Also, since $a_i + b_i + c_i = n$,

we will know

$$\gamma_1 = \frac{\sum y_i c_i}{n \sum y_i}, \quad \alpha_1 = \frac{\sum y_i a_i}{n \sum y_i}, \quad \beta_1 = \frac{\sum y_i b_i}{n \sum y_i}$$

Then we can derive $\alpha_0, \beta_0, \gamma_0$ by using the same method:

$$\gamma_0 = \frac{\sum (1-y_i) c_i}{n \sum (1-y_i)}, \quad \alpha_0 = \frac{\sum (1-y_i) a_i}{n \sum (1-y_i)}, \quad \beta_0 = \frac{\sum (1-y_i) b_i}{n \sum (1-y_i)}$$