Application and Employment Effects of Reduced Screening for Disability Insurance Benefits of Older Workers

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Abstract

We examine application, award, and employment responses to a 2022 reform in the Netherlands. That reform allowed long-term sick-listed workers aged 60 and above to bypass the medical assessment and receive full disability insurance (DI) benefits, while creating a new route into de facto early retirement for workers who have been sick for two years, and undermining activation efforts for those with remaining work capacity. Using administrative data and a difference-in-differences design that compares persons aged 60-64 to 55-59 across pre- and post-reform cohorts, we find that DI applications rose modestly (+1.2 percentage points (pp) relative to the pre-reform baseline of 39.6%), while awards increased markedly (+6.5 pp relative to the pre-reform baseline of 28.7%), driven by higher acceptance and a shift to full benefits. Effects are larger for women, service-sector workers, and the lowest quintile of pre-disability earners. One year after potential receipt, employment fell by 2.1 pp, and earnings responses imply a crowd-out of 31%. Overall, we find stronger evidence, consistent with moral-hazard behavior, in labor supply than in DI applications, with application responses emerging only later in the post-reform period, consistent with learning by applicants, employers, and caseworkers.

Samenvatting

Dit onderzoek meet de gevolgen van de 60+-versnellingsmaatregel die in Nederland is ingevoerd, waarbij de medische keuring bij de WIA-beoordeling werd afgeschaft voor zieke werknemers van 60 jaar en ouder na twee jaar ziekteverzuim. De maatregel, die in oktober 2022 is ingevoerd om de lange wachttijden bij WIA-claimbeoordelingen te verkorten, is in het bijzonder gericht op oudere werknemers, gezien hun doorgaans lagere arbeidsparticipatie.

Wij onderzoeken de effecten van deze maatregel op het aantal WIA-aanvragen, het aantal toegekende uitkeringen, het type uitkeringen en de daaropvolgende arbeidsmarktuitkomsten. Hiervoor maken wij gebruik van administratieve gegevens van het UWV, die alle langdurige ziekteverzuimtrajecten in Nederland omvatten. Met een difference-in-differences-opzet vergelijken wij personen van 55–59 jaar en 60–64 jaar vóór en na de invoering van de maatregel. De belangrijkste bevindingen zijn als volgt:

- Het aantal WIA-aanvragen is slechts beperkt toegenomen, met 1,2 procentpunt (pp) ten opzichte van het niveau vóór de maatregel (39,6%), al neemt dit effect toe naarmate mensen langer bekend zijn met de maatregel.
- Het aantal toegekende WIA-uitkeringen is substantieel gestegen, met 6,5 pp ten opzichte van het niveau vóór de maatregel (28,7%), vooral door een toename van volledige (tijdelijke) WIA-uitkeringen.
- De arbeidsparticipatie één jaar na het potentiële moment van uitkeringsontvangst is met 2,1 pp gedaald, wat overeenkomt met een arbeidsmarktcrowd-out van circa 31%.
- De samenstelling van WIA-uitkeringen is sterk verschoven, weg van gedeeltelijke en permanente WIA richting volledige tijdelijke WIA met zwakkere werkprikkels.
- De effecten zijn heterogeen en gemiddeld sterker voor vrouwen, werknemers in de dienstensector en personen in het laagste inkomenskwintiel.

In het geheel genomen wijzen de resultaten op beperkte gedragseffecten in termen van extra WIA-aanvragen, maar op duidelijke gedragseffecten in arbeidsparticipatie na toekenning van de uitkering. Voor de pensioensector heeft de maatregel in de praktijk geleid tot een extra route naar vervroegde uittreding voor oudere langdurig zieke werknemers, inclusief personen met resterende arbeidsmogelijkheden. Dit kan beleid dat is gericht op het verlengen van de arbeidsloopbaan ondermijnen en heeft daarmee gevolgen voor de pensioenopbouw. Daarnaast zal de toegenomen WIA-instroom naar verwachting doorwerken in aanvullende WIA-verzekeringen, zoals WIA-hiaat en WIA-excedent.

Een Nederlandstalige samenvatting van dit onderzoek is eerder verschenen als UWV-Kennisverslag (Jansen & Spijkerman, 2025), in het kader van een institutionele samenwerking met het UWV.

Executive summary

This study estimates the consequences of the fast-track measure introduced in the Netherlands, which removed medical screening from disability insurance (DI) assessments for sick-listed workers aged 60 and above after two years of sick leave. Implemented in October 2022, the policy aimed to reduce long waiting times for DI assessments and was explicitly targeted at older workers, who typically have lower employment rates.

We examine the effects of this reform on DI applications, benefit awards, the composition of benefit types, and subsequent employment outcomes. Using comprehensive administrative data from the Dutch National Social Insurance Institute (UWV) covering all long-term sick leave spells, we apply a difference-in-differences design comparing individuals aged 55–59 and 60–64 before and after the reform. The main findings are as follows:

- Disability insurance applications increased modestly, by 1.2 percentage points relative to a pre-reform baseline of 39.6%, with effects growing over time.
- Disability insurance awards rose substantially, by 6.5 percentage points relative to a pre-reform baseline of 28.7%, driven largely by increased access to full (temporary) DI.
- Employment one year after potential benefit receipt declined by 2.1 percentage points, corresponding to an employment crowd-out ratio of approximately 31%.
- The composition of DI benefits shifted markedly, away from partial and permanent DI toward full temporary DI with weaker work incentives.
- Effects are heterogeneous across groups and are particularly pronounced among women, workers in the services sector, and individuals in the lowest pre-disability earnings quintile.

Overall, the results point to limited ex-ante behavioral responses in terms of applications, but sizeable ex-post labor supply effects following benefit receipt. For the pension sector, the fast-track reform effectively created an additional pathway into early labor market exit for older long-term sick-listed workers, including those with remaining work capacity. This may undermine policies aimed at extending working lives, reduce pension accrual close to retirement, and affect reliance on supplementary disability pension arrangements linked to DI.

A Dutch-language summary of this study has been published as a UWV Kennisverslag (Jansen & Spijkerman, 2025), reflecting close institutional collaboration with the Dutch National Social Insurance Institute.

1. Introduction

Across many OECD labor markets, the employment rates of older workers remain considerably lower than those of prime-age workers (OECD, 2025). With rising retirement ages, these differences in employment rate are often used to justify age-specific eligibility rules that lower the disability insurance (DI) threshold for older workers. For example, in Austria, DI eligibility above age 60 is assessed relative to a similar prior occupation rather than any reasonable occupation that would apply to workers below age 60 (Ahammer & Packham, 2025; Haller et al., 2024), and DI benefit formulas in many systems depend on age and contributing years (OECD, 2022). These age-specific eligibility rules obviously come with a clear policy dilemma: weaker labor market prospects at older ages may raise the welfare value of benefits and argue for reduced screening or higher coverage, but a full assessment must also consider moral hazard: i.e., higher applications (ex-ante moral hazard) and lower employment (ex-post moral hazard).

This paper examines the ex-ante and ex-post moral hazard effects of reduced DI screening for older workers in the Netherlands. In October 2022, the Dutch government implemented a policy reform for DI applicants aged 60 years and older; at the end of the two-year sickness period this group can opt for a so-called 'fast-track' DI application procedure with reduced screening. Although this measure was prompted by the persistent shortage of insurance physicians and the resulting long waiting time for applications, there was broad consensus that the fast track should be targeted at the group of elderly workers who are close to retirement. Under the regular route, after two years of sick leave, applicants are assessed by an insurance physician and a vocational expert, who determine the degree and permanence of disability. Under the fast-track process, however, no medical assessment is conducted, and the award decision depends solely on the degree of recovery as reflected in the reintegration report at the end of the sickness period. Specifically, when workers resume their work with less than 65% of their pre-sickness earnings, they are automatically granted full DI benefits until retirement. This implies that, in practice, the reform functions as an early-retirement scheme, weakening older workers' attachment to the labor market and potentially conflicting with goals for sustainable employment. Given that work incentives under the full DI scheme are much weaker than under the partial DI scheme, work incentives for (former) partially disabled workers are lowered substantially. Overall, the policy reform thus combines reduced screening with higher benefits for older workers with remaining earnings capacity.

