

**Corrections and Table AI to:  
Monitoring medical procedures  
by exponential smoothing**

by

**Henrik Spliid**

**Reference:** Spliid, H. Monitoring medical procedures by exponential smoothing, *Statistics in Medicine*, in press (2006/2007).

## Corrections to original article

Section 7.1. Line 9 use:  $UCL(\infty) = 1.73$

Revised Table I. Use:

$UCL_{\xi}$ [ L=2.0: $UCL(\infty)=1.47$ ]	1.11	1.26	1.34	1.39	1.42	1.44	1.45	1.46	1.46
$UCL_{\xi}$ [ L=2.5: $UCL(\infty)=1.73$ ]	1.27	1.46	1.57	1.63	1.67	1.69	1.70	1.71	1.72

Table AI. The quantile values for  $\lambda = 0.10$  and  $0.15$  are between  $0.01$  and  $0.05$  too large (increasing with  $L$ ). The deviations are smaller for larger  $\lambda$ . An improved and more accurate table is given below.

## Revised and improved Table AI

Table of steady state mean, standard deviation and quantiles for the distribution of the EWMA of  $Z' = -\log(X - 0.5) + \log(1/p - 0.5)$  for selected failure probabilities and for different choices of  $\lambda$ . The mean and the standard deviation are exact. The quantiles are based on numerical simulation with  $n=10000000$   $X$  values per  $\lambda$  and  $p$  combination. Intermediate values can be computed by linear interpolation.

The variation of the last digit (0.001) illustrates the accuracy of the table.

The improved table is given on the next pages.

Table AI (1)

