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Paul Bingley
Nabanita Datta Gupta
Peder J. Pedersen

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ABSTRACT

This paper investigates the interaction between measures of health, disability pension take up and labor market performance in Denmark by charting their development over time and by examining how they are affected by key policy reforms in the area of early retirement. The main emphasis is on the long-run development of the Social Disability Pension (SDP) program, and whether it concurs with trends in population health based on mortality indicators (both overall and cause-specific) and with self-reported health. A strong relationship is found between labor force activity measures and non-health related programs for early retirement for those 60 and older. However, no clear relationship is evident between SDP take up and the health indicators. One reason for the lack of a correlation is most probably that SDP is "on its own track" due to program innovations and reforms creating competing risks or program substitution especially for the 50+ population.

Paul Bingley
Danish National Centre for Social Research
Herluf Trollesgade 11
1052
Copenhagen
DENMARK
pab@sfi.dk

Peder J. Pedersen
Department of Economics and Business
University of Aarhus
8000 Aarhus C
DENMARK
ppedersen@econ.au.dk

Nabanita Datta Gupta
Department of Economics and Business
University of Aarhus
8000 Aarhus C
DENMARK
ndg@asb.dk

1. Introduction

Over the last 50 – 60 years Danish society has undergone quite a fundamental change in terms of the share of the population 18 – 65 years old being provided for in one of several transfer programs. The increase has been from about 5 per cent to 20 per cent of the population in the labor market active age group. This development has occurred throughout quite different cyclical situations and it can be characterized by changes in programs that existed back in the 1950s and by the introduction of new programs – some permanent and some temporary.

In the present paper the main emphasis is given to Social Disability Pension (SDP) along with other programs for early retirement from the labor force. SDP is not an insurance based program but is financed from general tax revenues with eligibility depending on, originally medical and later on a mix of medical and social criteria. The long-run development in take-up of SDP reflects a number of different factors. Over the last 50 – 60 years a number of reforms of SDP have been enacted with different motives and impact on the contents and aspirations of the program. Over this time, the economy has undergone a number of big cyclical swings with the possible consequence that take-up of SDP to some extent might be influenced by movements in unemployment. Finally, as the primary criteria for entry to SDP are medical, take-up could be affected by trends in mortality or in the prevalence of more serious health conditions.

In the following, we present in Section 2 the background for further analyses in the subsequent sections by looking into some long run historical trends. We focus on some aggregate long-run trends in SDP take-up, in unemployment, in labor force participation and in mortality. Finally, Section 2 outlines the main questions or hypotheses being analyzed subsequently. The purpose in Section 3 is to introduce and describe trends in mortality over the period since 1960 as one element in an attempt to understand the development in the relationship between health – with mortality as the ultimate indicator – SDP and trends in the labor market regarding employment and unemployment by gender and age groups. Section 4 introduces a mix of health indicators over all or part of the period since 1960 consisting of register based data for the years since 1980 and indicators of self assessed health for a number of years between 1987 and 2005. The main purpose in Section 5 is to describe the specific programs with main emphasis on SDP and the reforms that were enacted since the 1960s. The section further contains descriptions of other early retirement programs which have had an impact on labor force participation for older workers. For these programs, the description focuses on the motives behind the introduction and subsequent reforms,

followed by data for the take up of each of the programs. Further, Section 5 illustrates the pathways from the labor force to retirement as well as evidence of substitution between programs. Section 6 describes trends in employment and unemployment with special emphasis on the timing of permanent as well as temporary policy changes in the area of early retirement. Next, the purpose in Section 7 is an attempt to identify the relationship – or the lack of such – between the changes we find in the labor market regarding employment for the age groups most relevant in an early retirement perspective and the trends we have found in the earlier sections looking into the development in mortality and health along with policy reforms. Finally, Section 8 concludes and summarizes.

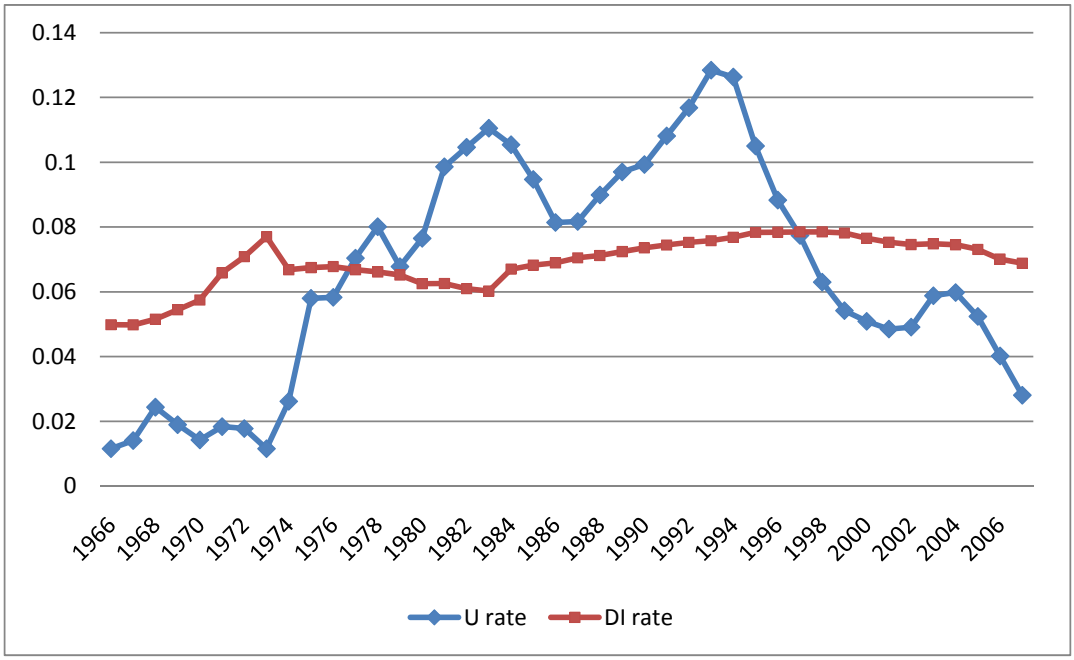
2. Historical Overview – Some Aggregate Trends

In this section we briefly summarize some aggregate trends before moving on to more disaggregate analyses. It is well known that a grey zone may exist between unemployment and disability insurance. The idea of a competing risk setting between SDP and unemployment programs is the topic in Black et al. (2002) and Autor and Duggan (2003). The possible interaction between DI and labor supply is the topic in Gruber (2000) and Campoliteti (2004) with focus on the US labor market. In Bratsberg (1999) the focus is on DI in the setting of a Scandinavian welfare state. In a recent contribution, Bratsberg et al. (2010) takes up explicitly the relationship between unemployment and DI in the Norwegian welfare state. Many studies in this area take the specific approach of analyzing the consequences of big firm closures with focus on what happens to older laid off workers. When panel data are available the laid off workers can be followed through an initial phase of unemployment to either a new job or to an exit to DI or another program for early retirement. Other obvious possibilities of program substitution is between SDP and alternative programs for early retirement beyond unemployment, especially programs without the medical or social eligibility criteria valid for SDP.

Figure 1 shows the aggregate profile in Denmark 1966 – 2008 in the unemployment rate and in the number of people in the SDP program relative to the population 18 – 65 years old. There is no obvious relationship between SDP and unemployment at the aggregate level. The unemployment rate follows an inverted U profile peaking slightly above 12 per cent in 1994. The SDP ratio shows a completely different profile, moving for most of the period between 6 and 8 per cent without any simple correlation with the business cycle represented by the unemployment rate. It should be

emphasized, however, that other programs were introduced in the period as pathways out of the labor force for older workers. Behind the aggregate lack of any relationship shown in Figure 1 the unemployment SDP interaction is more complicated when we consider program substitution.

Figure 1. Unemployment rate and DI/population share (18 – 65), 1966 – 2008. (Source: Statistics Denmark).



The next aggregate profiles shown in Figure 2 are the mortality rates for women and men 65 years over the last 50 years. Roughly, mortality for the 65 year olds is constant until a decline is seen from around 1990. Here we have, at least at the aggregate level, the same lack of any simple relationship between mortality and the SDP share.

The final aggregate profile is the labor force participation rates for the "critical" age group in the present context, the 60 – 64 years old shown in Figure 3 for women and men using consistent data since 1972. Looking at the profile for men it is obvious that other factors than SDP and mortality are behind the kinks and trends. We return to this in Section 6. For women the profile appears much more smooth reflecting that the impact from program innovations to a big extent is counteracted by strong cohort increases in female labor force participation.

Figure 2. Mortality rate per 100,000, Men and women, 65 years old, 1961 – 2008. (Source: Statistics Denmark).

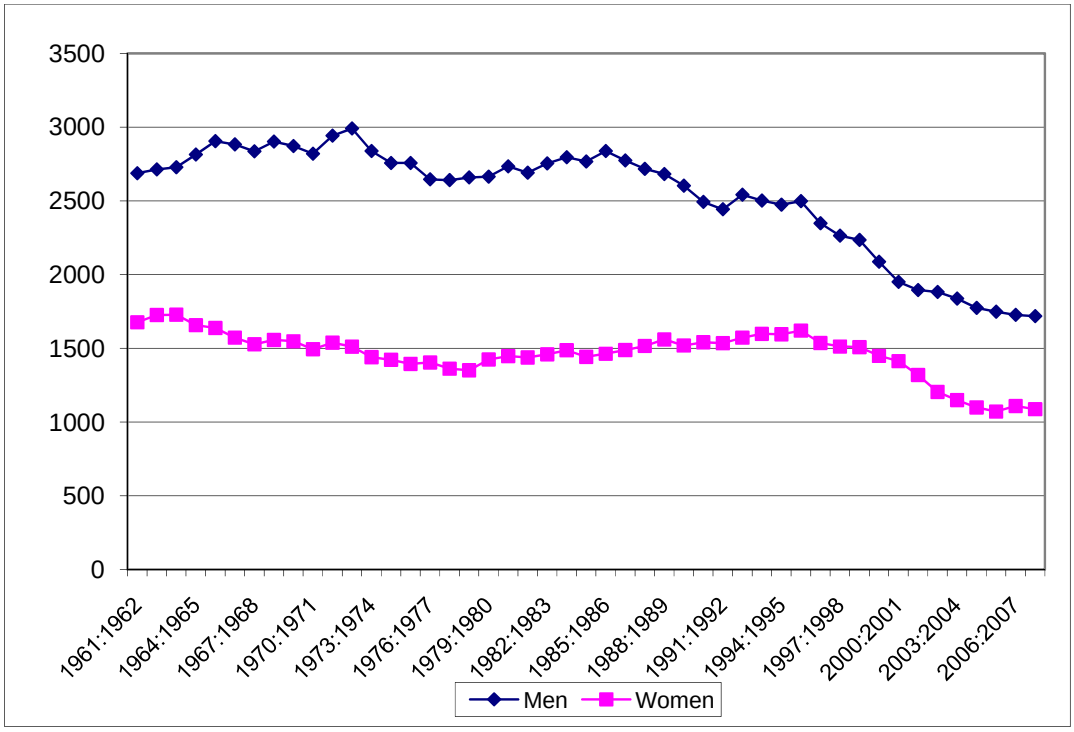
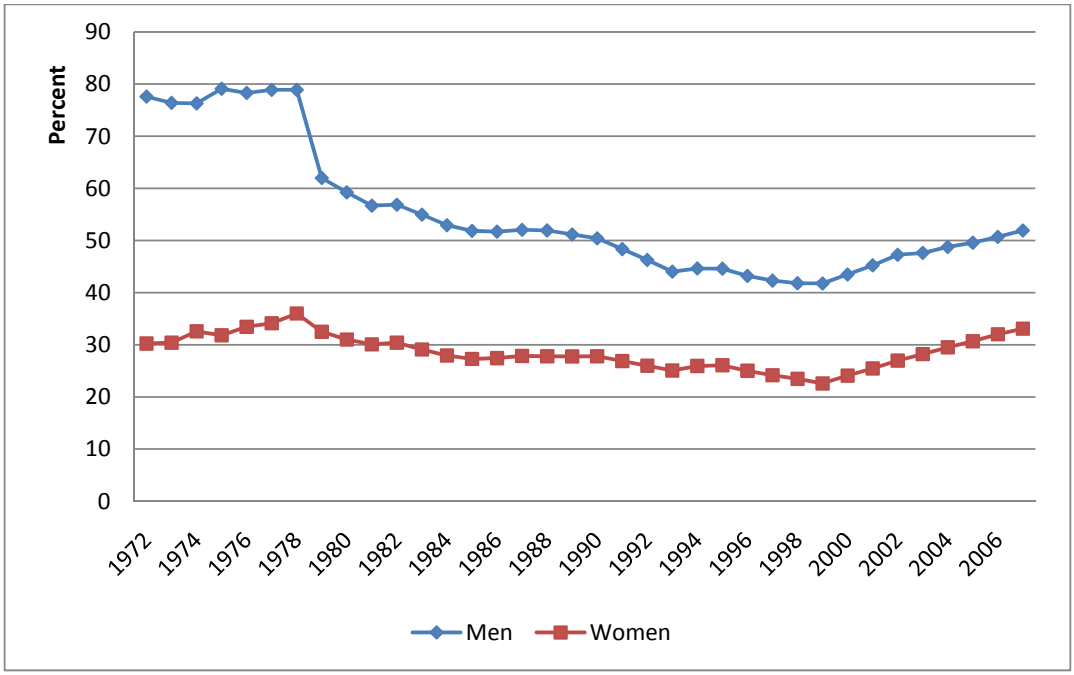


Figure 3. Labor force participation rates, 60 – 64 years old, men and women, 1972 – 2008. (Source: Statistics Denmark).



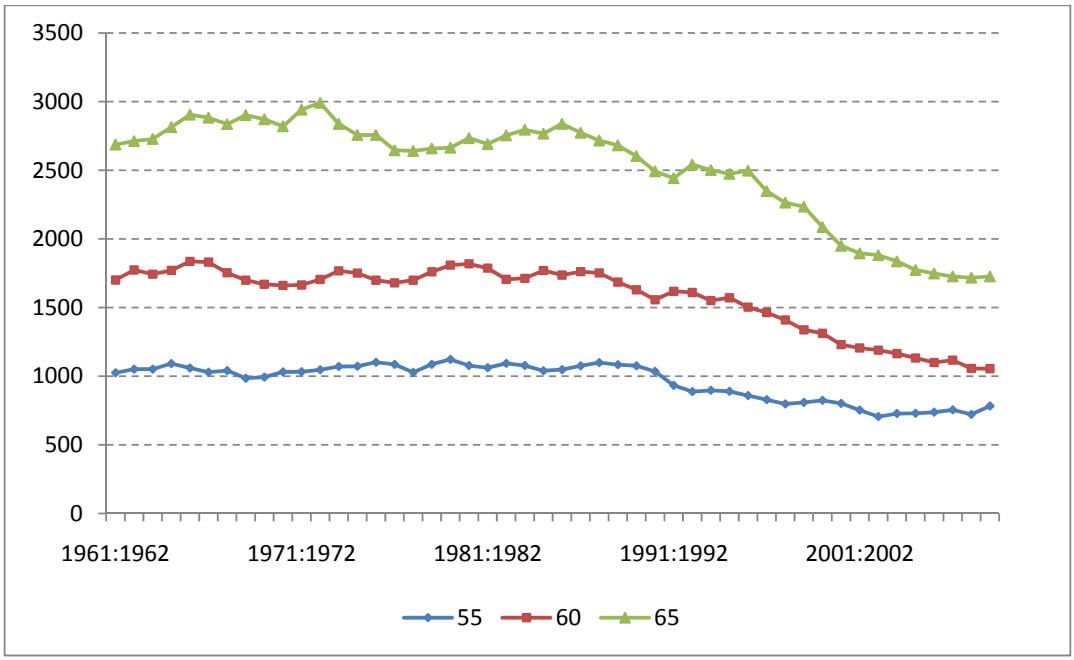
3. Mortality Trends

The main emphasis in the present paper is on the interaction between measures of health, DI(SDP) take up and labor market performance including the impact of policy reforms and changes in the area of early retirement. As an introduction to the treatment below of SDP and alternative retirement programs we begin with a brief description of available indicators of population health in Denmark over recent decades. In this section the focus is on mortality as an indicator of the general health status in the population.