We use unique administrative records from the Dutch National Social Security Institute (NSII), with information on long-term sick-leave periods (42 weeks and above) and DI applications and awards, data that are typically not available in the standard Statistics Netherlands micro-data. We use a difference-in-differences (DiD) framework comparing workers aged 60–64 (treated) to those aged 55–59 (control) at the end of the sickness period,

across pre- and post-reform cohorts of 42-week sick-listed workers. The pre-reform sample includes sick-leave periods starting between January 1, 2019 and September 30, 2020, ensuring that the end of the sick leave period falls before October 2022. The post-reform sample includes periods starting between May 1, 2021 and December 31, 2021. Because DI applications can be filed only in weeks 88-93 of the sick leave and fast-track registration was incomplete through December 2022, the first affected applications in our sample occurred in January 2023 and the final affected applicants in August 2023. As about one fourth of this sample of 42-week sick-listed workers apply after two years of sickness, our estimates are intention-to-treat effects.

To interpret our estimates, we distinguish mechanical from behavioral moral hazard effects. Mechanical effects arise directly from bypassing the medical assessment, raising award rates and reallocating cases from partial and full permanent DI towards full temporary DI. Behavioral moral hazard effects operate along two margins. First, ex-ante moral hazard (application responses): lower screening costs and greater certainty may raise applications after two years of sick pay. Second, ex-post moral hazard (labor supply responses): more sick-listed workers receive DI benefits due to the reform, which in turn lowers work incentive. In addition, workers with residual earning capacity, who might have pursued partial DI, instead selected into full DI, which also implies that negative labor supply incentives potentially reduce employment and hours worked. We expect ex-ante application responses to emerge only after implementation, due to learning by applicants, employers, and caseworkers. Since the first affected applications in our sample occurred in January 2023, we report results for the full post-reform period as well as for two separate windows: an early window (January-April 2023) and a later window (May-August 2023).

Our results show that the reform substantially increased the number of full DI awards, with only modest application responses. In the early window (January-April 2023), the increase is driven by mechanical effects: applications remain essentially unchanged, while the award rate rises by 5.3 percentage points, relative to the pre-reform baseline of 28.7%. In the later window (May-August 2023), applications respond; the application rate increases by 2.4 percentage points relative to the pre-reform baseline of 39.6%, and awards rise further, resulting in a total increase of 7.5 percentage points compared to non-treated individuals. Consistent with the mechanism, the fast track shifts awards away from partial and full permanent DI towards full temporary DI. Evidence consistent with moral hazard responses are more pronounced in labor supply than in DI application behavior. One year after the end of the sick leave period, employment falls by 2.1 percentage points, and the earnings response implies a 31% crowd-out effect, consistent with weaker work incentives under full temporary DI. Effects differ substantially across subgroups: application rates increase for women but not for men, and awards increase most among workers in the lowest pre-disability earnings quintile.

This paper makes two major contributions. First, we provide the first evidence on a

reform that reduced DI screening targeted at older workers.[1] Prior studies examined stricter DI screening via medical reviews (Campolieti, 2002; Liebert, 2019), procedural requirements (such as compulsory dialogue meetings with family doctors and employers) (Markussen et al., 2017), or reintegration requirements (De Jong et al., 2011; Godard et al., 2024)[2] and find reduced inflows and higher labor force participation. We complement this literature by showing how reduced screening increases both inflows and the composition of awards, and how it also reduces labor supply among older workers at the gateway to DI. In doing so, we speak directly to the role of administrative capacity in aging societies that face rising disability inflows and physician shortages. Second, by separating mechanical from moral-hazard effects and by quantifying impacts on applications, award composition, and employment in a single empirical framework, we clarify how screening policies shape take-up and employment near retirement in an aging labor market.

With our analysis, we also add to broader and related strands of literature. The first strand examines the effects of changes in eligibility rules on benefit take-up and employment outcomes. Theoretical work argues that tightening eligibility rules leads not only to a mechanical DI award reduction, but also to a behavioral one: fewer individuals apply to DI (see e.g. Haller et al. 2024, Jansen 2025). Empirically, it is found that consistently tightening eligibility criteria leads to lower DI use and higher employment rates. For Austria, Staubli (2011) and Ahammer and Packham (2025) show that stricter eligibility reduces take-up and raises employment; Karlström et al. (2008) report analogous effects for Sweden. A separate set of papers varies statutory generosity and estimates earnings offsets among recipients. Dutch evidence indicates large offsets of tighter eligibility rules: one euro less in DI benefits increases earnings by roughly 60-65 cents (Borghans et al., 2014; Garcia-Mandicó et al., 2020). US estimates are smaller, with a one-dollar increase in DI reducing earnings by about 20 cents (Gelber et al., 2017). Our setting maintains a fixed generosity level but varies the assignment across different types of DI, with varying work incentives, allowing us to isolate the effect of screening-induced reallocation on behavior.

The second strand of literature estimates the labor-supply effects of DI receipt. A substantial body of literature uses quasi-experimental variation to measure the employment response to receiving DI. Bound (1989) proposed using the labor supply of denied applicants as an upper bound on the counterfactual for recipients, an approach extended by Von Wachter et al., 2011. Other studies exploit variation in rules and adjudication processes (D. Autor et al., 2019; Deshpande, 2016; Gruber & Kubik, 1997; Moore, 2015) or examiner leniency (French & Song, 2014; Maestas et al., 2013). Across these designs, US employment

1 An exception is D. H. Autor and Duggan (2003), who studied a 1984 U.S. reform that reduced screening strictness and, together with more generous benefits, substantially increased the likelihood of high school dropouts seeking employment.

2 The evidence on reintegration obligations for the Netherlands points in the same direction for non-medical tightening: intensified screening in the sickness period before the DI award decision reduced long-term sick leave and DI applications, and the 2002 Gatekeeper Protocol, which added checks and required reintegration, reduced applications by about 40 percent (Godard et al., 2024).

crowd-out ratios typically range from 20 to 26 percent. We provide the first corresponding estimate for the Netherlands in a context of reduced screening, linking take-up and work responses within a single empirical framework.

The rest of this paper proceeds as follows. Section 2 describes the institutional details of the Dutch DI system and the fast-track measure. Section 3 presents the data, while Section 4 presents our DiD approach. Section 5 reports estimation results and heterogeneity analyses. Section 6 concludes.

2. The Dutch DI System and the Fast-Track for Older Workers

The Dutch system distinguishes a two-year period of sick leave (weeks 0-104) from subsequent DI assignment. During sick leave, the employer (or, in specific cases, the National Social Insurance Institute, NSII)[3] pays at least 70% of the worker's pre-illness wage, and both parties must follow a legally codified reintegration trajectory (the Gatekeeper Protocol). Taken together, these checkpoints constitute an elaborate, compliance-intensive procedure that requires sustained effort, documentation, and coordination from both employer and workers, involving regular medical assessments, written plans, progress logs, and formal notifications, with potential sanctions for non-compliance. If full return to work has not occurred by the end of 104 weeks, the sick-listed worker reaches the DI gateway: a reintegration report is reviewed and, if complete, the sick-listed worker proceeds to DI assessment. If reintegration efforts are insufficient, sick leave can be extended by up to one year. A detailed timeline appears in Appendix B.