$\lambda$	$p$	Mean	SD	Normal quantiles = $L$ in design									
				-3.0	-2.8	-2.6	-2.4	-2.2	-2.0	-1.5	-1.0	-0.5	0.0
0.05	0.001	0.577	0.205	0.021	0.054	0.088	0.121	0.156	0.190	0.280	0.373	0.469	0.568
	0.005	0.575	0.204	0.020	0.053	0.087	0.121	0.155	0.190	0.280	0.372	0.468	0.567
	0.010	0.573	0.203	0.020	0.054	0.087	0.120	0.155	0.190	0.279	0.371	0.467	0.566
	0.025	0.568	0.199	0.021	0.053	0.087	0.120	0.155	0.189	0.278	0.369	0.464	0.562
	0.050	0.558	0.195	0.016	0.049	0.083	0.116	0.150	0.185	0.273	0.364	0.458	0.554
	0.075	0.549	0.190	0.016	0.049	0.081	0.115	0.148	0.183	0.270	0.359	0.451	0.546
	0.100	0.539	0.186	0.012	0.045	0.077	0.111	0.144	0.178	0.264	0.353	0.443	0.536
	0.150	0.520	0.179	0.009	0.040	0.072	0.104	0.137	0.170	0.254	0.340	0.428	0.518
	0.200	0.501	0.172	0.003	0.034	0.066	0.098	0.130	0.162	0.244	0.328	0.413	0.499
0.250	0.482	0.166	-0.006	0.024	0.055	0.086	0.118	0.150	0.230	0.311	0.394	0.477	
0.10	0.001	0.577	0.294	-0.186	-0.142	-0.098	-0.054	-0.007	0.039	0.160	0.286	0.420	0.561
	0.005	0.575	0.292	-0.185	-0.142	-0.098	-0.054	-0.008	0.039	0.159	0.285	0.419	0.560
	0.010	0.573	0.290	-0.187	-0.143	-0.099	-0.055	-0.009	0.038	0.158	0.284	0.418	0.558
	0.025	0.568	0.285	-0.186	-0.143	-0.099	-0.055	-0.009	0.037	0.157	0.284	0.416	0.555
	0.050	0.558	0.279	-0.188	-0.145	-0.101	-0.056	-0.011	0.035	0.155	0.280	0.411	0.548
	0.075	0.549	0.273	-0.192	-0.148	-0.104	-0.060	-0.014	0.032	0.151	0.275	0.405	0.540
	0.100	0.539	0.267	-0.192	-0.149	-0.105	-0.061	-0.016	0.030	0.148	0.272	0.400	0.532
	0.150	0.520	0.257	-0.195	-0.152	-0.108	-0.064	-0.020	0.025	0.141	0.262	0.387	0.515
	0.200	0.501	0.247	-0.199	-0.157	-0.114	-0.071	-0.027	0.018	0.133	0.251	0.373	0.496
0.250	0.482	0.238	-0.203	-0.161	-0.118	-0.075	-0.032	0.012	0.124	0.239	0.357	0.476	
0.15	0.001	0.577	0.365	-0.341	-0.290	-0.238	-0.186	-0.132	-0.077	0.066	0.218	0.379	0.552
	0.005	0.575	0.362	-0.341	-0.291	-0.240	-0.187	-0.133	-0.078	0.065	0.217	0.378	0.552
	0.010	0.573	0.360	-0.341	-0.291	-0.239	-0.187	-0.133	-0.078	0.064	0.216	0.378	0.550
	0.025	0.568	0.354	-0.342	-0.292	-0.240	-0.187	-0.134	-0.079	0.064	0.215	0.376	0.547
	0.050	0.558	0.346	-0.342	-0.292	-0.241	-0.189	-0.135	-0.080	0.062	0.212	0.372	0.542
