

**Supplement to**

**Estimating Mortality Differentials in Developed  
Populations from Survey Information on Maternal and  
Paternal Orphanhood**

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## Abstract

This supplement contains improved parameters for applying the extended orphanhood method (EOM) to the Italian Multipurpose Surveys (MPS) of 1998 and 2003. In the European Demographic Research Paper 2009-3, the estimated age at childbirth of all mothers/fathers of survey respondents by information on age at childbirth of surviving mothers/fathers only (Tab. A.5 – A.8), the weighting factors  $W(n)$  (Tab. A.9-A.12) as well as the parameters  $a(n)$  and  $b(n)$  (Tab. A.13 – A.20) were based on the age-specific fertility rates of the Italian population at the time of respondents' birth. These rates were adjusted for variable ages at childbearing by taking into account the age composition of the Italian population at the time of respondents' birth. However, the age composition itself was not included in the parameters. The parameters presented in this supplement have also been adjusted for the age composition of the Italian population at the time of respondents' birth and thus should be the first choice when applying the EOM to the MPS 1998 and 2003 data. This supplement includes the adjusted Tables A.5 – A.20 as well as Figures 5 – 7 with the corresponding EOM estimates.

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*European Demographic Research Papers* are working papers that deal with all-European issues or with issues that are important to a large number of countries. All contributions have received limited review.

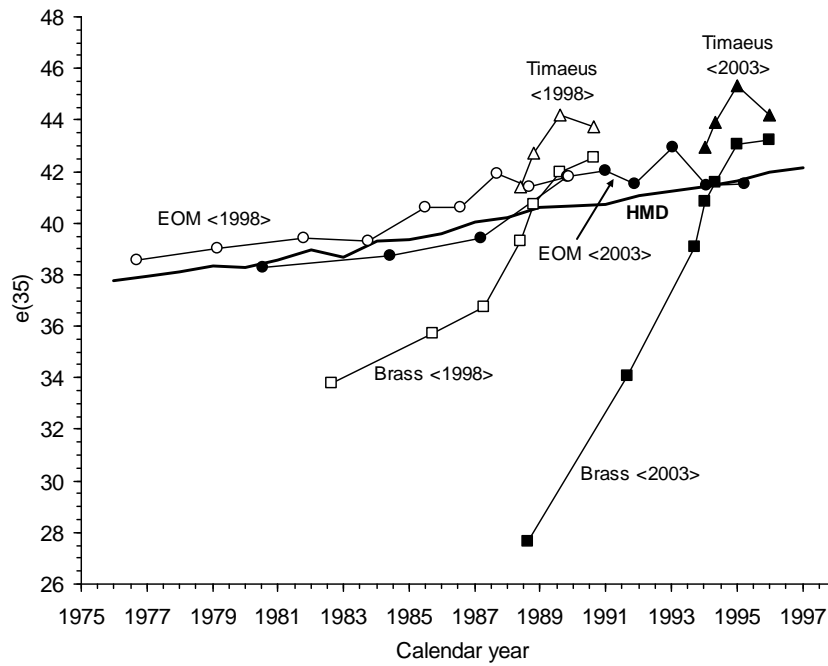
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Dimitar Philipov

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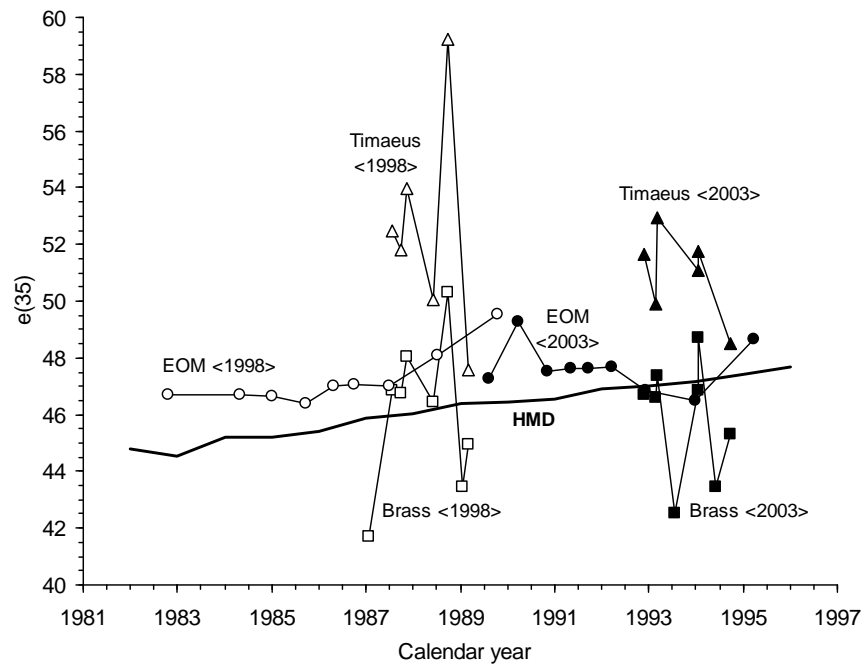
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**Figure 5a** Estimates for male life expectancy at age 35 by applying the extended orphanhood method (EOM) and the methods of Brass and Timæus, Italian 1998 and 2003 multipurpose surveys.



