How to use the mortality tables

Isabelle SÉGUY

Standard tables (Power model)

File "Table-type Entrée Qx- r=0.xlsx"

File contents

Spreadsheet name	Content
HoFe Q$_x$ préc et suivant	estimated mortality by age based on previous mortality rate: both sexes
	Estimated mortality by age based on following mortality rate: both sexes
Ho Q$_x$ préc et suivant	Estimated mortality by age based on previous mortality rate: Men
	Estimated mortality by age based on following mortality rate: Men
Fe Q$_x$ préc et suivant	Estimated mortality by age based on previous mortality rate: Women
	Estimated mortality by age based on following mortality rate: Women

How to use the spreadsheets

Estimates based on previous rate

Méthode du quotient précédent									intervalle de confiance à 95 %		intervalle de confiance à 66 %			intervalle de confiance à 95 %		intervalle de confiance à 66 %	
log aqx	variable explicative	valeur du quotient précédent	valeur de log aqx	a0	a1	R² ajusté	Ecart type du log aqx	Nombre final de tables	log aqx estimé	min	max	min	max	aqx estimé	min	max	min	max
log 1q4	log 1q0	0,2	-0,699	-0,116	1,039	0,74	0,0733	148	-0,842	-0,854	-0,830	-0,848	-0,836	0,144	0,140	0,148	0,142	0,146
log 5q5	log 1q4	0,12	-0,921	-0,397	1,092	0,75	0,0976	147	-1,403	-1,418	-1,387	-1,410	-1,395	0,040	0,038	0,041	0,039	0,040
log 5q10	log 5q5	0,04	-1,398	-0,685	0,673	0,81	0,0663	158	-1,625	-1,636	-1,615	-1,630	-1,620	0,024	0,023	0,024	0,023	0,024

FORMULE : log(aq(x+a)) = a0 + a1*log(aqx)

Enter data in the cell(s) corresponding to the observed previous rate *(valeur du quotient précédent)*

Read the average value of the estimated rate from column O (heading in red) and the values for ± 1 or 2 standard deviations from the columns to the right (headings in pink).

Estimates based on following rate

Méthode du quotient suivant								intervalle de confiance à 95 %		intervalle de confiance à 66 %			intervalle de confiance à 95 %		intervalle de confiance à 66 %	
entrée																
5q5	0,04	**log(5q5)**	-1,398													
FORMULE : log(aqx) = a0 + a1*log(5q5)																
log aqx	variable explicative	a0	a1	R² ajusté	Ecart type du log aqx	Nombre final de tables	log aqx estimé	min	max	min	max	aqx estimé	min	max	min	max
log 1q0	log 5q5	-0,183	0,407	0,808	0,043	131	**-0,752**	-0,759	-0,744	-0,755	-0,748	**0,177**	0,174	0,180	0,176	0,179
log 1q4	log 5q5	-0,142	0,547	0,802	0,057	138	**-0,907**	-0,916	-0,897	-0,911	-0,902	**0,124**	0,121	0,127	0,123	0,125

Enter in cell B39, the value of the observed rate.

Read the average value of the estimated rate from column M (heading in red) and the values for ± 1 or 2 standard deviations from the columns to the right (headings in pink).

Files: "Table-type Entrée a20.xlsx"; "Table-type Entrée IJ.xlsx"; "Table-type Entrée P.xlsx"; "Table-type combinaisons d'entrées.xlsx"

File contents

Spreadsheet name	Content
A_{20}-HoFe	Estimated mortality by age based on value "a_{20}" (average adult age at death): both sexes
A_{20}-Ho	Estimated mortality by age based on value "a_{20}" (average adult age at death): Men
A_{20}-Fe	Estimated mortality by age based on value "a_{20}" (average adult age at death): Women
IJ-HoFe	Estimated mortality by age based on value "IJ" (juvenility index): both sexes
IJ-Ho	Estimated mortality by age based on value "IJ" (juvenility index): Men
IJ-Fe	Estimated mortality by age based on value "IJ" (juvenility index): Women
P-HoFe	Estimated mortality by age based on value "P" (proportion of young people): both sexes
P-Ho	Estimated mortality by age based on value "P" (proportion de young people): Men
P-Fe	Estimated mortality by age based on value "P" (proportion de young people): Women
Meilleur modèle HoFe	Estimated mortality by age based on statistically most relevant values: both sexes
Meilleur modèle-Ho	Estimated mortality by age based on statistically most relevant values: Men
Meilleur modèle-Fe	Estimated mortality by age based on statistically most relevant values: Women
qualité estim a_{20} selon *r*	Mortality rates that can be accurately estimated by "a_{20}" ($R^2 \geq 0,78$): both sexes, men, women
qualité estim IJ ou P selon *r*	Mortality rates that can be accurately estimated by "IJ" or "P" ($R^2 \geq 0,78$): both sexes

