Τυπολόγιο ασφαλίσεις ζωής ΙΙ - ΜΕΡΟΣ 1ο

Κατάσταση επιβίωσης $u = xy$, επιβιώνουν και τα 2 - άτομα.

$u = \overline{xy}$: επιβιώνει ένα άτομο.

$${}_tp_{xy} = {}_tp_x \cdot {}_tp_y$$

$${}_tq_{\overline{xy}} = {}_tq_x \cdot {}_tq_y$$

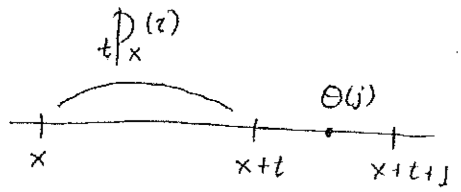
$$\overline{xy} = x + y - xy \quad (\text{bilaruler})$$

${}_tq_x^{(\tau)}$ = πιθανότητα θανάτου ανεξάρτητα αιτίας

${}_tq_x^{(j)}$: —″— λόγω αιτίας (j)

$${}_tq_x^{(\tau)} = \sum_j {}_tq_x^{(j)}$$

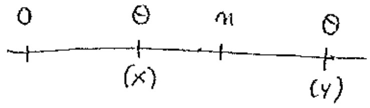
$${}_{t|}q_x^{(j)} = {}_tp_x^{(\tau)} \cdot q_{x+t}^{(j)} :$$



$${}_2q_x^{(1)} = q_x^{(1)} + p_x^{(\tau)} \cdot q_{x+1}^{(1)}$$

Σημειώσεις . Επιμέλεια Δρ. Σωκράτης Σκλάβος,
Χαρ. Τρικούπη 45, 10681, Αθήνα, (Μετρό Στάση Πανεπιστήμιο), Τηλ.: 2107780514, 6907495403
info@synelixis.net, www.synelixis.net

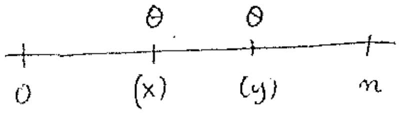
$_{n}q_{\overset{1}{x}y}$:



$$= \int_0^n {}_tp_{xy}\cdot\mu_{x+t}\,dt$$

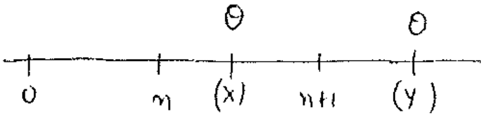
$$_{n}q_{xy} = {}_{n}q_{\overset{1}{x}y} + {}_{n}q_{x\overset{1}{y}}$$

$_{n}q_{x\overset{2}{y}}$:



$$_{n}q_{x\overset{2}{y}} = {}_{n}q_{y} - {}_{n}q_{x\overset{1}{y}}$$

$_{n|}q_{\overset{1}{x}y}$:



$$_{n|}q_{\overset{1}{x}y} = \int_n^{n+1} {}_tp_{xy}\cdot\mu_{x+t}\,dt$$

$$_{n}q_{y} = {}_{n}q_{x\overset{1}{y}} + {}_{n}q_{x\overset{2}{y}}$$

$_{n}d_x^{(j)}$ = αριθμός ατόμων (x) που αποχώρησαν τα προσεχή n-έτη λόγω (j)

$d_x^{(j)} = l_x^{(j)}\cdot q_x^{(j)}$, $d_{x+n}^{(j)} = l_x^{(\tau)}\cdot {}_{n|}q_x^{(j)}$

$l_x^{(\tau)}$ = αριθμός ατόμων που φτάνουν στην ηλικία x.

$p_x^{(\tau)} = \dfrac{l_{x+1}^{(\tau)}}{l_x^{(\tau)}}$ $\quad {}_{n}p_x^{(\tau)} = \dfrac{l_{x+n}^{(\tau)}}{l_x^{(\tau)}}$

Τ Υ Π Ο Λ Ο Γ Ι Ο

$$ {}_tp_x = \exp\left(-\int_x^{x+t}\mu_z\,dz\right) = \exp\left(-\int_0^t \mu_{x+z}\,dz\right) $$

$$ A_x = \sum_{k=0}^{\infty} \upsilon^{k+1}\,{}_kp_x\,q_{x+k} \qquad \bar{A}_u = \int_0^\infty \upsilon^t\,{}_tp_u\,\mu_{u+t}\,dt \qquad \ddot{a}_x = \sum_{k=0}^{\infty}\upsilon^k\,{}_kp_x \qquad \bar{a}_x = \int_0^\infty \upsilon^t\,{}_tp_x\,dt $$

$$ \bar{a}_x = \frac{1-\bar{A}_x}{\delta} \qquad \ddot{a}_x = \frac{1-A_x}{d} \qquad \upsilon = \frac{1}{1+i} \qquad \delta = \ln(1+i) \qquad d = 1-\upsilon $$

