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DO MEN WHO WORK LONGER LIVE LONGER? EVIDENCE FROM THE NETHERLANDS

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Introduction

Many countries have adopted policies to encourage people to work longer, which is a powerful lever for improving retirement security. In addition to the financial boost, some research suggests that longer working lives may be beneficial to physical, mental, and cognitive health, by keeping workers active in body and mind. Delayed retirement may also preserve social connections.[1] On the other hand, continued work under stressful or physically demanding conditions may reduce health and could shorten an individual's lifespan.

Establishing whether delayed retirement has a positive or negative net effect on health and longevity is crucial to forging an effective and humane retirement policy. This *brief*, based on a recent study, takes advantage of a policy change in the Netherlands – a tax credit aimed at encouraging Dutch workers to keep working into their mid-60s – to examine the effect of delayed retirement on the most important aspect of health: longevity.[2]

The discussion proceeds as follows. The first section explains why a causal effect of delayed retirement on mortality is hard to pin down. The second section describes the Dutch tax policy change, the *Doorwerkbonus*, and how this natural experiment is used to estimate the causal effect for older men. The third section presents the results on how delayed retirement affects mortality. The final section concludes that men who worked longer due to the policy change saw their mortality rate in their 60s fall from about 8 percent to 6 percent. This result implies about a two-month increase in their life expectancy if the improvement is limited to ages 62-65, but if the impact is longer lasting, it could raise life expectancy more substantially.

Why the Effect of Work on Mortality Is Hard to Measure

A simple estimate would likely find that longer worklives and lower mortality rates are correlated. But the question is, does working *cause* the worker to live longer? The effect may actually work in the opposite direction: better health may cause people to keep working. In addition, some other factor – such as income – could cause both better health and a desire to keep working.

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To help pin down a causal effect, researchers look to policy changes that simulate the conditions that might prevail in a controlled laboratory setting. The ideal experiment, in this context, is one that changes work incentives for a large group of people without directly affecting their longevity.

Previous studies have tended to focus on policies that encourage workers to retire *early*, which have been more common than policies aimed at working longer. For example, some studies have examined the effect of reaching eligibility for early retirement benefits, either in public sector defined benefit pensions or in social security systems.[3] Other studies have examined early retirement bonuses offered by employers facing tough economic conditions.[4]

But the factors that encourage people to retire early are likely not just the opposite of the factors that encourage them to work longer. People deciding whether to work longer are likely healthier than those contemplating early retirement. Many individuals in low socioeconomic groups may not even have the option to keep working given deteriorating health and diminishing job opportunities. Thus, if policymakers want to know how a policy promoting *delayed* retirement will affect longevity, they cannot simply reverse the signs on estimates from *early* retirement policies.

Mortality improved among men induced to work longer by the Dutch tax policy change.

While a few studies have focused on delayed retirement incentives, they tend to affect only small groups of workers: for example, public sector workers in an earlier reform in the Netherlands, or blue-collar workers in Austria.[5]

Using the *Doorwerkbonus* as a Natural Experiment

The *Doorwerkbonus* (DWB) policy in the Netherlands – which used tax incentives to encourage working longer – presents an ideal opportunity to estimate the causal effect of delayed retirement on mortality, for two main reasons.[6]

First, the policy affected all workers in the Netherlands from the early Baby Boomer cohort. The DWB reduced taxes on labor income for each year a person worked after age 62. This bonus, in the form of a tax credit automatically applied at filing, was substantial: up to 5 percent of taxable income (subject to a cap) for people age 62, increasing to 10 percent at age 64 before phasing out at older ages. The policy was introduced in 2009 and repealed in 2013.[7] The cohorts who stood to benefit the most were born during the period 1946-1949; these workers can be considered the treatment group. This group is compared to a control group of workers born just before, in 1943-1945. Since this control group was eligible for the DWB at older ages (after age 65), the analysis compares the treatment and control groups only at ages 62-65 in 2009-2011. Previous studies have shown that the DWB policy had a substantial effect on working longer, which is a prerequisite for using it to show whether work affects mortality.[8]

Second, the data are broad and detailed. Rather than relying on just a sample of workers, the data from Statistics Netherlands include information on every worker in the country from the relevant birth cohorts. The administrative records have information on labor market outcomes, income and benefit receipt, and dates of death. For this study, mortality information was available through 2016, so the analysis examines the probability that, after deciding whether to work at ages 62-65, an older individual died in the next five years (up to ages 67-70).

The analysis estimates two regression models. The first is the "correlational" model: the simple relationship between mortality and whether one works at ages 62-65, controlling for other factors (marital status, age, industry, and retirement income receipt). This model is intended to confirm the negative correlation between work and mortality.