2.1 DI application, assignment, and work incentives

In the Netherlands, disability insurance (DI) comes after a mandatory two-year period of employer-paid sick leave. Around week 88, sick-listed workers receive an invitation from the NSII and must submit their DI application within six weeks. The actual eligibility assessment then takes place at the end of the two-year waiting period (EWT) in week 104. At that point, the reintegration report is reviewed and, if complete, the case proceeds to a medical and vocational assessment to determine eligibility and benefit type.

Under the regular route, an NSII insurance physician and a vocational expert jointly determine the permanence and degree of work disability (defined as the expected income loss relative to pre-disability wages), based on detailed examination of functional limitations, medical outlook, and job opportunities. Unlike the United States, where Social Security disability is essentially binary, the Dutch system is tiered. Cases with an assessed loss below 35% receive no DI; losses between 35-80% qualify for partial DI; losses between 80-100% qualify for full DI, split into full temporary (reassessment possible) and full permanent (no reassessment). These tiers embed distinct work incentives.

Across DI types, recipients may work, and earnings interact with benefits through a wage-related schedule: each euro of earnings reduces the benefit by 0.70 euros, so overall income still rises with work but the implicit tax rate is high. Eligibility ends once earnings exceed about 65% of the pre-disability wage under partial DI and full temporary DI, and 20% under full permanent DI. Partial DI involves the strongest requirement, the so-called use capacity. After the initial wage-related entitlement period, the continuation phase conditions access to the wage-related formula on earning at least 50% of residual capacity; otherwise

3 In certain cases, the NSII pays sick leave benefits directly, such as for non-permanent workers whose contract expires, employment-agency workers, and for specific groups of workers, including pregnant workers. For an overview of the cases in which the NSII pays sick leave benefits, see for instance Jansen et al., 2025

the award switches to a flat amount linked to the minimum wage. Full temporary DI applies the same wage-related schedule but removes the 50% condition, weakening intensive-margin incentives relative to partial DI. Full permanent DI pays slightly more at a given earnings level but imposes the tight 20% cap, leaving little scope for work without loss of eligibility. Reassessments are possible under partial and full temporary DI but not under full permanent DI, which is not uncommon due to shortages of insurance physicians. Exact schedules are provided in Appendix C.

2.2 The 60+ fast-track measure

Between October 2022 and December 2024, workers aged 60 and older who reached the end of the two-year sick-leave period could be routed to a simplified DI assessment. This is relevant both for workers with permanent contracts who are still formally employed and for workers whose fixed-term contracts have ended during sick leave or who were unemployed at the start of sick leave. Instead of the usual medical examination, a vocational expert could grant DI if current (actual) earnings were no more than 65% of pre-sickness earnings. Permanent disability cases could still be medically reviewed, but in practice this was rare.

In this context, current earnings are inferred from the mandatory reintegration reports that are issued to the NSSI and assessed by a vocational expert only. Full-permanent cases that are suspect can still be examined for permanence, but in practice fast-tracked cases are rarely reassessed. The measure therefore removes the much more extensive and time-demanding physician-plus-vocational-expert allocation step at the DI gateway, shortens delays, and reduces uncertainty about the award.

The reform operates essentially through two channels. The first is mechanical: replacement of screening with a uniform default at week 104 should raise acceptance among applicants and shift awards away from partial and full permanent DI to full temporary DI. The second is incentive-based and takes the form of moral hazard on two margins. On the application margin, lower screening costs and greater certainty can encourage more sick-listed workers to file a claim (application or ex-ante moral hazard). On the type margin, workers with residual capacity who would have pursued partial DI may select into full temporary DI, which does not require earning at least half of residual capacity (type-substitution moral hazard).[4]

Overall, the fast-track thus implies testable predictions. Mechanically, acceptance should rise at the week 104 gateway, and the award mix should tilt from partial or full permanent DI to full temporary DI. On incentives, applications should increase where screening costs are highest, and labor supply should fall for claimants who, without the reform, would have been placed on partial DI. Because counterfactual DI types are unobserved, we infer these

4 There is also a potential offset: for claimants who would have been placed on full permanent DI, the earnings cap is higher under full temporary DI (65% versus 20%), which can increase work at the intensive margin. Given that employment rates in both schemes are comparably low, however, these effects are most likely negligible.

margins from compositional shifts at the gateway and from heterogeneity across groups with different ex-ante probabilities of partial versus permanent assignment, and we report intention-to-treat effects.

3. Data

3.1 Data sources and sample selection

We combine several unique administrative data sources provided by the NSII. Our main data sources are the sick leave register of the Sickness Benefits Act and the 42-week administration records, in which employers report sick-listed employees after 42 weeks of sick leave. These datasets identify the job sector and the start date of sick leave, as well as demographic information, including gender, date of birth, and, if applicable, date of death. The sick leave records are linked to the DI application register of the NSII. This register contains the DI award decision (approval or denial), the decision date, and the type of DI granted (partial, full temporary, full permanent, or full temporary via the fast-track procedure). We merge this with employment records from the NSII labor income register, which report monthly total labor income and monthly hours worked.

We construct our sample by from sick leave spells of at least 42 weeks. Left-censoring at this cutoff yields consistent samples of permanent workers and workers covered by the Sickness Benefits Act.[5] Depending on the start of the sick leave period, we distinguish between pre- and post-reform samples.[6] The pre-measure sample includes all sick leave spells starting between January 1, 2019 and September 30, 2020; this means that all end-of-waiting time (EWT) dates in this sample (exactly two years after the start of sick leave) are before October 2022, when the fast-track procedure started. The post-measure sample includes spells starting between May 1 and December 31, 2021. To examine whether behavioral responses emerged immediately or only after workers had time to adjust, we split the post-reform sample into *early* and *late* cohorts.

The early cohort consists of sick leave spells starting between May 1 and August 31, 2021. The individuals involved had completed at least 17 months of sickness when the reform was introduced in October 2022 and could first apply for DI from January 2023 onward, implying three to six months to adjust their behavior. The late cohort includes spells starting between September 1 and December 31, 2021. These individuals had been sick for about 13–16 months at the start of the reform and reached the end of waiting time between May and August 2023, allowing roughly seven to ten months of adjustment.

Ideally, for the post-reform sample, we would have included all sick leave spells applying from October 2022 onward. However, the NSII registration of the fast-track measure was inconsistent until January 2023. To avoid including cases that may have been (mis-)assessed before 2023, we only include sickness spells that started on or after May 1, 2021. DI applications can be submitted between week 88 and 93 of a sickness spell, so spells starting on May 1, 2021 or later could not have reached the DI assessment stage before January

5 As explained earlier, permanent workers are registered by the NSII following the 42-week absence notification, whereas workers covered by the Sickness Act must report sick to the NSII within two days.

6 By taking starting dates to determine the end of the two-year sick leave period, we avoid overlap between treatment groups. We also account for inconsistent recordings of fast-track procedure cases in the initial months.

2023. By restricting the sample in this way, we ensure that all observed fast-track cases are assessed in the period with complete and consistent fast-track registration. Given these administrative assurances and our sample restriction, we do not expect any remaining measurement issues in the fast-track variable for our analysis sample. Moreover, since we have employment data up to December 2024, we only select sick leave spells starting before 2022, implying at least three years of employment records and at least one year of post-EWT data.

To make treatment and control groups more comparable, we also restrict our sample to sick leave spells of workers aged 55 or older at the EWT moment. In addition, we apply several other sample restrictions related to missing key covariates. All sample restrictions are reported in Table 1, along with their effects on sample size. For a more detailed description of the sample selection and cleaning process, we refer to Appendix D. The final sample comprises 128,172 sick leave spells.

