

$$\bar{a}_x(t) = \int_0^{\infty} {}_s p_x(t) v(s, t) ds$$

$$\underbrace{e^{-\int_0^s \mu(x+y, t) dy}}_{\text{mortality}}$$

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$$\bar{a}_x(t) = \int_0^\infty {}_s p_x(t) v(s,t) ds$$

$$\dot{\bar{a}}_x(t) = \frac{\partial \bar{a}_x(t)}{\partial t}$$