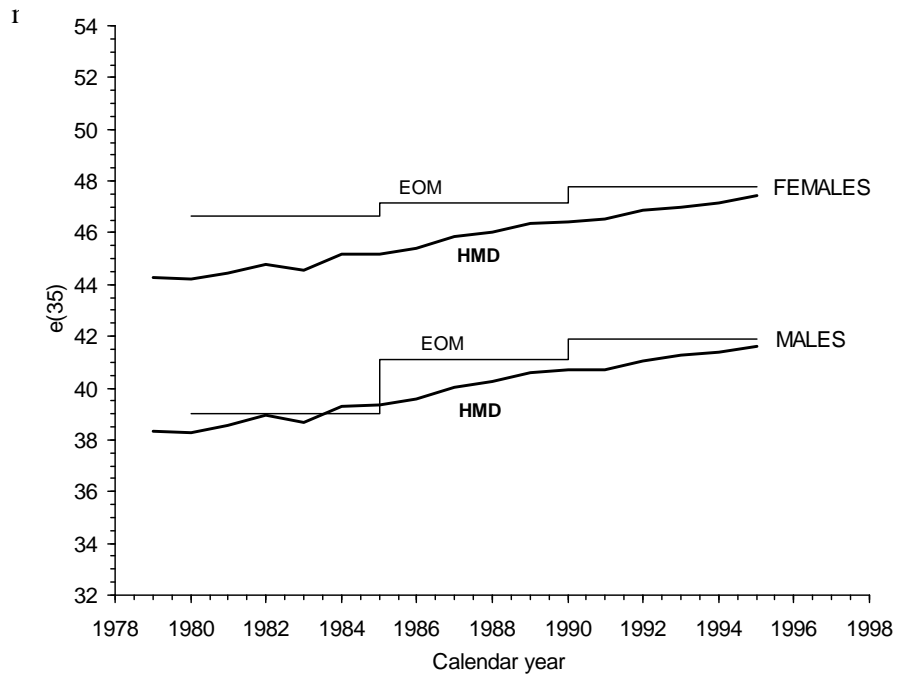
Notes: reference periods for the Brass/Hill and the Timæus method are estimated by using the method of Brass and Bamgboye (1981); HMD = values for  $e(35)$  derived from life tables from the Human Mortality Database for the total Italian male population.

**Figure 6a** Estimates for female life expectancy at age 35 by applying the extended orphanhood method (EOM) and the methods of Brass and Timæus, Italian 1998 and 2003 multipurpose surveys.



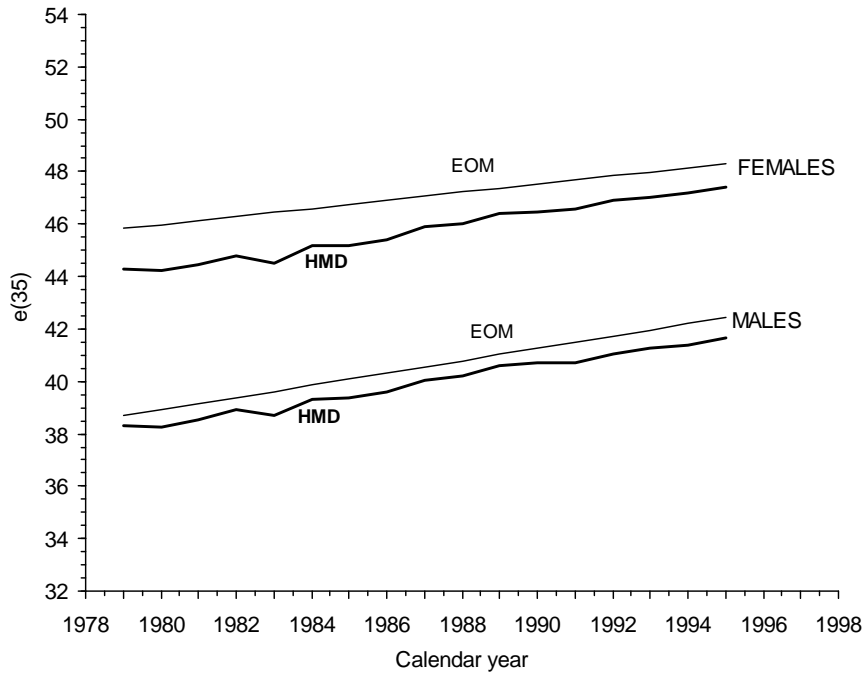
Notes: reference periods for the Brass/Hill and the Timæus method are estimated by using the method of Brass and Bamgboye (1981); HMD = values for  $e(35)$  derived from life tables from the Human Mortality Database for the total Italian female population.

**Figure 7a** Estimates for female and male life expectancy at age 35 by applying the extended orphanhood method (EOM) averaged for the calendar years 1980-1984, 1985-1989 and 1990-1994 from the Italian 1998 and 2003.



Note: HMD = values for  $e(35)$  derived from life tables from the Human Mortality Database for the total Italian population.

**Figure 7b** Linearly smoothed trends of estimates for female and male life expectancy at age 35 with the extended orphanhood method (EOM) from the Italian 1998 and 2003 multipurpose surveys.



Note: HMD = values for  $e(35)$  derived from life tables from the Human Mortality Database for the total Italian population.

**Table A.5a** Estimated age at childbirth of all mothers of 1998 survey respondents by information on age at childbirth of surviving mothers only.