The reduction in mortality over the last 50 years is among the lowest in the OECD area. We show the mortality rates for men and women at ages 55, 60 and 65 in Figures 4 and 5. It is evident that there were essentially no gains in this area until about 1990. From then on we observe a fairly strong decline in mortality at all three ages, most pronounced for the 65 year olds. The level is

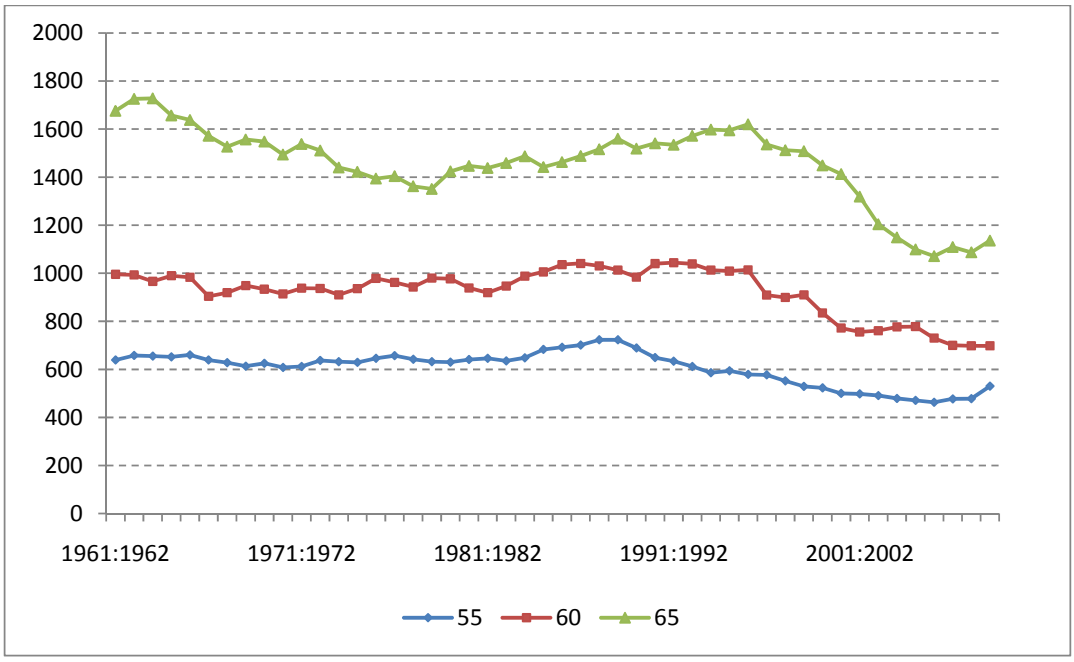
higher for men at all 3 ages and the reduction in mortality in absolute as well as in relative terms is greater for men[1].

Figure 4. Male mortality rate per 100,000, 1961 – 2008. (Source: Statistics Denmark).



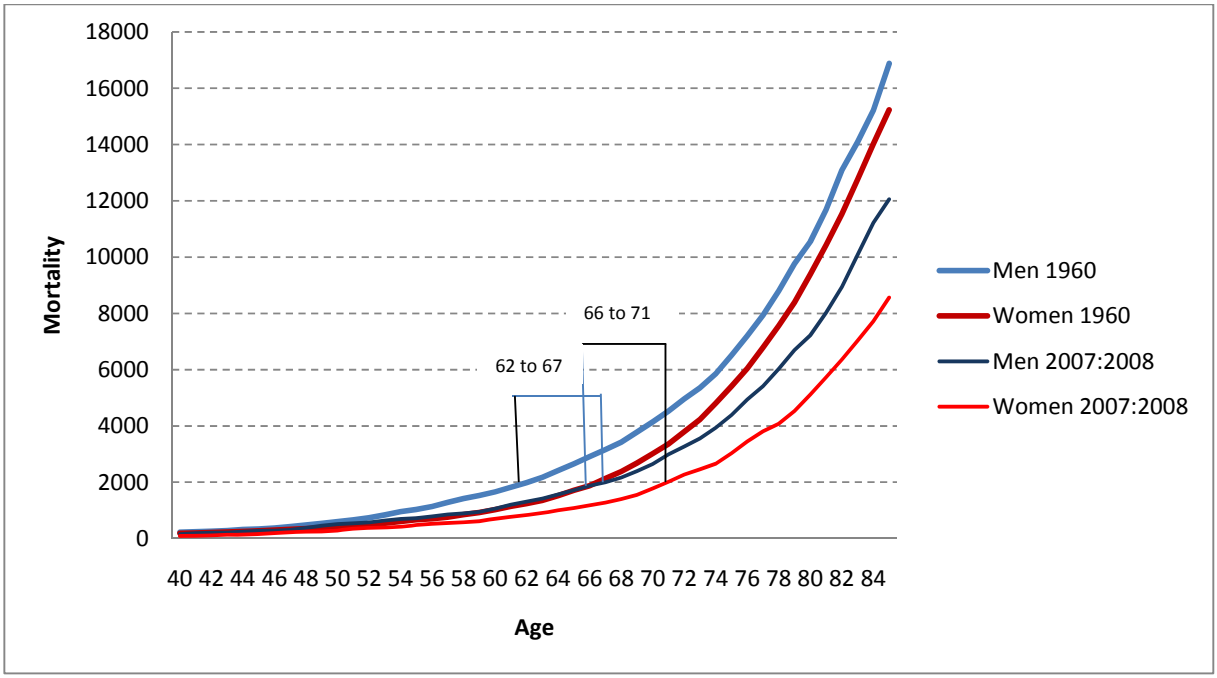
[1] Data are available for expected lifetime at birth back to 1840. It is interesting to note that the female-male difference in expected longevity is about 2 years for the first about 100 years of observations. It then increases from a minimum slightly below 2 years in the first half of the 1920s to a peak of 6 years in the second half of the 1980s. From then on the difference in expected lifetime goes down to 4,5 years in 2008.

Figure 5. Female mortality rate per 100,000, 1961 – 2008. (Source: Statistics Denmark).



The average retirement age has gone down in Denmark in the period since 1960. It is interesting to relate this to the increase in longevity shown in Figures 6 – 8. Figure 6 shows mortality by age, from 40 to 85, for men and women in 1960 and nearly 50 years later in 2008. Figure 6 illustrates by gender the age at which mortality is equal to 2 per cent in 1960, respectively in 2008. For men this occurs in 2008 at age 67 instead of 62 and for women mortality reaches this level at age 71 in 2008 compared with age 66 back in 1960. So, for both men and women the 2 per cent mortality level has moved up with 5 years of age since 1960. From Figures 4 and 5 we know that this increase occurred in the last 15 – 20 years.

Figure 6. Two year mortality rates by age and gender, 1960 and 2007:2008. (Source: Statistics Denmark).



Figures 7 and 8 illustrate the decline in mortality in a different way. From 1950 to 2009, we show which age a person should have in each of the years to have the same mortality as a 60 year old, respectively a 65 year old person in 1960. For men in Figure 7 and for women in Figure 8 we find that the overall decline in mortality after 1990 in this illustration corresponds with an increase to respectively the mid-60s or to around age 70 for having the same mortality at the end of the period as a 60 year old, respectively a 65 years old had in 1960.

Figure 7. Ages of equal mortality probability for men, 1960 – 2009. (Source: Statistics Denmark).

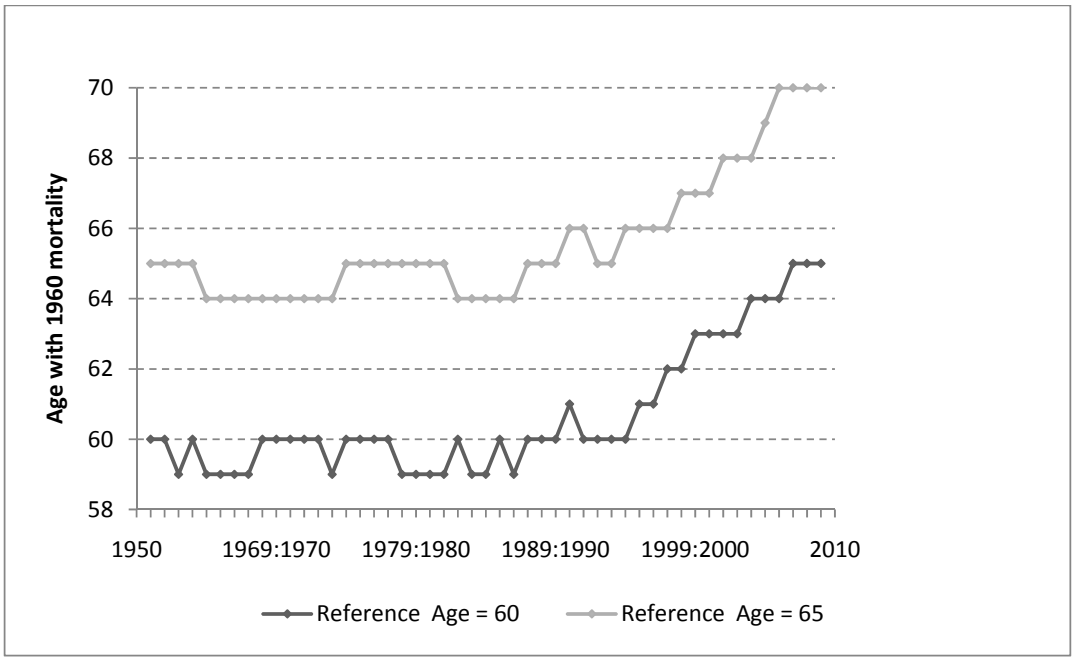
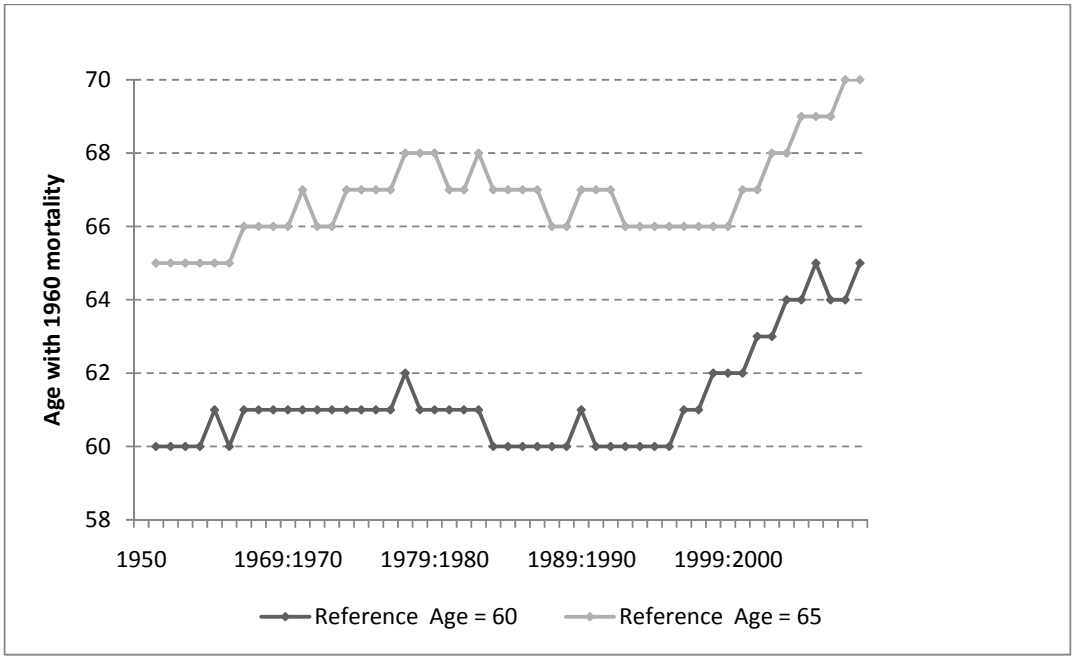
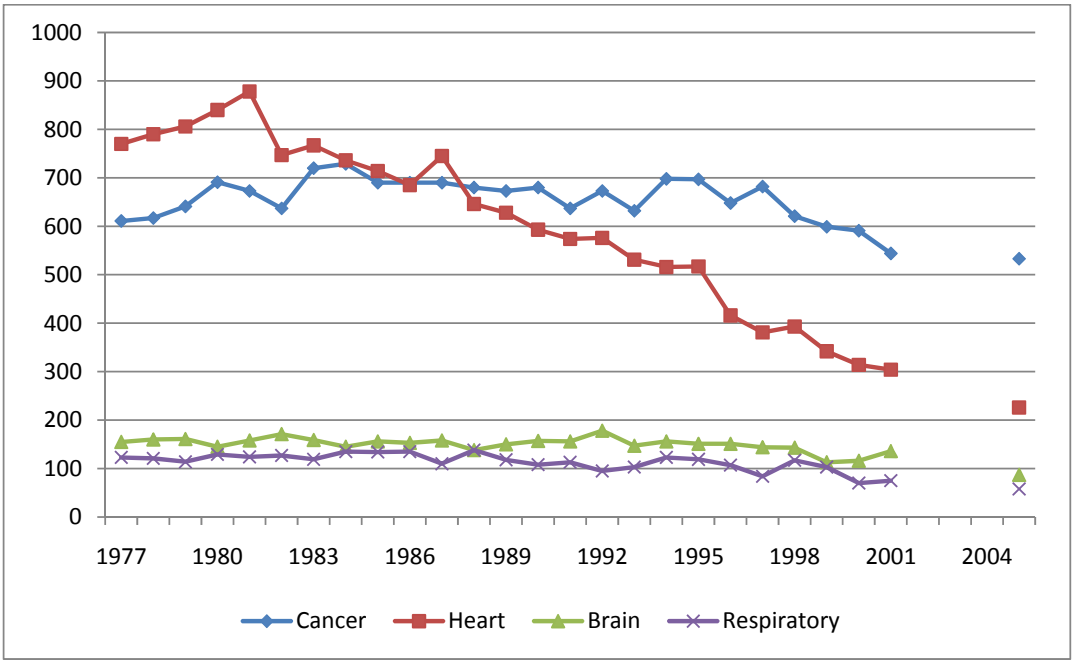


Figure 8. Ages of equal mortality probability for women, 1960 – 2009. (Source: Statistics Denmark).