How to use the spreadsheets

Single entry model

| entrée "a20" | 53,9 | | | | | | | | | | | | | | | | |

log q x	variable explicative	a0	a1	R2 ajusté	Ecart type du log q x	Nombre final de tables	valeur de r	log aq x estimé	intervalle de confiance à 95 % min	max	intervalle de confiance à 66 % min	max	aq x estimé	intervalle de confiance à 95 % min	max	intervalle de confiance à 66 % min	max
log 5q0	a20	0,3252	-0,0127	0,3289	0,0625	128	-0,03	-0,358	-0,369	-0,347	-0,363	-0,353	0,438	0,428	0,449	0,433	0,444
log 1q0	a20	0,3980	-0,0168	0,4768	0,0624	126	-0,03	-0,505	-0,516	-0,494	-0,511	-0,500	0,312	0,305	0,320	0,309	0,316
log 1q4	a20	-0,1314	-0,0114	0,2041	0,0811	125	-0,03	-0,747	-0,761	-0,732	-0,753	-0,740	0,179	0,173	0,185	0,176	0,182

Select chosen rate of increase (column H: valeur de r).

Enter value of entry (A_{20}, IJ or P) in cell B12.

Read the average value of the estimated rate from column N (heading in red) and the values for ± 1 or 2 standard deviations from the columns to the right (headings in pink).

Exercise caution for estimates with R^2 lower than 0.78 (column E, dark grey cells).

Combined entry model

entrées	IJ	log (IJ)	a20														
	0,127	-0,896	53,9														

log aqx	variable explicative	a0	a1	R² ajusté	Ecart type du log aqx	Nombre final de tables	valeur de r	log aq x estimé	intervalle de confiance à 95 % min	max	intervalle de confiance à 66 % min	max	aq x estimé	intervalle de confiance à 95 % min	max	intervalle de confiance à 66 % min	max
log 1q0	Log IJ	-0,335	0,441	0,823	0,042	129	0,01	-0,731	-0,738	-0,724	-0,734	-0,727	0,186	0,183	0,189	0,184	0,187
log 1q4	Log IJ	-0,365	0,573	0,808	0,054	128	0,01	-0,879	-0,888	-0,869	-0,883	-0,874	0,132	0,129	0,135	0,131	0,134
log 5q5	Log IJ	-0,387	1,065	0,979	0,030	163	0,01	-1,342	-1,346	-1,337	-1,344	-1,340	0,046	0,045	0,046	0,045	0,046

Select chosen rate of increase (column H) for a value of *r* between -0.1 and 0.1[1].

Enter the value of IJ in cell B12, A_{20} in cell D12 and P in cell E12.

Read the average value of the estimated rate from column N (heading in red) and the values for ± 1 or 2 standard deviations from the columns to the right (headings in pink).

Exercise caution for estimates with R^2 lower than 0.78 (column E, dark grey cells).

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[1] For values of r ≥+0.1 or ≤-0.1, construct series of equations using the value that presents the best estimate and/or lowest standard deviation (see final two spreadsheets in folder for decision-making tool).

Standard tables (logit model)

File "Table-type logits.xlsx"

These tables provide mortality rates by age as a function of parameters α and β of the logit model. They may also be used on the basis of an approximate value of one of the three paleodemographic parameters (average age at death, juvenility index and indicator P).

See Section 8 for instructions.

Constructing a mortality table

File "Utilitaire mortalité.xlsx"

Spreadsheet for establishing the main parameters of a mortality table on the basis of mortality rates by age (e.g., those taken from previous estimates).

1. calculation of the distribution of survivors and deceased by age, and life expectancy by age;
2. calculation of the mortality rate between birth and age 4;
3. graphical display of the parameters of the mortality table.