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Abstract

Female life expectancy has almost universally been higher than male life expectancy. But, both have increased rapidly during the past century. European countries differ as regards the magnitude and time trends of the female-male difference. In countries that can be characterised as Egalitarian from the point of view of gender equality, the difference increased rapidly after World War II. It is thought that a major factor in this was then wider adoption of smoking on the part of males. Subsequently the gap has clearly narrowed, and it is believed that the narrowing continues. In countries that can be characterised as Traditional from the point of view of gender equality, the gap started to widen already a century ago, with acceleration after World War II. these countries show only limited evidence of subsequent narrowing. In former socialist countries the gap has been large, and shows little narrowing. These developments are described in detail by graphical displays. It is shown that considerable heterogeneity exists in the time trends within the three groups of European countries

Key words: Female advantage, historical mortality data, life expectancy, mortality, survival probabilities.

Descriptive Findings on the Convergence of Female and Male Mortality in Europe

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MoPAct
Mobilising the Potential of Active Ageing in Europe

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Summary

Life expectancies in Europe have increased from 45-55 years in 1900 to 75-85 in the 2010s. The speed of increase has varied by country, and over time. Official forecasts typically assumed that the decline in mortality would come to a halt. This never happened, and the pessimistic forecasts are partly to blame for the inadequate preparedness of many European societies for the problems of aging.

Declines in mortality first started in the youngest ages with little change in older ages. This lead some to conclude that the survival curve would become rectangular, i.e., the deaths would concentrate into an ever narrower range around age 80 or 90. This has not happened either. Declines have gradually started in older ages. It is plausible to that declines will continue to ever higher ages, as resources are devoted to combat hazards that are characteristic of advanced ages.

Male mortality has almost universally been higher than female mortality, but as the economic and social roles of the two genders have become more similar in Europe, with respect to work, child rearing, leisure activities and other aspects of life style, many expect that male mortality will catch up with female mortality. Indeed, it is true that for a fixed age, as the level of mortality declines to a low level, the difference between male and female survival probabilities must decline, even if in relative terms the males would continue to have higher hazards.

Moreover, as male mortality has reached the level of female mortality from a decade or two ago, it seems clear that the difference cannot primarily be due to biological factors. Knowledge of healthier life styles and the ability and willingness to adopt them are more important.

However, when declines in mortality move to ever higher ages, the possible convergence in age-specific mortality does not necessarily translate into a convergence in expected years of life. For this, the developments in current retirement ages are crucial. An empirical study of gender differences in mortality in ages 65+ shows a number of remarkable trends in Europe. The discussion is formulated by taking six geographic areas (Nordic, Atlantic, Mediterranean, Central European, Baltic, Eastern European) as a starting point, but in the end a classification along broad social characteristics is arrived at.

In Denmark, the Netherlands, Norway and Sweden, and to a lesser degree in Ireland, a fast *divergence* in expected years for males and females occurred after World War II. Around 1950 a 65-year old male could expect to have ahead approximately 95 % of the remaining years of a 65-year old female. By 1970-1980 this had declined to 75-80 %. By 2010, the ratio of expected years

has increased to approximately 85 %. Differential smoking patterns between males and females are thought to have had a role in this development. Men started to smoke earlier and with greater intensity than females, but later the prevalence of smoking among men has declined and the smoking patterns of the two sexes have become more similar. Smoking is a major determinant of the incidence of cardio-vascular diseases and many cancers, so this provides a link from exposure to mortality.

In Finland, Belgium, the United Kingdom, France and Switzerland the ratio of expected remaining years in age 65 was approximately 95 % in 1850-1900, but started to decline already at that time to reach a low of 75 % around 1960-1980, followed by a recovery to approximately 85 %. A similar pattern was observed in Italy and Spain with data starting around 1900. It is clear that even if the patterns of smoking may have had an accelerating role in the speeding of the divergence and in the subsequent recovery, the causes underlying the decline over a hundred year period cannot be due to smoking.

A look at the probability of surviving from birth to age 65 shows that Finland, Belgium, the U.K., France, and Italy suffered major casualties during both world war periods. The Netherlands and Spain suffered similarly in a major way during World War II, but not World War I. Lesser casualties were observed in Norway during World War II, and in Switzerland during World War I. Notably Denmark and Sweden were not similarly hurt during either period. Our data do not include the war years for the other countries, but it is known that most of them suffered heavy losses during World War II. Thus, adverse conditions due to wars do not provide a simple reason for the different developments between the two sets of countries.

The data from the former socialist block countries only starts from the 1950s. The ratio of the remaining expected years in age 65 has declined all through the available data period in Estonia, Latvia, Lithuania, Slovakia and Hungary, from 85-95 % to 75-80 % in 2010. In Poland and the Czech Republic the initial decline in the ratio has flattened at approximately 80 %. In relative terms, some recovery has been observed, although changes in absolute years have been modest.

A tentative synthesis of the findings is that the countries can be classified into three broad groups: (1) *former socialist* countries, in which male mortality is clearly higher than females mortality; (2) countries around the North See and the Atlantic that might be characterized as *egalitarian* from the perspective of gender equality with a sharp increase in the gap between male and female expected years after World War II, and with a subsequent rapid, but partial recover; and (3) the remaining countries from Finland to Central Europe and the Mediterranean, in which divergence in expected years between expected years started to increase a century ago, with an acceleration after World War II, and a more modest recovery. In contrast two the egalitarian group, these countries might be characterized as *traditional* from the perspective of gender equality.

Statistical study of the male and female indicators of mortality and life expectancy suggest that the female trends show a more stable improvement and increasingly fast development, and the observed divergencies have primarily been due to cessation, slowdown, or even reversal of the improvement for males. But, statistical investigations also reveal a considerable diversity from country to country, even when the broad groupings are applied. Therefore, even if the convergence of male and female mortalities is a real possibility, it cannot be taken for granted, for every country, in forecasting, for example. Considerable uncertainty will remain.

An important development in European demographics is the the change in household structure. The share of single-person households is expected to increase both in young adult ages, and among the elderly. The analyses of mortality as summarized above suggest that the convergence of male and female mortalities cannot be expected to quickly reduce the fraction of elderly women living alone as widows, in any of the groups of countries.

A further, and simpler reason for why the fraction of elderly women living alone will not quickly change, is that while the analyses presented above consider period data, when actual birth cohorts are considered, the observed discrepancies in female and female mortality at any given time persist to the end of the cohort's life span. For the 65-year olds such effects last thirty years or more.

1 Introduction

In human populations, female life expectancy has nearly universally been higher than male life expectancy, but during the past 150 years both have increased. For example, in the year 1900 European life expectancies were in the range 45-55 years, but by the 2010s they had increased to 75-85 years. Purely biological processes cannot alone have produced such an increase. Social and economic factors must have played a key role in the increase, an aspect that has not received adequate weight e.g. in the otherwise encyclopedic review of the past literature on the subject by Kalben (2002).

Despite the observed rapid declines in mortality, in official forecasts that were prepared during the 1900s it was typically assumed that the declines would come to a halt a decade or two after the jump-off time of the forecast. From early on, it was noted that the improvements occurred in the youngest ages, with little or no progress in the oldest ages (Wicksell 1926). Perceived limitations in the effectiveness of public health measures and developments of medicine have also been seen as a factor in this (Whelpton 1936). In consequence, the shift in the age structure towards older ages was not observed in time and the financing of pension systems and elderly care has been insufficient.

Currently, a generally held belief is that female and male mortalities are converging (e.g., Meslé (2004), Pampel (2005), Li and Lee (2005), Staetsky (2009), King and Soneji (2011), Hyndman, Booth and Yasmeen (2013), Raftery, Lalic and Gerland (2013), Thorslund, Wastesson, Agahi, Lagergren and Parker (2013), Seligman, Greenberg and Tuljapurkar (2016) and references therein).

There are two aspects to this. First, as both female and male mortalities go down, they will eventually have to converge in each fixed age, simply because mortality cannot go below zero. This will happen, even if, in relative terms, the hazards of males would remain higher. In fact, the relative risk of males could even increase, as long the mortality of both sexes would go down fast enough.

The second aspect relates to those factors that are thought to influence the hazard of death. Women and men share a similar environment; their education is more similar than before; women's labor force participation has increased, so the economic roles of the two genders are becoming similar; the family roles of women and men are increasingly similar; and life style factors such as leisure activities, nutrition, smoking, or alcohol abuse show similar trends. It is tempting to conclude that mortalities should also converge.

Nevertheless, there are two reasons why a careful statistical examination of mortality trends is useful. First, the error of past mortality forecasts was partly due to the fact that declines started in young ages and only later progressed to older ages. This lead some to conclude that survival curves would become rectangular, with an ever larger fraction of deaths occurring around age 80 or 90. Wicksell (1926) has had many followers in thinking this way. This has not happened. Instead, declines have gradually started to occur in ever higher ages. If this continues, there is no logical reason why the *life expectancies* of the two sexes should converge. Women might simply gain new years faster than men.

A second factor that undermines the seemingly logical argument for convergence is that convergence was already expected before World War II. Whelpton (1947) understood that female and male mortalities are related, and assumed that their difference would decrease over time. Yet, after the war, major divergencies occurred. Roughly speaking, women's mortality continued to decline, while the life styles of males were such that the declines in mortality slowed down or stopped.

Given the low level of mortality in working ages, special attention needs to be given to developments in retirement age, in this study the ages 65+. In this, our work is closely related to Thorslund, Wastesson, Agahi, Lagergren and Parker (2013), who concentrate on low mortality countries in Europe and elsewhere. We present a more complete statistical description for a wider range of European countries. The evidence shows that the developments in different parts of Europe have been different. At the very least, this diversity has to be recognized in short term point forecasts of population, and as a factor increasing uncertainty in long term forecasts.

One of the major trends in household structure in Europe is the increase in single-person households. This is important because people living alone are deprived of the economies of scale that multi-person households provide to their members. An important part of single-person households are the elderly women living alone, who are widowed. It is tempting to think that the possible convergence of female and male mortalities might counteract the increasing prevalence of this group. This is a long-term possibility for some of the European countries studied. Yet, for others data do not support such a development, at least not yet. Notably, in former socialist countries the female and male mortalities do not show clear convergence at this time.

Another factor that is not immediately evident from the period data we have considered is that when divergences have occurred at one time, the effect will persist to the end of a cohort's life time. For a cohort that is in age 65, this means that the effects will persist for 30 years or more.

The report is organized as follows. Section 2 describes the data used in this study. In Section 3 we define and discuss the demographic measures used in the study. Comparative analyses are given for six geographically defined groups in Section 4, with central findings summarized in Section 4.1. This is followed by detailed data for each country in Section 5, with central findings summarized in Section 5.1. Countries with only post World War II data will have somewhat less detailed information.

2 Mortality Data

Mortality Data from 23 countries of Europe were collected from the Human Mortality Database (www.mortality.org). East- and West-Germany are treated as two countries in these analyses. The former Czechoslovakia is represented by the Czech Republic and Slovakia. The original data consisted of counts of death by age ($x = 0, 1, \ldots, 109, 110$) and sex, and population counts as of January 1 each year. The earliest observations started in Sweden in 1751. The observations from Finland were updated for other research and used as such here, so that the most recent mortality counts are from 2014.

For empirical analyses the countries were grouped by geographic, social and cultural proximity into six groups as follows (years for which mortality counts were available are given in parentheses):
1. Nordic Countries
Denmark (1835-2011), Finland (1878-2014), Norway (1846-2009), Sweden (1751-2011).
2. Atlantic Countries
Belgium (1841-2009), Ireland (1950-2009), the Netherlands (1850-2009), the United Kingdom (1841-2011).
3. Mediterranean Countries
France (1816-2010), Italy (1872-2009), Portugal (1940-2009), Spain (1908-2009).
4. Central Europe
Austria (1947-2010), East and West Germany (1956-2011), Switzerland (1876-2011).
5. Baltic Countries
Estonia (1959-2011), Latvia (1959-2011), Lithuania (1959-2011), Poland (1958-2009).
6. Eastern Europe
Czech Republic (1950-2011), Slovakia (1950-2009), Hungary (1950-2009).

Associated with this classification is data quality. The Nordic countries have a long history population registration and the long data series used here are believed to be accurate. The Atlantic and Mediterranean countries have long histories of census taking, but the registration of deaths may have been incomplete, especially in earlier years, and inter-censal population estimation by indirect methods is necessarily uncertain. These problems have been compounded by repeated changes in national borders. Finally, political upheavals have caused disruptions in data series in Central and Eastern Europe, and the Baltics.

The geographic nomenclature we use is not literally correct, nor in official use. Although there are many known heterogeneities within each group of countries, the expectation was that the groups would display generally similar trends. In some cases this turned out not to be true, so the grouping provides a backdrop for some unexpected demographic findings.

A complicating factor in the analysis of mortality by single years of age is that for small populations, especially for earlier years, there are years and age groups with no deaths, and even without any exposed individuals. There is no unique way in which such problems should be handled. In this study two types of things were done to reduce the complications arising from such data problems. First, ages 100+ have been analyzed as one group. Second, when zero counts or undefined rates were encountered, a median smoother over age or time was used to fill in the missing values. Some exclusions of countries were made because of data problems of this sort.

3 Demographic Measures and Estimation

3.1 Definition of Measures

Let $X \geq 0$ be an individual's lifetime. Define $p(x) = P(X > x)$ as the probability that the individual is alive at age $x \geq 0$. The conditional probability of being alive at age z given that the individual is alive at age $x \geq 0$ is then $p(z)/p(x)$, and the remaining life expectancy is (cf., Alho and Spencer (2005))

$$e(x) = \int_{x}^{+\infty} \frac{p(z)}{p(x)} dz. \tag{1}$$

For considerations relating to the elderly living alone, we wish to take into account the fact that more boys are born than girls, or for every girl the number of boys born is $\kappa \approx 1.05$. Then, we shall assess expected years lived in a (synthetic) birth cohort from some age $\beta > 0$ onwards.

Let us use the index $j = 1$ to designate measures for the females and $j = 2$ for the males. Then, the expected years of males will live beyond age β divided by the expected years females will live beyond age β is

$$Q = \kappa \times \frac{p_2(\beta)}{p_1(\beta)} \times \frac{e_2(\beta)}{e_1(\beta)}. \tag{2}$$

Writing $r(x,z) = \frac{p_2(z)}{p_2(x)} / \frac{p_1(z)}{p_1(x)}$ as the ratio of survival probabilities from x to z, we can also write

$$Q = \kappa \times r(0,\beta) \times \int_{\beta}^{+\infty} r(\beta,z) g(z) dz, \tag{3}$$

where

$$g(z) = \frac{p_1(z)}{p_1(\beta)} \times \frac{1}{e_1(\beta)}, \quad z \geq \beta, \tag{4}$$

is a weight function that integrates to $= 1$. Or, the integral in (3) is a weighted average of the age-specific ratios of survival probabilities from β.

The three components of the ratio of expected years in (3) provide one way to reduce the dimensionality of the comparative analysis. It has been chosen for this study because it neatly separates the trends in retirement ages from the younger ages. The processes that influence mortality among the young are different from those that influence the mortality of the elderly.

In addition to survival *per se*, we might be interested in the effect of population growth on Q. Under the condition of stable growth, the function $g(x)$ of (4) would be replaced by $g(x)e^{-\rho(z-\beta)}$, where ρ is the stable growth rate. Figure 1 displays the weight function for the Swedish females, when

$\rho = 0, -0.0025, -0.0093$. The first value corresponds to a stationary (life table) population, i.e., a population that does not grow or decline. The third value is the average intrinsic growth rate of 17 European countries, in the absence of migration. The second value is the stable growth rate of the same countries, but allows for recent past net migration (Alho 2008). The latter two values are negative, indicating that the European populations would eventually decline. In both cases the weight of the older ages is higher than in the stationary case. It turned out that for the types of results we wish to display in this report the effect of population decline is too small to alter the qualitative interpretations. Therefore, only the standard life table measures that correspond to $\rho = 0$ are displayed in this report.

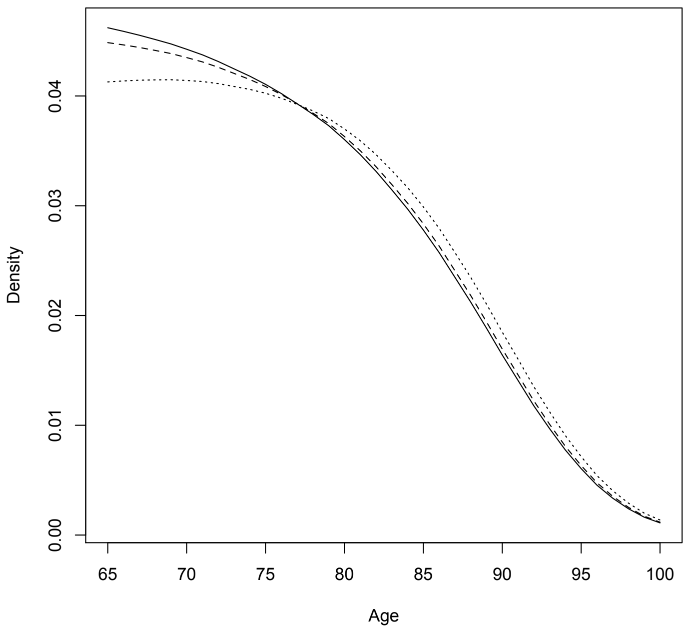

Figure 1: Age Distribution of the Swedish Female Population in 2011, When the Stable Growth Rate is $\rho = 0$ (Solid), $\rho = -0.0025$ (Dashed), and $\rho = -0.0093$ (Dotted).

In applications we will take $\beta = 65$, and display estimates for $r(0, \beta)$ and the ratio of expected years in age β, which is the last ratio on the right side of (2) or equivalently the integral on the right side of (3).

When $\kappa \times r(0, \beta) = 1$, then the same number of males and females from a birth cohort reach age 65.

Table 1 gives the latest available estimates for the probability of survival from birth to age 65 and expected remaining years at 65, for females and males. For the most part our analyses deal with *relative* numbers, but here we provide the probabilities and expected years as such.

The Mediterranean countries have higher expected years than e.g. the Nordic or Atlantic countries, but we will see later that the differences between males and females are generally smaller for the latter.

3.2 Estimation from Grouped Annual Data

Define D_{xt} as the number of deaths in age x during year t. Let K_{xt} be the corresponding person years of exposure. Then,

$$m_{xt} = \frac{D_{xt}}{K_{xt}} \tag{5}$$

is the age-specific mortality rate in age x during year t. This is the maximum likelihood estimator of the hazard μ_{xt} in the Poisson model, $D_{xt} \sim Po(\mu_{xt} K_{xt})$. Standard errors of the estimates (and summary measures derived from them) can be computed based on the Poisson assumption (Alho and Spencer 2005), but these effects are too small to alter the qualitative conclusions, so they are omitted.

In continuous time survival probabilities are known to have the form

$$p(x) = \exp(-\int_0^x \mu(z)dz). \tag{6}$$

For discrete ages $x = 1, 2, \ldots$ one can estimate the survival probability from data of year t, as

$$p_{xt} = \exp(-\sum_{z=1}^{x} m_{xt}). \tag{7}$$

The corresponding estimate of the remaining life expectancy at exact age x can be estimated (using the so-called trapezoid method; Alho and Spencer (2005)) as

$$e_{xt} = 0.5 + \sum_{z=x+1}^{+\infty} p_{zt}. \tag{8}$$

In practice, the calculation is truncated at some value (in our case, at 100), and the remaining life expectancy at that age is estimated separately, as the reciprocal or the observed mortality rate at that and higher ages.

Table 1: Probability of Surviving to 65, and Expected Remaining Years at 65

		Probability to 65		Expected Years at 65	
Country	Year	Female	Male	Female	Male
Nordic					
Denmark	2011	0.902	0.848	20.0	17.2
Finland	2014	0.926	0.847	21.4	18.0
Norway	2009	0.918	0.870	20.9	17.8
Sweden	2011	0.927	0.888	21.1	18.4
Atlantic					
Belgium	2009	0.904	0.834	20.7	17.3
Ireland	2009	0.909	0.851	20.3	17.1
Netherlands	2009	0.909	0.873	20.7	17.4
United Kingdom	2011	0.912	0.867	21.0	18.4
Mediterranean					
France	2010	0.919	0.829	22.7	18.6
Italy	2009	0.931	0.877	21.7	18.1
Portugal	2009	0.918	0.821	20.4	17.0
Spain	2009	0.934	0.853	22.0	18.1
Central European					
Austria	2010	0.917	0.840	21.0	17.7
East-Germany	2011	0.916	0.824	20.7	17.3
West-Germany	2011	0.913	0.851	20.9	17.8
Switzerland	2011	0.933	0.889	22.1	19.0
Baltic					
Estonia	2011	0.892	0.701	19.6	14.6
Latvia	2011	0.852	0.645	18.4	13.4
Lithuania	2011	0.855	0.620	18.9	13.9
Poland	2009	0.876	0.709	18.9	14.7
Eastern European					
Czech Republic	2011	0.902	0.790	18.9	15.5
Slovakia	2009	0.878	0.717	17.8	14.0
Hungary	2009	0.846	0.667	18.0	13.9

3.3 Comparative Measures Used

Remaining life expectancy at age 100 cannot be estimated reliably, because of the small counts of death. To reduce random variation, running medians are used. These estimates indicate the expected years women have ahead at age 100 have generally been higher than the years men have ahead. The quality of the data is poor, so the most important measure used for male-female comparisons is the expected years in ages 65-99. We consider their absolute values, their arithmetic difference, their relative difference (arithmetic difference divided by the female expected years), and their ratio. In practice, the ratio is computed like the third component of Q with $\beta = 65$ but the integral truncated at 100. A central finding is that the divergence of male and female life years seems to have come about typically by an acceleration in the expected female years, and a slowdown or even a reversal in the increase of male years.

Parametric models for the age-specific mortality counts can be useful in reducing random variation in the observed rates. Thus, we also present estimates from the loglinear model,

$$\log(\mu_{xt}) = \theta_{0t} + \theta_{1t}x + \theta_{2t}x^2 \tag{9}$$

that is fitted separately for every year observed in ages 65-99, and study the behavior of coefficient estimates as time series. To reduce collinearities in estimation, age was centered at 82, or x = age - 82. Thus, θ_{0t} gives directly the level of mortality in age 82. The term θ_{2t} measures the possible convexity/concavity of the mortality curve. It is expected to be close to 0. These estimates reflect differences in relative mortality rates rather than expected years, so they provide an alternative point of view. The two approaches are usually in agreement, but not in every case.

Examples. (a) If θ_0 goes down, but the other parameters remain fixed, then mortality declines at the same rate in all ages. (b) If mortality declines first in younger ages, and later in older ages, then θ_0 goes down and θ_1 goes up. The reverse implication holds, if the magnitudes of the changes are suitable. This is the typical case in our data. (c) We will use the difference of the linear predictors, i.e., the right hand side of (9) for males and females, to show how the divergence of the relative mortality hazard has started in younger ages, and how the subsequent convergence has primarily happened in the youngest ages. Years 1930 and 1950 or if not available the earliest available, 1970, 1990, and the latest available year, are used in the graphs.

A nonparametric way to reduce the effect of random fluctuations is the use of broad age groups. Thus, we will also consider the difference in the male and female mortalities in ages 65-74, 75-84, and 95-99. These measures complement estimates from the parametric models and directly confirm, not only that the main differences have been caused by the dynamics in the ages 65-74 (although weaker effects are also observed in the older age groups), but also the specific years when these changes occurred.

A second way that the data from broad age groups is utilized, is to contrast the development for the post World War II years, to the trend in mortality decline from the level observed in 1930-1934 to that in 1950-1954. The countries differ in the trends, but when divergencies have occurred, they appear to have come about from a slowdown of decline from males, whereas female mortality has more closely followed the past trend. About half of the countries have data starting from the post-war period, so this analysis is not feasible for them.

Additional measures that go deeper into the time-series dynamics of mortality rates via bilinear modeling will be presented elsewhere (Alho 2016). Similarly, trends calculated from the period data can be complemented by similar measures that are computed for actual birth cohorts. These results will also be reported elsewhere.

4 Grouped Analyses

Since the focus of the research is the convergence of female and male mortality, and expected life years, the statistical summaries presented here will be presented as graphs from which both long-term and short-term changes are visible. The measures we use are relative. This eliminates the effect of a sustained increase expected life years. In individual country analyses of Section 5 the actual values of expected years, and their difference is also considered.

4.1 Central Findings

4.1.1 Survival to Age 65

Consider first the relative probability of surviving from birth to age 65, using period estimates of survival. This age range contains those ages in which men have been involved in military activities during times of war. From Figures 2, 3, 4, 5, 6, and 7 we find that Finland, the U.K., France, and Italy suffered major casualties during both world war periods. The data for Belgium during World War I are missing, but it is clear that Belgium belongs to this group, as well. The Netherlands and Spain suffered similarly in a major way during World War II, but not World War I. Lesser casualties were observed in Norway during World War II and in Switzerland during World War I. Notably Denmark and Sweden were not similarly hurt during either period. For the other countries our data do not include the war years, but it is known from other sources that most, if not all of them suffered heavy losses during World War II. The losses translate into a major drop for the relative survival of males.

Figure 2 shows that apart from the major shocks caused by the wars, in Finland the relative disadvantage of men started already before the year 1900, whereas in the other Nordic countries Denmark, Norway and Sweden, the lot of men improved until around 1950, after which there was a decline in relative survival. Thus, different processes must have caused the observed developments in Finland.

The relative survival of the men in the Netherlands followed a pattern similar to that in Denmark, Norway and Sweden (Figure 3). Notably, the relative survival was almost equal for males and the females before World War II, at least if one takes into account that more boys are born than girls. For the U.K. we observe a long-term decline similar to that in Finland, but including a clear recovery during the two World Wars.

From Figure 4 we see evidence that in France and Italy of a long-term decline like in Finland and the U.K. The shorter time-series for Spain appears similar. The data for Italy before the period shown shows a *male advantage* in survival. There are many problems of data quality in the Italian data, so those observations have been omitted from this display.

For Switzerland the relative male survival was approximately 85 % of that of the females until the 1950s, as shown in Figure 5. Subsequently the gap has clearly narrowed. For the much shorter period of available data, the trends in Austria and West-Germany have been similar to those in Switzerland. East-Germany shows a notable deviation that occurs at the time of the unification. This deviation most likely has different determinants from those observed in the Netherlands or the Nordic countries.

Only post World War II data are available from the Baltic countries, in Figure 6. All four countries show a growing male disadvantage in survival until the early 1990s. Notably, the developments in Estonia, Latvia, and Lithuania resemble those in East-Germany, but with an even more severe drop around the time of they gained independence from the Soviet rule. It is difficult to discount the hypothesis that the breakdown of former political and social arrangements has been particularly detrimental to the males.

Figure 7 shows that developments in the Czech Republic look similar to those in Poland, whereas the Slovakian and Hungarian data look closer to what was observed in Estonia, Latvia, and Lithuania. The division into Baltic and Eastern countries could clearly have been made in another way.

The dotted line in the graphs has been drawn at $1/1.05 \approx 0.952$, or it gives the level of relative survival that leads to the same number of men and women surviving to age 65 from a birth cohort. We find that Denmark, Norway, Sweden, Ireland, the Netherlands,, the U.K., Italy, West-Germany, and Switzerland are at, or very close to that level of relative survival.

4.1.2 Expected Remaining Years at Age 65

Remaining life expectancy at age 65 has been here reduced to the analysis of expected years in ages 65-99 because the data for those ages are generally better than in ages 100+. Data on life expectancy at 100 are given as part of individual country data below. War is not similarly a factor in relative survival in ages 65+ as it is in ages 0-65, so the developments discussed in this section reflect broad social trends in a cleaner way. The data on the ratio of expected years of males relative to females, at 65, are given in Figures 8, 9, 10, 11, 12, and 13.

In Denmark, Norway, and Sweden the ratio of expected male years to female years increased (apart from annual random variation) in a systematic way during 1850-1950, and then a major drop occurred until the 1990s. Then there was a rapid recovery. It is thought that the increased prevalence of smoking has played a major role in this development, with influences to the incidence of cancer and cardio-vascular diseases (e.g., Meslé (2004), Pampel (2005)). In Finland the development has been notably different. The ratio started to decline already around 1900, and a sharp recovery occurred slightly earlier than in the other Nordic countries. An increase in the prevalence of smoking also occurred in Finland, but it can hardly explain the decline of the ratio during pre-World War II years. Some aspects of working life, nutrition, and adopted male culture, such as abuse of alcohol, may account for part of the difference (e.g., Palosuo et al. (2007)).

Like for survival to 65, the Netherlands resembles Denmark, Norway, and Sweden in terms of the relative expected years at 65: there is a gradual *increase*, followed by a sharp dip and a partial recovery after World War II. The U.K. and Belgium resemble Finland, in that there has been a long, sustained decline that started already in 1850. After the 1960s the gap has narrowed like in all the other countries considered up to this point. The development in Ireland is close to that observed in the Netherlands, and the development in Belgium is in between those observed in the U.K. and the Netherlands.

In France the ratio of expected years at 65 for males to expected years for females has declined systematically from 1850, at least. It resembles the U.K. and Finland in this respect, but there has not been an equally rapid closing of the gap after 1990. In broad outline, Italy, Portugal and Spain show similar trends, but at a somewhat higher level of the ratio.

In Switzerland, and to the extent data are available, in Austria and East- and West-Germany, the developments resemble those of France, the U.K., Belgium and Finland. These eight countries have differed greatly in their level of economic development and life styles over the years, so one would not, *a priori*, expect them to differ in such a similar manner from the Netherlands or Denmark, Norway and Sweden.

Estonia, Latvia, and Lithuania resemble again Slovakia and Hungary in the relative expected life years. None of these countries show an increase in the ratio of the expected male and female years. Poland and the Czech Republic display a slightly better development, but only the latter shows a slight recovery.

4.1.3 A Tentative Synthesis

Figure 14 summarizes part of the data discussed until now, by displaying the latest relative expected years as a function of latest relative survival to 65. That is, they come from the years 2009-2014. Two distinct groups emerge. The Baltic states Estonia, Latvia, Lithuania, and Poland together with Slovakia and Hungary form the group with the largest male disadvantage. The other group in which the males are less disadvantaged consists of the Nordic, Atlantic, Mediterranean, and Central European counties together with the Czech Republic. Taking into consideration that the latter group can further be divided into two according to the way the male-female divergence took place, we have the following three groups of countries:

(1) Estonia, Latvia, Lithuania, Poland, Slovakia, Hungary;

(2) Denmark, Norway, Sweden, Ireland, the Netherlands;

(3) Finland, Belgium, the U.K., France, Italy, Portugal, Spain, Austria, East-Germany, West-Germany, Switzerland, Czech Republic;

The grouping is not unique, as e.g. Belgium could be put into (2), but it roughly replicates the regularities we have described.

How, then, do the three groups differ? A hypothesis that may be put forth is that the severe disadvantage of the males in group (1) is due to a loss of social position and disruption of career paths during the last years of socialism, and especially after the break-up of the socialist system. Group (2) represents an opposite development. The countries prospered economically and adopted economic and social policies that supported women's greater involvement in the society at large. The wars also had, in relative terms, much less influence than in the other countries. For more discussion, see e.g., Thorslund, Wastesson, Agahi, Lagergren and Parker (2013). Group (3) involves countries that had more traditional family patterns that emphasize the role of men in economic and social life. They were also hard hit by the wars. Staetsky (2009) discusses some further reasons for the divergence across countries.

For lack of established nomenclature, we will call group (1) *Former Socialist* countries, group (2) *Egalitarian* countries, and group (3) *Traditional* countries. As with the *a priori* classification the coined terms are not strictly precise, but suggestive, one hopes. In fact, the difference between the Egalitarian and Traditional countries resembles the division of European welfare states by Esping-Andersen (1990) into Social-Democratic and Corporatist regimes. The former are characterized by the fusion of welfare and work, and women's high labor force participation. In the latter, the role of Church is emphasized and there is a commitment to traditional familyhood. Interestingly, Esping-Andersen makes a reference to Giddens (1985), who discussed the role of past wars in the creation of the welfare state. The Social Democratic/Egalitarian countries suffered fewer losses than the Corporatist/Traditional countries.

The average developments in these three groups of countries are given in Figure 15. The blue line of the figure shows how the Egalitarian countries started from a good position (i.e, a position close to the upper right-hand corner of the graph), dipped down low especially in terms of the ratio of the expected years, and then recovered. The green curve of the Traditional countries started from a clearly worse position, dipped down, but recovered especially in terms of survival to 65. The dismal experience of the Former Socialist countries shows some recovery in terms of the survival to 65 but little improvement in expected years.

A warning is in place at this time. Although Figure 15 suggests that the average developments in the three groups have been quite different - a true finding, there is considerable heterogeneity within each group. Figure 16 has the same paths for the *averages* of each group, but it also adds the paths for each of the 23 countries, colored according to the group they belong to. Although for the Egalitarian (blue) group the mean is a good descriptor for all countries, for the Traditional (green) countries there are some marked outliers. For example, the outlying country that deviates furthest to the left is Finland, a country that has more recently become closer to her Nordic neighbors, but based on the graph resembles the Former Socialist countries. The data for the Former Socialist (red) countries are heterogeneous indeed. Curiously, the outlier in the lower left hand corner is Estonia, Finland's neighbor, 100 kilometers south across the Gulf of Finland.

These findings have implications in forecasting, since one cannot take for granted that European countries, even when divided into such sub-groups cannot, be assumed to follow the average trends. Considerable variation will remain. The only way such variation can be correctly accommodated is to form the forecast in terms of a probabilistic, or stochastic, predictive distribution (cf., Alho and Spencer (2005)).

If broad hypotheses about the importance of socio-economic factors as causes of mortality differentials are accepted, then the expectation of how the male-female difference in mortality will develop in the future, will depend on how such underlying social processes will develop in the future. For example, related to nutritional habits, obesity has been seen as a relatively new risk that may cause reversals of trends, especially in the United States but perhaps also in Europe (cf., King and Soneji (2011), Staetsky (2009)). On the other hand, if adopted life style is important, it is also difficult to preclude the possibility that at some point in the future, in some cultures, women would adopt life styles that are less healthy than those of men.

An analytical step that many papers on the gender difference on longevity take is to use data on cause-specific mortality as the mediating causal factor that is associated with exposures such as smoking or alcohol consumption. Attributable risk to such factors is typically computed (e.g., Meslé (2004), Pampel (2005)). This is most useful, as it helps to inform us how public health measures should be directed, for example. Yet, caution is needed.

Alho and Spencer (1990) show that the adoption of a cause-specific approach has not improved the accuracy of forecasts of all-cause mortality of the U.S. Office of the Actuary. A central reason is that since, say, smoking is a major cause of cancers and cardio-vascular diseases, it is necessary to forecast the future prevalence of smoking, a task that is harder than the extrapolation of cause-specific rates themselves. This difficulty is further compounded by unreliability and variations over time of the diagnostic practices (Alho (1991)). At a more fundamental level, the analysis of cause-specific mortality data involves the handling of competing risks of death. There still does not exist a satisfactory theory for the joint effect of different causes of death (e.g., Tsiatis (1975)). It is not possible to accurately determine how the reduction or removal of a cause influences the effect of the remaining causes, a fact that is rarely mentioned in the cause-specific analyses of differences in male and female mortality.

4.2 Survival from Birth to Age 65: Nordic

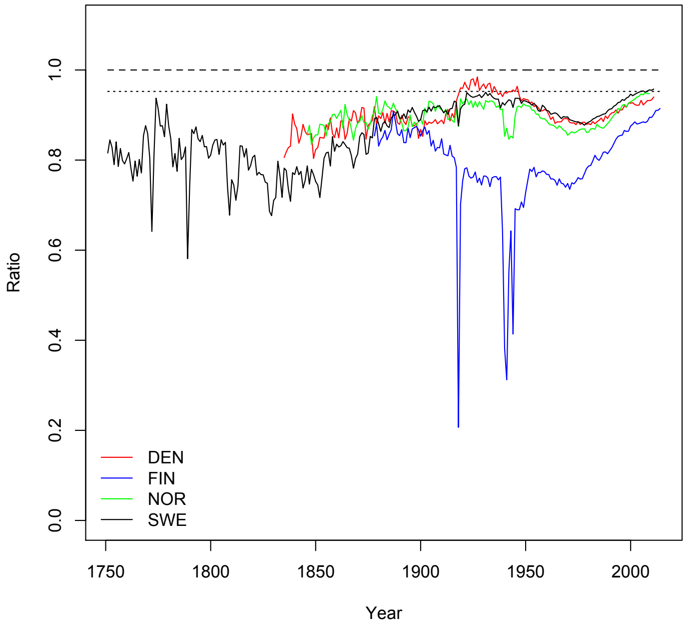

Figure 2: Ratio of Male Survival Probability to Female Survival Probability, from Birth to Age 65, in Nordic Countries.

4.3 Survival from Birth to Age 65: Atlantic

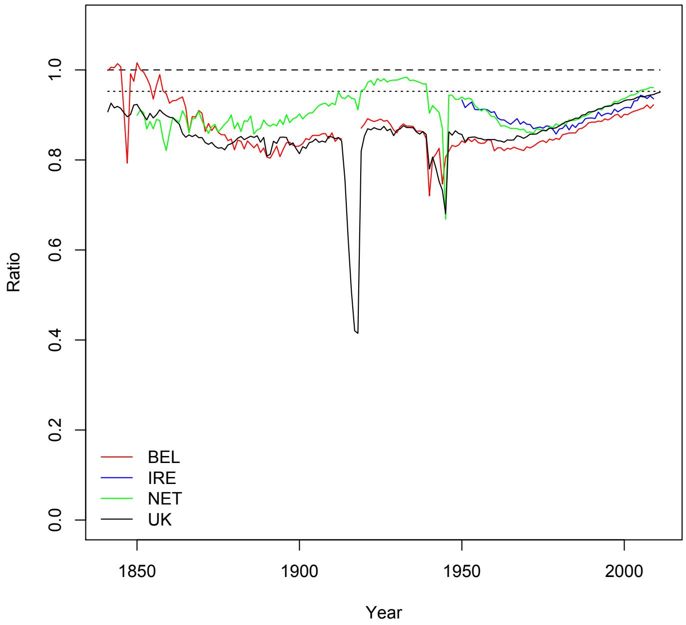

Figure 3: Ratio of Male Survival Probability to Female Survival Probability, from Birth to Age 65, in Atlantic Countries.

4.4 Survival from Birth to Age 65: Mediterranean

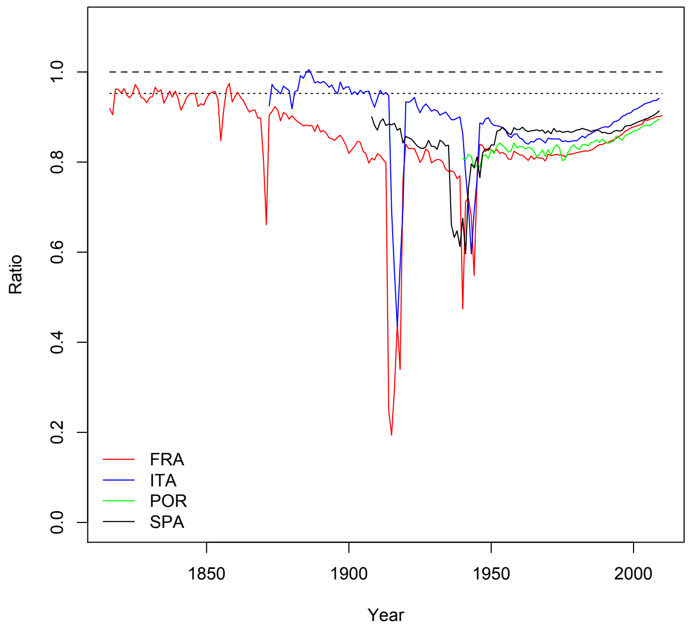

Figure 4: Ratio of Male Survival Probability to Female Survival Probability, from Birth to Age 65, in Mediterranean Countries.

4.5 Survival from Birth to Age 65: Central

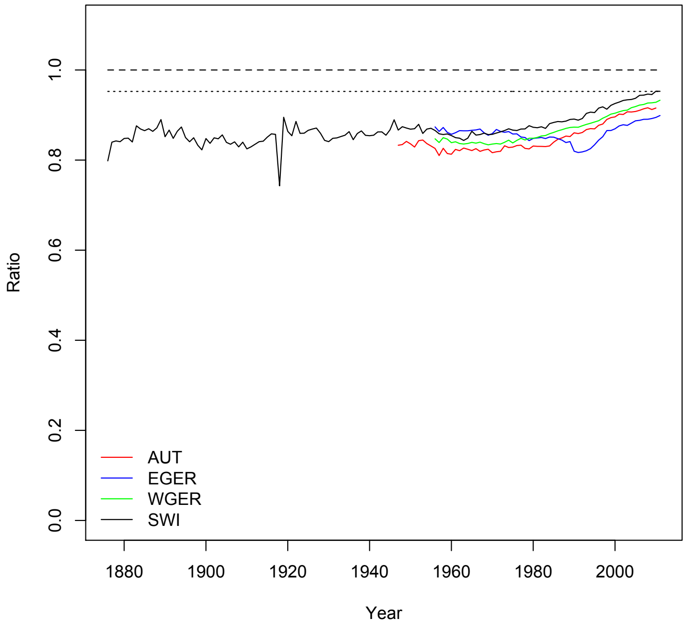

Figure 5: Ratio of Male Survival Probability to Female Survival Probability, from Birth to Age 65, in Central Europe.

4.6 Survival from Birth to Age 65: Baltic

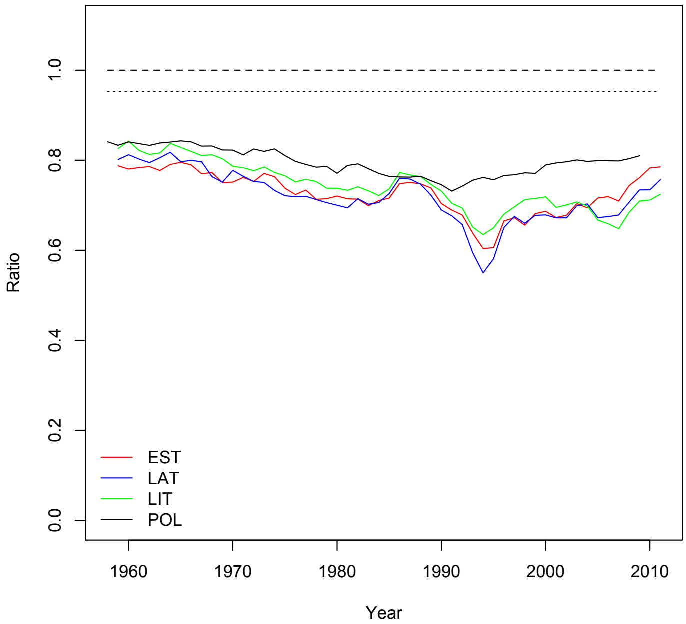

Figure 6: Ratio of Male Survival Probability to Female Survival Probability, from Birth to Age 65, in Baltic Countries.

4.7 Survival from Birth to Age 65: Eastern

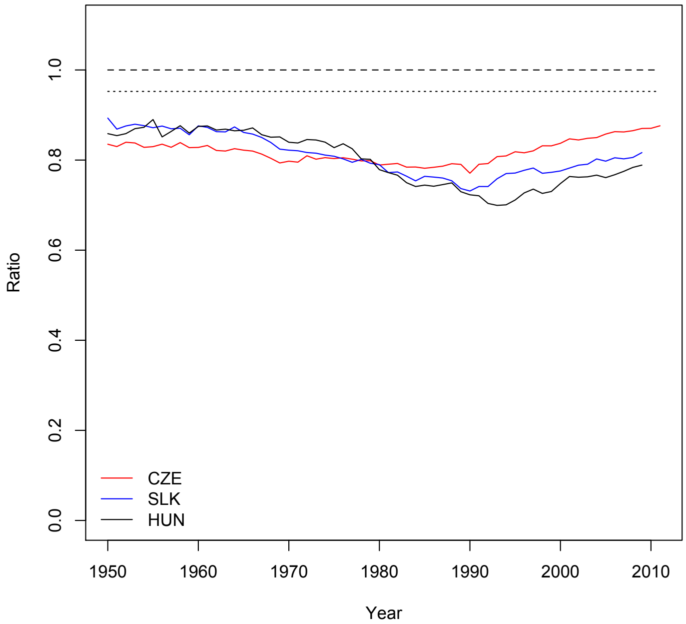

Figure 7: Ratio of Male Survival Probability to Female Survival Probability, from Birth to Age 65, in Eastern Europe.

4.8 Expected Years in Ages 65-99: Nordic

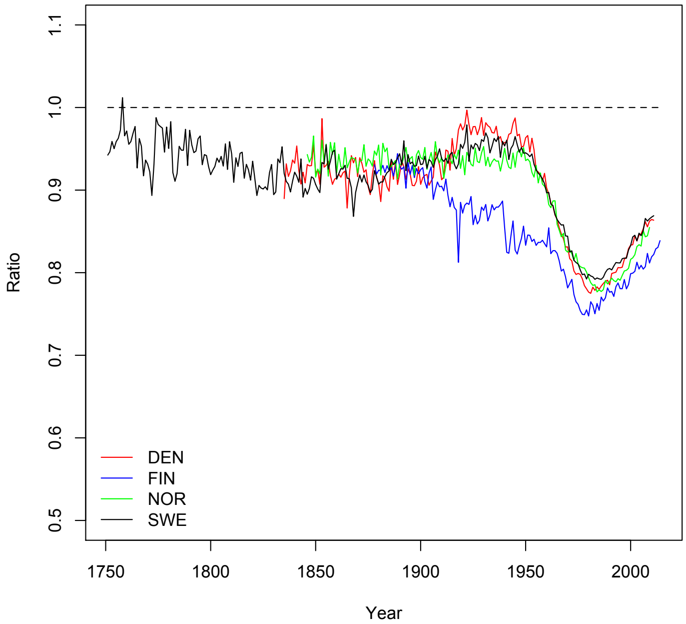

Figure 8: Ratio of Expected Years of Life in Ages 65-99, Given Survival to Age 65, in Nordic Countries.

4.9 Expected Years in Ages 65-99: Atlantic

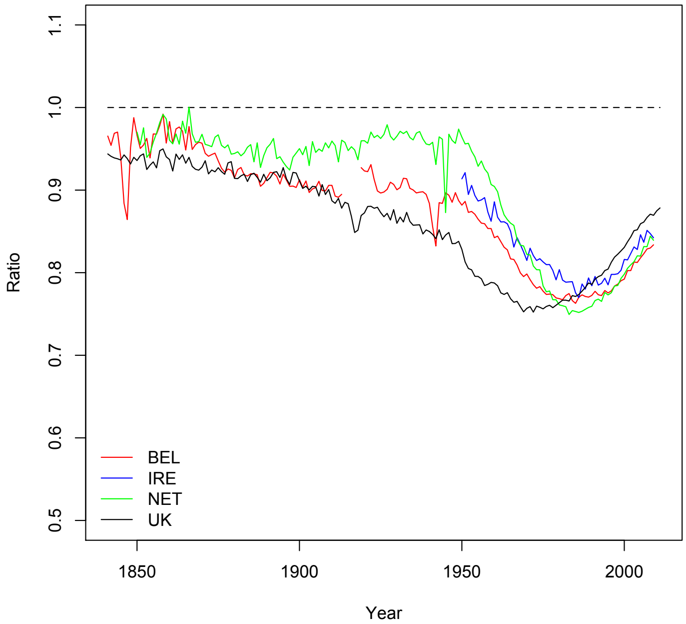

Figure 9: Ratio of Expected Years of Life in Ages 65-99, Given Survival to Age 65, in Atlantic Countries.

4.10 Expected Years in Ages 65-99: Mediterranean

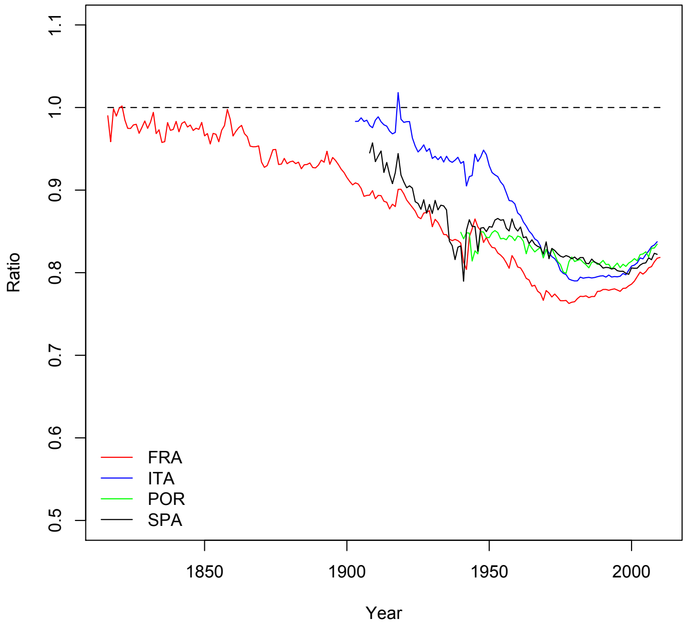

Figure 10: Ratio of Expected Years of Life in Ages 65-99, Given Survival to Age 65, in Mediterranean Countries.

4.11 Expected Years in Ages 65-99: Central

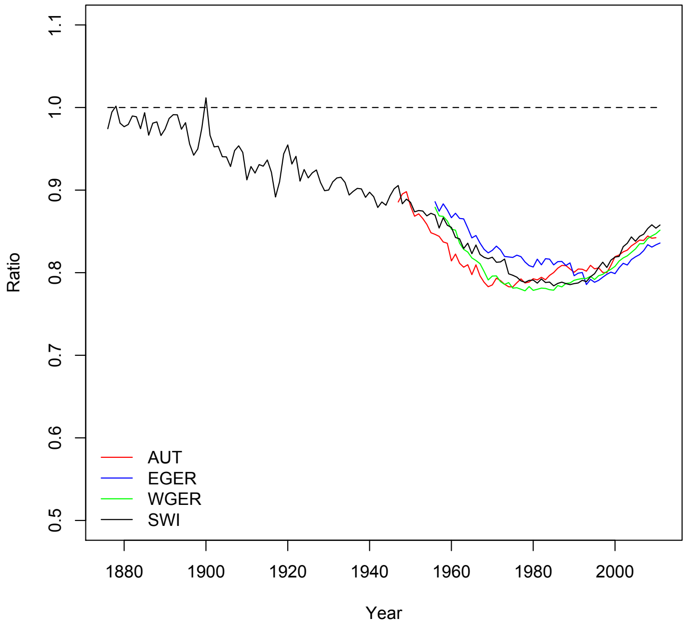

Figure 11: Ratio of Expected Years of Life in Ages 65-99, Given Survival to Age 65, in Central European Countries.