Age at child-birth	Age n								
	20	25	30	35	40	45	50	55	60
22	22.00	22.02	22.02	22.04	22.10	22.19	22.29	22.90	22.93
23	23.01	23.03	23.03	23.06	23.14	23.27	23.42	24.17	24.20
24	24.01	24.04	24.04	24.08	24.21	24.37	24.59	25.62	25.68
25	25.02	25.06	25.06	25.13	25.34	25.56	25.91	27.30	27.45
26	26.04	26.10	26.11	26.22	26.55	26.94	27.45	28.75	29.10
27	27.07	27.14	27.18	27.34	27.72	28.24	28.93	30.07	30.51
28	28.09	28.17	28.25	28.43	28.85	29.48	30.25	31.31	31.79
29	29.08	29.17	29.30	29.51	29.99	30.68	31.49	32.52	33.01
30	30.08	30.17	30.30	30.51	31.01	31.87	32.69	33.71	34.17
31	31.07	31.16	31.29	31.50	32.03	32.89	33.87	34.63	35.12
32	32.06	32.15	32.29	32.50	33.07	33.91	34.82	35.55	35.90
33	33.06	33.14	33.28	33.50	34.11	34.92	35.77	36.48	36.78
34	34.05	34.13	34.27	34.49	35.17	35.94	36.73	37.43	37.68
35	35.05	35.13	35.26	35.47	36.22	36.95	37.70	38.39	38.59

Note: age at childbirth in the left column refers to surviving mothers only, representing the available information from the multipurpose survey.



**Table A.6a** Estimated age at childbirth of all fathers of 1998 survey respondents by information on age at childbirth of surviving fathers only.

Age at child- birth	Age n								
	20	25	30	35	40	45	50	55	60
24	24.00	24.04	24.04	24.06	24.21	24.24	24.55	24.93	24.91
25	25.02	25.06	25.06	25.10	25.27	25.32	25.77	26.19	26.14
26	26.03	26.09	26.09	26.14	26.35	26.45	27.02	27.47	27.39
27	27.04	27.12	27.13	27.20	27.45	27.61	28.30	28.76	28.65
28	28.06	28.16	28.18	28.27	28.58	28.83	29.60	30.08	29.93
29	29.08	29.22	29.25	29.38	29.84	30.22	31.09	31.56	31.42
30	30.13	30.32	30.37	30.60	31.29	31.84	32.61	32.95	32.92
31	31.21	31.45	31.56	31.90	32.64	33.29	33.92	34.18	34.21
32	32.29	32.55	32.74	33.13	33.91	34.58	35.13	35.35	35.38
33	33.28	33.54	33.86	34.30	35.14	35.79	36.28	36.47	36.51
34	34.27	34.53	34.84	35.28	36.14	36.95	37.41	37.57	37.61
35	35.24	35.52	35.81	36.25	37.14	37.85	38.28	38.41	38.44
36	36.21	36.50	36.78	37.23	38.15	38.74	39.16	39.25	39.30
37	37.20	37.47	37.75	38.22	39.15	39.63	40.07	40.13	40.20

Note: age at childbirth in the left column refers to surviving fathers only, representing the available information from the multipurpose survey.

**Table A.7a** Estimated age at childbirth of all mothers of 2003 survey respondents by information on age at childbirth of surviving mothers only.

Age at child-birth	Age n								
	20	25	30	35	40	45	50	55	60
22	22.00	22.01	22.03	22.03	22.06	22.15	22.31	22.45	23.23
23	23.01	23.02	23.04	23.04	23.09	23.21	23.43	23.63	24.60
24	24.01	24.02	24.06	24.06	24.12	24.32	24.58	24.87	26.26
25	25.02	25.04	25.09	25.09	25.20	25.55	25.88	26.30	28.23
26	26.03	26.06	26.15	26.17	26.34	26.87	27.43	28.09	29.80
27	27.05	27.10	27.21	27.28	27.54	28.13	28.86	29.74	31.16
28	28.07	28.14	28.26	28.39	28.69	29.33	30.18	31.14	32.42
29	29.07	29.13	29.26	29.47	29.81	30.53	31.45	32.42	33.60
30	30.06	30.12	30.25	30.47	30.81	31.55	32.69	33.64	34.74
31	31.06	31.11	31.24	31.46	31.80	32.57	33.68	34.83	35.54
32	32.05	32.10	32.23	32.46	32.80	33.61	34.67	35.71	36.33
33	33.04	33.09	33.22	33.45	33.80	34.65	35.65	36.59	37.14
34	34.04	34.08	34.20	34.42	34.79	35.71	36.64	37.47	37.97
35	35.04	35.08	35.20	35.40	35.76	36.77	37.63	38.37	38.83

Note: age at childbirth in the left column refers to surviving mothers only, representing the available information from the multipurpose survey.

**Table A.8a** Estimated age at childbirth of all fathers of 2003 survey respondents by information on age at childbirth of surviving fathers only.

