

THE REVERSAL OF THE RELATION BETWEEN ECONOMIC GROWTH AND HEALTH PROGRESS: SWEDEN IN THE 19TH AND 20TH CENTURIES — SUPPLEMENTARY MATERIALS

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The tables and figures in this document supplement the data presented in the tables and figures in our paper “The reversal of the relation between economic growth and health progress: Sweden in the 19th and 20th centuries.” We hope they will facilitate the understanding of our conclusions to any reader who wants to go beyond the evidence presented in the printed paper. We have also included here the raw data we used (table S-o), so that our analysis can be reproduced.

The twenty seven tables and five figures in these SUPPLEMENTARY MATERIALS are numbered with an S as prefix, to differentiate them from the six tables and two figures in the paper numbered without letter prefix, and from the table A1 and the figure A1 in the appendix of the paper.

In these tables and figures we often present results using GDP growth as the indicator of economic growth, while in the paper, for the sake of consistency, we used the growth of GDP per capita as the measure of economic growth. Since both indicators correlate strongly, the results using one or the other are quite similar. In some analysis we found effects of GDP growth on age- and-sex-specific mortality in the 20th century that were marginally significant, with *P* values between 0.05 and 0.10. However, in these models, *P* values went slightly above 0.10 when the growth of GDP per capita instead of GDP growth was used as the regressor. In general, regression estimates show the effect of GDP growth on mortality as slightly stronger than the effect of GDP per capita growth.

We have also used, in many tables presented in these supplementary materials, the relative decline in longevity shortfall as an indicator of health progress. This indicator, proposed by

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Amartya Sen, is the annual relative decline in the difference between the observed longevity (life expectancy at birth) and an arbitrarily chosen longevity target. Therefore, assuming that 90 is the target of longevity to be reached, the mortality shortfall is $90 - e_{o,t}$, where $e_{o,t}$ is life expectancy at birth for year t (we repeated some analyses with longevity shortfall computed with 100 as the target for longevity, obtaining very similar results). We computed the relative progress in longevity shortfall as the negative difference of the natural logarithm of longevity shortfall, that is, $-\Delta \ln(90 - e_{o,t}) = -[\ln(90 - e_{o,t}) - \ln(90 - e_{o,t-1})]$. Using the relative decline in longevity shortfall as the measure of health progress, an increase of one year and a half in longevity from 60 to 61.5 years would be a progress equivalent to a one-year increase from 70 to 71.

The structure of this set of supplementary materials is as follows. The raw data are included in table S-0. Detailed descriptive statistics of the variables used in the investigation are in table S-1. Tables S-2 and S-3 present the parameter estimates of regressions in which health progress is modeled as a function of GDP growth and the interactions of GDP growth either with time or with the level of GDP per capita. Tables S-4 and S-5 are just expanded versions of tables 1 and 2 in the paper, including R^2 and AIC values, as well as results for specifications that were suppressed in table 2. In table S-6, zero-lag correlations between health progress and economic growth are presented, and tables S-7 to S-9 are estimates of lag regressions in which health progress is modeled as a function of coincidental and lagged values of economic growth. In table S-10, health progress during the years 1911–1999 is modeled as a function of coincidental and lagged values of unemployment. Tables S-11 to S-16 present correlations between moving averages of health indicators and economic indicators, exploring the coincidental or lag effects of economic growth on health progress. Parameter estimates of lag regressions to explore the potential lagged effects of health progress on economic growth are in table S-17, while table S-18 presents correlations exploring the same issue. Tables S-19 and S-20 show correlations between health progress and economic growth, the latter indexed by GDP growth from two different sources, and also by GDP per capita growth. Results of Granger-causality tests are shown in tables S-21 to S-24, and tables S-25 and S-26 are an expanded version of table A1, including correlations between moving averages. Figures S-1 and S-2 are descriptive statistics, figure S-3 shows some results of spectral analysis, and figures S-4 and S-5 illustrate the reversal of the relation between economic growth and health progress with plots of moving averages. In the final section of this supplementary material, several estimates of the size of the macroeconomic effect on health progress are presented.

Table S-o. Raw data used in the analysis. See sources in the text. GDP and GDP per capita are indexed to 100 in 1930, the GDP deflator is 100 for 1910-1912 (F= females, M = males)

Year	Age-specific mortality rates per thousand population (per 1000 births in infant mortality)										Life expectancy at birth				Gross domestic product		Unemployment rate	General crop index
	Mortality at ages 15-24					Mortality at ages 35-54					Mortality at ages 70-89		Per capita	Total	GDP deflator			
	Total	F	M	Total	F	M	Total	F	M	F	M	Total				Total		
1800	239.67	7.21	6.96	7.47	18.28	16.62	20.12	166.70	161.00	174.83	32.72	30.47	31.6	19.3	7.4	30.0	0.5	
1801	204.15	6.63	6.31	6.98	15.83	14.46	17.36	138.14	134.95	142.72	37.48	34.86	36.17	18.8	7.0	31.8	3.0	
1802	182.29	6.09	5.68	6.52	14.70	13.64	15.89	132.76	129.87	136.92	41.59	38.06	39.82	19.5	7.3	31.5	3.0	
1803	184.31	6.44	6.08	6.82	15.19	14.38	16.08	128.60	123.47	135.99	41.69	38.23	39.95	19.3	7.3	30.6	4.0	
1804	185.41	7.27	6.80	7.77	16.46	15.16	17.91	139.52	134.95	146.11	41.22	37.55	39.38	19.1	7.3	30.3	3.0	
1805	175.50	6.81	6.57	7.07	15.10	13.97	16.36	129.15	128.27	130.42	42.28	39.4	40.84	19.7	7.6	31.4	1.8	
1806	229.46	7.70	7.30	8.12	16.15	14.73	17.73	133.14	129.78	137.99	36.81	34.4	35.61	19.3	7.4	33.7	3.0	
1807	187.75	7.66	7.31	8.03	17.14	16.06	18.35	142.47	141.91	143.28	39.71	37.14	38.43	19.1	7.4	36.4	2.3	
1808	219.75	12.27	10.34	14.30	22.58	20.90	24.47	162.61	159.03	167.76	32.12	27.84	29.93	17.9	6.9	42.8	1.8	
1809	231.99	14.21	12.11	16.45	30.24	27.51	33.33	174.96	172.94	177.87	28.63	24.43	26.48	17.8	6.9	46.4	4.0	
1810	192.75	9.15	8.75	9.57	21.32	18.93	24.06	157.83	155.50	161.16	33.12	29.53	31.31	19.1	7.4	46.1	4.0	
1811	193.86	8.62	8.45	8.80	19.77	17.16	22.76	136.06	131.15	143.10	36.05	32.54	34.29	19.6	7.7	48.8	1.3	
1812	203.55	8.21	7.58	8.88	22.57	19.09	26.57	163.68	160.94	167.62	36.84	33.15	34.99	18.8	7.4	60.4	0.8	
1813	198.41	7.80	6.90	8.75	18.48	16.21	21.09	137.43	135.29	140.52	38.26	33.91	36.06	18.6	7.1	64.5	2.0	
1814	195.10	6.95	6.47	7.46	15.56	14.26	17.06	128.47	125.71	132.47	40.07	36.81	38.45	19.0	7.5	63.8	3.5	
1815	169.85	6.53	6.34	6.73	15.32	14.08	16.74	123.27	119.90	128.15	41.39	38.32	39.87	19.9	8.0	61.1	4.0	
1816	183.48	5.82	5.72	5.93	13.89	12.51	15.47	119.84	115.29	126.45	43.53	39.6	41.57	20.0	8.1	61.7	1.0	
1817	178.76	6.63	6.59	6.67	15.60	14.30	17.09	131.92	127.06	138.98	41.69	38.57	40.14	19.7	7.9	64.1	1.5	
1818	168.68	6.62	6.21	7.05	16.53	14.96	18.34	126.97	122.71	133.16	41.84	37.8	39.81	19.0	7.7	66.0	1.3	
1819	183.06	8.14	7.78	8.51	18.24	16.54	20.20	140.49	136.86	145.79	38.46	35.01	36.73	19.0	7.7	68.3	3.5	
1820	163.45	6.83	6.61	7.05	17.33	15.33	19.62	130.21	126.94	134.97	41.63	38.24	39.94	19.9	8.2	64.5	4.5	
1821	175.65	6.59	6.49	6.69	15.59	13.64	17.84	118.08	112.71	125.93	39.33	36.35	37.85	20.4	8.5	59.0	3.5	
1822	162.43	6.03	5.50	6.58	14.96	12.74	17.50	116.51	110.15	125.83	44.72	40.49	42.61	20.3	8.7	56.8	2.3	
1823	147.51	5.17	4.88	5.46	14.80	12.70	17.21	113.86	108.27	122.09	47.36	42.89	45.13	20.3	8.9	57.0	4.0	
1824	155.83	5.73	5.46	6.00	13.56	11.43	15.99	106.58	99.78	116.62	47.16	42.49	44.82	21.0	9.3	54.8	4.0	
1825	153.99	5.60	5.06	6.15	13.30	10.98	15.96	106.61	101.43	114.29	47.46	42.67	45.07	21.0	9.3	57.1	3.0	
1826	171.57	5.77	5.29	6.27	15.25	12.91	17.93	122.93	117.24	131.41	45.42	40.71	43.05	20.6	9.4	58.8	1.0	

1827	160.62	6.20	5.94	6.46	17.59	14.99	20.56	132.99	126.90	142.07	44.43	40.47	42.45	20.0	9.0	64.8	4.0
1828	170.32	6.90	6.28	7.54	19.95	16.43	23.96	132.62	127.64	140.07	40.01	34.94	37.43	20.8	9.5	58.6	4.0
1829	193.96	6.77	6.19	7.37	21.18	17.26	25.65	153.30	150.02	158.23	38.44	33.53	35.93	20.9	9.6	58.1	3.0
1830	180.49	5.75	5.32	6.18	17.63	14.57	21.12	137.49	130.35	148.25	43.38	38.35	40.84	20.4	9.4	61.2	2.3
1831	198.26	6.20	5.78	6.64	18.71	15.93	21.87	152.60	145.65	163.13	40.92	36.41	38.64	20.1	9.5	64.4	2.0
1832	166.01	6.01	5.68	6.35	16.87	14.99	18.99	127.86	124.97	132.26	42.27	38.67	40.47	20.2	9.4	66.6	4.0
1833	159.37	5.73	5.29	6.18	15.95	13.75	18.44	114.92	111.72	119.79	44.5	40.04	42.26	20.9	9.9	62.3	3.0
1834	173.47	7.63	6.73	8.55	22.35	19.35	25.74	126.67	124.30	130.29	40.83	36.11	38.43	21.2	10.1	61.4	2.0
1835	142.48	5.02	4.84	5.20	13.45	11.54	15.60	112.28	107.05	120.31	49.3	44.83	47.07	21.2	10.4	62.7	3.5
1836	152.55	4.89	4.50	5.28	13.61	11.30	16.21	125.30	119.71	133.90	47.18	42.89	45.04	21.2	10.6	63.1	3.0
1837	194.88	5.68	5.34	6.03	17.25	14.44	20.40	151.17	144.77	161.08	41.61	37.08	39.32	21.2	10.6	64.4	1.8
1838	175.94	6.39	5.86	6.92	18.38	15.30	21.84	146.38	139.83	156.56	42.05	37.55	39.77	20.6	10.2	67.0	3.5
1839	164.20	7.06	6.90	7.22	18.76	16.55	21.23	130.36	125.98	137.18	41.54	37.67	39.59	21.1	10.6	69.0	3.0
1840	145.63	5.72	5.37	6.08	15.85	13.40	18.57	125.24	121.71	130.78	46.03	41.65	43.83	21.6	10.8	66.4	3.5
1841	159.21	5.31	5.14	5.47	14.40	12.14	16.92	120.99	117.08	127.13	47.12	42.84	44.98	21.3	10.8	67.0	1.0
1842	161.80	6.27	5.85	6.70	14.91	13.02	17.00	121.18	117.50	126.96	44.91	40.34	42.61	20.5	10.5	70.3	2.3
1843	159.43	6.07	5.78	6.36	15.62	13.39	18.08	132.31	130.07	135.84	44.75	40.61	42.67	20.9	10.8	68.4	2.0
1844	140.78	5.23	4.88	5.58	14.42	11.81	17.31	122.54	117.39	130.66	46.81	41.04	43.87	21.7	11.5	64.1	2.5
1845	148.61	4.95	4.67	5.25	13.82	11.25	16.66	114.79	111.59	119.84	48.48	43.42	45.93	22.1	11.9	62.4	1.5
1846	163.14	6.29	6.06	6.52	15.53	13.44	17.83	131.56	126.77	139.14	43.86	39.97	41.92	21.5	11.5	69.4	2.5
1847	173.20	5.94	5.59	6.31	16.90	14.21	19.86	145.32	140.61	152.77	41.75	38.01	39.87	21.9	11.8	71.0	3.0
1848	140.97	4.85	4.55	5.14	15.24	12.75	17.98	126.11	122.91	131.19	47.13	42.74	44.92	22.5	12.3	69.8	3.5
1849	141.74	4.90	4.56	5.25	13.88	11.40	16.60	117.89	113.51	124.82	46.77	42.04	44.39	23.2	12.8	66.3	2.5
1850	146.22	5.60	5.03	6.18	14.55	11.86	17.50	115.83	110.75	123.90	47.3	42.09	44.66	23.5	13.1	66.9	3.0
1851	152.08	5.45	4.97	5.95	14.83	12.18	17.73	123.13	117.27	132.44	46.07	41.07	43.54	23.1	13.0	69.1	2.5
1852	162.54	6.19	5.55	6.85	16.15	13.16	19.43	134.55	129.81	142.08	43.64	38.87	41.21	22.8	12.9	70.9	3.5
1853	161.03	6.16	5.49	6.84	18.45	15.94	21.19	124.89	120.30	132.18	41.78	37.79	39.76	23.1	13.2	72.9	2.5
1854	126.21	5.43	5.06	5.82	13.83	11.90	15.95	111.66	107.95	117.55	46.51	42.5	44.5	23.3	13.5	80.4	3.0
1855	144.88	6.05	5.46	6.65	14.91	13.41	16.56	127.46	125.37	130.77	44.83	41.28	43.05	24.5	14.3	86.4	3.5
1856	144.75	5.76	5.04	6.49	13.50	11.96	15.18	126.83	123.28	132.44	43.99	40.13	42.05	24.4	14.4	97.5	2.5
1857	165.42	8.49	7.75	9.24	16.52	15.07	18.10	127.70	123.06	135.01	36.52	32.54	34.49	25.0	14.8	100.4	3.0
1858	142.72	6.68	6.11	7.26	13.26	12.44	14.17	109.77	107.91	112.69	43.56	40.26	41.9	25.7	15.3	88.0	3.5
1859	143.13	6.06	5.65	6.47	12.63	11.23	14.16	100.67	99.44	102.60	46.19	42.27	44.22	26.6	16.2	82.2	3.0