4.12 Expected Years in Ages 65-99: Baltic

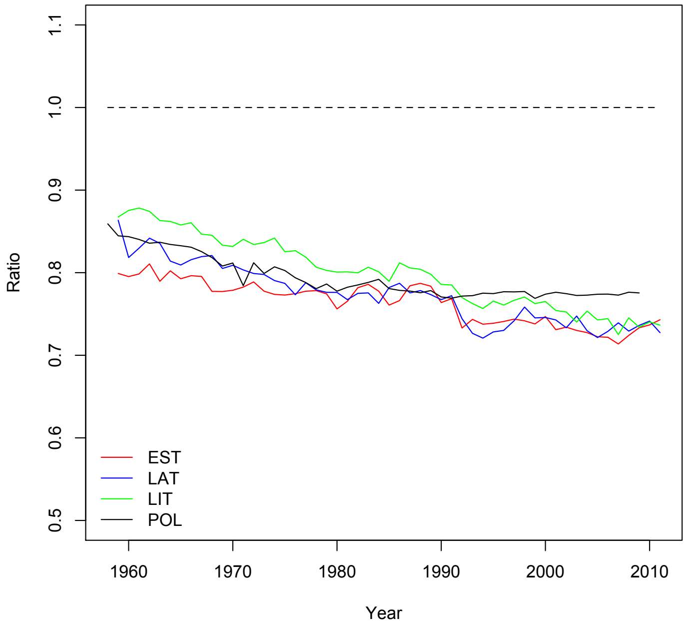

Figure 12: Ratio of Expected Years of Life in Ages 65-99, Given Survival to Age 65, in Baltic Countries.

4.13 Expected Years in Ages 65-99: Eastern

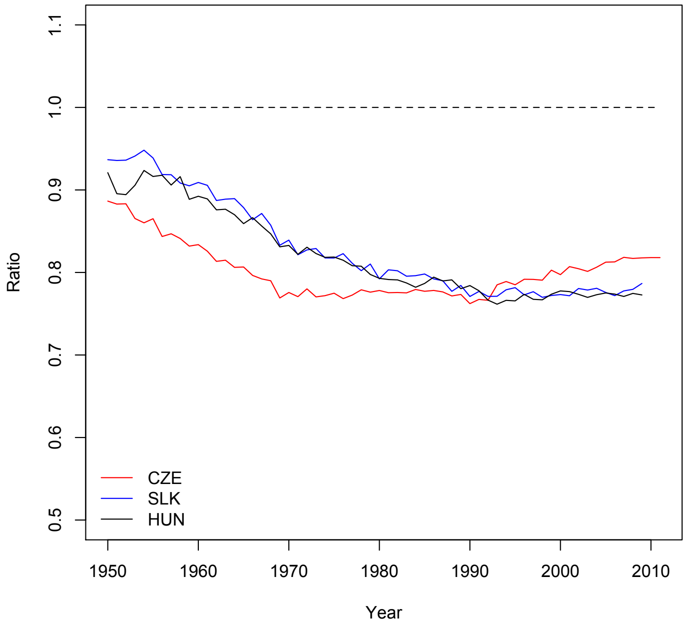

Figure 13: Ratio of Expected Years of Life in Ages 65-99, Given Survival to Age 65, in Eastern European Countries.

4.14 Countries Are Divided

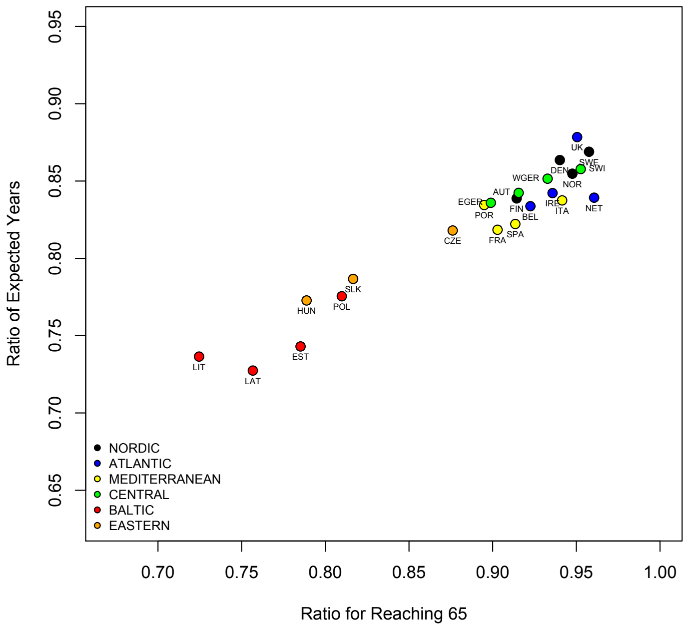

Figure 14: Ratio of Expected Years of Life in Ages 65-99, as a Function of the Ratio of Probabilities of Surviving to 65.

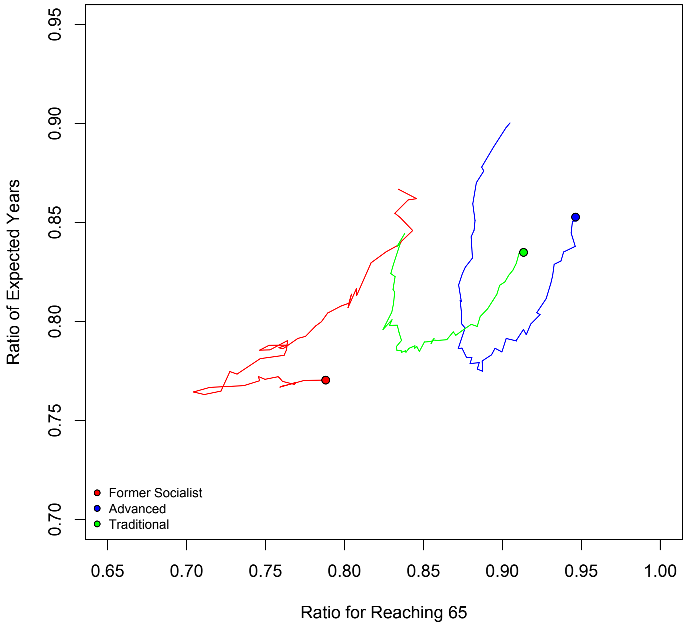

Figure 15: Ratio of Expected Years of Life in Ages 65-99, and Ratio of the Probability of Surviving to 65, in 2009, and the Path to This Observation Since 1959, Average Values For Three Groups of Countries

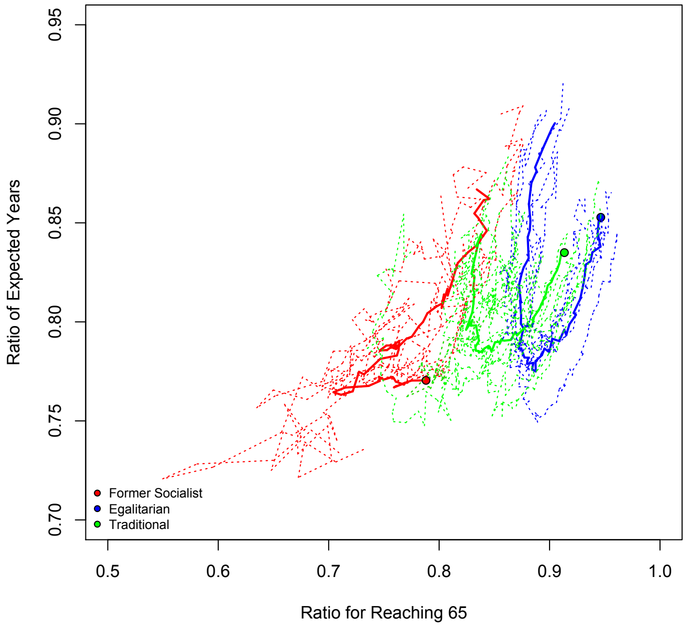

Figure 16: Ratio of Expected Years of Life in Ages 65-99, and Ratio of the Probability of Surviving to 65, in 2009, and the Path to This Observation Since 1959, Average Values For Three Groups of Countries

5 Individual Country Graphs

5.1 Central Findings

5.1.1 Comparative Measures Used

Graphical displays are now given for each of the 23 countries. Comments are provided here from the four different points of view described below (as available).

I. A smoothed graph of the estimated remaining life expectancy is given. Even when smoothed, these figures are erratic for many countries. When taken together they show that a 100-year old male or female can expect to live about two more years. There are indications that this figure has been and is, rising

II. Expected years of life in ages 65-99 is given, together with the female-male difference, the relative difference with the female years as a denominator, and the ratio of male years to female years. Generally, the different graphs lead to the same conclusions about the trends, but in some cases rapid increase in the expected years for both genders leads to decline in the relative female-male gap, when in absolute years the difference remains about the same.

III. The difference between males and females in the logarithm of mortality rate in ages 65-74, 75-84, and 85-99 is displayed, since 1930 or the from earliest available year. This is followed by a graph of the log-rates themselves including a trend forecast from the years 1930-1934 to 1950-1954. Together these figures indicate how the divergence and eventual convergence occurred by age since the 1930s. There are notable differences between the countries within regions, but they also support the similarity of the three groups formed in Section 4.1.2, especially for the Former Socialist group (1) and the Egalitarian group (2).

IV. We display parameter estimates for the log-linear models as time-series, and use the estimates to describe the difference in log-mortality rates in years 1930 and 1950 or the earliest available year, 1970, 1990, and the last available year. This complements the analyses of the three age groups and shows how, for most countries, the divergence occurred first in the youngest ages and progressed later and with lesser force to higher ages. The recovery was similarly most notable in the youngest ages.

5.1.2 Country-Specific Findings

Nordic Countries

Denmark

I. Figure 17 shows that the remaining life expectancy of females at age 100 has been higher than that of males. The gap has gradually narrowed.

II. Figures 18, 19, 20, and 21 show that the expected years in ages 65-99 for a 65-year old male were about 1 year, or some 7 % less than those of a female in 1835-1930. The gap narrowed markedly after that due to a slowdown of increase in female expected years. But, around 1950 the growth in female years picked up, that of males slowed down, and the gap increased to 4 years, or over 20 % by 1990. After that the gap has narrowed again to 2.7 years, or 14 %.

III. Figures 22 and 23 also show that the gap started to increase around 1950. In relative terms the largest gap was created in ages 65-74, followed by years 75-84, and the change in ages 85-99 was the smallest. Mortality had been decreasing in all three age groups, but especially in ages 65-74 the decrease for males slowed down, and mortality decrease in ages 75-84 was faster for females than in the past.

IV. Figure 24 shows that the average level of mortality declined faster for females. Figures 25 and 26 show that the gap tended to be the largest in the youngest ages. Figure 27 shows that increase occurred very fast in 1950-1970 in the youngest ages, but later in the older ages.

Finland

I. Figure 28 shows that the remaining life expectancy of females at age 100 has been generally higher than that of males. The gap has gradually narrowed.

II. Figures 29, 30, 31, and 32 show that the expected years in ages 65-99 for a 65-year old male were about 1 year, or some 7 % less than those of a female already in 1878. The gap increased after gradually until 1980 to 4 years, or 25 %. Expected years have increased for both sexes, but increases for females have been higher than for males. After that the gap has been rather stable, at 3.5 years or 16 % in 2014.

III. Figures 33 and 34 show that the gap increased in a rather similar manner for all three age groups, but the relative differences have been the highest for the 65-74 year olds, the next highest for the 75-84 year olds, and the smallest for the 85-99 year olds. Decline in mortality from 1930-1935 to 1950-1955 was modest, but after 1970 both female and male mortality declined fast. This explains the narrowing of the relative gap.

IV. Figure 35 shows that the average level of mortality declined faster for females. Figures 36 and 37 show that the gap tended to be the largest in the youngest ages. Figure 38 shows that a reversal in the trend of relative mortality occurred after 1970-1990.

Norway

I. Figure 39 shows that the remaining life expectancy of at age 100 has generally been approximately the same for females and males, stable until the 1950s, and after that both have increased.

II. Figures 40, 41, 42, and 43 show that the expected years in ages 65-99 for a 65-year old male were about just under 1 year, or some 6 % less than those of a female during 1848-1950. The gap increased rapidly in 1950-1970 to 4 years, or over 20 %. Expected years continued to increase for females, but for males a stagnation occurred. After that the gap has narrowed to 3.0 years or 15 % in 2009.

III. Figures 44 and 45 show that the gap increased the fastest for 65-74 year olds, the next fastest for 75-84 year olds, and the slowest for 85-99 year olds. in a rather similar manner for all three age groups. Compared to the decline in mortality from 1930-1935 to 1950-1955, the mortality of females declines as one would expect, but male mortality stagnated.

IV. Figure 46 shows that the average level of mortality declined fast for females. but that of males stagnated after 1950. Figures 47 and 48 show again that the developments for males that were unexpected. Figure 49 shows the fast increase in the gap in 1950-1990, and the subsequent fast decline.

Sweden

I. Figure 50 shows that since the early part of the 1800s the remaining life expectancy of at age 100 has generally been higher for females than for males. There has been some convergence until the 1930s, but after that some divergences have been observed.

II. Figures 51, 52, 53, and 54 show that the expected years in ages 65-99 for a 65-year old male were 0.5-1.0 year, or some 5 % less than those of a female during 1751-1950. The gap increased rapidly in 1950-1970 to 4 years, or 20 %. Expected years continued to increase for females, but for males a stagnation occurred. After that the gap has narrowed to 2.8 years, or 13 % in 2011.

III. Figures 55 and 56 show that the gap increased the fastest for 65-74 year olds, the next fastest for 75-84 year olds, and the slowest for 85-99 year olds, in a rather similar manner for all three age groups. Compared to the decline in mortality from 1930-1935 to 1950-1955, the mortality of males declined as one would have expected, but female mortality decline accelerated.

IV. Figure 57 shows that the average level of mortality declined much faster for females than for males after 1950. On the other hand, Figures 58 and 59 show that the developments for males were unexpected in the sense that declines for the youngest ages slowed down. Figure 60 shows the fast increase in the gap in 1950-1990, and the subsequent fast decline.

Atlantic Countries

Belgium

For Belgium, data from the years 1914-1918 are partially missing, so there are gaps in the graphs for those years.

I. Figure 61 shows that since the remaining life expectancy of at age 100 has generally been higher for females than for males. There has been some convergence until the 1930s, but after that some divergence has been observed.

II. Figures 62, 63, 64, and 65 show that the expected years in ages 65-99 for a 65-year old male increased from about 0.5 year, or some 5 % less than those of a female during 1841. Then the gap increased to 1.5 years by 1950, and then more rapidly to 4 years in 1950-1970, or over 20 %. Expected years continued to increase more rapidly for females, but for males a similar increase occurred with delay. After that the gap has narrowed to 3.5 years, or 17 % in 2009.

III. Figures 66 and 67 show that the gap increased the fastest for 65-74 year olds, the next fastest for 75-84 year olds, and the slowest for 85-99 year olds, in a rather similar manner for all three age groups. Compared to the decline in mortality from 1930-1935 to 1950-1955, the mortality of females declined faster than one would have expected, and for males somewhat slower than one would have expected.

IV. Figure 68 shows that the average level of mortality declined faster for females than for males after 1950. Figures 69 and 70 show that the developments for males were a bit unexpected in the sense that declines for the youngest ages slowed down. Figure 71 shows a notable increase in the gap in 1930-1990, and the subsequent decline.

Ireland

I. Figure 72 shows that the male life expectancy has been close to the female life expectancy since 1950, with a flat trend.

II. Figures 73, 74, 75, and 76 show that the difference in expected years in ages 65-99 for a 65-year old male and female increased gradually from 1 year in 1950 to 3 years, or 20 %, in 1990. Female years increased linearly, but male years stagnated until about 1990. This was followed by a decline in the gap to 3.2, or 16 % in 2009.

III. Figures for age-groups not available.

IV. Figure 77 shows that the average level of mortality declined faster for females, when the level for males started to decline in the late 1980s.

Figures 78 and 79 show that the developments for males diverged from those of females as declines for the youngest ages for males slowed down more. Figure 80 shows a gradual increase in the gap in 1950-1990.

The Netherlands

I. Figure 81 shows that the remaining life expectancy of at age 100 has been higher for females than for males, but with similar increasing trends.

II. Figures 82, 83, 84, and 85 show that the expected years in ages 65-99 for a 65-year old male increased from about 0.5 year, or 5 %, less than those of a female during 1850-1950. The gap increased rapidly to 4.5 years, or almost 25 % by the 1970s. Expected years continued to increase more rapidly for females, but for males a stagnation occurred. After that the gap has narrowed to 3.3 years, or 16 % in 2010.

III. Figures 86 and 87 show that the gap increased the fastest for 65-74 year olds, the next fastest for 75-84 year olds, and the slowest for 85-99 year olds, in a rather similar manner for all three age groups. Compared to the decline in mortality from 1930-1935 to 1950-1955, the mortality of females declined clearly faster than one would have expected, and for males clearly slower than one would have expected.

IV. Figure 88 shows that the average level of mortality declined faster for females than for males after 1950, as the female decline accelerated. Figures 89 and 90 show that the developments for males were unexpected in the sense that declines for the youngest ages slowed down. Figure 91 shows a rapid increase in the gap in 1950-1970, and the subsequent decline.

The United Kingdom

I. Figure 92 shows that the remaining life expectancy of at age 100 has been a bit higher for females than for males, but with similar flat trend.

II. Figures 93, 94, 95, and 96 show that the expected years in ages 65-99 for a 65-year old male increased from a little under 1 year, or some 6 % less than those of a female during 1841. The gap increased gradually to 2 years by 1950, and then more rapidly to 4 years, or 25 % , by the 1970s. Expected years continued to increase more rapidly for females than for males. After that the males rapidly caught up and the gap has narrowed to about 2.5 years, 12 % in 2011.

III. Figures 97 and 98 show that the gap increased the fastest for 65-74 year olds, the next fastest for 75-84 year olds, and the slowest for 85-99 year olds, in a rather similar manner for all three age groups. Compared to the decline in mortality from 1930-1935 to 1950-1955, the mortality of females declined approximately as fast as one would have expected, and for males the decline slowed down.

IV. Figure 99 shows that the average level of mortality declined faster for females than for males since 1900, as the female decline accelerated. Figures 100 and 101 show that the developments for males were unexpected in the sense that declines for the youngest ages slowed down. Figure 102 shows a gradual increase in the gap in 1930-1970, and the subsequent rapid decline.

Mediterranean Countries

France

I. Figure 103 shows that the remaining life expectancy of at age 100 has been a higher for females than for males since the early 1900s, but with similar increasing trend. Before that the life expectancies were very similar and with a distinct declining trend.

II. Figures 104, 105, 106, and 107 show that the expected years in ages 65-99 for a 65-year old male increased from a negligible level in 1816 gradually to 2 years in 1950, and then more rapidly to 4.5 years, or over 20 % by the 1990s. Expected years continued to increase more rapidly for females than for males. After that there has been a slight decline in the gap, especially in relative terms, to 4.1 years, or 18 %.

III. Figures 108 and 109 show that the gap increased the fastest for 65-74 year olds, the next fastest for 75-84 year olds, but with little change for 85-99 year olds. Compared to the decline in mortality from 1930-1935 to 1950-1955, the mortality of females declined faster than one would have expected, but for males such acceleration took place about 20 years later.

IV. Figure 110 shows that the average level of mortality declined faster for females than for males since 1900, as the female decline accelerated earlier and faster than male decline. Figures 111 and 112 show that the developments for males were unexpected in the sense that declines for the youngest ages slowed down. Figure 113 shows an accelerating increase in the gap in 1930-1990, and the subsequent small decline.

Italy

I. Figure 114 shows that the remaining life expectancy of at age 100 has generally been a higher for females, with a similar flat trend.

II. Figures 115, 116, 117, and 118 show that the expected years in ages 65-99 for a 65-year old male were *higher* than for females before year 1900. There are many data problems in the Italian data, so it is not clear if this finding is real. In any case the gap increased gradually to 1 year around 1950, and then rapidly to 4 years, or 20 % around 1980. Expected years continued to increase rapidly for females and for males similar increase occurred only later. After that there has been a slight decline in the gap, especially in relative terms, to 3.5 years, or 16 %, in 2009.

III. Figures 119 and 120 show that the gap increased the fastest for 65-74 year olds, the next fastest for 75-84 year olds, but with relative little change for 85-99 year olds. Compared to the decline in mortality from 1930-1935 to 1950-1955, the mortality of females declined faster than one would have expected, but for males the decline was slower than one would have expected.

IV. Figure 121 shows that the average level of mortality declined faster for females than for males since the 1940s, as the female decline accelerated and the male decline stagnated. Figures 122 and 123 show that the developments for males were unexpected in the sense that declines for the youngest ages slowed down. Figure 124 shows a fast increase in the gap in 1950-1990, and the subsequent small decline.

Portugal

I. Figure 125 shows that the male life expectancy has been close to the female life expectancy since 1940, with a flat trend.

II. Figures 126, 127, 128, and 129 show that the difference in expected years in ages 65-99 for a 65-year old male and female increased gradually from 2 years to 3 years, in 2009. In relative terms the gap has been 15-20 %. In 2009 it was 3.4 years or 17 % in 2009.

III. Figures 130 and 131 show that the gap increased the fastest for 65-74 year olds, the next fastest for 75-84 year olds, with no change for 85-99 year olds. Compared to the decline in mortality from 1940-1945 (note different starting years) to 1950-1955, mortality declined slower for males than one would have expected especially in the youngest ages.

IV. Figure 132 shows that the average level of mortality declined in a similar manner for females and for males. Figures 133 and 134 show that the developments for males diverged from those of females as declines for the youngest ages for males slowed down more. Figure 135 shows a gradual increase in the gap in 1930-2009.

Spain

I. Figure 136 suggests that the remaining life expectancy of at age 100 would have been higher for males than for females in around 1950-1970. It is not clear if this is a credible finding. In any case the long-term trends have been flat.

II. Figures 137, 138, 139, and 140 show that the expected years in ages 65-99 for a 65-year old male were about 0.5 years or 5 % lower than for females in 1908. The gap increased gradually to 4 years, or just under 20 %, by the 1990s. Expected years continued to increase more rapidly for females than for males. After that there has been a slight decline in the gap, to 3.9 years, or 18 % in 2009.

III. Figures 141 and 142 show that the gap increased the fastest for 65-74 year olds, the next fastest for 75-84 year olds, but with little change for 85-99 year olds. Compared to the decline in mortality from 1930-1935 to 1950-1955, mortality declined as one would have expected for both males and females.

IV. Figure 143 shows that the average level of mortality declined faster for females than for males. Figures 144 and 145 show that the developments for males gradually diverged from those of females as declines for the youngest ages slowed down. Figure 146 shows a gradual increase in the gap in 1930-2009.

Central European Countries

Austria

I. Figure 147 shows that the male life expectancy has been close to the female life expectancy since 1947, with a relatively flat trend that indicates slightly higher increase for females.

II. Figures 148, 149, 150, and 151 show that the difference in expected years in ages 65-99 for a 65-year old male and female increased gradually from 1.5 years in 1947 to 3.5 years in 2000. Female years increased linearly, but male years stagnated until about 1970. This was followed by a decline in the gap to 3.3 years, or 16 % in 2010. In relative terms the gap stayed around 20 % during 1970-1990.

III. Figures for age-groups not available.

IV. Figure 152 shows that the average level of mortality declined faster for females, when the level for males started to decline in the late 1970s. Figures 153 and 154 show that the developments for males diverged from those of females as declines for the youngest ages for males slowed down more. Figure 155 shows a rapid increase in the gap in 1950-1970 and the subsequent levelling off.

East-Germany

I. Figure 156 shows that the male life expectancy has been close to the female life expectancy since 1956, with a relatively flat trend that indicates slightly higher increase for females.

II. Figures 157, 158, 159, and 160 show that the difference in expected years in ages 65-99 for a 65-year old male and female increased gradually from just under 2 years in 1956 to over 3.5 years in the late 1990s. Female years increased faster. This was followed by a slight decline in the gap to 3.4 years, or 16 % in 2011.

III. Figures for age-groups not available.

IV. Figure 161 shows that the average level of mortality declined faster for females, when the level for males started to decline in the 1980s. Figures

162 and 163 show that the developments for males diverged from those of females as declines for the youngest ages for males slowed down more. Figure 164 shows an increase in the gap in 1956-1990. The shape of the survival curve also changed rapidly, which seems to explain why the curve for 2011 is higher than for 1990, even though in relative terms the difference in life expectancies has decreased.

West-Germany

I. Figure 165 shows that the female life expectancy at 100 has been generally higher than the male life expectancy since 1956, with a slightly rising trend.

II. Figures 166, 167, 168, and 169 show that the difference in expected years in ages 65-99 for a 65-year old male and female increased gradually from just under 2 years in 1956 to nearly 4 years around 1990. Female years increased faster. This was followed by a gradual decline in the gap to 3.1 years, or 15 % in 2011.

III. Figures for age-groups not available.

IV. Figure 170 shows that the average level of mortality declined linearly for females, when the level for males started to decline in the 1970s. Figures 171 and 172 show that the developments for males diverged from those of females as declines for the youngest ages for males slowed down more. Figure 173 shows a rapid increase in the gap in 1956-1970.

Switzerland

I. Figure 174 shows that the male life expectancy has been close to the female life expectancy since the 1950s, with an increasing trend. In the most recent years there is some indication of divergence.

II. Figures 175, 176, 177, and 178 show that the difference in expected years in ages 65-99 for a 65-year old male and female was negligible in 1876. The gap increased to 1 year by 1950, and then more rapidly to 4 years, or 20 %, by the 1980s. Expected years continued to increase more rapidly for females than for males. After that there has been a decline in the gap to 3.1 years, or 14 % in 2011.

III. Figures 179 and 180 show that the gap increased the fastest for 65-74 year olds, the next fastest for 75-84 year olds, with less change for 85-99 year olds. Compared to the decline in mortality from 1930-1935 to 1950-1955, mortality declined faster for females than one would have expected. For males the decline was as expected.

IV. Figure 181 shows that the average level of mortality declined faster for females than for males. Figures 182 and 183 show that the developments for males diverged from those of females as declines for the youngest ages slowed down. Figure 184 shows a gradual increase in the gap in 1930-1990, and the subsequent decline.

Baltic Countries

Estonia

I. Figure 185 shows that the female life expectancy at 100 has been generally higher than the male life expectancy since 1959, with a slightly rising trend.

II. Figures 186, 187, 188, and 189 show that the difference in expected years in ages 65-99 for a 65-year old male and female increased gradually from 3 years in 1959 to 5.0 years, or 26 %, in 2011. Female years increased faster after 1995.

III. Figures for age-groups not available.

IV. Figure 190 shows that the average level of mortality declined faster for females than for males. Figures 191 and 192 show that the developments in the shape of mortality curve were roughly similar for males and females. Figure 193 shows a continued increase in the relative hazard in 1959-2011.

Latvia

I. Figure 194 shows that the female life expectancy at 100 has been generally higher than the male life expectancy since 1959, with a flat trend.

II. Figures 195, 196, 197, and 198 show that the difference in expected years in ages 65-99 for a 65-year old male and female increased gradually from 2.5 years in 1959 to 5.0 years, or 27 %, in 2011. Male years decreased until 1990s.

III. Figures for age-groups not available.

IV. Figure 199 shows that the average level of mortality declined faster for females than for males, after 1990s. Figures 200 and 201 show that the developments for males and females were roughly similar. Figure 202 shows a continued increase in the relative hazard in 1959-2011.

Lithuania

I. Figure 203 shows that the female life expectancy at 100 has been generally higher than the female life expectancy since 1959, with a slightly declining trend.

II. Figures 204, 205, 206, and 207 show that the difference in expected years in ages 65-99 for a 65-year old male and female increased gradually from 2 years in 1959 to nearly 5.0 years, or 26 %, in 2011. Male years decreased until 1990s.

III. Figures for age-groups not available.

IV. Figure 208 shows that the average level of mortality declined faster for females than for males, after 1990s. Figures 209 and 210 show that the developments for males were similar in all ages, but for females the younger ages progressed faster. Figure 211 shows a continued increase in the relative hazard in 1959-2011.

Poland

I. Figure 212 shows that the female and male life expectancies at 100 have been been similar since 1958, with a slightly rising trend after 2000.

II. Figures 213, 214, 215, and 216 show that the difference in expected years in ages 65-99 for a 65-year old male and female increased gradually from 2 years in 1959 to 4.3 years, or 23 %, in 2011.

III. Figures for age-groups not available.

IV. Figure 217 shows that the average level of mortality declined faster for females than for males, after 1980s. Figures 218 and 219 show that the developments for males were similar in all ages, but for females the younger ages progressed faster. Figure 220 shows a continued increase in the relative hazard in 1958-2009.

Eastern European Countries

The Czech Republic

I. Figure 221 shows that the female and male life expectancies at 100 have been been similar since 1960s, with a flat trend.

II. Figures 222, 223, 224, and 225 show that the difference in expected years in ages 65-99 for a 65-year old male and female increased gradually from 1.5 years in 1950 to 3-3.5 years, or to 20-25 %, during 1970-2011. Female years increased more rapidly. By 2011 the relative size of the gap has gone down to 3.4 or 18 % of the female years.

III. Figures for age-groups not available.

IV. Figure 226 shows that the average level of mortality declined faster for females. For males, a decline in the level of mortality started in the 1980s. Figures 227 and 228 show that the developments for males in the younger ages were less favourable than for females until the 1980s. Figure 229 shows a rapid increase in the relative hazard in 1950-1970, and a slowdown of the increase thereafter.

Slovakia

I. Figure 230 shows that the remaining female life expectancy has been generally higher than the male life expectancy, at 100, since 1960s, with a slightly rising trend.

II. Figures 231, 232, 233, and 234 show that the difference in expected years in ages 65-99 for a 65-year old male and female increased gradually from just under 1 year in 1950 to 3.5 years, or to 20-25 %, during 1990-2011. Female years increased, while the male years stagnated. By 2011 the relative size of the gap has gone down to 3.8 years or 21 % of the female years.

III. Figures for age-groups not available.

IV. Figure 235 shows that the average level of mortality declined faster for females. For males, a decline in the level of mortality started in the late 1980s. Figures 236 and 237 show that the developments for males in the younger ages were less favourable than for females. Figure 238 shows a rapid increase in the relative hazard in 1950-1970, and a slower increase thereafter.

Hungary

I. Figure 239 shows that the remaining female life expectancy has been generally higher than the male life expectancy, at 100, since 1950, with flat trend. The gap has slightly narrowed.

II. Figures 240, 241, 242, and 243 show that the difference in expected years in ages 65-99 for a 65-year old male and female increased gradually from 1 year in 1950 to 4.1 years, or 23 %, during 1995-2011. Female years increased, while the male years stagnated.

III. Figures for age-groups not available.

IV. Figure 244 shows that the average level of mortality declined faster for females. For males, a decline in the level of mortality started in the 1980s. Figures 245 and 246 show that the developments for males in the younger ages were increasingly less favourable than for females. Figure 247 shows a rapid increase in the relative hazard in 1950-1970, and a slower increase thereafter.

5.2 Nordic Countries

5.2.1 Denmark 1835-2011

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

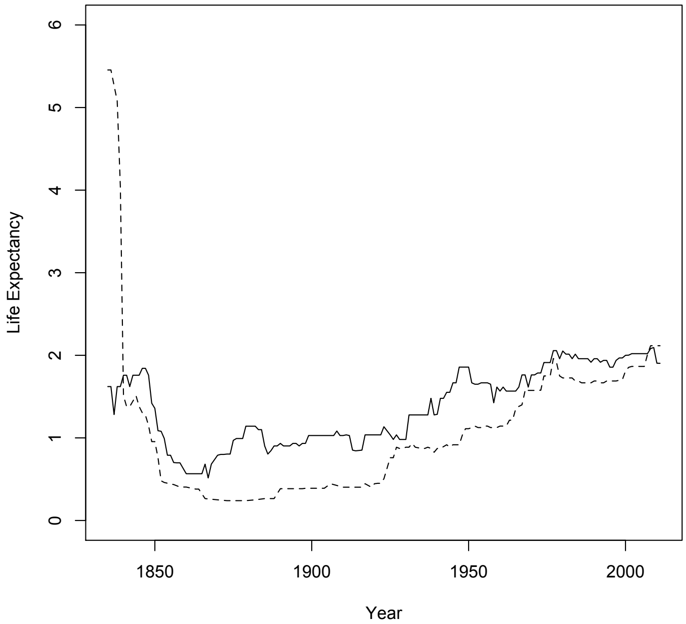

Figure 17: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1835-2011, in Denmark.

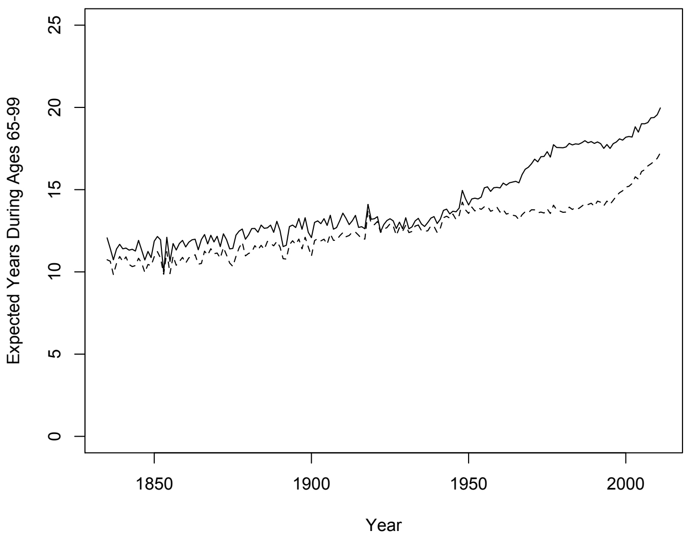

Figure 18: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1835-2011, in Denmark.

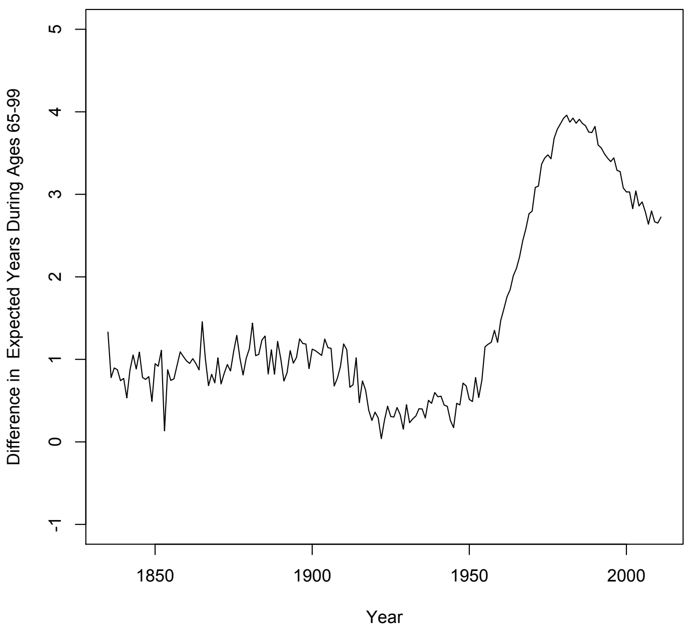

Figure 19: Difference in Female and Male Expected Years in Ages 65-99, in 1835-2011, in Denmark.

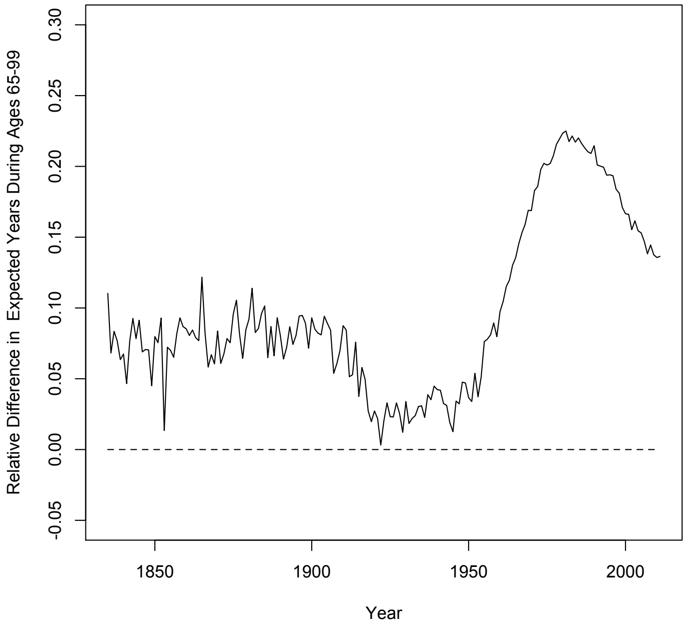

Figure 20: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1835-2011, in Denmark.

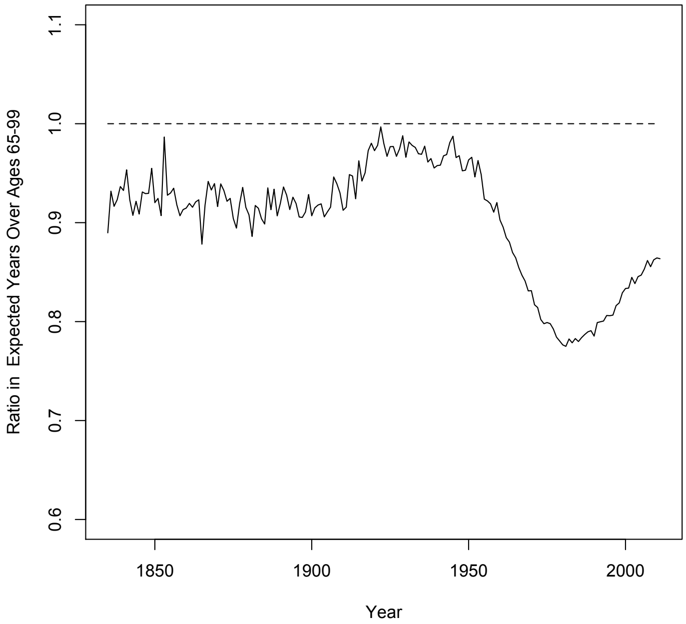

Figure 21: Ratio of Male and Female Expected Years in Ages 65-99, in 1835-2011, in Denmark.

Figure 22: Difference in Smoothed Male and Female Log-mortality in Ages 65-74 (Solid), 75-84 (Dashed) and 85-99 (Dotted), in 1930-2011, in Denmark.

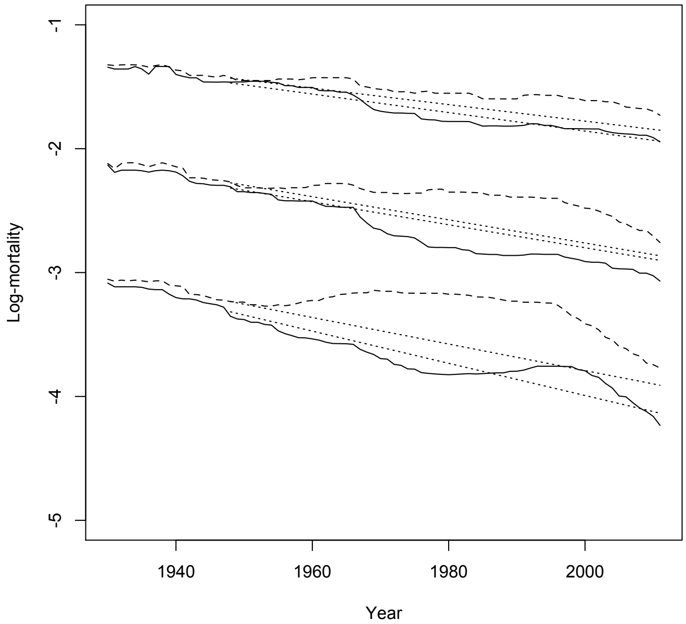

Figure 23: Smoothed Female (Solid) and Male (Dashed) Log-mortality, with Forecasts (Dotted), in Ages 65-74 (Bottom), 75-84 (Middle) and 85-99 (Top), in 1930-2011, in Denmark.

Running median of width 7 was used. Female mortality started to decline after 1945in all ages, but especially fast in younger ages, male mortality after 1960.

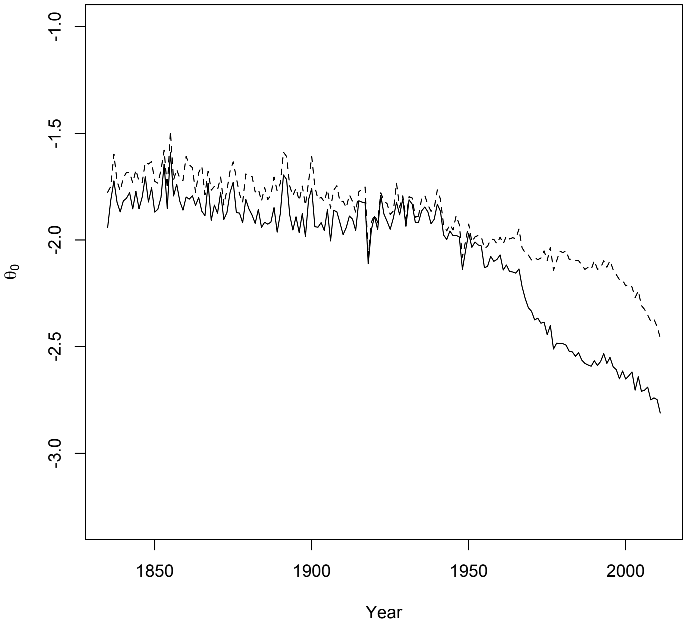

Figure 24: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1835-2011, for Females (Solid), and Males (Dashed), in Denmark.

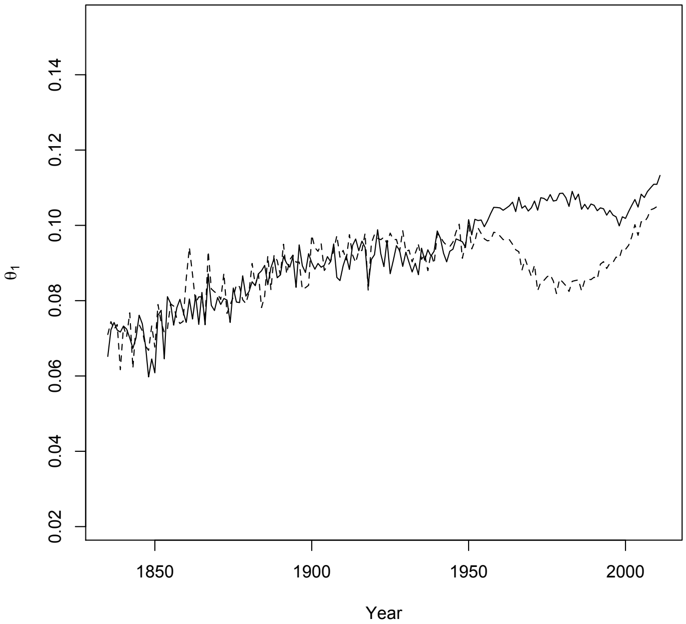

Figure 25: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Denmark in 1835-2011, for Females (Solid), and Males (Dashed), in Denmark.

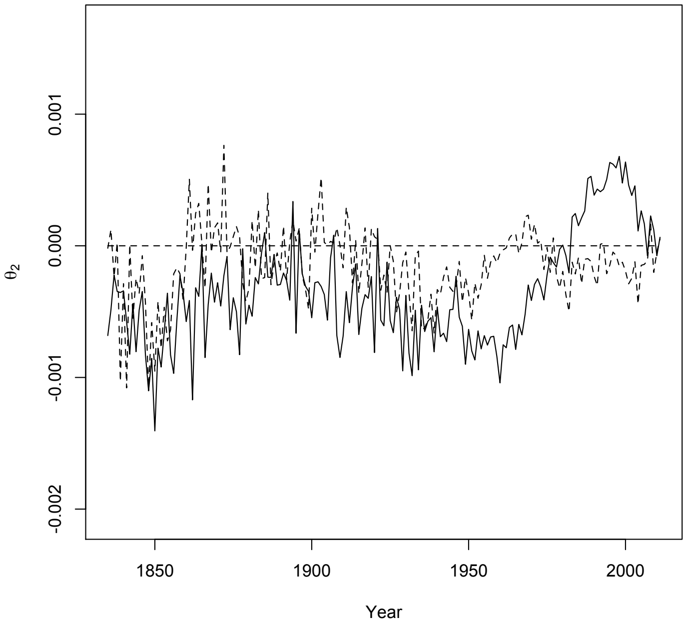

Figure 26: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1835-2011, for Females (Solid), and Males (Dashed), in Denmark.

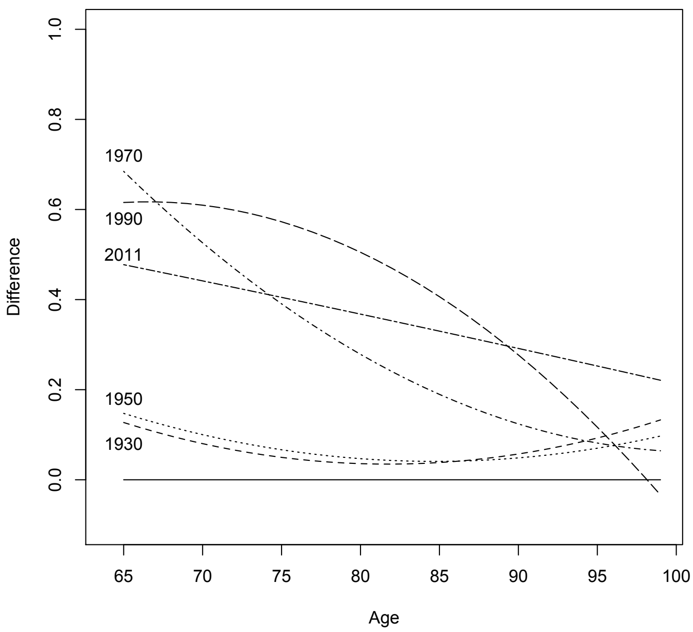

Figure 27: Male-Female Difference in the Loglinear Predictor in 1930, 1950, 1970, 1990, and 2011, in Denmark.

5.2.2 Finland 1878-2014

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

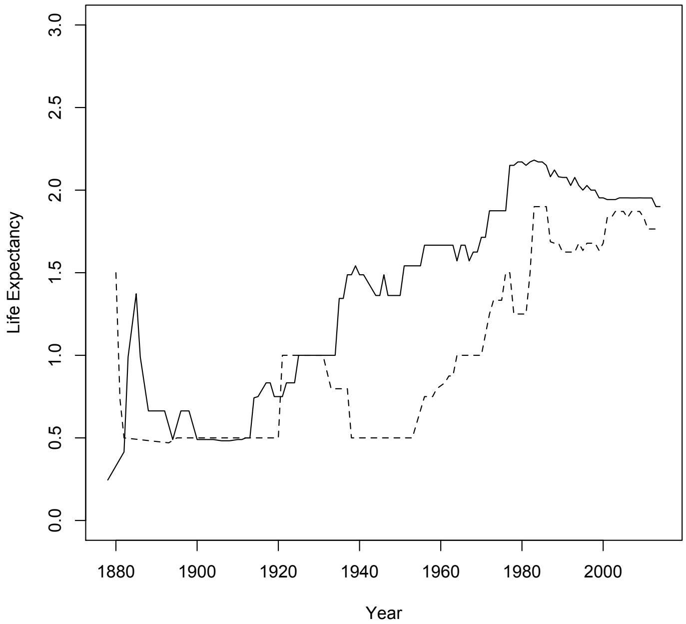

Figure 28: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1878-2014, in Finland.

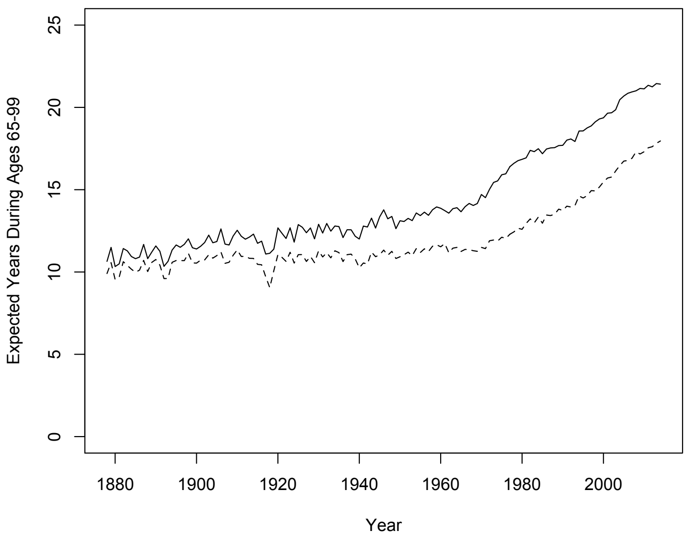

Figure 29: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1878-2014, in Finland.

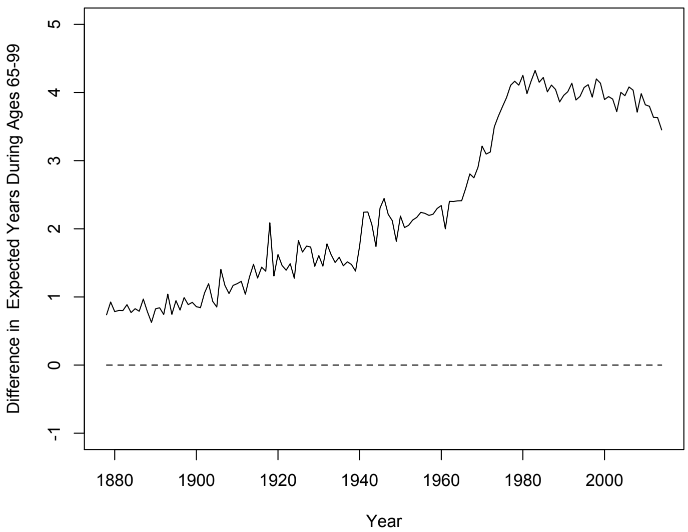

Figure 30: Difference in Female and Male Expected Years in Ages 65-99, in 1878-2014, in Finland.

