Two simple models of population, immigration and sampling

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Abstract

In this paper, I describe two simple models of population, immigration and sampling.
The paper ends with "The End"

Introduction

Models of population, immigration and sampling are central
to both public policy and international relations.
In this paper, I describe two simple model of population, immigration and sampling.

Preliminaries

Let P be the population of a nation.
Let I be the immigrants in the nation.
Let S be a sampling estimate of P.
Let s be a sampling estimate of I.

The sampling model of population and immigration

The sampling model of population and immigration is

$$S + s = aP + bI + cPI + d \ldots [1]$$

$$\frac{s}{S} = eI + f \ldots [2]$$

which can be solved to give

$$P = \frac{eS^2 + esS + bfS - bs - deS}{cs + aeS - cfS} \ldots [a]$$

$$I = \frac{s - fS}{eS} \ldots [b]$$

The population and immigration model of samples

The population and immigrants model of samples is

$$P + I = aS + bs + csS + d \dots [I]$$

$$\frac{I}{P} = es + f \dots [II]$$

which can be solved to give

$$P = \frac{aS + bs + csS + d}{1 + f + es} \dots [A]$$

$$I = \frac{(f + es)(aS + bs + csS + d)}{1 + f + es} \dots [B]$$

The End