1860	123.77	4.79	4.25	5.34	11.09	9.73	12.58	103.81	99.69	110.23	50.26	46.57	48.43	26.9	16.7	83.3	3.0
1861	137.26	4.49	3.93	5.06	11.63	10.33	13.05	106.06	102.72	111.31	48.78	45.03	46.91	26.9	16.9	86.2	2.3
1862	139.28	5.28	4.95	5.61	11.89	10.81	13.07	110.86	106.68	117.33	43.92	40.82	42.38	25.6	16.5	88.0	3.5
1863	132.60	4.96	4.50	5.43	10.89	9.57	12.33	102.37	98.40	108.49	47.13	43.85	45.5	27.4	17.7	85.5	3.0
1864	136.72	5.24	4.64	5.86	11.80	10.56	13.15	115.37	112.16	120.28	46.59	43.12	44.86	27.7	18.3	82.6	3.5
1865	133.44	5.39	4.71	6.10	11.14	10.05	12.33	102.15	97.44	109.27	47.47	43.29	45.37	28.4	18.8	80.1	2.7
1866	126.91	6.27	5.43	7.13	12.99	11.81	14.28	105.58	100.68	112.95	46.89	42.67	44.76	27.4	18.5	80.7	3.1
1867	140.13	5.68	5.20	6.17	12.51	10.79	14.37	122.65	116.64	131.63	48.07	43.97	46	27.9	19.0	81.8	2.6
1868	168.32	6.21	5.78	6.66	13.19	11.41	15.13	117.84	110.24	129.15	44.4	40.44	42.41	25.9	17.4	86.2	2.5
1869	145.77	6.26	5.99	6.54	13.74	12.07	15.57	118.63	112.91	127.19	42.29	38.71	40.5	27.7	18.6	85.3	3.6
1870	131.92	5.17	4.67	5.68	13.34	11.79	15.04	117.76	112.66	125.39	46.89	43.2	45.04	30.8	20.9	80.6	3.7
1871	113.68	4.80	4.36	5.26	11.40	10.26	12.65	111.46	107.28	117.69	50.92	47.4	49.16	31.7	21.7	81.7	3.6
1872	128.26	4.84	4.42	5.26	10.40	9.43	11.48	97.28	91.77	105.51	52.18	48.3	50.25	33.5	22.8	89.5	3.2
1873	128.77	5.17	4.55	5.81	11.10	9.90	12.42	98.82	94.60	105.09	50.52	47.02	48.78	33.6	23.3	99.7	3.4
1874	146.69	6.56	5.94	7.20	13.08	11.44	14.89	108.90	104.01	116.14	46.32	42.45	44.38	34.9	24.3	102.6	2.7
1875	148.95	5.90	5.60	6.20	12.82	11.10	14.74	112.50	108.02	119.12	46.61	42.73	44.66	33.9	23.8	101.9	3.5
1876	140.20	5.80	5.49	6.11	11.28	9.94	12.76	102.93	97.27	111.23	46.48	43.3	44.9	36.0	25.5	99.8	3.0
1877	125.52	5.30	4.88	5.74	10.45	9.30	11.74	98.85	93.21	107.11	47.94	44.33	46.14	34.9	25.1	99.2	2.7
1878	134.18	5.46	5.22	5.71	9.72	8.87	10.66	95.42	91.81	100.69	48.06	45.39	46.74	33.7	24.5	92.7	3.8
1879	111.22	5.01	4.72	5.32	9.79	9.05	10.63	96.74	92.74	102.53	50.34	47.49	48.93	34.9	25.8	85.2	3.3
1880	120.65	5.49	5.08	5.90	10.43	9.51	11.45	106.01	101.02	113.24	49.21	46.18	47.7	34.7	25.6	89.4	3.4
1881	112.75	5.14	4.88	5.39	10.38	9.30	11.59	104.92	99.97	112.04	49.97	46.96	48.48	36.0	26.2	91.3	2.5
1882	124.59	5.04	4.66	5.42	9.66	8.87	10.53	92.28	87.47	99.17	50.17	46.98	48.58	35.4	25.8	92.8	3.7
1883	115.68	5.29	5.00	5.58	9.60	8.84	10.47	94.70	90.58	100.59	50.61	47.47	49.05	37.9	27.8	89.2	3.0
1884	113.18	5.33	5.05	5.61	10.01	9.11	11.01	99.31	94.34	106.38	50.85	47.67	49.27	36.7	27.3	88.5	3.7
1885	114.31	5.22	4.87	5.58	10.16	9.04	11.41	99.74	95.67	105.49	50.59	47.46	49.03	38.0	28.4	85.0	2.9
1886	111.20	5.20	4.80	5.61	9.34	8.64	10.13	92.05	89.24	95.99	52.02	49.2	50.62	37.8	28.4	79.3	3.1
1887	103.10	5.40	5.02	5.79	9.14	8.46	9.90	87.45	84.58	91.45	52.98	50.03	51.52	37.1	28.0	77.8	3.2
1888	100.32	5.22	4.96	5.48	9.38	8.79	10.04	92.50	89.38	96.79	53.59	51.06	52.34	38.3	29.0	79.1	3.1
1889	107.23	5.20	5.03	5.37	9.26	8.59	10.02	90.85	87.62	95.25	53.35	51	52.2	38.9	29.5	83.2	2.7
1890	103.08	5.41	5.18	5.64	9.75	9.03	10.57	93.98	91.38	97.50	51.75	49.03	50.4	39.9	30.0	83.9	3.8
1891	107.93	5.24	5.02	5.45	9.13	8.58	9.76	94.14	90.74	98.68	52.59	49.65	51.13	41.2	31.4	84.5	3.2
1892	109.19	5.31	5.11	5.51	10.02	9.46	10.65	107.31	105.97	109.09	51.82	49.3	50.56	41.4	31.5	86.1	3.9

1893	101.21	5.42	5.22	5.61	9.63	8.87	10.49	92.62	88.67	97.81	52.61	49.97	51.3	42.0	32.3	83.4	3.0
1894	100.93	5.29	5.17	5.40	9.24	8.65	9.91	89.18	87.35	91.58	53.24	50.99	52.13	42.4	32.8	81.9	3.3
1895	94.69	5.15	4.97	5.33	8.64	7.94	9.43	85.12	81.61	89.67	55.47	52.94	54.22	43.9	34.5	82.2	3.1
1896	103.31	5.18	4.97	5.38	8.73	8.21	9.32	85.32	82.81	88.58	54.77	52.26	53.53	46.1	36.3	82.2	3.4
1897	98.56	5.14	5.11	5.17	8.59	8.01	9.24	85.83	82.34	90.33	55.35	52.84	54.11	48.1	38.3	84.7	3.3
1898	90.77	5.10	4.78	5.42	8.86	8.16	9.65	84.83	81.51	89.11	56.14	53.29	54.73	49.9	40.0	87.7	3.7
1899	111.66	5.89	5.46	6.30	9.71	9.05	10.45	99.11	96.02	103.09	52.35	49.53	50.94	51.0	41.2	91.8	2.7
1900	98.46	5.95	6.01	5.90	9.42	8.49	10.48	97.60	93.63	102.71	53.62	50.75	52.2	51.2	41.6	93.2	3.7
1901	102.95	5.66	5.57	5.75	8.89	8.22	9.64	88.20	85.06	92.24	54.1	51.68	52.9	52.3	42.5	89.4	3.0
1902	86.35	5.33	5.11	5.54	8.77	8.25	9.35	90.04	86.99	93.95	55.92	53.56	54.75	52.0	42.2	90.0	3.0
1903	92.84	5.19	4.94	5.42	8.50	7.85	9.23	88.32	84.55	93.14	56.44	53.59	55.03	53.7	44.0	92.1	3.4
1904	84.36	5.37	5.15	5.58	8.58	8.08	9.15	93.32	90.22	97.28	56.48	54.19	55.35	56.0	45.9	90.1	2.9
1905	88.30	5.63	5.38	5.88	9.06	8.38	9.83	90.98	87.85	94.99	55.8	53.28	54.55	55.4	45.7	92.5	3.3
1906	81.03	5.30	5.22	5.38	8.41	7.87	9.01	84.88	80.62	90.34	57.83	55.53	56.7	60.3	50.0	95.1	3.8
1907	76.82	5.27	5.22	5.33	8.52	8.04	9.07	91.45	88.42	95.35	58.17	55.82	57.01	63.1	53.2	98.3	3.4
1908	85.43	5.11	5.03	5.19	8.54	8.17	8.96	93.25	90.39	96.94	57.57	55.29	56.45	60.9	52.2	99.2	4.1
1909	72.18	4.83	4.61	5.05	8.10	7.55	8.71	87.31	84.68	90.71	59.57	57.26	58.43	61.3	52.4	98.1	3.5
1910	75.15	4.99	4.86	5.12	8.13	7.56	8.76	89.93	86.46	94.41	59.08	56.49	57.8	64.6	56.1	99.3	3.7
1911	72.02	5.02	4.60	5.43	8.25	7.73	8.83	87.58	84.63	91.38	59.44	56.51	57.99	65.7	57.5	98.9	3.1
1912	70.86	5.15	4.78	5.52	8.16	7.59	8.79	93.67	90.60	97.64	59.12	56.35	57.75	67.6	59.6	101.8	3.4
1913	69.71	4.84	4.48	5.19	8.01	7.36	8.73	90.19	86.84	94.51	60	57.21	58.62	72.0	64.1	103.1	2.5
1914	72.88	4.98	4.76	5.20	8.09	7.61	8.62	91.20	87.75	95.67	59.43	56.91	58.18	71.7	64.6	102.5	4.1
1915	75.78	5.64	5.17	6.11	8.23	7.85	8.64	99.25	96.00	103.45	58.3	55.78	57.05	73.5	65.6	116.4	4.0
1916	69.72	5.62	5.18	6.06	7.66	7.46	7.88	88.35	84.82	92.92	59.21	56.88	58.05	75.9	70.2	136.9	2.2
1917	64.52	5.42	5.03	5.81	7.58	7.43	7.75	90.64	86.05	96.59	60.05	57.55	58.81	70.8	67.0	168.2	2.2
1918	64.61	12.38	11.36	13.37	11.64	10.89	12.45	91.34	87.33	96.54	51.38	48.16	49.76	65.8	61.3	243.3	2.6
1919	69.63	5.99	5.51	6.46	8.30	7.90	8.73	93.61	91.77	96.01	57.92	55.04	56.47	68.6	64.0	291.6	3.1
1920	63.29	5.14	4.60	5.67	7.54	7.27	7.84	88.02	85.39	91.43	60.11	57.42	58.76	71.1	67.2	308.9	3.0
1921	64.02	4.31	3.92	4.70	6.81	6.54	7.11	86.46	85.15	88.16	62.18	59.55	60.86	66.8	63.9	246.6	14.9
1922	62.49	4.15	3.97	4.32	7.08	7.08	7.09	94.41	93.79	95.21	61.59	59.77	60.68	72.3	70.9	192.0	12.8
1923	56.23	3.69	3.44	3.94	6.27	6.20	6.33	83.80	80.61	87.86	63.85	61.54	62.7	75.0	73.2	177.5	7.0
1924	60.28	4.04	3.96	4.12	6.37	6.14	6.62	86.87	84.64	89.72	62.94	60.64	61.79	79.5	77.6	174.1	5.7
1925	55.67	4.06	3.83	4.28	6.60	6.37	6.84	84.66	82.67	87.20	63.59	61.22	62.41	80.6	78.3	176.2	6.2

1926	5596	3.75	3.58	3.93	6.45	6.23	6.68	86.79	84.85	89.25	63.67	61.6	62.64	86.1	84.3	166.7	6.8	3.3
1927	5976	3.81	3.56	4.06	6.92	6.63	7.22	95.04	92.71	97.97	62.49	60.29	61.39	87.8	86.2	164.4	6.7	3.1
1928	5880	3.61	3.59	3.64	6.46	6.22	6.72	88.44	85.66	91.96	63.16	61.14	62.16	90.0	89.0	164.6	5.9	3.1
1929	5854	3.63	3.59	3.68	6.78	6.48	7.09	90.06	88.35	92.23	63.36	61.11	62.23	96.5	95.8	161.2	5.7	3.2
1930	5473	3.49	3.50	3.47	6.52	6.23	6.82	85.29	83.42	87.65	64.15	62.07	63.11	100.0	100.0	154.4	6.7	3.2
1931	5665	3.51	3.54	3.47	6.59	6.33	6.86	95.82	94.61	97.34	63.55	61.69	62.62	97.4	97.9	146.2	9.4	2.9
1932	5074	3.33	3.24	3.41	6.15	5.85	6.46	87.04	85.79	88.62	64.84	62.89	63.86	93.0	94.2	141.5	12.6	3.4
1933	4952	2.88	2.77	2.98	5.81	5.50	6.15	85.42	82.28	89.35	65.88	63.56	64.72	95.9	97.4	139.4	13.1	3.1
1934	4717	2.84	2.87	2.82	5.82	5.48	6.18	85.12	83.04	87.73	66	63.76	64.88	102.3	104.4	141.7	10.1	3.1
1935	4589	2.82	2.64	2.99	5.83	5.49	6.18	90.24	88.85	91.99	66.04	63.66	64.84	107.6	110.1	144.7	8.4	3.2
1936	4337	2.90	2.71	3.10	5.96	5.67	6.26	92.16	89.96	94.88	65.82	63.48	64.64	112.1	115.2	147.0	7.1	3.1
1937	4517	2.69	2.40	2.97	5.94	5.64	6.25	91.99	90.40	93.96	65.9	63.51	64.7	115.9	118.8	156.2	6.1	3.3
1938	4249	2.55	2.18	2.90	5.69	5.20	6.21	89.08	85.96	92.95	67.15	64.11	65.62	119.6	123.3	156.9	6.1	3.4
1939	3948	2.15	1.94	2.35	5.40	5.01	5.81	93.13	91.25	95.46	67.77	65.15	66.45	127.5	131.8	159.4	5.2	3.1
1940	3924	2.10	1.74	2.45	5.20	4.72	5.70	93.85	91.69	96.53	68.14	65.4	66.76	117.6	122.6	181.1	6.6	2.3
1941	3695	2.20	1.79	2.59	4.97	4.49	5.47	93.28	91.25	95.77	68.36	65.8	67.07	114.6	120.9	204.7	6.3	2.0
1942	2928	1.96	1.65	2.25	4.63	4.24	5.04	79.24	76.29	82.85	70.49	67.72	69.1	117.1	123.9	219.4	4.2	2.8
1943	2894	2.10	1.74	2.45	4.62	4.26	5.00	79.73	77.48	82.46	70.24	67.54	68.88	121.1	130.1	226.1	3.2	2.9
1944	3108	2.46	1.83	3.07	4.68	4.31	5.05	86.36	84.68	88.40	69.4	66.34	67.85	124.7	135.5	225.9	2.7	3.0
1945	2995	2.23	1.98	2.48	4.57	4.21	4.93	86.17	84.95	87.63	69.56	67.2	68.37	125.9	138.3	228.3	2.5	3.1
1946	2652	1.68	1.42	1.94	4.22	3.92	4.52	86.27	84.89	87.91	70.65	68.32	69.48	138.7	154.2	233.6	1.8	3.2
1947	2538	1.45	1.28	1.62	4.29	4.01	4.57	91.18	89.22	93.49	70.59	68.26	69.42	148.8	167.5	242.0	1.6	2.4
1948	2318	1.20	0.89	1.51	3.97	3.53	4.41	81.71	80.27	83.41	72.09	69.29	70.68	151.2	172.0	258.3	1.6	3.1
1949	2328	1.08	0.72	1.43	3.88	3.56	4.19	84.12	82.29	86.26	72.11	69.41	70.75	155.9	177.9	259.8	1.5	3.3
1950	2098	0.96	0.66	1.26	3.71	3.35	4.08	85.39	83.31	87.82	72.41	69.8	71.1	166.2	190.4	267.2	1.2	3.2
1951	2159	0.97	0.71	1.23	3.61	3.22	4.01	83.66	81.36	86.35	72.67	69.98	71.32	170.8	194.6	324.4	1.0	2.8
1952	2003	0.87	0.54	1.19	3.51	3.06	3.96	80.49	77.87	83.54	73.26	70.38	71.81	171.3	195.1	354.0	1.3	3.0
1953	1874	0.93	0.57	1.29	3.41	2.99	3.84	80.92	78.69	83.53	73.38	70.42	71.89	174.6	202.8	347.4	1.6	3.2
1954	1871	0.77	0.47	1.08	3.37	2.91	3.82	79.69	76.77	83.10	73.83	70.82	72.31	181.3	210.7	354.6	1.5	3.0
1955	1744	0.80	0.50	1.10	3.34	2.94	3.74	77.19	73.18	81.89	74.13	71.02	72.56	185.6	216.8	368.8	1.4	2.3
1956	1733	0.80	0.49	1.11	3.26	2.70	3.83	78.10	73.68	83.29	74.4	70.96	72.66	190.3	224.8	385.1	1.6	
1957	1777	0.78	0.49	1.06	3.25	2.66	3.83	80.03	75.54	85.33	74.25	70.72	72.47	197.3	233.8	396.9	2.1	
1958	1590	0.74	0.43	1.03	3.12	2.71	3.52	76.94	72.53	82.18	74.77	71.49	73.12	195.4	236.0	409.9	2.7	