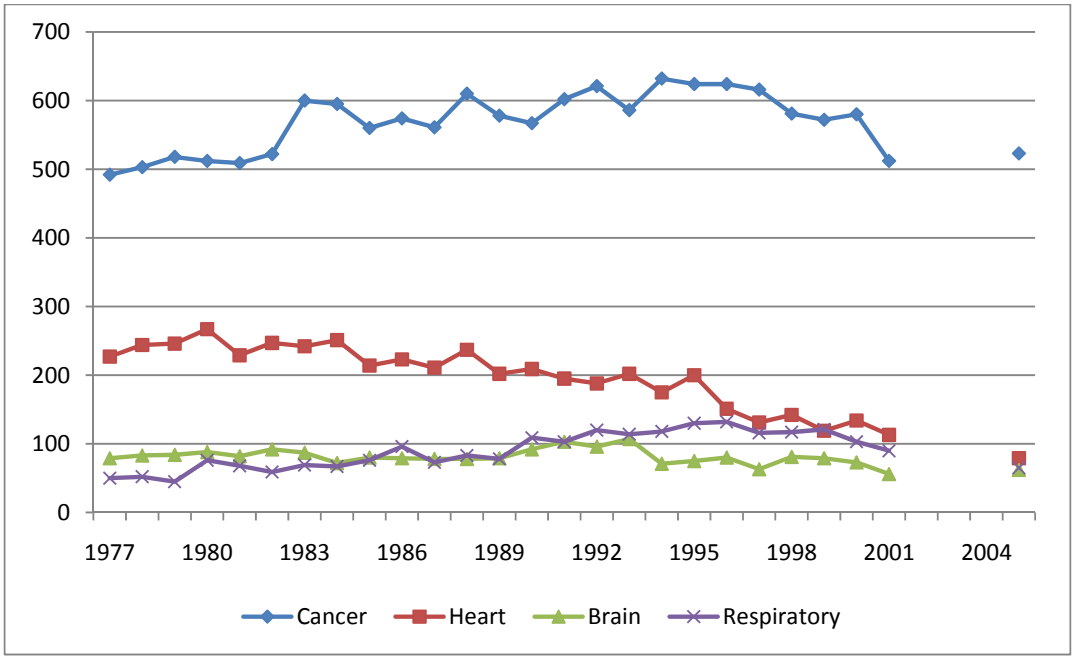
Finally, we summarize in this section in Figures 9 and 10 how four major causes of death have evolved since 1977 for 60 – 64 year old, men and women. For men, it is evident from Figure 9 that a strong decline in heart attacks and related diseases is the main factor behind the decline in mortality since the years around 1990. The number of deaths due to cancer has also gone down, although not as much as heart attacks. The two other major causes, strokes and related diseases and diseases in the respiratory system have been fairly stable over the period.

Figure 9. Four major causes of death per 100,000, men, 60 – 64 years old, 1977 – 2005. (Source: Statistics Denmark).



For women, Figure 10 shows a different picture. The number of deaths due to cancer is fairly stable over the period while heart attacks go down as found for men. Comparing causes of death for men and women, 60 – 64 years old, we find excess mortality for men due to cancer, heart attacks and related diseases and to strokes and related diseases. For strokes excess mortality is constant since 1977. For cancer it is falling until no excess mortality found by the end of the period, and for heart attacks the decline is much stronger for men. There is only one exception to this pattern, i.e. for diseases of the respiratory system initially with a clear excess mortality for men but with a shift to female excess mortality from around 1990.

Figure 10. Four major causes of death, women, 60 – 64 years old, 1977 – 2005. (Source: Statistics Denmark).



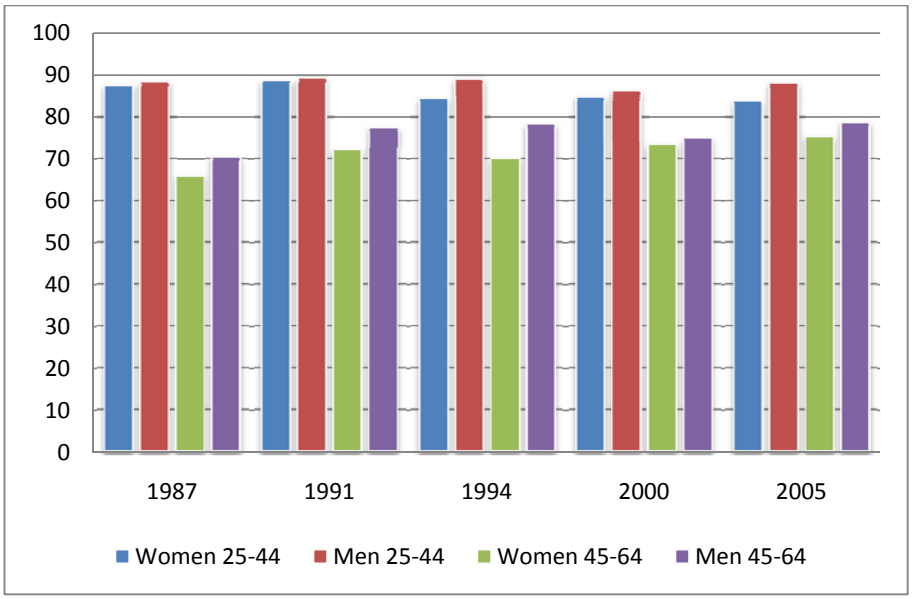
4. Trends in Population Health

It is straightforward to find reliable mortality data. It is more difficult to find long, consistent time series for the topics in focus in this section, i.e. self reported health and register data based health indicators. Looking first at indicators for self reported health we have two sources which are both used in this section. The first source is a survey run by the National Institute of Public Health (NIPH), collected 5 times between 1987 and 2005. The other source is the Danish panel in the European Community Household Panel (ECHP), collected annually from 1994 to 2001. The share reporting their health status as "good" in NIPH survey seems to be at the same level as the aggregate share of respondents finding their health status "very good" or "good" in the ECHP.

In Figure 11 we show the results from the NIPH survey separately for women and men, aged 25 – 44, respectively 45 – 64 years. The surveys cover a time span of 18 years so – with some caution – it seems we can conclude that satisfaction with health status is falling or about constant for the 25 – 44 year olds and seems to be increasing for the 45 – 64 year olds. A tentative conclusion is that self

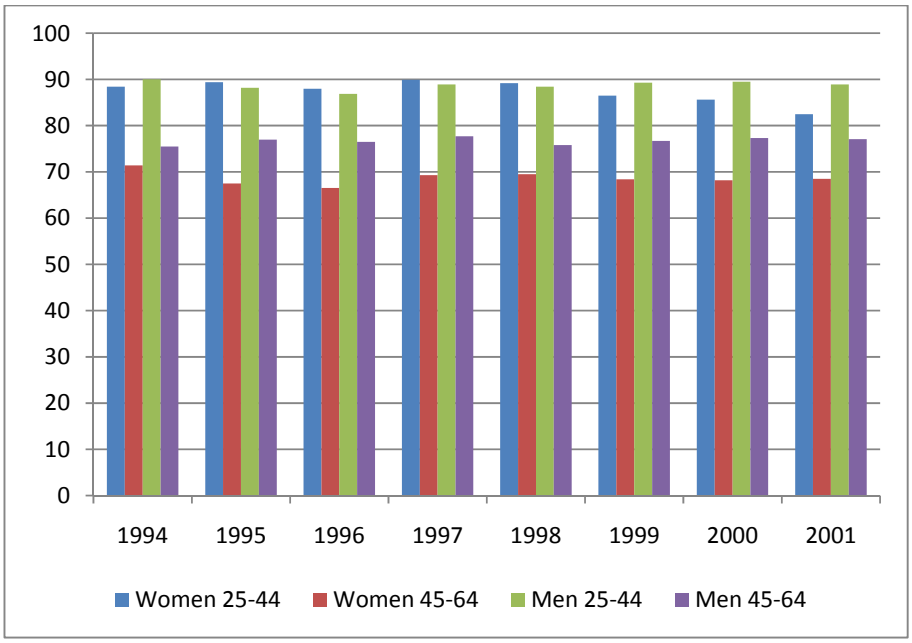
reported health – and mortality, cf. Section 3 – seems to become better for the groups most relevant for SDP and the other early retirement programs being introduced in the period in focus here.

Figure 11. Share with self reported health "good". (Source: OECD Health Data, June 2010. (Primary Source: National Institute of social health)).



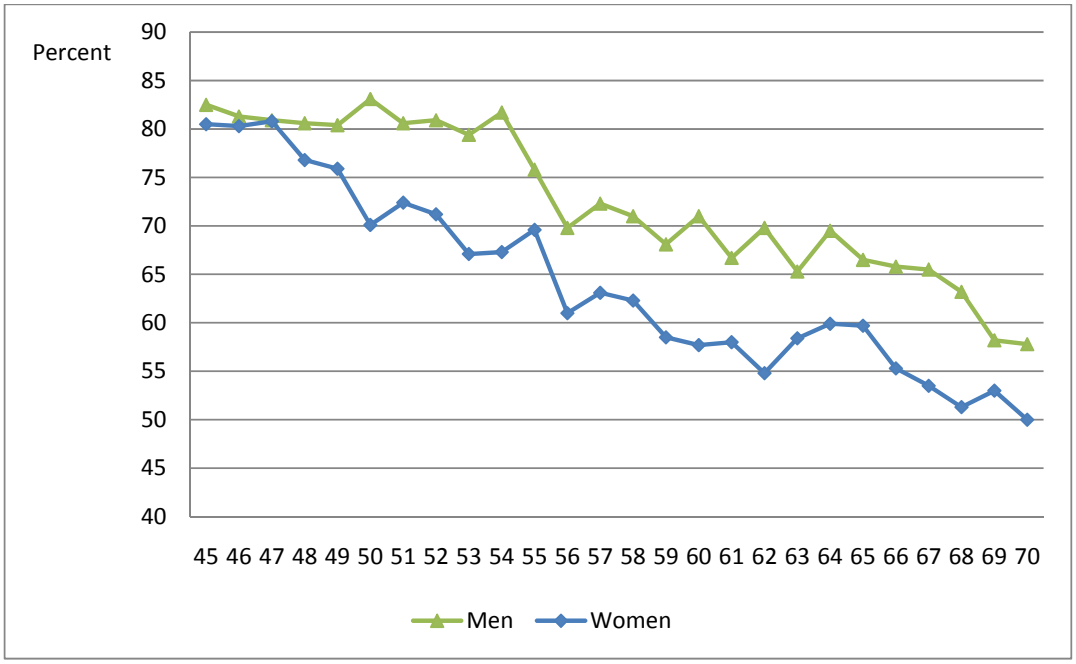
When we compare with the shorter period covered by the ECHP, we find in Figure 12 approximately the same trend for the 25 – 44 years old as in Figure 11, while the share for the 45 – 64 years old is approximately constant.

Figure 12. Share with self reported health “good” and “very good”. (Source: Calculations from European Community Household Panel)



The Danish panel in the ECHP has been used also in Figure 13. We have pooled data for all 8 waves and show in the graph the share by age, 45 – 70, and gender who find their health status to be “very good” or “good”. As expected the share is falling with age but at varying speed. It seems that two points – with caution – can be concluded from Figure 13. First, while the share is at the same level for women and men in their mid-40s the decline is much faster for women. Secondly, the share seems to be flat or only falling quite slowly from the mid-50s to the mid-60s, i.e. the age interval where many were eligible for one or another of the early retirement programs that were open in the years covered by the ECHP, cf. the detailed description of these programs in Section 5.

Figure 13. Share of respondents with self reported health “very good” or “good” by age and gender, Average values 1994 – 2001. (Source: calculations from European Community Household Panel, pooled over 8 waves)



Next we present a few health indicators based on register data. First, Figure 14 shows the total number of new cases (per 100.000) of all kinds of cancer found annually from 1978 – 2008 separately for women and men. Notice that that the number increases throughout the period and most so as mortality goes down, also due to cancer in the 60 – 64 years old group, cf. Figures 9 and 10.

Figures 15 – 16 show for the same age group and separately by gender the (scaled) prevalence of annual diagnoses of 3 major disease groups, i.e. malign tumors, heart infarcts and related diseases and psychiatric diagnoses along with mortality. Due to a new classification system for diagnoses introduced in 1991 this year is the first in Figures 15 and 16. The data shown in Figures 15 – 16 are illustrative. A cautious interpretation is that diagnoses and mortality are on different tracks. For instance for men, 60 – 64 years old, the number of diagnoses of cases with serious diseases of the heart goes up quite strongly while heart diseases as cause of death goes down equally strongly, cf. Figure 9

Figure 14. New cases of cancer per 100.000, 1978-2008. (Source: Statistics Denmark).

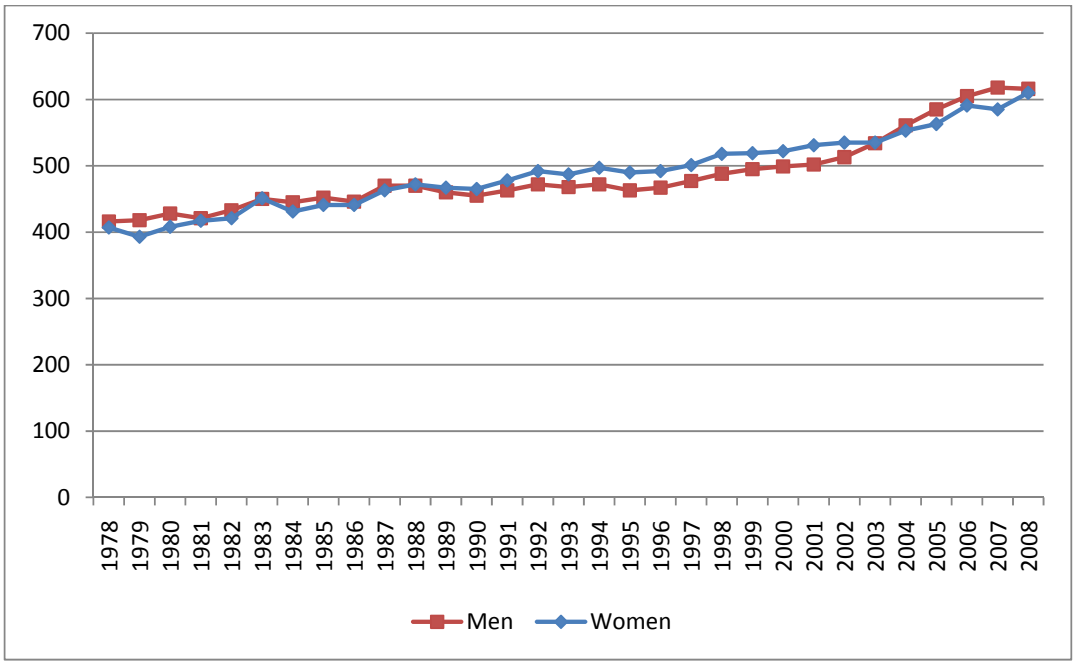


Figure 15. Mortality and prevalence of 3 major diagnoses, men 60 – 64 years. (Source: Statistics Denmark).