Sample restrictions	Observations	Difference	% initial sample
1. All unique sick leave spells and DI applications in initial dataset	1 322 456	−150 536	100.00
2. Excluding sick leave spells outside of time period restrictions	505 496	−816 960	38.22
3. Excluding sick leave spells without income records although recorded as permanent employee	505 368	−128	38.21
4. Excluding sick leave spells without date of birth recorded	501 903	−3465	37.95
5. Deleting sick leave spells where fast-track procedure was recorded in the pre-measure sample or for individuals < 60	501 889	−14	37.95
6. Excluding sick leave spells without gender recorded	501 878	−11	37.95
7. Excluding sick leave spells where individual's age at EWT is < 55 or ≥ 65	128 172	−373 706	9.69

Notes: Stepwise sample restrictions. *Observations* report the number of spells remaining after each restriction; *Difference* reports the change relative to the previous row; Percentages give the remaining share of the initial sample.

Table 1: *Sample restrictions*

3.2 Descriptive evidence

Table 2 reports summary statistics for the two samples: before (column 1) and after (column 2) the fast-track measure was introduced, respectively. The sample size of the pre-reform sample (92,729 sick leave spells) is larger than that of the post-reform sample (35,443 sick leave spells) due to the longer inclusion period. The top panel of Table 2 focuses on our dependent variables: *i*) DI application and award outcomes, *ii*) DI benefit types, and *iii*) employment outcomes. As to the DI application and award outcomes, 39.6% of the sick leave spells resulted in a DI application before the procedure was introduced, compared to only 37.9% after introduction. The DI award variable equals zero when no type of DI is awarded, including cases with an unknown application outcome (9.7% before and 11.1% after the implementation of the fast-track, as a share of all DI applications). It equals one when

	Pre-reform		Post-reform	
	Mean	SD	Mean	SD
Main Outcome Variables				
DI outcomes				
DI Application	0.396	0.489	0.379	0.485
DI Award	0.287	0.452	0.290	0.454
Employment outcomes, one year after EWT				
Monthly labor earnings (in euros)	1634	2301	2044	2774
Monthly working hours	68.16	76.22	72.63	85.24
Employed	0.526	0.499	0.550	0.497
DI benefit type (in %)	*100.0*		*100.0*	
No DI	17.8		12.4	
Partial DI	15.0		7.1	
Full temporary DI	24.2		13.0	
Full permanent DI	33.2		26.4	
Full temporary via fast-track	0.0		30.0	
Unknown outcome	9.7		11.1	
Background characteristics				
Age at EWT	60.0	2.855	60.1	2.860
Female	0.509	0.500	0.528	0.499
Registration (in %)	*100.0*		*100.0*	
Sickness Benefits Act	26.8		22.9	
42-weeks registration	73.2		77.1	
Job sector, one year before sick leave (in %)	*100.0*		*100.0*	
Industry	19.4		18.0	
Wholesale and retail	10.2		10.3	
Transport	8.0		7.5	
Services	17.3		17.1	
Public	45.1		47.1	
Observations				
Sick leave spells	92 729		35 443	
Early			19 242	
Late			16 201	

Notes: Summary statistics for the pre- and post-reform cohorts. The upper panel presents the main outcome variables: DI outcomes, employment outcomes one year after the end of the waiting period, and the distribution of DI benefit types. The lower panel reports background characteristics, including demographics (age and gender), registration type, and job sector. Percentages within categorical variables add up to 100 in each category. The post-reform cohort is further split into *early* (sick leave spells starting May 1–August 31, 2021) and *late* (September 1–December 31, 2021) groups, as defined in the main text.

Table 2: *Summary statistics of pre- and post-reform samples*

any type of DI is awarded. The total award percentage increased slightly after the procedure was introduced, from 28.7% to 29.0%. This pattern suggests that any behavioral effect of the measure on DI applications is not visible at the aggregate level, and the modest increase in awards may instead reflect a mechanical effect on the acceptance rate.

Turning to the benefit outcomes, we find that full permanent DI was most often awarded before the fast-track procedure was introduced (33.2%). However, its frequency decreased thereafter to 26.4%. Instead, full temporary DI awarded through the fast-track measure became the most common type after the policy change, accounting for 30.0% of all applications. The percentage of cases with no DI awarded declined significantly, from 17.8% to 12.4%. Finally, employment outcomes show significant increases in total labor earnings, hours worked, and employment rate. This likely reflects wage inflation and favorable labor market trends at the end of the COVID pandemic.

The bottom panel of Table 2 presents summary statistics for our controls and demographic variables. Before the fast-track measure was implemented, 50.9% of sick leave spells involved women, increasing slightly to 52.8% afterward. Average age at EWT remains stable at approximately 60 years. Most sick leave spells originate from the 42-weeks registration (of permanent workers) rather than the Sickness Benefits Act registration, with 73.2% before the measure and 77.1% after the measure. The most common job sector of the (previous) employment position of sick-listed workers in the calendar year before sick leave was the public sector (45.1% before and 47.1% after the measure).

4. Emperical strategy

The fast-track measure was introduced exclusively for workers who are at least 60 years old at their EWT date, enabling the use of a difference-in-differences (DiD) design. We compare individuals above and below this age threshold, and in cohorts with EWT dates before and after the reform. We use our data on long-term sick leave spells from our pre- and post-measure samples as defined in the previous section. We estimate the following general equation:

$$\begin{aligned} y_i &= \alpha + \beta_1 I\left(age_i \geq 60\right) + \beta_2 I\left(t_i + 24 \geq t^*\right) + \beta_3 I\left(age_i \geq 60\right) \cdot I(t_i \geq t^*) + \\ &\quad \beta_4 I(t_i > 2020) + \epsilon_i, \end{aligned} \tag{1}$$

where y_i represents the outcome variable for an individual i with a sick leave period beginning at time (in months) t_i and with age_i at the time of the EWT (exactly two years after the start of sick leave, i.e., $t_i + 24$). t^* corresponds to October 2022, the month in which the reform was implemented. Only 2.2% of individuals in our sample has multiple spells in the time period under investigation.[7]

The treatment group dummy takes on the value of one for individuals aged 60-64 at their EWT date, and is zero otherwise; the corresponding parameter is β_2. The time dummy corresponding to parameter β_2 equals one for sick leave spells in the post-measure period, and is zero otherwise. β_3 resembles the treatment effect of the fast-track procedure. Finally, β_4 is a dummy that captures sick leave spells that started in 2020 and possible year-specific effects, and ϵ_i denotes the error term of the sick leave spell of individual i which is assumed to be identically and independently distributed.

Our DiD approach relies on three identifying assumptions: parallel trends, no spillovers, and exogeneity of treatment status. The parallel trends assumption states that, when the fast-track procedure would not have been introduced, the treatment and control group would have followed the same outcome trends in the post-measure time period. While this assumption cannot be formally tested, we eyeball for all relevant outcome variables whether the trends of the treatment and control groups were similar before the introduction of the measure. Alongside this, we conduct placebo treatment tests: instead of defining our post dummy as being zero for sick leave spells that start on or after May 1, 2021, we define two placebo dummies for sick leave spells that started on or after May 1, 2019 and May 1, 2020. We interact these dummies with the treatment indicator and re-estimate the DiD model using only the pre-measure data. Significant interaction terms in these placebo tests would suggest violations of the parallel trends assumption prior to the introduction of the measure.

The second assumption underlying our causal interpretation is that there were no spillovers of the measure to the control group of individuals between the age of 55 and 60.

7 To assess the impact of multiple spells per individual on our results, we performed robustness checks excluding individuals with multiple spells, as well as analyses including them but clustering standard errors at the individual level. Neither approach altered our findings.