1959	1663	0.78	0.43	1.11	3.04	2.54	3.54	75.73	70.52	81.94	75.17	71.55	73.34	200.1	242.9	417.3	2.2
1960	1662	0.72	0.44	0.99	3.12	2.64	3.59	79.18	73.64	85.84	74.87	71.23	73.02	209.1	255.0	430.6	1.5
1961	15.76	0.69	0.41	0.96	3.01	2.48	3.54	76.40	71.25	82.65	75.39	71.65	73.49	219.4	269.6	445.1	1.3
1962	15.43	0.69	0.38	0.99	3.06	2.43	3.67	78.66	72.06	86.71	75.43	71.37	73.37	230.0	284.6	459.6	1.4
1963	15.37	0.77	0.47	1.05	2.99	2.44	3.54	76.13	69.00	84.92	75.64	71.57	73.57	238.8	298.6	470.0	1.5
1964	14.22	0.77	0.44	1.10	3.09	2.48	3.70	74.25	67.02	83.24	75.91	71.66	73.75	257.8	325.5	482.9	1.2
1965	13.35	0.73	0.44	1.01	3.13	2.48	3.77	74.95	67.16	84.78	76.1	71.73	73.87	269.0	342.9	506.6	1.2
1966	12.56	0.77	0.47	1.05	3.09	2.35	3.83	73.67	66.16	83.21	76.45	71.82	74.09	274.3	353.3	530.5	1.5
1967	12.85	0.66	0.39	0.92	3.15	2.34	3.95	73.11	65.53	82.80	76.54	71.82	74.13	278.5	361.7	559.2	1.8
1968	13.07	0.74	0.44	1.01	3.12	2.37	3.86	74.82	67.06	84.79	76.37	71.69	73.98	288.4	378.0	571.9	2.2
1969	11.74	0.71	0.43	0.99	3.19	2.48	3.89	73.60	65.41	84.19	76.61	71.68	74.08	290.8	384.5	593.9	1.8
1970	11.00	0.74	0.47	1.01	3.17	2.44	3.89	68.29	60.14	78.90	77.2	72.22	74.66	304.4	406.6	622.5	1.6
1971	11.09	0.74	0.41	1.06	3.25	2.42	4.07	69.25	59.62	81.87	77.4	71.98	74.61	312.7	419.3	657.3	2.2
1972	10.82	0.74	0.40	1.06	3.23	2.35	4.11	68.77	59.51	80.99	77.53	72.04	74.71	311.6	420.4	703.1	2.4
1973	9.87	0.72	0.40	1.02	3.17	2.30	4.03	69.03	59.05	82.31	77.71	72.16	74.85	326.9	441.0	751.5	2.2
1974	9.56	0.68	0.40	0.94	3.23	2.29	4.15	68.05	57.78	81.83	77.9	72.2	74.97	350.1	472.8	843.1	1.7
1975	8.63	0.74	0.39	1.08	3.23	2.33	4.11	68.17	58.26	81.57	77.94	72.17	74.97	348.7	475.4	971.6	1.4
1976	8.32	0.73	0.48	0.97	3.15	2.23	4.05	69.15	58.81	83.24	77.94	72.14	74.95	348.7	473.2	1086.8	1.4
1977	8.05	0.67	0.40	0.92	3.17	2.23	4.11	65.51	54.96	79.98	78.54	72.37	75.36	337.0	462.0	1194.0	1.6
1978	7.80	0.71	0.42	0.99	3.03	2.10	3.93	65.87	55.50	80.16	78.66	72.43	75.45	330.2	454.3	1324.1	2.0
1979	7.49	0.66	0.38	0.93	3.03	2.10	3.95	65.53	54.58	80.69	78.71	72.49	75.51	347.6	478.6	1420.1	1.8
1980	6.91	0.58	0.33	0.82	2.93	2.07	3.77	64.74	54.45	79.04	78.85	72.78	75.74	353.8	486.3	1565.9	1.7
1981	6.94	0.58	0.33	0.83	2.72	1.86	3.57	64.44	54.29	78.57	79.13	73.07	76.03	351.2	481.9	1694.7	2.2
1982	6.85	0.51	0.30	0.71	2.64	1.86	3.39	62.24	51.96	76.58	79.38	73.42	76.34	353.1	484.5	1831.6	2.8
1983	7.04	0.57	0.32	0.80	2.55	1.84	3.23	61.50	51.00	76.18	79.63	73.62	76.57	363.3	499.6	2001.5	3.1
1984	6.40	0.54	0.27	0.79	2.43	1.71	3.13	60.52	50.52	74.54	79.93	73.85	76.84	378.7	520.8	2144.5	2.7
1985	6.76	0.55	0.32	0.76	2.40	1.71	3.06	62.01	51.75	76.45	79.7	73.78	76.69	383.2	531.1	2277.6	2.5
1986	5.93	0.56	0.29	0.81	2.42	1.75	3.06	61.10	50.86	75.56	80.03	73.98	76.96	390.5	544.2	2461.2	2.4
1987	6.12	0.56	0.31	0.80	2.38	1.71	3.02	60.45	50.33	74.79	80.15	74.18	77.13	400.1	561.4	2562.8	2.0
1988	5.82	0.58	0.34	0.80	2.42	1.81	3.01	61.90	51.98	76.00	79.95	74.15	77.02	406.5	575.0	2714.7	1.7
1989	5.77	0.55	0.31	0.77	2.31	1.73	2.87	58.49	49.29	71.61	80.58	74.8	77.67	414.0	590.2	2921.8	1.5
1990	5.96	0.52	0.30	0.74	2.24	1.67	2.80	60.67	50.91	74.56	80.4	74.81	77.59	413.6	596.8	3129.5	1.6
1991	6.15	0.48	0.25	0.71	2.28	1.70	2.84	58.78	49.23	72.36	80.53	74.94	77.72	402.4	587.9	3256.7	3.0

1992	5.35	0.43	0.27	0.60	2.22	1.68	2.74	57.87	48.64	70.97	80.78	75.35	78.07	396.0	582.7	3224.2	5.1
1993	4.84	0.45	0.30	0.60	2.20	1.62	2.75	59.07	49.95	72.04	80.77	75.48	78.13	385.0	570.7	3365.4	8.2
1994	4.45	0.39	0.22	0.55	2.24	1.73	2.72	55.33	46.68	67.60	81.37	76.06	78.73	394.6	592.3	3458.4	8.0
1995	4.15	0.41	0.26	0.56	2.18	1.64	2.70	56.21	47.13	69.07	81.45	76.16	78.82	409.1	625.6	3576.4	7.7
1996	3.96	0.36	0.23	0.48	2.13	1.62	2.61	55.87	47.26	68.07	81.52	76.52	79.04	413.9	632.2	3612.2	8.0
1997	3.62	0.39	0.28	0.51	2.07	1.56	2.56	55.07	46.50	67.18	81.79	76.7	79.27	422.3	649.7	3647.9	8.0
1998	3.55	0.43	0.27	0.59	2.06	1.55	2.54	54.96	46.21	67.31	81.64	76.68	79.19	437.1	674.8	3651.5	6.5
1999	3.37	0.40	0.23	0.55	2.10	1.64	2.55	56.24	48.45	67.21	81.74	76.89	79.35				5.6

Table S-1. Descriptive statistics*A. Variables in levels*

	GDP	Life expectancy at birth		Infant mortality	Mortality ages 15-24		Mortality ages 35-54		Mortality ages 70-89					
		Total	Males		Females	Total	Males	Females	Total	Males	Females			
Mean	127.1	55.6	53.8	57.4	94.1	428.5	463.1	394.2	963.0	1084.6	852.3	9922.3	10560.8	9464.8
SD	(173.3)	(13.9)	(13.8)	(14.1)	(64.8)	(257.7)	(271.9)	(246.5)	(559.6)	(640.4)	(494.7)	(2507.8)	(2419.6)	(2622.4)
Min	6.9	26.5	24.4	28.6	4.1	39.1	55.2	22.2	217.9	270.1	162.0	5532.9	6760.0	4667.5
Max	625.6	78.8	76.2	81.5	232.0	1420.9	1645.2	1210.8	3023.7	3333.3	2751.1	17496.3	17786.9	17293.7

Note: SD is standard deviation, GDP is volume GDP indexed to 100 in 1930; life expectancy is in years; infant mortality is in annual deaths before age one per 1000 live births; age-specific mortality rates are annual deaths per 100,000 population. The sample size is close to 200 for all series.

Table S-1 (Cont.). *Descriptive statistics**B. Variables in annual change*

Variable	Years	Mean	SD	Minimum	Maximum
GDP growth ($\Delta \ln \text{GDP}$)	1801– ca. 1998	2.3	3.5	– 8.9	11.7
	1801– 1850	1.1	3.4	– 7.0	7.0
	1851– 1900	2.3	3.4	– 8.8	11.7
	1901– 1950	3.0	4.2	– 8.9	10.9
	1951– ca. 1998	2.6	2.4	– 2.4	8.6
GDP per capita growth ($\Delta \ln \text{GDP per capita}$)	1801– ca. 1998	1.6	3.3	– 8.1	10.6
	1801– 1850	0.4	2.8	– 6.5	7.0
	1851– 1900	1.6	3.4	– 7.4	10.6
	1901– 1950	2.4	4.1	– 8.1	9.7
	1951– ca. 1998	2.0	2.4	– 3.4	7.7
Inflation ($\Delta \ln d$, where d is the GDP deflator)	1801– ca. 1998	2.4	6.5	– 25.0	36.9
	1801– 1850	1.6	5.9	– 10.1	21.3
	1851– 1900	0.7	4.9	– 13.2	12.1
	1901– 1950	2.1	9.3	– 25.0	36.9
	1951– ca. 1998	5.4	3.9	– 1.9	19.4
Rate of decline in longevity shortfall ($-\Delta \ln [90 - e_{o,t}]$, where e_o is life expectancy at birth)	1801– ca. 1998	0.9	5.1	– 25.5	18.3
	1801– 1850	0.5	6.4	– 15.3	18.3
	1851– 1900	0.4	5.5	– 14.6	14.3
	1901– 1950	1.4	5.5	– 25.5	18.2
	1951– ca. 1998	1.2	1.5	– 1.9	5.2
Annual increase in life expectancy at birth ($\Delta e_{o,t}$)	1801– ca. 1998	0.20	2.33	– 9.05	8.64
	1801– 1850	0.10	3.46	– 8.50	8.64
	1851– 1900	0.13	2.58	– 7.56	7.41
	1901– 1950	0.38	1.85	– 9.05	6.71
	1951– ca. 1998	0.16	0.22	– 0.32	0.55
Rate of decline in infant mortality ($-\Delta \ln m_{<1,t}$)	1801– ca. 1998	2.1	8.6	– 26.8	24.4
	1801– 1850	1.0	11.0	– 26.8	20.6
	1851– 1900	0.8	9.8	– 20.7	24.4
	1901– 1950	3.1	7.1	– 10.6	23.3
	1951– ca. 1998	3.7	5.0	– 5.5	14.0
Rate of decline in mortality 15– 24 ($-\Delta \ln m_{15-24,t}$)	1801– ca. 1998	1.5	13.7	– 82.5	72.5
	1801– 1850	0.5	15.9	– 47.1	44.1
	1851– 1900	– 0.1	10.8	– 38.9	23.9
	1901– 1950	3.6	17.8	– 82.5	72.5
	1951– ca. 1998	1.8	7.7	– 10.9	18.8
Rate of decline in mortality 35– 54 ($-\Delta \ln m_{35-54,t}$)	1801– ca. 1998	1.1	10.0	– 42.8	50.8
	1801– 1850	0.5	15.1	– 33.7	50.8
	1851– 1900	0.9	9.3	– 20.2	28.8
	1901– 1950	1.9	8.9	– 42.8	33.8
	1951– ca. 1998	1.2	2.4	– 3.3	7.3
Rate of decline in mortality 70– 89 ($-\Delta \ln m_{70-89,t}$)	1801– ca. 1998	0.5	7.1	– 18.8	18.8
	1801– 1850	0.7	10.0	– 18.8	18.8
	1851– 1900	0.3	7.7	– 15.6	15.1
	1901– 1950	0.3	6.1	– 11.6	16.3
	1951– ca. 1998	0.9	2.6	– 4.5	7.5

Note: All numbers are annual rates in percentage, except the annual gain in life expectancy, which is in years

Table S-2. Parameter estimates of models in which annual health progress, measured as $-\Delta \ln h_t$, is regressed on a constant, time t , GDP growth g , and the interaction of time and economic growth, $g \cdot t$. Standard errors are in parentheses following parameter estimates. For the explanation of the tipping point, see text in the paper

Sample	Health indicator, h	Economic growth, g	Interaction $g \cdot t$	Tipping point
19th & 20th centuries	Longevity shortfall	0.76*** (0.20)	-0.004* (0.002)	1990
	Infant mortality	0.91** (0.35)	-0.005 (0.003)	1982
19 th century	Longevity shortfall	0.73* (0.32)	-0.003 (0.006)	2043
	Infant mortality	0.86 (0.56)	-0.000 (0.010)	
20 th century	Longevity shortfall	1.55* (0.66)	-0.009* (0.005)	1972
	Infant mortality	-0.09 (1.04)	-0.001* (0.007)	1890
19th & 20th centuries	Longevity shortfall males	0.75*** (0.20)	-0.004* (0.002)	1988
	Mortality 15-24 males	2.54*** (0.56)	-0.012* (0.005)	2012
	Mortality 35-54 males	1.49*** (0.41)	-0.009* (0.003)	1966
	Mortality 70-89 males	0.82** (0.27)	-0.007* (0.003)	1917
19 th century	Longevity shortfall males	0.73* (0.31)	-0.004 (0.006)	1983
	Mortality 15-24 males	3.44*** (0.74)	-0.038** (0.013)	1891
	Mortality 35-54 males	1.88** (0.68)	-0.021 (0.012)	1890
	Mortality 70-89 males	1.03* (0.48)	-0.011 (0.009)	1894
20 th century	Longevity shortfall males	1.67* (0.63)	-0.010* (0.004)	1967
	Mortality 15-24 males	6.22** (2.22)	-0.036* (0.016)	1973
	Mortality 35-54 males	3.56** (1.12)	-0.023** (0.008)	1955
	Mortality 70-89 males	0.17* (0.73)	-0.002 (0.005)	1885
19th & 20th centuries	Longevity shortfall females	0.77*** (0.21)	-0.004* (0.002)	1993
	Mortality 15-24 females	1.81** (0.57)	-0.007* (0.005)	2059
	Mortality 35-54 females	1.73*** (0.41)	-0.011* (0.004)	1957
	Mortality 70-89 females	0.80* (0.31)	-0.006* (0.003)	1933
19 th century	Longevity shortfall females	0.72* (0.33)	-0.002 (0.006)	2160
	Mortality 15-24 females	2.00** (0.69)	-0.013* (0.013)	1954
	Mortality 35-54 females	2.12*** (0.69)	-0.021 (0.013)	1901
	Mortality 70-89 females	1.06* (0.52)	-0.011 (0.009)	1896
20 th century	Longevity shortfall females	1.38* (0.70)	-0.008* (0.005)	1973
	Mortality 15-24 females	4.36 (2.54)	-0.025 (0.018)	1971
	Mortality 35-54 females	2.46* (1.08)	-0.016* (0.008)	1954
	Mortality 70-89 females	-0.05* (0.87)	-0.000 (0.006)	

* $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$. Durbin-Watson $d > 2.2$ in all 27 regressions

Table S-3. Parameter estimates of models in which annual health progress, measured as $-\Delta \ln h_t$, is regressed on a constant, log GDP per capita $\ln y_t$, GDP growth g_t , and the interaction $g \cdot \ln y_t$. Standard errors are in parentheses following parameter estimates. For the explanation of the tipping point, see text.