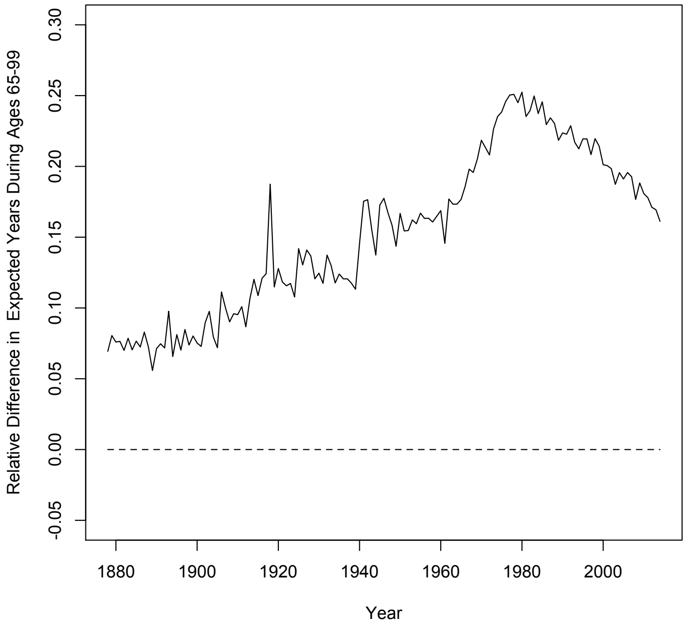

Figure 31: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1878-2014, in Finland.

Figure 32: Ratio of Male and Female Expected Years in Ages 65-99, in 1878-2014, in Finland.

Figure 33: Difference in Smoothed Male and Female Log-mortality in Ages 65-74 (Solid), 75-84 (Dashed) and 85-99 (Dotted), in 1930-2014, in Finland.

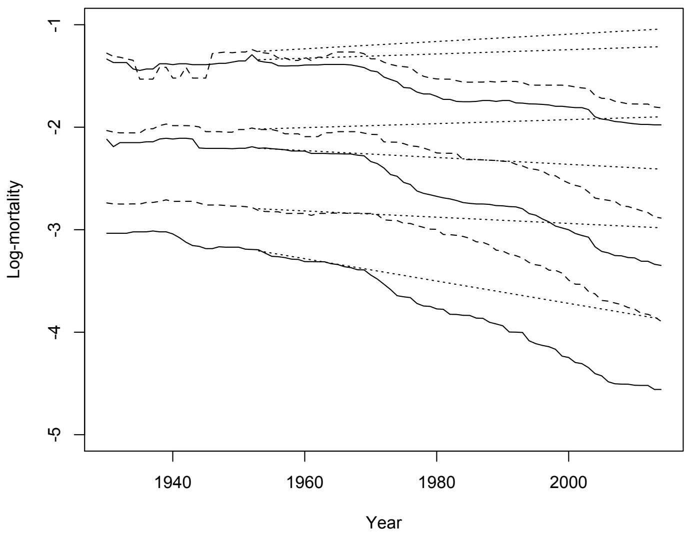

Figure 34: Smoothed Female (Solid) and Male (Dashed) Log-mortality, with Forecasts (Dotted), in Ages 65-74 (Bottom), 75-84 (Middle) and 85-99 (Top), in 1930-2014, in Finland.

Running median of width 7 was used. Female mortality started to decline after 1945in all ages, but especially fast in younger ages, male mortality after 1960.

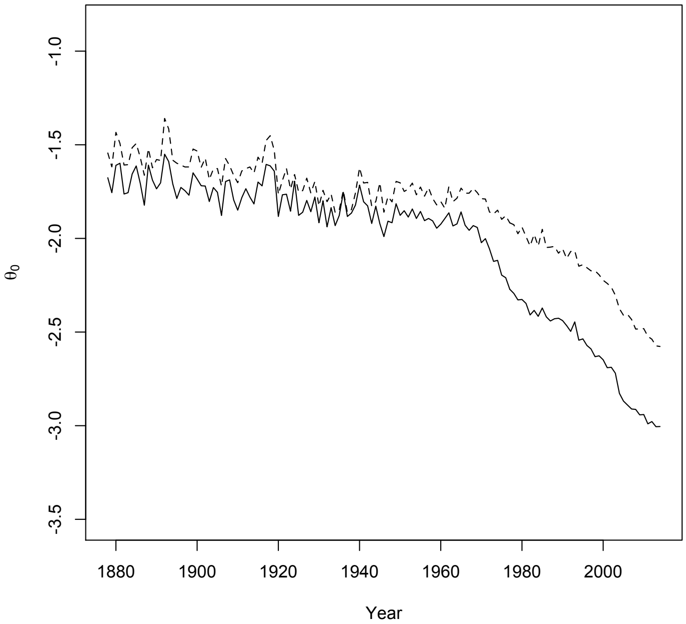

Figure 35: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1878-2014, for Females (Solid), and Males (Dashed), in Finland.

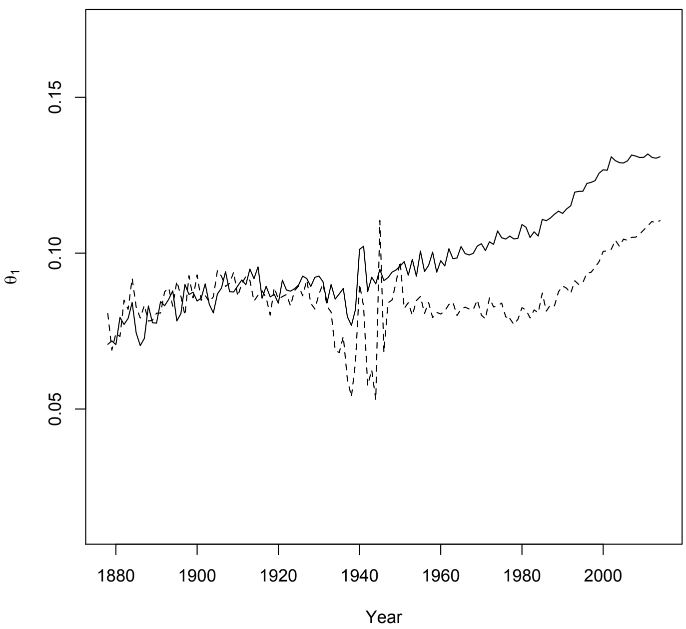

Figure 36: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Finland in 1878-2014, for Females (Solid), and Males (Dashed), in Finland.

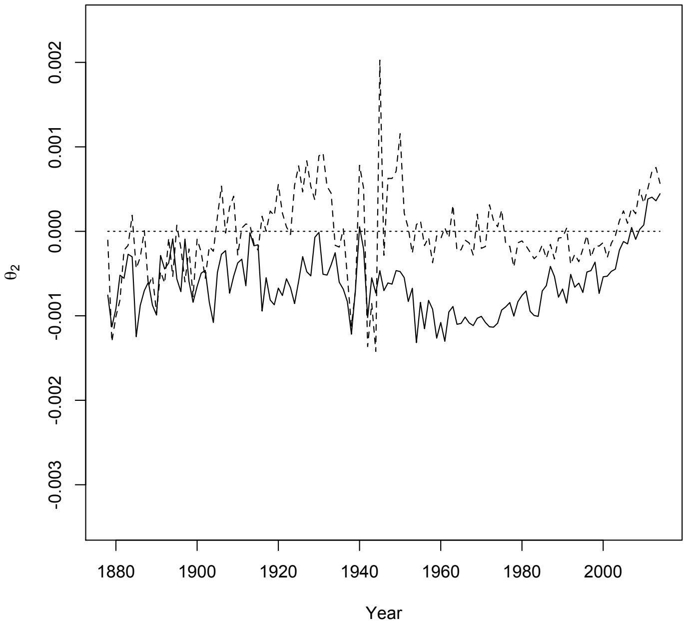

Figure 37: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1878-2014, for Females (Solid), and Males (Dashed), in Finland.

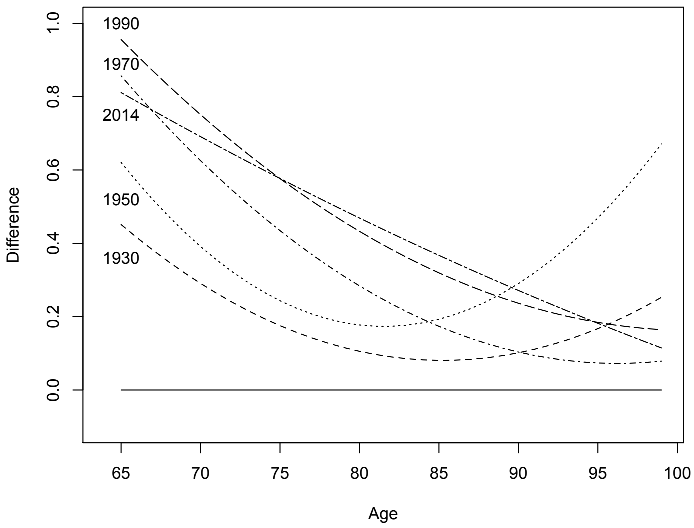

Figure 38: Male-Female Difference in the Loglinear Predictor in 1930, 1950, 1970, 1990, and 2014, in Finland.

5.2.3 Norway 1846-2009

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

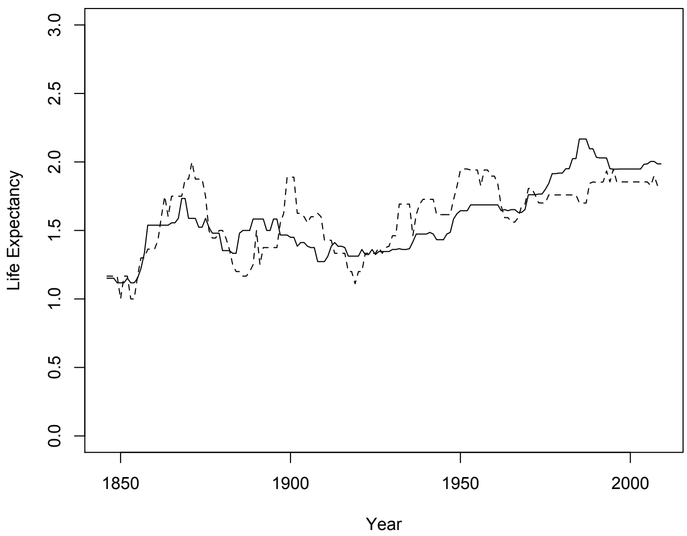

Figure 39: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1846-2009, in Norway.

Running median of width 7 was used. Female mortality started to decline after 1945in all ages, but especially fast in younger ages, male mortality after 1960.

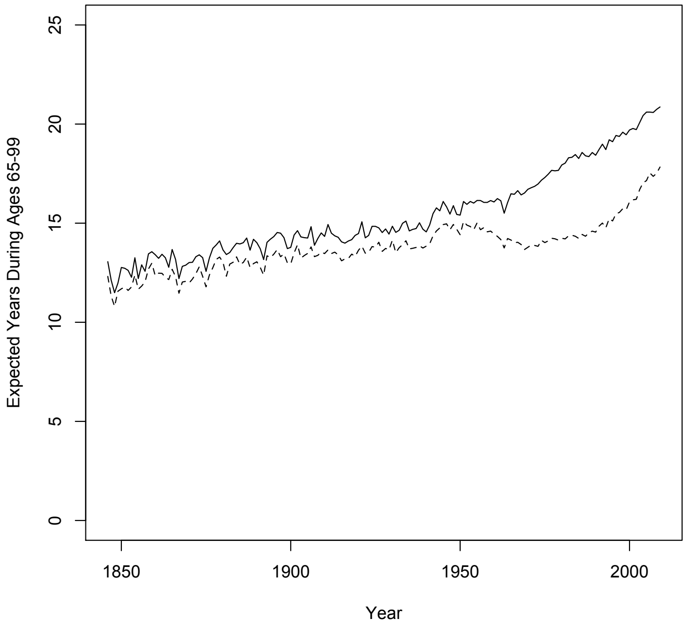

Figure 40: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1846-2009, in Norway.

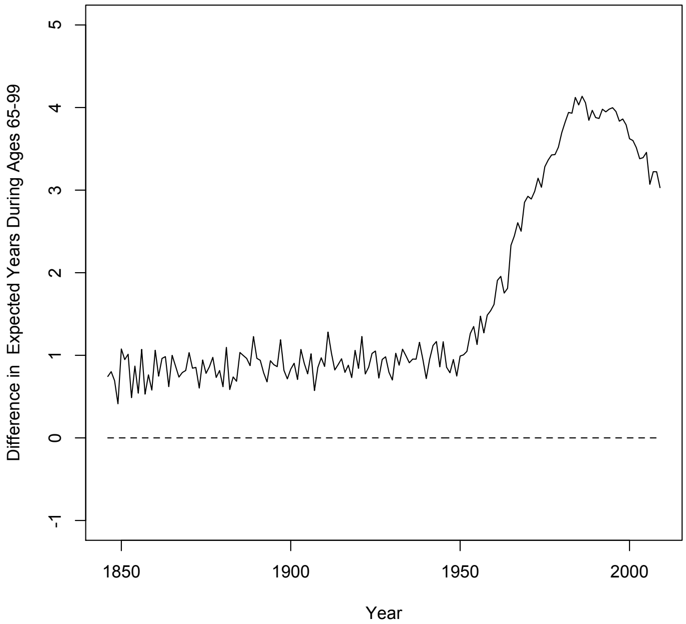

Figure 41: Difference in Female and Male Expected Years in Ages 65-99, in 1846-2009, in Norway.

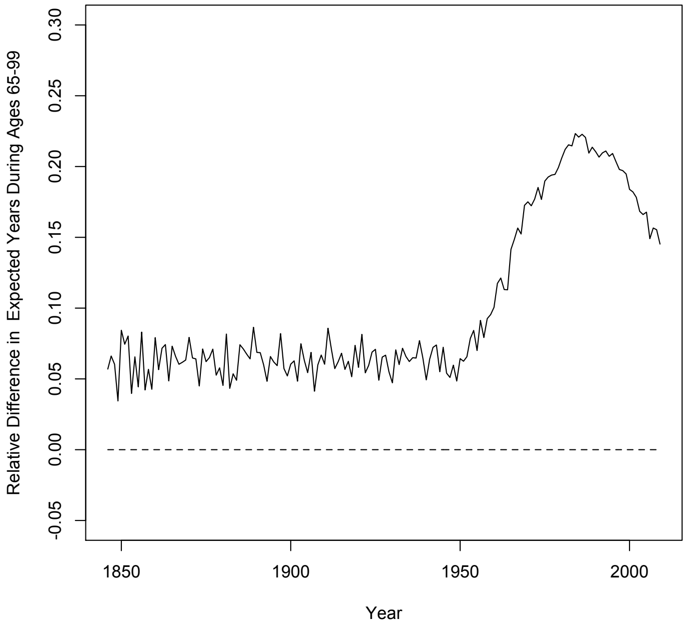

Figure 42: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1846-2009, in Norway.

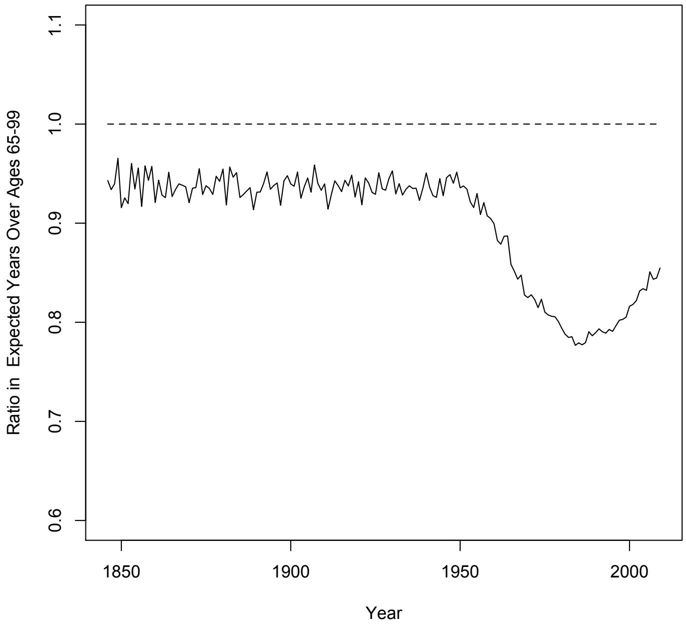

Figure 43: Ratio of Male and Female Expected Years in Ages 65-99, in 1846-2009, in Norway.

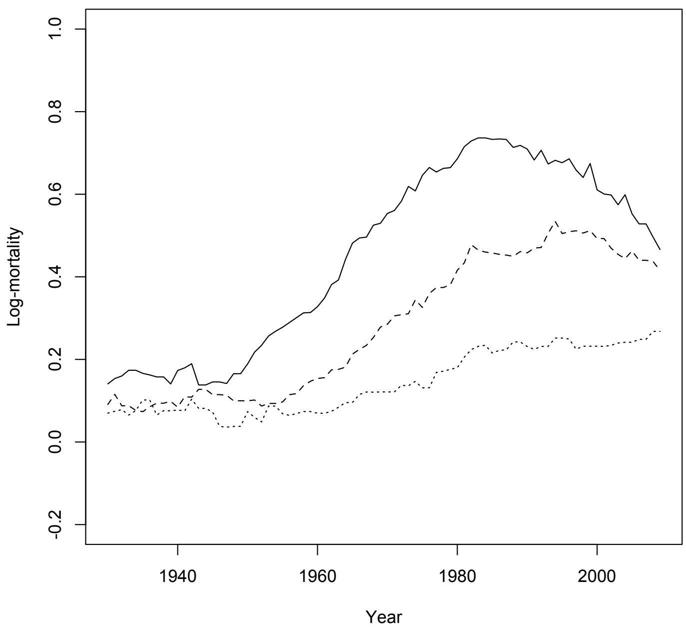

Figure 44: Difference in Smoothed Male and Female Log-mortality in Ages 65-74 (Solid), 75-84 (Dashed) and 85-99 (Dotted), in 1930-2009, in Norway.

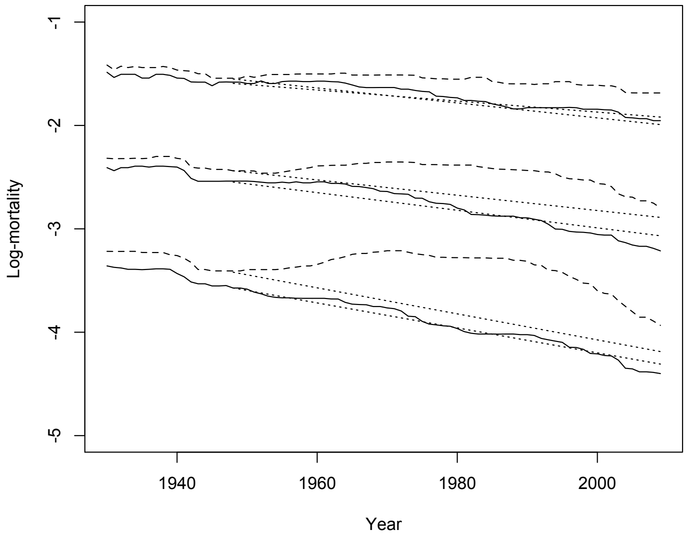

Figure 45: Smoothed Female (Solid) and Male (Dashed) Log-mortality, with Forecasts (Dotted), in Ages 65-74 (Bottom), 75-84 (Middle) and 85-99 (Top), in 1930-2009, in Norway.

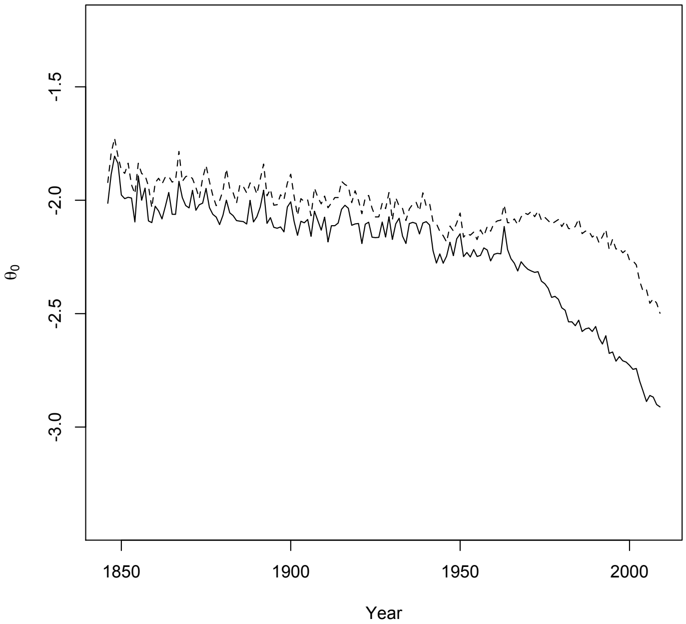

Figure 46: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1846-2009, for Females (Solid), and Males (Dashed), in Norway.

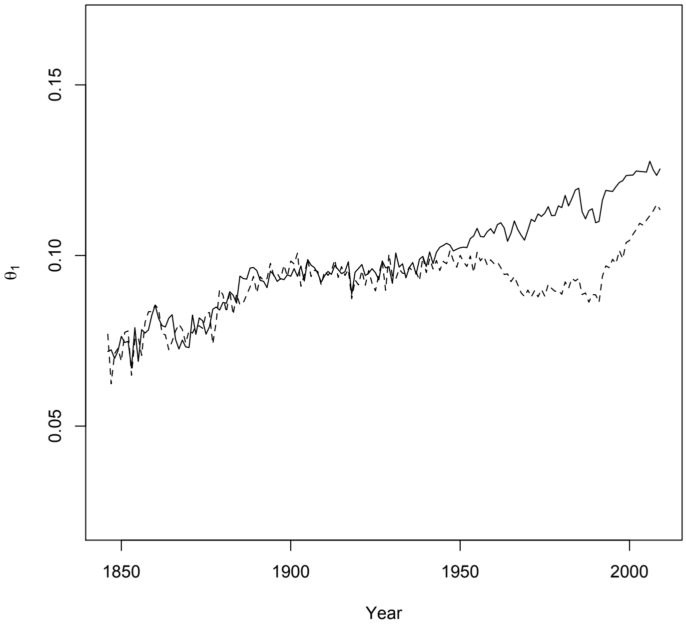

Figure 47: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Norway in 1846-2009, for Females (Solid), and Males (Dashed), in Norway.

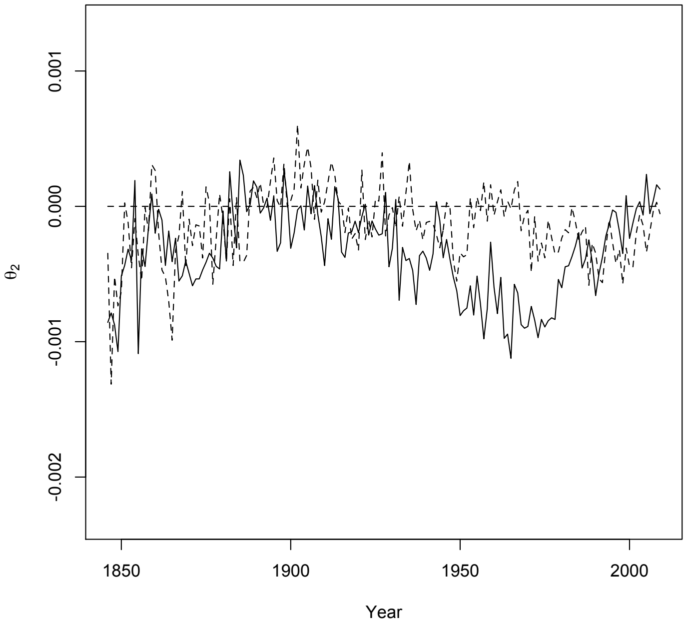

Figure 48: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1846-2009, for Females (Solid), and Males (Dashed), in Norway.

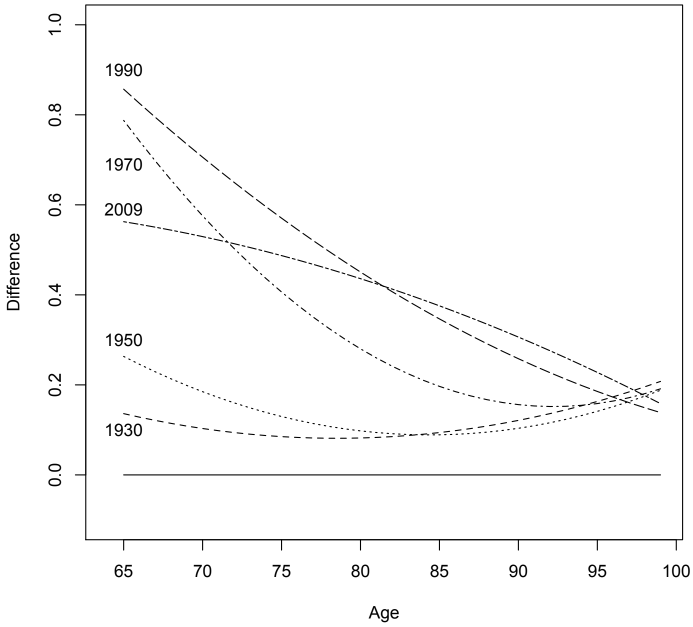

Figure 49: Male-Female Difference in the Loglinear Predictor in 1930, 1950, 1970, 1990, and 2009, in Norway.

5.2.4 Sweden 1751-2011

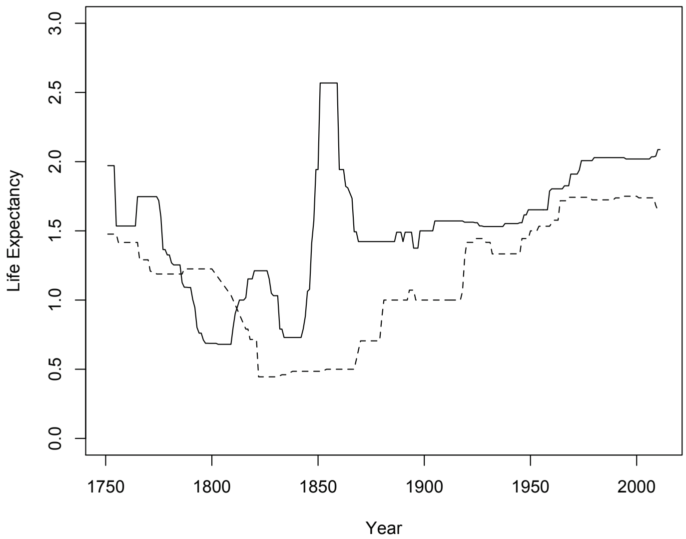

Figure 50: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1751-2011, in Sweden.

Running median of length 15 is used for smoothing, death rates $= 0$ are omitted from smoothing.

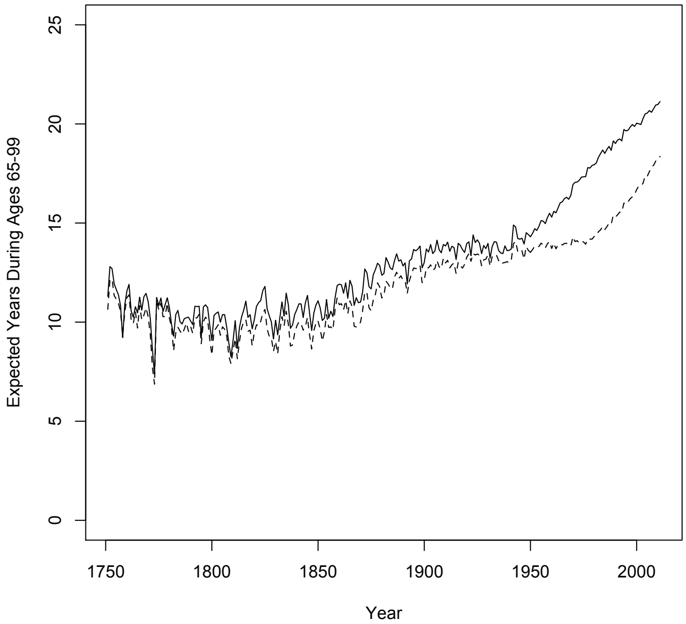

Figure 51: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1751-2011, in Sweden.

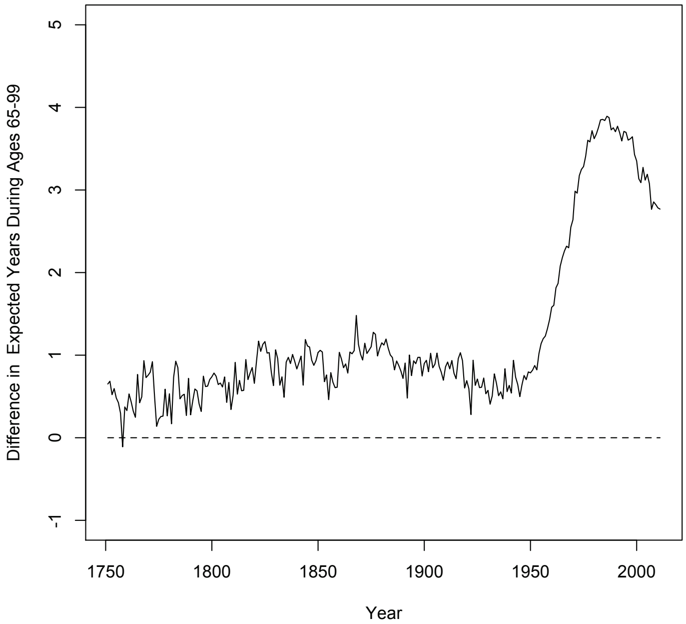

Figure 52: Difference in Female and Male Expected Years in Ages 65-99, in 1751-2011, in Sweden.

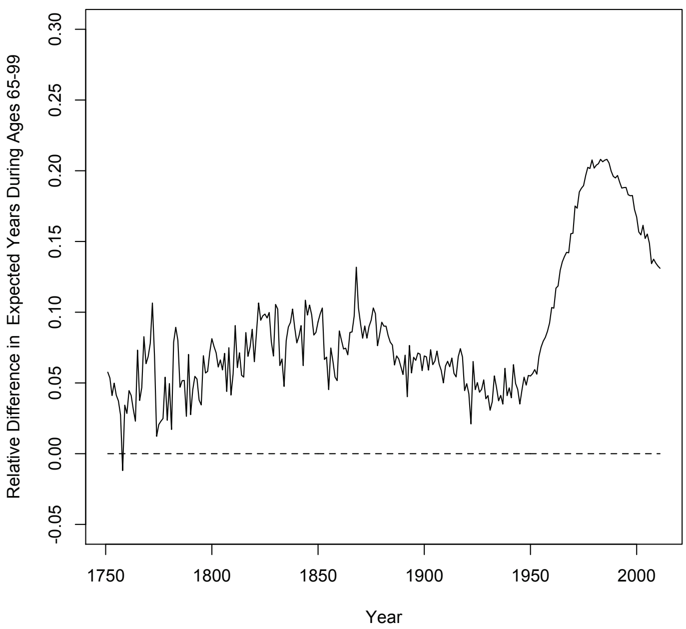

Figure 53: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1751-2011, in Sweden.

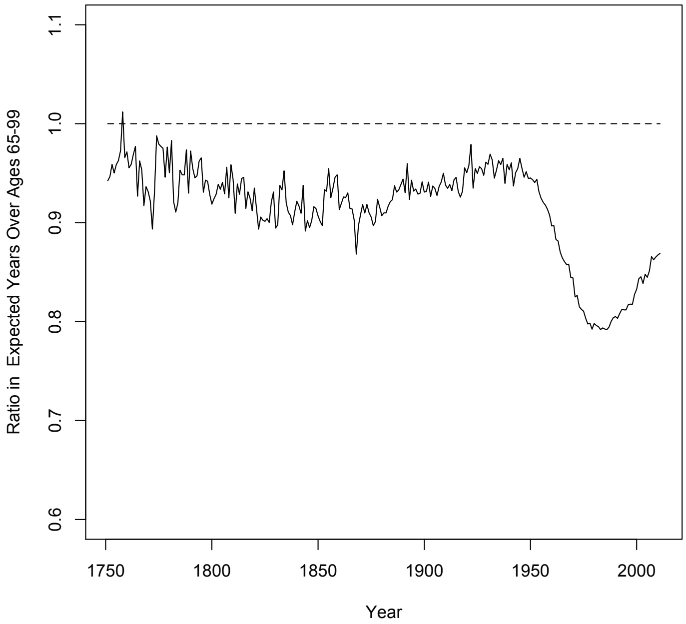

Figure 54: Ratio of Male and Female Expected Years in Ages 65-99, in 1751-2011, in Sweden.

Figure 55: Difference in Smoothed Male and Female Log-mortality in Ages 65-74 (Solid), 75-84 (Dashed) and 85-99 (Dotted), in 1930-2011, in Sweden.

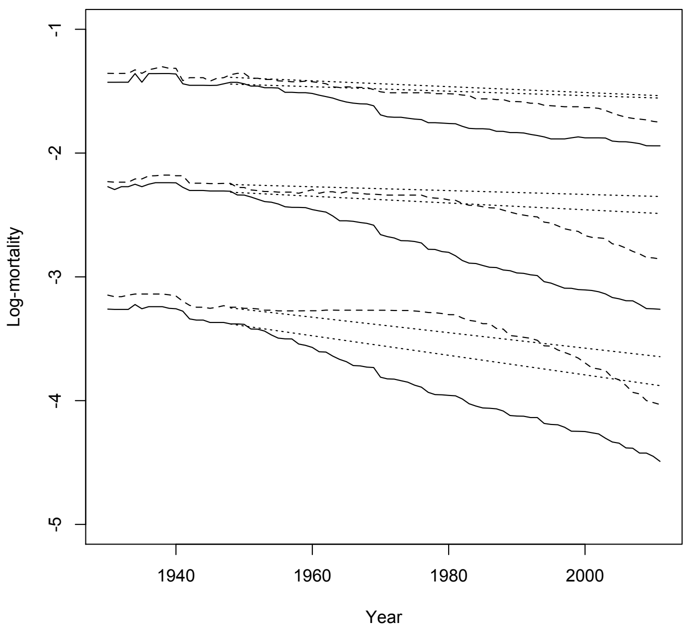

Figure 56: Smoothed Female (Solid) and Male (Dashed) Log-mortality, with Forecasts (Dotted), in Ages 65-74 (Bottom), 75-84 (Middle) and 85-99 (Top), in 1930-2011, in Sweden.

Running median of width 7 was used. Female mortality started to decline after 1945in all ages, but especially fast in younger ages, male mortality after 1960.

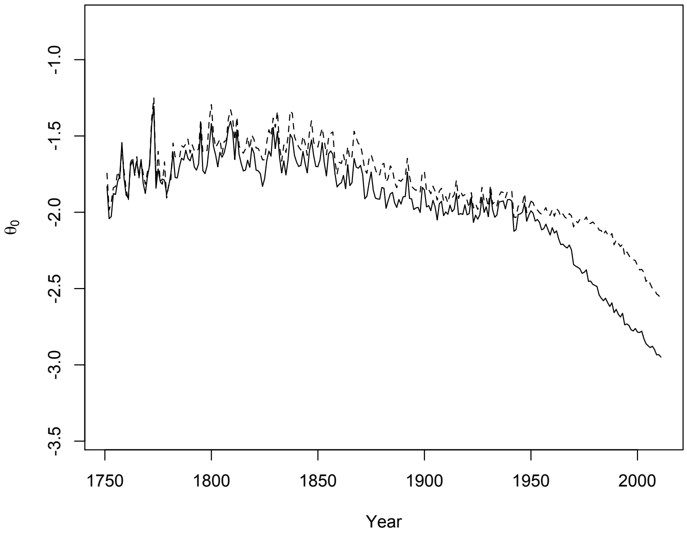

Figure 57: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1751-2011, for Females (Solid), and Males (Dashed), in Sweden.

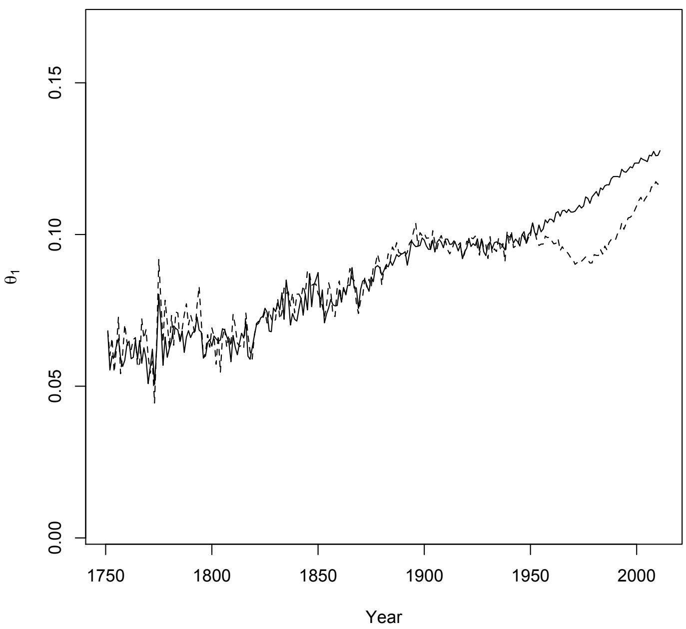

Figure 58: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Sweden in 1751-2011, for Females (Solid), and Males (Dashed), in Sweden.

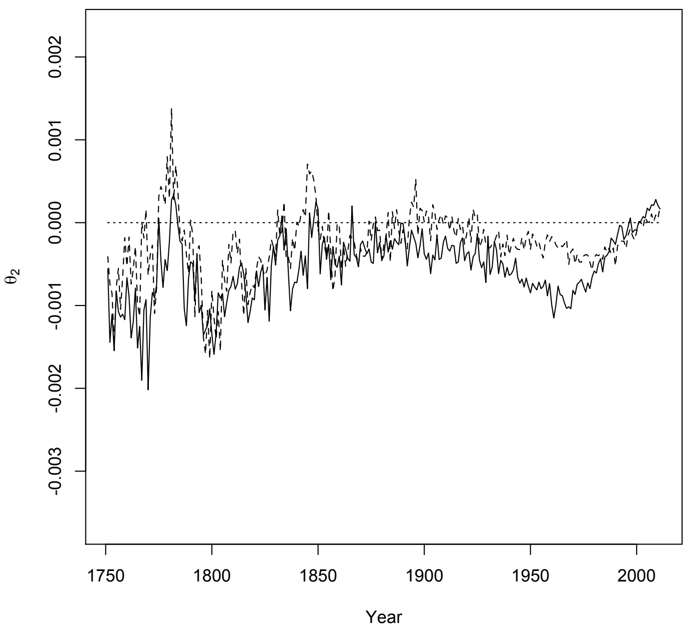

Figure 59: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1751-2011, for Females (Solid), and Males (Dashed), in Sweden.

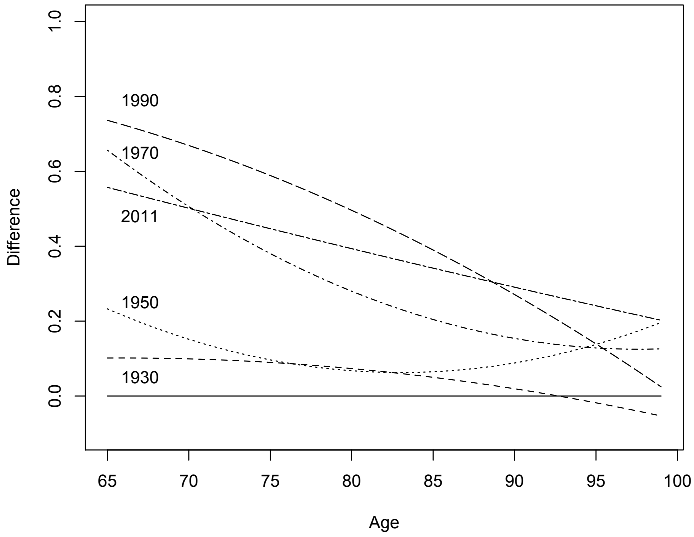

Figure 60: Male-Female Difference in the Loglinear Predictor in 1930, 1950, 1970, 1990, and 2011, in Sweden.

5.3 Atlantic Countries

5.3.1 Belgium 1841-2009

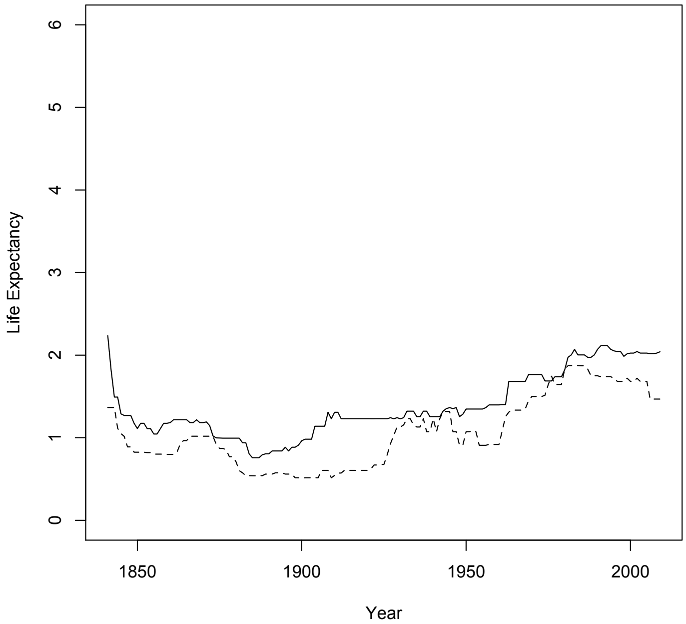

Figure 61: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1841-2009, in Belgium.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

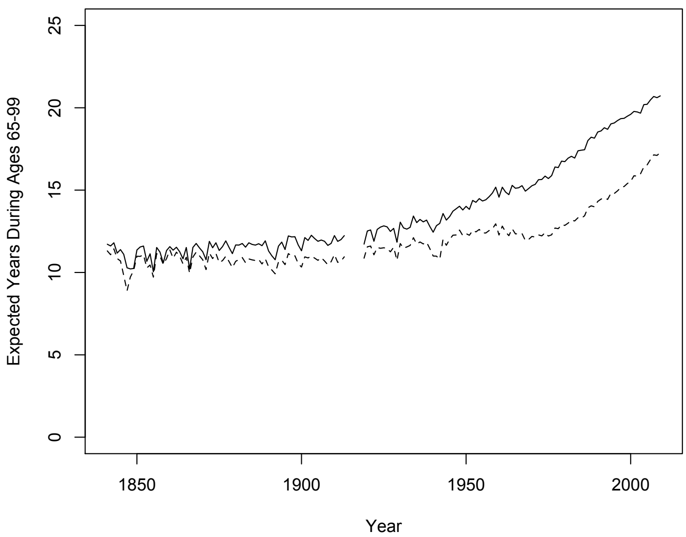

Figure 62: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1841-2009, in Belgium.

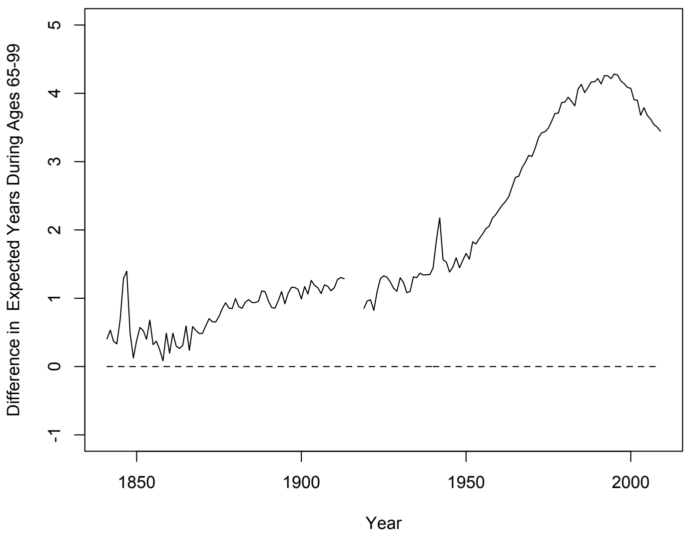

Figure 63: Difference in Female and Male Expected Years in Ages 65-99, in 1841-2009, in Belgium.

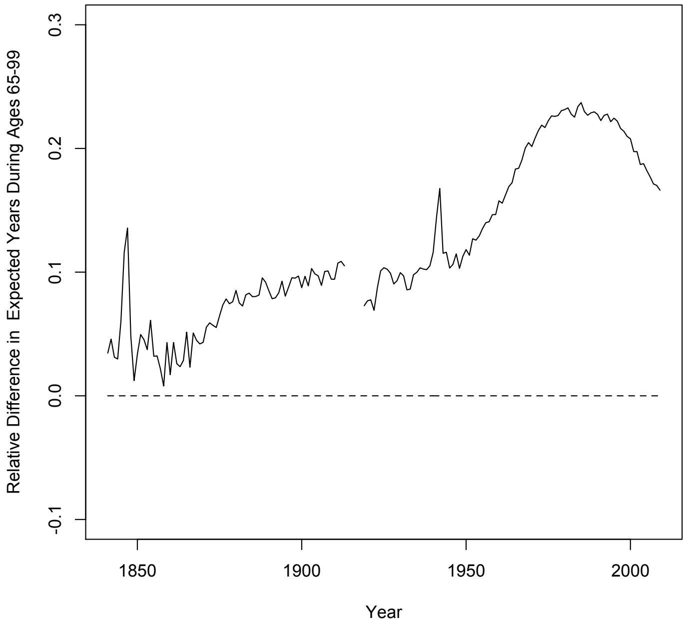

Figure 64: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1841-2009, in Belgium.

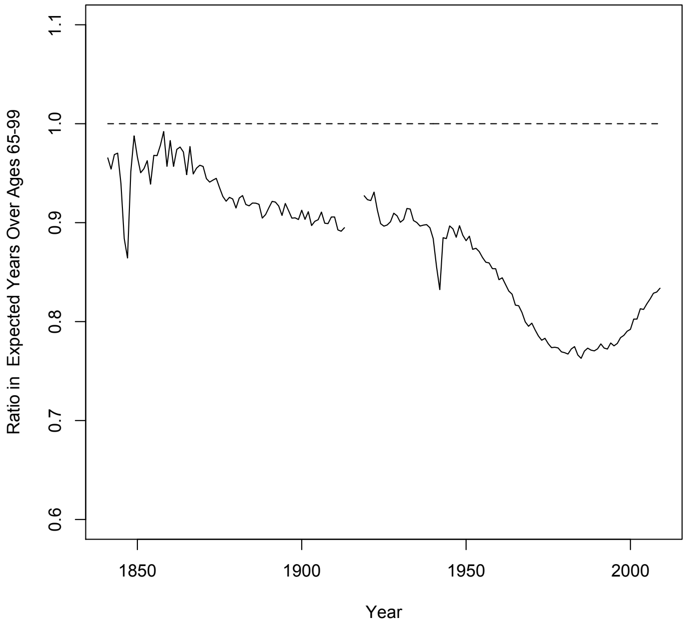

Figure 65: Ratio of Male and Female Expected Years in Ages 65-99, in 1841-2009, in Belgium.

Figure 66: Difference in Smoothed Male and Female Log-mortality in Ages 65-74 (Solid), 75-84 (Dashed) and 85-99 (Dotted), in 1930-2009, in Belgium.

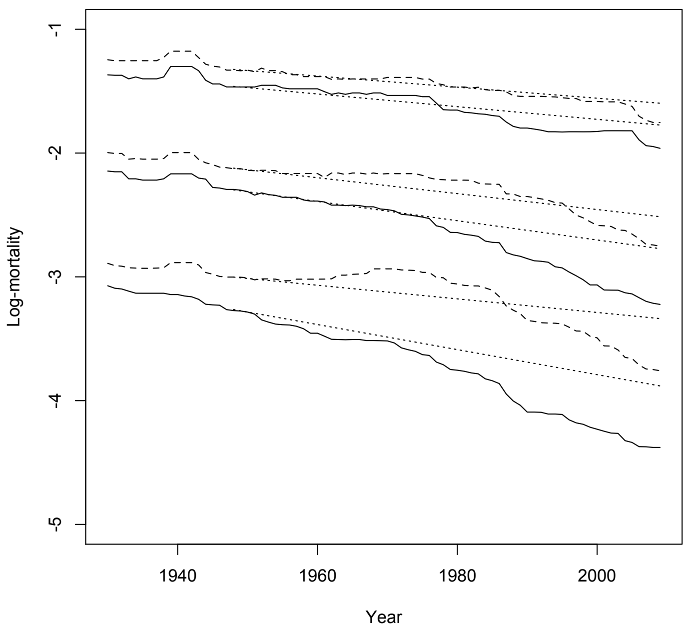

Figure 67: Smoothed Female (Solid) and Male (Dashed) Log-mortality, with Forecasts (Dotted), in Ages 65-74 (Bottom), 75-84 (Middle) and 85-99 (Top), in 1930-2009, in Belgium.

Running median of width 7 was used. Female mortality started to decline after 1945in all ages, but especially fast in younger ages, male mortality after 1960.

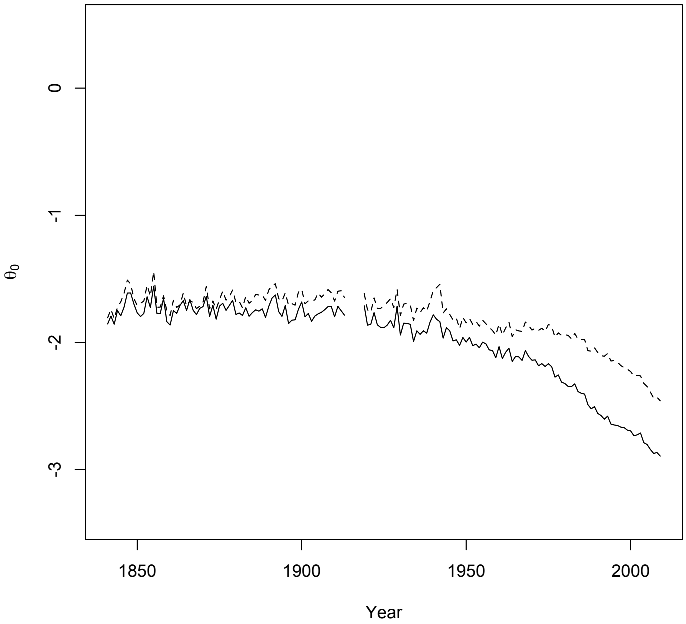

Figure 68: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1841-2009, for Females (Solid), and Males (Dashed), in Belgium.

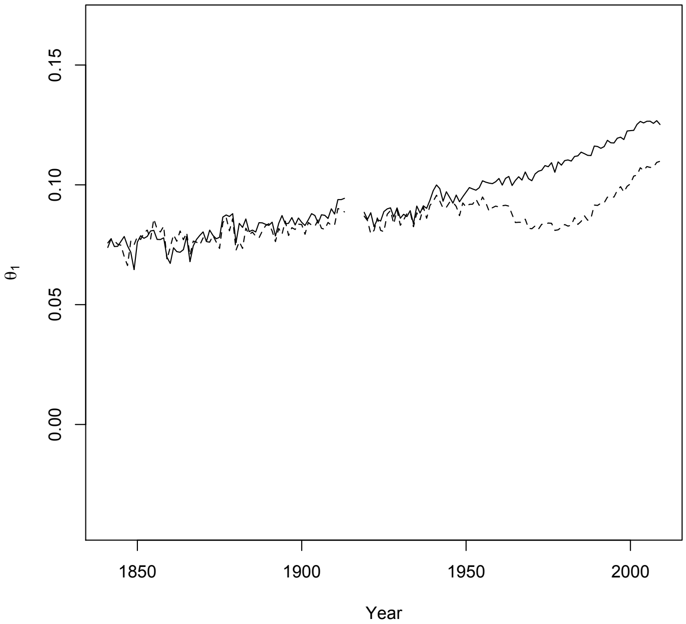

Figure 69: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Belgium in 1841-2009, for Females (Solid), and Males (Dashed), in Belgium.