Age at child-birth	Age n								
	20	25	30	35	40	45	50	55	60
24	24.00	24.02	24.06	24.06	24.09	24.29	24.34	24.70	25.04
25	25.01	25.03	25.09	25.09	25.14	25.39	25.46	25.94	26.35
26	26.01	26.04	26.13	26.14	26.20	26.51	26.61	27.23	27.68
27	27.02	27.06	27.18	27.19	27.28	27.65	27.82	28.55	29.03
28	28.04	28.09	28.24	28.27	28.37	28.82	29.07	29.89	30.39
29	29.05	29.13	29.32	29.36	29.55	30.16	30.54	31.45	31.90
30	30.09	30.20	30.47	30.53	30.85	31.74	32.28	33.03	33.29
31	31.15	31.33	31.67	31.81	32.27	33.17	33.80	34.35	34.50
32	32.23	32.44	32.81	33.07	33.57	34.49	35.11	35.54	35.63
33	33.22	33.43	33.80	34.24	34.79	35.74	36.33	36.68	36.71
34	34.20	34.40	34.78	35.20	35.74	36.70	37.47	37.77	37.76
35	35.17	35.36	35.76	36.16	36.69	37.67	38.32	38.60	38.55
36	36.15	36.32	36.72	37.11	37.63	38.64	39.17	39.43	39.36
37	37.14	37.30	37.67	38.07	38.59	39.62	40.02	40.30	40.20

Note: age at childbirth in the left column refers to surviving fathers only, representing the available information from the multipurpose survey.

**Table A.9a** Weighting factors  $W(n)$  for conversion of proportions of 1998 survey respondents aged  $(n, n+4)$  with mother alive into female survivorship probabilities  $l(33+n)/l(30)$ .

Age at childbirth	Age n								
	20	25	30	35	40	45	50	55	60
22	0.98051	0.97524	0.95755	0.92623	0.87501	0.77787	0.60336	0.38884	0.19993
23	0.98693	0.97766	0.96121	0.93248	0.88568	0.79565	0.63865	0.41118	0.22265
24	0.98823	0.98038	0.96531	0.93961	0.89917	0.81678	0.67915	0.45612	0.26252
25	0.98992	0.98368	0.97037	0.94852	0.91764	0.84523	0.71899	0.52165	0.31365
26	0.99214	0.98791	0.97693	0.95996	0.94092	0.88547	0.77637	0.58787	0.36869
27	0.99484	0.99269	0.98498	0.97425	0.96462	0.92785	0.84291	0.65847	0.43495
28	0.99765	0.99733	0.99369	0.98858	0.98938	0.97264	0.91370	0.73837	0.53174
29	0.99957	1.00094	1.00233	1.00334	1.01681	1.02258	0.99504	0.86215	0.67129
30	1.00167	1.00485	1.00923	1.01557	1.04087	1.07937	1.09169	1.03301	0.89997
31	1.00390	1.00908	1.01687	1.02931	1.06864	1.13178	1.20970	1.22461	1.13268
32	1.00639	1.01368	1.02531	1.04481	1.10108	1.19342	1.32856	1.47694	1.41053
33	1.00923	1.01861	1.03467	1.06244	1.13928	1.26632	1.47613	1.74705	1.76911
34	1.01237	1.02414	1.04486	1.08229	1.18397	1.35371	1.66644	2.11004	2.38096
35	1.01602	1.03083	1.05635	1.10412	1.23621	1.45907	1.91327	2.65630	3.25107

Note:  $l(33+n)/l(30) = S(n) \cdot W(n)$ .

**Table A.10a** Weighting factors  $W(n)$  for conversion of proportions of 1998 survey respondents aged  $(n, n+4)$  with father alive into male survivorship probabilities  $l(33+n)/l(30)$ .

Age at childbirth	Age n								
	20	25	30	35	40	45	50	55	60
24	0.97111	0.95398	0.91334	0.85734	0.79581	0.68345	0.51000	0.32193	0.14480
25	0.97677	0.95995	0.92300	0.87427	0.82112	0.71454	0.54816	0.36012	0.18385
26	0.97943	0.96676	0.93427	0.89340	0.84936	0.75072	0.59279	0.40592	0.22784
27	0.98277	0.97432	0.94733	0.91495	0.88122	0.79362	0.64507	0.46393	0.27850
28	0.98689	0.98314	0.96245	0.93914	0.91778	0.84509	0.70623	0.54349	0.33362
29	0.99188	0.99339	0.97983	0.96797	0.96393	0.91329	0.79798	0.65529	0.43184
30	0.99862	1.00671	1.00139	1.00368	1.02512	1.00780	0.94368	0.82998	0.58396
31	1.00793	1.02341	1.02850	1.04686	1.09137	1.11688	1.11579	1.04116	0.87769
32	1.01783	1.03995	1.05768	1.09198	1.16376	1.23780	1.29358	1.28560	1.14445
33	1.02410	1.05269	1.08728	1.14015	1.24704	1.37883	1.49737	1.60518	1.79826
34	1.03090	1.06721	1.11313	1.18394	1.32673	1.53482	1.76104	2.04465	2.82844
35	1.03815	1.08368	1.14218	1.23341	1.42021	1.68535	2.06938	2.61113	3.89401
36	1.04688	1.10225	1.17490	1.28949	1.53043	1.86650	2.50215	3.40405	5.65565
37	1.05732	1.12311	1.21139	1.35394	1.66241	2.10767	3.14768	4.88976	8.35416

Note:  $l(33+n)/l(30) = S(n) \cdot W(n)$ .

**Table A.11a** Weighting factors  $W(n)$  for conversion of proportions of 2003 survey respondents aged  $(n, n+4)$  with mother alive into female survivorship probabilities  $l(33+n)/l(30)$ .