Sample	Health indicator, h_t	Economic growth, g_t	Interaction $g_t \cdot y_t$	Tipping point
19th & 20th centuries	Longevity shortfall	1.44** (0.45)	- 0.26* (0.11)	1963
	Infant mortality	1.68* (0.68)	- 0.31 (0.19)	1961
	Mortality 35-54	2.95** (0.89)	- 0.57** (0.30)	1953
19 th century	Longevity shortfall	2.57 (2.05)	- 0.62 (0.63)	1909
	Infant mortality	2.26 (3.64)	- 0.45 (1.13)	1948
	Mortality 35-54	8.66* (4.31)	- 2.39 (1.34)	1883
20 th century	Longevity shortfall	2.17* (0.90)	- 0.40* (0.18)	1961
	Infant mortality	- 0.16 (1.40)	0.06 (0.29)	<1800
	Mortality 35-54	4.33** (1.42)	- 0.83** (0.30)	1954

* $P < 0.05$ ** $P < 0.01$

Table S-4. Parameter estimates (with standard errors, SE) of models in which the annual health progress (either *absolute gain* in years of life expectancy or *relative decline* in mortality) is regressed on a constant, time t , GDP per capita growth γ , and the interaction of time and economic growth, $\gamma \cdot t$. For the explanation of the tipping point, see text. AIC is the Akaike information criterion

Sample (centuries)	Dependent variable	Growth of GDP per capita (γ)		Interaction $\gamma \cdot t$		Tipping point		R^2	AIC
		Parameter estimate	SE	Parameter estimate	SE	Parameter estimate	SE		
19 th	Life expectancy	55.490**	19.000	-0.510	0.325	1909	40.8	0.12	492.7
20 th		53.650*	21.940	-0.330*	0.157	1963	16.6	0.09	331.9
19 th & 20 th		44.500***	10.330	-0.275**	0.094	1962	27.8	0.10	872.3
19 th	Life expectancy, females	52.430**	19.090	-0.447	0.326	1917	52.3	0.11	493.7
20 th		48.560*	21.550	-0.297	0.154	1964	18.5	0.08	328.4
19 th & 20 th		43.370***	10.330	-0.266**	0.094	1963	29.1	0.10	872.4
19 th	Life expectancy, males	58.070**	18.950	-0.565	0.324	1903	33.7	0.12	492.2
20 th		58.470*	22.450	-0.361*	0.160	1962	15.3	0.10	336.4
19 th & 20 th		45.390***	10.360	-0.282**	0.094	1961	27.0	0.11	873.5
19 th	Infant mortality	1.499*	0.689	-0.012	0.012	1926	79.6	0.08	-170.6
20 th		0.215	1.057	-0.001	0.008	... ^a	...	0.02	-262.5
19 th & 20 th		1.162**	0.400	-0.007*	0.004	1956	37.7	0.07	-415.4
19 th	Mort. 15-24 females	2.704**	0.849	-0.025	0.015	1907	36.1	0.14	-129.0
20 th		3.817	2.623	-0.022	0.019	1976	39.4	0.05	-84.4
19 th & 20 th		2.039**	0.666	-0.010	0.006	... ^a	...	0.08	-213.2
19 th	Mort. 15-24 males	4.519***	0.892	-0.056***	0.015	1880	11.0	0.23	-119.1
20 th		5.531*	2.320	-0.032	0.017	1974	22.6	0.11	-108.4
19 th & 20 th		2.809***	0.649	-0.015*	0.006	1987	40.5	0.12	-223.8
19 th	Mort. 35-54 females	3.171***	0.825	-0.038**	0.014	1883	15.5	0.15	-134.7
20 th		2.250*	1.113	-0.014	0.008	1957	17.3	0.05	-252.4
19 th & 20 th		2.086***	0.467	-0.014***	0.004	1945	20.6	0.10	-353.7
19 th	Mort. 35-54 males	2.867**	0.812	-0.037**	0.014	1878	14.5	0.12	-137.7
20 th		3.175**	1.170	-0.020*	0.008	1956	12.6	0.09	-242.6
19 th & 20 th		1.852***	0.468	-0.012**	0.004	1949	24.8	0.08	-352.9
19 th	Mort. 70-89 females	1.903**	0.615	-0.023*	0.011	1882	18.9	0.10	-193.5
20 th		-0.062	0.894	0.000	0.006	... ^a	...	0.01	-295.4
19 th & 20 th		1.173**	0.354	-0.009**	0.003	1926	20.0	0.05	-464.1
19 th	Mort. 70-89 males	1.952***	0.559	-0.023*	0.010	1884	17.5	0.13	-212.6
20 th		0.178	0.753	-0.002	0.005	1880	151.9	0.01	-329.0
19 th & 20 th		1.279***	0.316	-0.010***	0.003	1923	15.5	0.08	-508.8

* $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$. Durbin-Watson $d > 2.0$ in all regressions.

^a The tipping point is not well defined when the interaction is not significant

Table S-5. Parameter estimates (with standard errors, SE) of models in which the annual health progress (either *absolute gain* in years of life expectancy or *relative decline* in mortality) is regressed on a constant, the log of GDP per capita, the growth of GDP per capita γ , and the interaction of these two, $\gamma \cdot \log(\text{GDPpc})$. For the explanation of the tipping point, see text. AIC is the Akaike information criterion

Sample (centuries)	Dependent variable	Growth of GDP per capita (γ)		Interaction $\gamma \cdot \log(\text{GDPpc})$		Tipping point		R^2	AIC
		Parameter estimate	SE	Parameter estimate	SE	Estimate	SE		
19 th	Life expectancy	230.8	116.5	-62.3	35.8	1890	16.4	0.12	492.5
20 th		70.8*	30.3	-13.1*	6.3	1961	16.8	0.09	331.9
19 th & 20 th		76.5***	21.9	-14.5**	5.3	1956	21.1	0.10	873.4
19 th	Life expectancy females	215.3	117.1	-57.5	36.0	1892	18.5	0.12	493.4
20 th		63.7*	29.8	-11.7	6.2	1962	19.0	0.08	328.4
19 th & 20 th		75.1***	21.9	-14.3*	5.3	1956	21.6	0.09	873.3
19 th	Life expectancy males	244.3*	116.3	-66.5	35.8	1889	14.8	0.12	492.1
20 th		77.5*	31.0	-14.4*	6.5	1960	15.2	0.10	336.2
19 th & 20 th		77.6***	22.0	-14.8*	5.3	1956	20.8	0.10	874.8
19 th	Infant mortality	6.2	4.2	-1.6	1.3	1894	24.2	0.08	-171.1
20 th		0.20	1.5	-0.0	0.3	... ^a	...	0.01	-262.2
19 th & 20 th		2.06*	0.8	-0.4	0.2	1953	28.3	0.07	-415.6
19 th	Mort. 15-24 females	11.7*	5.2	-3.2*	1.6	1889	13.9	0.14	-130
20 th		5.6	3.6	-1.0	0.7	1969	32.4	0.05	-84.92
19 th & 20 th		3.4*	1.4	-0.6	0.3	1985	63.7	0.08	-213.6
19 th	Mort. 15-24 males	21.0***	5.5	-6.0**	1.7	1879	6.7	0.22	-118.1
20 th		7.5*	3.2	-1.3*	0.7	1971	22.5	0.11	-108.8
19 th & 20 th		4.3**	1.4	-0.7*	0.3	1983	47.	0.12	-222.2
19 th	Mort. 35-54 females	14.2**	5.1	-4.0*	1.6	1881	9.4	0.14	-133.8
20 th		3.0	1.5	-0.6	0.3	1956	17.3	0.05	-252.3
19 th & 20 th		3.5***	1.0	-0.7**	0.2	1948	17.8	0.09	-350.7
19 th	Mort. 35-54 males	12.8*	5.0	-3.7*	1.5	1879	9.9	0.11	-136.3
20 th		4.4**	1.6	-0.8*	0.3	1954	11.7	0.09	-243
19 th & 20 th		3.1**	1.0	-0.6*	0.2	1951	21.2	0.07	-350.8
19 th	Mort. 70-89 females	8.5*	3.8	-2.4*	1.2	1880	11.7	0.09	-192.8
20 th		-0.3	1.2	0.04	0.3	... ^a	...	0.01	-295.5
19 th & 20 th		1.9*	0.8	-0.4*	0.2	1933	18.4	0.04	-460.9
19 th	Mort. 70-89 males	9.1**	3.4	-2.6	1.0	1880	9.8	0.13	-212.6
20 th		0.1	1.0	-0.0	0.2	... ^a	...	0.01	-328.8
19 th & 20 th		2.2**	0.7	-0.5*	0.2	1930	13.5	0.06	-504.7

* $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$. Durbin-Watson $d > 2.0$ in all regressions.

^a The tipping point is not well defined when the interaction is not significant

Table S-6. Correlations between health progress and economic growth at lag 0 and other lags, during overlapping half-centuries in Sweden

Years	Lag 0	Lag 1	Lag 2	Lag 3	Lag 4	Lag 5	Lag 6
<i>A</i> – Health progress as measured by the relative decline in longevity shortfall ($90 - e_0$)							
1801-1849	0.33*	0.10	0.01	- 0.27	- 0.04	0.08	- 0.17
1825-1874	0.32*	0.26	- 0.16	- 0.31*	- 0.05	0.02	0.09
1850-1899	0.34*	0.16	- 0.21	- 0.14	- 0.23	0.07	0.18
1875-1924	0.32*	- 0.03	- 0.43**	0.15	- 0.06	- 0.15	0.06
1900-1949	0.27	- 0.06	- 0.37**	0.17	0.09	- 0.25	0.10
1925-1975	- 0.05	- 0.28*	- 0.05	0.17	0.25	- 0.17	0.08
1950-1998	- 0.10	- 0.24	- 0.02	- 0.21	- 0.10	0.00	- 0.10
<i>B</i> – Health progress as measured by the relative decline in mortality at ages 35-54							
1801-1849	0.36*	0.13	- 0.07	- 0.20	- 0.01	0.01	- 0.10
1825-1874	0.20	0.18	0.02	- 0.35*	- 0.03	- 0.02	- 0.02
1850-1899	0.15	0.11	- 0.04	- 0.17	- 0.16	0.03	0.28
1875-1924	0.32*	- 0.07	- 0.36*	0.13	0.01	- 0.17	0.18
1900-1949	0.27	- 0.09	- 0.30	0.10	0.13	- 0.24	0.09
1925-1975	- 0.16	- 0.42**	0.10	- 0.02	0.31*	- 0.21	0.13
1950-1998	- 0.26	- 0.21	0.00	- 0.23	- 0.20	- 0.15	- 0.08

* $P < 0.05$ ** $P < 0.01$

Table S-7. Regression estimates of the effect of economic growth (annual percentage change in GDP per capita) on health progress (as measured by the change in life expectancy or the relative decline in mortality at ages 35-54) in lag models including data for the 19th and 20th centuries. Only the results for lags zero to six are presented in the specifications including 15 lags

	Effects on the annual gain in life expectancy at birth							Effects on the annual rate of decline of mortality 35-54						
	Number of lags included in the regression							Number of lags included in the regression						
	0	1	2	3	4	5	15	0	1	2	3	4	5	15
β_0	16.9***	17.3***	16.3***	16.3***	17.0***	17.0***	11.5*	0.65**	0.67**	0.64**	0.63**	0.63**	0.62**	0.37
β_1		5.9	7.4	7.2	7.2	7.2	7.1		0.20	0.24	0.23	0.22	0.25	0.20
β_2			-7.6	-7.4	-8.0†	-7.9	-9.6†			-0.27	-0.27	-0.26	-0.26	-0.20
β_3				-2.3	-1.6	-1.7	-3.0				-0.14	-0.15	-0.17	-0.33
β_4					-7.5	-7.3	-4.6					-0.06	-0.03	0.03
β_5						0.3	-1.2						-0.15	-0.14
β_6							2.8							0.17

† $P < 0.1$ * $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$.

Table S-8. Regression results in models $-\Delta \ln H_t = \alpha + \sum_{i=0}^k \beta_i \cdot g_{t-i}$ in which health progress (as measured by the rate of decline in infant mortality or a sex-specific health indicator H) is regressed on a constant and GDP growth g in the same year ($k = 0$) or lagged up to two years ($k = 2$). M and F indicate if the sex-specific mortality used as outcome variable is for males or females, respectively.

$k =$	19 th century, first half			19 th century, 2nd half			20 th century, 1st half			20 th century, 2nd half						
	M	F	2	M	F	2	M	F	2	M	F	2				
Infant mortality rate¹																
β_0	0.80†		0.97†	0.82*	0.78†	0.15	0.37*	0.33†	0.31†	0.25	0.11	-0.04	-0.01			
β_1			-0.45		-0.13						-0.01		-0.02			
β_2			-0.23		-0.31						-0.45†		-0.08			
Longevity shortfall																
β_0	0.59*	0.65*	0.78**	0.87*	0.53*	0.62*	0.50*	0.58*	0.37*	0.33†	0.31†	0.25	-0.10	-0.04	0.08	
β_1			0.19	0.23	0.24	0.34	0.24	0.34	-0.08	-0.05	-0.08	-0.05	-0.12	-0.12	-0.25†	
β_2			0.27	0.31	-0.31	-0.30	-0.31	-0.30	-0.39*	-0.46*	-0.39*	-0.46*	-0.02	-0.02	0.11	
Mortality ages 15-24																
β_0	2.68***	1.78**	3.11***	2.17**	0.57	1.11*	0.57	0.98*	1.72**	1.28*	1.55*	1.14†	-0.48	-0.40	-0.57	-0.43
β_1			0.31	0.47	0.11	0.67	0.11	0.67	-0.24	0.10	-0.24	0.10	0.29	0.29	0.69	0.69
β_2			0.34	0.46	-0.69	-1.03*	-0.69	-1.03*	-0.95	-0.79	-0.95	-0.79	-0.65	-0.65	-1.38†	-1.38†
Mortality ages 35-54																
β_0	1.41*	1.81	1.78*	2.20**	0.35	0.44	0.35	0.44	0.71*	0.45	0.60†	0.35	-0.39*	-0.19	-0.34†	-0.10
β_1			0.35	0.65	0.31†	0.36	0.31†	0.36	-0.20	-0.17	-0.20	-0.17	-0.13	-0.13	-0.18	-0.18
β_2			0.30	0.32	-0.13	0.06	-0.13	0.06	-0.61†	-0.46	-0.61†	-0.46	-0.11	-0.11	0.25	0.25
Mortality ages 70-89																
β_0	0.88*	0.96*	1.11*	1.15*	0.16	0.11	0.16	0.11	-0.11	-0.10	-0.18	-0.20	-0.13	0.04	-0.01	0.21
β_1			-0.07	0.23	-0.18	-0.13	-0.18	-0.13	-0.13	-0.08	-0.13	-0.08	-0.01	-0.01	-0.34	-0.34
β_2			-0.27	-0.24	0.09	0.24	0.09	0.24	-0.31	-0.44	-0.31	-0.44	-0.27	-0.27	0.17	0.17

¹ Infant mortality is the only non sex-specific health indicator in this table.