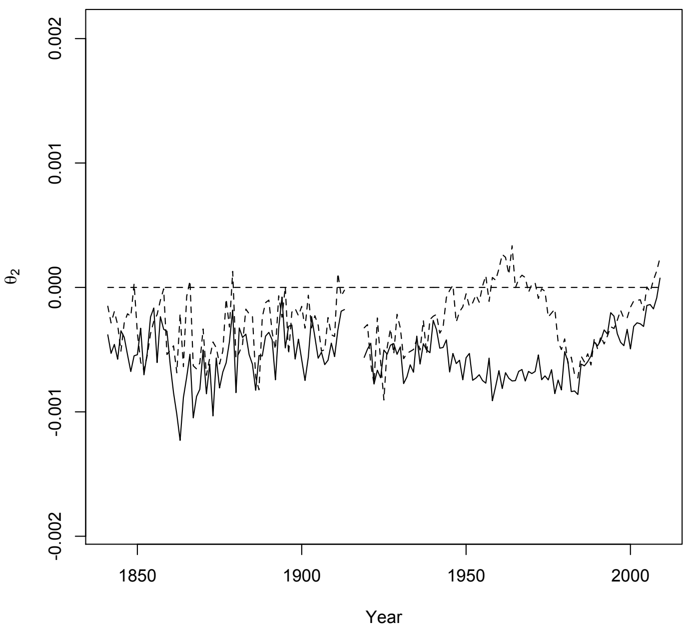

Figure 70: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1841-2009, for Females (Solid), and Males (Dashed), in Belgium.

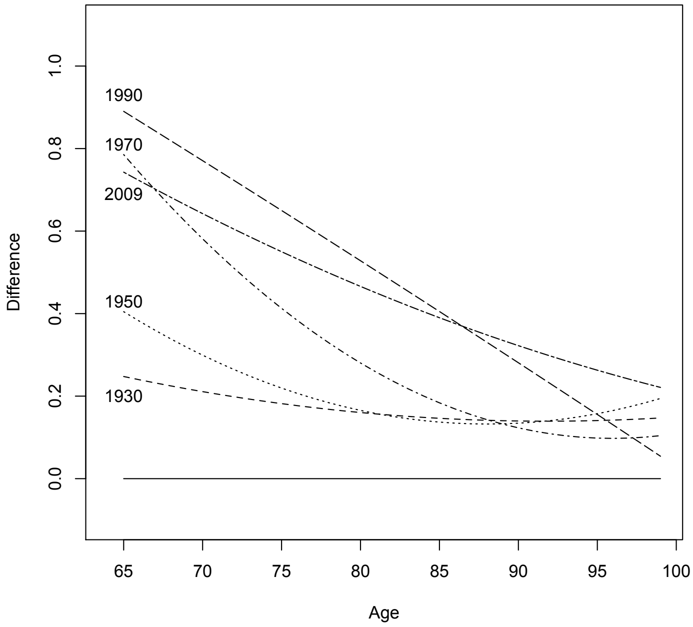

Figure 71: Male-Female Difference in the Loglinear Predictor in 1930, 1950, 1970, 1990, and 2009, in Belgium.

5.3.2 Ireland 1950-2009

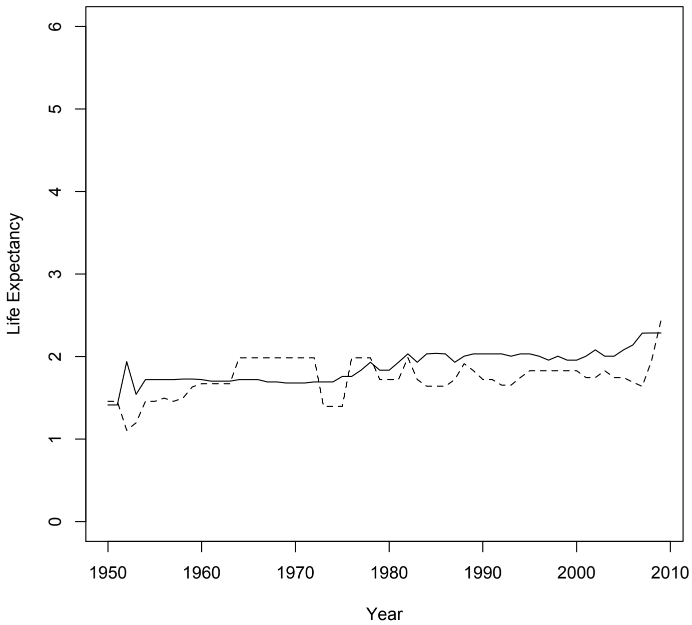

Figure 72: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1950-2009, in Ireland.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

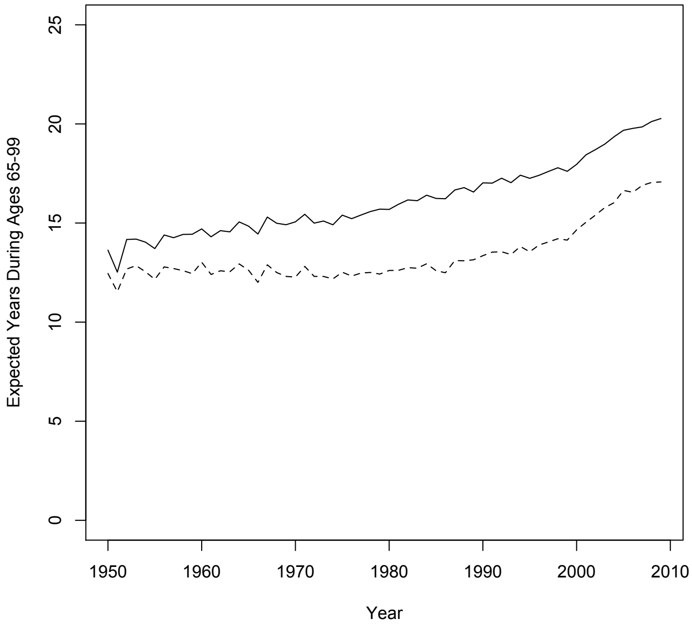

Figure 73: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1950-2009, in Ireland.

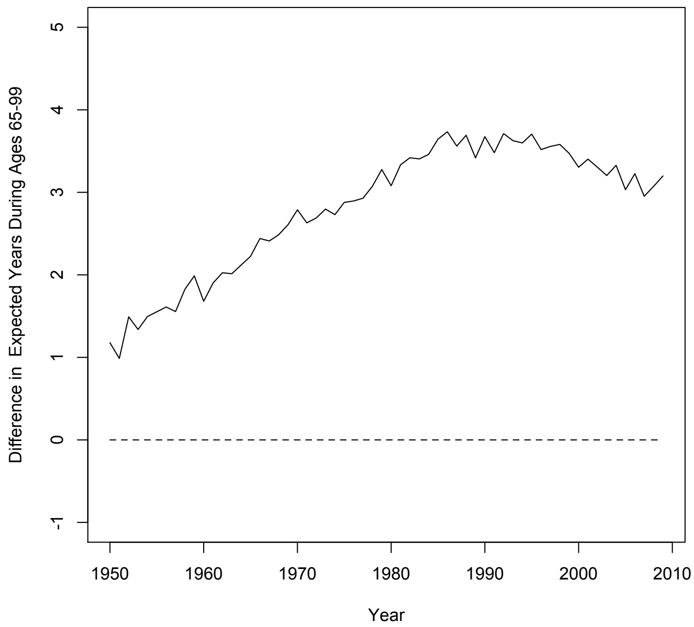

Figure 74: Difference in Female and Male Expected Years in Ages 65-99, in 1950-2009, in Ireland.

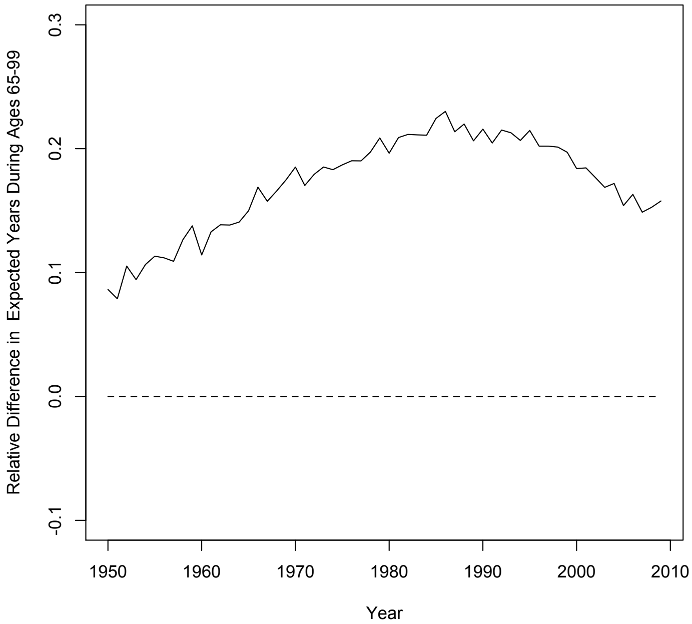

Figure 75: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1950-2009, in Ireland.

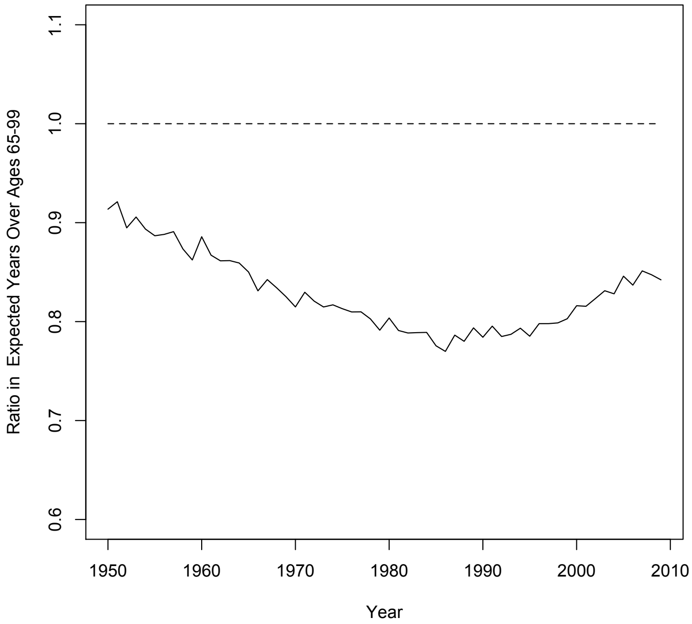

Figure 76: Ratio of Male and Female Expected Years in Ages 65-99, in 1950-2009, in Ireland.

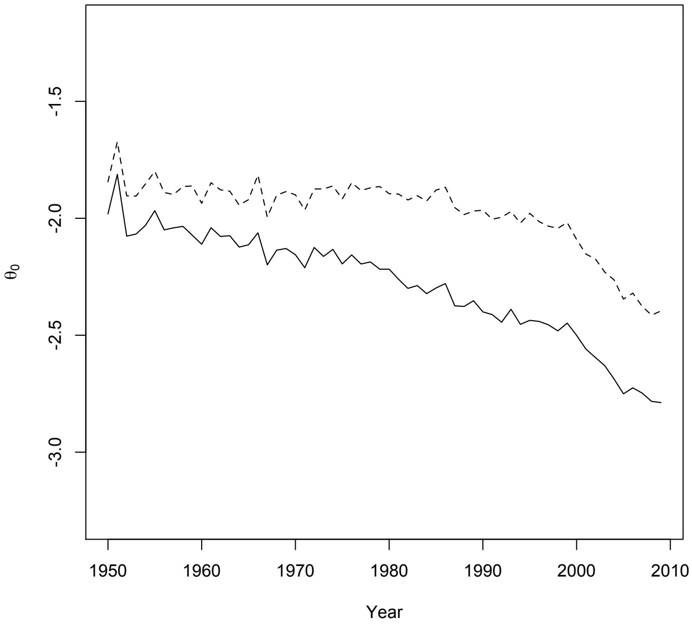

Figure 77: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1950-2009, for Females (Solid), and Males (Dashed), in Ireland.

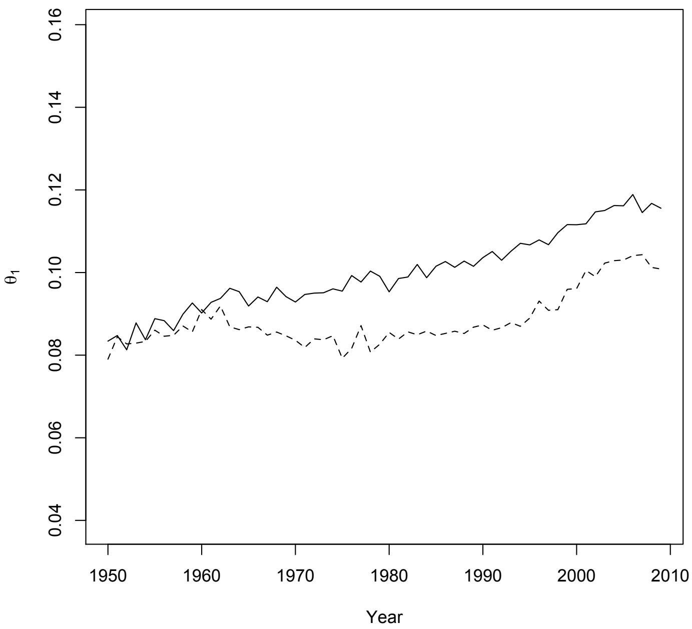

Figure 78: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Ireland in 1950-2009, for Females (Solid), and Males (Dashed), in Ireland.

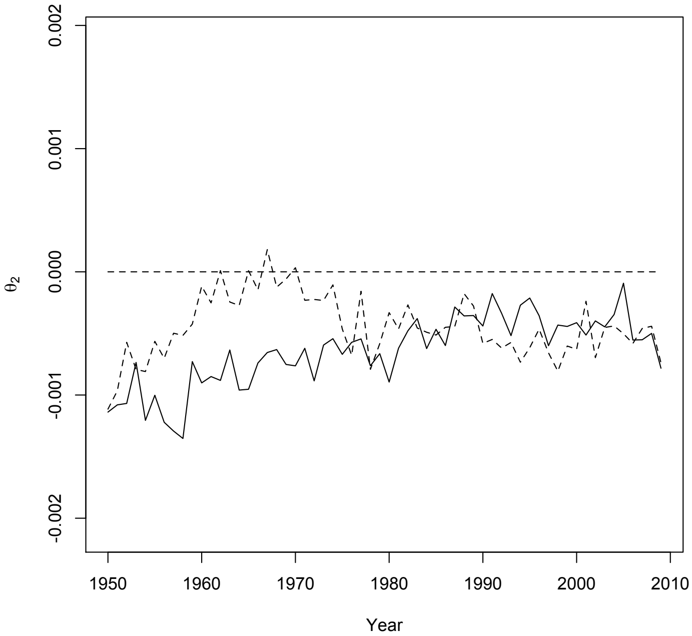

Figure 79: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1950-2009, for Females (Solid), and Males (Dashed), in Ireland.

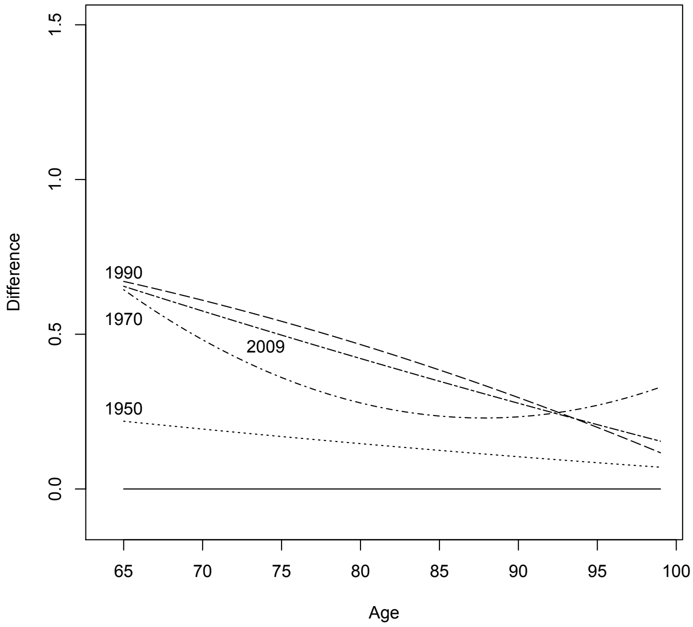

Figure 80: Male-Female Difference in the Loglinear Predictor in 1950, 1970, 1990 and 2009, in Ireland.

5.3.3 The Netherlands 1850-2009

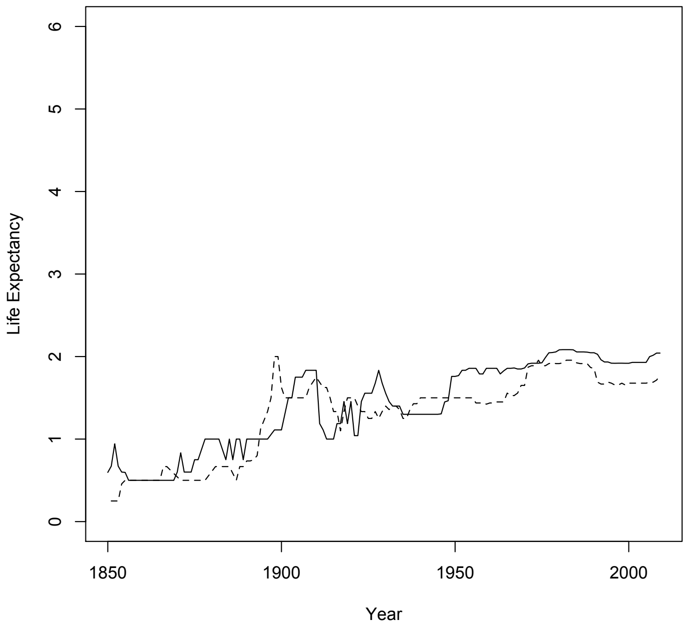

Figure 81: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1850-2009, in the Netherlands.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

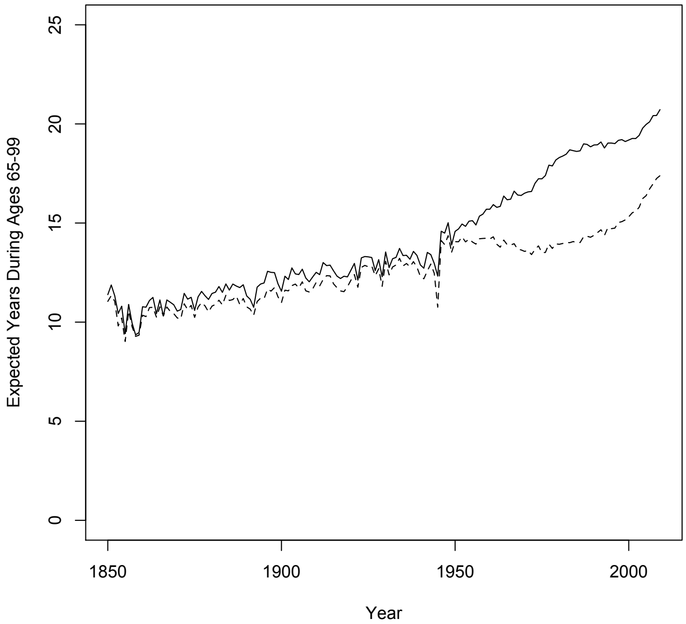

Figure 82: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1850-2009, in the Netherlands.

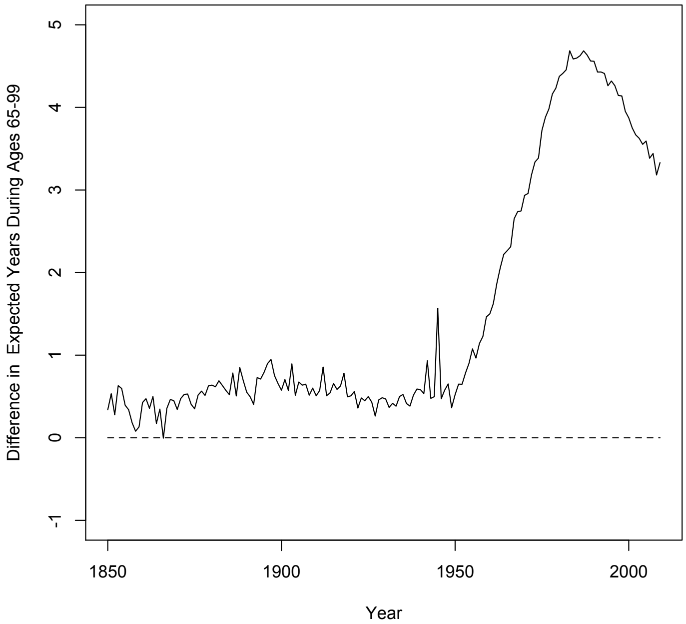

Figure 83: Difference in Female and Male Expected Years in Ages 65-99, in 1850-2009, in the Netherlands.

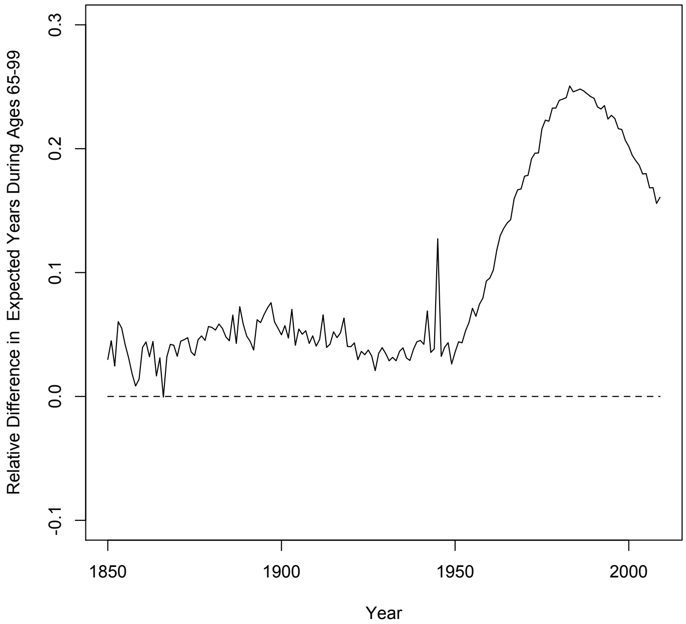

Figure 84: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1850-2009, in the Netherlands.

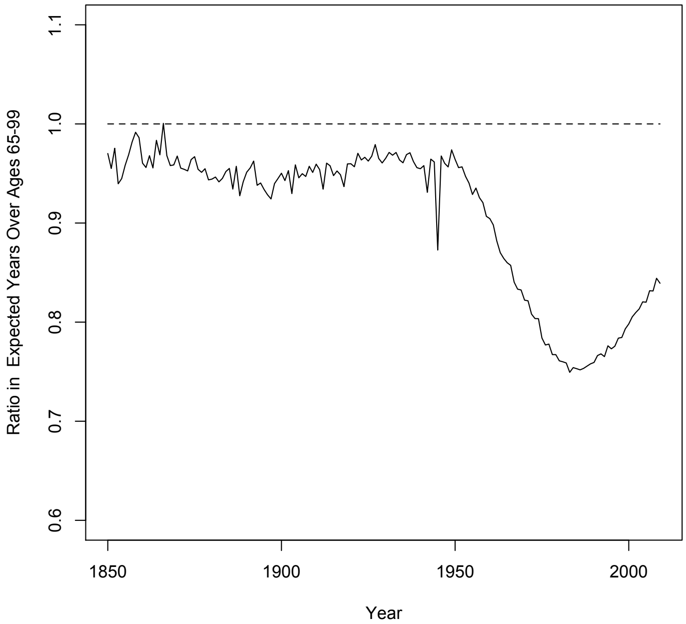

Figure 85: Ratio of Male and Female Expected Years in Ages 65-99, in 1850-2009, in the Netherlands.

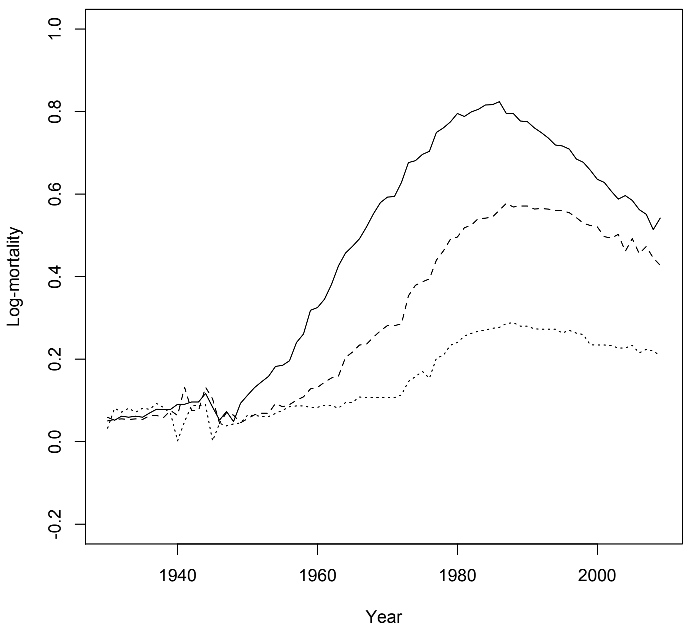

Figure 86: Difference in Smoothed Male and Female Log-mortality in Ages 65-74 (Solid), 75-84 (Dashed) and 85-99 (Dotted), in 1930-2009, in the Netherlands.

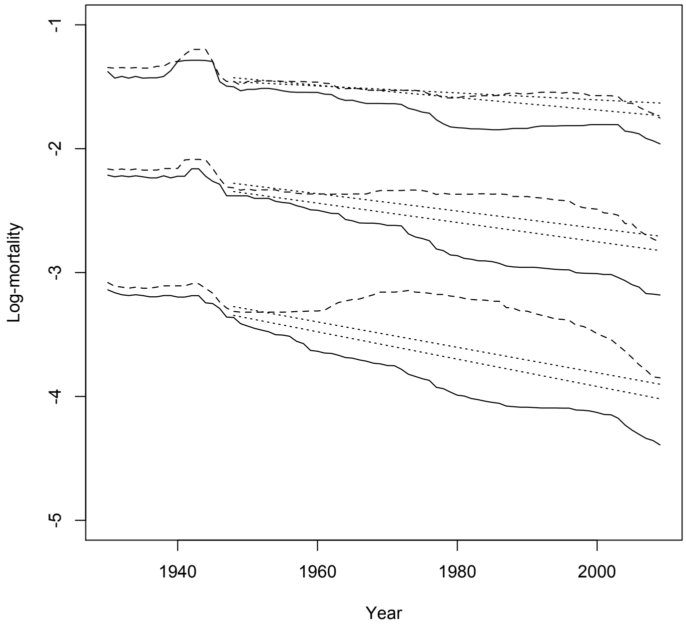

Figure 87: Smoothed Female (Solid) and Male (Dashed) Log-mortality, with Forecasts (Dotted), in Ages 65-74 (Bottom), 75-84 (Middle) and 85-99 (Top), in 1930-2009, in the Netherlands.

Running median of width 7 was used. Female mortality started to decline after 1945in all ages, but especially fast in younger ages, male mortality after 1960.

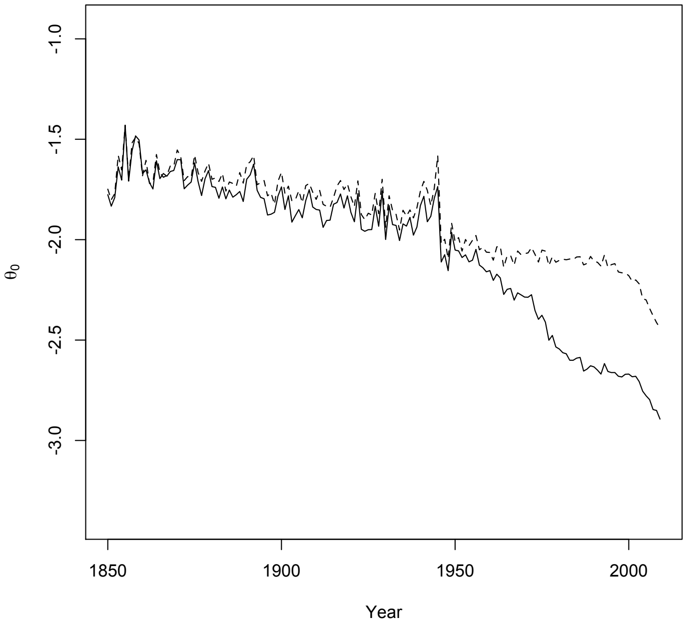

Figure 88: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1850-2009, for Females (Solid), and Males (Dashed), in the Netherlands.

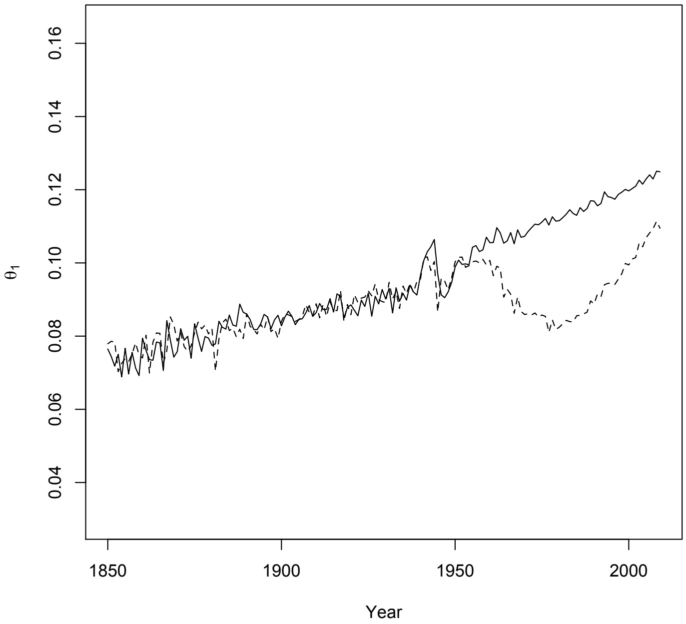

Figure 89: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in the Netherlands in 1850-2009, for Females (Solid), and Males (Dashed), in the Netherlands.

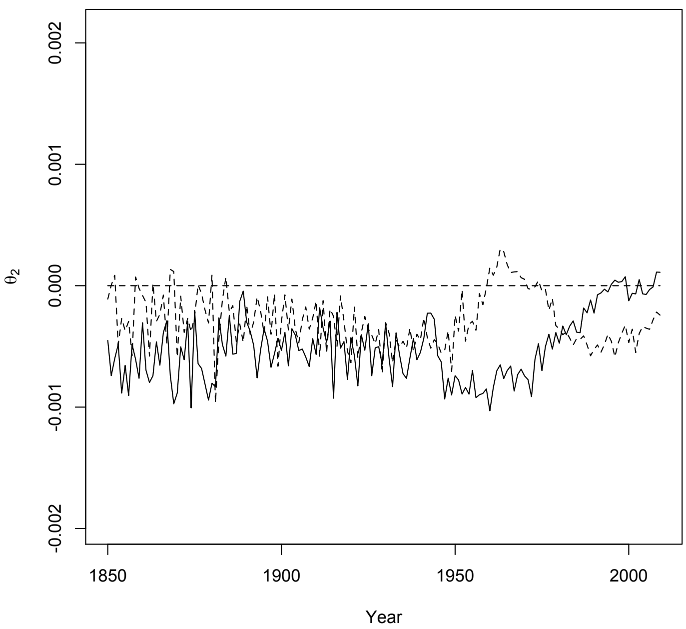

Figure 90: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1850-2009, for Females (Solid), and Males (Dashed), in the Netherlands.

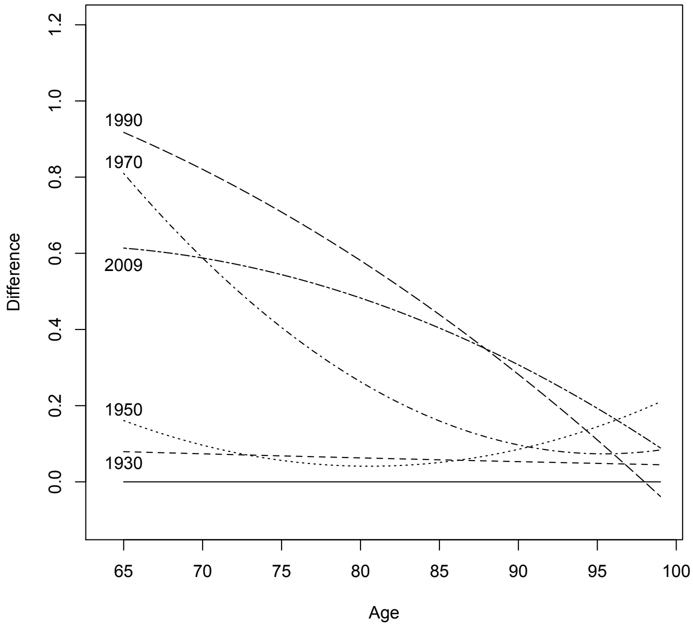

Figure 91: Male-Female Difference in the Loglinear Predictor in 1930, 1950, 1970, 1990, and 2009, in the Netherlands.

5.3.4 The United Kingdom 1841-2011

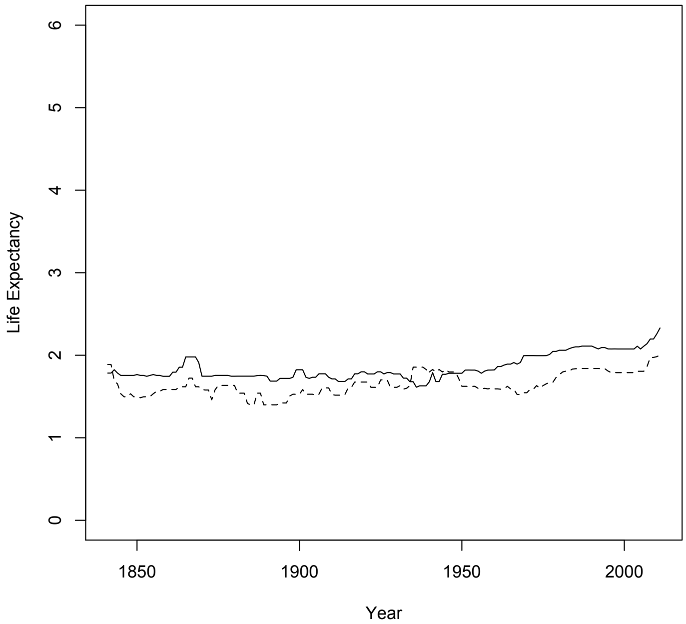

Figure 92: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1841-2011, in the United Kingdom.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

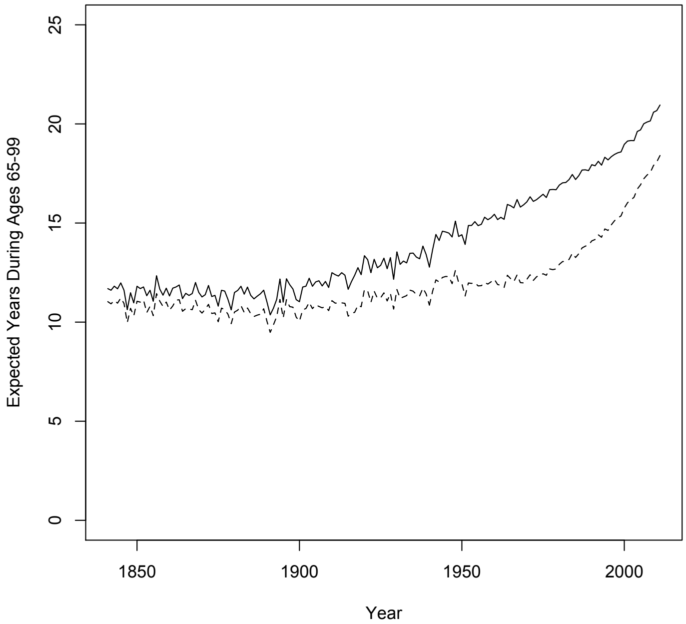

Figure 93: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1841-2011, in the United Kingdom.

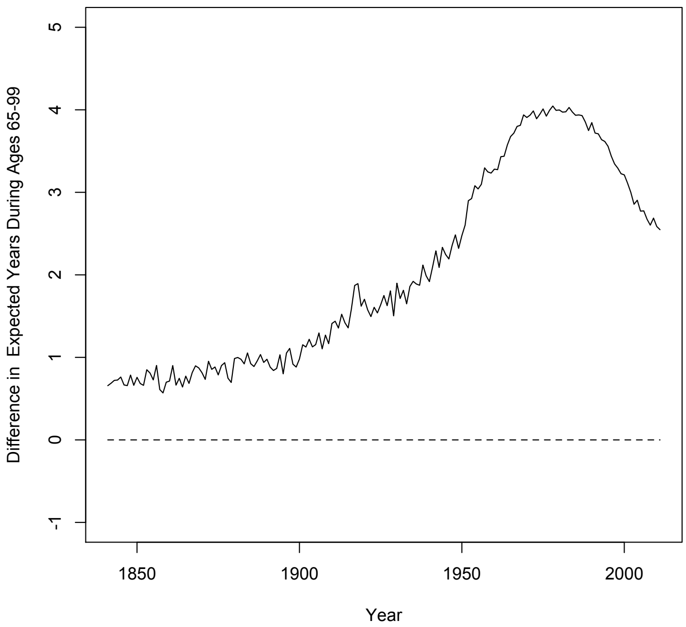

Figure 94: Difference in Female and Male Expected Years in Ages 65-99, in 1841-2011, in the United Kingdom.

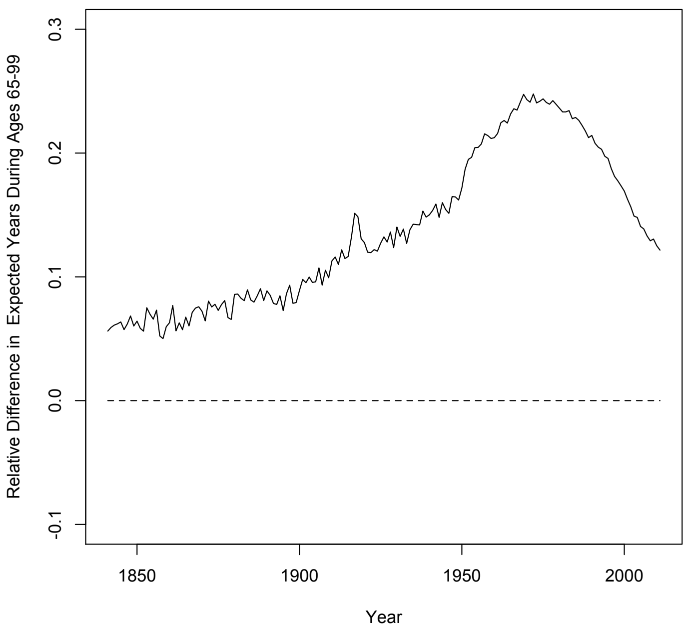

Figure 95: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1841-2011, in the United Kingdom.

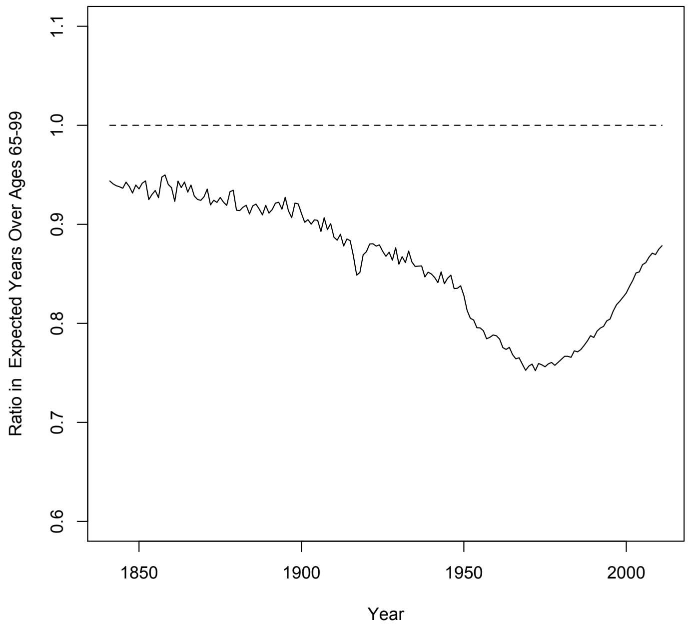

Figure 96: Ratio of Male and Female Expected Years in Ages 65-99, in 1841-2011, in the United Kingdom.

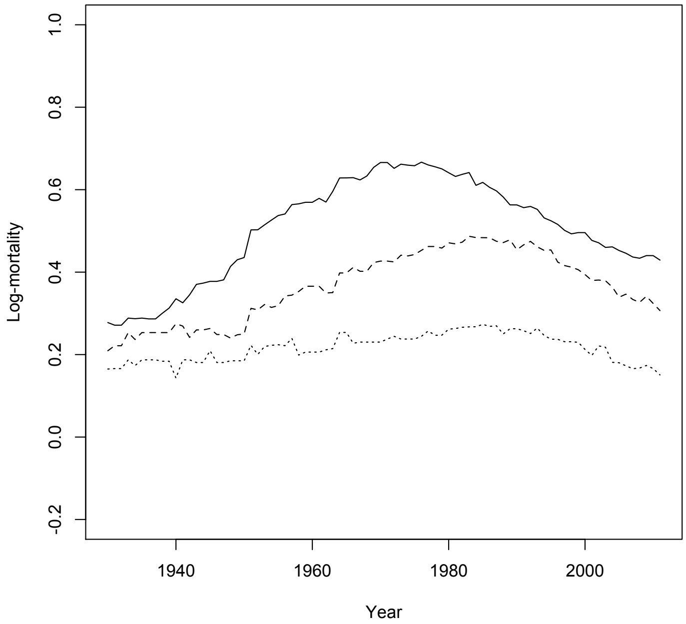

Figure 97: Difference in Smoothed Male and Female Log-mortality in Ages 65-74 (Solid), 75-84 (Dashed) and 85-99 (Dotted), in 1930-2011, in the United Kingdom.

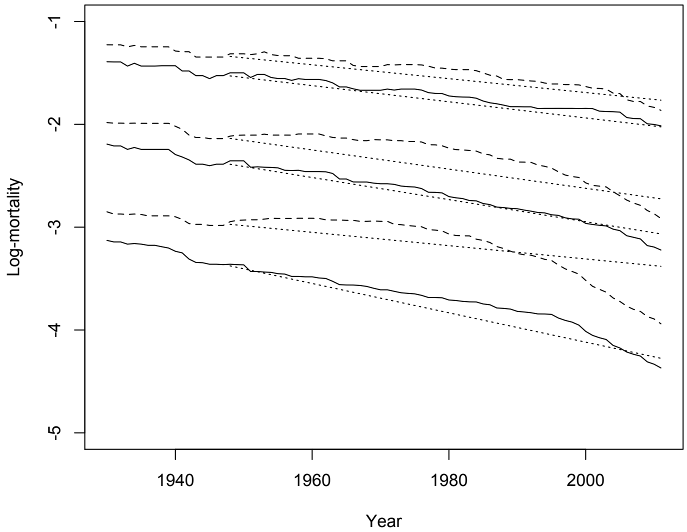

Figure 98: Smoothed Female (Solid) and Male (Dashed) Log-mortality, with Forecasts (Dotted), in Ages 65-74 (Bottom), 75-84 (Middle) and 85-99 (Top), in 1930-2011, in the United Kingdom.

Running median of width 7 was used. Female mortality started to decline after 1945in all ages, but especially fast in younger ages, male mortality after 1960.

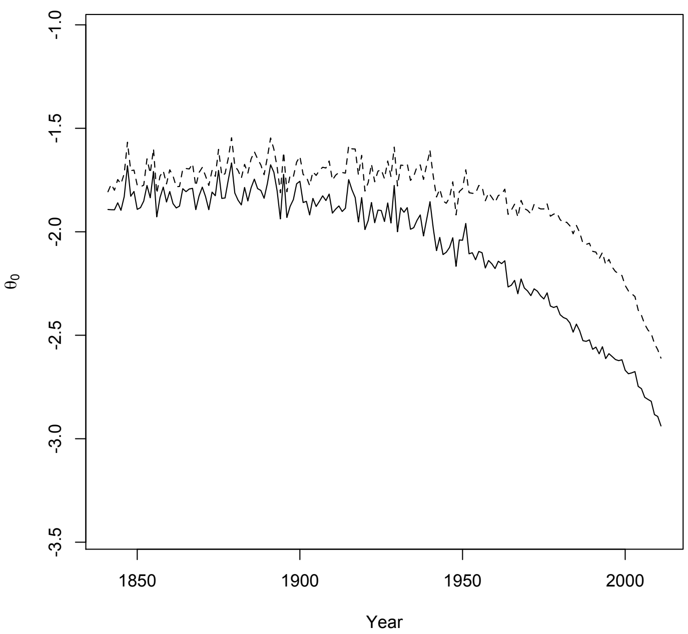

Figure 99: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1841-2011, for Females (Solid), and Males (Dashed), in the United Kingdom.

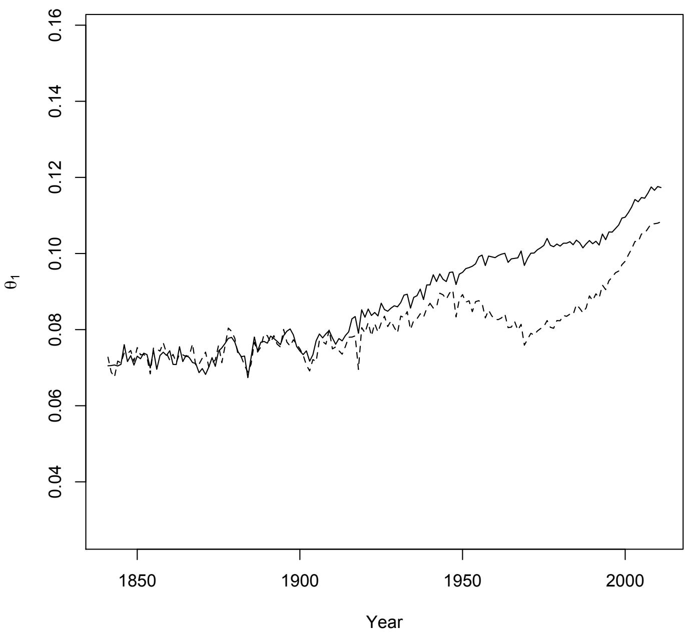

Figure 100: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in the United Kingdom in 1841-2011, for Females (Solid), and Males (Dashed), in The United Kingdom.

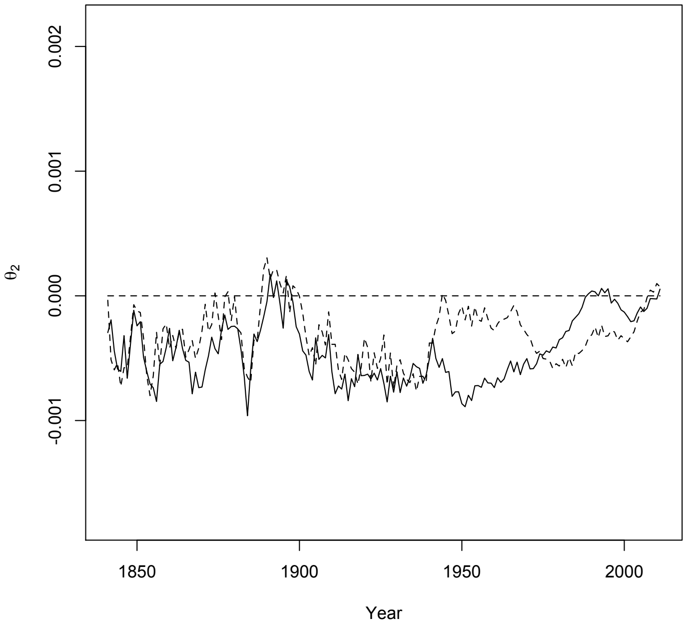

Figure 101: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1841-2011, for Females (Solid), and Males (Dashed), in the United Kingdom.

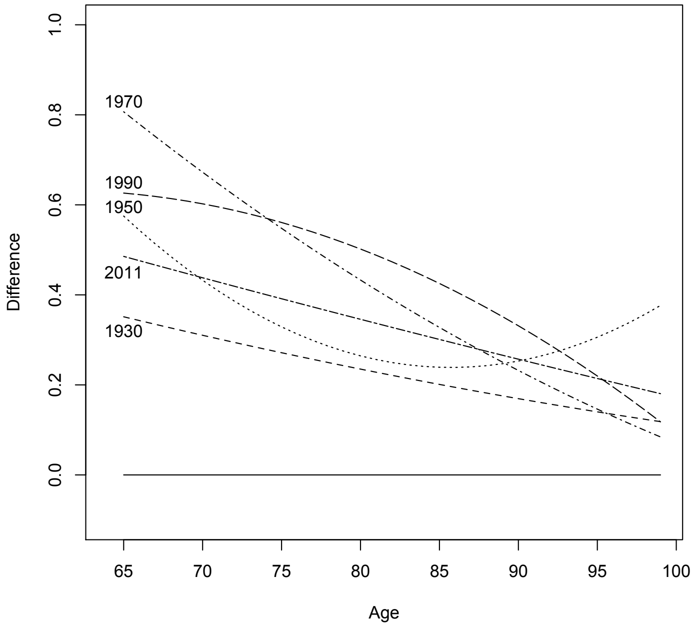

Figure 102: Male-Female Difference in the Loglinear Predictor in 1930, 1950, 1970, 1990, and 2011, in the United Kingdom.