The second model is the "causal" model, which consists of two steps.[9] The first step estimates the relationship between whether someone works at ages 62-65 and is eligible for the DWB:

$$Work = f(DWB\ eligible,\ other\ personal\ characteristics)$$

The estimates from this first step are used to predict whether someone works based on their DWB eligibility $(\widehat{Work})$. The second step estimates a regression where the outcome variable, *Mortality*, is whether someone dies in the subsequent five years. The regression therefore estimates:

$$Mortality = f(\widehat{Work},\ other\ personal\ characteristics)$$

The only difference between the correlational and the causal models is that the causal model uses predicted, rather than actual, work status. Because work status is predicted from the person's eligibility for the DWB, rather than their actual work status, it is not related to other factors, such as income or work satisfaction, that might complicate the relationship between work and mortality. This estimate can be considered a causal estimate of how mortality improved among those induced to work longer by the DWB.

The full study includes results for both men and women, but this *brief* focuses only on men. The results for women are similar in the correlational model, but women were less likely to respond to the DWB by working longer, so their causal model results are inconclusive.

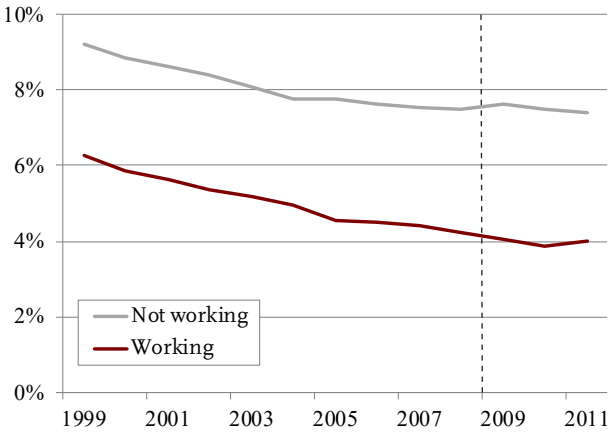
Results

As expected, the raw data show that Dutch men who worked at ages 62-65 were less likely to die over the subsequent five years than men who were not working (see Figure 1). Importantly, Figure 1 shows that mortality decreased at nearly identical rates for working and non-working men between 1999 and 2008, before the policy became available. The fact that these trends are parallel provides more confidence in the policy experiment, indicating that whatever was happening to working men prior to the DWB was also happening to non-working men. In contrast, the mortality rate in 2009-2011 continued to improve somewhat for working men, who were benefiting from the DWB, while the mortality rate for non-working men plateaued.

While these patterns from the raw data are suggestive of a possible relationship between work and mortality, the fact that men who do not work at ages 62-65 *always* have higher mortality indicates that these two groups differ in important ways. Thus, these patterns do not provide clear evidence on how working longer affects mortality. To do so, we turn to the regression results (see Figure 2). The correlational model, which looks at the simple relationship between working and mortality, echoes the difference in the trends in Figure 1, even after controlling for other factors: men who work at ages 62-65 are about 2.1 percentage points less likely to die over the subsequent five years than men who do not work at these ages.

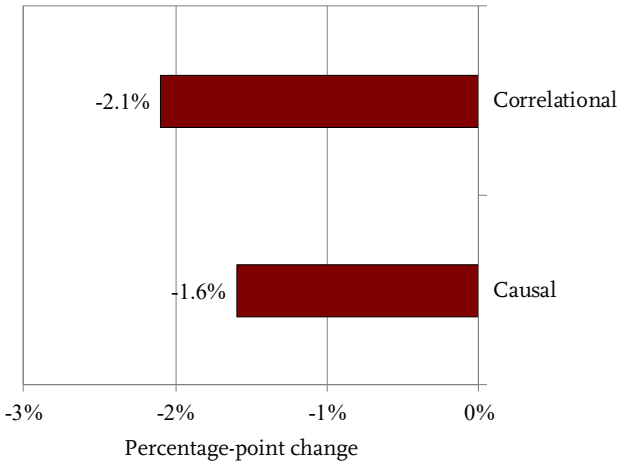
The more relevant results are from the causal model, which accounts for the ways in which men who work are different from men who do not work at ages 62-65. That model finds that men induced to work by the DWB are about 1.6 percentage points less likely to die over the subsequent five years than

Figure 1. Five-Year Mortality Rate for Men Ages 62-65 in the Netherlands, 1999-2011



Source: Authors' calculations using non-public microdata from Statistics Netherlands, 1999-2016.

Figure 2. Estimated Effect of Work at Ages 62-65 on Five-Year Mortality



Notes: Both estimates are statistically significant at the 1-percent level. See Zulkarnain and Rutledge (2018) for full details on the regression models.
Source: Authors' estimates using non-public microdata from Statistics Netherlands (1999-2016).

the men who do not work at those ages. This estimate suggests that if non-working men were to work longer, they could see their mortality rate fall from about 8 percent to just below 6 percent over a five-year period.

A key question is whether the reduction in mortality is only temporary – will it only occur during the five-year window studied in this analysis – or whether it will put mortality on a permanently lower track. If the reduction in men's mortality is only temporary, their remaining life expectancy after age 60 would rise from 21.5 years to 21.7 years, or about two extra months. If, however, the effect on mortality is longer lasting, remaining life expectancy could increase by about two full years.

