**Algorithm:**

For each of the 7862 I10 codes with one-to-many mapping of I10 to I9, use the 2015 California State ICD9 diagnosis code to calculate the frequency of corresponding I9 code. For the I9 code with the highest frequency, if its frequency over all I9 codes is higher than 0.5, then adopt this I9 code and remove other I9 codes, which would reduce the one-to-many mapping to one-to-one mapping.

**Quantify the reduction in 1:many mappings:**

Using the above algorithm, 7391 one-to-many mappings were reduced to one-to-one mapping.

**Justify the algorithm choice:**

I set the criteria of mapping frequency to 0.5 because it would reduce most one-to-many mappings to one-to-one mappings. If the criteria is less than 0.5, the one-to-many mappings could not be reduced because there is no I9 code which could represent the majority of occurrence over all I9 codes.