5.4 Mediterranean Countries

5.4.1 France 1816-2010

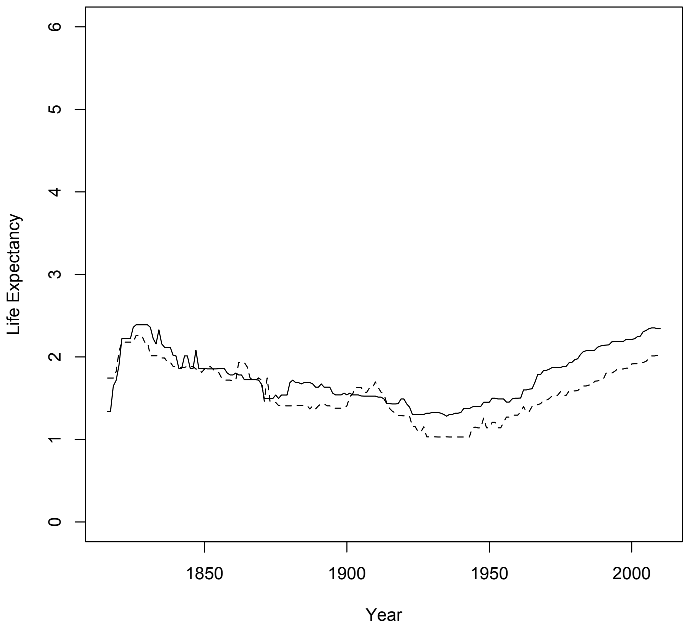

Figure 103: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1816-2010, in France.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

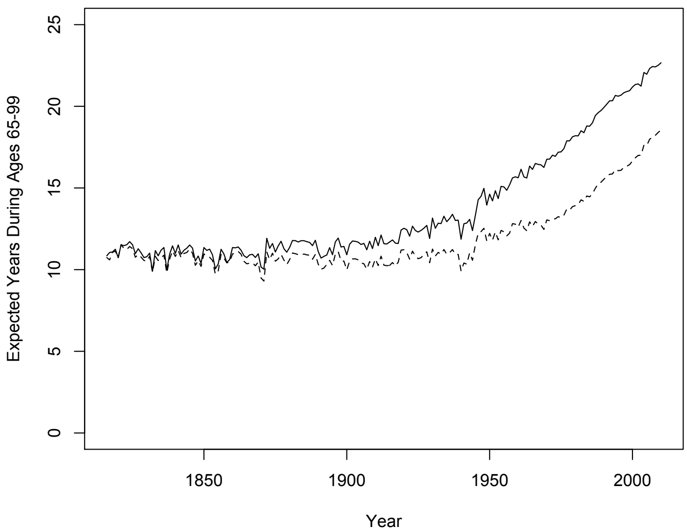

Figure 104: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1816-2010, in France.

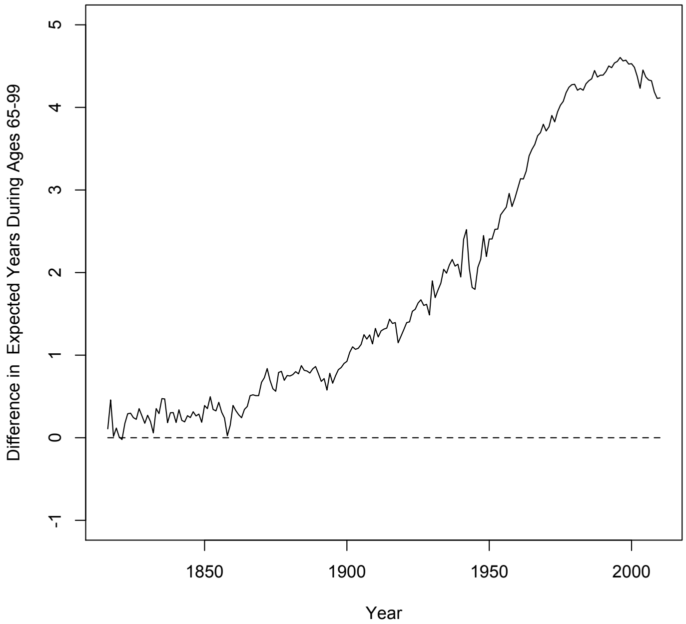

Figure 105: Difference in Female and Male Expected Years in Ages 65-99, in 1816-2010, in France.

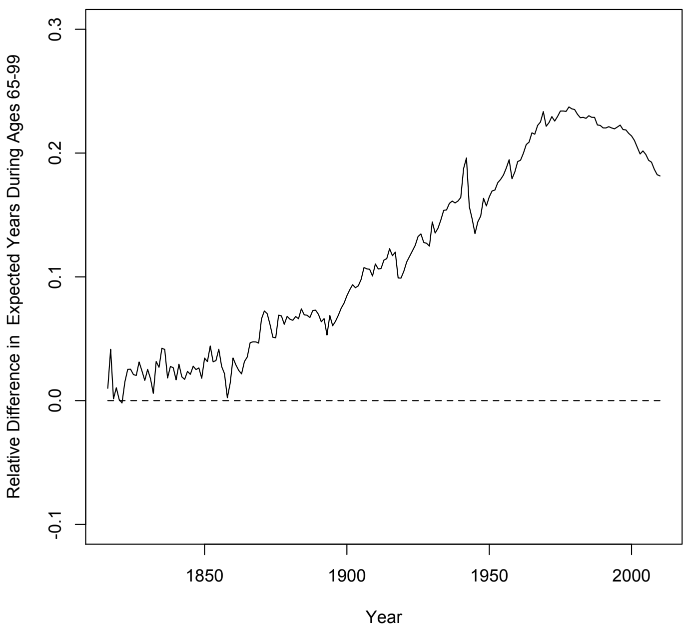

Figure 106: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1816-2010, in France.

Figure 107: Ratio of Male and Female Expected Years in Ages 65-99, in 1816-2010, in France.

Figure 108: Difference in Smoothed Male and Female Log-mortality in Ages 65-74 (Solid), 75-84 (Dashed) and 85-99 (Dotted), in 1930-2010, in France.

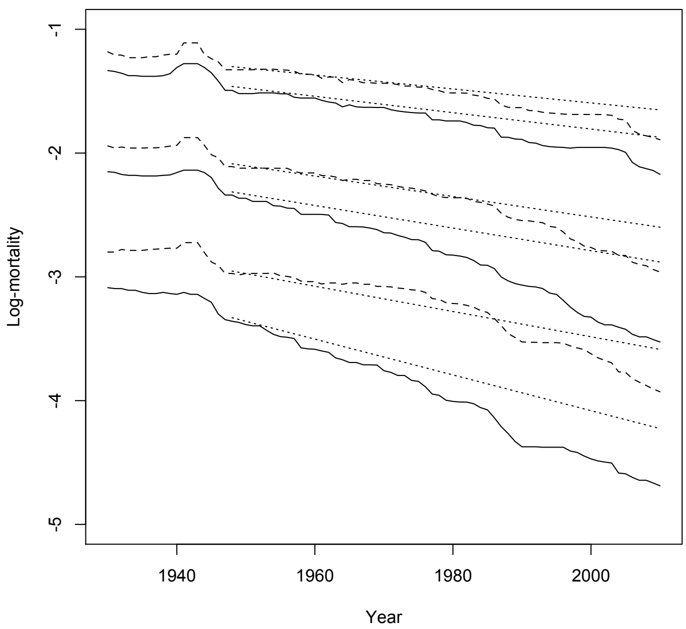

Figure 109: Smoothed Female (Solid) and Male (Dashed) Log-mortality, with Forecasts (Dotted), in Ages 65-74 (Bottom), 75-84 (Middle) and 85-99 (Top), in 1930-2010, in France.

Running median of width 7 was used. Female mortality started to decline after 1945in all ages, but especially fast in younger ages, male mortality after 1960.

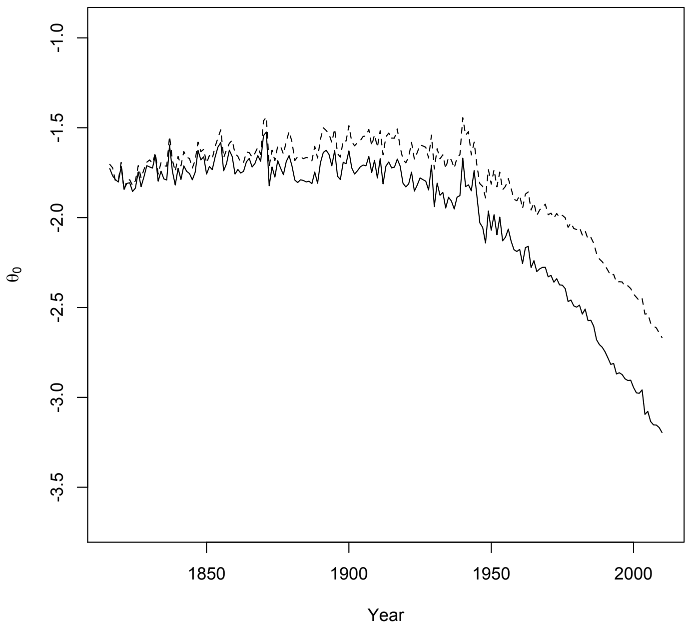

Figure 110: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1816-2010, for Females (Solid), and Males (Dashed), in France.

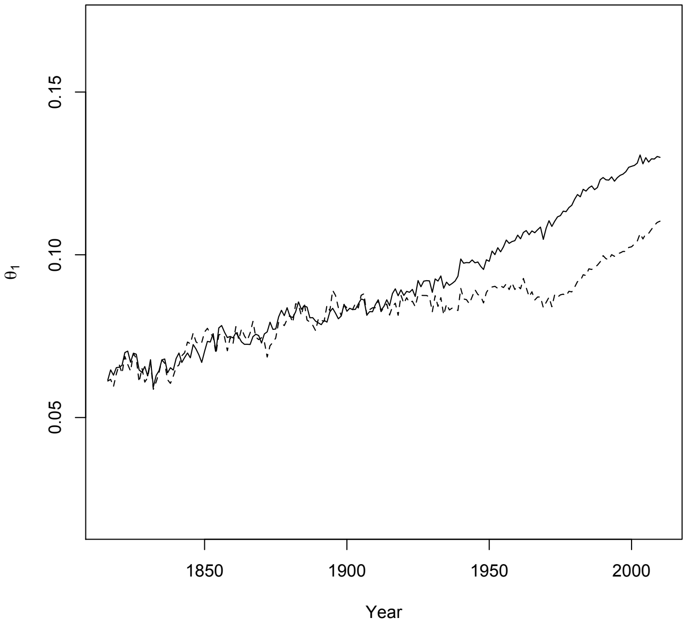

Figure 111: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in France in 1816-2010, for Females (Solid), and Males (Dashed), in France.

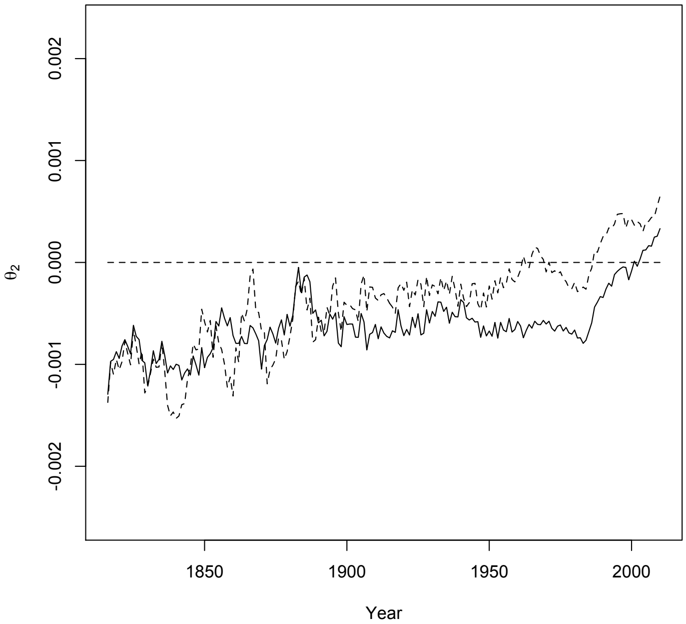

Figure 112: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1816-2010, for Females (Solid), and Males (Dashed), in France.

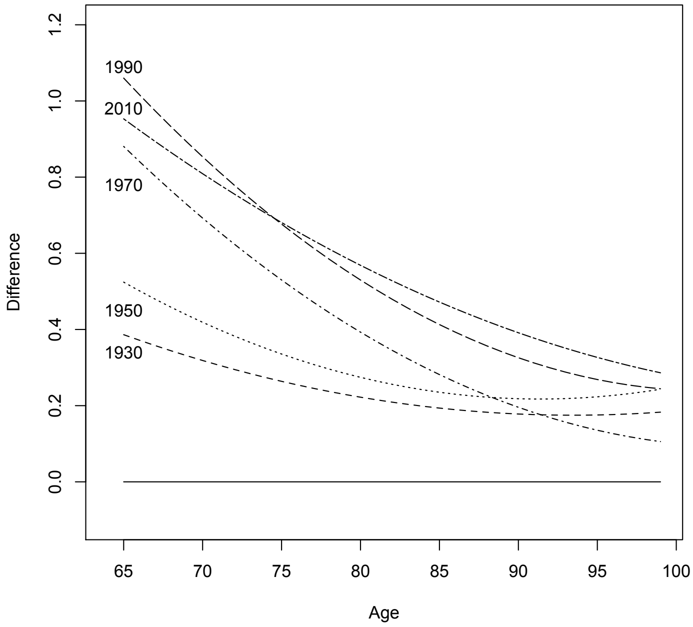

Figure 113: Male-Female Difference in the Loglinear Predictor in 1930, 1950, 1970, 1990, and 2010, in France.

5.4.2 Italy 1872-2009

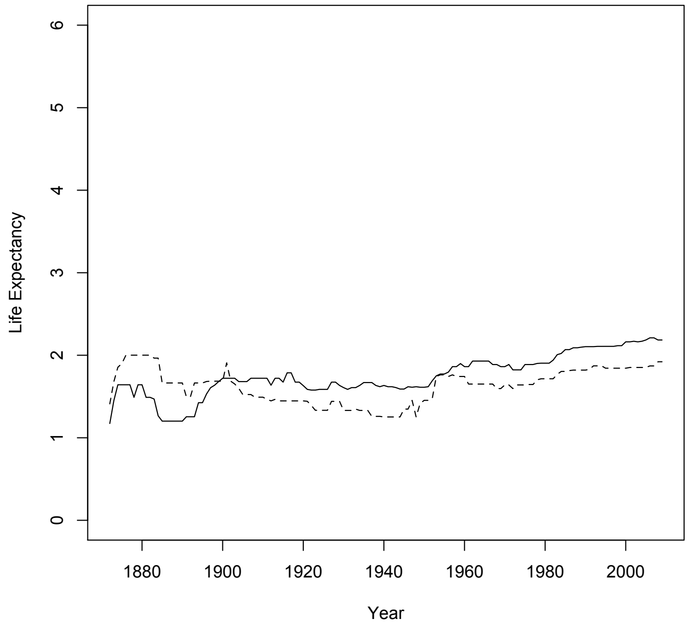

Figure 114: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1872-2009, in Italy.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

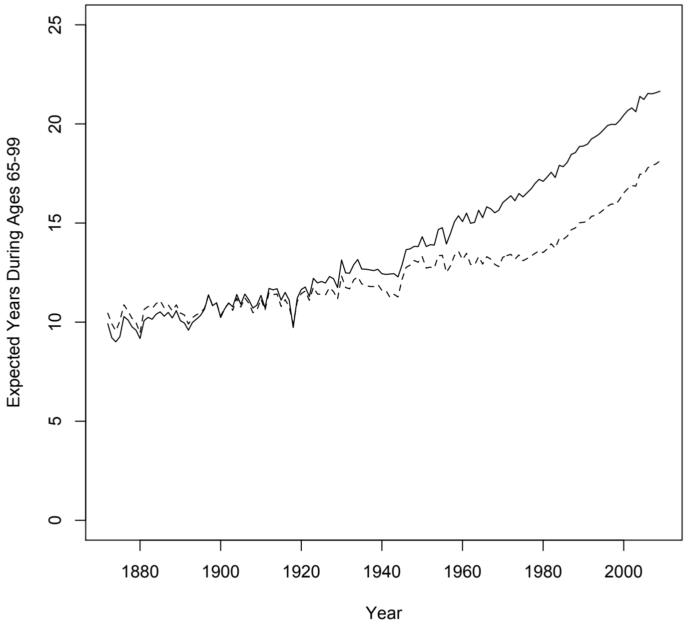

Figure 115: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1872-2009, in Italy.

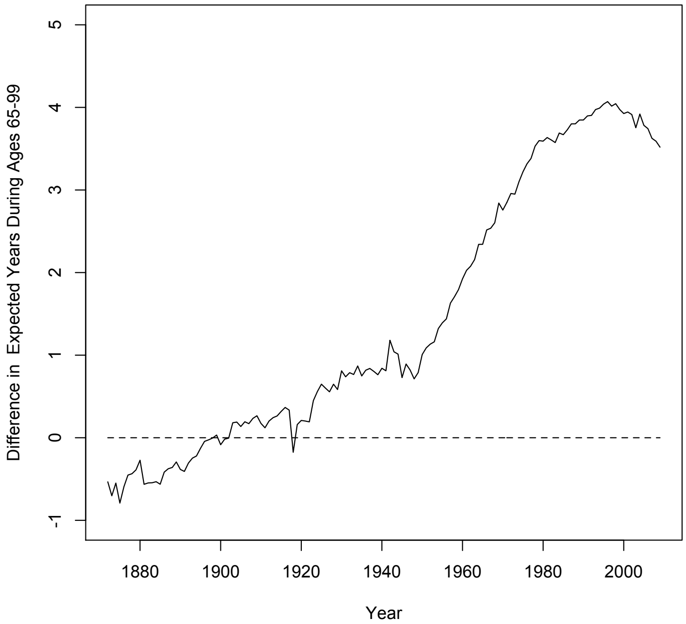

Figure 116: Difference in Female and Male Expected Years in Ages 65-99, in 1872-2009, in Italy.

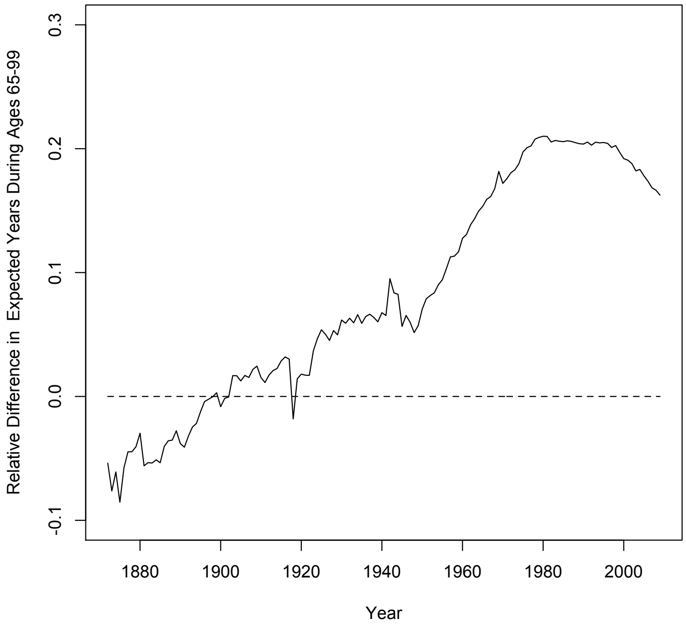

Figure 117: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1872-2009, in Italy.

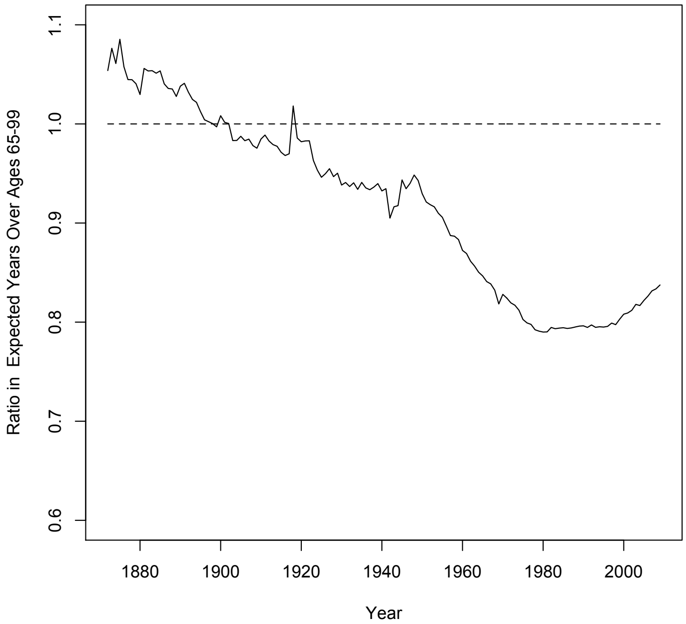

Figure 118: Ratio of Male and Female Expected Years in Ages 65-99, in 1872-2009, in Italy.

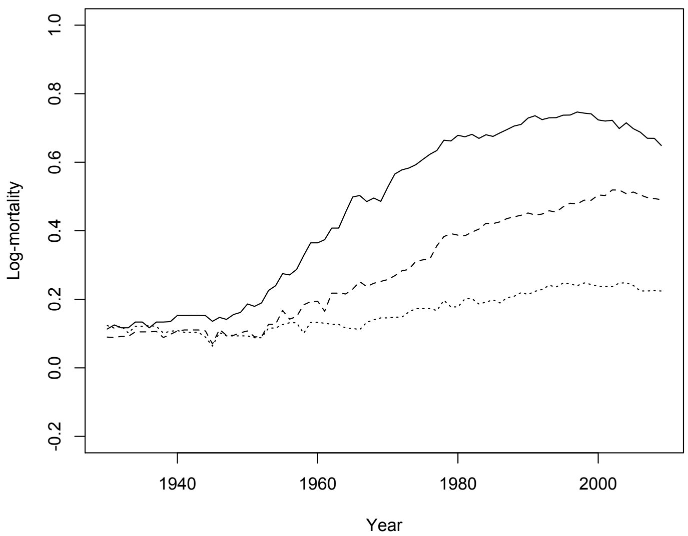

Figure 119: Difference in Smoothed Male and Female Log-mortality in Ages 65-74 (Solid), 75-84 (Dashed) and 85-99 (Dotted), in 1930-2009, in Italy.

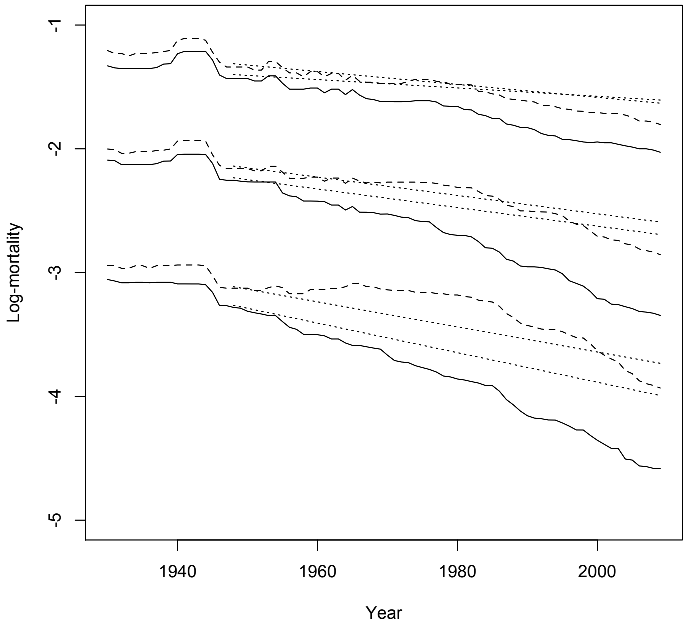

Figure 120: Smoothed Female (Solid) and Male (Dashed) Log-mortality, with Forecasts (Dotted), in Ages 65-74 (Bottom), 75-84 (Middle) and 85-99 (Top), in 1930-2009, in Italy.

Running median of width 7 was used. Female mortality started to decline after 1945in all ages, but especially fast in younger ages, male mortality after 1960.

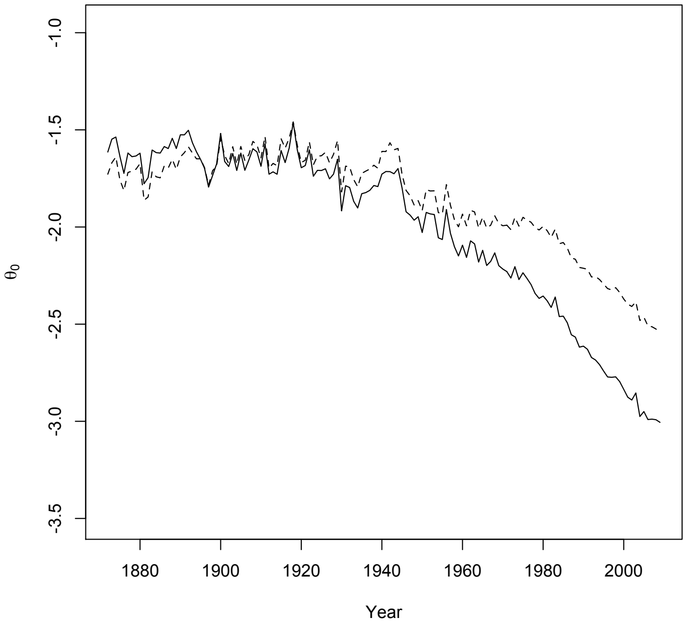

Figure 121: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1872-2009, for Females (Solid), and Males (Dashed), in Italy.

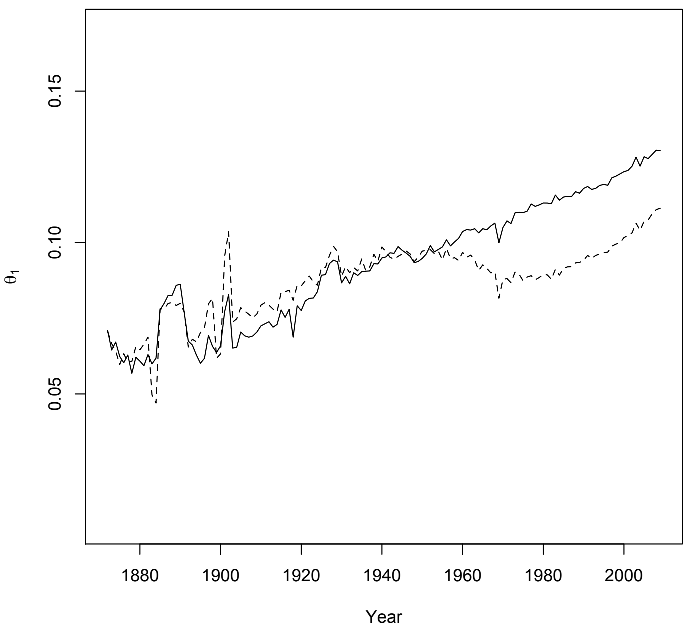

Figure 122: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Italy in 1872-2009, for Females (Solid), and Males (Dashed), in Italy.

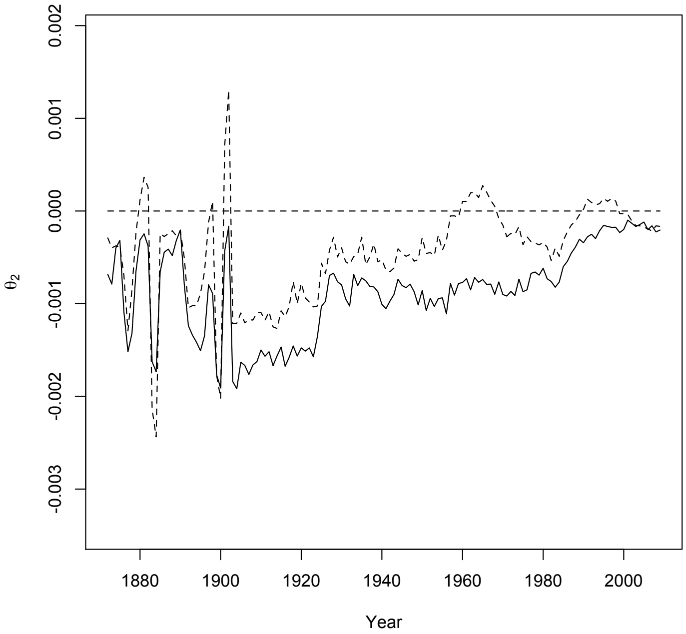

Figure 123: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1872-2009, for Females (Solid), and Males (Dashed), in Italy.

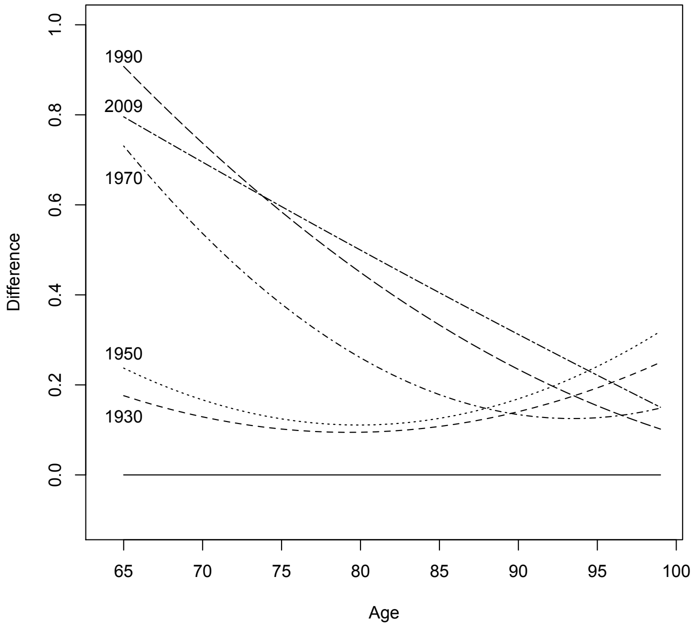

Figure 124: Male-Female Difference in the Loglinear Predictor in 1930, 1950, 1970, 1990, and 2009, in Italy.

5.4.3 Portugal 1940-2009

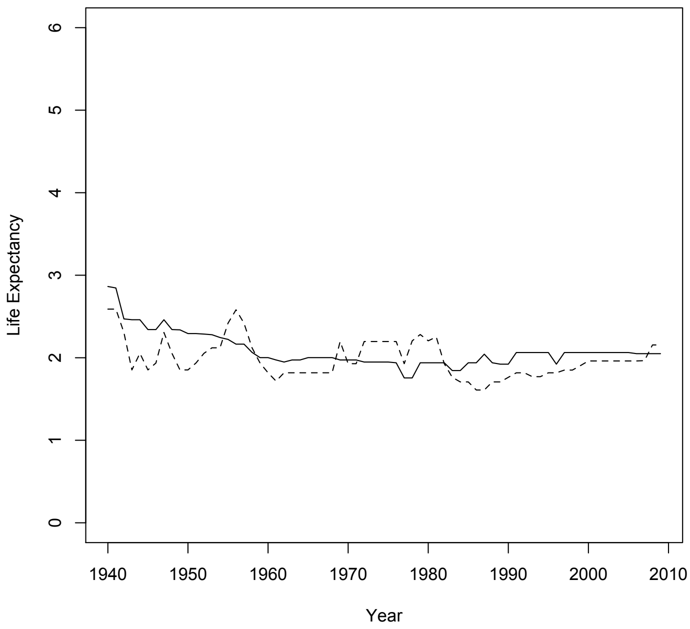

Figure 125: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1940-2009, in Portugal.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

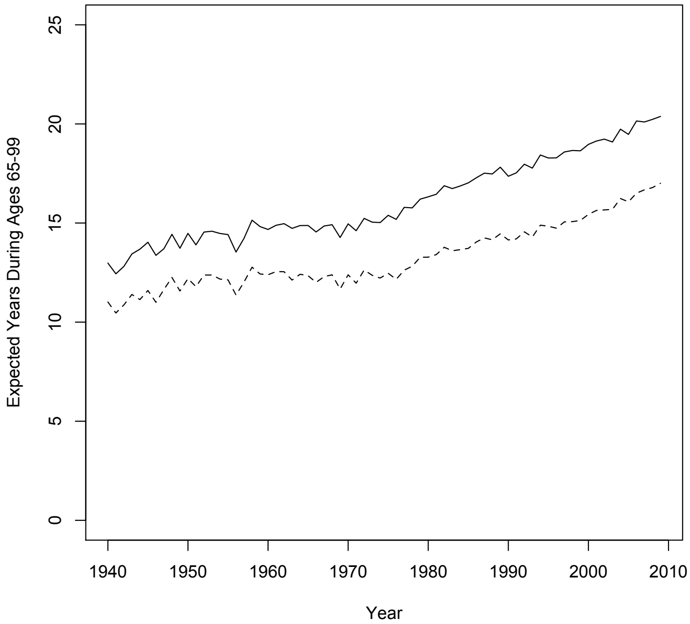

Figure 126: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1940-2009, in Portugal.

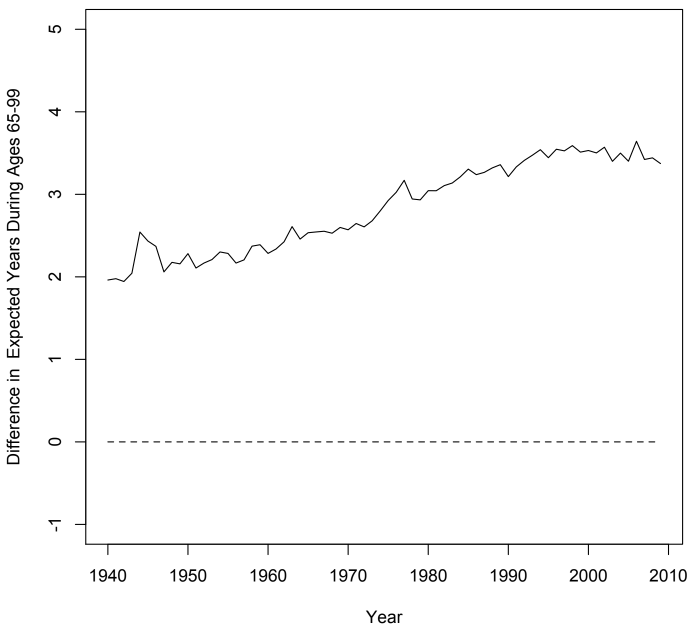

Figure 127: Difference in Female and Male Expected Years in Ages 65-99, in 1940-2009, in Portugal.

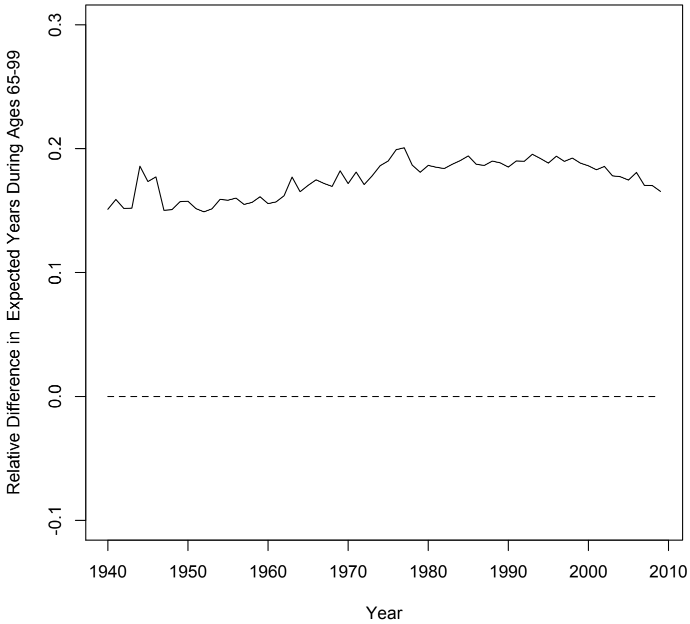

Figure 128: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1940-2009, in Portugal.

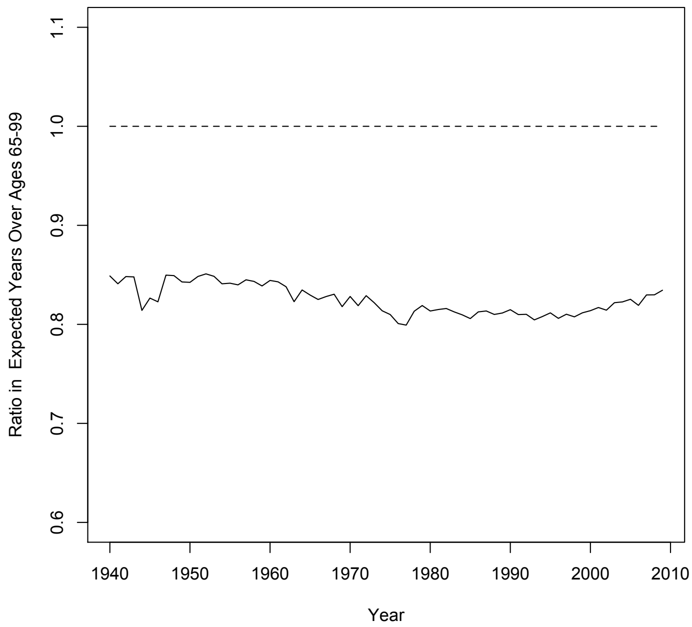

Figure 129: Ratio of Male and Female Expected Years in Ages 65-99, in 1940-2009, in Portugal.

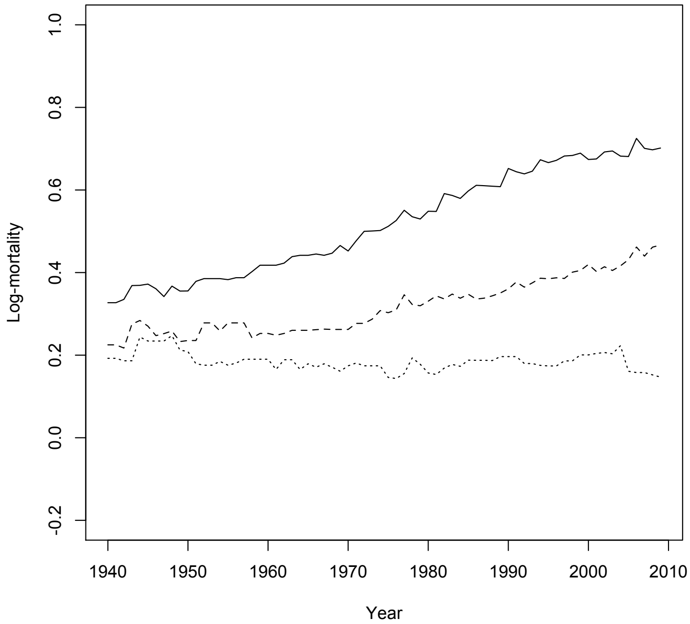

Figure 130: Difference in Smoothed Male and Female Log-mortality in Ages 65-74 (Solid), 75-84 (Dashed) and 85-99 (Dotted), in 1940-2009, in Portugal.

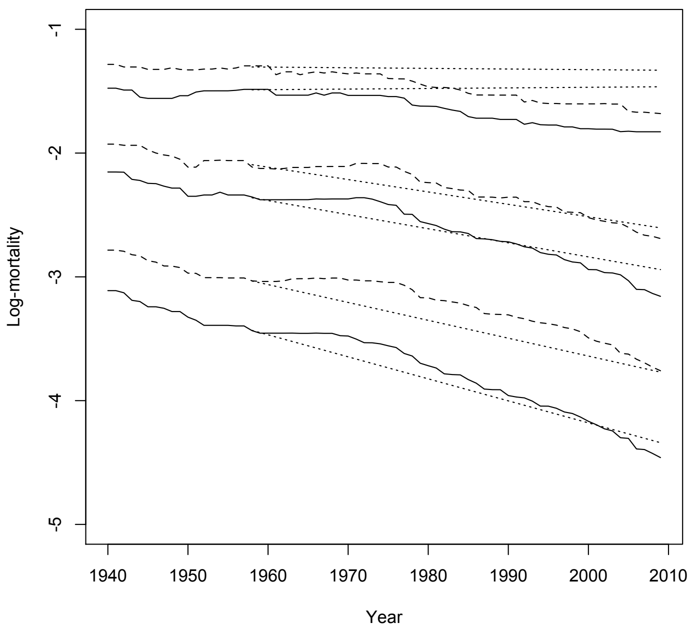

Figure 131: Smoothed Female (Solid) and Male (Dashed) Log-mortality, with Forecasts (Dotted), in Ages 65-74 (Bottom), 75-84 (Middle) and 85-99 (Top), in 1940-2009, in Portugal.

Running median of width 7 was used. Female mortality started to decline after 1945in all ages, but especially fast in younger ages, male mortality after 1960.

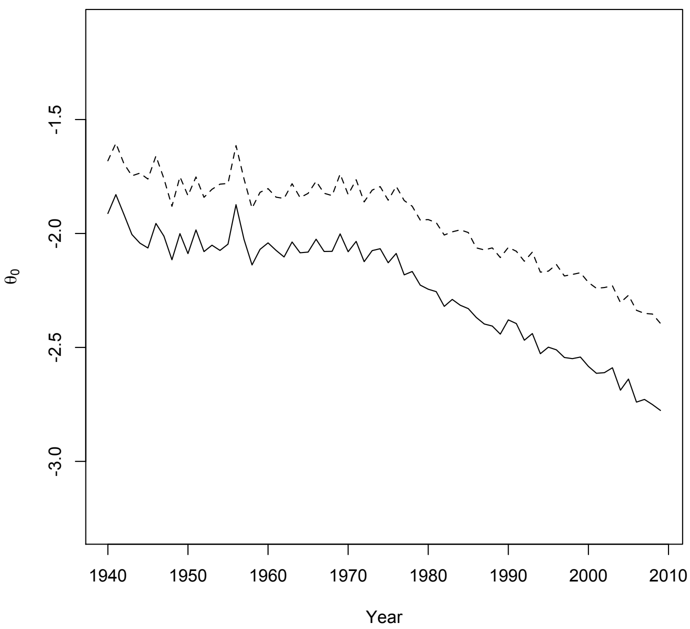

Figure 132: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1940-2009, for Females (Solid), and Males (Dashed), in Portugal.

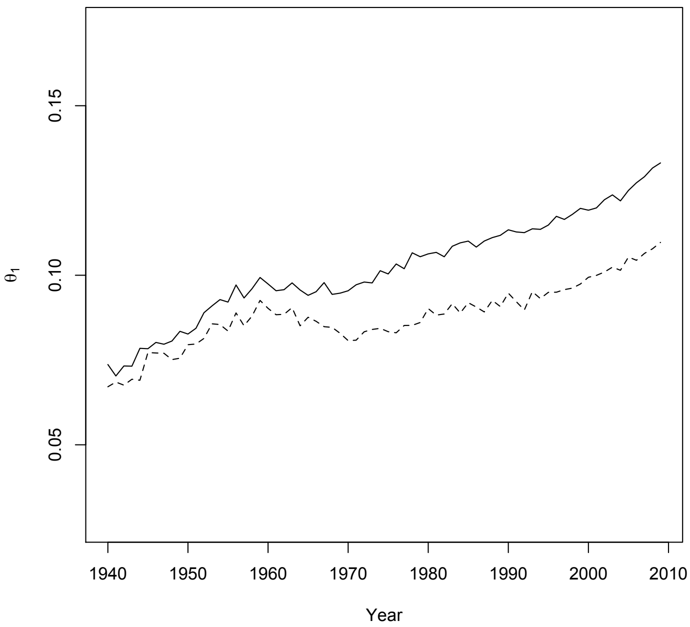

Figure 133: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Portugal in 1940-2009, for Females (Solid), and Males (Dashed), in Portugal.

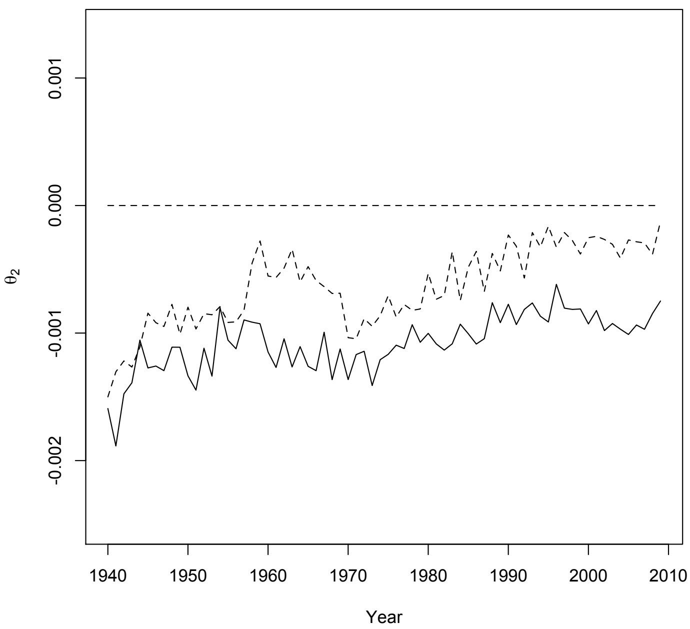

Figure 134: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1940-2009, for Females (Solid), and Males (Dashed), in Portugal.

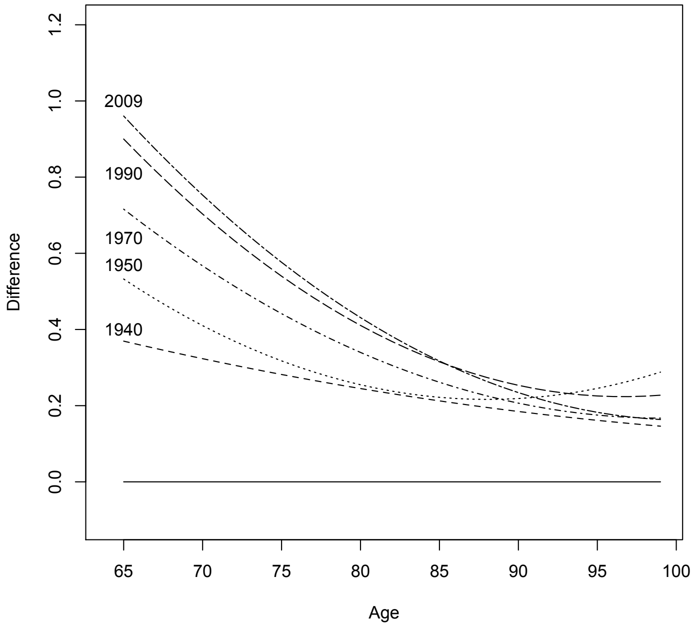

Figure 135: Male-Female Difference in the Loglinear Predictor in 1940, 1950, 1970, 1990, and 2009, in Portugal.

5.4.4 Spain 1908-2009

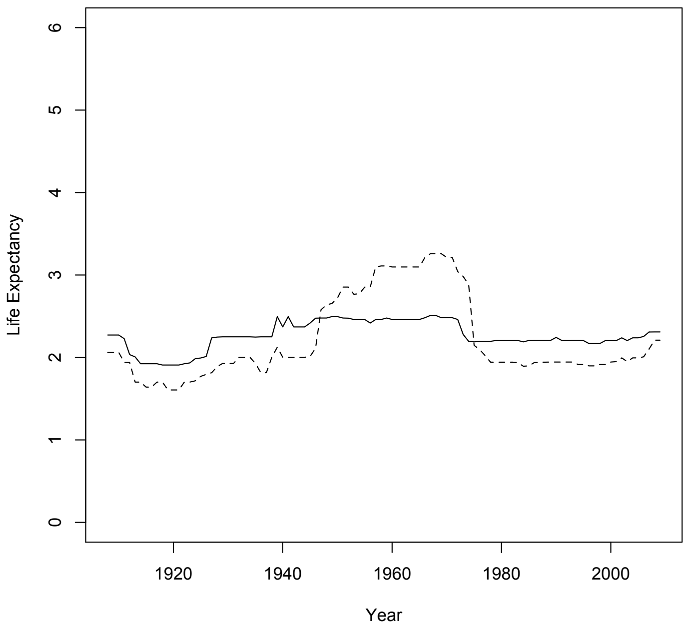

Figure 136: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1908-2009, in Spain.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

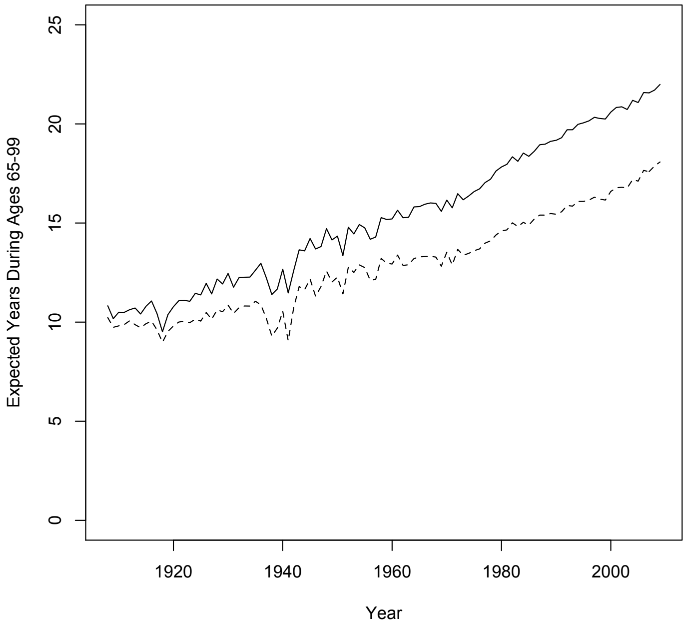

Figure 137: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1908-2009, in Spain.

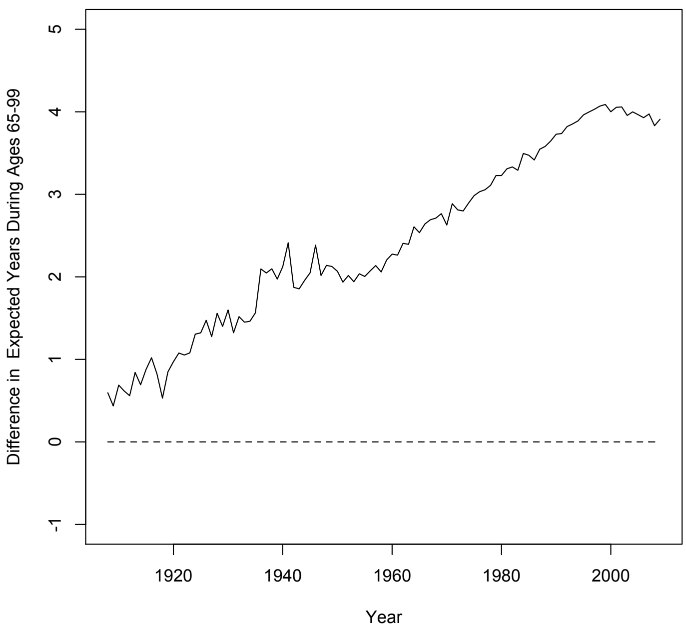

Figure 138: Difference in Female and Male Expected Years in Ages 65-99, in 1908-2009, in Spain.