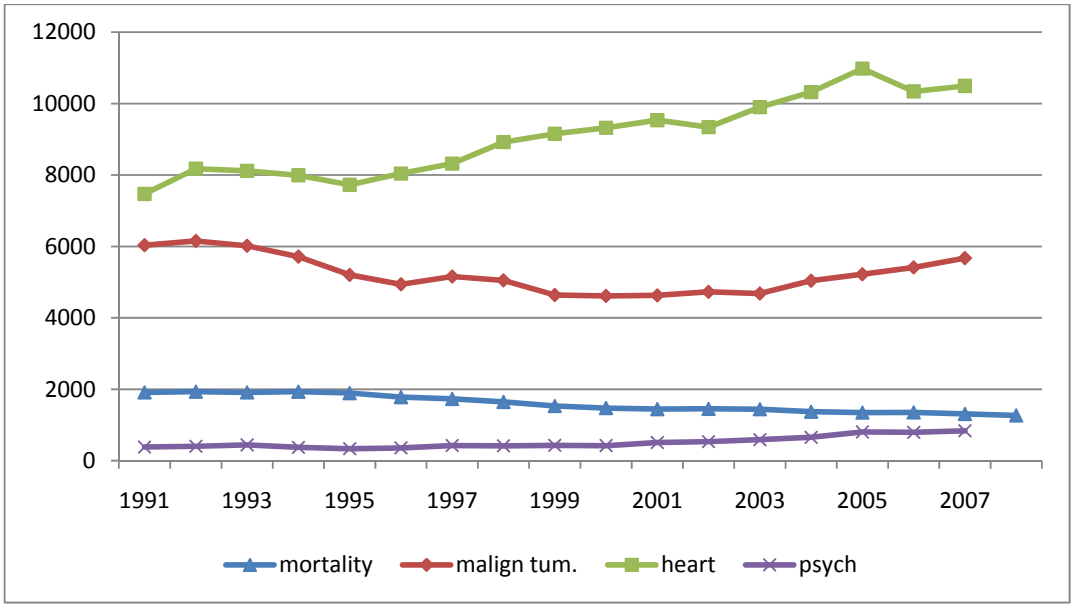
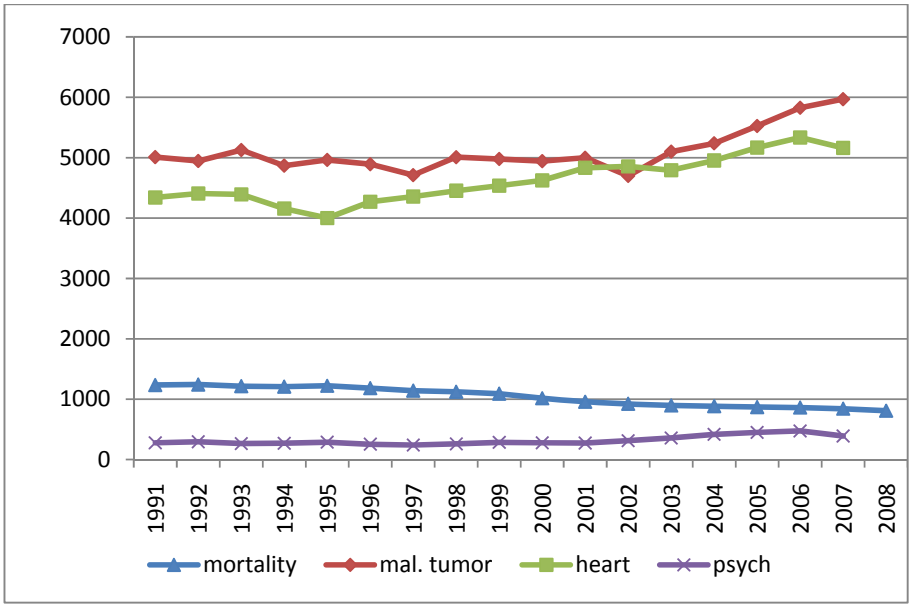


Figure 16. Mortality and prevalence of 3 major diagnoses, women 60 – 64 years. (Source: Statistics Denmark).



5. DI and other early retirement programs

a. Social Disability Pension (SDP)

The historical origin of SDP is a "classic" disability pension granted on medical criteria ending with a transition to Old Age Pension (OAP, folkepension) at age 67 (from 2004: 65 years). The number of participants in SDP relative to the population is shown in Figure 17. Until 1983 there was along with SDP a number of smaller social security pension programs available before the OAP age granted on a mix of medical and social criteria. These small programs consisted of a program for widows pension conditional on being 55 years or older and programs for granting "Early OAP" before age 67 to single women and to women above a certain age with an older spouse receiving OAP. Further, a small group of men could be granted "Early OAP" on specific social criteria. Policy changes and reforms have been enacted on several occasions. The first policy change – in the period we consider – occurred in 1965. The decline in the number of participants from 1965 to 1967

– after a strong increase from 1960 – was however due to purely administrative re-classifications (Bengtsson, 1989).

The next policy change was in 1967 making the eligibility criteria less restrictive regarding health. From 1974 married women 62 – 66 years old with an older spouse receiving OAP no longer received an independent early OAP. This was replaced with an increase in pension benefits to the retired spouse. The decline in the number of DI recipients from 1974 to 1975 was thus "artificial", i.e. the number of people in the labor force was not affected and the expenditures for the program were not affected either. A major change of SDP was enacted in 1984 through a major reform of social security programs regarding early retirement. The reformed SDP was intended to encompass a number of earlier programs. The by far biggest among these was the "classical" disability pension. Other programs, which were included into the new SDP, were as before a public financed program for widows pension, a programme for early OAP for specific groups, and a program for disabled persons with a low level compensation. The data break in 1984 occurred as a consequence of new groups who became eligible at the same time as some among the previously eligible groups lost their eligibility. New groups that became eligible were 50 – 66 year olds on social criteria and all 18 – 66 years old on a broad mix of social and/or health criteria. Those now excluded were a number of widows 55 years and older and single women, 62 – 66 years old, excluded on a new means test. The group of newly eligible was significantly bigger than the group who lost eligibility.

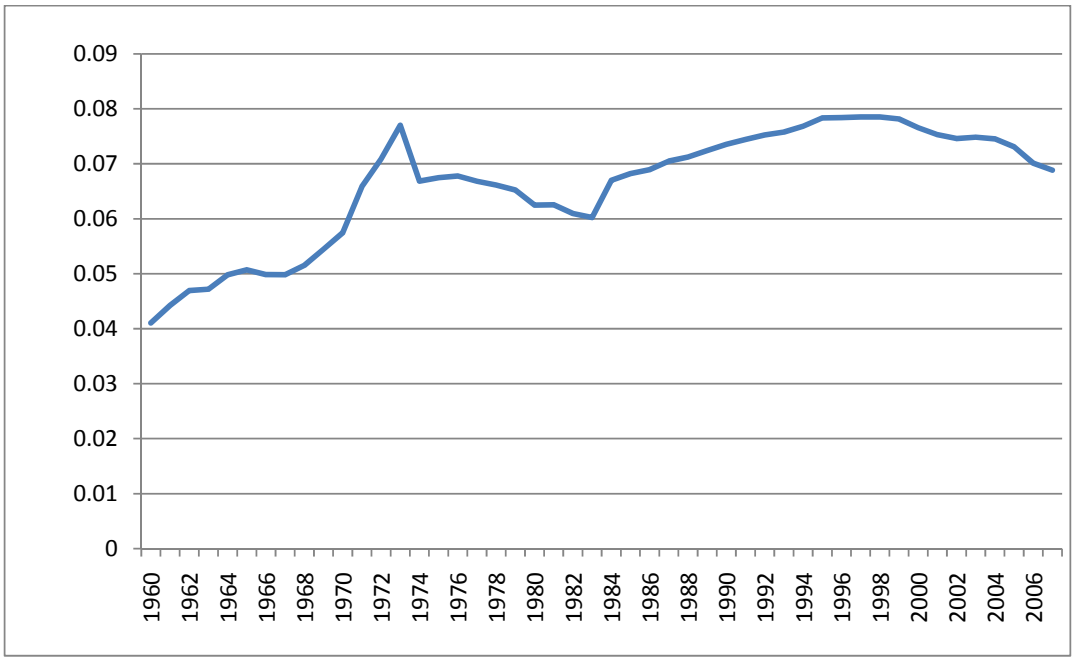
From 1984 SDP on medical or social criteria could be granted on three levels. The highest level was applicable to persons younger than 60 whose work capacity had been reduced to almost nothing. The intermediate level SDP was open for those younger than 60 with a work capacity reduced to one-third of the normal level and to people 60 to 66 years old with almost no remaining work capacity. Eligibility for the highest and the intermediate levels SDP was decided on medical criteria. Finally, eligibility for the lowest level, so-called, ordinary level SDP depended on work capacity having been reduced to below half the normal level. The evaluation of this was based on health criteria or on a combination of health and social criteria. Recipients of the ordinary level of SDP that were younger than age 60 were entitled to a supplementary amount. From 1999 the granting of the ordinary level pension was dependent on rehabilitation having been considered or tried without success.

Recipients of benefits in the number of smaller programs that were merged with the "classical" disability pension from 1984 were all entitled to the lowest level of SDP. It is consequently only

possible to avoid the data break in 1984 if the focus is on the group of people entitled to the highest and the intermediate level of benefits. For this group a data series is consistent until a reform making the program more simple was enacted in 2003.

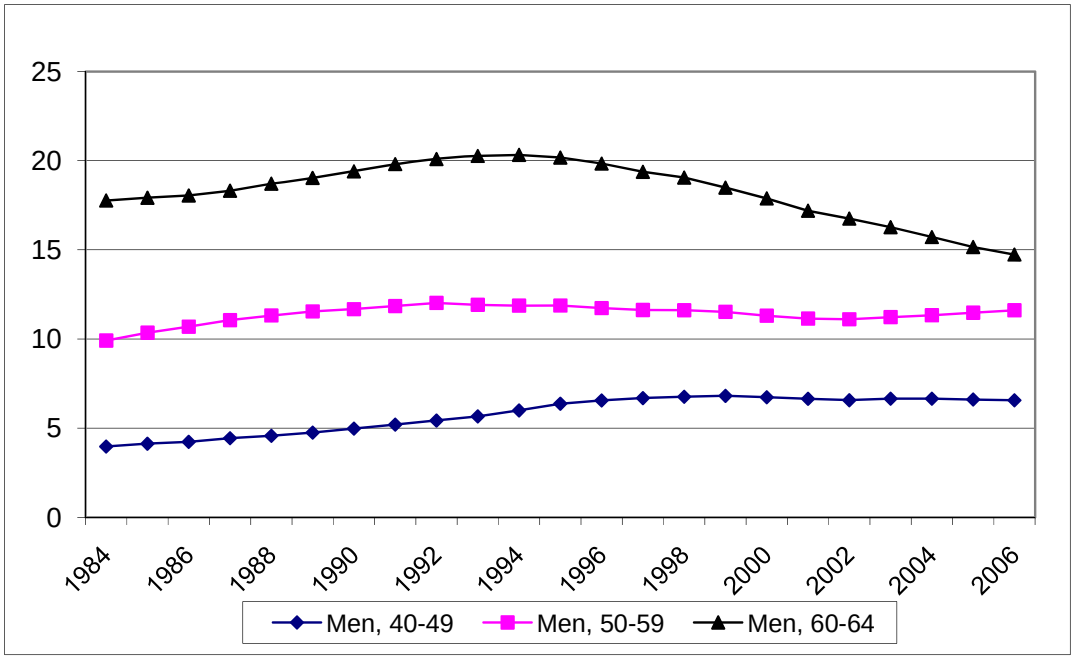
In 1992, 1997, 1998 and 1999 administrative and financial incentives were tightened up for the municipalities who are responsible for granting SDP. The purpose of these changes was to restrict/reduce entry to the program. A reform was as mentioned enacted in 2003. The main contents were a tightening of the eligibility criteria and a reduction of benefits for future SDP pensioners. The three levels of benefits (+ different ad hoc benefits) were replaced by one benefit set at maximum unemployment insurance benefits for married/cohabiting and 85 per cent of this amount for singles.

Figure 17. Participants in DI, age 18-66/64 as share of population, 1960-2008 (Policy reforms in 1967, 1974, 1983, 1998 and 2003). (Source: Statistics Denmark).



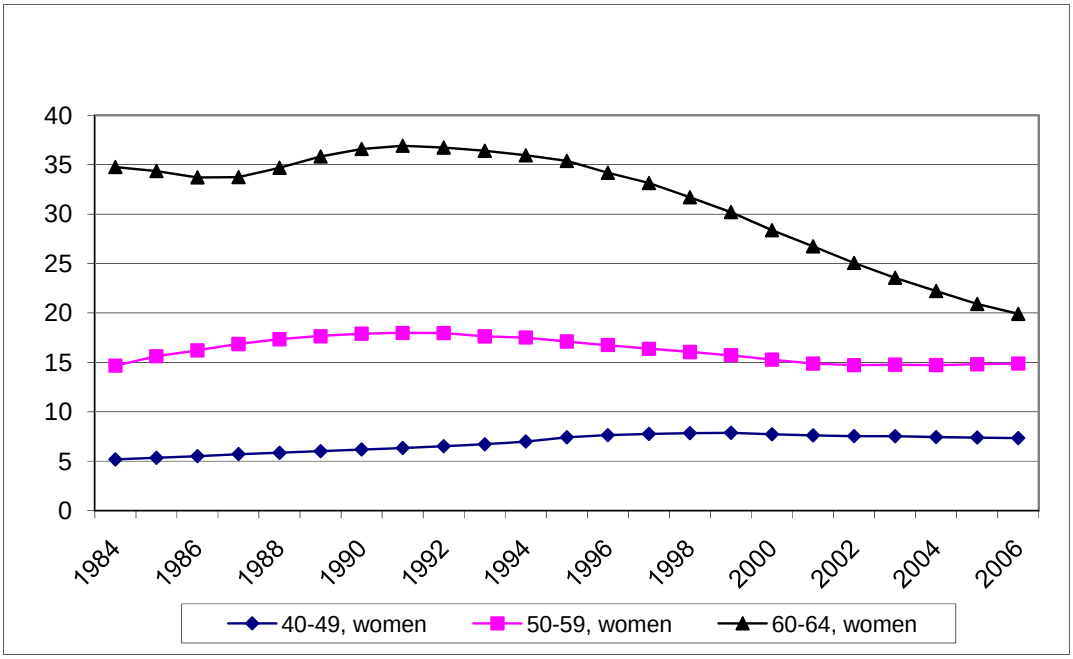
In Figures 18 and 19 we disaggregate by gender and age and show the relative participation in SDP since the 1984 reform. In this period alternative early retirement programs were introduced – or already in operation – to be described below. One of these, the Post Employment Wage (*efterlon*, hereafter PEW) program is relevant from 1979 for the 60 – 66(64) years old while another one, the Transitional Benefit Program (*overgangsydelse*, hereafter TBP) program was relevant for the 50 – 59 years old[2]. This program was open from 1992 to 1996 and is described below. For the 40 – 49 years old, SDP was the only potentially available early retirement program and for this age group we find an increase in the share in contrast to the two older groups. For the 50 – 59 years old, and especially for the 60 – 64 years old, it seems evident that program substitution is occurring. We return to this below.

Figure 18. SDP/population, men, 1984 – 2006. (Source: Statistics Denmark).



[2] The PEW program was relevant for the 60 – 66 years old until 2004, but data for Figures 14 and 15 are only available for the age interval 60 – 64.

Figure 19. SDP/population, women, 1984 – 2006. (Source: Statistics Denmark).