Age at childbirth	Age n								
	20	25	30	35	40	45	50	55	60
22	0.98127	0.97652	0.96286	0.93693	0.88937	0.81015	0.67668	0.47866	0.25212
23	0.98652	0.97837	0.96635	0.94210	0.89847	0.82534	0.70105	0.50892	0.28715
24	0.98777	0.98051	0.97026	0.94803	0.90898	0.84592	0.73056	0.54674	0.33848
25	0.98934	0.98322	0.97507	0.95553	0.92258	0.87424	0.77096	0.59996	0.41565
26	0.99117	0.98663	0.98142	0.96546	0.94075	0.91062	0.82928	0.68292	0.51674
27	0.99355	0.99078	0.98867	0.97808	0.96370	0.94807	0.89391	0.78448	0.64963
28	0.99614	0.99511	0.99574	0.99178	0.98707	0.98777	0.96315	0.89954	0.83446
29	0.99784	0.99811	1.00113	1.00544	1.01134	1.03251	1.04269	1.04095	1.04618
30	0.99964	1.00132	1.00704	1.01615	1.03114	1.07241	1.13640	1.22223	1.36264
31	1.00166	1.00467	1.01350	1.02809	1.05379	1.11932	1.22778	1.44750	1.78762
32	1.00397	1.00842	1.02054	1.04143	1.07979	1.17523	1.33960	1.67875	2.52074
33	1.00653	1.01276	1.02808	1.05639	1.10999	1.24246	1.47830	1.98673	3.88781
34	1.00948	1.01760	1.03663	1.07279	1.14488	1.32301	1.65403	2.44031	5.25441
35	1.01264	1.02330	1.04722	1.09154	1.18454	1.42011	1.87769	3.11539	10.13902

Note:  $l(33+n)/l(30) = S(n) \cdot W(n)$ .

**Table A.12a** Weighting factors  $W(n)$  for conversion of proportions of 2003 survey respondents aged  $(n, n+4)$  with father alive into male survivorship probabilities  $l(33+n)/l(30)$ .

Age at childbirth	Age n								
	20	25	30	35	40	45	50	55	60
24	0.97224	0.95454	0.92614	0.87252	0.79946	0.71439	0.58411	0.37907	0.17421
25	0.97711	0.95899	0.93450	0.88635	0.82158	0.74791	0.62489	0.42380	0.21417
26	0.97952	0.96429	0.94416	0.90233	0.84712	0.78671	0.67374	0.48053	0.27699
27	0.98249	0.97042	0.95542	0.92080	0.87667	0.83180	0.73302	0.55317	0.33091
28	0.98604	0.97746	0.96862	0.94223	0.91083	0.88511	0.80613	0.63150	0.35056
29	0.99025	0.98563	0.98401	0.96710	0.95288	0.95440	0.90672	0.73249	0.55805
30	0.99582	0.99621	1.00412	0.99866	1.00620	1.04869	1.03960	0.88684	0.73054
31	1.00330	1.01056	1.02946	1.03915	1.07254	1.15425	1.19200	1.09099	0.92512
32	1.01180	1.02583	1.05483	1.08380	1.14283	1.27393	1.37369	1.40299	1.32074
33	1.01684	1.03585	1.07462	1.12972	1.21919	1.41563	1.60596	1.70859	2.04726
34	1.02234	1.04673	1.09711	1.16969	1.28979	1.55531	1.89013	2.09261	3.04850
35	1.02842	1.05833	1.12255	1.21537	1.37143	1.72546	2.17266	2.89060	4.31410
36	1.03555	1.07220	1.15129	1.26774	1.46825	1.93125	2.53647	3.74263	6.71221
37	1.04377	1.08861	1.18372	1.32729	1.58232	2.18169	3.05350	4.92288	11.25821

Note:  $l(33+n)/l(30) = S(n) \cdot W(n)$ .

**Table A.13a** Parameters a(n) for the calculation of the time reference for female survivorship estimates from data on maternal orphanhood of the Italian 1998 multipurpose survey.

Age at childbirth	Age n								
	20	25	30	35	40	45	50	55	60
22	-3.8092	-4.5474	-5.2287	-5.8659	-6.4291	-6.9942	-7.8658	-8.4720	-8.7212
23	-3.7155	-4.5086	-5.1883	-5.8147	-6.3697	-6.9071	-7.7052	-8.2955	-8.5339
24	-3.6940	-4.4727	-5.1444	-5.7773	-6.3204	-6.8203	-7.5214	-8.1036	-8.3787
25	-3.6715	-4.4398	-5.1120	-5.7405	-6.2482	-6.7198	-7.3524	-7.9154	-8.2530
26	-3.6505	-4.4107	-5.0830	-5.6921	-6.1713	-6.5663	-7.1850	-7.7844	-8.1597
27	-3.6295	-4.3867	-5.0569	-5.6548	-6.0945	-6.4538	-7.0547	-7.6859	-8.0921
28	-3.6146	-4.3675	-5.0274	-5.6147	-6.0403	-6.3482	-6.9635	-7.6067	-8.0381
29	-3.6032	-4.3464	-5.0104	-5.5801	-5.9904	-6.2830	-6.8921	-7.5419	-7.9914
30	-3.5931	-4.3330	-4.9977	-5.5654	-5.9566	-6.2393	-6.8351	-7.4889	-7.9468
31	-3.5848	-4.3216	-4.9786	-5.5411	-5.9111	-6.2163	-6.7894	-7.4483	-7.9043
32	-3.5780	-4.3118	-4.9696	-5.5185	-5.8669	-6.1949	-6.7623	-7.4163	-7.8607
33	-3.5724	-4.3036	-4.9540	-5.4976	-5.8236	-6.1747	-6.7372	-7.3904	-7.8074
34	-3.5678	-4.2912	-4.9481	-5.4785	-5.7800	-6.1554	-6.7156	-7.3658	-7.7458
35	-3.5631	-4.2856	-4.9359	-5.4614	-5.7595	-6.1376	-6.7011	-7.3393	-7.6765

Notes: reference year = survey year – t(n);  $t(n) = a(n) \cdot \ln[S(n)] + b(n)$ ; survey year: 1998.5.



