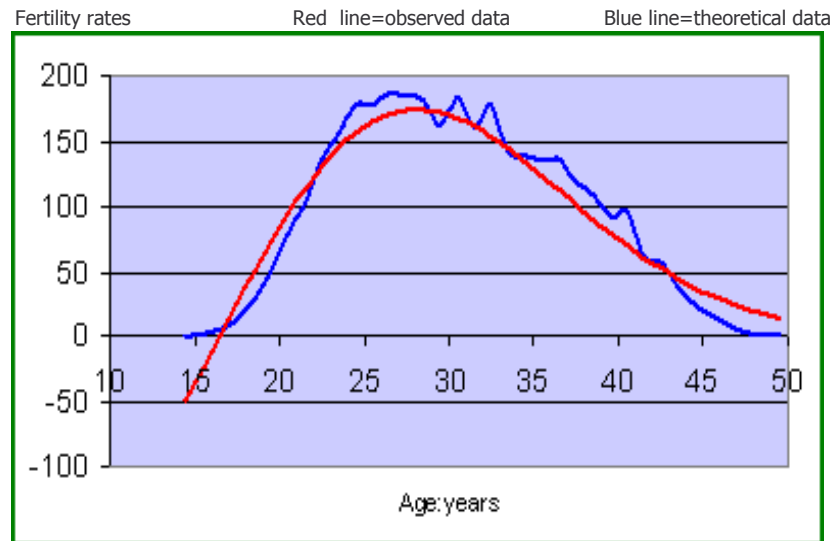


FERTILITY FUNCTIONS

(Source: Petrioli Luciano, "PRODEMOG 3.0-Demographic software for Windows", EMMECI-SIENA-ITALY,(2000).

RAYLEIGH



Age-specific fertility rates: Italy, year 1931

The density function and the distribution of Rayleigh are respectively:

$$f(x) = \left[C \cdot (x - B) / A^2 \right] \cdot e^{-0.5[(x-B)/A]^2} \quad \text{for } x > B \quad [1]$$

$$F(x) = -C \cdot \left[e^{-(x-B)^2 / 2A^2} + 1 \right]. \quad [2]$$

the values of mean and variance are:

$$MED = B + A \cdot \sqrt{\pi / 2} ; \quad DS = A^2 \cdot [(4 - \pi) / 2]. \quad [3]$$

Hence, we obtain an estimate of the parameters of the function, such that:

$$A = \sqrt{2 \cdot DS / (4 - \pi)} ; \quad B = MED - \sqrt{\pi \cdot DS / (4 - \pi)} \quad [4]$$

Values of age-specific fertility rates are negative until $B > x$. (*)

(*) In Rayleigh's function some negative values of fertility rates may appear especially

at the initial ages 14.5;15.5;...

The integral of the function is possible when beginning at 24.5 or 25.5 years of age.