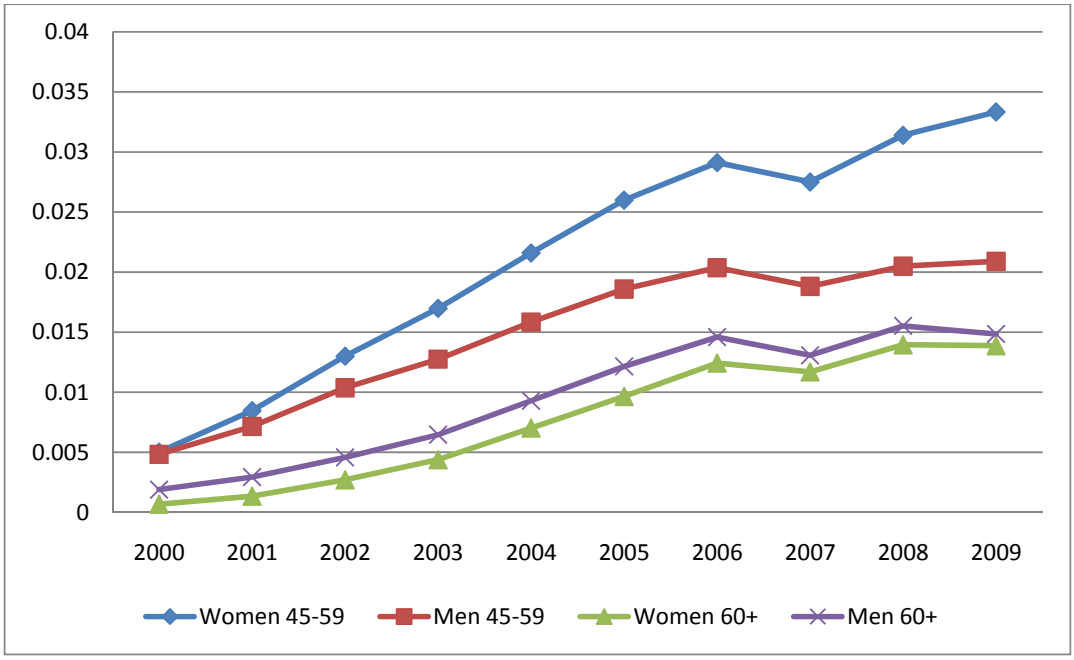


The Flex Job Program

This program was introduced in 1998. One explicit purpose was to reduce the entry to SDP by creating a new type of work opportunity for people with permanently reduced work capacity, but with a residual work capacity above the level for becoming eligible to SDP. The employer pays the wage to a flex job employee and is reimbursed from the public sector with either half or two thirds of the collectively agreed minimum wage in the relevant part of the labor market, the share depending on the work capacity of the individual employee.

The program is supplemented with a Unemployment Compensation Benefit (not part of the standard unemployment insurance program) designed to provide an income for persons from becoming admitted to the Flex Job program until a Flex Job is available and to provide an income during unemployment spells between Flex Jobs. The program quickly became popular with entry rates far above predictions in the policy preparation phase and seemingly without much impact on entry rates to the SDP program. By mid 2009 about 60.000 persons corresponding to about 2 per cent of the labor force were enrolled, cf. Figure 20.

Figure 20. Number of participants in the Flex Job Program, women and men, by age, relative to population in relevant age groups, 2000 – 2009. (Source: Statistics Denmark).



The Post Employment Wage (PEW) Program

In 1979 a new early retirement program, the PEW, was introduced with eligibility based solely on being at least 60 years old and having sufficient tenure as member of an unemployment insurance fund. Entry to the program was high compared to estimates made during the policy preparation phase. There were two main arguments behind the introduction of the program. One was that certain groups of manual workers with a labor market history of hard physical work should have an option for early retirement without having to fulfill the formal medical criteria for the disability pension program. The other was to release jobs during a deep recession for younger unemployed workers.

In 1979 the OAP age was 67 so the relevant age group was the 60 – 66 years old in the labor force. Initially, eligibility was conditional on membership of an unemployment insurance fund for 5 out of the most recent 10 years. Benefits in the program for workers coming from a job were set at unemployment insurance benefits for the first 2,5 years and at 82 per cent of maximum

unemployment benefits for the remaining period until age 67. Participants were allowed to work at most 200 hours per year reflecting the original motive of creating jobs for young unemployed. A recent study, Bingley et al. (2010) concluded that the program did not have the intended impact on youth employment or unemployment.

During the 30 years since introduction of PEW the program has undergone a number of changes. The first came already in 1980 when eligibility became conditional on unemployment insurance fund membership in 10 out of the most recent 15 years. Like later reforms of the program this was however grandfathered so the more restrictive rule was applied only for workers younger than 50 at the time of the change. The initial 5 out of 10 years rule was thus effective for all entrants over the first 10 years with the program.

The next major change was in 1992 with the purpose of reducing entry which became conditional on unemployment insurance fund membership in 20 out of the previous 25 years. However, this was again grandfathered to apply only to persons younger than 40 in 1992. The 1992 reform introduced a "63 years rule" meaning that entry from age 63 implied PEW at 100 per cent of unemployment insurance benefit level through to age 66. Also in 1992 another temporary program for early retirement for individuals 50 – 59 years old were introduced, This, socalled, Temporary Benefits Program (TBP) is described below.

The next reform of PEW came in 1999 introducing the "Flexible PEW". The main elements in the reform were that entry before age 62 implied means testing against private pension plans, also those with delayed benefits, and further PEW benefits were 91 per cent of maximum unemployment insurance benefits for the whole duration of PEW. Entry 62 years and older implied no means testing against individual pension schemes. Further, postponing entry implied accumulation of a quarterly tax free premium up to the duration of the whole PEW period.

Next, the 200 hours limit on paid work was replaced by a reduction of benefits by a fixed amount for each hour worked. Another new element was the introduction of voluntary PEW contribution, however far lower than a fair actuarial contribution. These were previously bundled with Unemployment Insurance contributions. Finally, the number of years of unemployment insurance fund membership was changed again now to 25 out of the last 30 years. This was however also grandfathered.

The most important part of the pension reform in 1999 was a reduction of the OAP age from 67 to 65 effective from 2004 for those born July 1931 or later. The impact on labor supply from this was

relatively small as most of the 65 – 66 years old were in the PEW program or in other early retirement programs. For the public purse, financial savings were that for two years individuals could no longer collect PEW but instead became eligible to OAP which was less generous. On the other hand, a number of people, either working or being provided for by their family, could now collect OAP for two more years.

Overall, the motive in reforms in this area has been to change incentives for entering PEW, thus keeping more people in the labor force. We return to look into whether these intentions have succeeded or not. We show in Figures 21 and 22 the number of men and women in the PEW program relative to the number of people in the relevant part of the population. In both figures we attempt to correct for the OAP reform by including in the graphs from 2005 the number of people 65 – 66 years old who would have collected PEW assuming the same take – up rate for those two cohorts as in 2004. For men, we find a very strong increase in the share collecting PEW in the first period after 1979 until all eligible 60 – 66 years old could collect benefits. A new increase occurs throughout the 1990s followed by a 5 percentage points decline when adjusting for the OAP change from age 67 to 65. For women Figure 17 shows a nearly uninterrupted increase in the PEW share until a peak in 2003 followed by a very moderate decline after adjustment. From around 2000 the share of women surpasses the share of men collecting PEW. For SDP the share of women has been significantly higher than the share of men ever since 1984, cf. Figures 14 and 15.

Figure 21. Number of participants in PEW relative to population in relevant age group, men, 1979-2008. (Source: Ministry of Labor and Statistics Denmark).

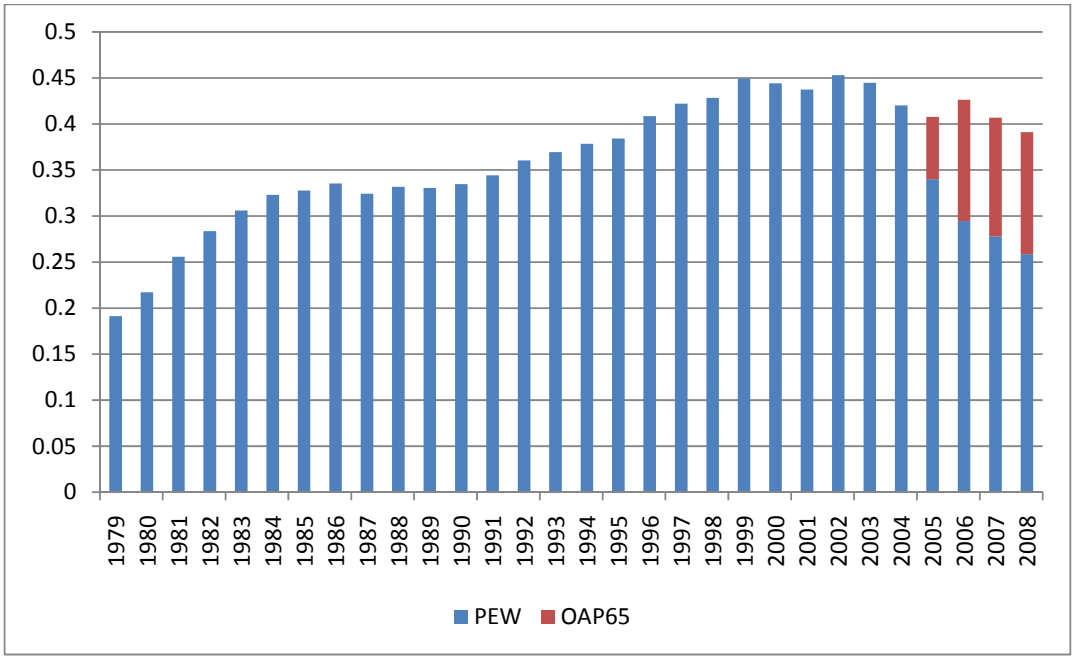
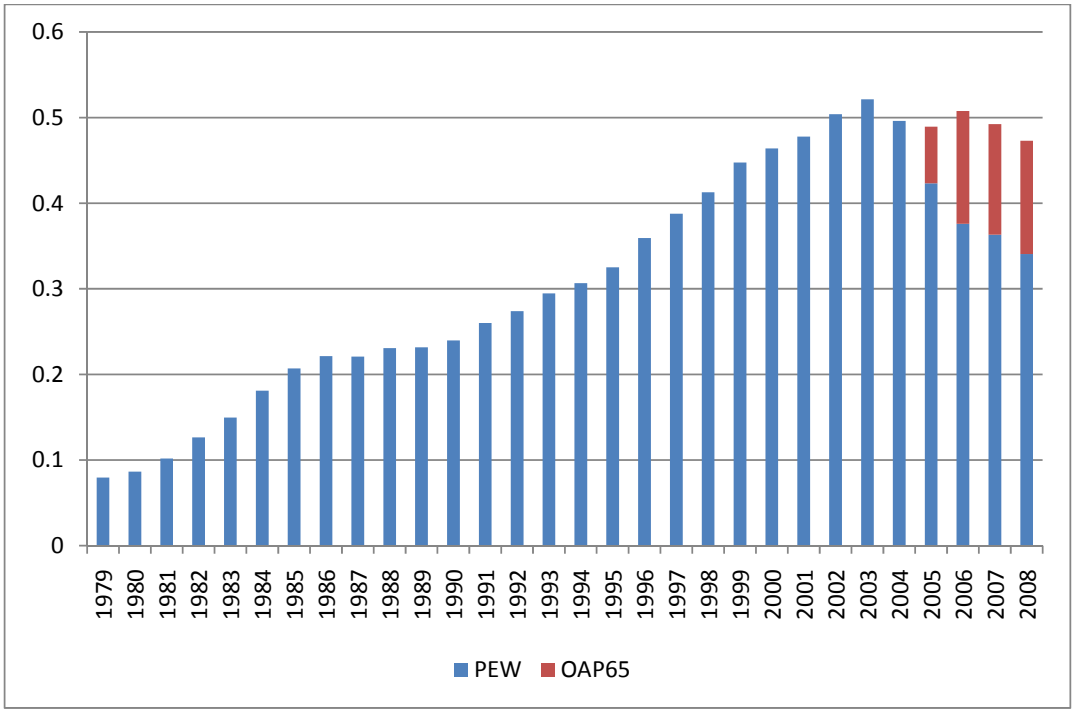


Figure 22. Number of participants in PEW relative to population in relevant age group, women, 1979-2008. (Source: Ministry of Labor and Statistics Denmark).

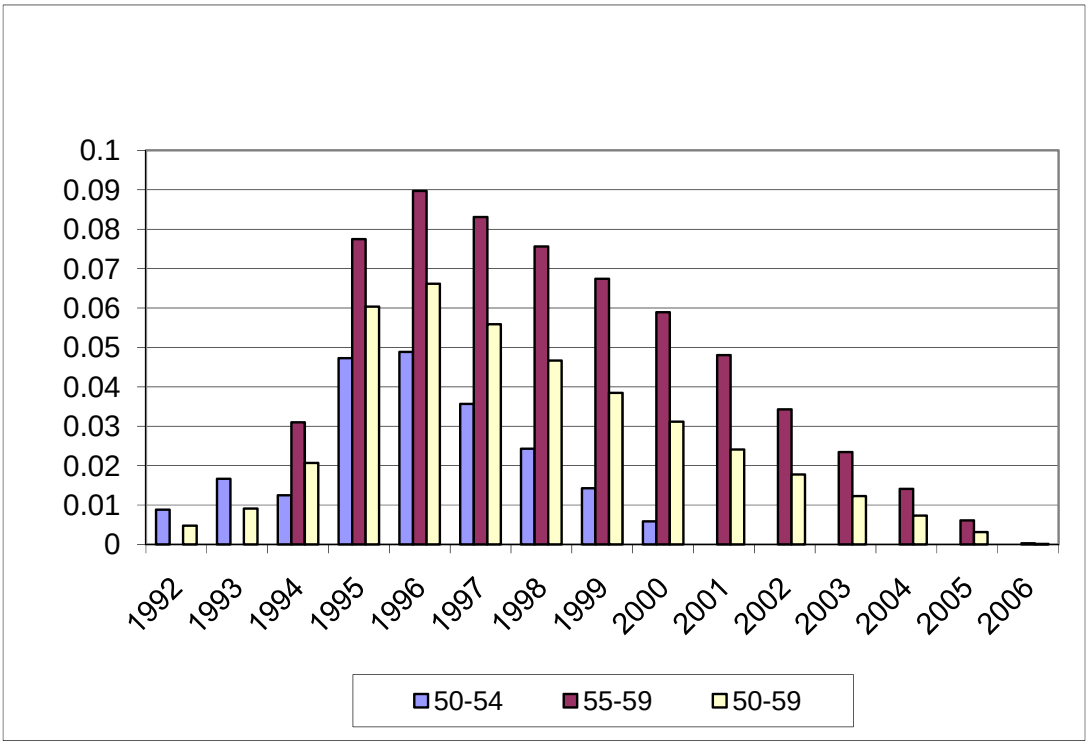


The Transitional Benefits Program

Besides the PEW program, a more restricted early retirement program in the Social Security area the Transitional Benefit program (TBP) was opened for long term unemployed people in their 50s in 1992. Eligibility conditions were stricter than to the PEW program as it was made additionally dependent on 12 months in unemployment out of the most recent 15 months. In 1992 long-term unemployed people 55 – 59 years old could enter the program. After entry they collected reduced unemployment insurance benefits and had no longer to search actively and be available for a job offer. Entry was thus an effective exit from the labor force. From age 60 participants were transferred to PEW. From 1994 the program was open also for long-term unemployed 50 – 54 years old. Entry to the program was closed again in 1996. In spite of being open for entry only in 4 years the TBP had an impact for several years on the labor market for people 50 – 59 years old. A person entering 50 years old in 1996 just before the closing of the program would thus transfer to PEW in 2006. The number of participants relative to the population in relevant ages is shown in Figure 23.

For the 55 – 59 years old the increase was a dramatic one going from 3 per cent entering the first year to a stock of 9 per cent of all 55 – 59 years old in the third year. Like for PEW the entry far exceeded estimates in the policy preparing phase.

Figure 23. Number of participant in the TBP program by age relative to population 1992 – 2006. (Source: Statistics Denmark).



