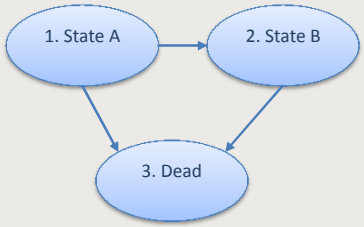
Supplementary file for Jones, Epstein, Garcia-Mochon, "A procedure for deriving formulas to convert transition rates to probabilities for multi-state Markov models"

Model 1. Three-state model with forward transitions only



Matrix Q

	State A	State B	Dead
State A	-0.01	0.002996	0.0023346
State B	0.00	0.00	0.00099
Dead	0.00	0.00	0.00

Matrix D

	State A	State B	Dead
State A	-0.0053	0	0
State B	0	-0.0010	0
Dead	0	0	0

Matrix U

	State A	State B	Dead
State A	1.0000	0.00	1
State B	0	0.0043	1
Dead	0	0	1

Matrix U^(-1)

	State A	State B	Dead
State A	1.00	-0.69	-0.31
State B	0.00	230.57	-230.57
Dead	0.00	0.00	1.00

Matrix Exp(D)

	State A	State B	Dead
State A	0.9947	0	0
State B	0	0.9990	0
Dead	0	0	1

Matrix P(1) = U * Exp(D) * U^(-1)

	State A	State B	Dead
State A	0.995	0.003	0.002
State B	0.000	0.999	0.001
Dead	0.000	0.000	1.000

Transition rates

	From State A to ...			From State B to ...	
	State A	State B	Dead	State B	Dead
Cycle	q11	q12	q13	-q23	q23
0					
1	-0.01	0.0029957	0.0023346	-0.000993	0.00099
2	-0.01	0.0036877	0.0027034	-0.001785	0.00179
3	-0.01	0.0043751	0.0030449	-0.002386	0.00239
4	-0.01	0.0050513	0.0033702	-0.003002	0.00300
5	-0.01	0.0057231	0.0036938	-0.003714	0.00371
6	-0.01	0.0064007	0.0040325	-0.004503	0.00450
7	-0.01	0.0070966	0.0044027	-0.005341	0.00534
8	-0.01	0.0078172	0.0048117	-0.006204	0.00620
9	-0.01	0.0085558	0.0052566	-0.007073	0.00707
10	-0.02	0.009298	0.0057349	-0.007943	0.00794
11	-0.02	0.0100377	0.0062397	-0.008797	0.00880
12	-0.02	0.0107798	0.0067639	-0.009632	0.00963
13	-0.02	0.0115252	0.007309	-0.010455	0.01045
14	-0.02	0.0122756	0.0078889	-0.011283	0.01128
15	-0.02	0.0130302	0.0085212	-0.012136	0.01214
16	-0.02	0.0137858	0.0092185	-0.013032	0.01303
17	-0.02	0.0145385	0.0099915	-0.014013	0.01401
18	-0.03	0.0152881	0.0108583	-0.015122	0.01512
19	-0.03	0.0160405	0.0118465	-0.016375	0.01638
20	-0.03	0.0167826	0.0129892	-0.01778	0.01778
21	-0.03	0.0174968	0.0142995	-0.019324	0.01932
22	-0.03	0.0181637	0.0157778	-0.020995	0.02099
23	-0.04	0.0187573	0.0174253	-0.022768	0.02277
24	-0.04	0.0192367	0.0192662	-0.024639	0.02464
25	-0.04	0.0195705	0.0213433	-0.026604	0.02660
26	-0.04	0.0197615	0.0236544	-0.028664	0.02866
27	-0.05	0.0198191	0.0261833	-0.030823	0.03082
28	-0.05	0.019745	0.0289248	-0.033096	0.03310
29	-0.05	0.0195386	0.0318917	-0.035485	0.03548
30	-0.05	0.0191978	0.0351053	-0.037976	0.03798
31	-0.06	0.0187206	0.0385895	-0.040544	0.04054
32	-0.06	0.0180982	0.0423698	-0.043163	0.04316
33	-0.06	0.0173071	0.0464756	-0.045829	0.04583
34	-0.07	0.0163075	0.0509314	-0.048526	0.04853
35	-0.07	0.0150387	0.0557517	-0.051202	0.05120
36	-0.07	0.0134288	0.0609449	-0.0538	0.05380
37	-0.08	0.0114066	0.0665358	-0.056247	0.05625
38	-0.08	0.008918	0.0725969	-0.058481	0.05848