We argue that these spillovers are unlikely to have occurred, as insurance physicians were instructed to maintain the same medical review for DI applications through the normal screening procedure. Given that the macro impact on labor supply of workers was limited, general equilibrium effects on the labor market were most likely negligible as well

Finally, we assume that treatment status is an exogenous outcome. While age is exogenous in this context, the key question is whether the timing of sick leave, which in turn determines the EWT date, could be manipulated. This is not the case: all individuals in our sample had sick leave spells starting before October 2022. Accordingly, they were unaware of the measure when they called in sick initially. Moreover, it was not possible to manipulate the EWT date by voluntarily extending sick leave, as the original EWT date determined access to the measure.

5. Results

5.1 DI applications and awards

This subsection examines whether the introduction of the fast-track procedure increased the number of DI applications through behavioral responses, or whether the observed rise in DI awards primarily stemmed from the mechanical effect of reduced screening. An increase in DI applications would suggest ex-ante moral hazard, with individuals who previously did not expect to qualify now choosing to apply. On the other hand, if DI awards increased mainly because the fast track made benefits easier to obtain for existing applicants, this suggests that the current reintegration process, particularly the Gatekeeper Protocol, effectively deterred additional individuals from applying.

Since DI applications can only be filed after two years of sick leave (the end of the waiting period, EWT) and award decisions follow with some delay, we do not expect immediate behavioral responses to the fast-track reform. Ex-ante moral hazard in the form of increased applications can only materialize once sick-listed workers have had time to adjust their expectations and behavior. To capture this, we distinguish between the full post-reform sample and two subsamples that differ in the adjustment period available at the time of reform. The early window (sick leave spells starting May–August 2021) reached the EWT between January and April 2023, implying three to six months to adjust after the introduction of the reform in October 2022. The later window (spells starting September–December 2021) reached the EWT between May and August 2023, leaving seven to ten months to adjust.

For our DiD estimates to be interpreted as causal, the parallel trends assumption must hold for both DI applications and awards. Therefore, Figure 1 shows the fraction of long-term sick leave periods (longer than 42 weeks) that result in DI applications and awards for individuals 55-59 years of age (control group, blue line) and 60-64 years of age (treatment group, red line). Recall that accurate data on applications and awards are missing for the period from October 2022 to December 2022, explaining the 'donut hole' in the figures of both panels. Both outcomes appear to display parallel pre-reform trends, and the widening difference indicates a slight increase in the application rate. The rise in the award rate following the reform appears much more substantial. As a more formal test, we conduct a placebo analysis on the pre-reform data, assigning placebo treatment dates to sick leave spells starting in or after May 2019 and May 2020. Appendix Table A1 reports the results, which show that the placebo treatment indicators are statistically insignificant for both outcomes.

Although the parallel trend appears consistent in the pre-treatment period, a remaining concern is the potential influence of COVID-19 on DI applications and awards, given that the pandemic generally affected older workers more severely. Our difference-in-differences design should absorb such shocks as long as COVID-19 influenced the treatment and control groups similarly before and after the reform. However, evidence indicates that the share of

DI applications listing COVID-19 as the primary diagnosis was higher in 2023 than in 2021–2022 (Schreuder & de Vries, 2024). This suggests that COVID-19 may have been less severe in the pre-reform than in the post-reform period, and that this pattern was stronger for the older treated sample. If so, COVID-19 would have raised DI application rates among the treated group more strongly after the reform, biasing our estimates upward and implying that the reported effects may represent an upper bound of the reform's true impact. Nonetheless, the scale of this potential bias is probably limited: only about 5% of all DI awards between 2022 and 2024 listed COVID-19 or long COVID as the primary diagnosis (Tweede Kamer der Staten-Generaal, 2025), and any differential effects between the 55-60 and 60-65 age groups are expected to be small given the narrow age range.

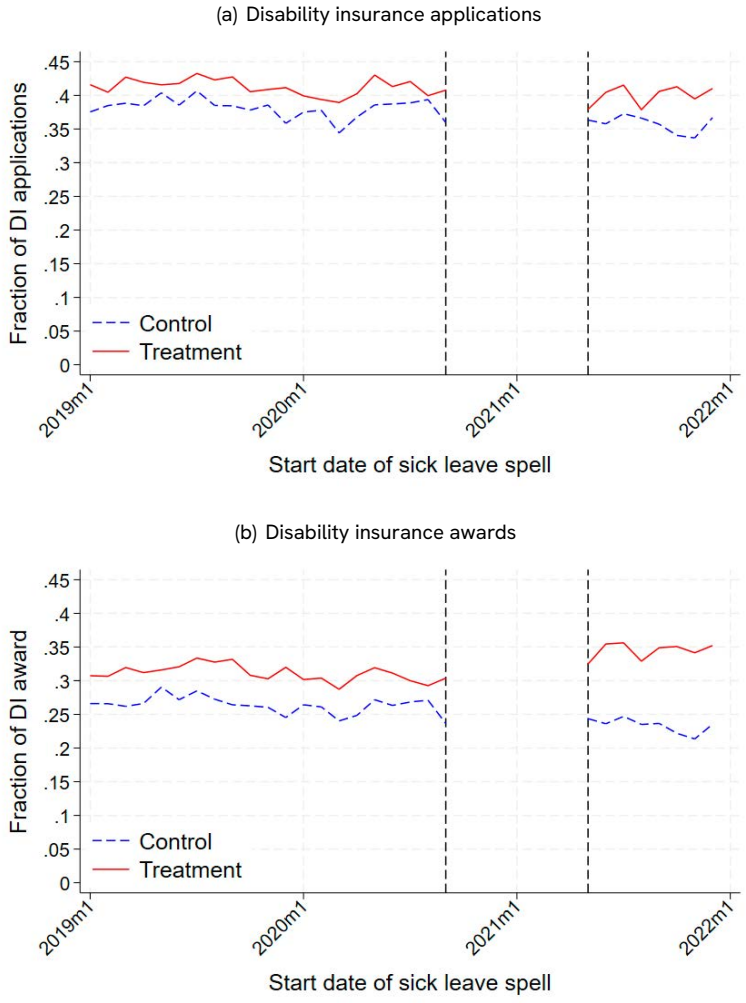

Figure 1: *DI applications and awards among 42-week sick-listed workers*

Notes: Share of sick leave spells ≥42 weeks that resulted in a DI application (a) or DI award (b). The treatment group (red) consists of individuals aged 60–64 at the end of the waiting period (EWT), eligible for the fast track; the control group (blue) includes individuals aged 55–59. We exclude spells starting between Sep. 2020 and Apr. 2021 to prevent treatment overlap and outcome misclassification.

Table 3 presents the DiD estimates for DI applications and awards, following from

Equation 1. Column 1 reports the results for the full post-reform sample. The introduction of the fast-track procedure increased the likelihood that a sick leave spell would lead to a DI application increase by 1.2 percentage points. Given a baseline application rate of 39.6%, this represents a modest 3% relative increase. This suggests limited behavioral response in terms of application behavior over the full period. By contrast, the effect on the DI award rate is considerably larger; it increased by 6.5 percentage points, corresponding to a 22.6% increase relative to the pre-reform mean of 28.7%. Since the increase in awards (6.5pp) far exceeds the increase in applications (1.2pp), this suggests that, over the full period, most of the additional DI awards were driven by an increased acceptance rate, i.e., a mechanical effect from bypassing medical screening, rather than a large behavioral response in benefit take-up.

To capture potential delays in behavioral response, we divided the post-reform sample into an early cohort with 3 to 6 months to adjust and a later cohort with 7 to 10 months to adjust. Columns 2 of 3 of Table 3 display the results separately for these periods. In the early post-reform period, we find that the award rate increased by 5.3 percentage points, with no statistically significant change in the application rate. This indicates that initial effects were primarily mechanical. In the later post-reform period, however, we do observe a behavioral response: the application rate increased by 2.4 percentage points, and the award rate rose by an additional 2.2 percentage points above the initial mechanical effect. Taken together, this implies a total increase of 7.5 percentage points in DI awards relative to non-treated individuals. These patterns indicate that the fast-track reform not only mechanically increased DI awards by lowering screening barriers but also induced additional applications over time, consistent with the presence of ex-ante moral hazard.