No less than 8 programs for early retirement – not all in operation in all the years – have been available in Denmark in the period 1970 – 2008. In Figures 24 and 25 we attempt to illustrate the shifting importance of these different pathways over the period. This is a pragmatic approach as the ideal flow data are not available for the period. Instead we have separately for men and women, 55 – 66 years old, calculated the relative distribution on the different programs annually. Taking a specific year as example the graphs show the distribution of men, respectively women, on the included programs for early retirement[3]. The importance of opening up of new programs and subsequent crowding out, at least in relative terms, of older programs is evident from Figures 24

[3] The relative importance of unemployment as a pathway is exaggerated as a share of unemployment spells in the age group end with employment in a new job.

and 25. The opening of new programs has not only a substitution effect but also an effect on the total number of people 55 – 66 years old being provided for in the different programs. This effect on the absolute numbers is not visible from the two graphs.

Figure 24. Pathways to retirement, men 55-66 years, Denmark, 1970-2008. (Source: Calculations from Statistics Denmark).

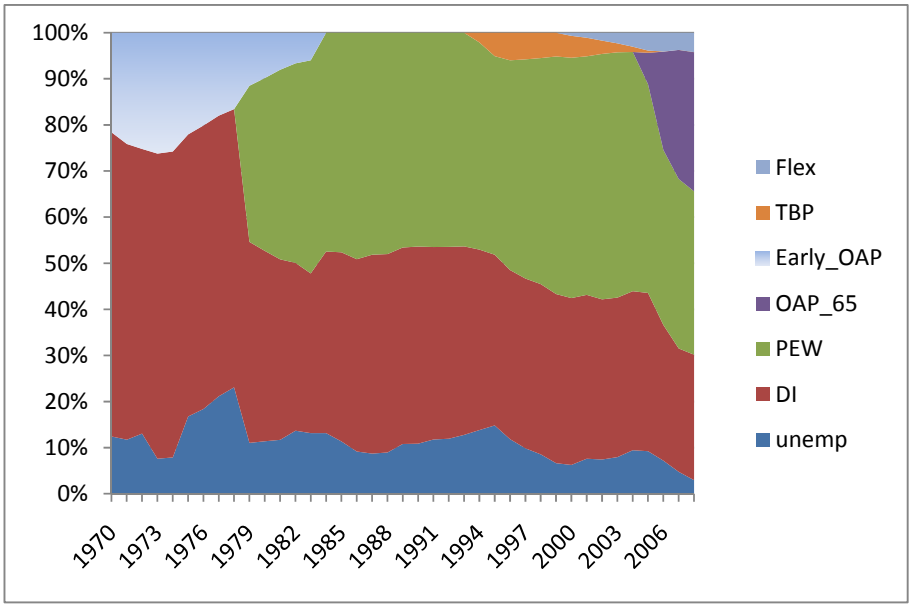
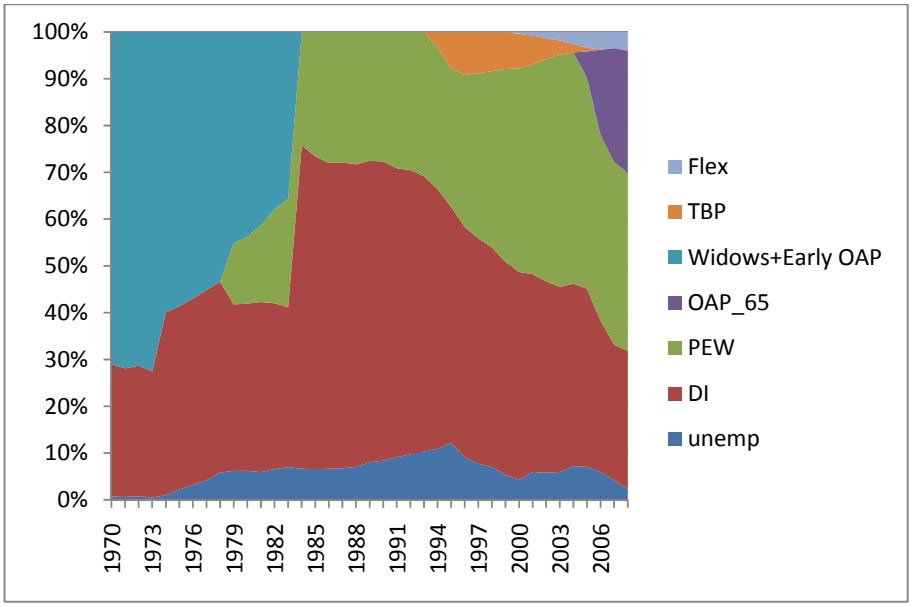


Figure 25. Pathways to retirement, women 55-66 years, Denmark, 1970-2008(Source: Calculations from Statistics Denmark).



For the period 1984 – 2000 data are available (Larsen and Pedersen, 2008) on origin and destination for people moving into early retirement programs. Annual average values are shown for men and women in Figures 26 and 27 for the composition by origin for people having PEW, SDP, Other early retirement programs and OAP as destinations with coming from a job as dominant for all destinations. The importance of coming from unemployment varies between destinations with least importance for SDP as destination. For women we see the destination “Other early retirement” differ by origin relative to other early retirement states. The relative importance of unemployment presumable reflects the TBP program where long-term unemployment was a condition for eligibility.

Figure 26. Relative distribution on flows into Early retirement and OAP, average values, men, 1984 – 2000. (Calculation from Larsen and Pedersen, 2008)

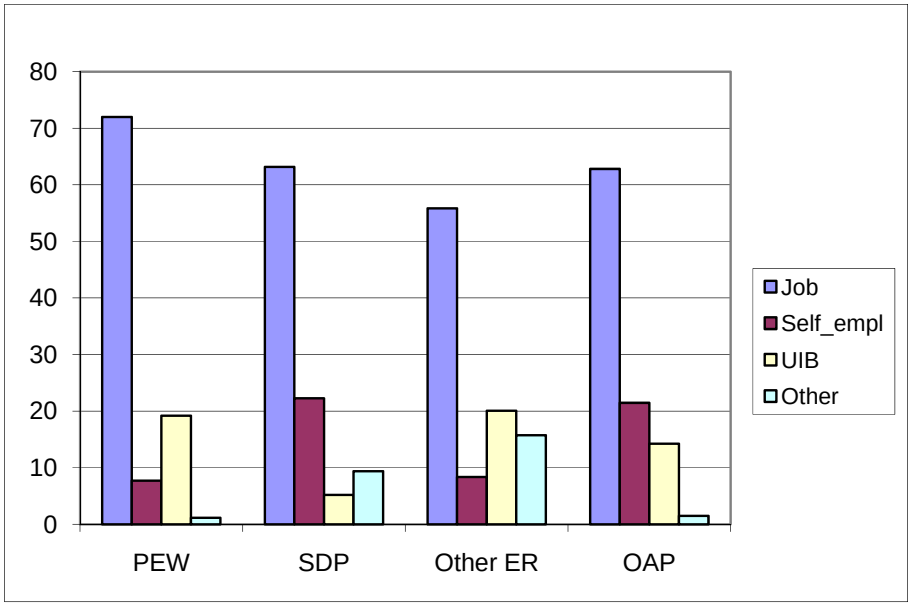
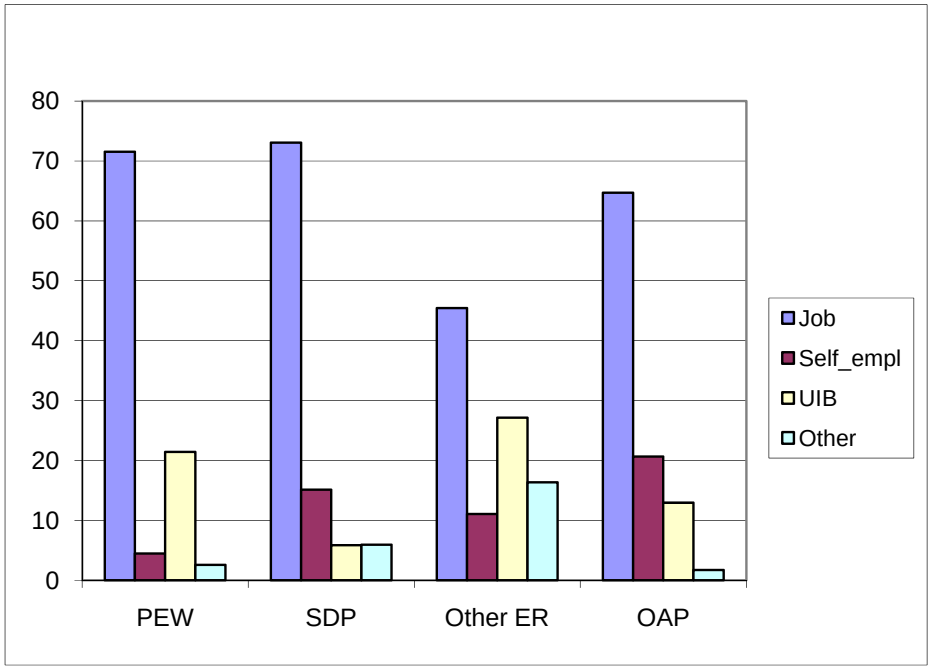


Figure 27. Relative distribution on flows into Early retirement and OAP, average values, women, 1984 – 2000. (Calculation from Larsen and Pedersen, 2008).



For the two big programs SDP and PEW we show in Figures 28 and 29 the shares being participants in each program by gender for the period from opening of PEW in 1979 until 2008. For men 60 – 66 years old the SDP share is stable until the late 1990s when a decline of 5 percentage points is seen at the same time as the PEW share goes down. For women, on the other hand, the SDP share goes down with some 20 percentage points at the same time as the PEW share goes up. There is, however no evidence of a more direct program substitution.

Figure 28. Share of male population 60 – 66 years old in SDP and PEW programs, 1979 – 2008. (Source: Statistics Denmark).

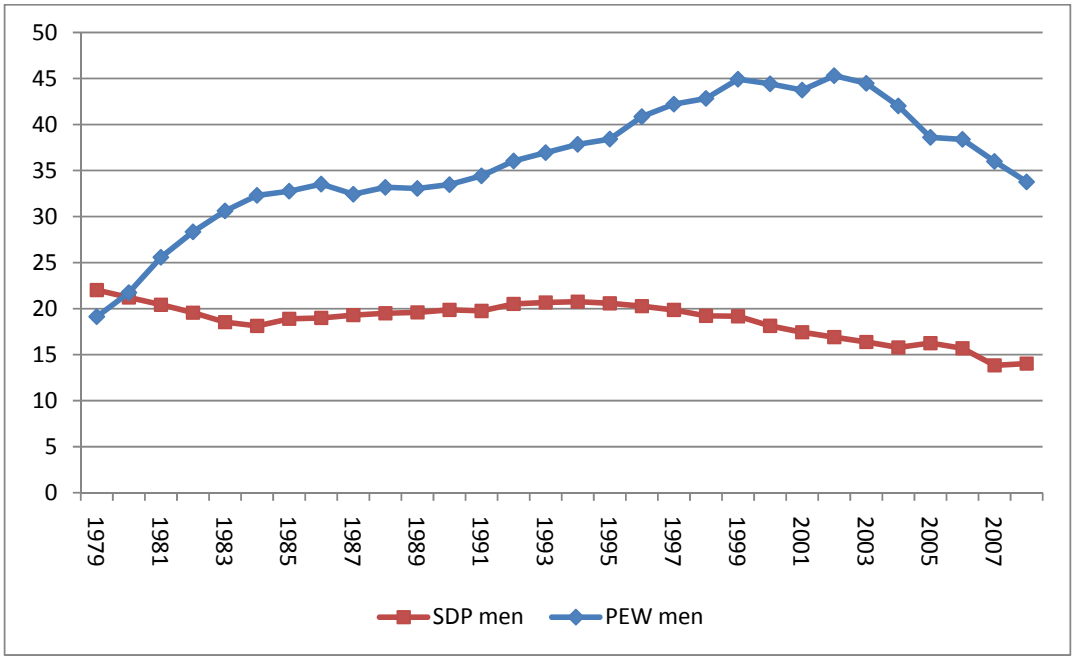
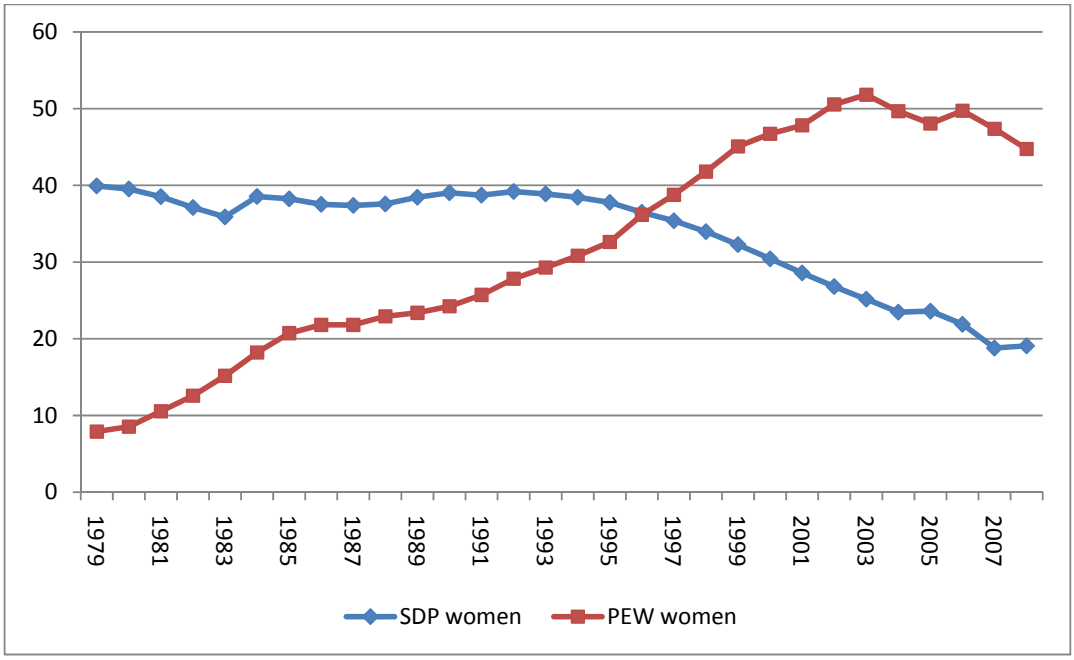


Figure 29. Share of female population 60 – 66 years old in SDP and PEW programs, 1979 – 2008. (Source: Statistics Denmark).



6. Labor Force Participation, Unemployment – and Policy Reforms

The opening of new programs has had a clear impact on labor force participation in the eligible age groups. Labor force participation rates for men 55 – 59, 60 – 64 and 65 – 69 years old are shown in Figure 30 including indications for major policy changes. The impact from the introduction of PEW is very clearly illustrated while no impact is found in 1984 from the SDP reform. The opening of TBP in 1994 for the 55 – 59 year olds is equally visible. The participation rate for the 60 – 64 year olds shows a fairly strong increase after the 1999 reform for both men and women. Part of this may however reflect statistical conventions as earnings above a certain level in the most recent years (from 2003) can result in a participant in the PEW program being classified as labor force participant if earnings are sufficiently high. For women, shown in Figure 31, the reaction to PEW is weaker than for men due to much lower participation rates for women in their 60s. For the 50 – 59 year olds, on the other hand, the TBP reaction is much stronger than for men. The 1984 SDP reform is however not visible in the participation rates.

