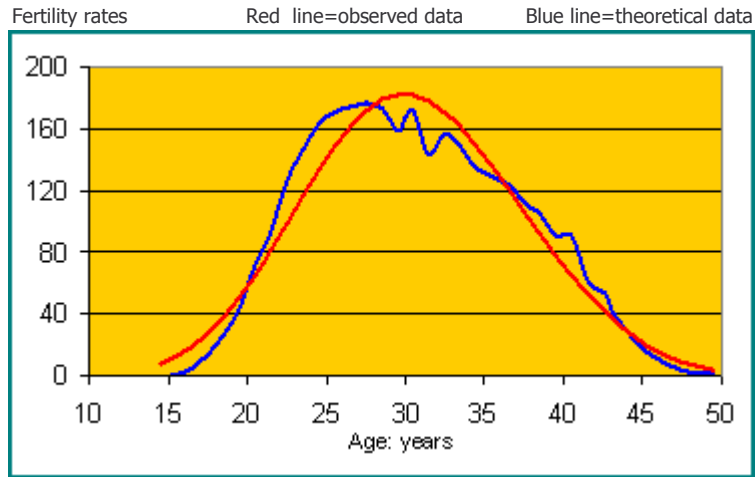


FERTILITY FUNCTIONS

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

WEIBULL



Age-specific fertility rates: Italy, year 1933

Weibull's distribution (where V is the variable of transformation) is:

$$F(x) = C \cdot e^{-A(V-x)^B} \quad [1]$$

while for the density function we have:

$$f(x) = C \cdot A \cdot B \cdot (V-x)^{B-1} \cdot e^{-A(V-x)^B} \quad [2]$$

Mean and variance are respectively:

$$\begin{aligned} MED &= V - A^{-1/B} \cdot \Gamma(1 + 1/B); \\ DS &= A^{-2/B} [\Gamma(1 + 2/B) - \Gamma^2(1 + 1/B)]. \end{aligned} \quad [3]$$

We could initially try to determine a provisional value for B, and then vary it in a way to optimize the estimate of A and of B, using:

$$A = [\Gamma(1 + 1/B) / (V - MED)]^B \quad [4]$$

but the problem is not easy to resolve.