* $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$ † $P < 0.1$

Table S-9. Regression results in models $H_t = \alpha + \sum_{i=0}^k \beta_i \cdot g_{t-i}$ in which sex specific health progress H_t (as measured either by the annual gain in life expectancy or by the rate of decline in mortality at specific ages) is regressed on a constant and growth of GDP per capita g in the same year ($k = 0$) or lagged up to two years ($k = 2$). M and F indicate if the sex-specific health indicator used as outcome variable is for males or females, respectively.

$k =$	19 th century, first half			19 th century, 2nd half			20 th century, 1st half			20 th century, 2nd half				
	0	2		0	2		0	2		0	2			
Life expectancy at birth														
β_0	41.1*	39.8*		20.6†	22.1*		12.1†	10.3†		10.2	8.1		-1.14	0.47
β_1										0.08	-1.1		-1.43	-1.69
β_2										-12.1†	-13.2*		-0.47	1.29
Mortality ages 15-24														
β_0	3.40***	2.23**		0.48	0.85†		1.59*	1.19†		1.41*	1.05		-0.24	-0.23
β_1										0.04	0.34		0.01	0.34
β_2										-0.91	-0.67		-0.72	-1.11
Mortality ages 35-54														
β_0	1.98*	2.48**		0.29	0.37		0.61*	0.40		0.30	0.51		-0.34†	-0.02
β_1										-0.02	-0.05		-0.09	-0.24
β_2										-0.45	-0.56		-0.08	0.35
Mortality ages 70-89														
β_0	1.55**	1.54**		0.21	0.15		-0.12	-0.11		-0.19	-0.21		-0.07	0.13
β_1										-0.09	-0.05		-0.20	-0.25
β_2										-0.34	-0.46		-0.09	0.11

† $P < 0.1$ * $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$.

Note how in table S-8 several negative effects of GDP growth on health progress during the 20th century which appear statistically significant (or marginally significant at the 0.1 level) are no longer significant in table S-9 when GDP per capita growth is the index of economic growth.

Table S-10. Regression results in lag models $-\Delta \ln H_t = \alpha + \sum_{i=0}^k \beta_i \cdot \Delta u_{t-i}$ in which health progress (as measured by the rate of decline in longevity shortfall $H_t = 90 - e_{o,t}$) is regressed on a constant and the change in the unemployment rate (Δu_t) in specifications with k lags, $k \leq 3$

$k =$	1911-1999			1911-1950			1950-1999						
	0	1	2	3	0	1	2	3	0	1	2	3	
β_0	0.001	0.001	0.003	0.003	0.001	0.001	0.004	0.002	0.002	0.002	-0.002	-0.002	-0.002
β_1		0.001	0.000	-0.001		0.001	0.000	-0.002		0.007*	0.009†	0.011*	
β_2			0.007**	0.008**			0.008†	0.008†			-0.001	-0.005	
β_3				-0.004				-0.005					0.006

† $P < 0.1$ * $P < 0.05$ ** $P < 0.01$

Table S-11. Correlations between annual GDP growth and annual rate of progress in health indicators. IMR is infant mortality rate. All correlations computed between moving averages of the annual rate of GDP growth and the rate of growth in life expectancy or the rate of decline in age-specific mortality

Period	Life expectancy at birth			Mortality ages 15-24			Mortality ages 35-54			Mortality ages 70-89			
	Total	Males	Females	IMR	Total	Males	Females	Total	Males	Females	Total	Males	Females
<i>A - Five year moving average</i>													
1801-1995	0.19**	0.18*	0.20**	0.27***	0.41***	0.40***	0.41***	0.34***	0.30***	0.38***	0.15*	0.10	0.19*
1801-1900	0.35***	0.34*	0.35***	0.24**	0.36***	0.36***	0.36***	0.45***	0.42***	0.46***	0.36***	0.34***	0.37***
1901-1995	0.08	0.06	0.10	-0.05	0.36***	0.36***	0.36***	0.10	0.06	0.16	-0.30**	-0.42***	-0.18
1801-1850	0.53***	0.51***	0.54***	0.46***	0.64***	0.61***	0.68***	0.58***	0.53***	0.63***	0.47***	0.41**	0.50***
1825-1974	0.41**	0.41**	0.41**	0.30*	0.30*	0.28	0.31*	0.46***	0.43***	0.47***	0.41**	0.40**	0.41**
1850-1900	0.32**	0.31*	0.33*	0.03	0.13	0.08	0.17	0.24	0.19	0.27	0.28	0.28	0.27
1875-1924	0.13	0.11	0.15	0.04	0.51***	0.51***	0.51***	0.34*	0.02	0.35*	-0.11	-0.20	-0.04
1901-1950	0.08	0.09	0.08	0.06	0.62***	0.64***	0.58***	0.32*	0.44***	0.29*	-0.31*	-0.37**	-0.25
1925-1974	-0.35*	-0.33*	-0.36**	0.17	0.22	0.28	0.13	-0.30*	-0.30*	-0.29*	-0.35*	-0.43**	-0.27
1951-ca.1995	-0.29*	-0.49***	0.12	-0.17	-0.54***	-0.55***	-0.29	-0.48***	-0.59***	-0.17	-0.22	-0.54***	0.11
<i>B - Ten year moving average</i>													
1801-1995	0.10	0.07	0.13	0.44***	0.46***	0.46***	0.46***	0.46***	0.39***	0.52***	0.17*	0.09	0.22**
1801-1900	0.25*	0.25*	0.24*	0.30**	0.39***	0.45***	0.32**	0.56***	0.57***	0.53***	0.26	0.24*	0.26**
1901-1995	0.12	0.06	0.20	-0.03	0.32**	0.31**	0.37***	0.04	-0.08	0.23	-0.09	-0.25*	0.03
1800-1850	0.41**	0.38**	0.43***	0.51**	0.69***	0.69***	0.69***	0.60***	0.58***	0.60***	0.21	0.19	0.22
1825-1975	0.27	0.27	0.26	0.27	0.20	0.26*	0.13	0.59***	0.59***	0.55***	0.36*	0.31*	0.38**
1850-1900	0.15	0.14	0.16	-0.17	-0.03	-0.04	-0.02	0.06	0.03	0.08	0.07	0.03	0.09
1875-1925	0.06	0.03	0.10	-0.08	0.43**	0.41**	0.45**	0.17	-0.09	0.21	0.13	-0.19	-0.09
1901-1950	0.09	0.07	0.10	0.32*	0.74***	0.75***	0.71***	0.52***	0.50***	0.52***	0.06	-0.02	0.12
1925-1975	-0.17	-0.15	-0.19	-0.11	0.11	0.19	0.04	-0.09	-0.11	-0.06	0.11	0.02	0.13
1951-ca.1995	-0.18	-0.51***	0.39**	-0.23	-0.38**	-0.47**	-0.11	-0.52***	-0.69***	-0.09	-0.21	-0.62***	0.29

Note: The stars indicate levels of statistical significance assuming correlations computed between series in which adjacent observations are independent. Since that assumption is false, the stars must be interpreted as just indicating that the correlation is “strong.”

Table S-12. Correlations between unemployment and health progress. Correlations computed between centered 5-year and 10-year moving averages of the annual unemployment and the annual rate of health progress, measured by a moving average of the rate of growth in life expectancy or the rate of decline in age-specific mortality.

Period	Life expectancy at birth			Infant mortality			Mortality ages 15-24			Mortality ages 35-54			Mortality ages 70-89		
	Total	Male	Females	Total	Male	Females	Total	Male	Females	Total	Male	Females	Total	Male	Females
<i>A - Five-year moving average</i>															
1911-1995	0.35***	0.37***	0.33*	-0.01	0.13	0.16	0.08	0.15	0.17	0.08	-0.22*	-0.04	-0.33**		
1911-1950	0.29	0.29	0.29	-0.09	0.13	0.18	0.07	0.16	0.15	0.15	-0.03	-0.01	-0.05		
1925-1974	0.36**	0.39**	0.31*	-0.16	0.05	0.04	0.05	0.13	0.19	0.00	-0.33*	-0.14	-0.42**		
1951-1995	0.30*	0.51***	-0.17	0.54***	0.32*	0.47***	-0.09	0.08	0.20	-0.17	0.15	0.44**	-0.12		
<i>B - Ten-year moving average</i>															
1911-1995	0.45*	0.48***	0.40***	-0.18	0.06	0.08	0.01	0.04	0.09	-0.06	-0.50***	-0.19	-0.62		
1911-1950	0.22	0.22	0.23	-0.25	0.04	0.11	-0.03	-0.02	-0.06	0.01	-0.24	-0.18	-0.28		
1925-1974	0.51***	0.53***	0.46***	-0.27	0.12	0.12	0.09	-0.15	0.22	-0.02	-0.69***	-0.39**	-0.77***		
1951-1995	0.13	0.52***	-0.49***	0.48***	0.26	0.44**	-0.12	-0.05	0.25	-0.38**	-0.02	0.57***	-0.54***		

Note: The stars indicate levels of statistical significance assuming correlations computed between series in which adjacent observations are independent. Since that assumption is false, the stars must be interpreted as just indicating that the correlation is “strong.”

Table S-13. Correlations between the rate of change in unemployment and the rate of progress in selected health indicators. Correlations computed between centered 5-year or 10-year moving averages of the annual rate of change in unemployment and the annual rate of progress in selected health indicators.

Period	Life expectancy at birth			Infant mortality	Mortality ages 15–24			Mortality ages 35–54			Mortality ages 70–89		
	Total	Males	Females		Total	Males	Females	Total	Males	Females	Total	Males	Females
<i>A – Five-year moving average</i>													
1911-1995	0.41***	0.44***	0.38***	-0.13	0.06	-0.07	0.08	0.10	0.03	0.04	0.28**	0.03	
1911-1950	0.47**	0.49**	0.44**	-0.31	-0.03	-0.14	0.06	0.08	0.04	0.10	0.22	0.00	
1925-1974	-0.12	-0.15	-0.07	-0.29	-0.19	-0.24	-0.27	-0.32*	-0.19	0.21	0.11	0.26	
1951-1995	0.39**	0.55***	0.02	0.25	0.64***	0.31*	0.12	0.17	0.02	0.34*	0.53***	0.11	
<i>B – Ten-year moving average</i>													
1911-1995	0.32***	0.37***	0.25*	-0.44*	-0.27*	-0.46***	-0.28**	-0.19	-0.39***	-0.03	0.16	-0.15	
1911-1950	0.38*	0.42**	0.33*	-0.68***	-0.35*	0.53***	-0.37*	-0.33*	-0.41**	-0.05	0.07	-0.16	
1925-1974	-0.64***	-0.64***	-0.61***	-0.61***	-0.42**	0.50***	-0.65***	-0.70***	-0.57***	0.06	-0.29*	0.23	
1951-1995	0.22	0.55***	-0.35*	0.40***	0.33*	0.04	0.06	0.23	-0.34*	0.06	0.58***	-0.43**	

Note: The stars indicate levels of statistical significance assuming correlations computed between series in which adjacent observations are independent. Since that assumption is false, the stars must be interpreted as just indicating that the correlation is “strong.”

Table S-14. Correlations between inflation and health progress. Correlations computed between inflation, as measured by a centered 5-year or 10-year moving average of the rate of change in the GDP deflator, and health improvement, as measured by a moving average of the rate of growth in life expectancy at birth or the rate of decline in mortality

Period	Life expectancy at birth			Infant mortality			Mortality ages 15–24			Mortality ages 35–54			Mortality ages 70–89		
	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females
<i>A – Five-year moving averages</i>															
1801-1850	-0.21	-0.18	-0.23	-0.27	-0.37**	-0.30*	-0.37**	-0.36**	-0.37**	-0.27	-0.25	-0.29*			
1851-1900	-0.42**	-0.40*	-0.44**	-0.43**	-0.48**	-0.44**	-0.30*	-0.20	-0.41**	-0.19	-0.14	-0.22			
1901-1950	-0.35*	-0.35*	-0.34*	0.07	-0.68***	-0.52***	-0.45**	-0.47**	-0.42**	0.12	0.14	0.10			
1951-ca. 2000	0.05	-0.07	0.16	0.08	-0.07	0.08	0.30	0.31	0.28	0.11	0.12	0.04			
<i>B – Ten-year moving averages</i>															
1801-1850	-0.12	-0.08	-0.16	-0.22	-0.47***	-0.38**	-0.37**	-0.37**	-0.36**	-0.15	-0.13	-0.17			
1851-1900	-0.38**	-0.35*	-0.41**	-0.51***	-0.47***	-0.41**	-0.16	-0.09	-0.27	0.01	0.01	0.01			
1901-1950	-0.30*	-0.29*	-0.30*	0.18	-0.48***	-0.36*	-0.22	-0.22	-0.22	0.22	0.22	0.20			
1951-ca. 2000	-0.05	-0.18	0.10	0.25	0.04	0.08	0.34*	0.34*	0.32	0.34*	0.20	0.24			

Note: The stars indicate levels of statistical significance assuming correlations computed between series in which adjacent observations are independent. Since that assumption is false, the stars must be interpreted as just indicating that the correlation is “strong.”

Table S-15. Correlations between health progress and GDP growth both smoothed with centered moving means in periods of 5, 11, and 15 years

		<i>A</i> — Health progress and economic growth both averaged from $t-(k-1)/2$ to $t+(k-1)/2$				<i>B</i> — Economic growth averaged from $t-k+1$ to t , correlated with health progress at t			
Health progress as measured by the decline in	<i>k</i>	1801-1850	1851-1900	1901-1950	1950-1999	1801-1850	1851-1900	1901-1950	1950-1999
Longevity shortfall	5	0.56	0.27	0.17	-0.49	-0.04	-0.04	0.04	-0.25
	11	0.53	0.00	0.44	-0.40	-0.07	0.07	0.07	-0.15
	15	0.55	0.12	0.37	-0.49	-0.10	0.06	0.01	-0.25
Mortality 15-24	5	0.60	0.18	0.42	-0.53	0.08	-0.09	0.17	-0.19
	11	0.63	-0.08	0.54	-0.18	0.04	0.00	0.09	-0.07
	15	0.63	0.08	0.49	-0.03	0.02	0.01	0.09	-0.13
Mortality 35-54	5	0.48	0.25	0.14	-0.48	0.03	-0.06	0.05	-0.39
	11	0.41	0.00	0.35	-0.46	-0.02	0.00	0.08	-0.28
	15	0.50	-0.10	0.31	-0.37	-0.04	0.04	0.00	-0.27
Mortality 70-89	5	0.31	0.29	-0.31	-0.24	-0.10	-0.12	-0.02	-0.06
	11	0.04	-0.02	0.08	-0.16	-0.15	-0.04	0.00	0.06
	15	0.03	-0.03	0.12	-0.19	-0.17	0.01	-0.05	-0.02

Table S-16. Lagged effect of economic growth on health, estimated by the correlations between a 5-year or 10-year moving average of GDP growth and the rate of change in selected health indicators at the ending year of the quinquennium or decenium

Period	Life expectancy		Infant mortality	Mortality at ages		
	Males	Females		15-24	35-54	70-89
<i>A – Five-year moving averages</i>						
1801-1995	-0.04	-0.04	-0.00	0.12	0.05	0.02
1801-1900	-0.05	-0.06	-0.11	0.02	0.03	0.12
1901-1995	-0.01	0.01	-0.02	0.15	0.03	-0.15
1801-1850	-0.06	-0.08	-0.13	-0.11	0.05	0.07
1851-1900	0.00	0.02	-0.10	-0.11	-0.06	0.23
1901-1950	-0.03	-0.00	0.06	0.26	0.12	-0.18
1951-1995	-0.27	0.01	-0.14	-0.19	-0.38**	-0.04
<i>B – Ten-year moving average</i>						
1801-1995	-0.06	-0.06	0.04	0.07	0.04	0.02
1801-1900	-0.07	-0.08	-0.09	0.04	0.02	0.00
1901-1995	-0.03	-0.00	0.02	0.05	0.04	0.01
1801-1850	-0.10	-0.11	-0.15	-0.08	-0.00	0.08
1851-1900	0.02	0.03	-0.03	-0.03	-0.01	-0.07
1901-1950	-0.03	-0.03	0.04	0.12	0.05	0.06
1951-1995	-0.19	0.19	-0.00	-0.10	-0.33**	-0.02

Note: The stars indicate levels of statistical significance assuming correlations computed between series in which adjacent observations are independent. Since that assumption is false, the stars must be interpreted as just indicating that the correlation is “strong.”