Policy changes are reflected also when we look at employment and unemployment rates for men in the age intervals 55 – 59 and 60 – 64 from 1972 to 2007, cf. Figures 32 and 33. Employment rates for the 55 – 59 year olds return to the level about 0.80 found during the 1980s after the TBP generated dip in the the 1990s. Looking at unemployment rates in Figure 33 the impact from policy changes is even more clearly found than in the labor force participation data. In the late 1970s, after the first oil price shock and before introduction of PEW, unemployment was significantly higher for the 60 – 64 year olds than for those aged 55 – 59. Introduction of PEW results – as expected – in unemployment falling to half the pre-1979 level for the 60 – 64 year olds. Unemployment remains low until the early 1990s while it increases from about 6 to about 12 per cent for the 55 – 59 year olds. The TBP Program results in a large decline in unemployment for this age group.

Figure 30. Labor Force Participation, men 55-59, 60-64 and 65-69 years old. (Source: Statistics Denmark).

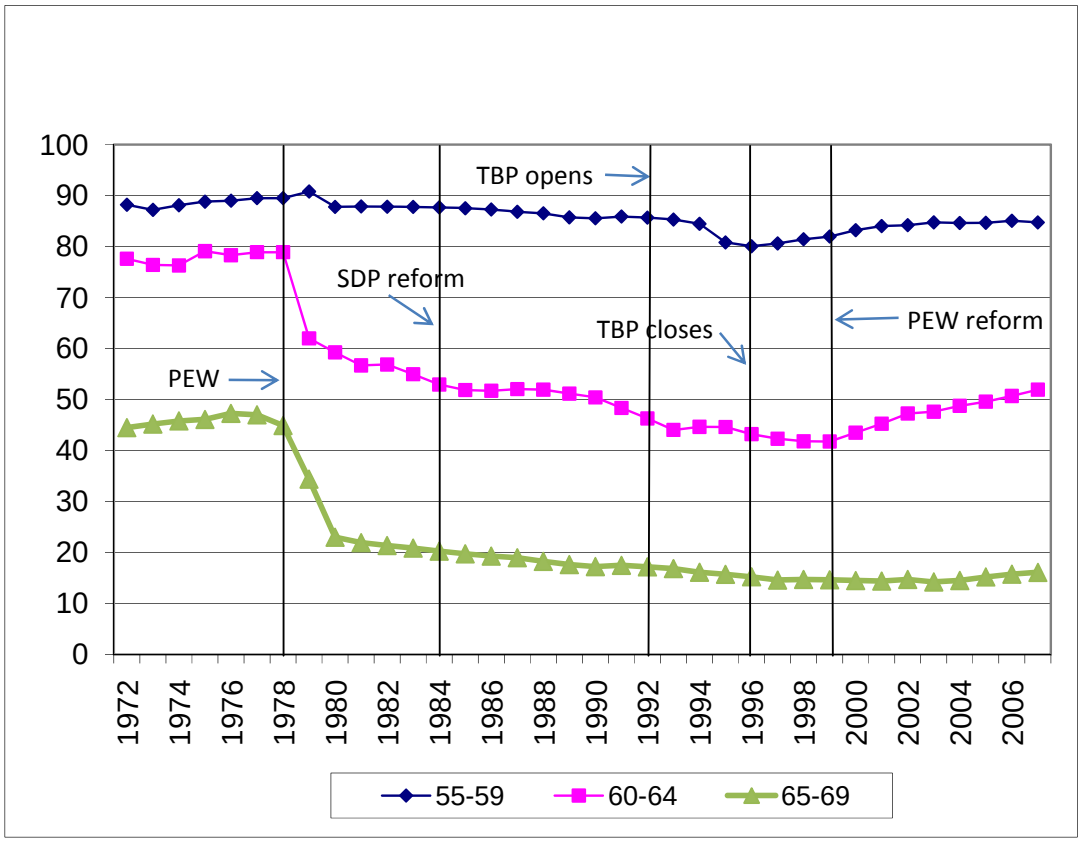


Figure 31. Labor Force Participation, women 55-59, 60-64 and 65-69 years old. (Source: Statistics Denmark).

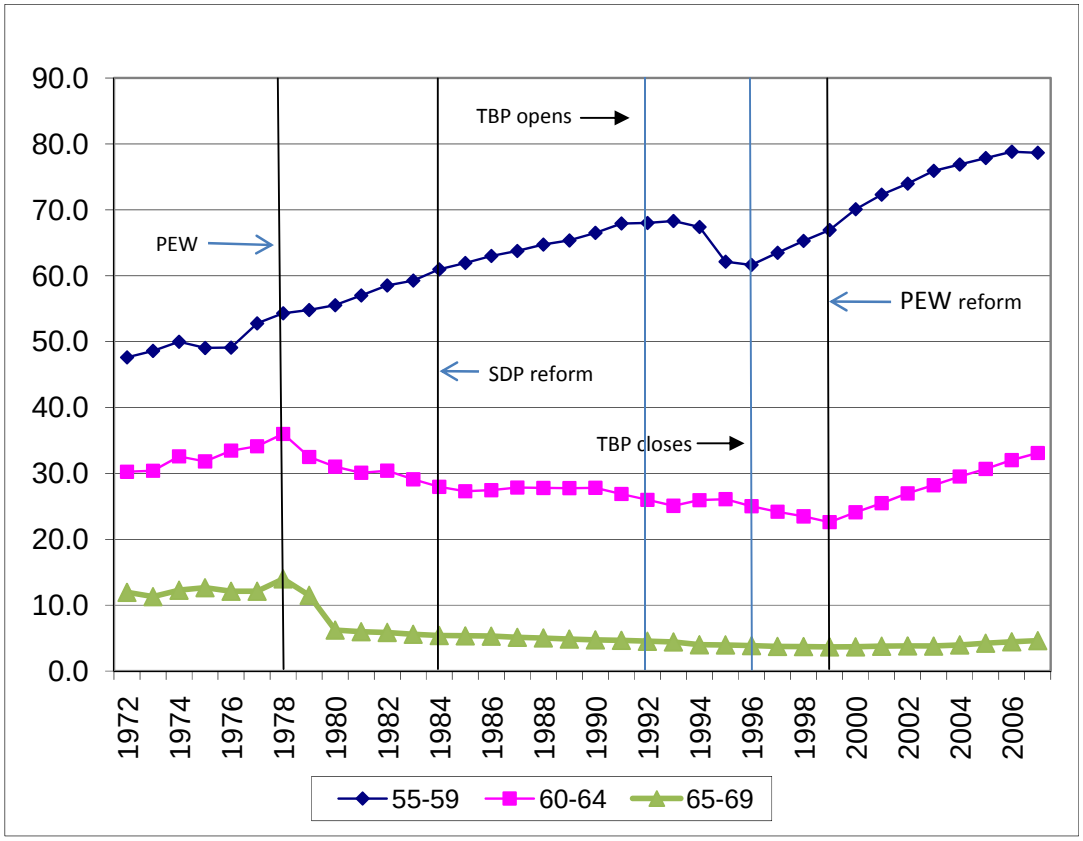


Figure 32. Male employment rates, 55-59 and 60-64. Denmark. (Source: Statistics Denmark).

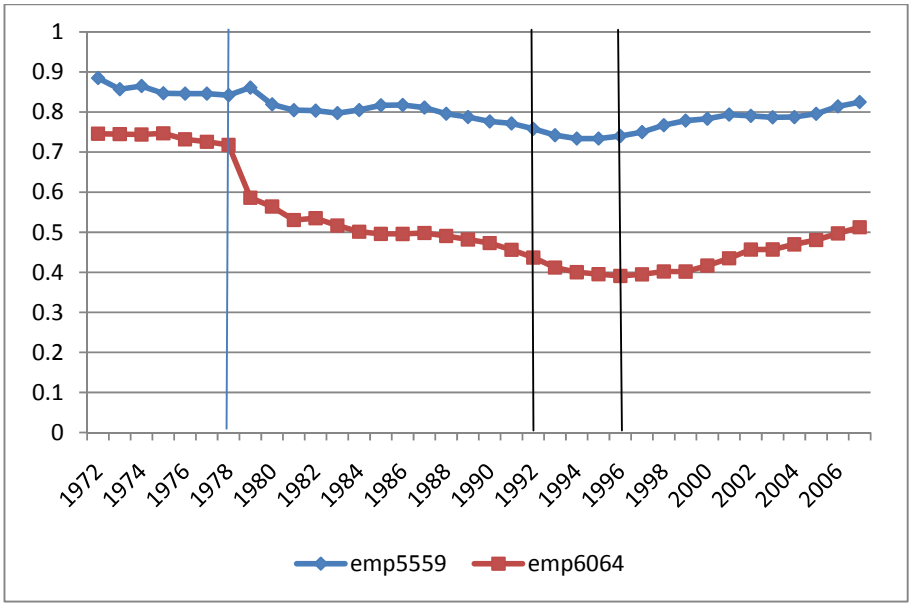
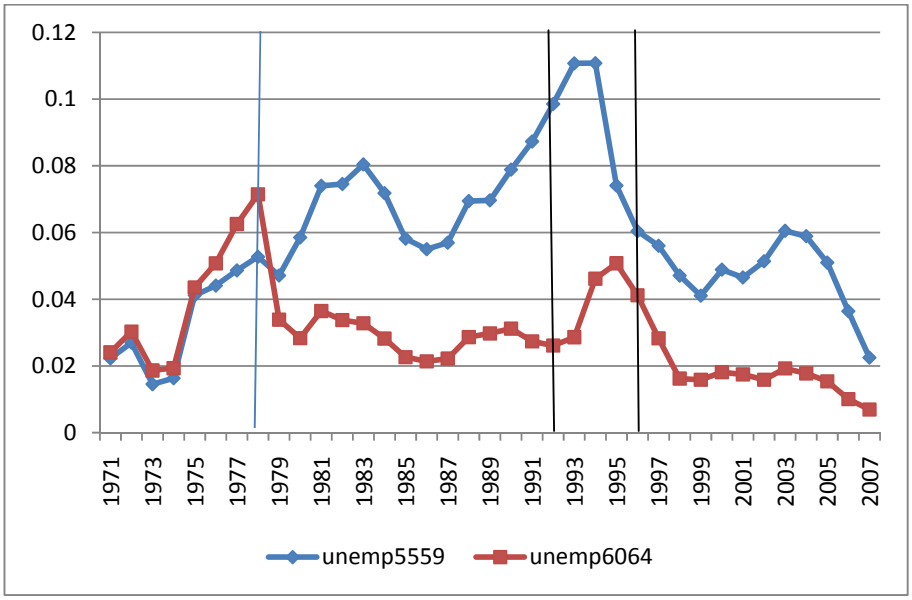


Figure 33. Male unemployment rates, 55-59 and 60-64. Denmark. (Source: Statistics Denmark).



7. Health, Policy Reforms and the Labor Market

The focus above has been on the impact on labor force participation, employment and unemployment from a number of changes in labor market and retirement policies. We found no visible impact from reforms in the SDP program as an indicator for changes in health and mortality. The purpose in this section is to relate labor market changes in a more explicit way to changes in mortality and SDP participation. In the first illustration we show in Figure 34 the employment rate for men 50 -70 years old at three points in time, 1981, 1994 and 2008. We find the "ranking" between the years as expected, i.e. the highest employment rate in 1981 where PEW not yet had full effect, a strong decline in the peak unemployment year 1994, and finally a return to a higher employment rate in the near full employment year of 2008.

What we do next is for each age between 50 and 70 in each of the years to find mortality and plot that against the employment rate. This is done in Figure 35 for men. The result is an unstable relationship over time between mortality and employment at given ages. Instead we find mortality declining at a given employment rate or employment declining at a given rate of mortality. Taking mortality as a health indicator we thus have that an improvement of health is accompanied by a decline in employment rates. A possible explanation is that non-health related early retirement programs have a crowding out effects relative to the impact from health in isolation.

For women Figure 36 reflects a strong cohort effect regarding employment until the early 60s. Still, we find in Figure 37 a shift of the relationship to the left indicating as for men that reduced mortality (improved health) correlates with lower employment rates.

Figure 34. Employment Rate, men 50-70 years, 1981, 1994 and 2008. (Calculations from Statistics Denmark).

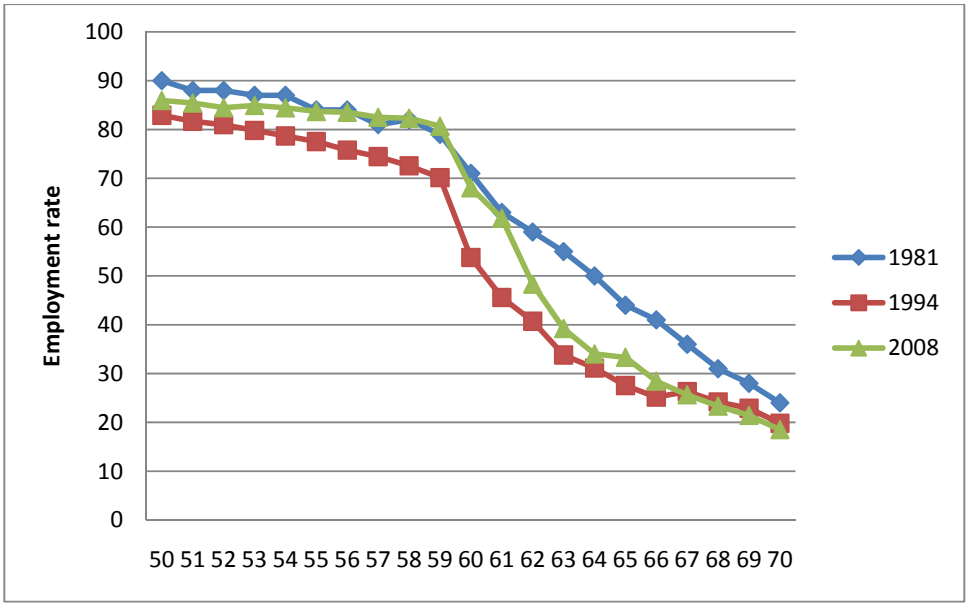


Figure 35. Employment rate by mortality risk*100, men 50-70 years old, 1981, 1994 and 2008. (Calculations from Statistics Denmark).

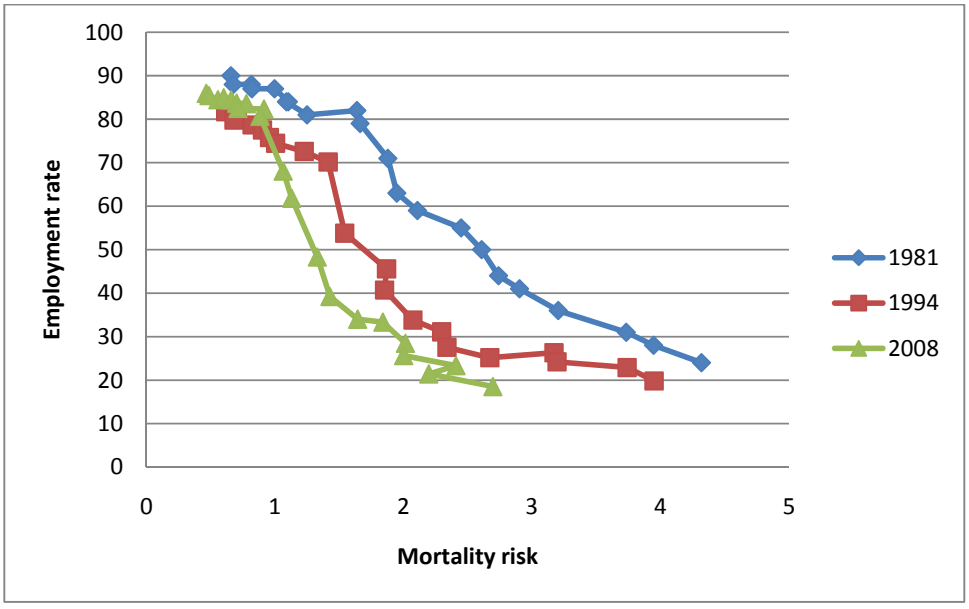


Figure 36. Employment Rate, women 50-70 years, 1981, 1994 and 2008. (Calculations from Statistics Denmark).