	0.075	0.549	0.338	-0.340	-0.291	-0.240	-0.188	-0.135	-0.081	0.060	0.210	0.368	0.535
	0.100	0.539	0.331	-0.343	-0.294	-0.244	-0.191	-0.138	-0.084	0.057	0.206	0.363	0.528
	0.150	0.520	0.319	-0.346	-0.296	-0.246	-0.194	-0.141	-0.087	0.052	0.199	0.352	0.512
	0.200	0.501	0.307	-0.349	-0.300	-0.250	-0.198	-0.146	-0.092	0.046	0.190	0.340	0.495
0.250	0.482	0.296	-0.350	-0.302	-0.252	-0.201	-0.150	-0.098	0.038	0.179	0.325	0.475	
0.20	0.001	0.577	0.427	-0.469	-0.413	-0.356	-0.297	-0.237	-0.176	-0.014	0.158	0.344	0.544
	0.005	0.575	0.424	-0.466	-0.410	-0.354	-0.296	-0.236	-0.174	-0.014	0.159	0.343	0.543
	0.010	0.573	0.422	-0.468	-0.413	-0.356	-0.297	-0.237	-0.175	-0.015	0.158	0.343	0.542
	0.025	0.568	0.415	-0.468	-0.413	-0.356	-0.298	-0.238	-0.176	-0.016	0.156	0.341	0.539
	0.050	0.558	0.405	-0.469	-0.414	-0.357	-0.299	-0.239	-0.178	-0.017	0.154	0.338	0.535
	0.075	0.549	0.396	-0.470	-0.414	-0.358	-0.300	-0.240	-0.179	-0.020	0.151	0.333	0.528
	0.100	0.539	0.388	-0.473	-0.417	-0.360	-0.302	-0.242	-0.180	-0.021	0.149	0.330	0.523
	0.150	0.520	0.373	-0.472	-0.417	-0.361	-0.304	-0.245	-0.184	-0.026	0.142	0.320	0.507
	0.200	0.501	0.359	-0.472	-0.417	-0.361	-0.305	-0.247	-0.186	-0.030	0.135	0.310	0.491
0.250	0.482	0.346	-0.475	-0.421	-0.366	-0.308	-0.250	-0.191	-0.036	0.127	0.298	0.473	
0.25	0.001	0.577	0.484	-0.580	-0.520	-0.457	-0.394	-0.329	-0.262	-0.086	0.104	0.310	0.534
	0.005	0.575	0.481	-0.579	-0.520	-0.458	-0.395	-0.330	-0.262	-0.086	0.104	0.310	0.534
	0.010	0.573	0.478	-0.581	-0.520	-0.459	-0.395	-0.330	-0.263	-0.087	0.103	0.309	0.532
	0.025	0.568	0.470	-0.580	-0.520	-0.458	-0.395	-0.330	-0.262	-0.087	0.102	0.308	0.530
	0.050	0.558	0.459	-0.580	-0.520	-0.458	-0.395	-0.330	-0.263	-0.087	0.101	0.305	0.527
	0.075	0.549	0.449	-0.581	-0.522	-0.461	-0.397	-0.331	-0.265	-0.090	0.099	0.302	0.521
	0.100	0.539	0.440	-0.582	-0.522	-0.461	-0.398	-0.333	-0.266	-0.092	0.096	0.298	0.515
	0.150	0.520	0.423	-0.585	-0.525	-0.463	-0.400	-0.336	-0.269	-0.095	0.091	0.290	0.503
	0.200	0.501	0.407	-0.586	-0.525	-0.464	-0.401	-0.336	-0.271	-0.099	0.086	0.282	0.490
0.250	0.482	0.392	-0.585	-0.525	-0.465	-0.403	-0.339	-0.274	-0.104	0.078	0.271	0.472	