**Table A.14a** Parameters a(n) for the calculation of the time reference for male survivorship estimates from data on paternal orphanhood of the Italian 1998 multipurpose survey.

Age at childbirth	Age n								
	20	25	30	35	40	45	50	55	60
24	-3.7956	-4.5471	-5.1445	-5.6086	-5.8769	-6.1666	-7.0062	-7.9651	-8.1866
25	-3.7289	-4.4899	-5.0607	-5.5171	-5.8102	-6.1336	-6.9658	-7.8750	-8.1895
26	-3.7013	-4.4359	-4.9933	-5.4399	-5.7451	-6.1135	-6.9341	-7.7961	-8.1934
27	-3.6732	-4.3813	-4.9269	-5.3665	-5.6826	-6.1043	-6.9110	-7.7326	-8.1935
28	-3.6465	-4.3385	-4.8707	-5.3169	-5.6534	-6.1040	-6.8973	-7.6848	-8.1858
29	-3.6194	-4.2968	-4.8250	-5.2711	-5.6465	-6.1151	-6.8954	-7.6580	-8.1616
30	-3.5991	-4.2679	-4.7909	-5.2395	-5.6521	-6.1396	-6.9041	-7.6375	-8.1181
31	-3.5833	-4.2413	-4.7688	-5.2191	-5.6610	-6.1654	-6.9133	-7.6165	-8.0641
32	-3.5682	-4.2201	-4.7463	-5.1952	-5.6722	-6.1903	-6.9233	-7.5945	-7.9993
33	-3.5575	-4.2058	-4.7343	-5.1995	-5.6864	-6.2158	-6.9332	-7.5687	-7.9235
34	-3.5488	-4.1891	-4.7205	-5.2005	-5.6976	-6.2426	-6.9413	-7.5362	-7.8374
35	-3.5385	-4.1751	-4.7041	-5.2055	-5.7123	-6.2627	-6.9408	-7.4987	-7.7539
36	-3.5331	-4.1635	-4.6919	-5.2140	-5.7296	-6.2832	-6.9403	-7.4547	-7.6596
37	-3.5256	-4.1547	-4.6896	-5.2260	-5.7490	-6.3037	-6.9371	-7.4019	-7.5576

Notes: reference year = survey year – t(n);  $t(n) = a(n) \cdot \ln[S(n)] + b(n)$ ; survey year: 1998.5.

**Table A.15a** Parameters a(n) for the calculation of the time reference for female survivorship estimates from data on maternal orphanhood of the Italian 2003 multipurpose survey.

Age at childbirth	Age n								
	20	25	30	35	40	45	50	55	60
22	-3.6206	-4.4732	-5.1880	-5.7885	-6.3533	-6.8009	-7.1903	-7.8424	-8.5003
23	-3.6431	-4.4384	-5.1435	-5.7499	-6.2977	-6.7327	-7.0778	-7.7254	-8.3601
24	-3.6327	-4.3999	-5.1056	-5.7155	-6.2581	-6.6587	-6.9671	-7.6089	-8.2130
25	-3.6207	-4.3705	-5.0652	-5.6724	-6.2027	-6.5551	-6.8272	-7.4789	-8.0833
26	-3.6089	-4.3480	-5.0380	-5.6418	-6.1431	-6.4458	-6.7060	-7.3481	-8.0063
27	-3.5983	-4.3308	-5.0151	-5.5999	-6.0806	-6.3581	-6.6313	-7.2575	-7.9545
28	-3.5873	-4.3173	-4.9969	-5.5747	-6.0302	-6.2698	-6.5809	-7.2029	-7.9154
29	-3.5799	-4.3042	-4.9743	-5.5440	-5.9743	-6.2039	-6.5439	-7.1674	-7.8829
30	-3.5726	-4.2882	-4.9631	-5.5212	-5.9468	-6.1732	-6.5164	-7.1460	-7.8527
31	-3.5652	-4.2813	-4.9541	-5.5111	-5.9209	-6.1575	-6.5080	-7.1354	-7.8207
32	-3.5590	-4.2771	-4.9385	-5.4916	-5.8966	-6.1430	-6.5021	-7.1323	-7.7884
33	-3.5543	-4.2747	-4.9324	-5.4738	-5.8613	-6.1292	-6.4984	-7.1292	-7.7522
34	-3.5524	-4.2730	-4.9267	-5.4690	-5.8280	-6.1152	-6.4967	-7.1269	-7.7065
35	-3.5522	-4.2717	-4.9130	-5.4550	-5.7973	-6.1017	-6.4974	-7.1272	-7.6483

Notes: reference year = survey year – t(n);  $t(n) = a(n) \cdot \ln[S(n)] + b(n)$ ; survey year: 2003.9.

