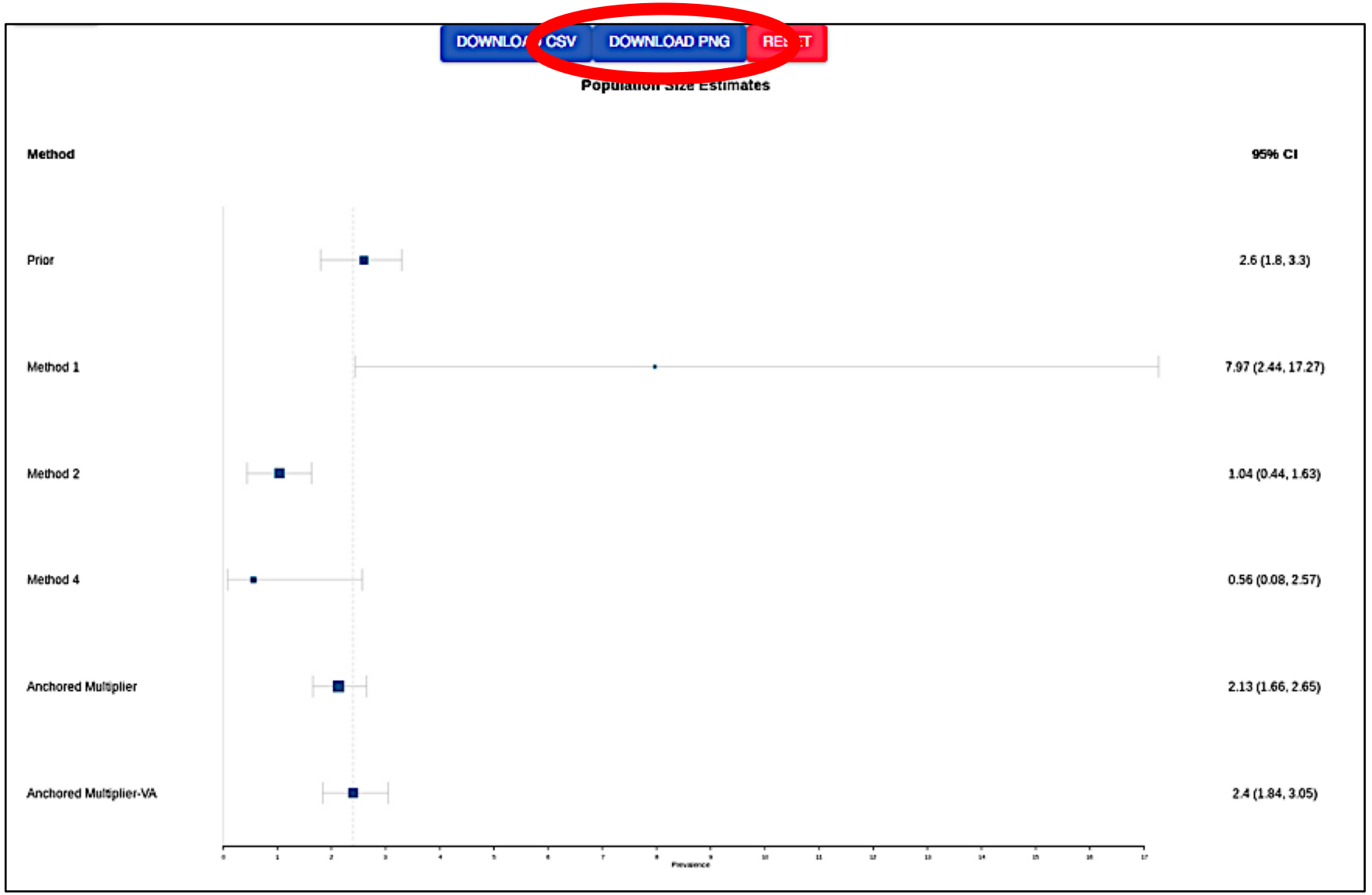




When you have finished entering all of your population size estimates, click the “Submit” button.



If there is a problem with the data synthesis, the program will identify which estimate is causing the error. Often the error is the result of the program being unable to fit the data to a beta distribution. Double check your estimates and how the lower and upper bounds were calculated. If the problem persists, you may need to drop this data point from your data synthesis. Estimates may be deleted by using the trash can icon.



The forest plot displays the data you entered on the previous screen.

The calculator will always display the “Anchored Multiplier” estimate.

When there is additional variance between the estimated population sizes you entered that needs to be taken into account, the calculator will also provide the variance adjusted estimate (“Anchored Multiplier-VA”). We recommend you use the variance adjusted estimate to be conservative.

The forest plot can be downloaded as a .PNG file.

The same information from the forest plot is also displayed in tabular form and can be downloaded as a .csv file.

The table also displays information on the beta distribution shape parameters for each of the data points entered. "Probability Mass" refers to the the proportion of the beta distribution that is contained within the lower and upper bounds. In order to be included in the data synthesis, each data point must have a probability mass of at least 0.7.

Name	Mean	Lower	Upper	Population Count (Mean)	Population Count (Lower)	Population Count (Upper)	Alpha	Beta	Probability Mass
Anchored Multiplier	2.13	1.66	2.65	16557	12948	20636	67.22	3090.16	0.95
Anchored Multiplier Variance Adjusted	2.4	1.84	3.05	18665	14279	23715	57.13	2322.96	0.95
prior	2.6	1.8	3.3	20219	13998	25663	51.59	1932.81	0.96
Method 1	7.97	2.44	17.27	62000	18976	134312	2.52	29.08	0.87
Method 2	1.04	0.44	1.63	8057	3450	12667	11.6	1108.26	0.95
Method 4	0.56	0.08	2.57	4332	589	19960	0.54	62.01	0.71