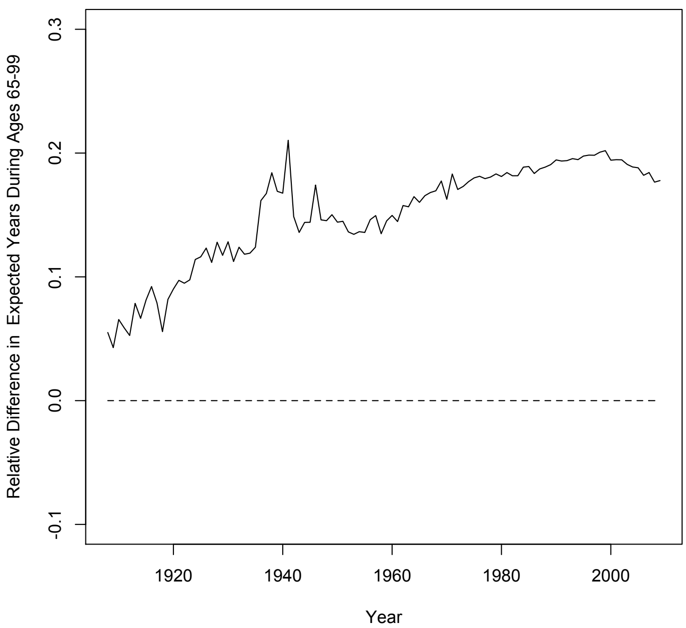

Figure 139: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1908-2009, in Spain.

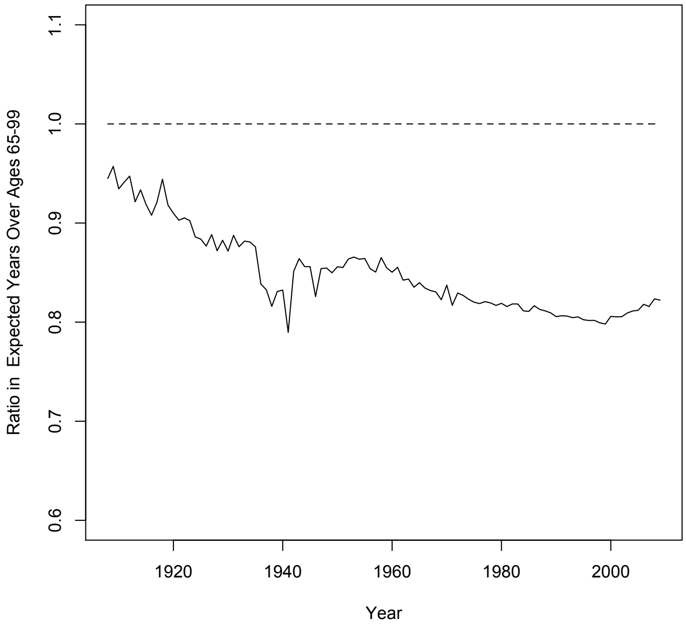

Figure 140: Ratio of Male and Female Expected Years in Ages 65-99, in 1908-2009, in Spain.

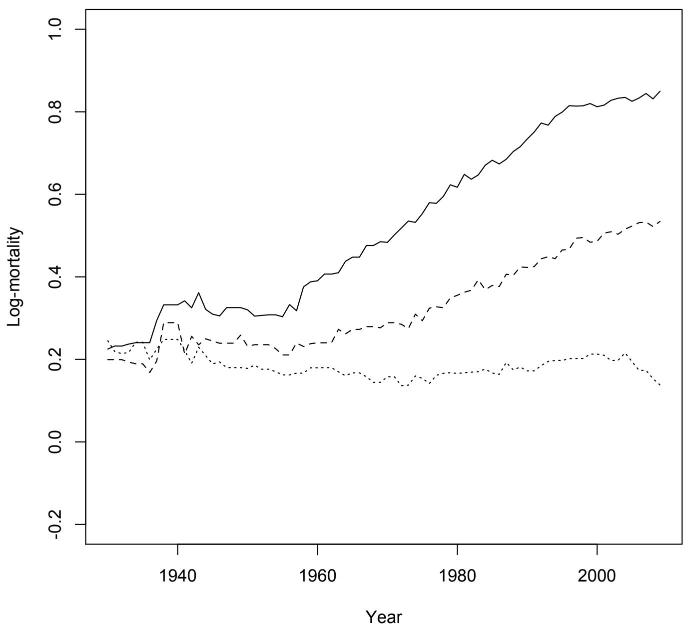

Figure 141: Difference in Smoothed Male and Female Log-mortality in Ages 65-74 (Solid), 75-84 (Dashed) and 85-99 (Dotted), in 1908-2009, in Spain.

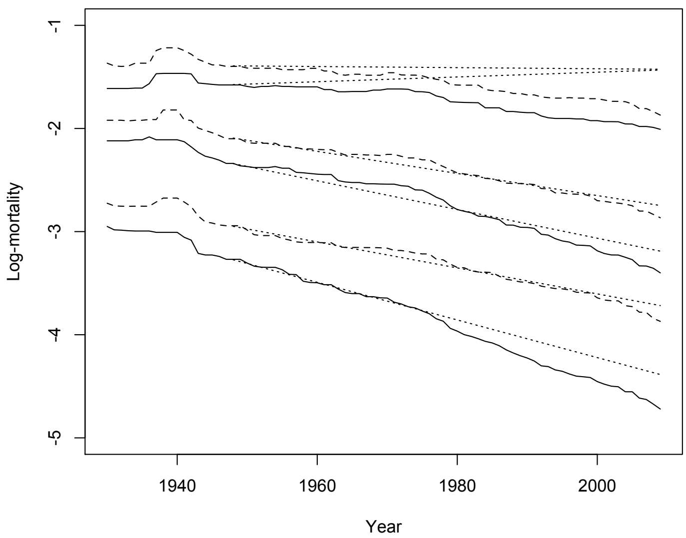

Figure 142: Smoothed Female (Solid) and Male (Dashed) Log-mortality, with Forecasts (Dotted), in Ages 65-74 (Bottom), 75-84 (Middle) and 85-99 (Top), in 1908-2009, in Spain.

Running median of width 7 was used. Female mortality started to decline after 1945in all ages, but especially fast in younger ages, male mortality after 1960.

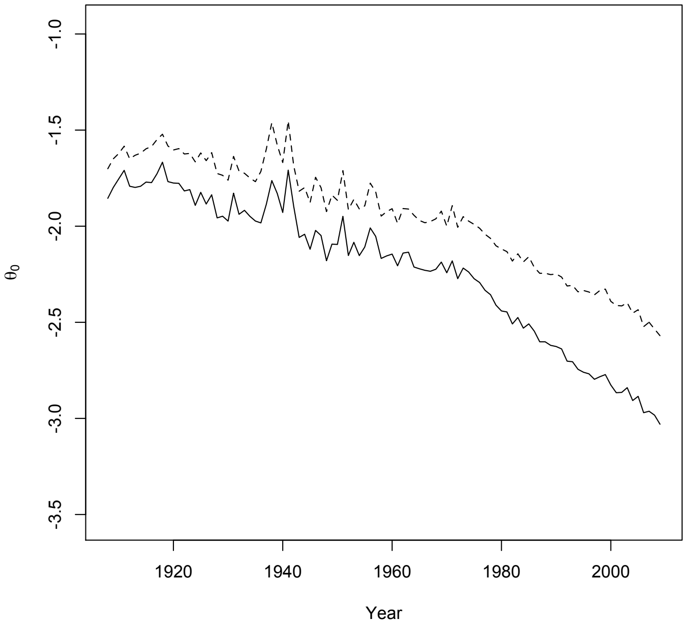

Figure 143: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1908-2009, for Females (Solid), and Males (Dashed), in Spain.

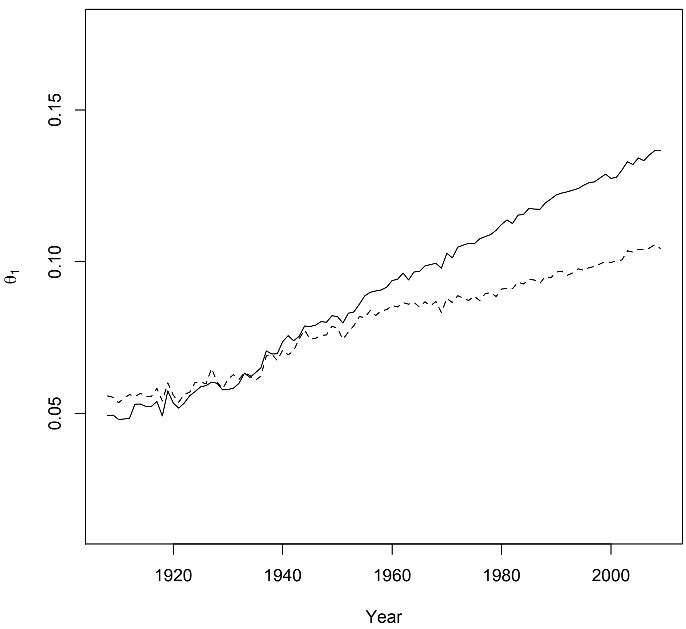

Figure 144: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Spain in 1908-2009, for Females (Solid), and Males (Dashed), in Spain.

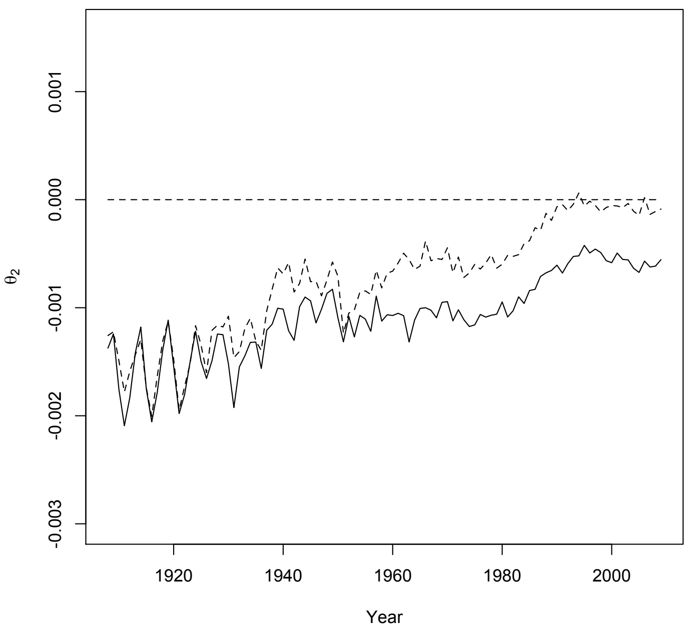

Figure 145: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1908-2009, for Females (Solid), and Males (Dashed), in Spain.

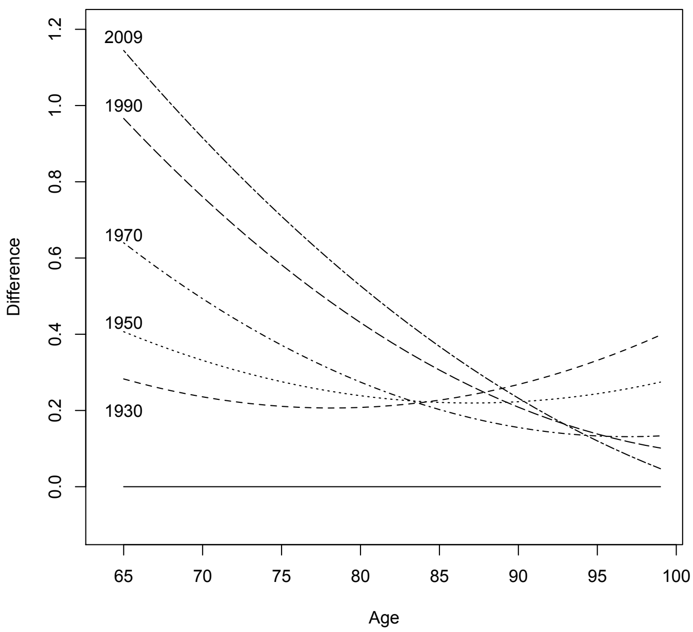

Figure 146: Male-Female Difference in the Loglinear Predictor in 1930, 1950, 1970, 1990, and 2009, in Spain.

5.5 Central European Countries

5.5.1 Austria 1947-2010

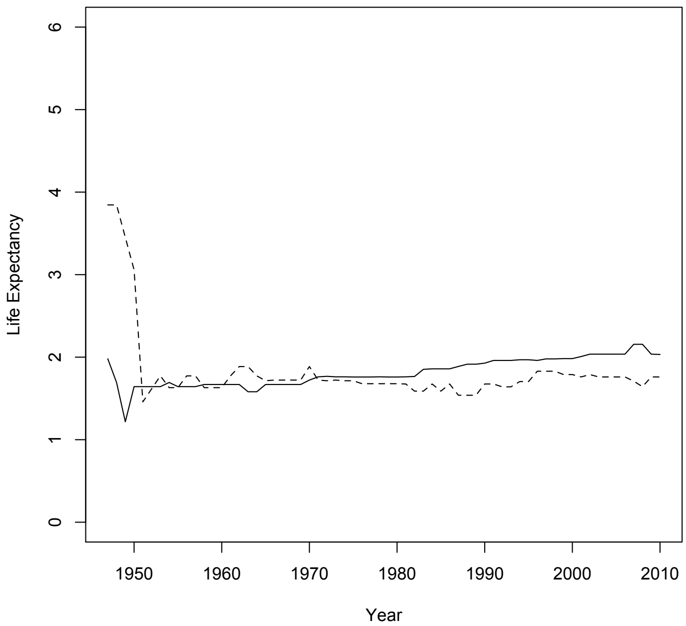

Figure 147: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1947-2010, in Austria.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

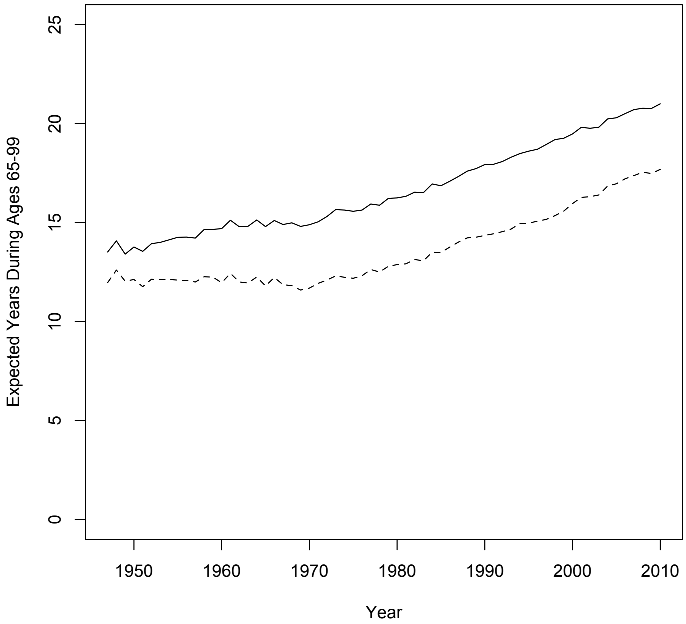

Figure 148: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1947-2010, in Austria.

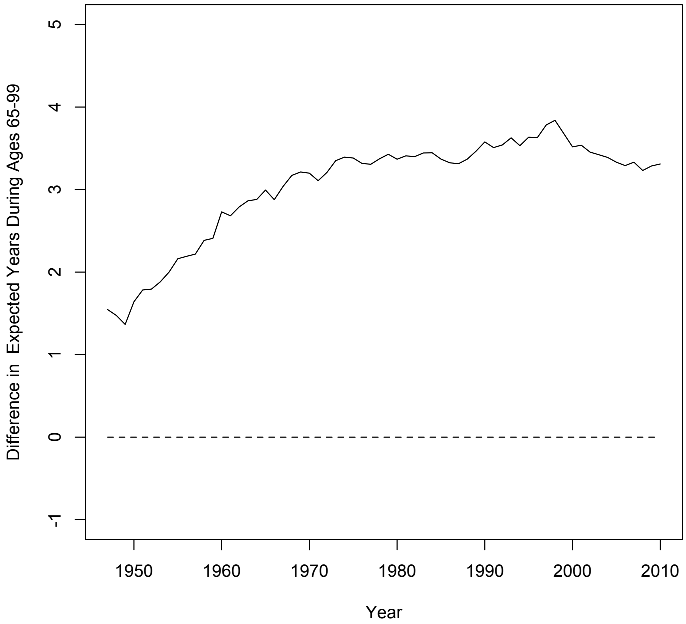

Figure 149: Difference in Female and Male Expected Years in Ages 65-99, in 1947-2010, in Austria.

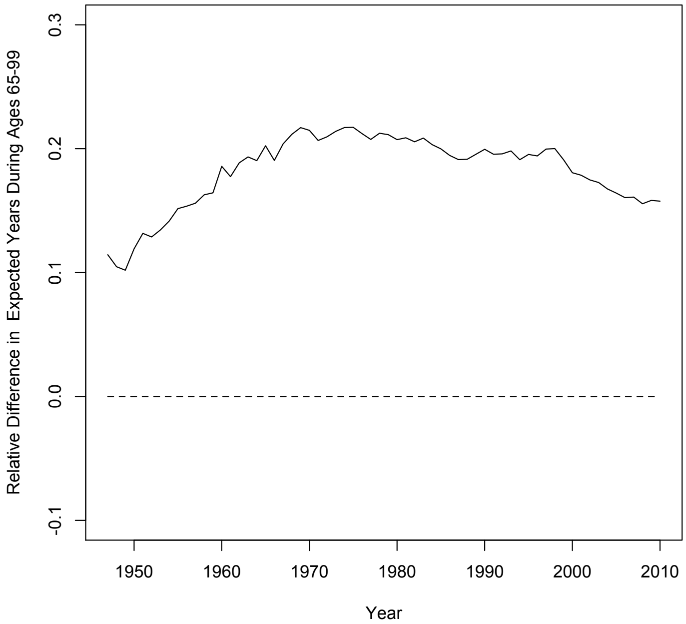

Figure 150: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1947-2010, in Austria.

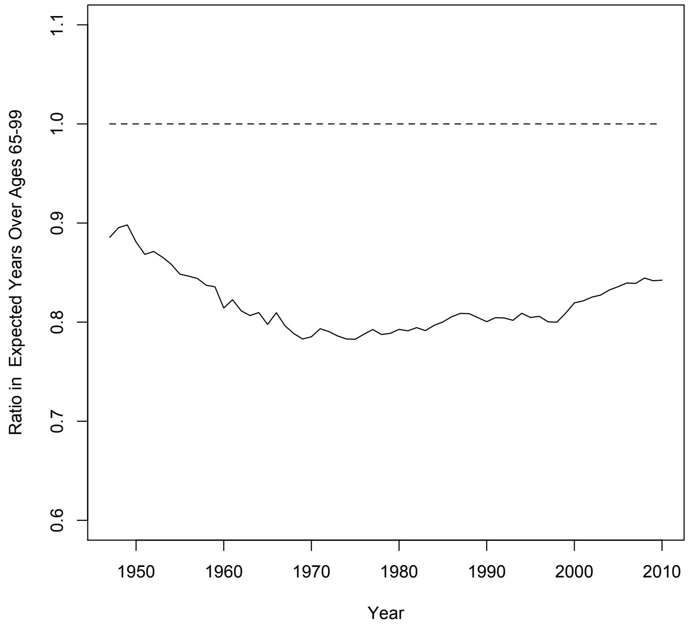

Figure 151: Ratio of Male and Female Expected Years in Ages 65-99, in 1947-2010, in Austria.

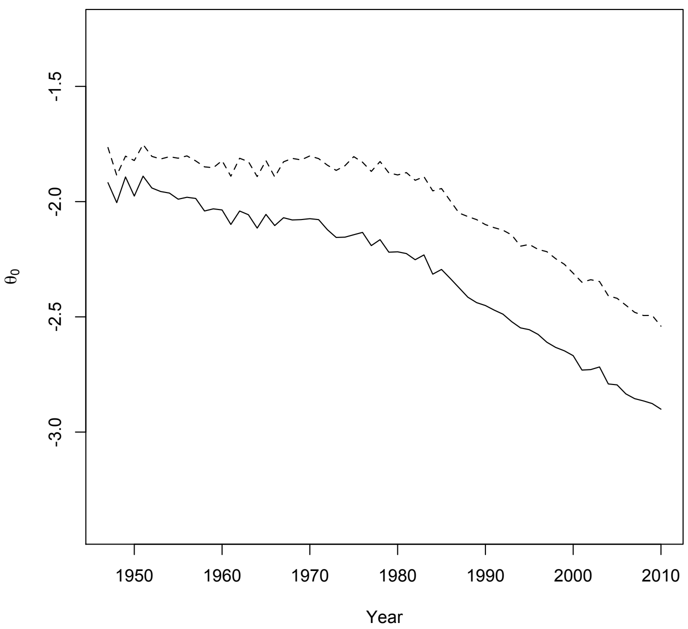

Figure 152: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1947-2010, for Females (Solid), and Males (Dashed), in Austria.

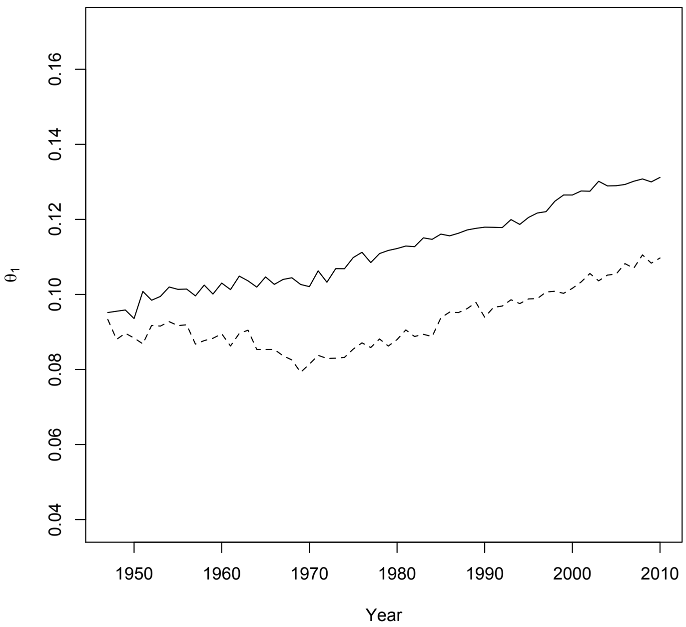

Figure 153: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Austria in 1947-2010, for Females (Solid), and Males (Dashed), in Austria.

Figure 154: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1947-2010, for Females (Solid), and Males (Dashed), in Austria.

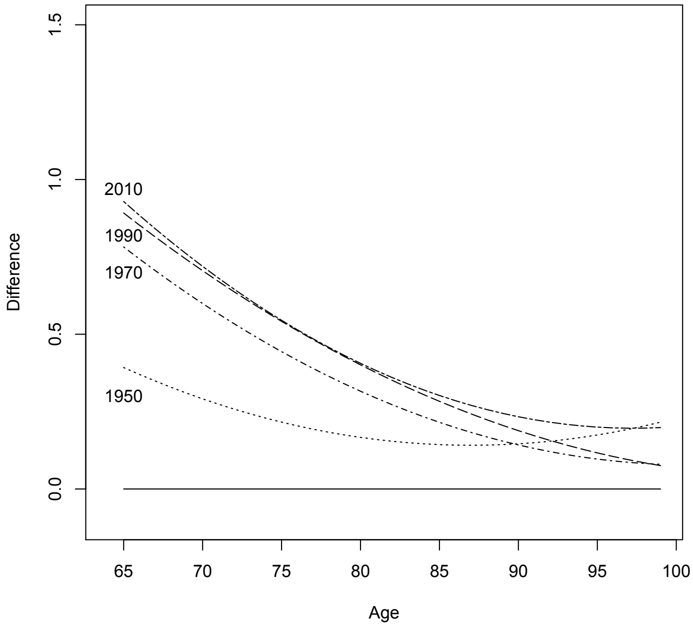

Figure 155: Male-Female Difference in the Loglinear Predictor in 1950, 1970, 1990, and 2010, in Austria.

5.5.2 East-Germany 1956-2011

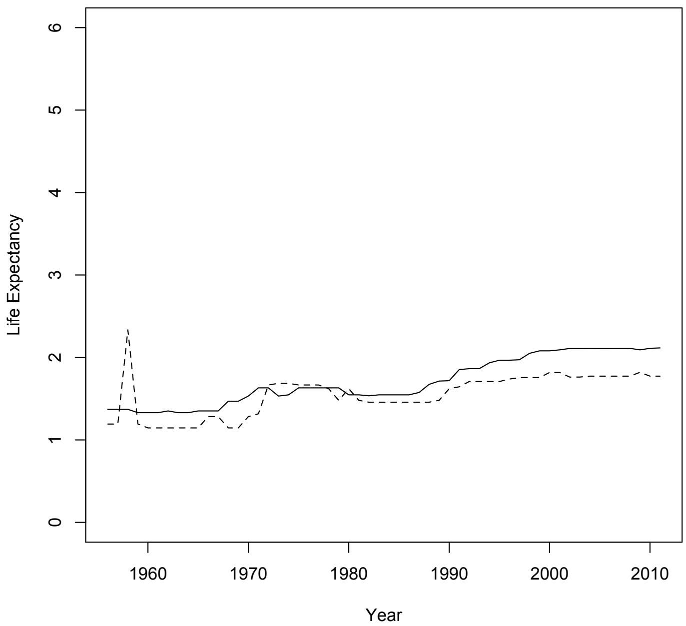

Figure 156: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1956-2011, in East-Germany.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

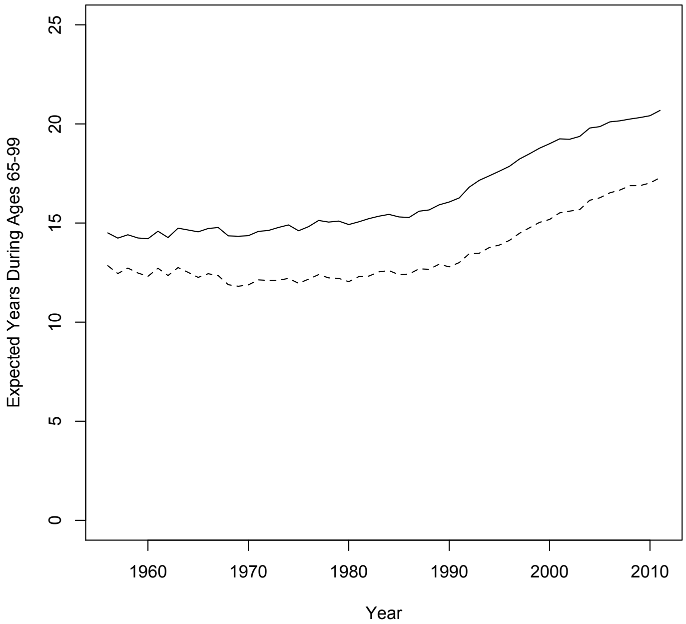

Figure 157: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1956-2011, in East-Germany.

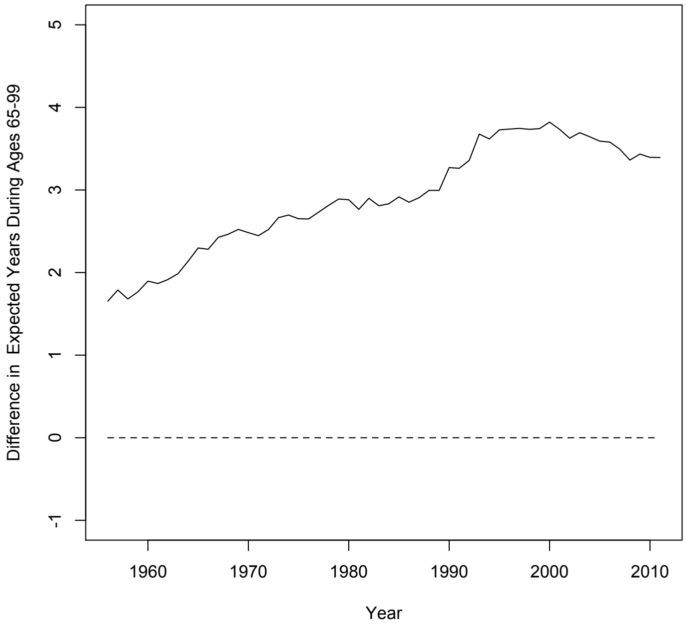

Figure 158: Difference in Female and Male Expected Years in Ages 65-99, in 1956-2011, in East-Germany.

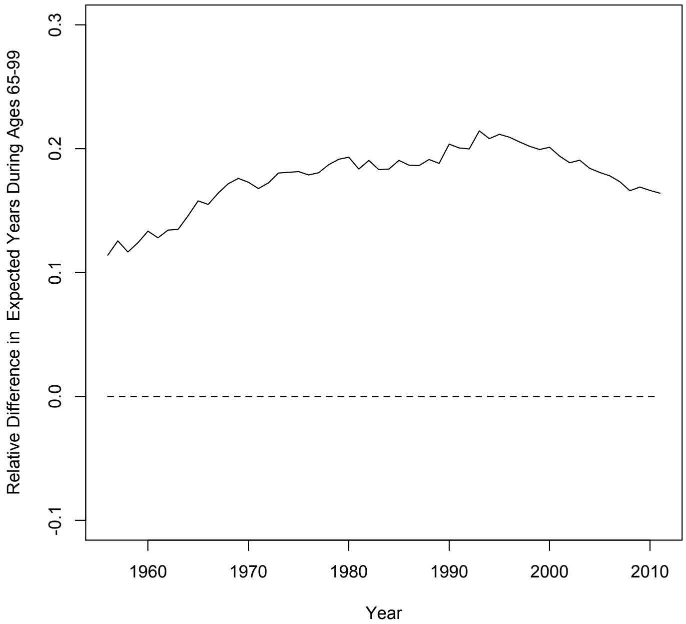

Figure 159: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1956-2011, in East-Germany.

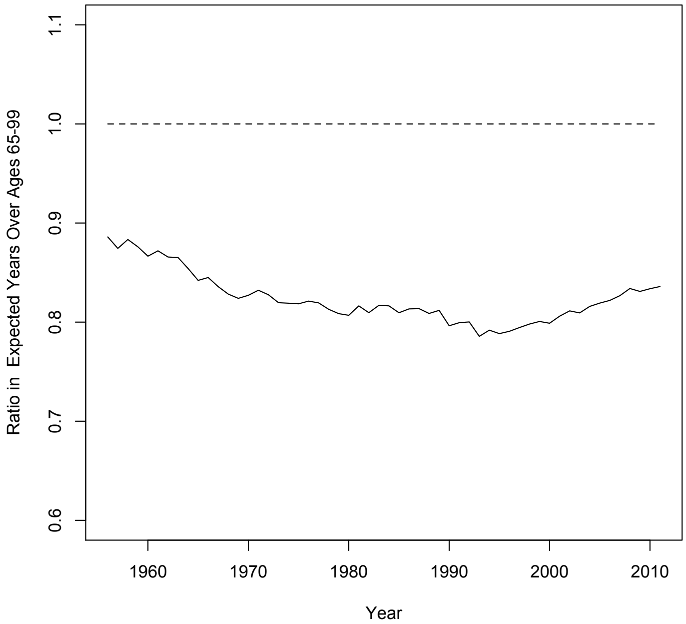

Figure 160: Ratio of Male and Female Expected Years in Ages 65-99, in 1956-2011, in East-Germany.

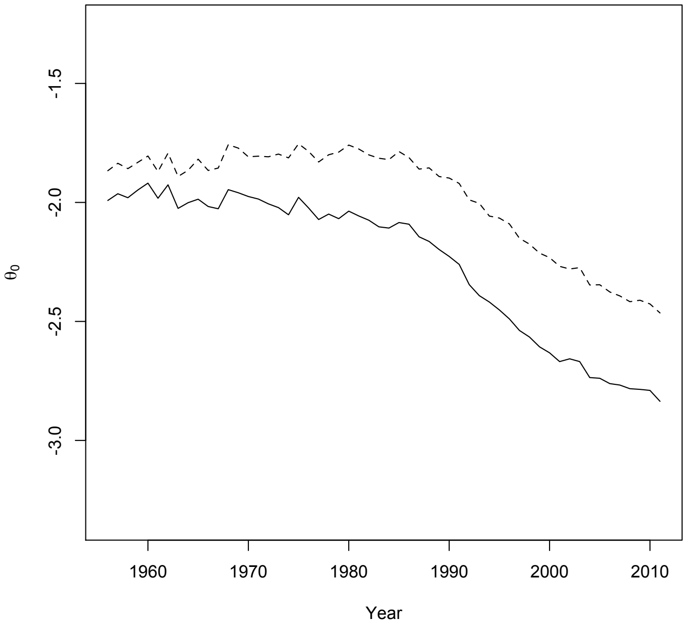

Figure 161: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1956-2011, for Females (Solid), and Males (Dashed), in East-Germany.

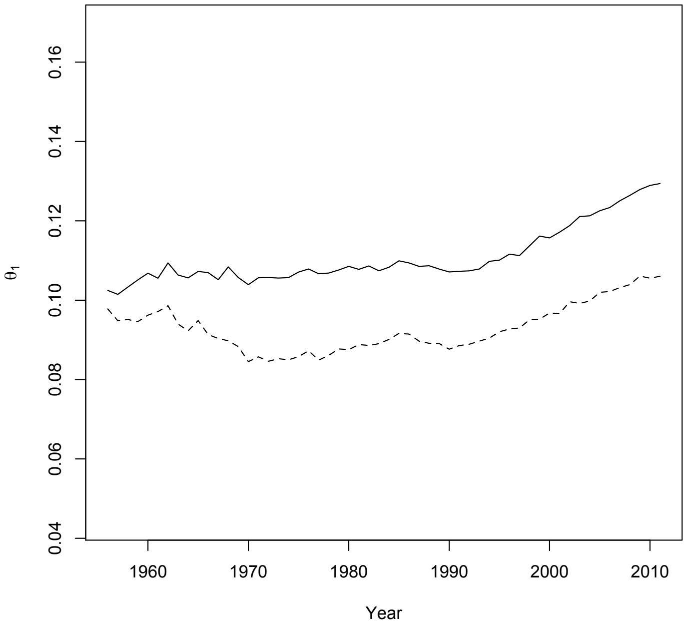

Figure 162: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in East-Germany in 1956-2011, for Females (Solid), and Males (Dashed), in East-Germany.

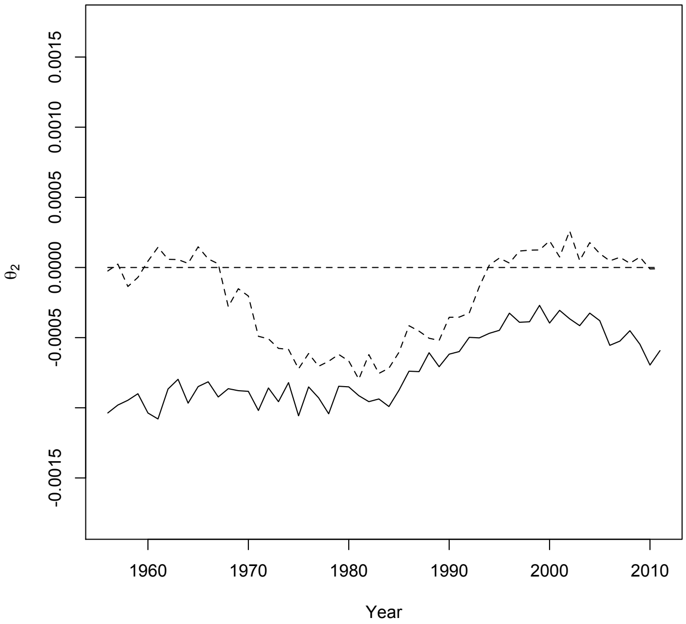

Figure 163: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1956-2011, for Females (Solid), and Males (Dashed), in East-Germany.

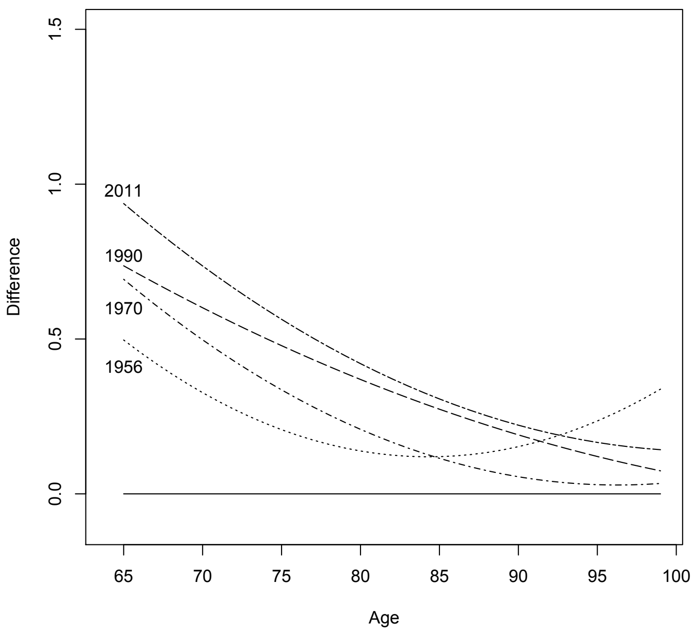

Figure 164: Male-Female Difference in the Loglinear Predictor in 1956, 1970, 1990, and 2011, in East-Germany.

5.5.3 West-Germany 1956-2011

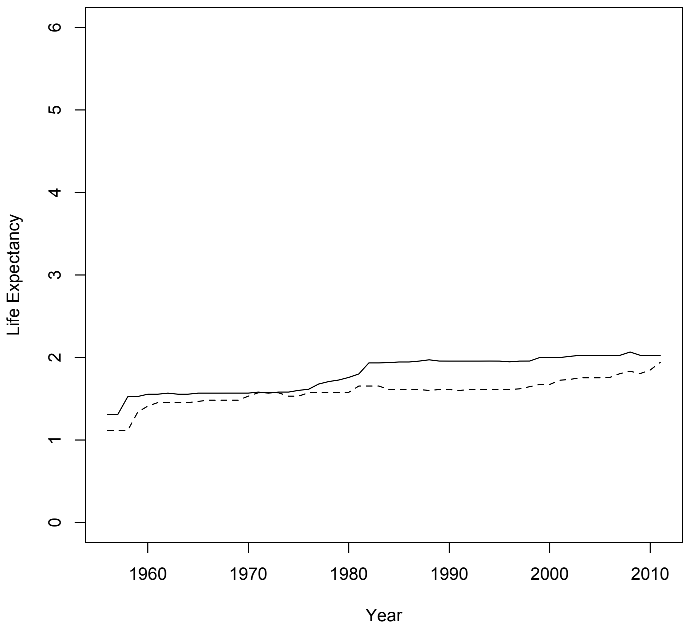

Figure 165: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1956-2011, in West-Germany.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

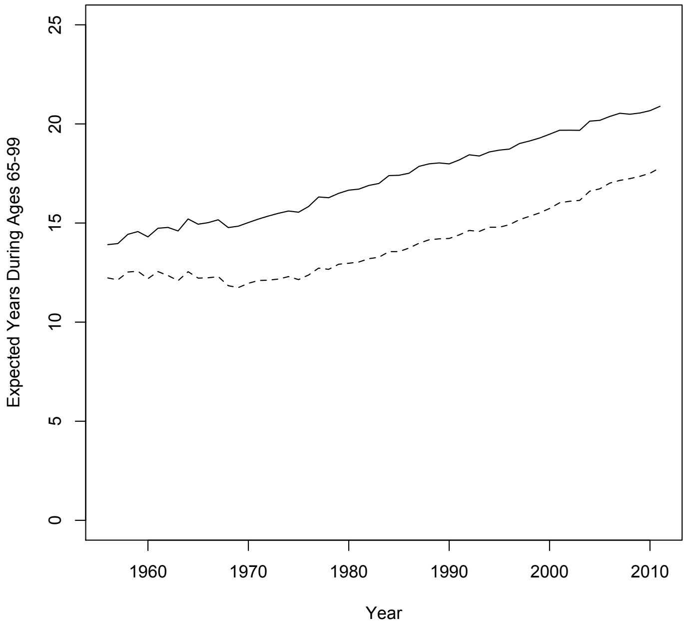

Figure 166: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1956-2011, in West-Germany.

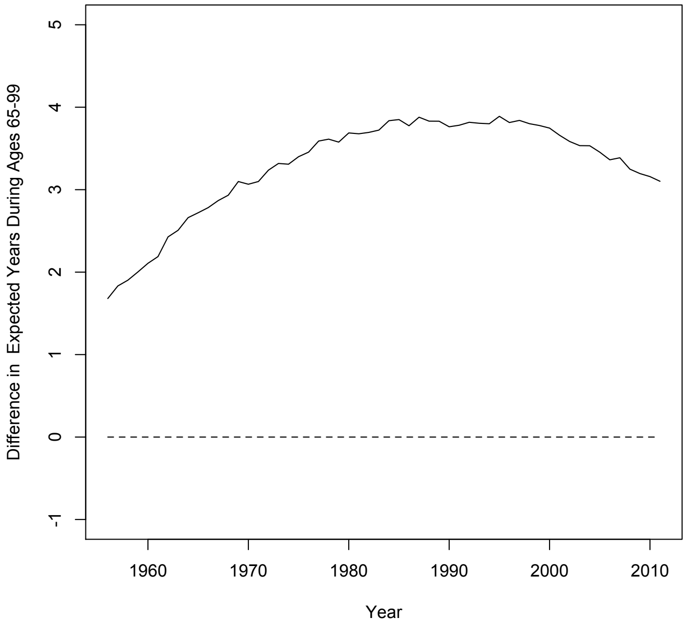

Figure 167: Difference in Female and Male Expected Years in Ages 65-99, in 1956-2011, in West-Germany.

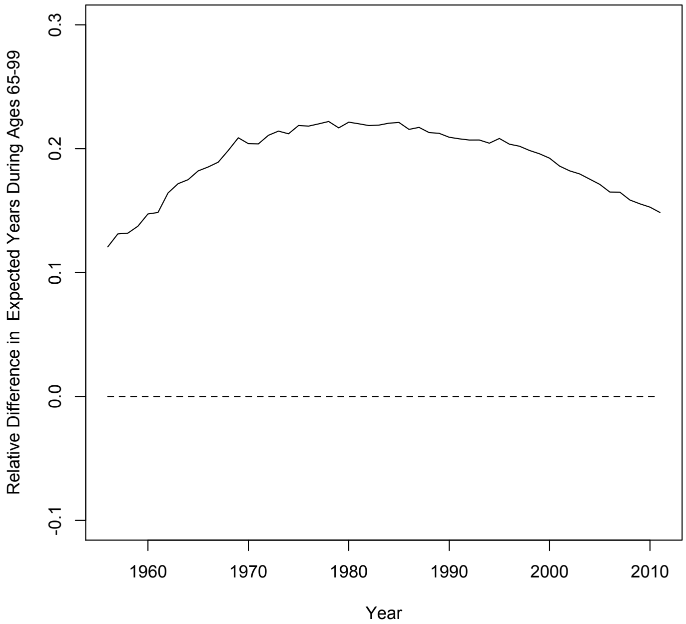

Figure 168: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1956-2011, in West-Germany.

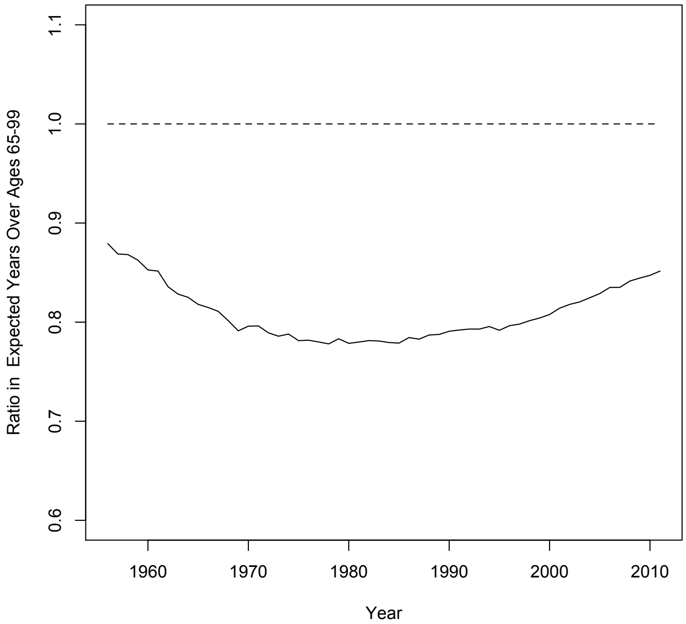

Figure 169: Ratio of Male and Female Expected Years in Ages 65-99, in 1956-2011, in West-Germany.

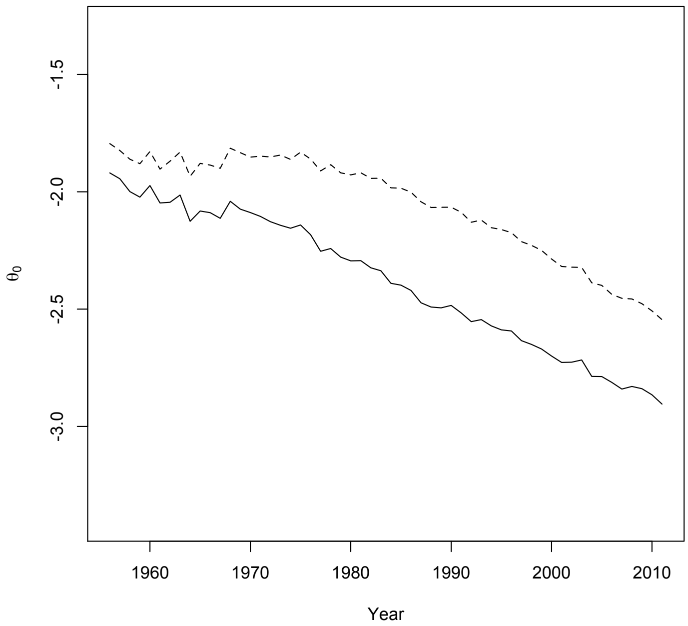

Figure 170: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1956-2011, for Females (Solid), and Males (Dashed), in West-Germany.

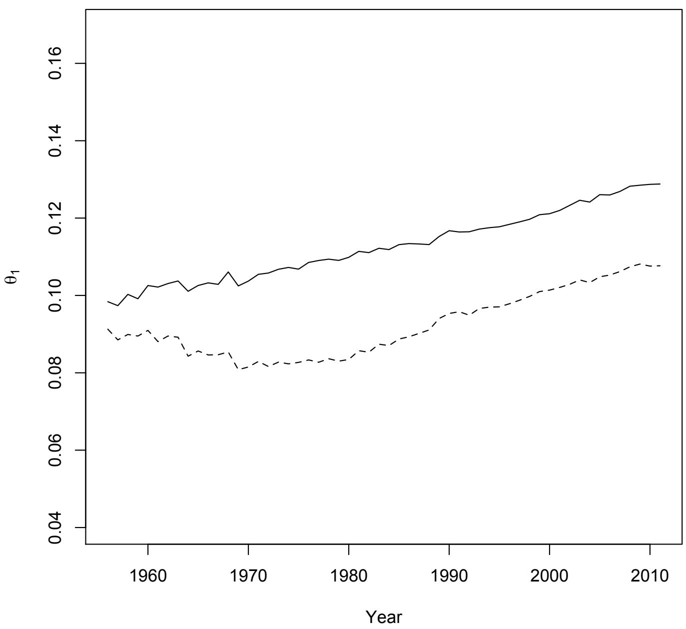

Figure 171: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in 1956-2011, for Females (Solid), and Males (Dashed), in West-Germany.

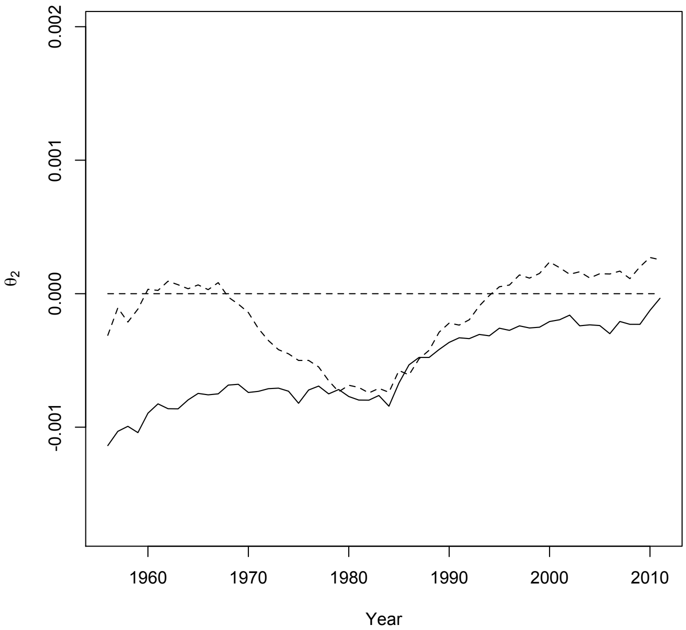

Figure 172: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1956-2011, for Females (Solid), and Males (Dashed), in West-Germany.

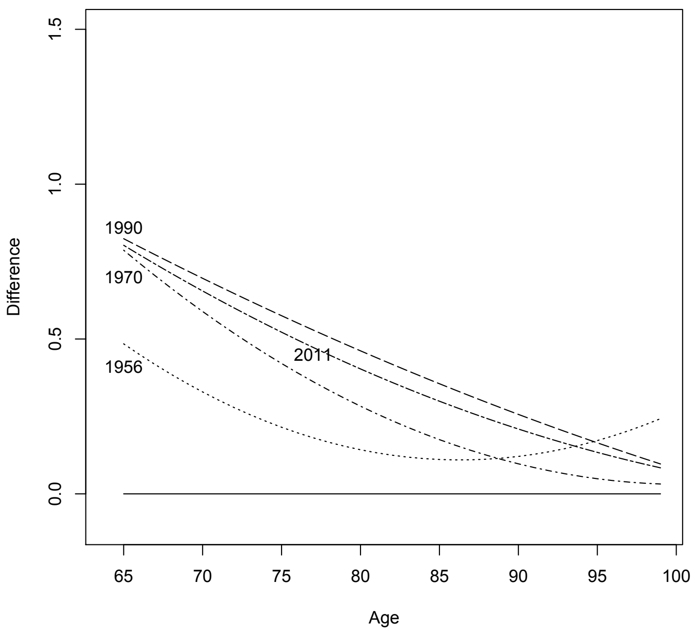

Figure 173: Male-Female Difference in the Loglinear Predictor in 1956, 1970, 1990, and 2011, in West-Germany.