**Table A.16a** Parameters a(n) for the calculation of the time reference for male survivorship estimates from data on paternal orphanhood of the Italian 2003 multipurpose survey.

Age at childbirth	Age n								
	20	25	30	35	40	45	50	55	60
24	-3.5757	-4.5213	-5.1791	-5.6479	-6.0027	-6.2143	-6.5959	-7.4105	-8.3788
25	-3.6658	-4.4731	-5.1089	-5.5610	-5.9150	-6.1807	-6.5823	-7.3924	-8.3063
26	-3.6623	-4.4257	-5.0386	-5.4872	-5.8548	-6.1585	-6.5798	-7.3816	-8.2387
27	-3.6524	-4.3823	-4.9866	-5.4274	-5.7972	-6.1467	-6.5865	-7.3772	-8.1791
28	-3.6385	-4.3392	-4.9360	-5.3804	-5.7530	-6.1443	-6.6008	-7.3789	-8.1272
29	-3.6227	-4.3087	-4.9036	-5.3355	-5.7130	-6.1528	-6.6262	-7.3907	-8.0878
30	-3.6032	-4.2862	-4.8655	-5.3139	-5.7168	-6.1736	-6.6658	-7.4055	-8.0443
31	-3.5895	-4.2670	-4.8462	-5.2869	-5.7290	-6.1958	-6.7026	-7.4126	-7.9927
32	-3.5793	-4.2524	-4.8307	-5.2753	-5.7430	-6.2190	-6.7348	-7.4131	-7.9346
33	-3.5664	-4.2405	-4.8131	-5.2572	-5.7584	-6.2438	-6.7641	-7.4062	-7.8692
34	-3.5574	-4.2313	-4.7995	-5.2598	-5.7696	-6.2633	-6.7905	-7.3906	-7.7956
35	-3.5495	-4.2243	-4.7827	-5.2663	-5.7841	-6.2849	-6.8067	-7.3620	-7.7193
36	-3.5441	-4.2094	-4.7761	-5.2766	-5.8016	-6.3076	-6.8191	-7.3279	-7.6378
37	-3.5372	-4.2033	-4.7660	-5.2901	-5.8214	-6.3306	-6.8266	-7.2865	-7.5495

Notes: reference year = survey year – t(n);  $t(n) = a(n) \cdot \ln[S(n)] + b(n)$ ; survey year: 2003.9.

**Table A.17a** Parameters  $b(n)$  for the calculation of the time reference for female survivorship estimates from data on maternal orphanhood of the Italian 1998 multipurpose survey.

Age at childbirth	Age n								
	20	25	30	35	40	45	50	55	60
22	9.9989	10.3636	11.3529	12.1939	12.6748	12.9077	13.1859	11.8936	9.1704
23	8.9772	10.2432	11.2571	12.0721	12.4978	12.6211	12.6930	11.1323	8.2009
24	8.8712	10.1433	11.1707	11.9420	12.2811	12.3130	12.1827	10.2936	7.1556
25	8.7847	10.0599	11.0763	11.7923	12.0068	11.9263	11.5620	9.3935	6.0344
26	8.7238	9.9806	10.9690	11.6184	11.6526	11.4600	10.8489	8.4388	4.8712
27	8.6770	9.9070	10.8474	11.4132	11.4368	11.0558	10.2034	7.8285	3.7174
28	8.6383	9.8460	10.7419	11.2494	11.2034	10.7190	9.6501	7.0580	2.5213
29	8.5996	9.8059	10.6505	11.1055	10.9754	10.3795	9.1205	6.2574	1.2716
30	8.5706	9.7698	10.5942	11.0111	10.8174	10.0324	8.5905	5.4099	-0.0441
31	8.5525	9.7380	10.5415	10.8872	10.6537	9.7570	8.0431	4.6147	-1.3805
32	8.5418	9.7084	10.4835	10.8196	10.4730	9.4592	7.5582	3.7351	-2.7798
33	8.5341	9.6804	10.4287	10.7140	10.2723	9.1368	7.0308	2.7656	-4.3057
34	8.5276	9.6510	10.3717	10.6011	10.0518	8.7855	6.4440	1.6915	-5.9250
35	8.5183	9.6097	10.3153	10.4853	9.7969	8.4048	5.7958	0.5250	-7.6164

Notes: reference year = survey year –  $t(n)$ ;  $t(n) = a(n) \cdot \ln[S(n)] + b(n)$ ; survey year: 1998.5.

**Table A.18a** Parameters b(n) for the calculation of the time reference for male survivorship estimates from data on paternal orphanhood of the Italian 1998 multipurpose survey.

