Migration statistics can be considered in vital statistics. There is a registration for migration but it is much less widespread. In most countries, migration is not registered. Net migration in these countries may be estimated by rearranging the basic demographic equation as follows:

It – Et = Pt+1 – Pt – Bt + Dt

POPULATION ESTIMATION For many purposes, it is desired to know the population in different areas at dates other than census years (either in inter-census or in post-census years).

The population may be estimated by:

1-The Natural Increase: The difference between the births and deaths every year is added to the population of the last census. This is suitable for countries where immigrants and emigrants can be neglected (small numbers). Example: The mid-year population For 1415 was 6,000,000. In 1416 there were 500,000 Births and 100,000 deaths.

2-The arithmetic method: Example: if mid-year population for year 1415 was 6,000,000 and midyear population for year 1425 was 13,300,000; The population increase over the 10 years was 7,300,000.

If this increase was equally distributed on the 10 years, then the yearly increase would be= 7,300,000 ÷ 10 = 730,000 So, the mid-year population for year 1416 would be= 6,000,000+730,000 = 6,730,000

3-The straight line method: It is used also for inter-census estimation of the population. It is a rather correct method. Plot the two census values on graph paper and connect between the two dots by a straight line and extend this as far as required beyond the last census. The value opposite the given inter-census year represents its mid-year population

Population estimation in inter-census and post census years by the straight-line method

**-The Geometric Method:**

In this method we realize that the population is growing by a constant percent using a certain formula:

Pt = Pa ( Pb/Pa) ta/ba

Where: Pt = Population estimate at a certain time.

Pa = Population count in census one (e.g. 1415) e.g. 26,000,000

Pb = Population count in census two (1425) e.g. 33,300,000

ta = Number of years after census one (at which the population estimate is needed). e.g. 2 years (at 1417)

ba = The inter census period (years) 10 years

Example: P1417 =P1415 (P1425/P1415) 2/10 P1417 =26,000,000 (33,300,000/26,000,000)1/5 = 26,000,000 (1.3)1/5 Pop.1417 = 26,000,000 x 1.054 = 27,404,000

Questions :

1. Saudi Arabia Population: 1-1rst census 1974 (6.2 million)

2nd census 1992 (12.3 million)

3rd census 2004 (16.5 million)

4th census 2010 (27,136,977)

Use arithmetic and geometric methods to estimate population size in years 1977, 1999, 2008

1. Search for Saudi MOH and GAStat for the census data, annual number of births and deaths.

▪ Get the number of births and deaths for years 2004 to 2010, then estimate the net-migration during this period using the demographic equation.

▪ Estimate the population size of 2005 and 2012 using the natural increase method of population estimation.

Note: use the basic demographic equation: Pt+1= Pt+(Bt to t+1 – Dt to t+1)+(It to t+1 – Et to t+1) Net migration (It – Et) = Pt+1 – Pt – Bt + Dt

https://www.stats.gov.sa/

Number of births and deaths per year: WORLD <https://ourworldindata.org/grapher/births-and-deaths-projected-to-2100>

3- Use the internet and the following tables to estimate the world population in 2014 and 2018