Table S-17. Lagged effects of health progress on economic growth. Parameter estimates of lag regressions
$$\Delta \ln y_t = \alpha + \sum_{i=0}^k \beta_{t-i} \cdot \Delta h_{t-i}$$
 in which annual economic growth ($\Delta \ln y_t$, where y_t is GDP or GDP per capita)

 is a function of k lagged values ($k \leq 5$) of the annual improvement in health, measured either by the relative decline in an age-specific mortality ($\Delta h_t = -\Delta \ln m_t$) or by the absolute increase in life expectancy ($\Delta h_t = \Delta e_{o,t}$)

Sample	k	i	Effects of the absolute		Effects on GDP growth			
			increase in life expectancy on		of the relative decline in mortality at ages			
			GDP growth	GDP per capita growth	< 1 (infant mort.)	15-24	35-54	70-89
1801-1850	0	0	0.0035 *	0.0028 *	0.08 †	0.11 ***	0.08 *	0.11 *
1851-1900	0	0	0.0044 *	0.0039 *	0.11 *	0.07 †	0.05	0.03 .
1901-1950	0	0	0.0065 *	0.0055 †	0.03	0.09 *	0.13 †	-0.05 .
1951-1999	0	0	-0.0081	-0.0097	0.01	-0.03	-0.28 †	-0.07 .
1801-1850	1	0	0.0044 **	0.0032 **	0.15 ***	0.12 ***	0.10 **	0.15 ***
	1	1	0.0012	0.0004	0.13 **	0.02	0.03	0.10 *
1851-1900	1	0	0.0044 *	0.0038 *	0.14 **	0.08 †	0.07	0.04 .
	1	1	0.0001	-0.0004	0.10 †	0.01	0.04	0.12 †
1901-1950	1	0	0.0077 *	0.0062 †	0.05	0.09 **	0.15 *	-0.01 .
	1	1	0.0031	0.0017	0.02	0.04	0.06	0.08 .
1951-1999	1	0	-0.0109	-0.0129	-0.00	-0.09 †	-0.33 *	0.00 .
	1	1	0.0016	0.0008	0.03	-0.10 *	-0.11	0.09 .
1801-1850	2	0	0.0040 **	0.0028 *	0.15 **	0.10 ***	0.08 *	0.14 **
	2	1	0.0008	-0.0001	0.14 **	0.01	0.02	0.09 †
	2	2	-0.0022	-0.0019	0.00	-0.05 †	-0.05	-0.06 .
1851-1900	2	0	0.0041 *	0.0035 †	0.13 *	0.08	0.06	0.05 .
	2	1	-0.0001	-0.0006	0.08	0.00	0.04	0.13 †
	2	2	-0.0016	-0.0015	-0.06	-0.01	-0.01	0.07 .
1901-1950	2	0	0.0066 †	0.0050	0.04	0.09 **	0.12 †	-0.04 .
	2	1	0.0009	-0.0006	-0.02	0.02	0.01	0.03 .
	2	2	-0.0054	-0.0055	-0.08	-0.05	-0.12 †	-0.11 .
1951-1999	2	0	-0.0127	-0.0150	-0.01	-0.09 †	-0.34 *	-0.01 .
	2	1	-0.0022	-0.0032	0.03	-0.15 *	-0.12	0.05 .
	2	2	-0.0088	-0.0068	-0.03	-0.10 †	0.03	-0.05 .
1801-1850	3	0	0.0041 **	0.0028 *	0.15 **	0.10 ***	0.08 *	0.14 **
	3	1	0.0006	-0.0002	0.14 *	0.00	0.01	0.08 †
	3	2	-0.0024	-0.0020	-0.00	-0.05 †	-0.05 †	-0.06 .
	3	3	-0.0015	-0.0010	-0.04	-0.03	-0.04	-0.05 .
1851-1900	3	0	0.0040 †	0.0034	0.12 *	0.07	0.05	0.00 .
	3	1	-0.0001	-0.0007	0.07	-0.00	0.03	0.07 .
	3	2	-0.0016	-0.0015	-0.07	-0.02	-0.02	0.03 .
	3	3	0.0002	0.0002	-0.01	0.01	-0.02	-0.14 †
1901-1950	3	0	0.0080 *	0.0063 †	0.06	0.09 **	0.16 *	-0.04 .
	3	1	0.0035	0.0017	-0.02	0.03	0.06	0.05 .
	3	2	-0.0014	-0.0018	-0.08	-0.02	-0.03	-0.11 .
	3	3	0.0080 *	0.0075 *	-0.02	0.08 *	0.19 **	-0.04 .
1951-1999	3	0	-0.0113	-0.0155	-0.00	-0.09 †	-0.42 *	0.02 .
	3	1	0.0038	0.0016	0.02	-0.16 **	-0.17	0.09 .
	3	2	0.0016	0.0028	-0.03	-0.06	0.07	-0.03 .
	3	3	0.0173	0.0182	-0.05	0.08	0.25	0.03 .

Table S-17. Lagged effects of health progress on economic growth (cont.)

Sample	<i>k</i>	<i>i</i>	Effect of the absolute increase in life expectancy		Effect on GDP growth of the relative decline in mortality at ages			
			GDP per capita		< 1 (infant mort.)	15-24	35-54	70-89
			GDP growth	growth				
1801-1850	4	0	0.0051 ***	0.0035 **	0.16 **	0.11 ***	0.10 ***	0.16 ***
	4	1	0.0007	-0.0001	0.14 *	0.01	0.01	0.09 †
	4	2	-0.0018	-0.0016	0.01	-0.03	-0.02	-0.05
	4	3	-0.0008	-0.0006	-0.02	-0.02	-0.03	-0.04
	4	4	0.0043 **	0.0026 *	0.04	0.08 **	0.10 **	0.09 †
1851-1900	4	0	0.0044 †	0.0036	0.14 *	0.10 †	0.05	0.02
	4	1	0.0009	-0.0000	0.11	0.03	0.04	0.11
	4	2	-0.0011	-0.0012	-0.06	-0.01	-0.01	0.07
	4	3	0.0008	0.0005	0.02	0.03	-0.01	-0.11
	4	4	0.0017	0.0012	0.07	0.08	0.00	0.09
1901-1950	4	0	0.0080 *	0.0062 †	0.06	0.09 **	0.16 *	-0.04
	4	1	0.0035	0.0020	-0.02	0.03	0.06	0.06
	4	2	-0.0012	-0.0011	-0.04	-0.02	-0.03	-0.11
	4	3	0.0084 *	0.0087 *	0.09	0.08 *	0.19 *	-0.02
	4	4	0.0010	0.0027	0.23 *	-0.00	0.00	0.06
1951-1999	4	0	-0.0117	-0.0153	-0.01	-0.08	-0.43 *	0.02
	4	1	0.0023	0.0033	0.02	-0.16 **	-0.16	0.07
	4	2	0.0001	0.0040	-0.03	-0.07	0.08	-0.04
	4	3	0.0154	0.0190	-0.05	0.09	0.23	0.04
	4	4	-0.0019	-0.0005	0.01	0.04	-0.06	0.01
1801-1850	5	0	0.0051 ***	0.0034 **	0.16 **	0.10 ***	0.10 **	0.17 ***
	5	1	0.0007	-0.0001	0.15 *	0.02	0.01	0.10 *
	5	2	-0.0018	-0.0016	0.01	-0.03	-0.02	-0.04
	5	3	-0.0009	-0.0007	-0.02	-0.02	-0.03	-0.03
	5	4	0.0042 **	0.0025 †	0.04	0.09 **	0.09 **	0.09 †
	5	5	-0.0001	0.0001	0.04	0.01	0.01	0.06
1851-1900	5	0	0.0048 †	0.0040	0.17 *	0.10 †	0.06	0.02
	5	1	0.0006	-0.0000	0.12	0.02	0.03	0.10
	5	2	-0.0016	-0.0008	-0.05	-0.03	-0.01	0.05
	5	3	0.0006	0.0008	0.03	0.03	-0.01	-0.14
	5	4	0.0014	0.0014	0.08	0.07	-0.00	0.08
	5	5	-0.0004	0.0011	0.03	-0.02	0.02	-0.05
1901-1950	5	0	0.0091 *	0.0072 *	0.05	0.11 **	0.17 *	-0.04
	5	1	0.0038	0.0022	-0.03	0.04	0.07	0.08
	5	2	-0.0006	-0.0006	-0.03	-0.02	-0.02	-0.05
	5	3	0.0097 *	0.0099 *	0.11	0.09 *	0.21 *	0.05
	5	4	0.0031	0.0047	0.30 *	0.02	0.04	0.15
	5	5	0.0050	0.0050	0.12	0.05	0.08	0.15
1951-1999	5	0	-0.0160	-0.0203	-0.01	-0.09 †	-0.44 *	0.01
	5	1	-0.0000	0.0004	0.01	-0.16 **	-0.14	0.07
	5	2	-0.0060	-0.0032	-0.03	-0.07	0.00	-0.06
	5	3	0.0143	0.0164	-0.05	0.08	0.17	0.04
	5	4	-0.0016	-0.0024	-0.01	0.02	-0.07	0.03
	5	5	0.0076	0.0044	-0.06	-0.01	0.17	0.03

† $P < 0.1$ * $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$.

Table S-18. Lagged effect of health progress on economic growth, measured by correlations of a 5-year or 10-year moving average of the rate of improvement in selected health indicators, and GDP growth at the ending year of the quinquennium or decennium considered

Period	Life expectancy		Infant mortality	Mortality at ages		
	Males	Females		15-24	35-54	70-89
<i>A – Five year moving average</i>						
1801-1995	0.16*	0.16*	0.24***	0.23**	0.22**	0.15*
1801-1900	0.18*	0.17	0.24*	0.23*	0.22*	0.22*
1901-1995	0.22*	0.24*	0.12	0.18	0.16	-0.02
1801-1850	0.25	0.26	0.33*	0.29*	0.29*	0.28*
1851-1900	0.08	0.06	0.10	0.15	0.03	0.09
1901-1950	0.27	0.26	0.23	0.27	0.26	0.03
1951-1995	-0.17	0.09	-0.04	-0.20	-0.20	-0.04
<i>B – Ten year moving average</i>						
1801-1995	0.13	0.13	0.21**	0.18**	0.23**	0.16*
1801-1900	0.14	0.13	0.24*	0.12*	0.21*	0.21*
1901-1995	0.25*	0.28**	0.06	0.15	0.15	-0.01
1801-1850	0.27	0.28	0.41**	0.23	0.29*	0.38**
1851-1900	-0.04	-0.06	-0.04	0.10	-0.06	-0.10
1901-1950	0.31*	0.29*	0.16	0.22	0.24	0.05
1951-1995	0.01	0.22	-0.09	0.18	-0.03	0.00

Note: The stars indicate levels of statistical significance assuming correlations computed between series in which adjacent observations are independent. Since that assumption is false, the stars must be interpreted as just indicating that the correlation is “strong.”

Table S-19. Correlations between health progress—as measured by the annual improvement in several health indicators—and economic growth as computed with GDP and GDP per capita data from Olle Krantz (Krantz 2002) and GDP data from Angus Maddison (Maddison, 2003)

	Relative decline in longevity shortfall		Increase in life expectancy at birth		Correlation between		
	GDP (Krantz)	GDP per capita (Krantz)	GDP (Maddison)	GDP per capita (Krantz)	GDP (Maddison)	GDP growth according to Krantz and Maddison	
1820-1900	0.27*	0.12	0.22†	0.26*	0.13	0.21†	0.40***
1901-1999	0.21*	0.12	0.18†	0.25*	0.13	0.21*	0.77***
1851-1900	0.33*	0.11	0.29*	0.33*	0.13	0.29*	0.34*
1901-1950	0.27†	0.16	0.23	0.29*	0.15	0.25†	0.76***
1951-1999	-0.11	-0.11	-0.13	-0.10	-0.09	-0.12	0.84***

	Relative decline in infant mortality rate		Relative decline in mortality at ages 35-54		
	GDP (Krantz)	GDP per capita (Krantz)	GDP (Krantz)	GDP per capita (Krantz)	GDP (Maddison)
1820-1900	0.22*	0.27*	0.34*	0.22*	0.27*
1901-1999	0.05	0.03	0.76***	0.03	0.03
1851-1900	0.29*	0.10	0.84***	0.10	0.10
1901-1950	0.09	0.05	0.09	0.05	0.05
1951-1999	-0.02	-0.05	-0.02	-0.02	-0.05

† $P < 0.1$ * $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$

Table S-20. Correlations between annual GDP growth and the annual rate of progress in selected health indicators. Variables transformed into centered moving averages with a window of five years. GDP data from Maddison (2003).

Period	Life expectancy at birth			Mortality ages 70–89		
	Total	Males	Females	Total	Males	Females
1825-1874	0.41**	0.42**	0.40**	0.49***	0.50***	0.48***
1851-1900	0.23	0.23	0.23	0.22	0.24	0.20
1875-1924	0.31*	0.29*	0.32*	-0.08	-0.10	-0.5
1901-1950	0.30*	0.30*	0.31*	-0.11	-0.12	-0.10
1925-1974	-0.32*	-0.32*	-0.32*	-0.22	-0.26	-0.18
1951-ca. 1995	-0.31*	-0.56**	-0.19	-0.19	-0.56***	0.17

Note: The stars indicate levels of statistical significance assuming correlations computed between series in which adjacent observations are independent. Since that assumption is false, the stars must be interpreted as just indicating that the correlation is “strong.”

Table S-21. *F*-tests for Granger-causality: economic growth causing health progress

Null hypothesis	Sample	Lags	<i>F</i>	<i>P</i>	Schwartz Bayesian Criterion	
					Expanded model	Restricted model
GDP growth does not Granger-cause relative decline in longevity shortfall	19 th century	1	3.26	0.07	-269	-271
		2	2.94	0.06	-263	-266
		3	2.06	0.11	-255	-262
		4	1.42	0.23	-248	-260
		5	1.15	0.34	-236	-253
		10	0.52	0.87	-200	-239
	20 th century	1	0.01	0.93	-347	-352
		2 (*)	6.02	0.00	-350	-348
		3	3.79	0.01	-337	-339
		4	2.78	0.03	-323	-330
		5	2.30	0.05	-314	-326
		10	1.91	0.06	-259	-285
	20 th century, 2 nd half	1 (*)	5.16	0.03	-266	-265
		2	2.86	0.07	-255	-257
		3	3.39	0.03	-248	-250
		4	3.06	0.03	-237	-241
		5 (*)	2.54	0.04	-255	-232
	Growth of GDP per capita does not Granger-cause gain in life expectancy at birth	19 th century	1 (*)	5.07	0.02	498
2			3.50	0.03	497	495
3			1.97	0.12	500	492
4			1.49	0.21	499	487
5			1.19	0.32	503	486
10			0.41	0.93	495	455
20 th century		1	0.60	0.44	334	330
		2	4.23	0.02	326	326
		3	2.62	0.06	333	327
		4	1.87	0.12	339	328
		5	1.84	0.11	341	327
		10	1.68	0.10	359	331
20 th century, 2 nd half		1	2.68	0.11	-8.16	-9.36
		2	1.82	0.17	-7.13	-11.16
		3	2.38	0.08	-2.81	-7.23
		4	2.24	0.08	1.30	-5.01
		5 (*)	2.58	0.04	5.22	-1.15

(*) Specifications in which the Schwartz Bayesian Criterion is minimized by the expanded model

Table S-22. *F*-tests for Granger-causality: economic growth causing health progress (cont.)