Transition probabilities

	From State A to ...			From State B to ...	
	State A	State B	Dead	State B	Dead
1	0.995	0.003	0.002	0.999	0.001
2	0.994	0.004	0.003	0.998	0.002
3	0.993	0.004	0.003	0.998	0.002
4	0.992	0.005	0.003	0.997	0.003
5	0.991	0.006	0.004	0.996	0.004
6	0.990	0.006	0.004	0.996	0.004
7	0.989	0.007	0.004	0.995	0.005
8	0.987	0.008	0.005	0.994	0.006
9	0.986	0.009	0.005	0.993	0.007
10	0.985	0.009	0.006	0.992	0.008
11	0.984	0.010	0.006	0.991	0.009
12	0.983	0.011	0.007	0.990	0.010
13	0.981	0.012	0.007	0.990	0.010
14	0.980	0.012	0.008	0.989	0.011
15	0.979	0.013	0.008	0.988	0.012
16	0.977	0.014	0.009	0.987	0.013
17	0.976	0.015	0.010	0.986	0.014
18	0.974	0.015	0.010	0.985	0.015
19	0.972	0.016	0.011	0.984	0.016
20	0.971	0.017	0.012	0.982	0.018
21	0.969	0.018	0.014	0.981	0.019
22	0.967	0.018	0.015	0.979	0.021
23	0.964	0.019	0.017	0.977	0.023
24	0.962	0.019	0.018	0.976	0.024
25	0.960	0.020	0.020	0.974	0.026
26	0.958	0.020	0.023	0.972	0.028
27	0.955	0.020	0.025	0.970	0.030
28	0.952	0.020	0.028	0.967	0.033
29	0.950	0.020	0.030	0.965	0.035
30	0.947	0.019	0.033	0.963	0.037
31	0.944	0.019	0.037	0.960	0.040
32	0.941	0.018	0.040	0.958	0.042
33	0.938	0.017	0.044	0.955	0.045
34	0.935	0.016	0.049	0.953	0.047
35	0.932	0.015	0.053	0.950	0.050
36	0.928	0.014	0.058	0.948	0.052
37	0.925	0.012	0.063	0.945	0.055
38	0.922	0.009	0.069	0.943	0.057

State transition model (Markov trace)

State A	State B	Dead	*Check*
1			
0.995	0.003	0.002	1.00
0.988	0.007	0.005	1.00
0.981	0.011	0.008	1.00
0.973	0.016	0.011	1.00
0.964	0.021	0.015	1.00
0.954	0.028	0.019	1.00
0.943	0.034	0.023	1.00
0.931	0.041	0.028	1.00
0.918	0.049	0.033	1.00
0.904	0.057	0.038	1.00
0.890	0.066	0.044	1.00
0.874	0.075	0.051	1.00
0.858	0.084	0.058	1.00
0.841	0.094	0.065	1.00
0.823	0.104	0.073	1.00
0.804	0.114	0.082	1.00
0.785	0.124	0.091	1.00
0.765	0.134	0.101	1.00
0.744	0.144	0.112	1.00
0.722	0.154	0.124	1.00
0.699	0.164	0.137	1.00
0.676	0.173	0.151	1.00
0.652	0.182	0.166	1.00
0.627	0.191	0.182	1.00
0.602	0.198	0.200	1.00
0.576	0.204	0.219	1.00
0.551	0.210	0.240	1.00
0.524	0.214	0.262	1.00
0.498	0.217	0.285	1.00
0.472	0.218	0.310	1.00
0.445	0.218	0.336	1.00
0.419	0.217	0.363	1.00
0.393	0.215	0.392	1.00
0.368	0.211	0.421	1.00
0.343	0.206	0.451	1.00
0.318	0.200	0.482	1.00
0.294	0.193	0.513	1.00
0.271	0.185	0.544	1.00