5.5.4 Switzerland 1876-2011

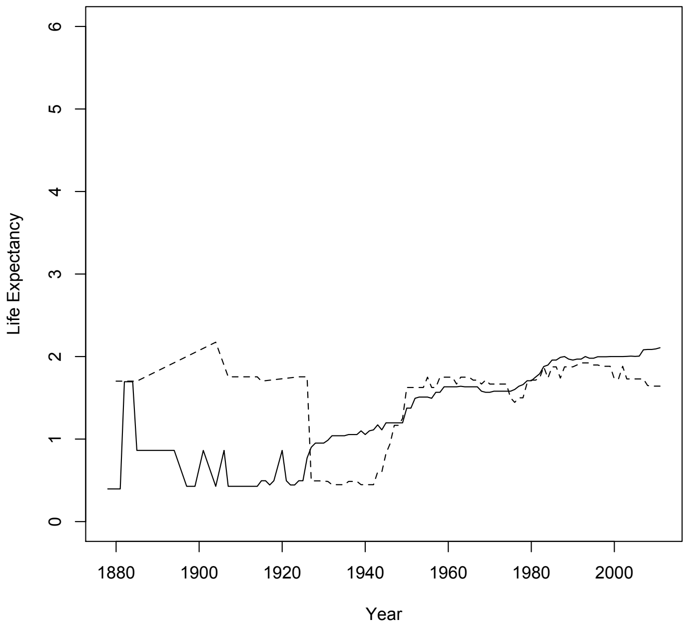

Figure 174: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1876-2011, in Switzerland.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

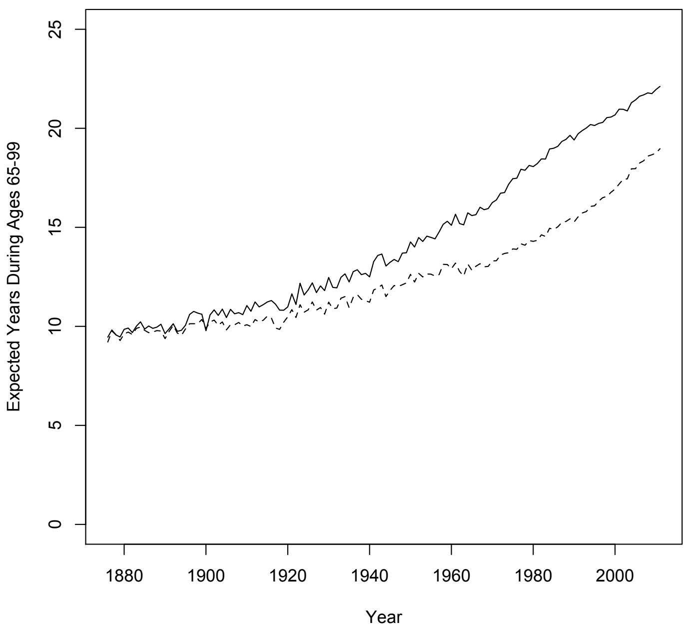

Figure 175: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1876-2011, in Switzerland.

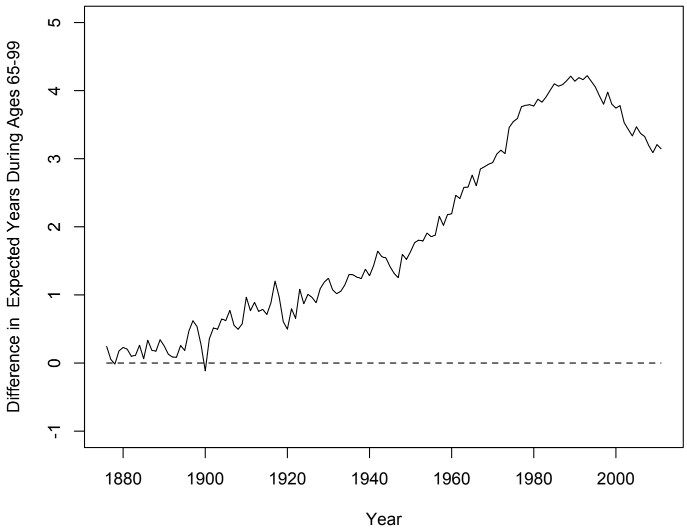

Figure 176: Difference in Female and Male Expected Years in Ages 65-99, in 1876-2011, in Switzerland.

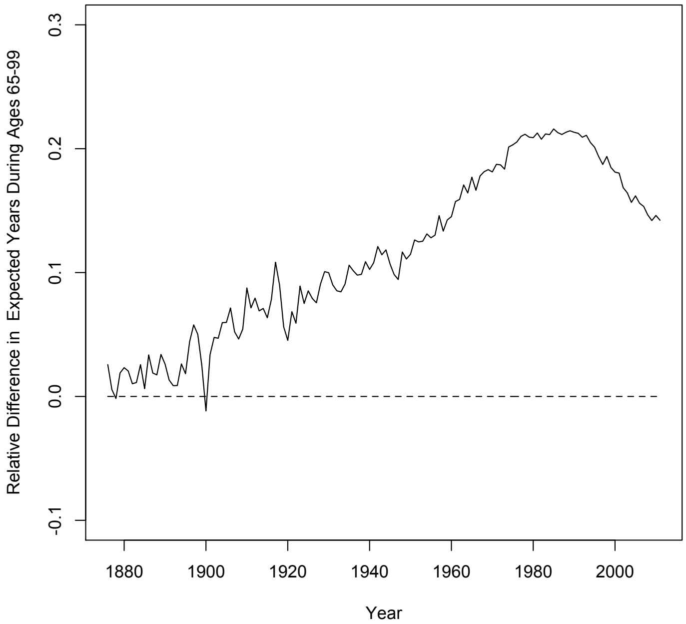

Figure 177: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1876-2011, in Switzerland.

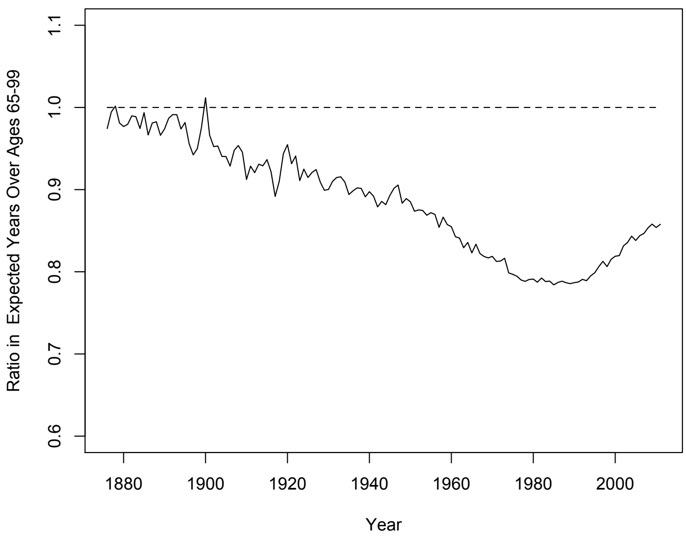

Figure 178: Ratio of Male and Female Expected Years in Ages 65-99, in 1876-2011, in Switzerland.

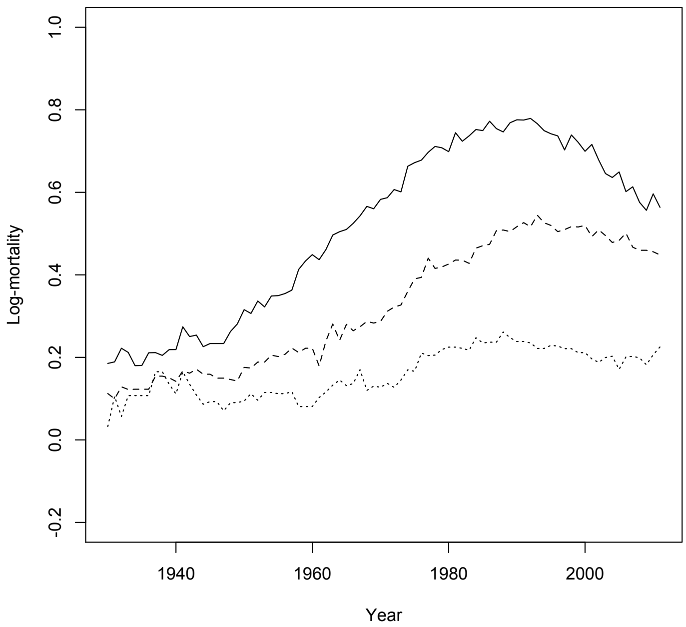

Figure 179: Difference in Smoothed Male and Female Log-mortality in Ages 65-74 (Solid), 75-84 (Dashed) and 85-99 (Dotted), in 1930-2011, in Switzerland.

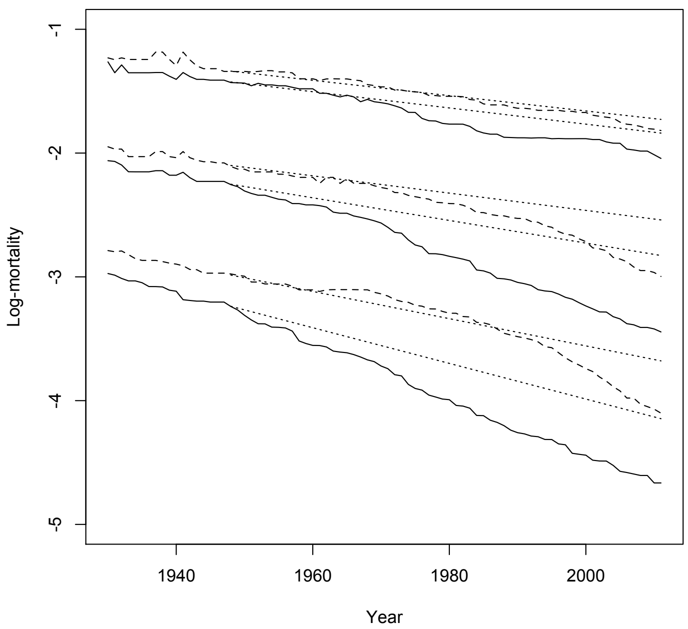

Figure 180: Smoothed Female (Solid) and Male (Dashed) Log-mortality, with Forecasts (Dotted), in Ages 65-74 (Bottom), 75-84 (Middle) and 85-99 (Top), in 1930-2011, in Switzerland.

Running median of width 7 was used. Female mortality started to decline after 1945in all ages, but especially fast in younger ages, male mortality after 1960.

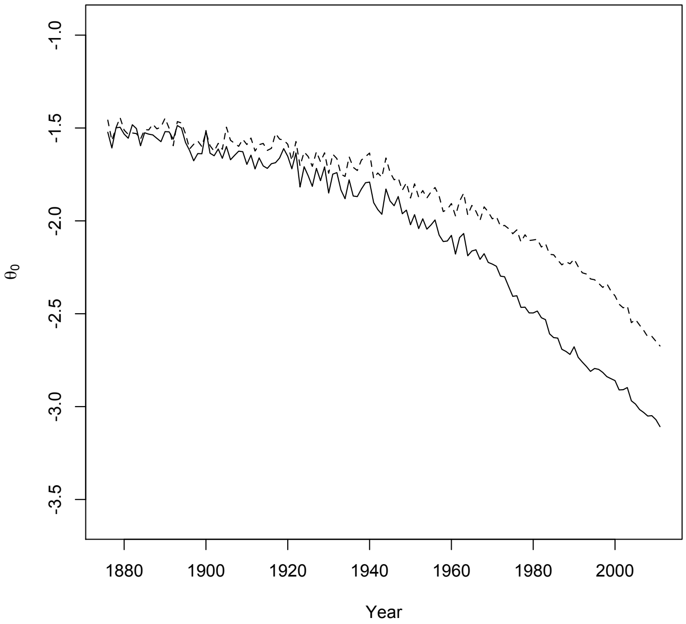

Figure 181: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1876-2011, for Females (Solid), and Males (Dashed), in Switzerland.

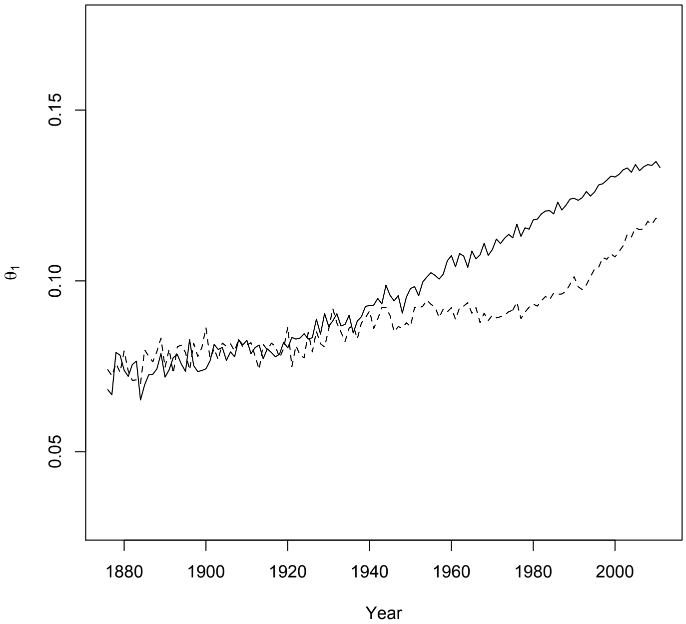

Figure 182: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Switzerland in 1876-2011, for Females (Solid), and Males (Dashed), in Switzerland.

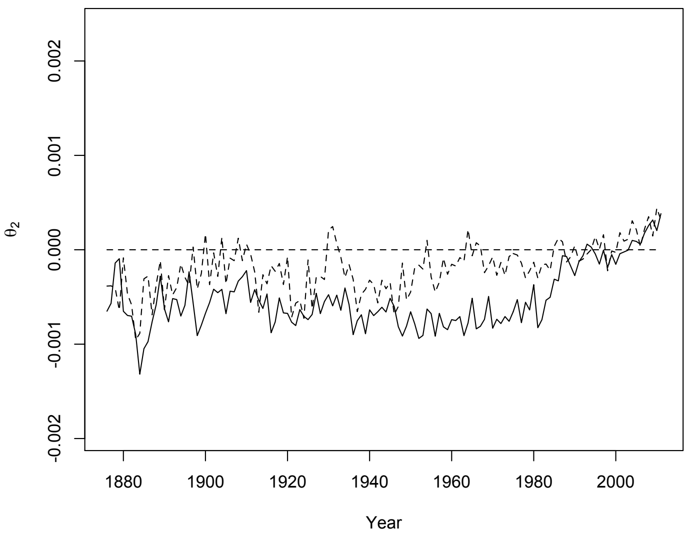

Figure 183: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1876-2011, for Females (Solid), and Males (Dashed), in Switzerland.

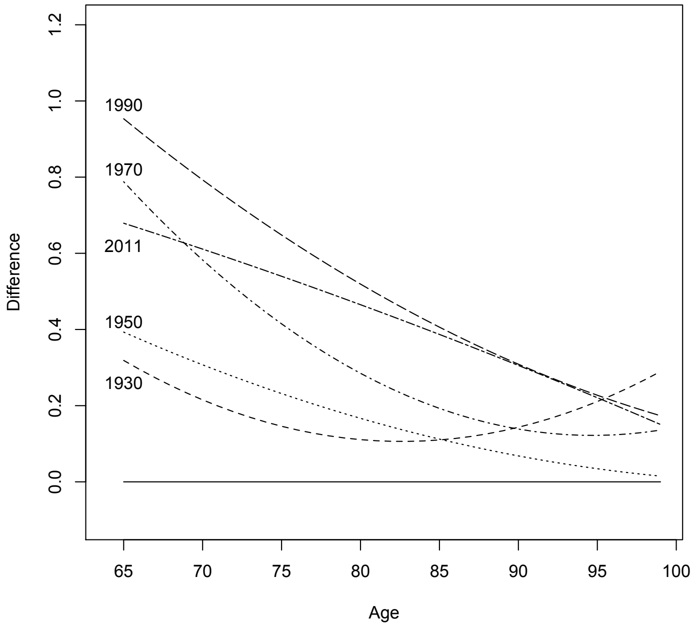

Figure 184: Male-Female Difference in the Loglinear Predictor in 1930, 1950, 1970, 1990, and 2011, in Switzerland.

5.6 Baltic Countries

5.6.1 Estonia 1959-2011

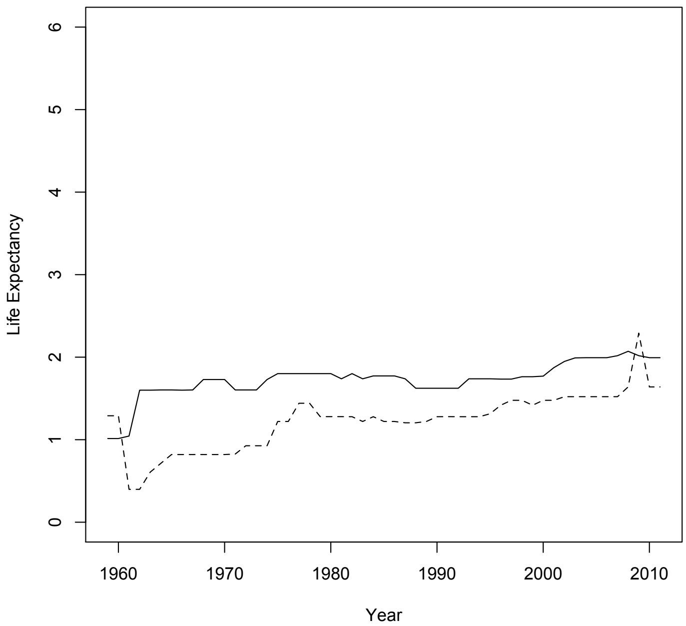

Figure 185: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1959-2011, in Estonia.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

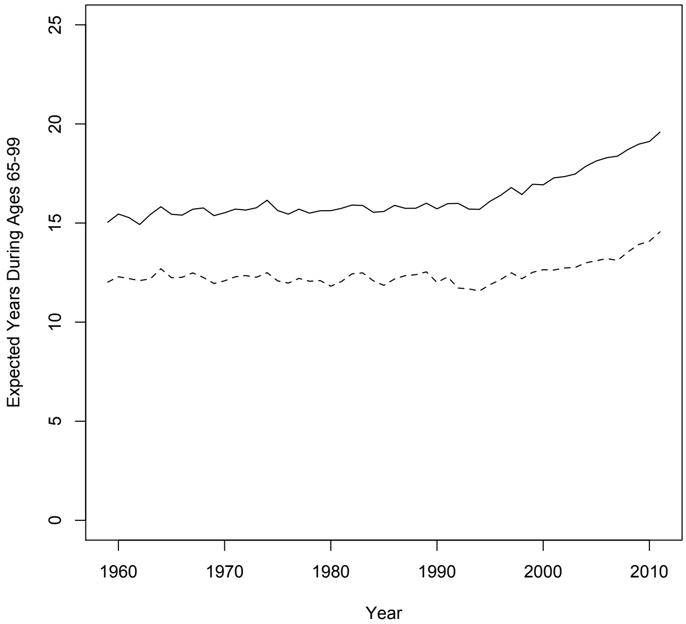

Figure 186: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1959-2011, in Estonia.

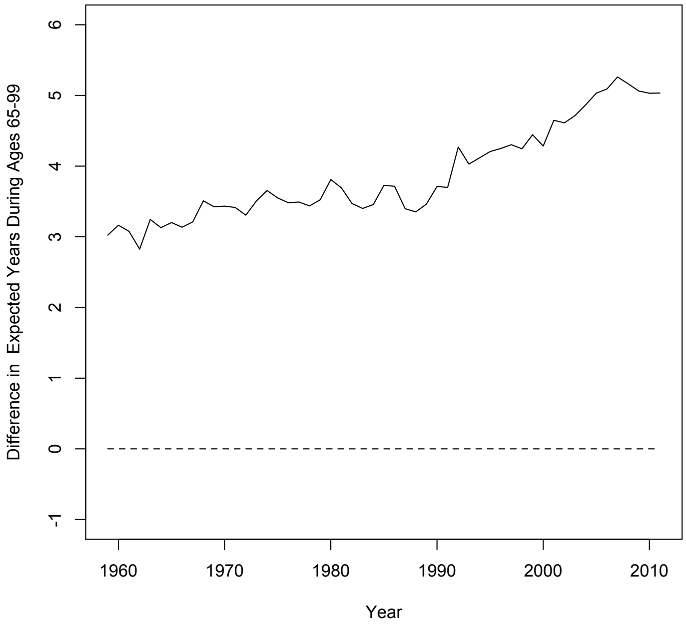

Figure 187: Difference in Female and Male Expected Years in Ages 65-99, in 1959-2011, in Estonia.

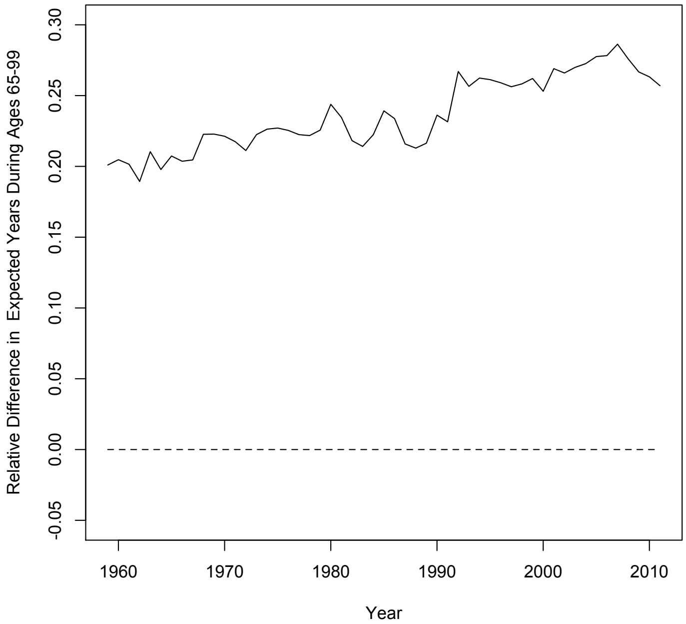

Figure 188: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1959-2011, in Estonia.

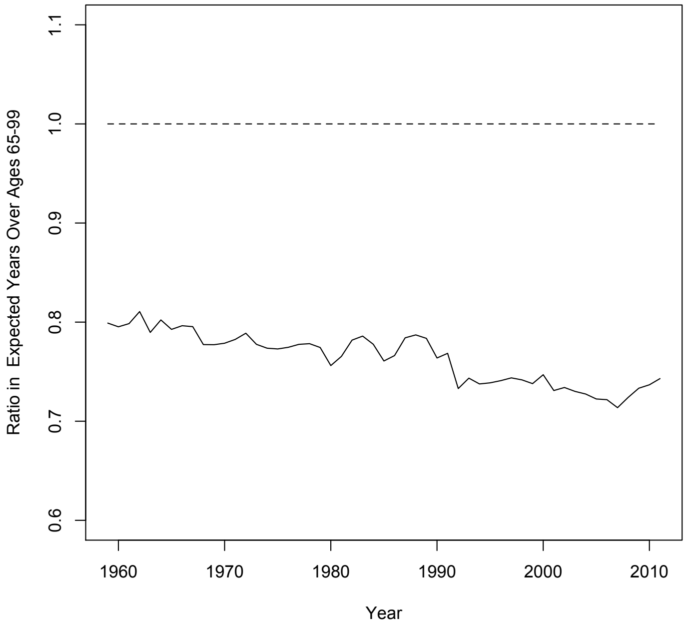

Figure 189: Ratio of Male and Female Expected Years in Ages 65-99, in 1959-2011, in Estonia.

Figure 190: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1959-2011, for Females (Solid), and Males (Dashed), in Estonia.

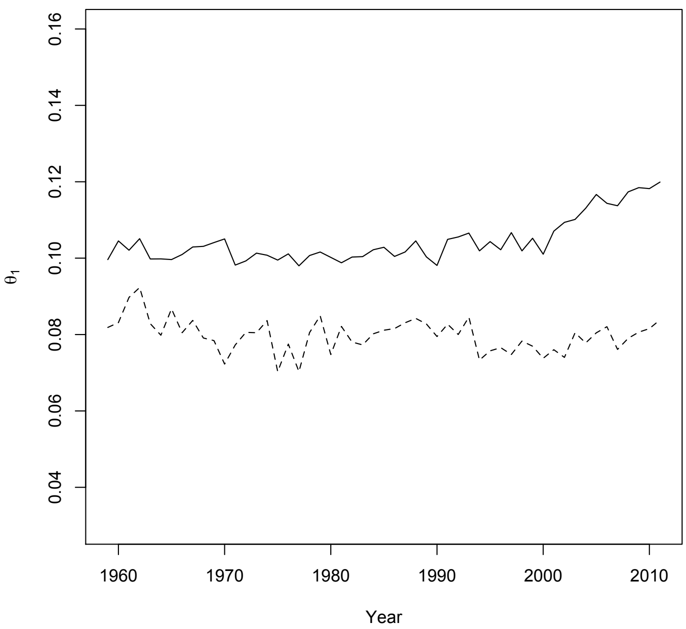

Figure 191: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Estonia in 1959-2011, for Females (Solid), and Males (Dashed), in Estonia.

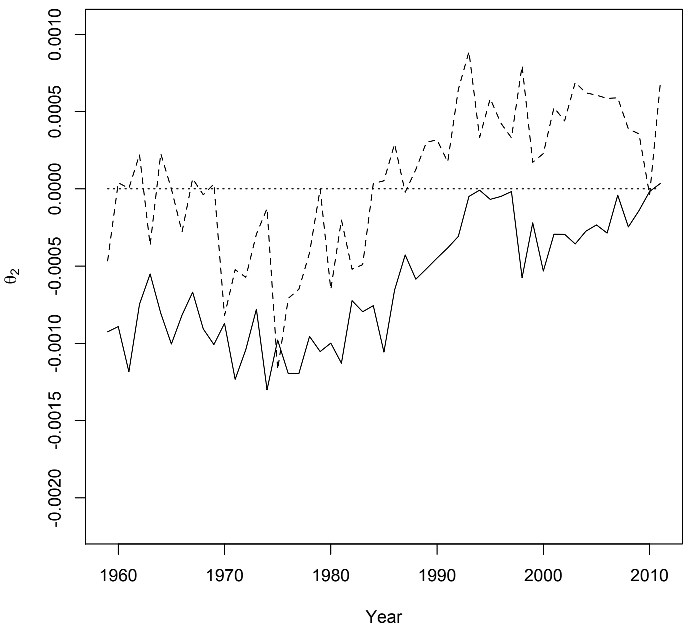

Figure 192: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1959-2011, for Females (Solid), and Males (Dashed), in Estonia.

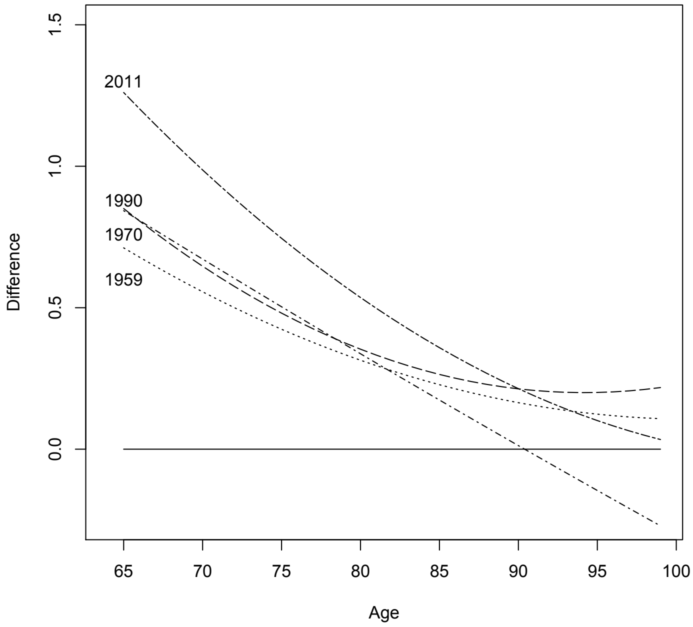

Figure 193: Male-Female Difference in the Loglinear Predictor in 1959, 1970, 1990, and 2011, in Estonia.

5.6.2 Latvia 1959-2011

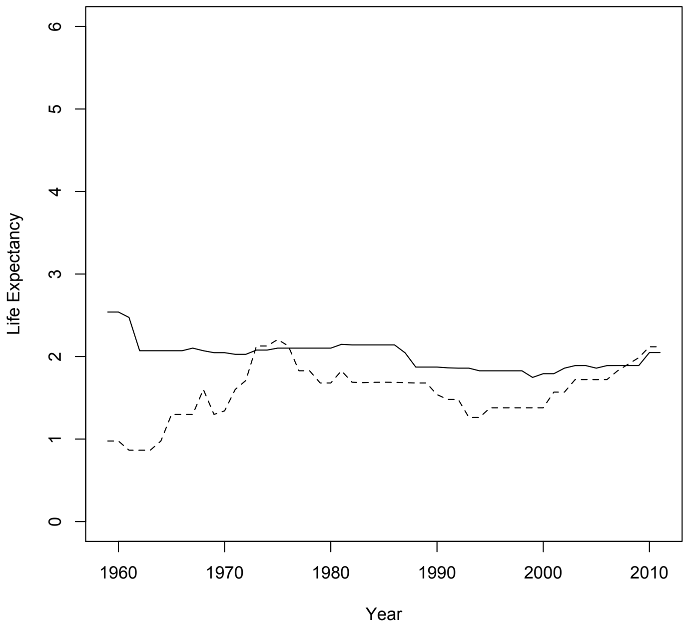

Figure 194: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1959-2011, in Latvia.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

Figure 195: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1959-2011, in Latvia.

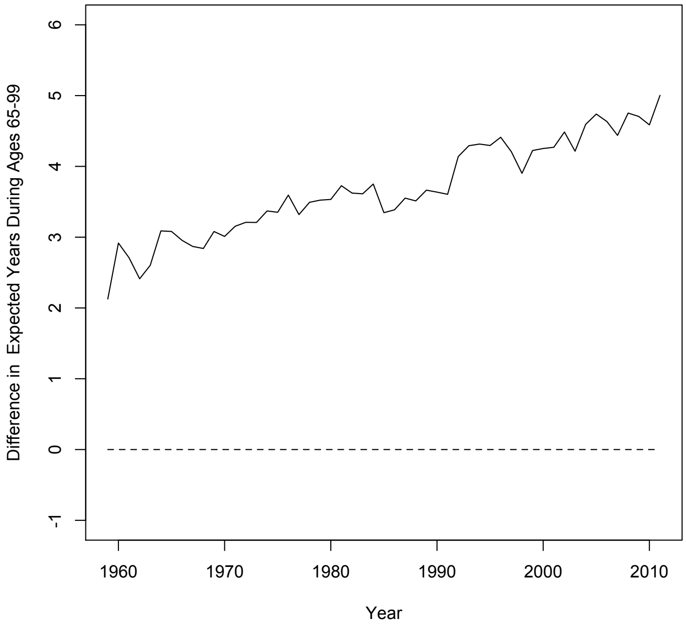

Figure 196: Difference in Female and Male Expected Years in Ages 65-99, in 1959-2011, in Latvia.

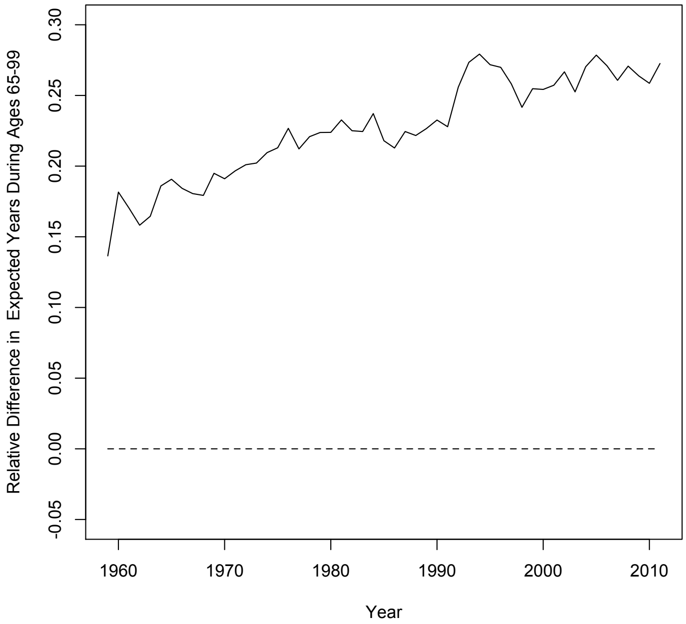

Figure 197: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1959-2011, in Latvia.

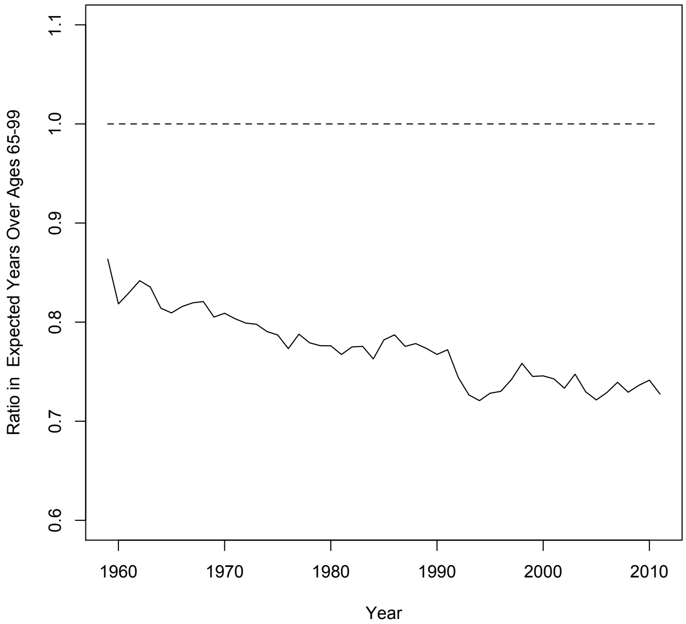

Figure 198: Ratio of Male and Female Expected Years in Ages 65-99, in 1959-2011, in Latvia.

Figure 199: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1959-2011, for Females (Solid), and Males (Dashed), in Latvia.

Figure 200: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Latvia in 1959-2011, for Females (Solid), and Males (Dashed), in Latvia.

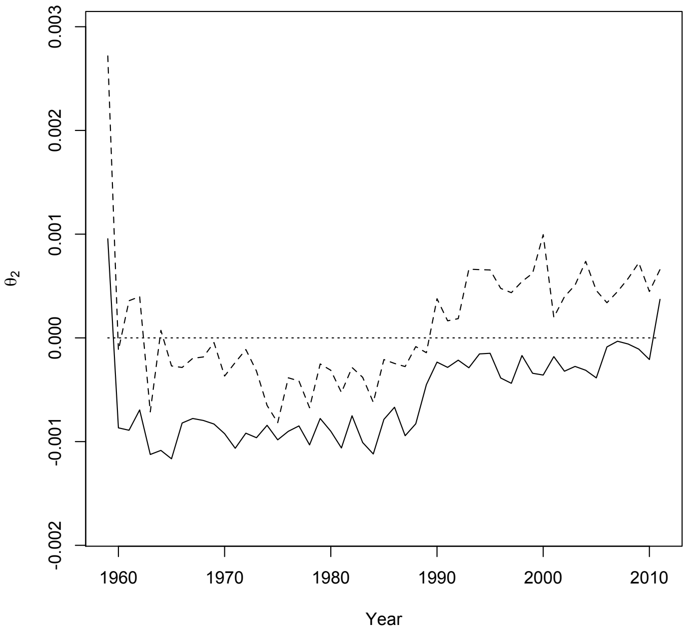

Figure 201: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1959-2011, for Females (Solid), and Males (Dashed), in Latvia.

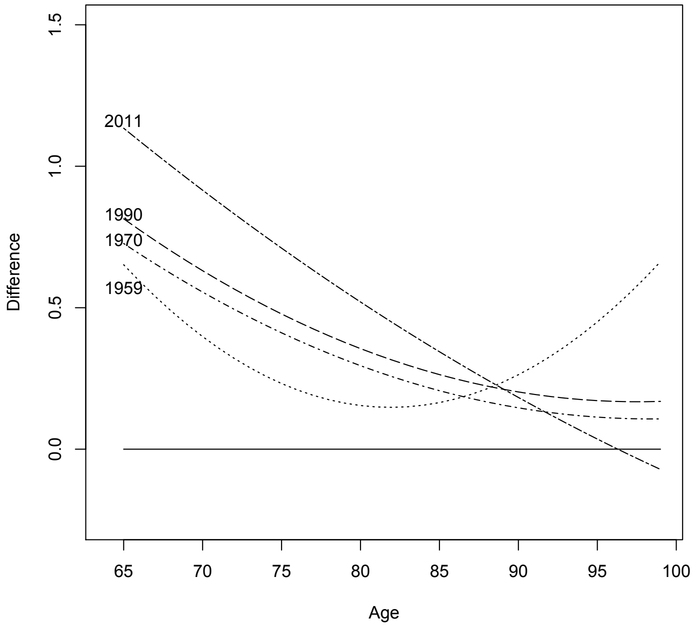

Figure 202: Male-Female Difference in the Loglinear Predictor in 1959, 1970, 1990, and 2011, in Latvia.

5.6.3 Lithuania 1959-2011

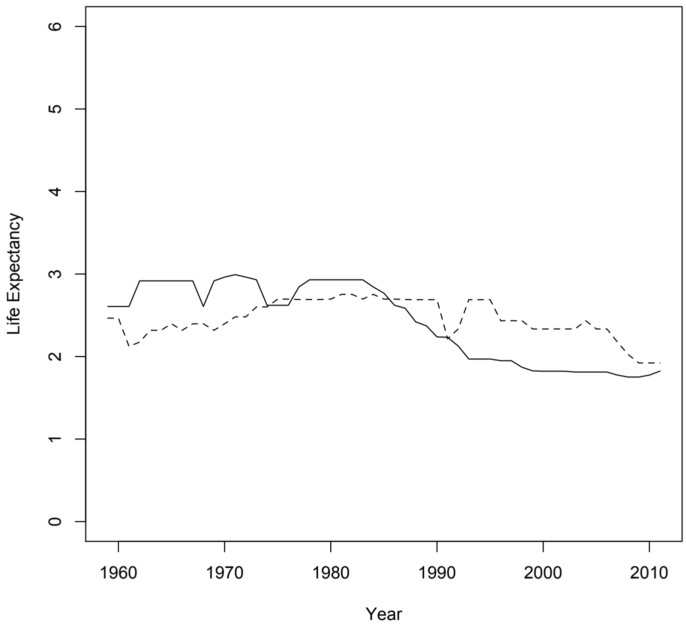

Figure 203: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1959-2011, in Lithuania.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

Figure 204: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1959-2011, in Lithuania.

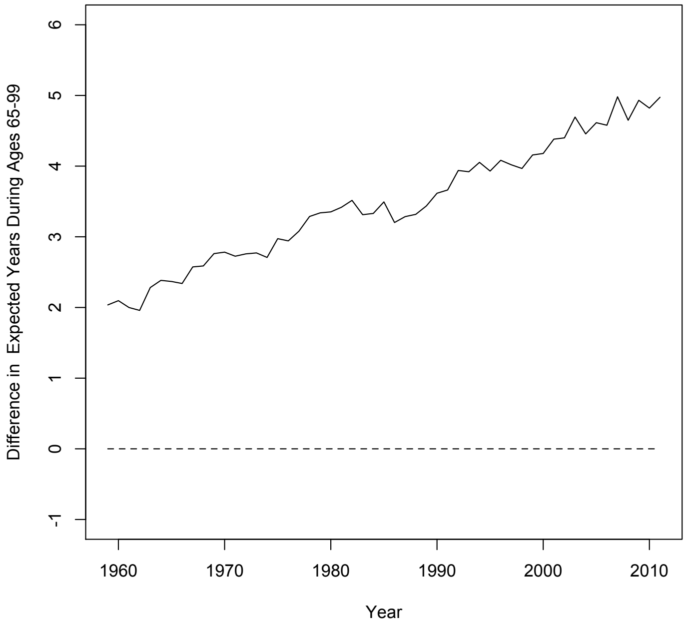

Figure 205: Difference in Female and Male Expected Years in Ages 65-99, in 1959-2011, in Lithuania.

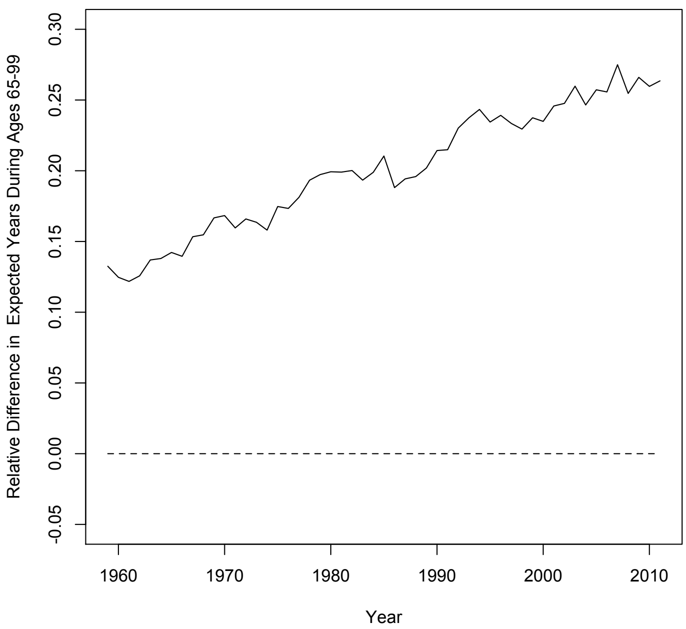

Figure 206: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1959-2011, in Lithuania.

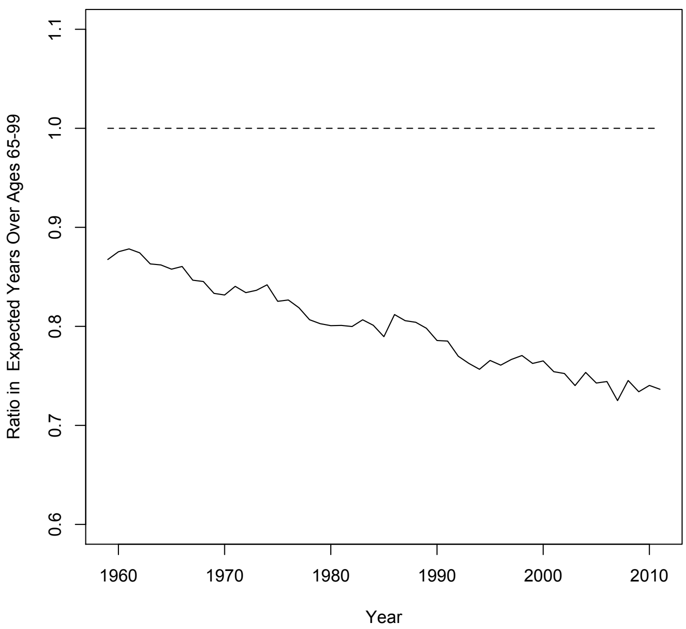

Figure 207: Ratio of Male and Female Expected Years in Ages 65-99, in 1959-2011, in Lithuania.

Figure 208: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1959-2011, for Females (Solid), and Males (Dashed), in Lithuania.

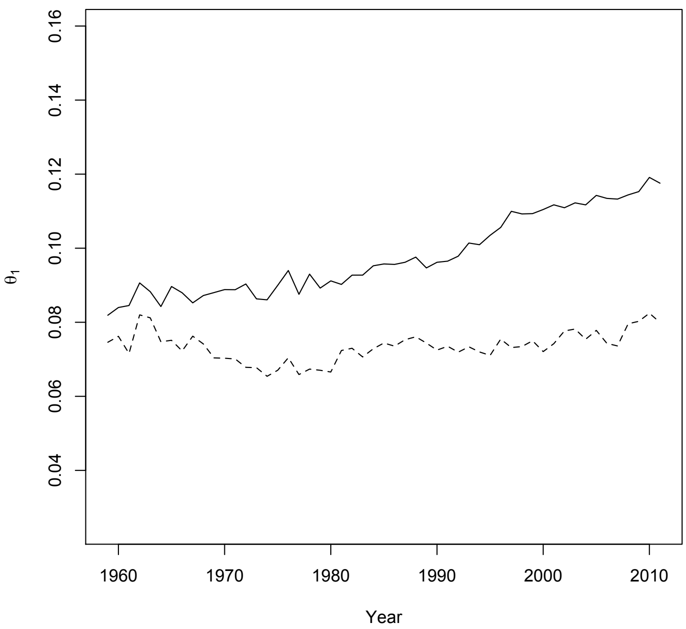

Figure 209: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Lithuania in 1959-2011, for Females (Solid), and Males (Dashed), in Lithuania.

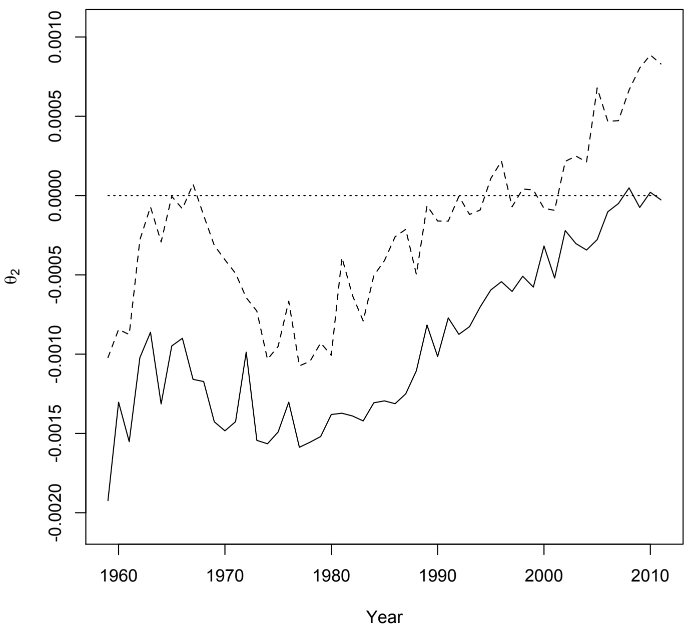

Figure 210: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1959-2011, for Females (Solid), and Males (Dashed), in Lithuania.

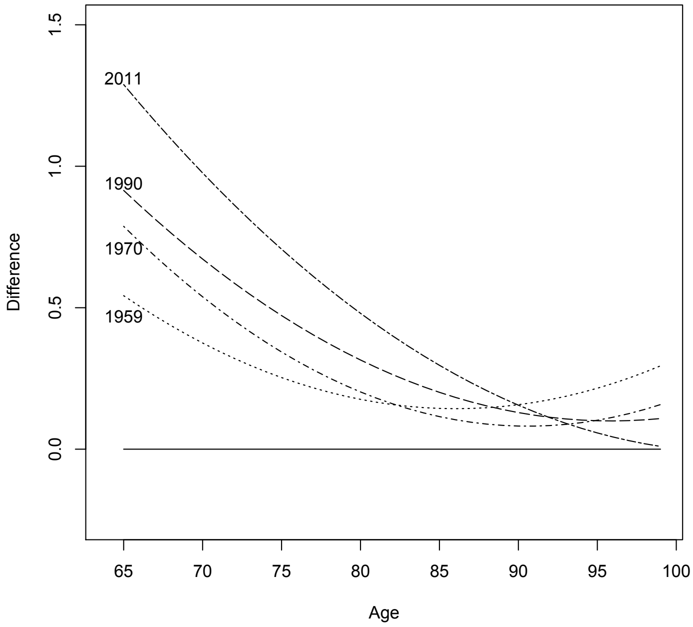

Figure 211: Male-Female Difference in the Loglinear Predictor in 1959, 1970, 1990, and 2011, in Lithuania.

5.6.4 Poland 1958-2009

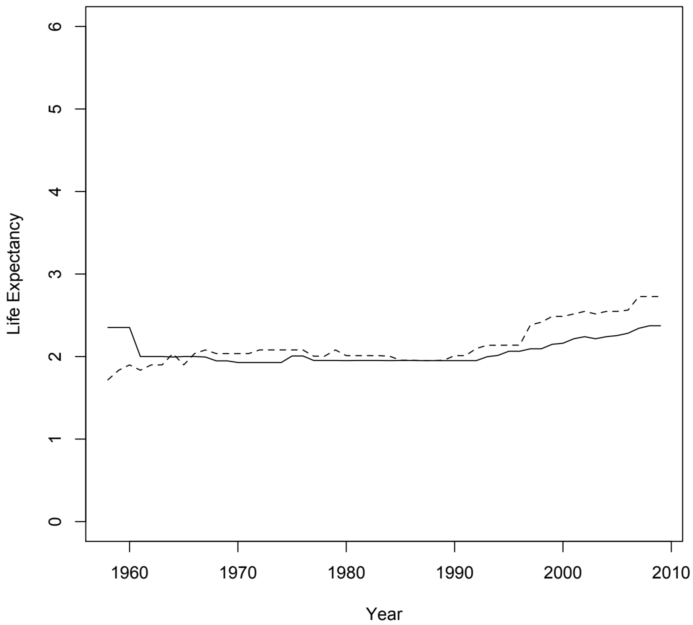

Figure 212: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1958-2009, in Poland.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

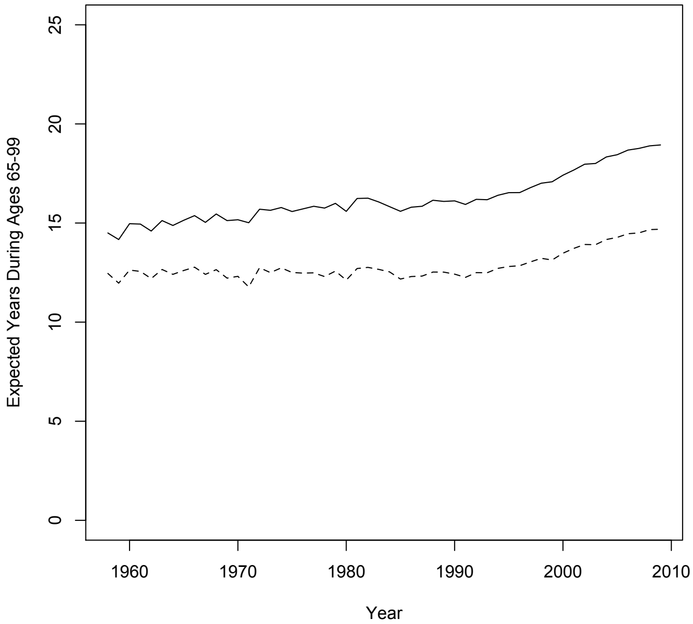

Figure 213: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1958-2009, in Poland.