Null hypothesis	Lags	19 th century		20 th century		20 th century, 2 nd half	
		<i>F</i>	<i>P</i>	<i>F</i>	<i>P</i>	<i>F</i>	<i>P</i>
Growth of GDP per capita does not Granger-cause relative decline in infant mortality	1	0.07	0.79	0.14	0.71	0.01	0.94
	2	1.42	0.25	2.90	0.06	0.15	0.86
	3	1.04	0.38	2.18	0.10	1.44	0.24
	4	0.75	0.56	1.55	0.19	1.02	0.41
	5	0.46	0.80	1.18	0.33	1.01	0.43
	10	0.56	0.84	0.82	0.61		
Growth of GDP per capita does not Granger-cause relative decline in mortality 35-54	1	4.02	0.05	0.02	0.88	2.30	0.14
	2	2.82	0.06	2.59	0.08	2.03	0.14
	3	1.68	0.18	1.82	0.15	3.70	0.02
	4	1.06	0.38	1.89	0.30	16.20	<0.01
	5	0.87	0.50	1.48	0.10	2.82	0.03
	10	0.49	0.89		0.16		

Table S-23. *F*-tests for Granger-causality: health progress causing economic growth

Null hypothesis	Sample	Lags	<i>F</i>	<i>P</i>	Schwartz Bayesian Criterion	
					Expanded model	Restricted model
Relative decline in longevity shortfall does not Granger-cause GDP growth	19 th century	1	0.12	0.73	-376	-380
		2	1.31	0.27	-367	-373
		3	0.67	0.57	-357	-368
		4	1.04	0.39	-346	-360
		5	0.67	0.65	-333	-353
	20 th century	10	1.18	0.31	-290	-322
		1	0.03	0.87	-364	-369
		2	2.21	0.12	-359	-364
		3	3.77	0.01	-356	-359
		4	2.90	0.03	-343	-349
	20 th century, 2 nd half	5	3.47	0.01	-338	-344
		10	2.48	0.01	-288	-309
		1	0.32	0.58	-212	-216
		2	0.39	0.68	-202	-209
		3	0.55	0.65	-193	-203
Gain in life expectancy at birth does not Granger-cause GDP per capita growth	19 th century	4	0.66	0.66	-180	-193
		5	0.60	0.70	-169	-185
		1	0.04	0.84	-393	-397
		2	1.73	0.18	-383	-389
		3	0.77	0.52	-373	-384
	20 th century	4	0.65	0.62	-360	-376
		5	0.40	0.85	-348	-368
		10	1.21	0.29	-308	-340
		1	0.21	0.64	-370	-375
		2	2.04	0.14	-364	-369
	20 th century, 2 nd half	3	4.42	0.01	-362	-363
		4	3.28	0.01	-349	-354
		5	3.77	0.00	-343	-348
		10	2.51	0.01	-294	-315
		1	0.39	0.53	-211	-215
	20 th century, 2 nd half	2	0.18	0.84	-199	-207
		3	0.67	0.57	-198	-199
		4	0.44	0.76	-177	-190
		5	0.54	0.74	-166	-182

(*) Specifications in which the Schwartz Bayesian Criterion is minimized by the expanded model

Table S-24. *F*-tests for Granger-causality: health progress causing economic growth (cont.)

Null hypothesis	Lags	19 th century		20 th century		20 th century, 2 nd half	
		<i>F</i>	<i>P</i>	<i>F</i>	<i>P</i>	<i>F</i>	<i>P</i>
Relative decline in infant mortality does not Granger-cause GDP per capita growth	1	3.23	0.08	0.03	0.86	0.50	0.48
	2	1.92	0.15	0.26	0.77	0.23	0.79
	3	1.42	0.24	0.05	0.98	0.29	0.83
	4	0.88	0.48	1.87	0.12	0.34	0.85
	5	0.79	0.56	1.26	0.29	0.36	0.87
	10	1.93	0.05	0.59	0.82	1.29	0.28
Relative decline in mortality 35-54, does not Granger-cause GDP per capita growth	1	0.13	0.72	0.30	0.58	0.10	0.75
	2	1.88	0.16	2.72	0.07	0.12	0.88
	3	0.90	0.44	5.94	<0.01	0.45	0.71
	4	0.97	0.43	4.52	<0.01	0.51	0.73
	5	0.73	0.60	4.64	<0.01	0.66	0.65
	10	1.47	0.16	2.54	0.01		

Table S-25. Correlations between economic growth, inflation, and harvest quality, indexed respectively by the rate of growth of GDP, the rate of growth of the GDP deflator, and the general crop index for the years 1801–1957. Series untransformed (column A) or smoothed with 5- or 10-year moving averages (columns B and C).

Variables correlated	Period	A	B	C
		Annual series	Moving averages ^a	
			Five year	Ten year
GDP growth and inflation	1801-1850	-0.75***	-0.60***	-0.71***
	1825-1874	-0.51***	0.09	0.06
	1851-1900	-0.21	0.34*	0.46***
	1875-1924	-0.29*	-0.46***	-0.27
	1901-1950	-0.35*	-0.53***	-0.48***
	1925-1974	-0.23	-0.17	-0.13
	1951- <i>ca.</i> 1995	-0.26	-0.46***	-0.48***
GDP growth and crop index	1801-1850	0.31*	0.27	0.40**
	1825-1874	0.16	0.39**	0.56***
	1851-1900	0.08	0.40**	0.19
	1875-1924	0.11	0.48**	0.54***
	1901-1950	0.36**	0.33*	0.00
GDP growth and crop index lagged one year	1801-1850	0.64***	0.28*	0.39***
	1825-1874	0.48***	0.36*	0.47***
	1851-1900	0.56***	0.44***	0.17
	1875-1924	0.35*	0.48***	0.51***
	1901-1950	0.17	0.23	-0.07
Inflation and crop index	1801-1850	-0.38**	-0.34*	-0.45**
	1825-1874	-0.09	0.29*	0.15
	1851-1900	-0.23	-0.08	-0.32*
	1875-1924	-0.19	-0.38**	-0.36**
	1901-1950	-0.34*	-0.42**	-0.39**
Inflation and crop index lagged one year	1801-1850	-0.57***	-0.22	-0.42**
	1825-1874	-0.32*	0.22	0.07
	1851-1900	-0.13	-0.08	-0.31*
	1875-1924	-0.32*	-0.35*	-0.24
	1901-1950	-0.39**	-0.38**	-0.32*

* $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$

^a The stars following the correlations in these two columns indicate levels of statistical significance assuming correlations computed between series in which adjacent observations are independent. Since that assumption is false, the stars must be interpreted as just indicating that the correlation is “strong.”

Table S-26. Correlations between the general crop index and health progress. Correlations computed between annual series or 5- and 10-year moving averages of the general crop index and health progress as measured by the rate of growth in life expectancy or the rate of decline in age-specific mortality.

Variables correlated	Period	Annual series	Moving averages ^a	
			Five year	Ten year
Crop index and rate of change in life expectancy	1801-1850	0.14	-0.02	-0.08
	1825-1874	0.22	0.04	0.14
	1851-1900	0.17	0.27	0.06
	1875-1924	0.19	0.16	-0.02
	1901-1950	0.26	0.14	0.04
Crop index with rate of decline in infant mortality	1801-1850	0.35*	0.01	0.04
	1825-1874	0.47**	0.03	0.04
	1851-1900	0.23	0.28	0.34*
	1875-1924	-0.04	0.04	0.07
	1901-1950	-0.08	-0.37**	-0.62***
Crop index with rate of decline in mortality ages 15-24	1801-1850	0.17	-0.03	0.10
	1825-1874	0.11	-0.06	0.06
	1851-1900	0.01	0.29*	0.31*
	1875-1924	0.26	0.45*	0.44**
	1901-1950	0.27	0.11	-0.25
Crop index with rate of decline in mortality ages 35-54	1801-1850	0.19	-0.06	-0.13
	1825-1874	0.20	-0.00	0.14
	1851-1900	0.04	0.26	0.07
	1875-1924	0.19	0.25	0.18
	1901-1950	0.25	-0.07	-0.41**
Crop index with rate of decline in mortality ages 70-89	1801-1850	0.29*	0.03	0.42**
	1825-1874	0.24	0.07	0.01
	1851-1900	-0.06	0.14	0.02
	1875-1924	0.02	-0.10	-0.04
	1901-1950	0.15	-0.24	-0.28

* $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$

^a The stars following the correlations in these two columns indicate levels of statistical significance assuming correlations computed between series in which adjacent observations are independent. Since that assumption is false, the stars must be interpreted as just indicating that the correlation is “strong.”

Figure S-1. GDP growth, inflation, unemployment (as percent of economically active population), and life expectancy at birth (females, total, and males) in 19th and 20th century Sweden. Except for the line plot for the unemployment rate, all plots are 15-year centered moving averages.

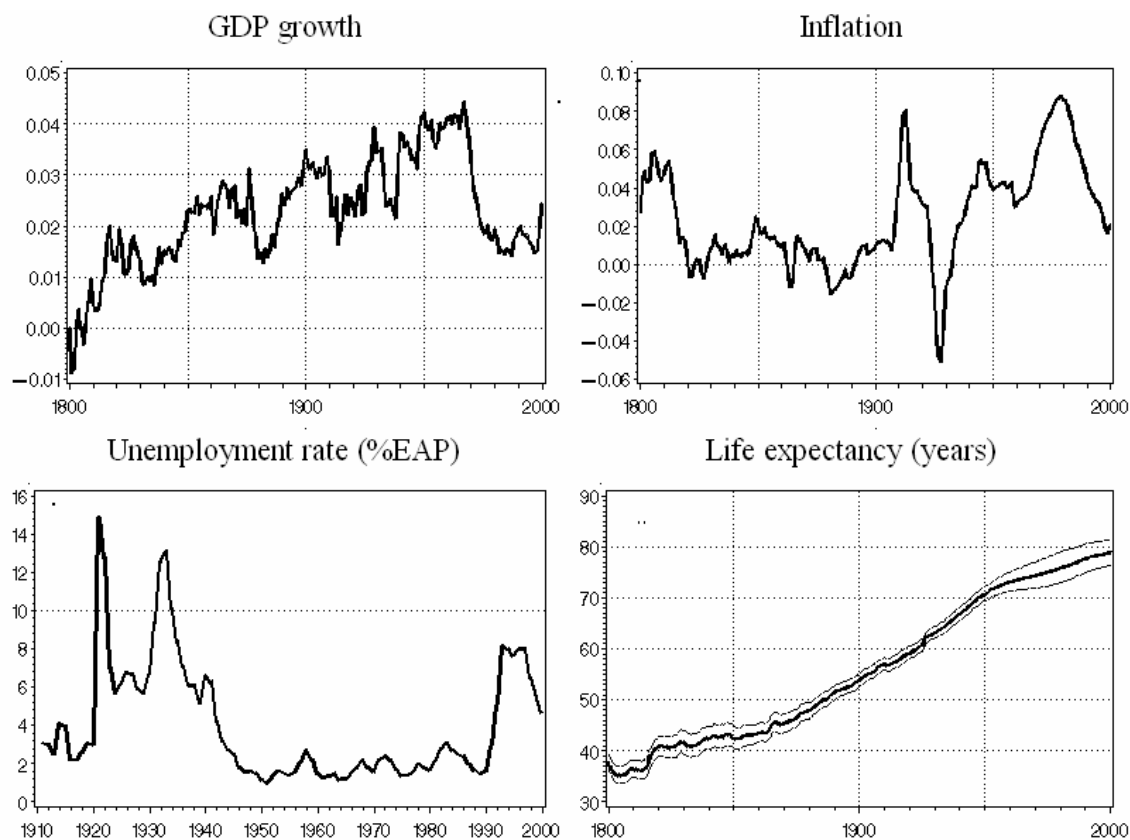


Figure S-2. Health progress in 19th and 20th century Sweden as measured by the annual decline in the natural logarithm of four health indicators: the longevity shortfall (the difference between 90 and life expectancy at birth), and age-specific mortality rates at ages 15-24, 35-54, and 70-89.

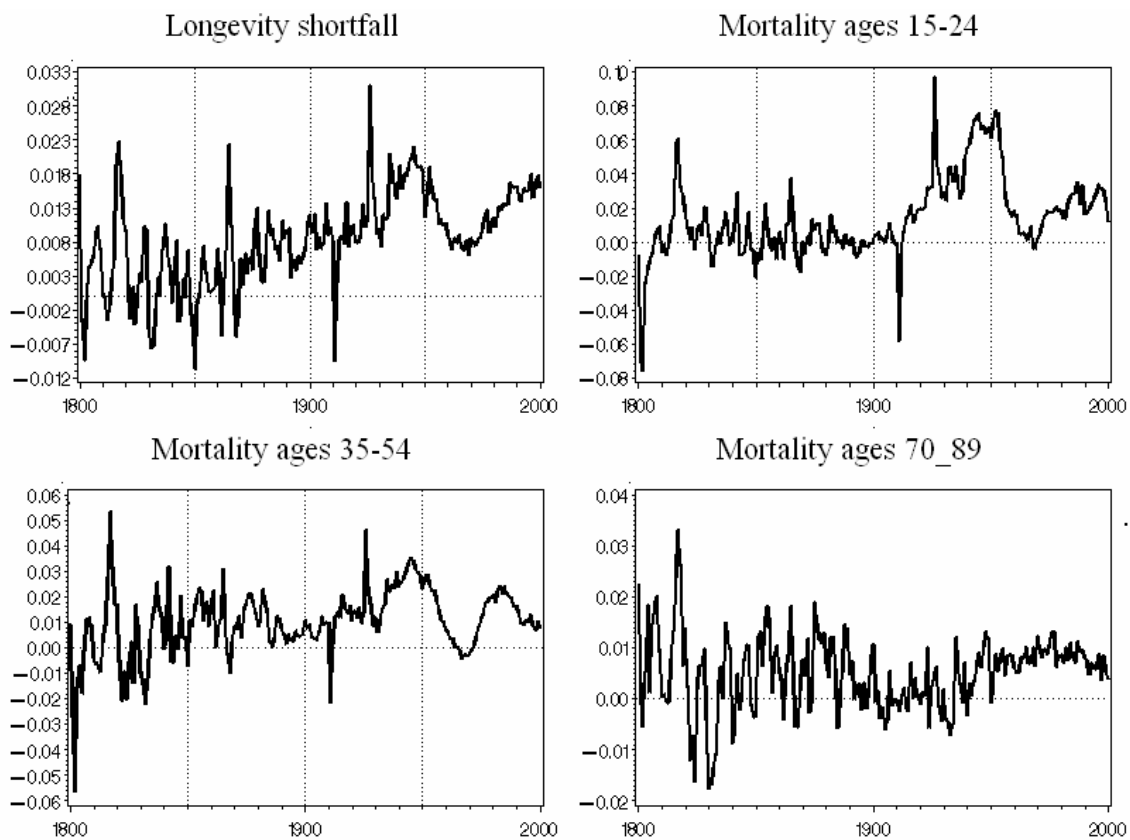


Figure S-3. Spectral analysis for the decline in mortality 35-54 and GDP growth. In the horizontal axis the period is in years. Dotted lines are 95% confidence limits.