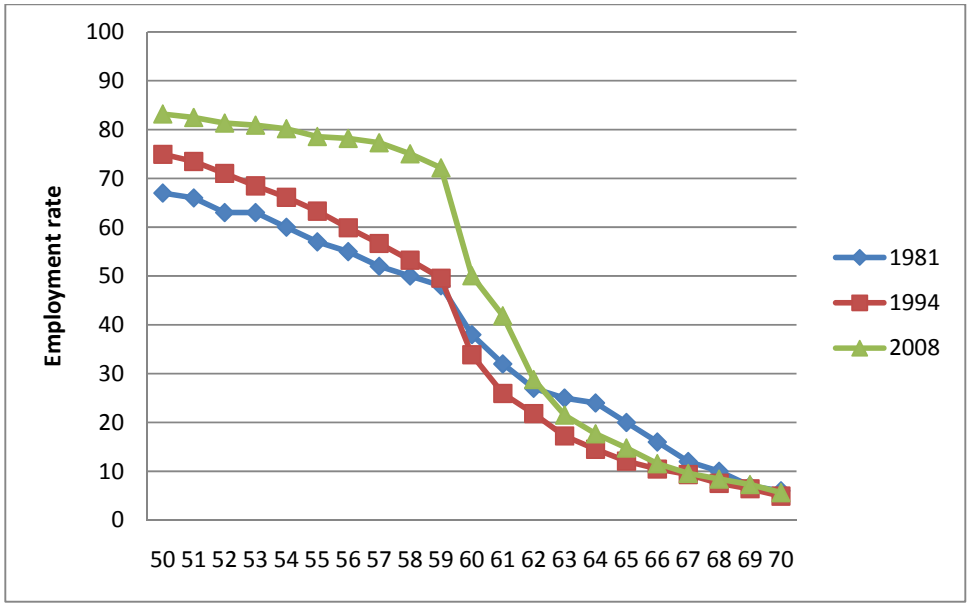
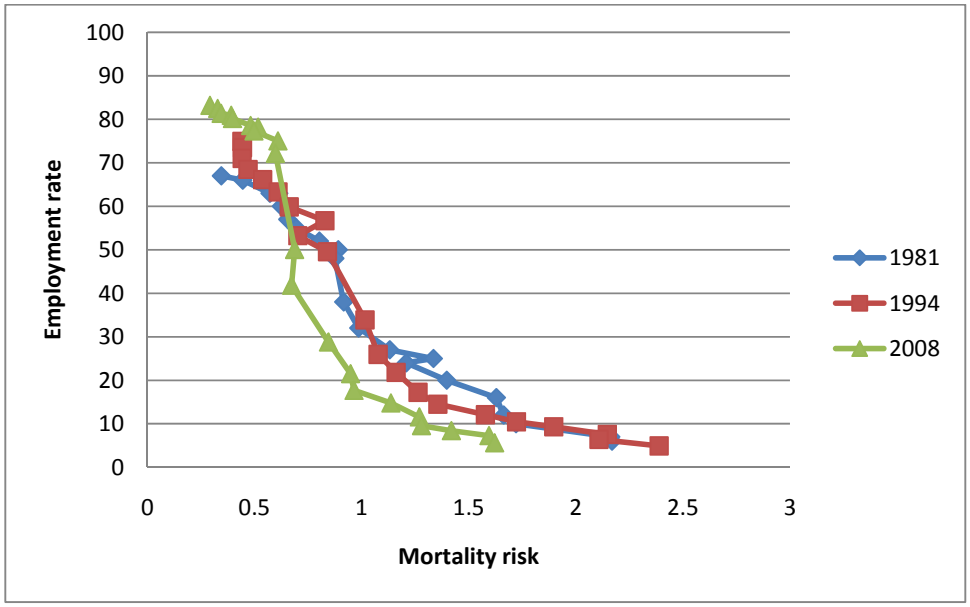


Figure 37. Employment rate by mortality risk*100, women 50 – 70 years, 1981, 1994 and 2008. (Calculations from Statistics Denmark).



In the four last Figures 38 – 41 we include in the same graphs for men and women 55 – 59 and 60 – 66 years old, mortality rates, (scaled) relative participation in the SDP program and labor force participation rates for the period 1973 – 2008. For expositional reasons disability rates are multiplied with 200. For all four gender/age groups mortality as a health indicator is falling from the first half of the 1990s. Due to the introduction of PEW, SDP participation is not comparable between the 55 – 59 and the 60 – 66 years old. Furthermore, the impact from TBP makes it difficult to interpret SDP as a health indicator for the 55 – 59 year olds from the mid-1990s. With these reservations in mind SDP is flat until the impact from the SDP reform and introduction of competing programs makes it difficult to interpret SDP take-up as a genuine health indicator. Labor force participation has the profile for the four gender/age groups described above, i.e. heavily influenced by program innovations and reforms since the early 1980s.

Figure 38. Labor force participation, mortality and (scaled) disability, men, 55 – 59 years. (Calculations from Statistics Denmark).

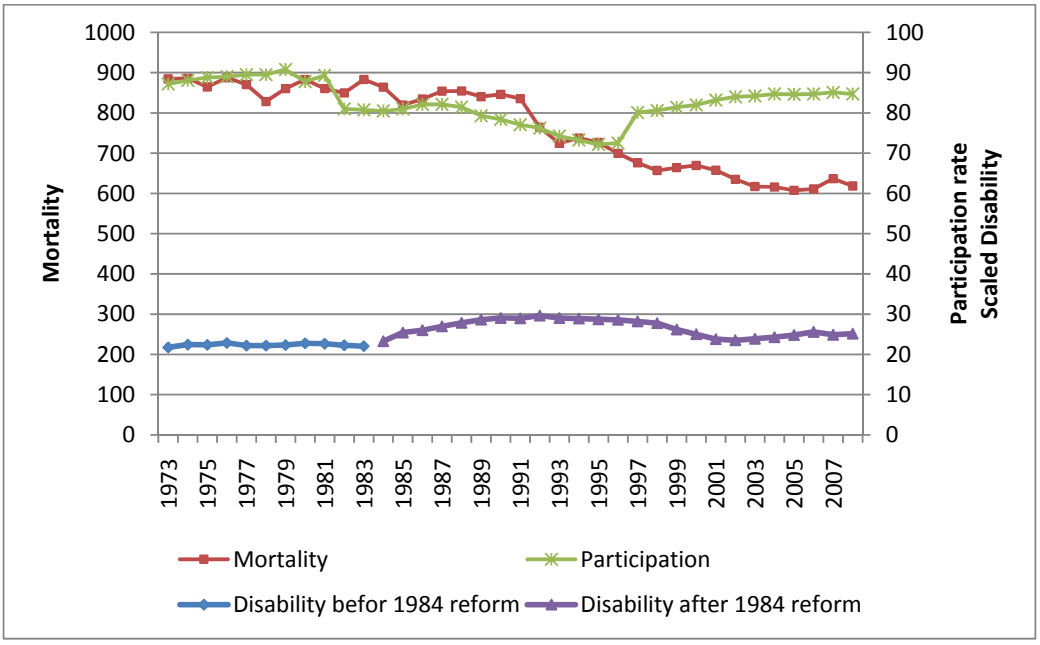


Figure 39. Labor force participation, mortality and (scaled) disability, men, 60-64 years. (Calculations from Statistics Denmark).

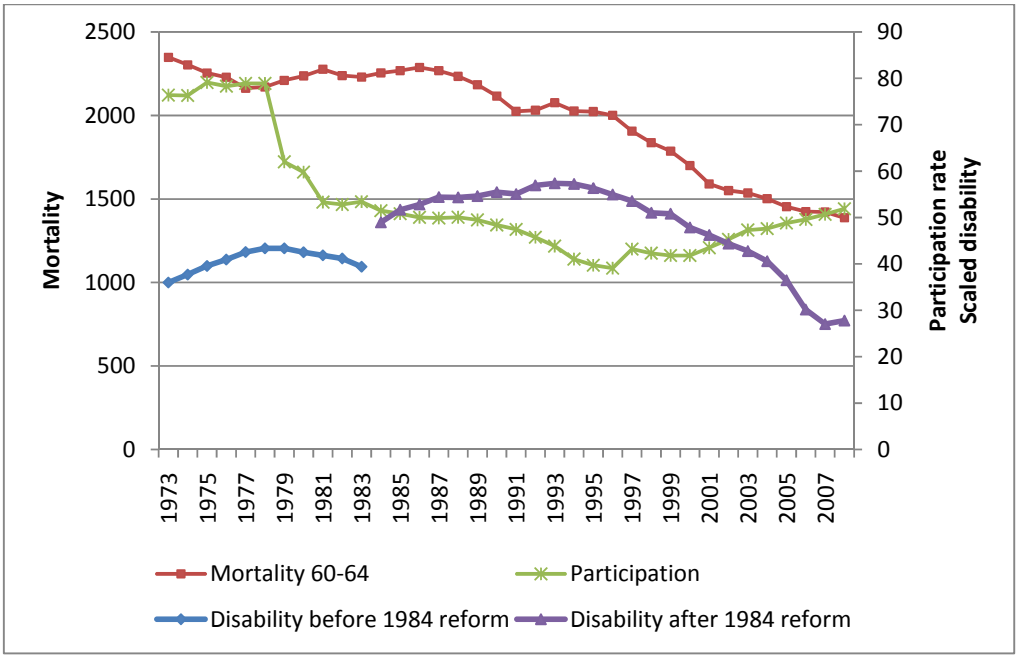


Figure 40. Labor force participation, mortality and (scaled) disability, women, 55 – 59 years. (Calculations from Statistics Denmark).

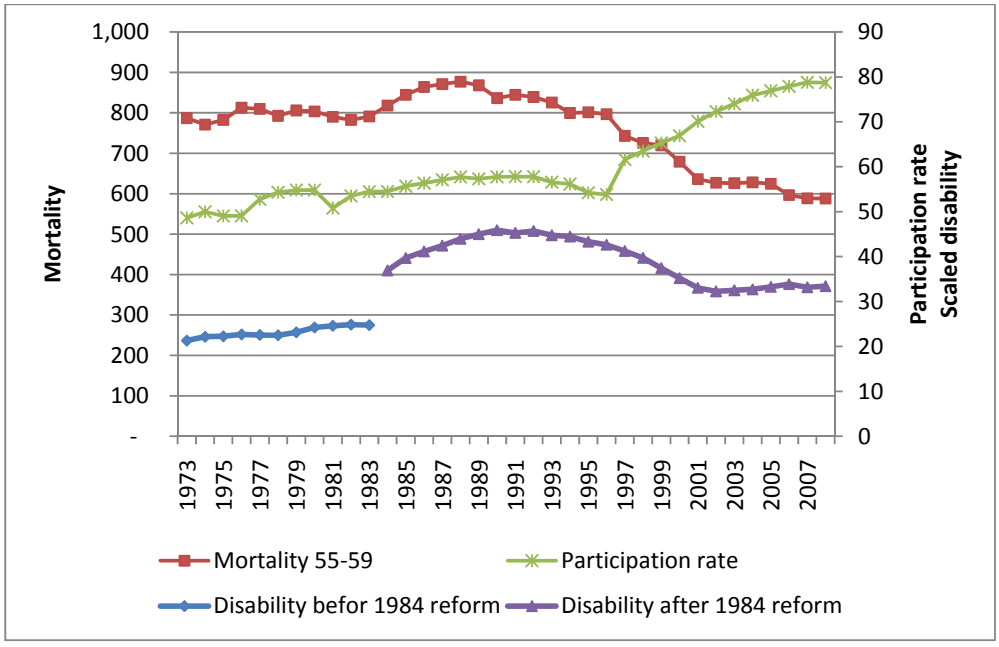
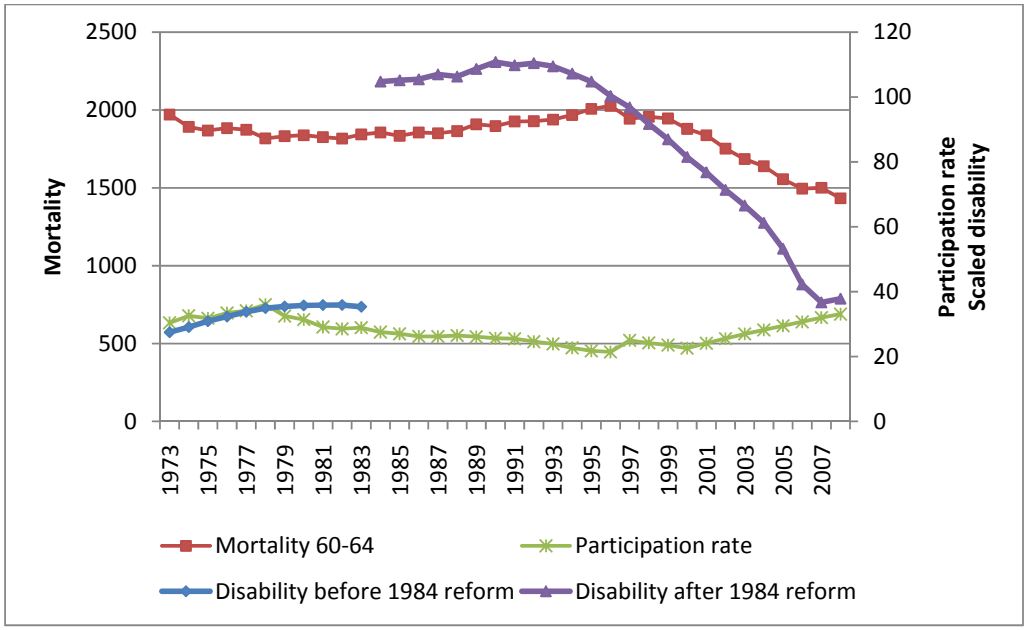


Figure 41. Labor force participation, mortality and (scaled) disability, women, 60-66. (Calculations from Statistics Denmark).



8. Summary and conclusions

The main conclusion from the above analyses is the strong relationship between labor force participation, employment and unemployment on one hand and non-health related programs for early retirement on the other hand for everybody 60 years or older for most of the period for which we have consistent data series. For the last 20 years this applies also for people in their 50s.

Only fairly incomplete evidence exists for self reported health status. We combine this with register based evidence for the health sector, i.e. prevalence of some major diseases and some main causes of death, and finally we include mortality for the most relevant age/gender groups. However, as mentioned, no clear relationship appears between labor market performance and these health indicators.

Changes in transfer programs unrelated to health status tend to dominate any relationship between labour market attachment and health measures. It is fairly difficult based on available data to construct a long consistent series of take-up of the health related part of SDP. This might be part of the reason that no evident relationship appears between health indicators and SDP take-up.

A very important reason for, or explanation of the lack of a number of expected correlations is most probably that SDP is "on its own track" due to program innovations and reforms creating competing risks or program substitution dominating the picture in the most recent decades for those older than 50 in focus in the present study. While it seems to be difficult to relate SDP take-up to available health indicators it is still a highly relevant question to continue analyses of the factors behind the development in this very expensive public sector program for early retirement.

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