❖ **Methods for correcting demographic data:**

1. Correcting the age group from (0-4) years:

   Children in the age of (0-4) are often counted very incompletely in many countries, which necessitates refining this category, so the researcher resorts to using the annual population growth rate in estimating the total population numbers in The five years preceding the census, then multiplying the estimated total population by the crude birth rate estimated in the five years preceding the census, or estimated from the census data under study and considering it as the average for the five years preceding the census.

2. Correcting the age group from (5-9) years:

   Age data in this category are usually considered more accurate than data for other ages, and the results for this category are often accepted unless there are special reasons to doubt their accuracy. In fact, if the age statement is exposed to significant errors, doubt extends to all age groups, including It includes the age group (5-9), and in this case this age group can be revised using the following formula:

$$P_{5-9} = \frac{1}{2}(P_5 + P_{10}) + P_6 + P_7 + P_8 + P_9$$

   Where

   P: The number of people counted at the given ages

3. Correcting the age group from (10-14) to (70-74) years:

Age groups from (11-14) to (70-74) can be revised using the following formula:

$$C_P = \frac{1}{16}(-P_{-2} + 4P_{-1} + 10\,P + 4P_1 - P_2)$$

C_P: Number of population in the relevant age group after revision.

P: The number of population counted in the category to be revised.

P₋₂, P₋₁: The number of population counted in the two age groups preceding the category to be revised.

P₁, P₂: The number of population counted in the two age groups subsequent to the category to be revised.

4. Correct the age groups 75 years and over:

Most of the errors that affect data for this category are exaggeration in reporting the ages of elderly people, and estimating the population at these ages is a difficult issue in addition to being of relatively little importance, because the number at these ages is small and the probability of death is very high.

The method of refining it depends on determining the percentage of the population aged 75 and over in the standard model population and comparing it with the same percentage in the study population. The correction is made on the basis of this percentage.

5. Correction of unclear data or ages (not shown):

A common error in census data and vital statistics is not specifying age, and there are different treatments for such cases, including resorting to other questions such as educational level and marital status in order to correct, and if it turns out that there is an indicator for correction, the correction is made according to the proportions of the population in the different categories.

$$\text{No. of residents whose ages are clear} = \text{the total population} - \text{No. of residents whose ages are unclear}$$

and

$$the\ ration = \frac{\text{the total population}}{\text{No. of residents whose ages are clear}}$$

After finding the proportions, we multiply the proportion by the total of each category, and the total population must be equal to the original total.

Note: An equation 1/16 cannot be applied unless the ratio is found and the ages not shown are eliminated

Example:

The following table represents the population in one country. Correct the data using an equation 1/16

digits	No. population P_x	Ratio * No. population	Correct the age (10-74)
0-4	2764833	2800282	2800282
5-9	2468250	2499896	2499896
10-14	2148409	2175955	2197486
15-19	1909111	1933588	1915131
20-24	1514022	1533434	1499171
25-29	1018381	1031438	1118168
30-34	1018688	1031749	959070.6
35-39	741327	750831.8	775802.9
40-44	560815	568005.4	572643.6
45-49	457189	463050.8	447332.2
50-54	337214	341537.5	366920.3
55-59	355968	360532	337652.6
60-64	267546	270976.3	275659.8
65-69	187480	189883.8	197862.5
70-74	157315	159332	149515.5
75-79	92552	93738.64	93738.64
80-84	63767	64584.58	64584.58
85-	65592	66432.98	66432.98
unclear	206789	-----	
sum	16335248	16335248	

Solution :

No. of residents whose ages are clear (shown) = the total population – No. of residents whose ages are unclear (not shown)

No. of residents whose ages are clear = 16335248 – 206789 = 16128459

To find the ratio

$$the\ ration = \frac{the\ total\ population}{No.\ of\ residents\ whose\ ages\ are\ clear}$$

$$the\ ratio = \frac{16335248}{16128459}$$

$$= 1.012821374$$

Now we multiply this percentage by the numbers in the table, and the results are in the third column in the table above.

The next step, is correct the age group from (10-14) to (65-69) years by using the equation (1/16)

$$C_P = \frac{1}{16}(-P_{-2} + 4P_{-1} + 10\,P + 4P_1 - P_2)$$

$$C_{p(10-14)} = \frac{1}{16}(-P_{-2} + 4P_{-1} + 10\,P + 4P_1 - P_2)$$