	Full sample		Early applicants		Late applicants	
	DI appl.	DI award	DI appl.	DI award	DI appl.	DI award
Treatment × Post	0.012^{**}	0.065^{***}	-0.002	0.053^{***}	0.024^{***}	0.075^{***}
	(0.006)	(0.006)	(0.008)	(0.008)	(0.008)	(0.007)
Treatment	0.032^{***}	0.047^{***}	0.032^{***}	0.047^{***}	0.032^{***}	0.047^{***}
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Post	-0.029^{***}	-0.036^{***}	-0.020^{***}	-0.028^{***}	-0.036^{***}	-0.042^{***}
	(0.005)	(0.004)	(0.006)	(0.005)	(0.006)	(0.005)
Year = 2020	-0.012^{***}	-0.013^{***}	-0.012^{***}	-0.013^{***}	-0.012^{***}	-0.013^{***}
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Intercept	0.385^{***}	0.268^{***}	0.385^{***}	0.268^{***}	0.385^{***}	0.268^{***}
	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
Observations	128 172	128 172	108 930	108 930	111 971	111 971
Pre-reform average	0.396	0.287				

Notes: Difference-in-differences (DiD) estimates of Equation 1. Heteroskedasticity-robust standard errors in parentheses. The "pre-reform average" reports the mean of the dependent variable before the introduction of the fast-track measure (full sample). The post-reform sample is split into an *early* cohort (3–6 months to adjust at reform onset) and a *late* cohort (7–10 months to adjust). Significance levels: $^{***}\,p < 0.01$, $^{**}\,p < 0.05$, $^{*}\,p < 0.1$.

Table 3: *DiD results for DI applications and awards: full sample, early, and late cohorts*

5.2 Types of DI benefits

Knowing that there is an overall increase in DI awards following the introduction of the fast-track procedure, we next examine how the reform affected the composition of awarded DI benefits. We distinguish between partial DI, full temporary DI, full permanent DI, and full temporary DI awarded via the fast-track procedure (see Section 2). Since the reform effectively replaced the standard procedure for many applicants, we expect crowding-out effects to full and temporary benefits through the fast track.

Figure 2 plots the shares of each benefit type awarded out of all sick leave spells exceeding 42 weeks, stratified by treatment groups. The figures illustrate the type substitution following from the reform, with a sharp rise in the full DI awards through the fast-track measure and a decline in comparable sizes for all other DI types. Figure 2 also reveals that pre-reform trends are similar across groups, with the expected exception of full temporary DI via the fast-track procedure, which—by construction—did not exist prior to the reform. Appendix Table A2 presents the results of the placebo DiD analyses for each benefit type. The placebo effects are statistically insignificant, with the exception of full temporary DI via the regular procedure; here the second placebo period (May 2020) yields a small negative coefficient of -0.011 that is statistically significant at the 5% level. Given its small magnitude and the lack of consistent effects across placebo periods, we do not interpret this as strong evidence of violation of the parallel trends assumption.

Table 4 reports the DiD estimates for the various benefit types. Among sick leave spells of individuals aged 60 or older at the end of the waiting period (EWT), 22.3% were granted full temporary DI via the fast-track procedure, accounting for roughly 60% of all post-reform applications. This shift was accompanied by substitution effects away from partial DI (–5.0pp), full temporary DI via the regular route (–6.5pp), and full permanent DI (–4.4pp). The impact of the reform on the distribution of benefit types thus appears largely mechanical: inherent with its design, the fast-track procedure automatically assigned eligible applicants to full temporary DI, reducing the likelihood of all other outcomes. Most notably, we also find a decline in full permanent DI awards. This suggests that some individuals who would have qualified for the more generous full permanent DI scheme under the standard procedure now opt for the fast-track route. A plausible explanation is that these individuals valued the certainty and speed of the fast-track decision. The regular assessment process entailed a non-trivial risk of being assigned to partial DI or even being denied benefits altogether; this may have rendered the fast-track option more attractive.

5.3 Employment outcomes

We finally examine whether the fast-track procedure translated into moral hazard effects in labor supply. As detailed in Section 2 and Appendix C, partial DI provides the strongest work incentives, while full temporary DI is more generous and less conditional. The reform shifted older applicants directly into full temporary DI, raising overall DI receipt and reallocating

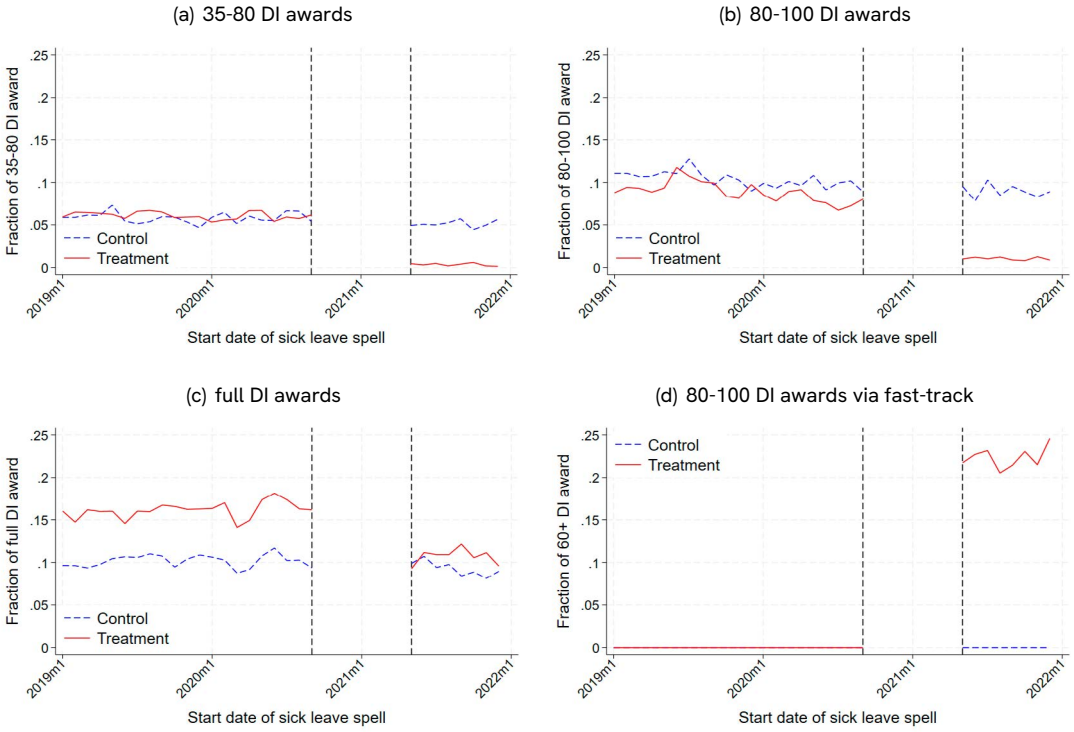

Figure 2: *Trends in DI award types over time, by treatment group*

Notes: Share of sick leave spells ≥42 weeks resulting in (a) 35–80 DI awards, (b) 80–100 DI awards, (c) full DI awards, and (d) 80–100 DI awards via fast-track. Control group: individuals aged 55–59 at EWT (blue); treatment group: 60–64 (red). Values left of the vertical lines (Sept. 2020, May 2021) are pre-reform; right are post-reform. Spells starting between these dates are excluded to avoid overlap and misclassification.

claimants toward benefit types with weaker work incentives. Consistent with this shift, we expect—and find—adverse effects on post-EWT employment.