$\lambda$	$p$	Mean	SD	Normal quantiles = $L$ in design									
				0.0	0.5	1.0	1.5	2.0	2.2	2.4	2.6	2.8	3.0
0.05	0.001	0.577	0.205	0.568	0.672	0.780	0.892	1.010	1.057	1.106	1.156	1.205	1.256
	0.005	0.575	0.204	0.567	0.670	0.777	0.890	1.005	1.053	1.101	1.149	1.198	1.249
	0.010	0.573	0.203	0.566	0.668	0.776	0.885	1.000	1.047	1.093	1.141	1.189	1.238
	0.025	0.568	0.199	0.562	0.664	0.769	0.875	0.986	1.031	1.077	1.123	1.169	1.215
	0.050	0.558	0.195	0.554	0.654	0.755	0.859	0.964	1.007	1.050	1.092	1.136	1.180
	0.075	0.549	0.190	0.546	0.643	0.741	0.841	0.944	0.985	1.026	1.068	1.110	1.152
	0.100	0.539	0.186	0.536	0.630	0.725	0.823	0.923	0.962	1.002	1.042	1.082	1.122
	0.150	0.520	0.179	0.518	0.608	0.701	0.792	0.885	0.923	0.960	0.997	1.035	1.071
	0.200	0.501	0.172	0.499	0.586	0.673	0.760	0.847	0.882	0.917	0.952	0.986	1.021
	0.250	0.482	0.166	0.477	0.561	0.643	0.726	0.809	0.841	0.874	0.906	0.939	0.971
0.10	0.001	0.577	0.294	0.561	0.711	0.868	1.036	1.214	1.289	1.364	1.442	1.520	1.600
	0.005	0.575	0.292	0.560	0.708	0.866	1.032	1.207	1.279	1.353	1.427	1.503	1.579
	0.010	0.573	0.290	0.558	0.707	0.863	1.027	1.197	1.268	1.339	1.412	1.485	1.558
	0.025	0.568	0.285	0.555	0.701	0.854	1.013	1.178	1.245	1.313	1.382	1.451	1.520
	0.050	0.558	0.279	0.548	0.691	0.839	0.992	1.149	1.213	1.276	1.340	1.404	1.468
	0.075	0.549	0.273	0.540	0.680	0.826	0.972	1.121	1.182	1.241	1.302	1.362	1.423
	0.100	0.539	0.267	0.532	0.670	0.810	0.953	1.097	1.155	1.213	1.270	1.328	1.387
	0.150	0.520	0.257	0.515	0.646	0.780	0.913	1.047	1.100	1.154	1.206	1.259	1.310
	0.200	0.501	0.247	0.496	0.622	0.748	0.874	1.000	1.050	1.099	1.147	1.195	1.242
	0.250	0.482	0.238	0.476	0.596	0.717	0.835	0.953	0.999	1.044	1.089	1.133	1.177
0.15	0.001	0.577	0.365	0.552	0.737	0.937	1.151	1.382	1.480	1.579	1.682	1.787	1.895
	0.005	0.575	0.362	0.552	0.736	0.934	1.146	1.372	1.466	1.562	1.658	1.758	1.857
	0.010	0.573	0.360	0.550	0.735	0.931	1.141	1.362	1.453	1.545	1.639	1.734	1.831
	0.025	0.568	0.354	0.547	0.729	0.922	1.125	1.336	1.422	1.509	1.597	1.685	1.772
	0.050	0.558	0.346	0.542	0.721	0.907	1.102	1.300	1.380	1.461	1.541	1.621	1.702
	0.075	0.549	0.338	0.535	0.710	0.892	1.078	1.267	1.342	1.417	1.493	1.568	1.642
	0.100	0.539	0.331	0.528	0.699	0.877	1.056	1.236	1.309	1.380	1.452	1.523	1.592
	0.150	0.520	0.319	0.512	0.676	0.844	1.011	1.178	1.244	1.309	1.373	1.437	1.499
	0.200	0.501	0.307	0.495	0.652	0.810	0.967	1.123	1.183	1.243	1.301	1.358	1.414
	0.250	0.482	0.296	0.475	0.625	0.775	0.923	1.066	1.122	1.176	1.230	1.281	1.331
0.20	0.001	0.577	0.427	0.544	0.760	0.995	1.252	1.533	1.653	1.776	1.903	2.032	2.164
	0.005	0.575	0.424	0.543	0.759	0.994	1.249	1.524	1.638	1.755	1.874	1.995	2.117
	0.010	0.573	0.422	0.542	0.758	0.992	1.243	1.512	1.623	1.737	1.850	1.964	2.079
	0.025	0.568	0.415	0.539	0.754	0.983	1.226	1.480	1.583	1.687	1.790	1.895	2.000
	0.050	0.558	0.405	0.535	0.745	0.968	1.200	1.437	1.532	1.627	1.721	1.816	1.910
	0.075	0.549	0.396	0.528	0.734	0.951	1.172	1.397	1.486	1.575	1.662	1.749	1.835
	0.100	0.539	0.388	0.523	0.725	0.934	1.148	1.361	1.446	1.529	1.611	1.692	1.771
	0.150	0.520	0.373	0.507	0.703	0.900	1.099	1.294	1.370	1.444	1.518	1.589	1.659
	0.200	0.501	0.359	0.491	0.678	0.865	1.050	1.228	1.297	1.364	1.429	1.492	1.551
	0.250	0.482	0.346	0.473	0.652	0.829	1.002	1.167	1.230	1.290	1.349	1.405	1.457
0.25	0.001	0.577	0.484	0.534	0.779	1.049	1.345	1.675	1.816	1.963	2.115	2.271	2.429
	0.005	0.575	0.481	0.534	0.778	1.047	1.341	1.665	1.800	1.939	2.079	2.219	2.360
	0.010	0.573	0.478	0.532	0.777	1.045	1.337	1.652	1.782	1.913	2.045	2.178	2.310
	0.025	0.568	0.470	0.530	0.773	1.037	1.321	1.615	1.734	1.854	1.974	2.094	2.212
	0.050	0.558	0.459	0.527	0.767	1.024	1.291	1.565	1.673	1.782	1.888	1.994	2.097
	0.075	0.549	0.449	0.521	0.757	1.007	1.262	1.518	1.619	1.721	1.819	1.916	2.010
	0.100	0.539	0.440	0.515	0.748	0.989	1.233	1.477	1.572	1.665	1.756	1.846	1.932
	0.150	0.520	0.423	0.503	0.725	0.953	1.180	1.399	1.484	1.567	1.647	1.724	1.797
	0.200	0.501	0.407	0.490	0.703	0.918	1.127	1.328	1.404	1.477	1.547	1.614	1.677
	0.250	0.482	0.392	0.472	0.676	0.878	1.074	1.257	1.326	1.391	1.453	1.511	1.565

[End-of-document]