Age at childbirth	Age n								
	20	25	30	35	40	45	50	55	60
24	10.1736	10.2363	10.7878	11.1170	11.1264	10.8653	10.2900	8.3113	4.4589
25	9.0800	10.0283	10.5976	10.9410	10.9494	10.6419	9.8613	7.5820	3.3478
26	8.9055	9.8522	10.4309	10.7855	10.7872	10.4071	9.4034	6.8177	2.1492
27	8.7560	9.7082	10.2952	10.6526	10.6347	10.1530	8.9157	6.0154	0.8765
28	8.6324	9.5879	10.1810	10.5260	10.4652	9.8743	8.3976	5.1701	-0.4852
29	8.5345	9.4931	10.0841	10.4103	10.2656	9.5418	7.7988	4.2084	-1.9429
30	8.4611	9.4152	10.0001	10.2881	10.0270	9.1422	7.1353	3.1883	-3.4671
31	8.4129	9.3558	9.9204	10.1526	9.7887	8.7371	6.4745	2.1390	-5.0206
32	8.3756	9.3017	9.8470	10.0257	9.5482	8.3320	5.7861	1.0356	-6.5976
33	8.3281	9.2461	9.7709	9.8825	9.2951	7.9077	5.0530	-0.1296	-8.2190
34	8.2877	9.1989	9.7019	9.7590	9.0697	7.4546	4.2699	-1.3531	-9.8789
35	8.2546	9.1559	9.6374	9.6288	8.8222	7.0315	3.5092	-2.5679	-11.5876
36	8.2270	9.1152	9.5718	9.4893	8.5497	6.5692	2.6733	-3.8561	-13.3659
37	8.2083	9.0764	9.5005	9.3359	8.2475	6.0568	1.7499	-5.2311	-15.2100

Notes: reference year = survey year – t(n);  $t(n) = a(n) \cdot \ln[S(n)] + b(n)$ ; survey year: 1998.5.

**Table A.19a** Parameters  $b(n)$  for the calculation of the time reference for female survivorship estimates from data on maternal orphanhood of the Italian 2003 multipurpose survey.

Age at childbirth	Age n								
	20	25	30	35	40	45	50	55	60
22	9.8253	10.1578	11.1324	11.9894	12.5794	12.6720	12.3439	11.7655	9.3296
23	8.9312	10.0265	11.0382	11.9037	12.4315	12.4315	11.9806	11.1690	8.3671
24	8.8261	9.9239	10.9604	11.8125	12.2650	12.1383	11.5952	10.5436	7.1788
25	8.7372	9.8488	10.8930	11.7034	12.0632	11.7693	11.1411	9.8194	5.7257
26	8.6682	9.8020	10.8041	11.5518	11.8049	11.3613	10.5707	8.9023	4.3454
27	8.6205	9.7595	10.7111	11.3710	11.5095	11.0217	10.0555	8.0429	2.9382
28	8.5902	9.7219	10.6346	11.1996	11.2667	10.7296	9.5921	7.2535	1.4079
29	8.5444	9.6875	10.5972	11.0633	11.0617	10.4354	9.1336	6.4480	-0.3032
30	8.5053	9.6682	10.5587	10.9900	10.9318	10.2135	8.6641	5.5857	-2.2546
31	8.4759	9.6598	10.5209	10.9067	10.7912	9.9614	8.2653	4.6277	-4.0282
32	8.4597	9.6572	10.4862	10.8236	10.6384	9.6836	7.8256	3.7582	-6.0706
33	8.4527	9.6509	10.4479	10.7352	10.4784	9.3761	7.3390	2.7752	-8.4500
34	8.4552	9.6430	10.4005	10.6390	10.3045	9.0382	6.7960	1.6440	-11.3058
35	8.4644	9.6241	10.3349	10.5380	10.1222	8.6689	6.1975	0.3432	-14.7760

Notes: reference year = survey year –  $t(n)$ ;  $t(n) = a(n) \cdot \ln[S(n)] + b(n)$ ; survey year: 2003.9.

**Table A.20a** Parameters b(n) for the calculation of the time reference for male survivorship estimates from data on paternal orphanhood of the Italian 2003 multipurpose survey.

Age at childbirth	Age n								
	20	25	30	35	40	45	50	55	60
24	10.3837	10.3287	10.8527	11.2283	11.3996	11.1948	10.3948	8.7575	5.0534
25	9.3431	10.0827	10.6691	11.0640	11.2454	10.9662	10.0589	8.1346	3.9552
26	9.1468	9.8769	10.5227	10.9230	11.0916	10.7285	9.6940	7.4526	2.7638
27	8.9631	9.7127	10.3980	10.8023	10.9465	10.4769	9.2922	6.7083	1.4660
28	8.7997	9.5890	10.2987	10.6946	10.7973	10.2052	8.8465	5.8978	0.0531
29	8.6602	9.4929	10.2111	10.5994	10.6378	9.8811	8.3077	4.9272	-1.5791
30	8.5525	9.4284	10.1427	10.4948	10.4237	9.4841	7.6487	3.8499	-3.3054
31	8.4781	9.3906	10.0750	10.3831	10.1742	9.0852	6.9729	2.7696	-5.0882
32	8.4232	9.3565	10.0083	10.2591	9.9295	8.6797	6.2923	1.6411	-6.9900
33	8.3566	9.3053	9.9479	10.1425	9.6829	8.2500	5.5763	0.4399	-9.0526
34	8.2994	9.2620	9.8898	10.0329	9.4754	7.8672	4.8114	-0.8401	-11.3114
35	8.2549	9.2244	9.8374	9.9156	9.2496	7.4430	4.0925	-2.0824	-13.4599
36	8.2238	9.1985	9.7801	9.7879	9.0020	6.9720	3.3027	-3.4211	-15.8268
37	8.2019	9.1742	9.7253	9.6489	8.7276	6.4441	2.4291	-4.8808	-18.4904

Notes: reference year = survey year – t(n);  $t(n) = a(n) \cdot \ln[S(n)] + b(n)$ ; survey year: 2003.9.