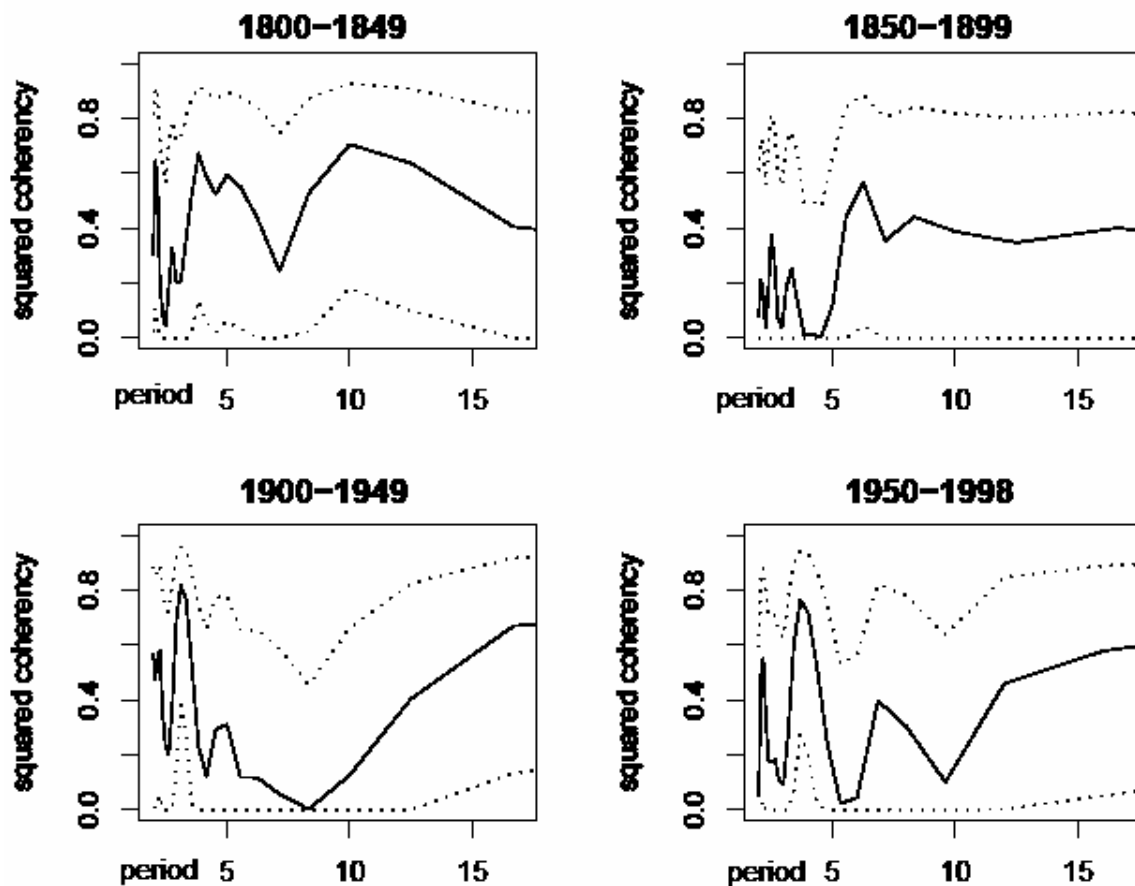


Figure S-4. GDP growth (g , thick line) and rate of change of mortality at ages 35-54 in 19th and 20th century Sweden. Both variables are transformed into 5-year centered moving means. Scales in percentages. Compare with figure 2 in the paper. They both reveal the same pattern of reversal of the relation between economic growth and health progress

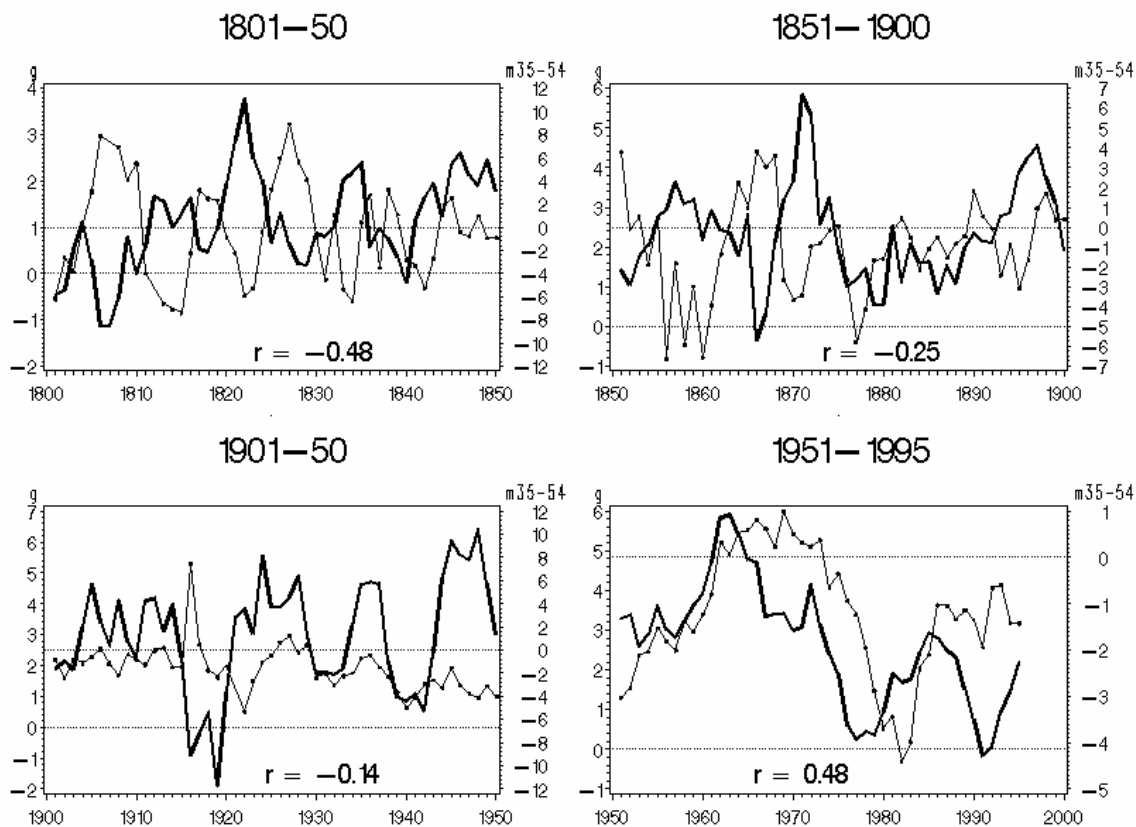


Figure S-5. GDP growth (thick line) and rate of change in life expectancy at birth (e_0) in Sweden, 1800–1995; both series are centered 5-year moving averages of year-to-year percent change. Note how the fluctuations of the rate of change in life expectancy dampen as time passes (the scale for e_0 is different in the 1951–1995 panel, where e_0 has always a positive rate of change), with the last strong drop in life expectancy caused by the world flu pandemics in 1918–1919 (third panel).

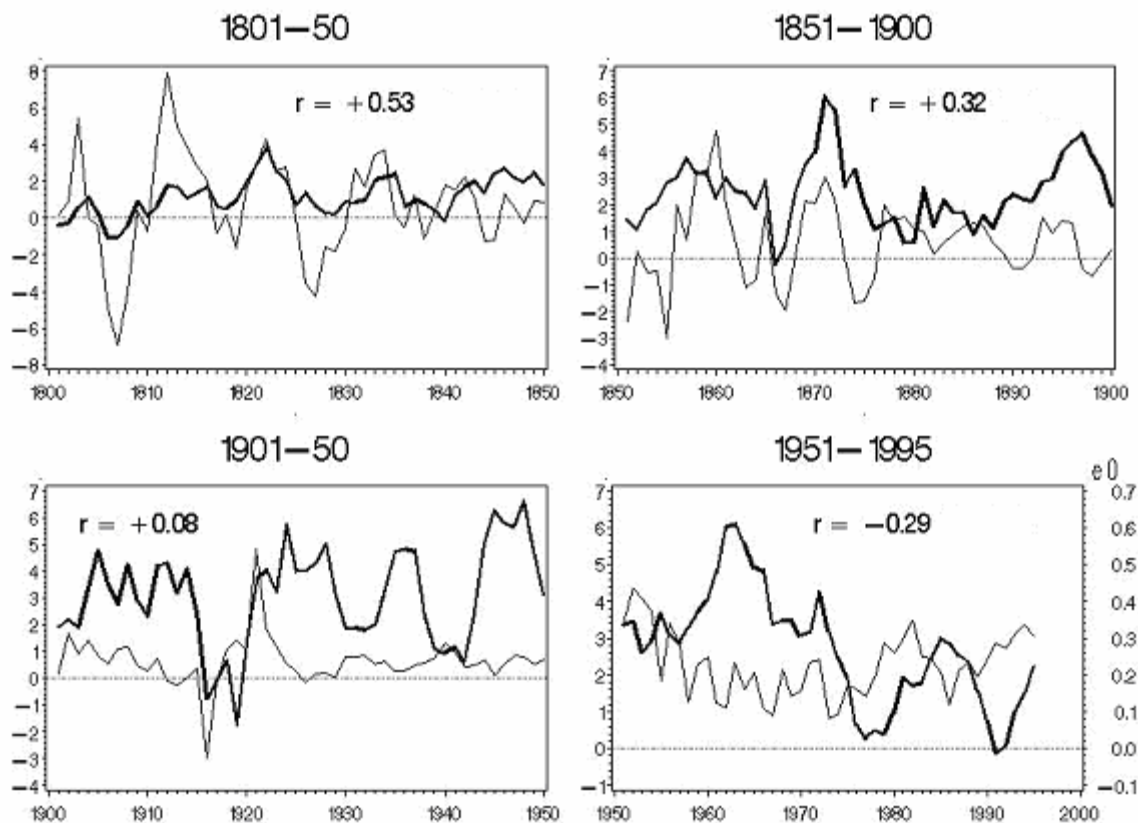
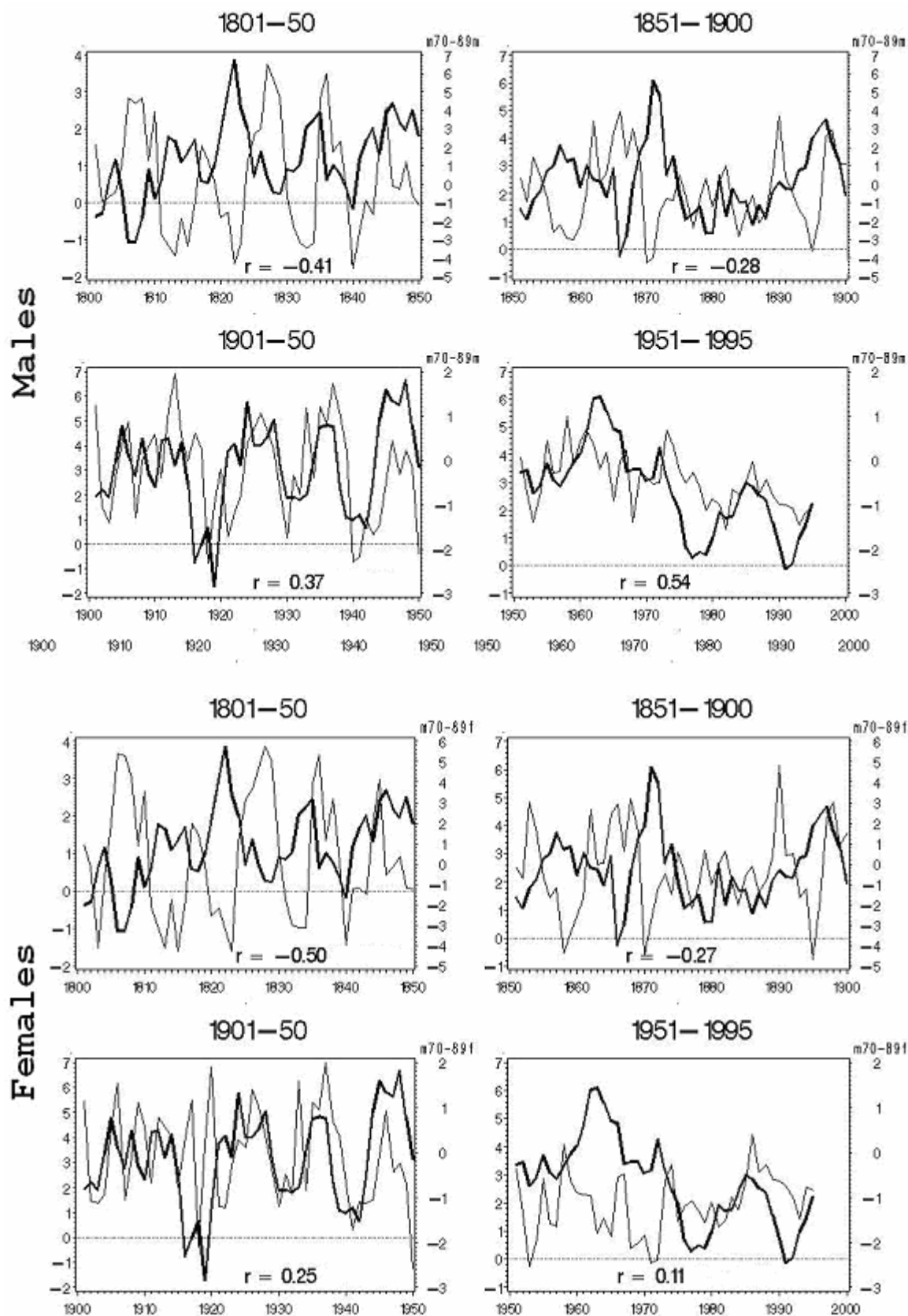


Figure S-6. GDP growth (thick line) and rate of change of sex-specific mortality at ages 70–89, both as centered 5-year moving average of year-to-year percent change.



An estimation of the size of the macroeconomic effect on health progress. In the years 1911-1999 the unemployment effect on gains in life expectancy (see table 4) is given by the equation (standard errors in parenthesis below parameter estimates)

$$\Delta e_{0,t} = 0.225 + 0.104 \Delta u_t - 0.013 \Delta u_{t-1} + 0.217 \Delta u_{t-2} \quad [1]$$

(0.145) (0.088) (0.085) (0.089).

Therefore, assuming that there is no change in unemployment for three consecutive years, so that $\Delta u_t = \Delta u_{t-1} = \Delta u_{t-2} = 0$, the expected annual gain in life expectancy at birth at year t would be 0.225 years. Three years with consecutive increases in the unemployment rate of 1 percentage point each would make $\Delta u_t = \Delta u_{t-1} = \Delta u_{t-2} = 1$, so that the expected increase in life expectancy would be $0.225 + 0.104 - 0.013 + 0.217 = 0.533$, a gain 2.4 times greater than in conditions of stable unemployment.

For the model restricted to the years 1951-1999, the unemployment effect on gains in life expectancy is given by

$$\Delta e_{0,t} = 0.154 - 0.029 \Delta u_t + 0.106 \Delta u_{t-1} - 0.026 \Delta u_{t-2} \quad [2]$$

(0.033) (0.054) (0.062) (0.025).

Therefore, without change in unemployment for three consecutive years, $\Delta u_t = \Delta u_{t-1} = \Delta u_{t-2} = 0$, and the expected annual change in life expectancy at birth at year t is 0.154 years. Three years with consecutive increases in the unemployment rate of 1 percentage point each would make $\Delta u_t = \Delta u_{t-1} = \Delta u_{t-2} = 1$, so that $\Delta e_{0,t} = 0.154 - 0.029 + 0.106 - 0.026 = 0.205$ and the expected increase in life expectancy would be 33% greater than in conditions of constant unemployment.

For the model restricted to the years 1911-1950 the unemployment effect on gains in life expectancy is given by

$$\Delta e_{0,t} = 0.351 - 0.122 \Delta u_t - 0.07 \Delta u_{t-1} - 0.242 \Delta u_{t-2} \quad [3]$$

From equations [2] and [3] it is easy to compute the change in unemployment in three successive years ($\Delta u_t = \Delta u_{t-1} = \Delta u_{t-2}$) that would reduce the annual gain in life expectancy to zero: that value is -3.02 for 1911-1959 and -0.98 for 1950-1999. The models therefore predict that for an interruption of the secular increasing trend in life expectancy, there would need to be three consecutive equal drops of about one percentage point in unemployment in 1911-1950 and about three percentage point in 1950-1999.