Conclusion

As countries move to encourage later retirement, one crucial piece of information is still uncertain: whether working longer improves mortality. The simple correlation between working and mortality does suggest a relationship, but it does not imply that work is *causing* the better outcomes. To estimate this causal effect, the analysis takes advantage of a Dutch tax policy change. The results indicate that Dutch men ages 62-65 induced to work by the policy change do live longer: their mortality falls at a rate that implies at least two extra months of longevity, and up to two years if the effect is longer lasting.

These results require some caveats. First, the causal estimates relate to the people who responded to the tax policy by working longer, and may not apply to everyone who worked longer. Second, the tax policy takes a "carrot" approach, offering incentives to work longer, rather than the "stick" approach of some U.S. proposals that aim to discourage early retirement by reducing benefits; it is unclear whether a penalty would be more or less effective than a bonus such as the DWB. Nonetheless, these results indicate that encouraging some people to work longer may result in longer lives.

Endnotes

1 Dave, Rashad, and Spasojevic (2008); Staudinger, Yu, and Cheng; (2020); and Patacchini and Engelhardt (2016).

2 Zulkarnain and Rutledge (2018).

3 Haernes et al. (2013); Hallberg, Johansson, and Josephson (2015); Fitzpatrick and Moore (2018); and Nielsen (2019).

4 Coe and Lindeboom (2008).

5 Bloemen, Hochguertel, and Zweerink (2017); Hagen (2018); and Kuhn et al. (2020).

6 The term *Doorwerkbonus* translates literally as "Work-Through Bonus."

7 The policy was repealed for budgetary reasons and was replaced with a less generous bonus aimed at younger ages.

8 Zulkarnain (2015) and Zulkarnain and Mastrogiacomo (2017).

9 This procedure uses a two-stage least squares approach.

References

Bloemen, Hans, Stefan Hochguertel, and Jochem Zweerink. 2017. "The Causal Effect of Retirement on Mortality: Evidence from Targeted Incentives to Retire Early." *Health Economics* 26: e204-e218.

Coe, Norma B. and Maarten Lindeboom. 2008. "Does Retirement Kill You? Evidence from Early Retirement Windows." Discussion Paper 3817. Bonn, Germany: Institute for the Study of Labor (IZA).

Dave, Dhaval, Inas Rashad, and Jasmina Spasojevic. 2008. "The Effects of Retirement on Physical and Mental Health Outcomes." *Southern Economic Journal* 75: 497-523.

Fitzpatrick, Maria D. and Timothy J. Moore. 2018. "The Mortality Effects of Retirement: Evidence from Social Security Eligibility at Age 62." *Journal of Public Economics* 157: 121-137.

Hagen, Johannes. 2018. "The Effects of Increasing the Normal Retirement Age on Health Care Utilization and Mortality." *Journal of Population Economics* 31(1): 193-234.

Hallberg, Daniel, Per Johansson, and Malin Josephson. 2015. "Is an Early Retirement Offer Good for Your Health? Quasi-experimental Evidence from the Army." *Journal of Health Economics* 44: 274-285.

Hernaes, Erik, Simen Markussen, John Piggott, and Ola L. Vestad. 2013. "Does Retirement Age Impact Mortality?" *Journal of Health Economics* 32: 586-598.

Kuhn, Andreas, Stefan Staubli, Jean-Philippe Wuellrich, and Josef Zweimueller. 2020. "Fatal Attraction? Extended Unemployment Benefits, Labor Force Exits, and Mortality." *Journal of Public Economics* 191(104087).

Nielsen, Nick F. 2019. "Sick of Retirement?" *Journal of Health Economics* 65: 133-152.

Patacchini, Eleonora and Gary V. Engelhardt. 2016. "Work, Retirement, and Social Networks at Older Ages." Working Paper 2016-15. Chestnut Hill, MA: Center for Retirement Research at Boston College.

Staudinger, Ursula M., Yan-Liang Yu, and Bin Cheng. 2020. "Novel Information Processing at Work Across Time Is Associated with Cognitive Change in Later Life: A 14-year Longitudinal Study." *Psychology and Aging* 35(6): 793-805.

Zulkarnain, Alice. 2015. "A Delayed Retirement Policy and Male Labor Supply: Evidence from the Entire Dutch Population." Netspar Discussion Paper 12/2015-52. Tilburg, The Netherlands.

Zulkarnain, Alice and Mauro Mastrogiacomo. 2017. "The Effect of a Delayed Retirement Policy on Female Labor Supply: Evidence from the Entire Dutch Population." Available at SSRN: https://ssrn.com/abstract=3172286

Zulkarnain, Alice and Matthew S. Rutledge. 2018. "How Does Delayed Retirement Affect Mortality and Health?" Working Paper 2018-11. Chestnut Hill, MA: Center for Retirement Research at Boston College.

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