$$ A_{xy} + A_{\overline{xy}} = A_x + A_y \qquad \bar{A}^{1}_{\overline{xy}:\overline{n|}} = \bar{A}^{1}_{x:\overline{n|}} + \bar{A}^{1}_{y:\overline{n|}} - \bar{A}^{\;1}_{\widehat{xy}:\overline{n|}} \qquad \bar{A}_{xy} + \bar{A}_{\overline{xy}} = \bar{A}_x + \bar{A}_y \qquad \bar{a}_{xy} + \bar{a}_{\overline{xy}} = \bar{a}_x + \bar{a}_y $$

$$ \ddot{a}_{xy} + \ddot{a}_{\overline{xy}} = \ddot{a}_x + \ddot{a}_y \qquad \ddot{a}_{xy:\overline{n|}} + \ddot{a}_{\overline{xy}:\overline{n|}} = \ddot{a}_{x:\overline{n|}} + \ddot{a}_{y:\overline{n|}} $$

$$ \bar{A}_{x\overset{2}{y}} = \int_0^\infty \upsilon^t\,{}_tq_x\,{}_tp_y\,\mu_{y+t}\,dt = \int_0^\infty \upsilon^t\,{}_tp_y\,\mu_{y+t}\,dt - \int_0^\infty \upsilon^t\,{}_tp_x\,{}_tp_y\,\mu_{y+t}\,dt = \bar{A}_y - \bar{A}_{x\overset{1}{y}} $$

$$ \bar{A}_{\overset{1}{x}y} = \int_0^\infty \upsilon^s\,{}_sp_y\,{}_sp_x\,\mu_{x+s}\,ds = \int_0^\infty \upsilon^s\,{}_sp_{xy}\,\mu_{x+s}\,ds \qquad A_{x\overset{2}{y}} = \sum_{k=0}^{\infty}\upsilon^{k+1}\,{}_{k|}q_{x\overset{2}{y}} = \sum_{k=0}^{\infty}\upsilon^{k+1}\left({}_{k|}q_y - {}_{k|}q_{x\overset{1}{y}}\right) $$

$$ \bar{A}_{xy} = \bar{A}_{\overset{1}{x}y} + \bar{A}_{x\overset{1}{y}} \qquad \bar{A}^{\;1}_{\widehat{xy}:\overline{n|}} = \bar{A}^{1}_{xy:\overline{n|}} + \bar{A}^{\;1}_{xy:\overline{n|}} \qquad A^{\;1}_{\widehat{xy}:\overline{n|}} = A^{1}_{xy:\overline{n|}} + A^{\;1}_{xy:\overline{n|}} $$

$$ A^{2}_{xy:\overline{n|}} + A^{\;2}_{xy:\overline{n|}} = A_{\overline{xy}:\overline{n|}} \qquad \bar{A}^{2}_{xy:\overline{n|}} + \bar{A}^{\;2}_{xy:\overline{n|}} = \bar{A}_{\overline{xy}:\overline{n|}} \qquad \bar{A}_{\overset{2}{x}x} = \bar{A}_{x\overset{2}{x}} \qquad \bar{A}_{\overset{1}{x}x} = \bar{A}_{x\overset{1}{x}} $$

$$ a_{x|y} = \frac{A_{xy} - A_y}{d} \qquad \bar{a}_{x|y} = \bar{a}_y - \bar{a}_{xy} \qquad \bar{a}_{v|u} = \bar{a}_u - \bar{a}_{vu} \qquad \ddot{a}_{x|y} = a_{x|y} $$

$$ \ddot{a}_{v|u} = \ddot{a}_u - \ddot{a}_{vu} \qquad \ddot{a}_{x|y} = a_{x|y} \qquad \ddot{a}_{x|y:\overline{n|}} = \ddot{a}_{y:\overline{n|}} - \ddot{a}_{xy:\overline{n|}} $$

$$ \ddot{a}_{v|u:\overline{n|}} = \ddot{a}_{u:\overline{n|}} - \ddot{a}_{vu:\overline{n|}} \qquad \bar{a}_{v|u:\overline{n|}} = \bar{a}_{u:\overline{n|}} - \bar{a}_{vu:\overline{n|}} $$

$$ \bar{a}_{\overline{x:\overline{n|}}|y} = \bar{a}_y - \bar{a}_{\overline{x:\overline{n|}}:y} = \bar{a}_y - (\bar{a}_{xy} + \bar{a}_{y:\overline{n|}} - \bar{a}_{xy:\overline{n|}}) = (\bar{a}_y - \bar{a}_{y:\overline{n|}}) - (\bar{a}_{xy} - \bar{a}_{xy:\overline{n|}}) = {}_{n|}\bar{a}_y - {}_{n|}\bar{a}_{xy} $$

$$ {}_{n|}\bar{a}_{xy} = \bar{a}_{\overline{n|}|xy} = \bar{a}_{xy} - \bar{a}_{xy:\overline{n|}} $$

$$ \mu^{(\tau)}_{x+t} = \sum_{j=1}^{m}\mu^{(j)}_{x+t}, \qquad {}_tp^{(\tau)}_x = \exp\left(-\int_0^t \mu^{(\tau)}_{x+s}\,ds\right), \qquad f_{T,J}(t,j) = {}_tp^{(\tau)}_x\,\mu^{(j)}_{x+t} $$