All Girls World?

Question: In a world where everyone wants a girl child, each family continues having babies till they have a girl. What do you think will the boy to girl ratio be eventually? (Assuming probability of having a boy or a girl is the same.)

Solution: Note each family has one girl. Let X be the number of boys each family has.

$E(X) = \sum_{i=0}^{\infty} (1/2)^{i+1} = \frac{1/2}{1-1/2} = 1.$

Thus, on average each family will also have one boy. Thus, the ratio is $1 : 1$.