Before presenting the DiD estimates on employment outcomes, we again assess the parallel trends assumption first. Figure 3 shows monthly employment outcomes one year after potential DI receipt by the treatment and control groups over time. The two groups follow very similar trends prior to the reform, and they only began to diverge thereafter. The parallel trends assumption is again confirmed by the placebo DiD analyses in Appendix Table A3, where placebo treatment effects are all insignificant.

Table 5 reports the DiD estimates for employment outcomes three years after the first day of sick leave, i.e., one year after the EWT date, which may have resulted in DI receipt. Column 1 shows that average monthly labor earnings declined by 164 euros, a 10.0% reduction relative to the pre-reform mean. Column 2 shows that monthly hours worked decreased by 3.9 hours (5.8%), while column 3 shows that the probability of being employed, defined as working positive hours, fell by 2.1 percentage points (a 4% decline). These results suggest that the reform reduced labor supply, consistent with moral hazard arising from both increased DI receipt and the reallocation of recipients from partial DI benefits toward full temporary DI benefits.

	Standard assessment			Fast-track
	Partial	Full temporary	Full permanent	Full temporary
Treatment × Post	-0.050^{***}	-0.064^{***}	-0.044^{***}	0.223^{***}
	(0.002)	(0.003)	(0.004)	(0.003)
Treatment	0.002	-0.015^{***}	0.060^{***}	0.000
	(0.002)	(0.002)	(0.002)	(0.000)
Post	-0.008^{***}	-0.019^{***}	-0.009^{***}	0.000
	(0.002)	(0.003)	(0.003)	(0.000)
Year = 2020	-0.002	-0.012^{***}	0.001	0.000
	(0.002)	(0.002)	(0.002)	(0.000)
Intercept	0.059^{***}	0.109^{***}	0.101^{***}	0.000
	(0.001)	(0.002)	(0.002)	(0.000)
Observations	128 172	128 172	128 172	128 172
Pre-reform average	0.150	0.242	0.332	0.000

Notes: DiD estimates of Equation 1 for the probability of receiving partial DI (35–80), full temporary DI (80–100), full permanent DI, or full temporary DI via the fast-track. Heteroskedasticity-robust standard errors in parentheses. The bottom row shows the pre-reform mean of the dependent variable. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4: *Main DiD results on type of DI benefits*

	Earnings	Hours worked	Employment
Treatment × Post	-164.005^{***}	-3.925^{***}	-0.021^{***}
	(33.006)	(1.028)	(0.006)
Treatment	-421.595^{***}	-17.437^{***}	-0.126^{***}
	(15.060)	(0.497)	(0.003)
Post	519.323^{***}	7.490^{***}	0.046^{***}
	(25.565)	(0.792)	(0.005)
Year = 2020	54.909^{***}	2.172^{***}	0.024^{***}
	(15.101)	(0.497)	(0.003)
Intercept	1823.322^{***}	76.018^{***}	0.580^{***}
	(13.035)	(0.424)	(0.003)
Observations	128 172	128 172	128 172
Pre-measure average	1634	68.160	0.526

Notes: Monthly outcomes are measured one year after the end of the waiting period (three years after sick-leave start). Reported are labor earnings, work hours, and an employment dummy. The bottom row shows pre-reform averages. Heteroskedasticity-robust standard errors in parentheses. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5: *DiD estimates of employment outcomes one year after EWT*

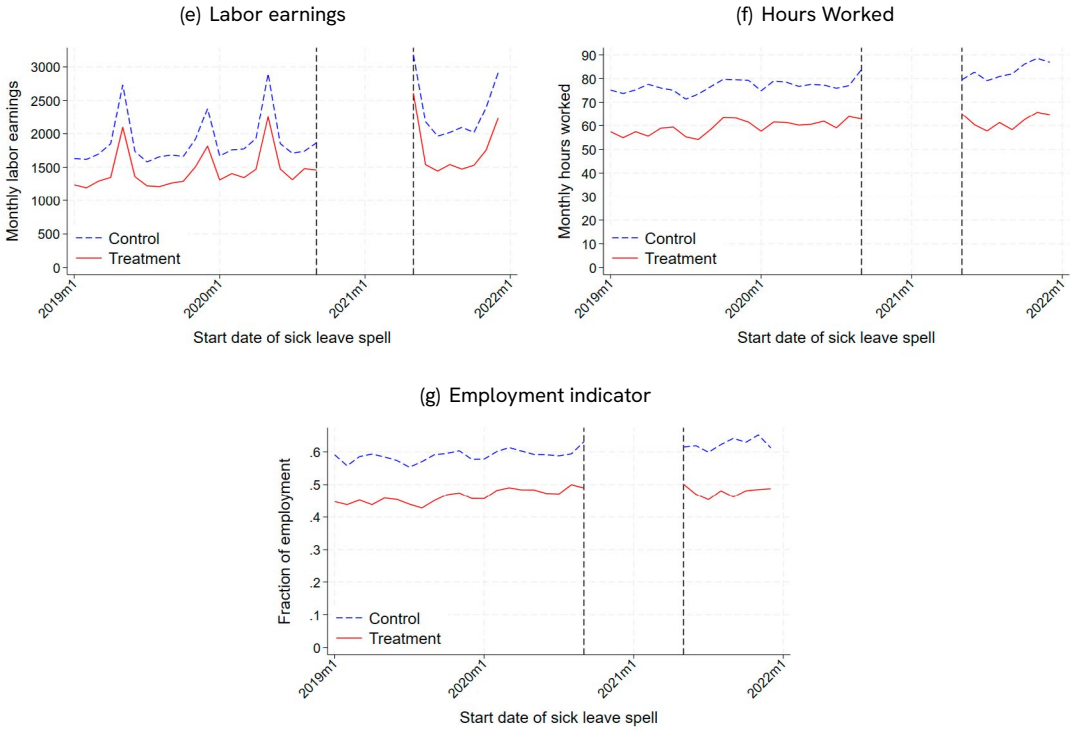

Figure 3: *Employment outcomes one year after EWT, treatment vs. control*

Notes: Employment outcomes one year after the end of the waiting period (EWT, i.e. 36 months after sick-leave start). (a) monthly labor earnings, (b) hours worked, (c) employment fraction. Blue: control group (55–59 at EWT), red: treatment group (60–64). Dotted vertical lines mark September 2020 and May 2021; spells starting between these dates are excluded to avoid treatment overlap and misclassification. Seasonal spikes in labor earnings reflect institutional features of Dutch payroll, notably holiday allowance (summer) and end-of-year bonuses (December).

To interpret our estimates in terms of earnings crowd-out, we next compare the estimated reduction in labor income with the increase in DI benefits. Average monthly labor earnings declined by 164 euros due to the reform. At the same time, the DI award rate increased by 6.5 percentage points. Assuming an average DI replacement rate of 70% of pre-disability wages, average monthly labor earnings of €2886, and an employment rate of 89% for our post-reform sample, the implied average monthly DI benefits are approximately 2270 euros ($0.70 \times \frac{2886}{0.89}$.). Multiplying this amount by the 6.5 percentage points increase in DI receipt yields an average increase of 148 euros in DI benefits. Concurrently, we estimate a 5.5 percentage points decrease in the receipt of partial benefits; after the reform, this group received full benefits instead. When assuming that their degree of disability was 50%, the average benefit increase due to the move from partial to full benefits equaled 57 euros. In total, average DI benefits thus increased by 204 euros, and the crowd-out effect we find equals 80%. This percentage is larger than estimates based on Dutch reforms of 62% by Borghans et al. (2014) and 64% of Garcia-Mandicó et al. (2020), who consider benefit losses rather than gains and focus on all age groups.