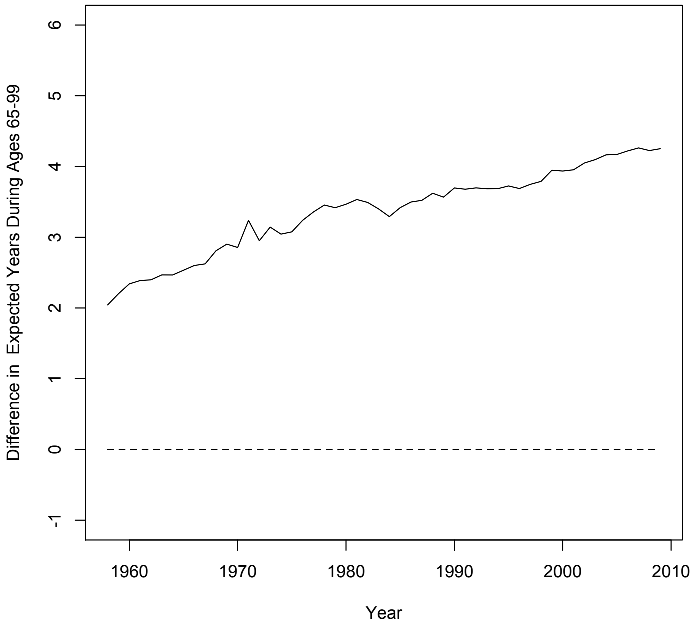

Figure 214: Difference in Female and Male Expected Years in Ages 65-99, in 1958-2009, in Poland.

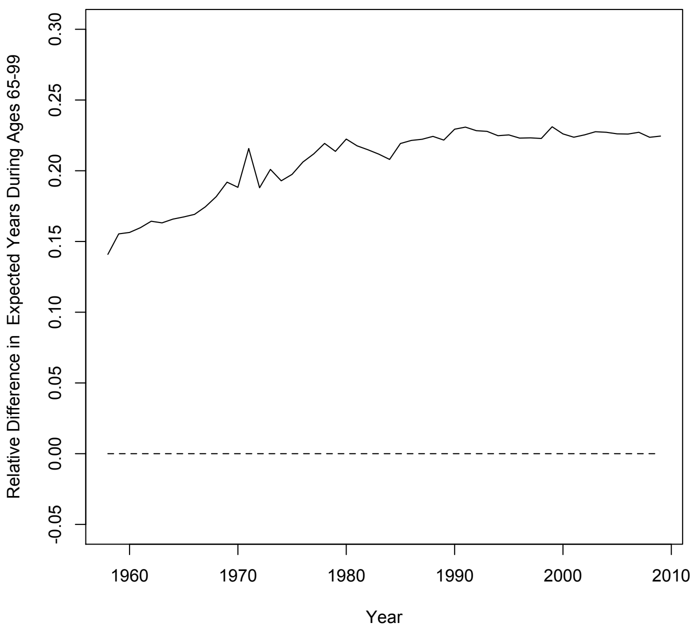

Figure 215: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1958-2009, in Poland.

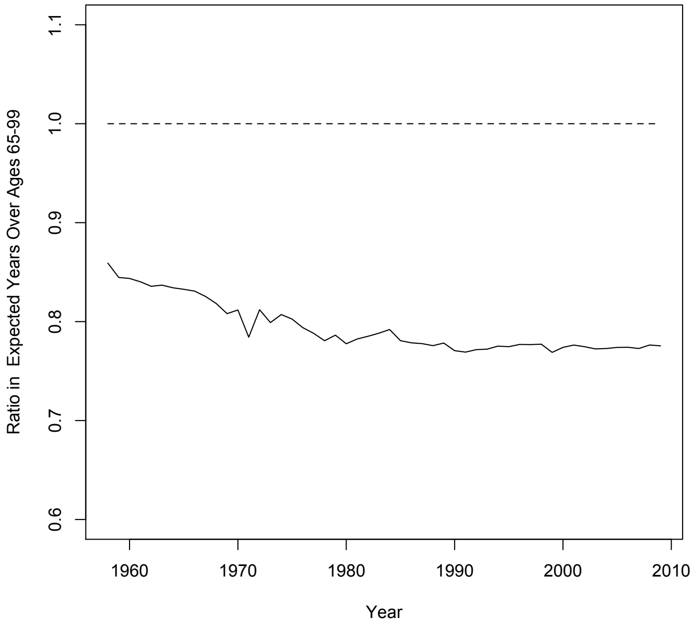

Figure 216: Ratio of Male and Female Expected Years in Ages 65-99, in 1958-2009, in Poland.

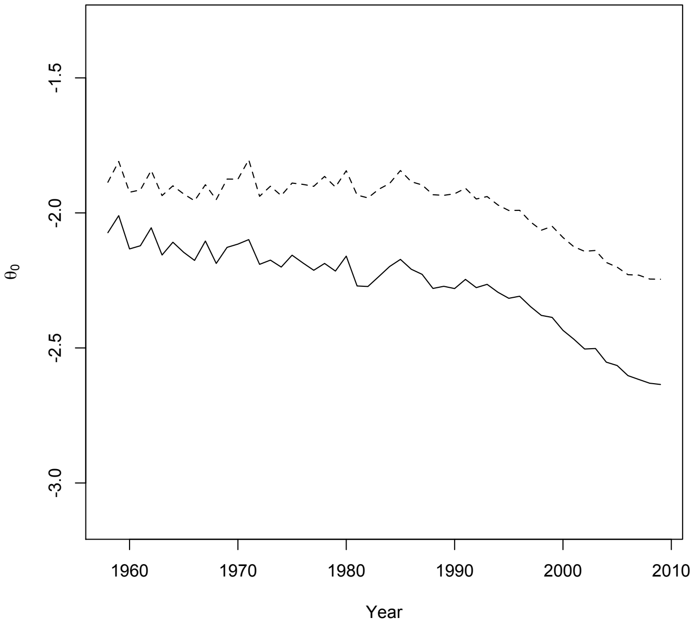

Figure 217: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1958-2009, for Females (Solid), and Males (Dashed), in Poland.

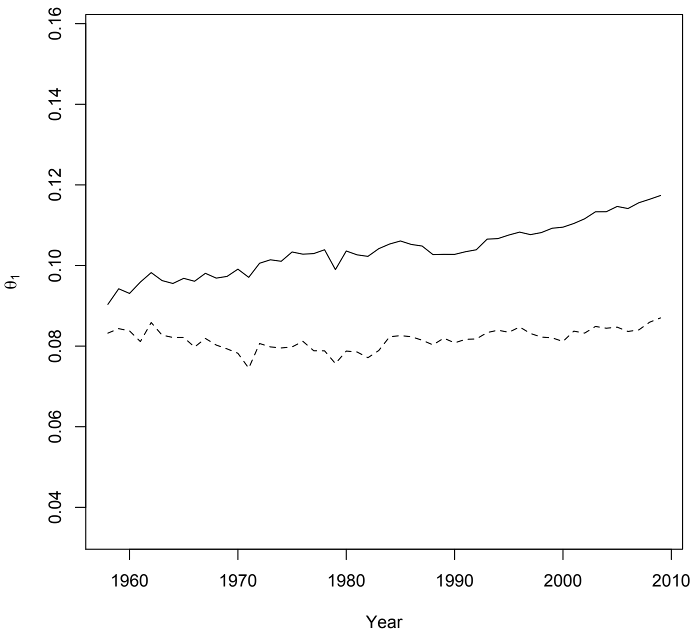

Figure 218: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Poland in 1958-2009, for Females (Solid), and Males (Dashed), in Poland.

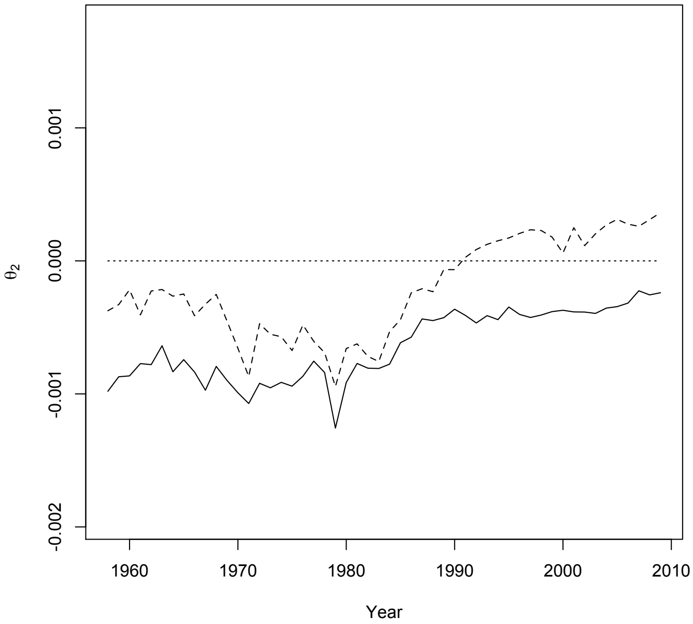

Figure 219: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1958-2009, for Females (Solid), and Males (Dashed), in Poland.

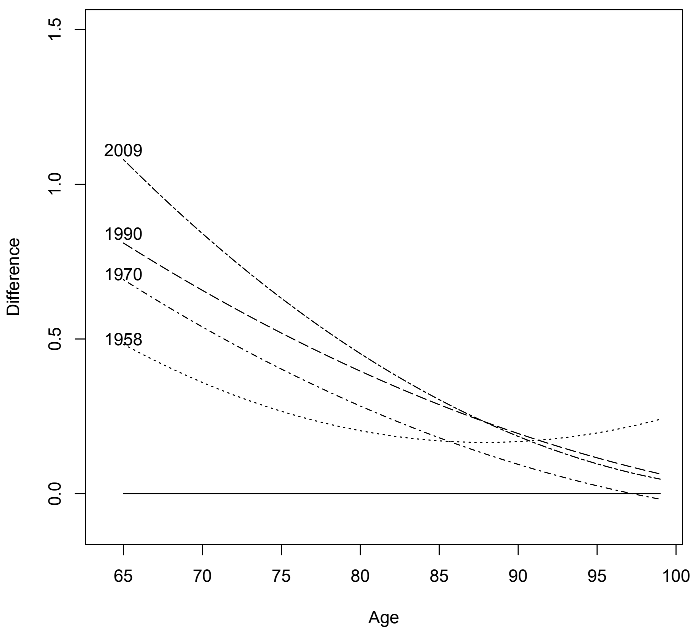

Figure 220: Male-Female Difference in the Loglinear Predictor in 1958, 1970, 1990, and 2009, in Poland.

5.7 Eastern European Countries

5.7.1 Czech Republic 1950-2011

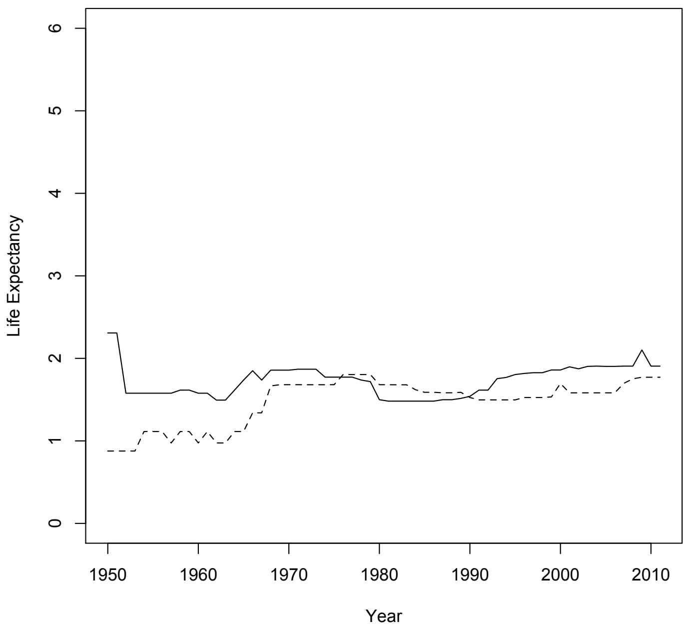

Figure 221: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1950-2011, in Czech Republic.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

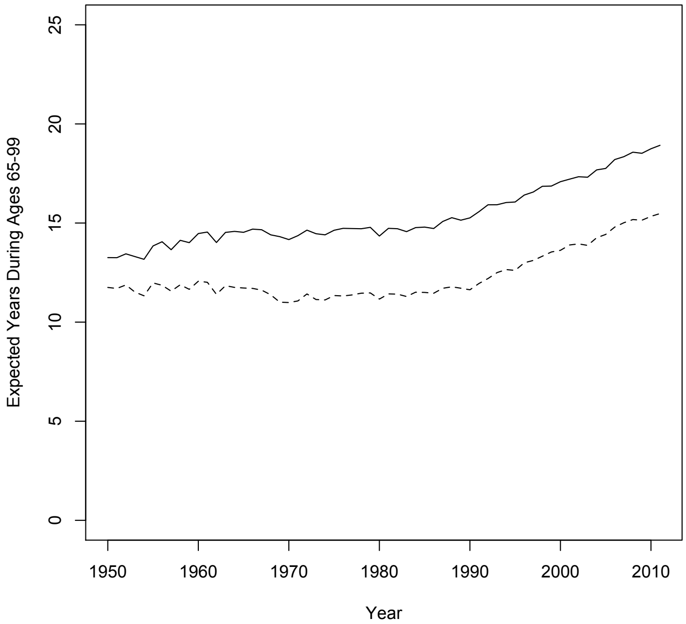

Figure 222: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1950-2011, in Czech Republic.

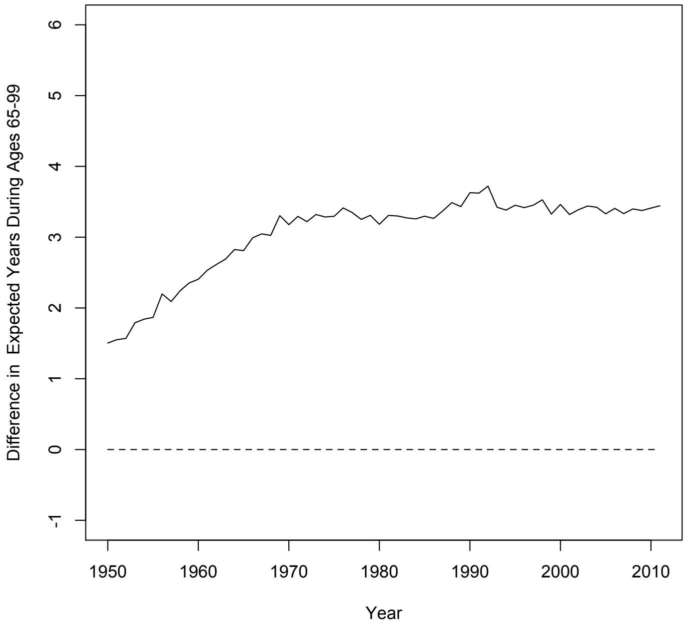

Figure 223: Difference in Female and Male Expected Years in Ages 65-99, in 1950-2011, in Czech Republic.

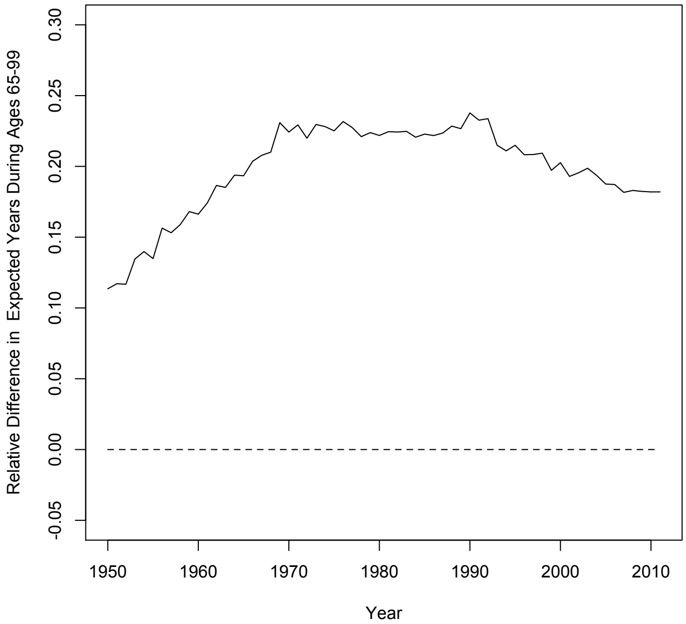

Figure 224: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1950-2011, in Czech Republic.

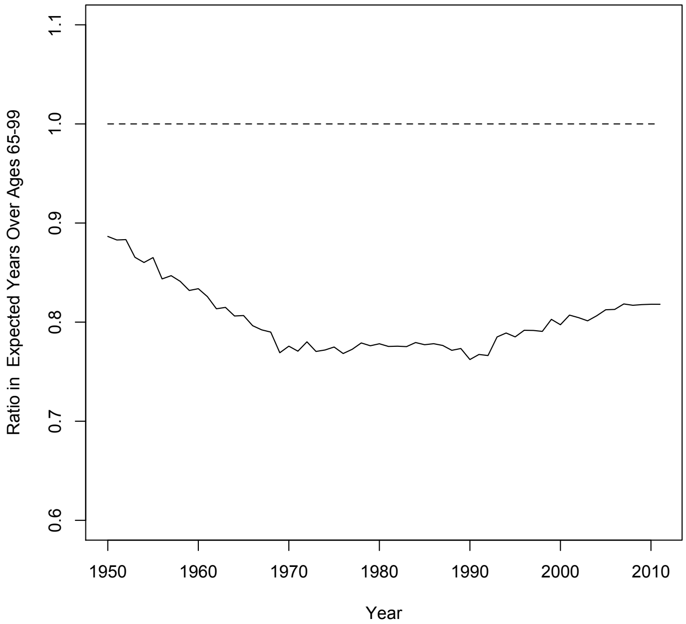

Figure 225: Ratio of Male and Female Expected Years in Ages 65-99, in 1950-2011, in Czech Republic.

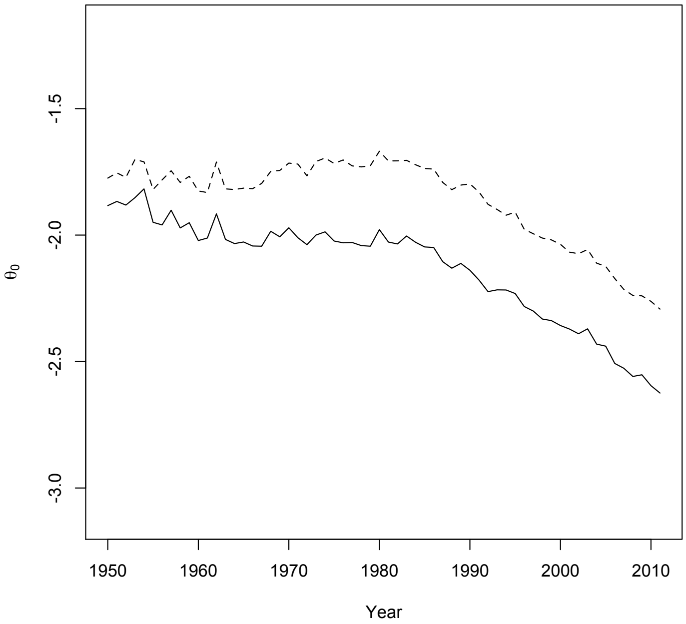

Figure 226: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1950-2011, for Females (Solid), and Males (Dashed), in Czech Republic.

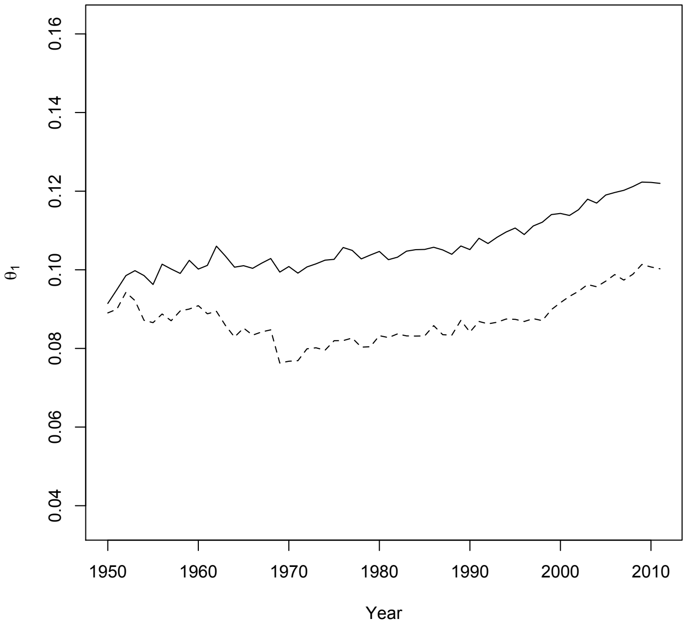

Figure 227: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Czech Republic in 1950-2011, for Females (Solid), and Males (Dashed), in Czech Republic.

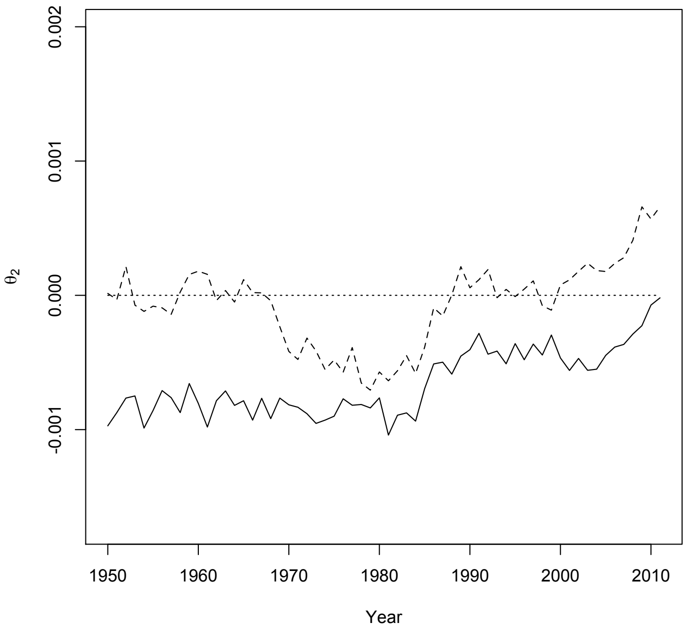

Figure 228: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1950-2011, for Females (Solid), and Males (Dashed), in Czech Republic.

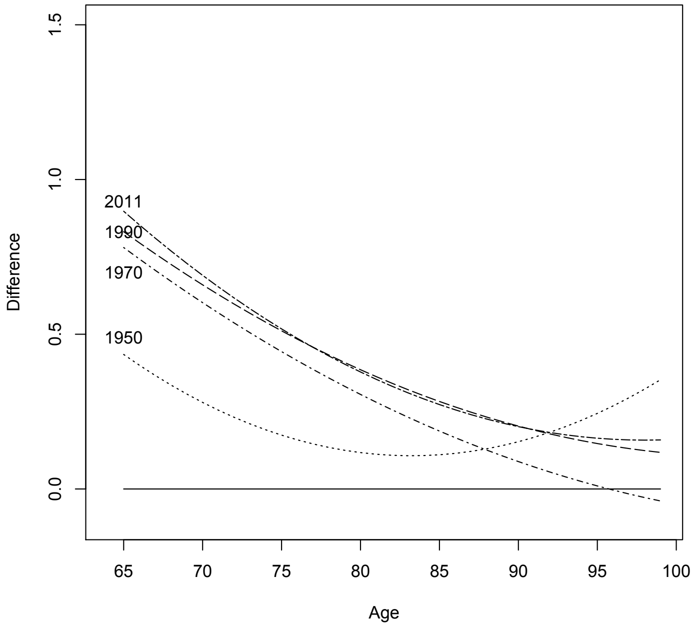

Figure 229: Male-Female Difference in the Loglinear Predictor in 1950, 1970, 1990, and 2011, in Czech Republic.

5.7.2 Slovakia 1950-2009

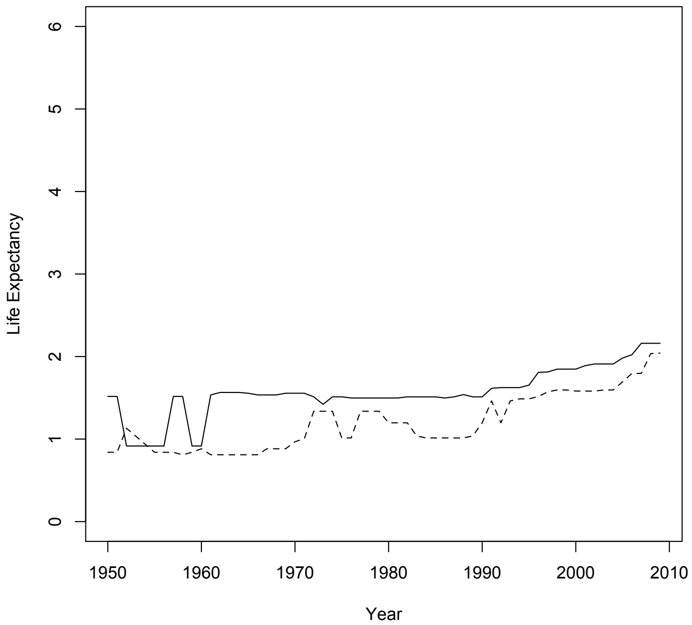

Figure 230: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1950-2009, in Slovakia.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

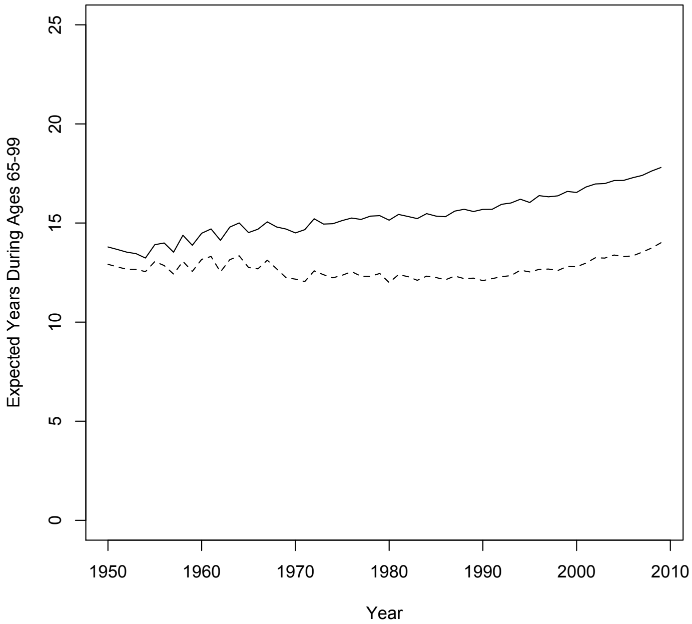

Figure 231: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1950-2009, in Slovakia.

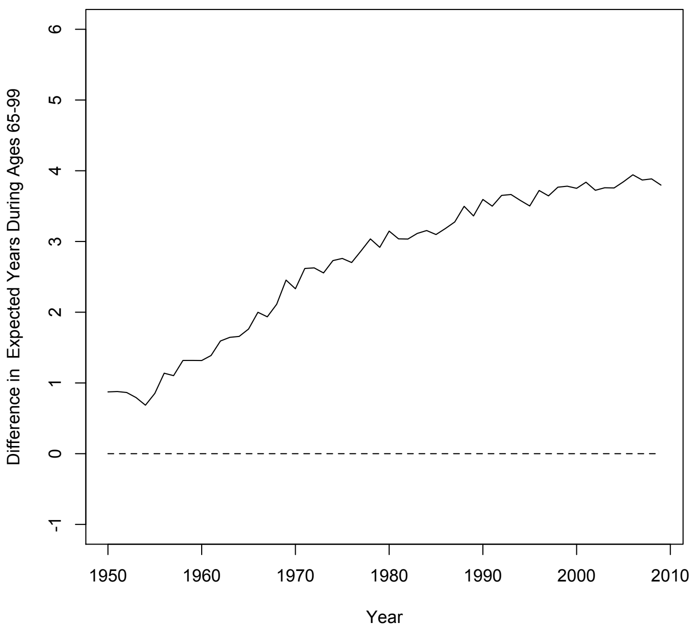

Figure 232: Difference in Female and Male Expected Years in Ages 65-99, in 1950-2009, in Slovakia.

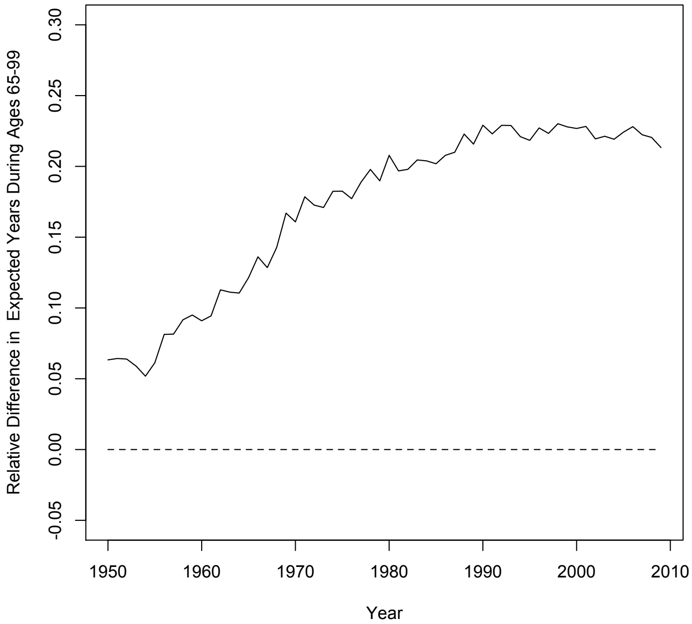

Figure 233: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1950-2009, in Slovakia.

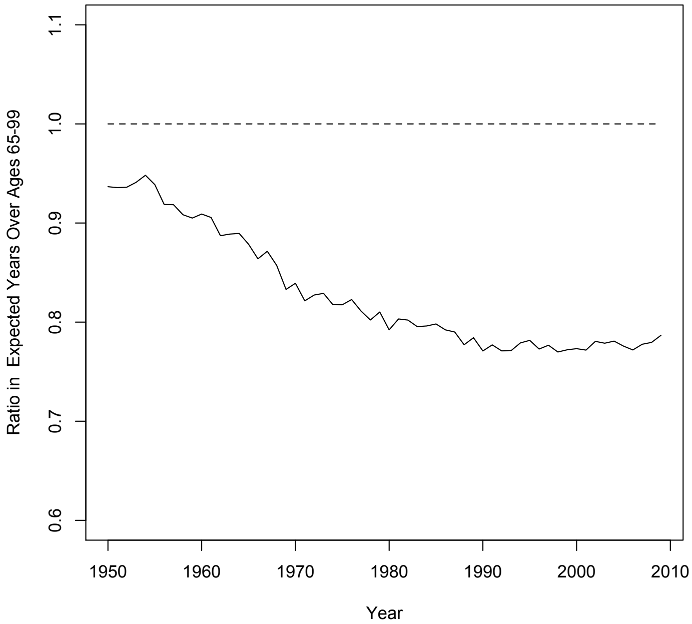

Figure 234: Ratio of Male and Female Expected Years in Ages 65-99, in 1950-2009, in Slovakia.

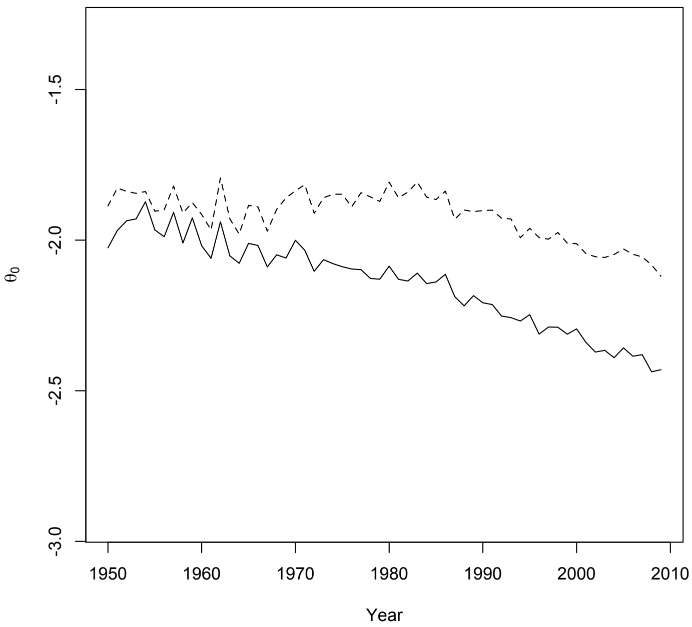

Figure 235: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1950-2009, for Females (Solid), and Males (Dashed), in Slovakia.

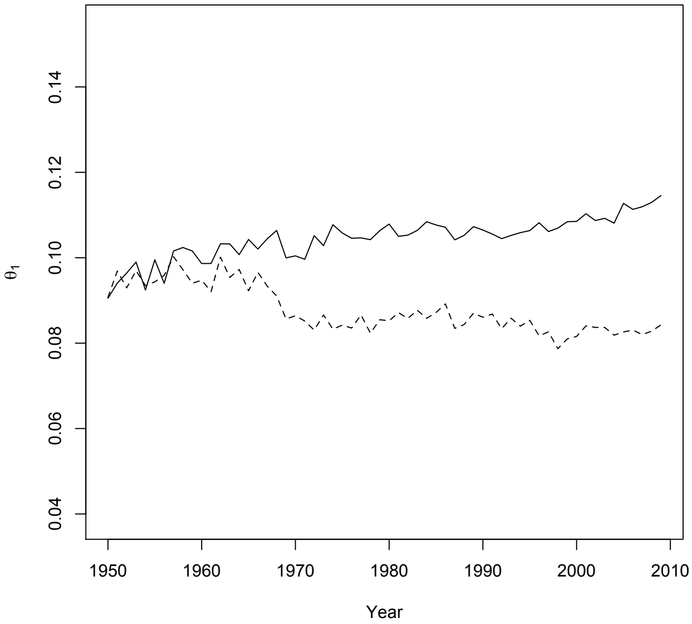

Figure 236: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Slovakia in 1950-2009, for Females (Solid), and Males (Dashed), in Slovakia.

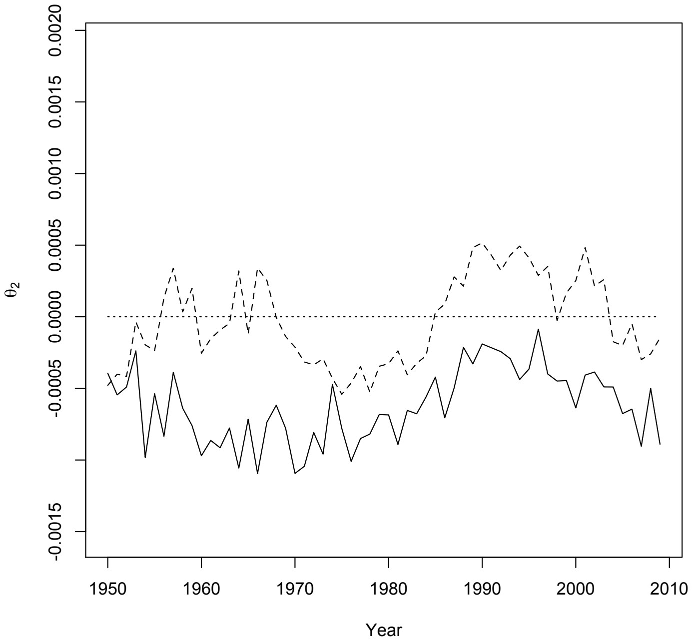

Figure 237: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1950-2009, for Females (Solid), and Males (Dashed), in Slovakia.

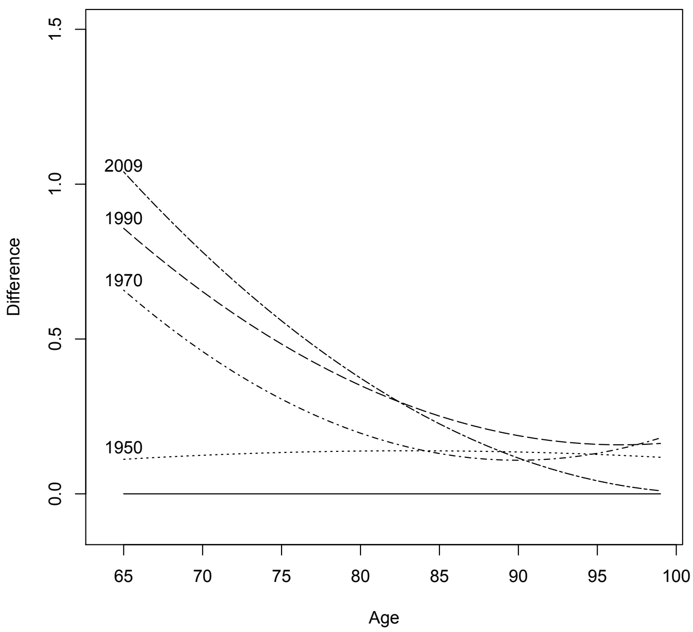

Figure 238: Male-Female Difference in the Loglinear Predictor in 1950, 1970, 1990, and 2009, in Slovakia.

5.7.3 Hungary 1950-2009

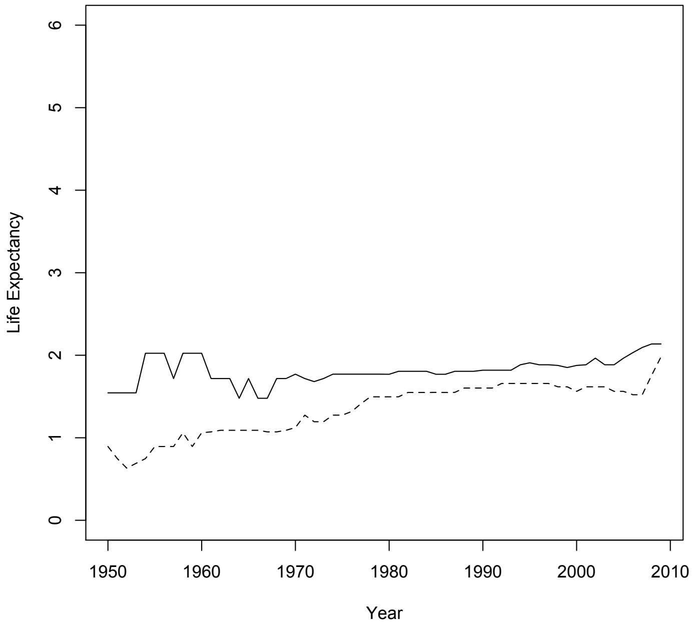

Figure 239: Smoothed Estimate of Female (Solid) and Male (Dashed) Life Expectancy at 100, in 1950-2009, in Hungary.

Running median of length 15 is used for smoothing, death rates = 0 are omitted from smoothing.

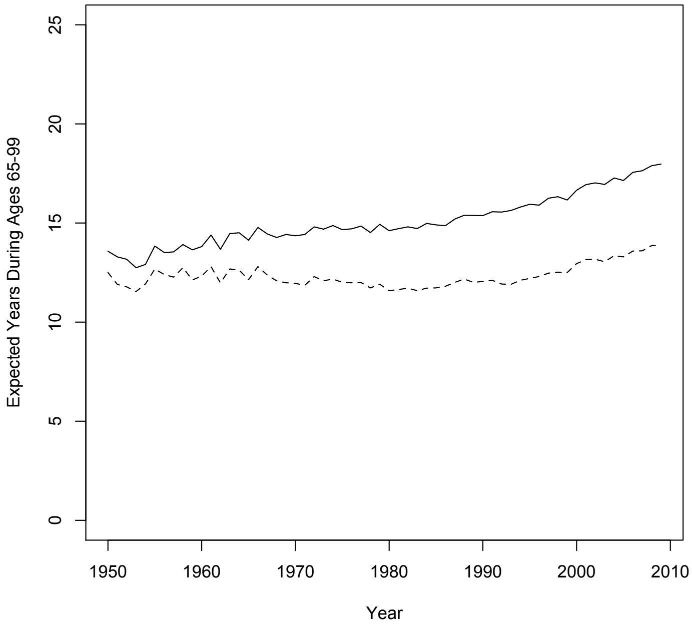

Figure 240: Female (Solid) and Male (Dashed) Expected Years in Ages 65-99, in 1950-2009, in Hungary.

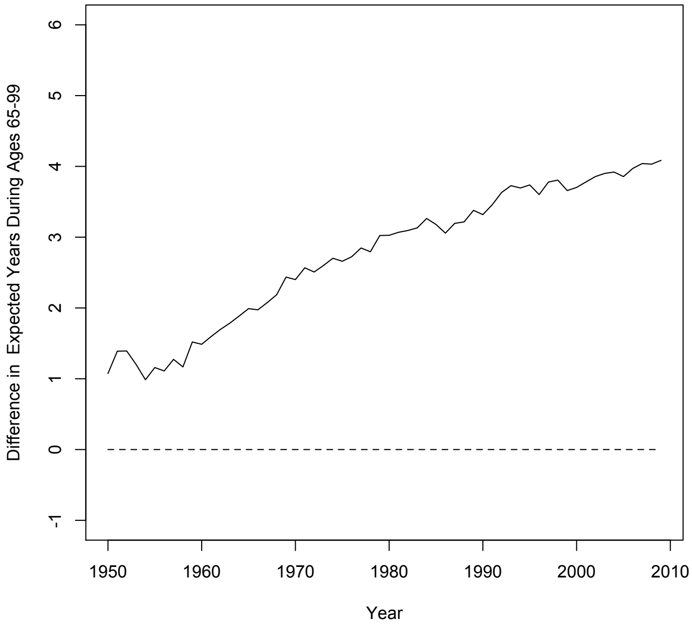

Figure 241: Difference in Female and Male Expected Years in Ages 65-99, in 1950-2009, in Hungary.

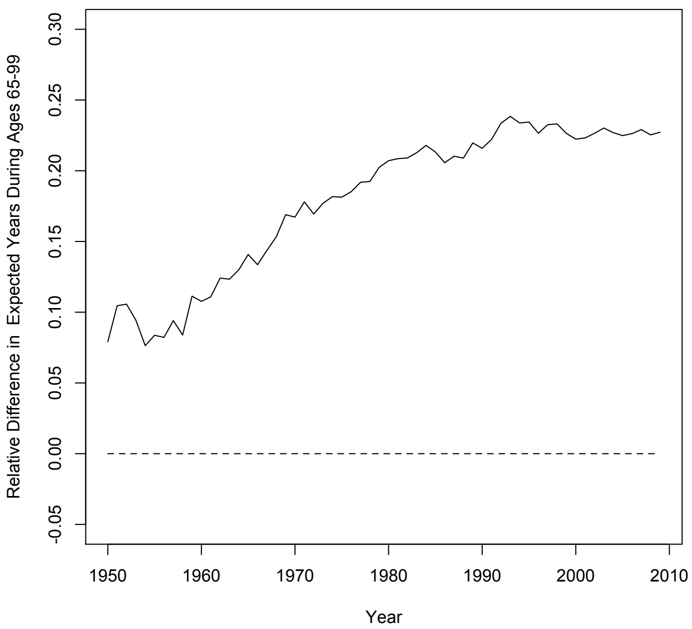

Figure 242: Relative Difference in Female and Male Expected Years in Ages 65-99, in 1950-2009, in Hungary.

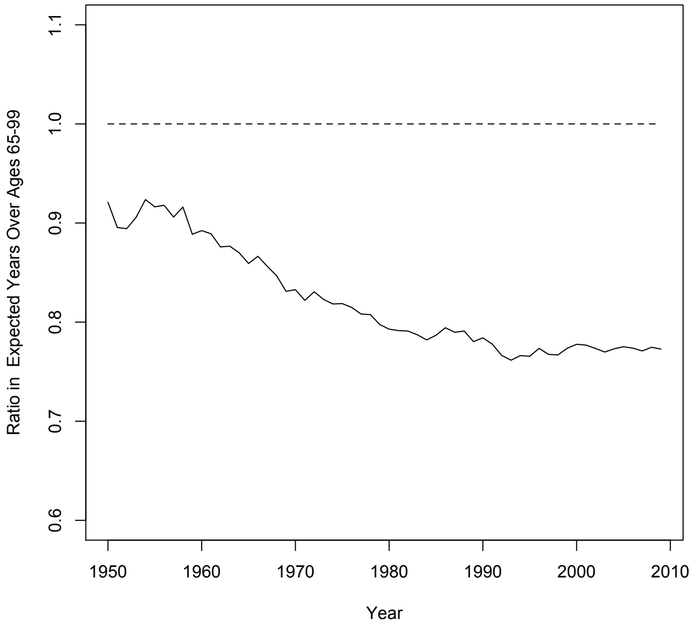

Figure 243: Ratio of Male and Female Expected Years in Ages 65-99, in 1950-2009, in Hungary.

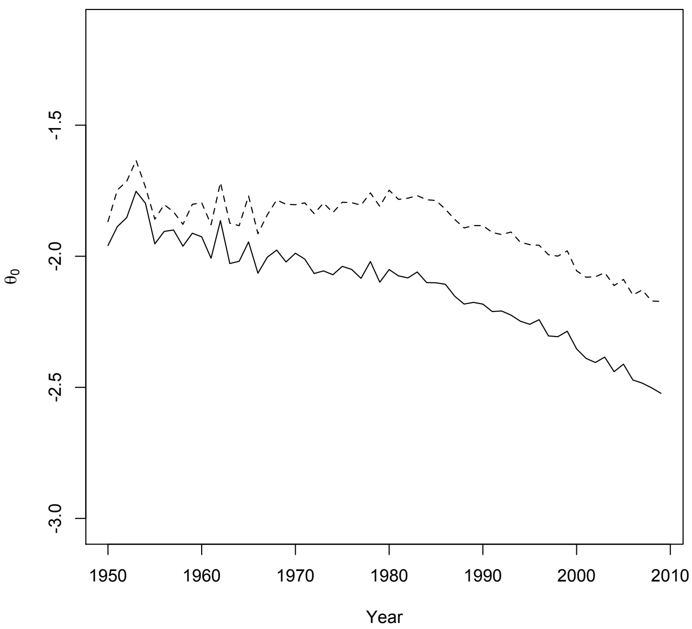

Figure 244: Values for the Level Term θ_0 of the Loglinear Mortality Model, for Ages 65-99, in 1950-2009, for Females (Solid), and Males (Dashed), in Hungary.

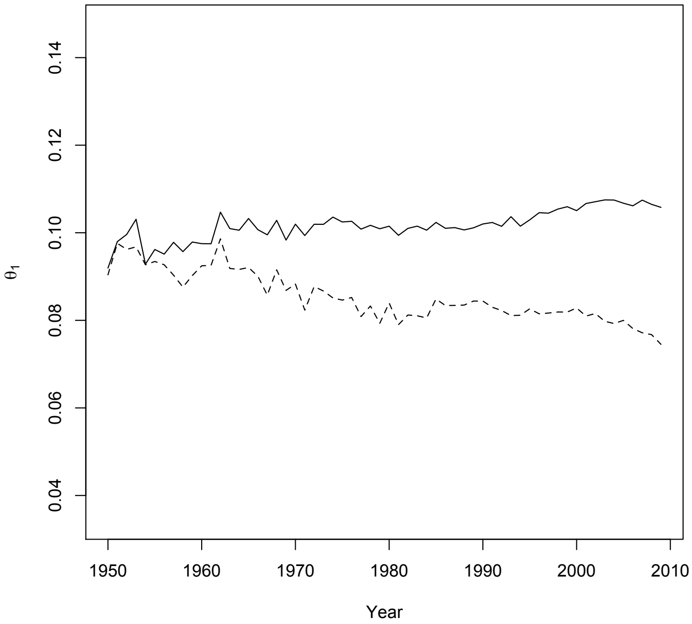

Figure 245: Values for the Slope Term θ_1 of the Loglinear Mortality Model, for Ages 65-99, in Hungary in 1950-2009, for Females (Solid), and Males (Dashed), in Hungary.

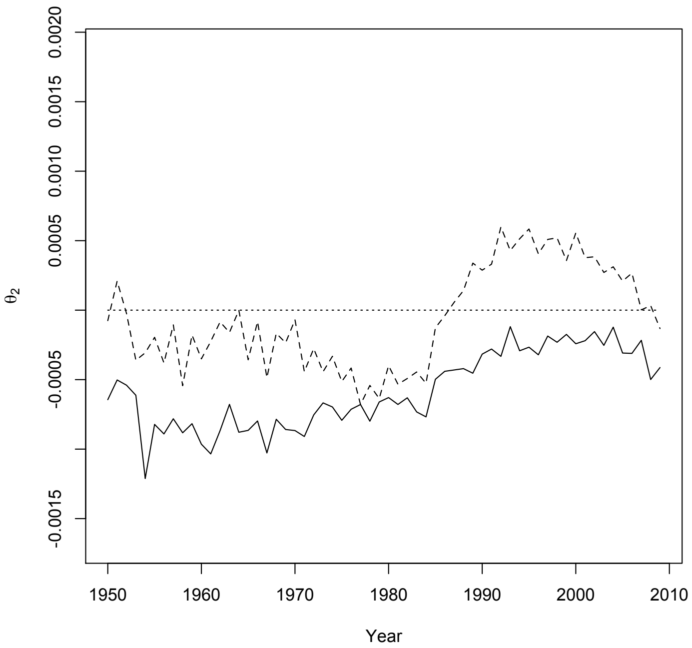

Figure 246: Values for the Convexity Term θ_2 of the Loglinear Mortality Model, for Ages 65-99, in 1950-2009, for Females (Solid), and Males (Dashed), in Hungary.

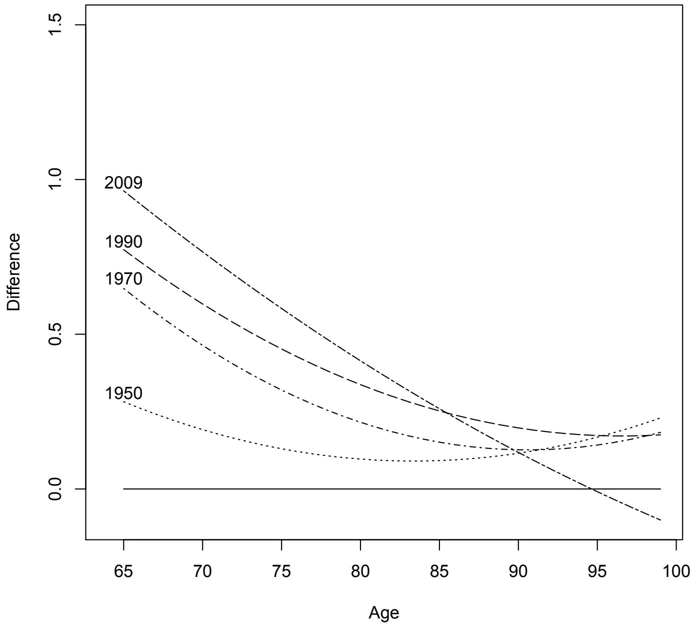

Figure 247: Male-Female Difference in the Loglinear Predictor in 1950, 1970, 1990, and 2009, in Hungary.

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