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Family Planning Campaign : A Model for Evaluation of its Activity

Introduction

A campaign starts at a locality populated by eligible couples usually of heterogeneous attitudes towards the campaign. Some succumb to it almost immediately, some after a good deal of campaign has been made, while others are diehard and do not yield at all. Naturally, the problem arises as how to measure the activity of the campaign and when should it cease at the locality under reference. To suggest answers to such questions, a model is presented here for evaluating the activity. The problem has an inherent statistical aspect. Any eligible couple in the large population of the locality has an equal probability to yield to the campaign.

Yielding Equation

We can set up an yielding equation giving the number of couples yielding in a given time.

Let N be the number of couples present at any time t after the campaign had its start. Assuming the number of couples yielding at any instant to be proportional to the total number of eligible couples at that instant, we may write

$$-\,dN/dt \propto N$$

or,

$$dN/dt = -\lambda N \qquad (1)$$

where ,\ is the constant of proportionality and may be termed as the *yielding constant.* It is a characteristic constant of the population of the locality and can be evaluated from survey data.

Re-arranging equation (I) as AN/N — —y*dt* and integrating,

$$\log N = -yt + C$$

where C is the constant of integration.

Now, at the start of the campaign, i.e., at $t = 0$, $N = N_0$, the number of eligi ble couples present initially in the locality. So, C = log N_Q, Finally, therefore,

$$\log N/N_0 = -\lambda t$$

$$N = N_0 e\text{-}yt. \qquad \textbf{(2)}$$

This equation may be termed as the *yielding equation.*

The yielding equation shows that an infinite time is required to make every eligible couple at a given locality yield to the campaign. In this respect, all localities would behave similarly. But to distinguish one locality from another, in so far as the effect of the campaign is concerned, we can speak of a *half-life* defined as the time in which the number of eligible couples in the locality would reduce to half its initial number.

Substituting N by $N_o/2$ in equation (2), the half life T_{vt} is given by

$$N_0/2 = N_o\, e^{-\lambda T_{1/2}}$$

or, $$T_{1/3} - (\log, 2),\wedge$$

The half life could thus be known from a knowledge of the yielding constant A. The lower the half life, the more yielding is the population and more effective is the campaign.

When to Stop Campaign

Once the half life is defined, we can conventionally stop the operation after the lapse of one half life. Similarly, one may as well define two-third or three-fourth life etc. and, purely by convention, use them as criteria for halting the campaign.

Discussion

There is an inherent dynamism involved in the problem. As time passes by, some more couples are promoted to the rank of eligible couples while some of the once-eligible couples lose their eligibility by either yielding to the campaign or by aging or by natural processes (e.g. death). This factor however does not materially affect the situation, for the new entrants can, in general, influence the magnitude of N only if the operation is a long term one.