

Text S2 Calculating numbers of infant and under-5 deaths

To calculate the absolute number of deaths among infants and children under five in a given year and country, an abridged life table approach is used.

Terminology:

${}_nq_x$ is the probability of dying between age x and age $x+n$

D_0 is the number of deaths for age < 1 year

D_1 is the number of deaths for age group 1-4 years

P_0 is the mid-year population for age < 1 year

P_1 is the mid-year population for age group 1-4 years

$M_0 = D_0/P_0$, death rate for age <1,

$M_1 = D_1/P_1$, death rate for age group 1-4 years,

The central death rates of age groups 0 and 1-4 years are used, computed back from the probability of dying ${}_5q_0$ and ${}_1q_0$, to which population is applied. First, ${}_1q_4$ is derived from ${}_1q_0$ and ${}_5q_0$ as follows: ${}_4q_1 = ({}_5q_0 - {}_1q_0)/(1 - {}_1q_0)$. Then, for each age group 0 and 1-4, the central death rate M_0 and M_1 is computed as follows:

$$M_0 = {}_1q_0/[1 - (1-a) \cdot {}_1q_0]$$

$$M_1 = 4 \cdot {}_4q_1 / 4 \cdot [1 - (1-0.4) \cdot {}_4q_1],$$

where a is the fraction of year lived by an infant

= 0.1 for low mortality country and $a = 0.3$ for high mortality country.

Finally, country population estimates from the *World Population Prospects: the 2010 revision* produced by UN DESA/Population Division are used to the death rates to obtain the number of deaths. For greater accuracy, the number of deaths is calculated separately for infants and children age 1-4 years.