Another way to put our employment effects in perspective is to present these as extensive

margin effects. The fast-track reform increased DI awards by 6.5 percentage points and reduced employment by 2.1 percentage points, implying an extensive-margin employment crowd-out ratio of 31%. This estimate is somewhat higher than those commonly found for the U.S., where Chen and Van der Klaauw (2008) and French and Song (2014) estimate that DI receipt reduced employment in the 1990s by 20 and 26 percentage points, respectively, and where Maestas et al. (2013) find that applicants on the margin of award would have had employment rates 28 percentage points higher in the absence of DI receipt in 2005–2006.

Finally, table 6 reports the DiD estimates for employment outcomes for the early window (January-April 2023) and a later window (May-August 2023). Consistent with application rates, responses are more pronounced in the later window.

	Earnings		Hours of work		Employment	
	Early appl.	Late appl.	Early appl.	Late appl.	Early appl.	Late appl.
Treatment × Post	-135.1^{***}	-188.0^{***}	-1.929	-5.624^{***}	-0.011	-0.031^{***}
	(45.1)	(43.3)	(1.232)	(1.447)	(0.008)	(0.008)
Treatment	-421.6^{***}	-421.6^{***}	-17.437^{***}	-17.437^{***}	-0.126^{***}	-0.126^{***}
	(15.1)	(15.1)	(0.497)	(0.497)	(0.003)	(0.003)
Post	533.7^{***}	507.2^{***}	4.599^{***}	9.939^{***}	0.034^{***}	0.056^{***}
	(34.3)	(33.2)	(0.917)	(1.109)	(0.006)	(0.006)
Year = 2020	54.9^{***}	54.9^{***}	2.172^{***}	2.172^{***}	0.024^{***}	0.024^{***}
	(15.1)	(15.1)	(0.497)	(0.497)	(0.003)	(0.003)
Intercept	1823.3^{***}	1823.3^{***}	76.018^{***}	76.018^{***}	0.580^{***}	0.580^{***}
	(13.0)	(13.0)	(0.424)	(0.424)	(0.003)	(0.003)
Observations	108 930	111 971	108 930	111 971	108 930	111 971

Notes: Monthly labor earnings, work hours, and employment status are measured one year after the end of the waiting period (three years after sick-leave start). Estimates are reported separately for early applicants (about 3–6 months to adjust after the reform) and late applicants (about 7–10 months). Heteroskedasticity-robust standard errors in parentheses. Significance levels: $^{***}\ p < 0.01$, $^{**}\ p < 0.05$, $^{*}\ p < 0.1$.

Table 6: *DiD estimates of employment outcomes one year after EWT, by early and late cohorts*

5.4 Heterogeneity by gender, sector, pre-DI earnings, and employment type

Our main analyses establish that the fast-track measure led to a relatively small increase in the number of DI applications, and a much larger relative increase in the number of accepted DI claims. In this subsection, we show that these effects differ by subgroup. We explore differences across gender, the employment sector, pre-disability earnings quintiles, and as to whether a sick leave was registered as a permanent worker by the employer through the 42-weeks absence notification or by the NSII through the Sickness Benefits Act registration.

First, we examine whether the treatment effect varies by gender. Table 7 reports the DiD analyses for DI application and DI award separately for men (columns 1 and 3) and for women (columns 2 and 4). The 1.2 percentage points increase in DI applications estimated earlier is driven almost entirely by women, as the reform had no significant effect on the applications of men, while applications of women increased by 2.4 percentage points. For DI

awards, women also experienced a larger effect of the reform: their award percentage increased by 8 percentage points, compared to a 5 percentage points increase for men. A substantial part of this increase could be attributed to the increased number of female applications. Presumably, women were thus more responsive to reduced screening. This is in line with Godard et al., 2024, who find that women are more responsive to increased screening. That is, women disproportionally stopped applying for DI after the introduction of the Gatekeeper Protocol in the Netherlands.

Second, Table 7 presents the results of our DiD analyses for DI application and award by employment sector in the year preceding sick leave. With their DI application rate rising by 6 percentage points, employees in the services sector show an increase that far exceeds the average increase of applications of 1.2 percentage points. The estimates of the other sectors are much closer to the average, with the exception of the transportation sector. The application rate of the transportation sector decreased by 4.2 percentage points, although statistically insignificant. The effect on DI award rates is positive across all job sectors, but smaller and statistically insignificant for the transportation sector (3 percentage points).

Third, Table 7 reports the DiD results for the lowest pre-disability earnings quintile in the year before sick leave (columns 1 and 3) and the highest quintile (columns 2 and 4). For DI applications, the coefficients of the two quintiles are nearly identical (2.7 and 2.8 percentage points), while the estimates diverge for DI award: an 11.3 percentage points increase for the lowest earnings quintile and 5.6 for the highest earnings quintile. This possibly reflects the fact that high-income individuals were already more likely to be awarded DI prior to the reform: with higher pre-disability earnings, the assessed relative loss of earnings capacity is generally substantial (OCTAS, 2023).

Finally, we split our sample by sick leave spell registration, comparing (permanent) workers whose employer registered their sick leave spell through a 42-week absence notification and fixed-term and unemployed workers registered by the NSIII through the Sickness Benefits Act registration. While most individuals who report sick have an employer throughout their entire sick leave period, temporary workers and agency workers in the Sickness Benefits Act registration may not or no longer have an employer during their sick leave period. Table 7 reports the DiD analyses split by sick leave spells from the 42-weeks registration and the Sickness Benefits Act registration. For both DI application and DI award, the effect of the fast-track procedure is strongest for individuals who are registered under the Sickness Benefits Act. Similar to our findings, which are stratified by pre-disability earnings quintiles, this represents a group of more vulnerable workers (Koning et al., 2025). The fast-track measure may have further strengthened their tendency to enter the DI scheme.

	N	DI application		DI award		Employment	
		Coef.	SE	Coef.	SE	Coef.	SE
Gender							
Men	62 246	0.001	0.009	0.050***	0.008	−0.017*	0.009
Women	65 926	0.024***	0.008	0.080***	0.008	−0.025***	0.009
Sector							
Industry	13 228	0.014	0.017	0.065***	0.016	−0.061***	0.017
Wholesale & Retail	7230	0.014	0.023	0.107***	0.022	−0.055**	0.023
Transportation	5495	−0.042	0.026	0.030	0.024	0.028	0.027
Services	12 161	0.060***	0.018	0.104***	0.017	−0.052***	0.018
Public	32 505	0.011	0.011	0.054***	0.010	−0.020*	0.011
Earnings quintile							
Bottom quintile	14 453	0.027	0.017	0.113***	0.016	−0.039**	0.017
Top quintile	14 453	0.028*	0.016	0.056***	0.014	−0.053***	0.016
Type of registration							
Permanent workers	95 250	0.010	0.007	0.052***	0.006	−0.023***	0.007
Sickness Benefits Act	32 922	0.027**	0.013	0.117***	0.012	−0.014	0.011

Notes: Difference-in-differences estimates of Equation 1 for DI applications, DI awards, and employment, reported separately by gender, sector, earnings quintile, and registration type. Employment is measured one year after the end of the waiting period (EWT). Robust standard errors are shown in adjacent columns. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 7: *Heterogeneity in treatment effects by subgroup*

5.5 Cost–benefit analysis

To assess the fiscal implications of the reform, we combine the estimated DiD effects from Tables 3–5 with wage data, replacement rates, and administrative cost parameters. The calculations use the 18,050 affected individuals aged 60 and above in the post-reform period and annualize this caseload to 27,075 individuals for fiscal interpretation. Because the observation period spans only eight months and application timing is not observed precisely, these annualized amounts are best interpreted as the expected fiscal effects in the next year, assuming that newly awarded DI beneficiaries remain on DI throughout that period.

The DiD estimates imply a 6.5 percentage point increase in DI awards and a 5 percentage point shift from partial to full benefits. Applied to the annualized affected population, these changes correspond to approximately 1,760 additional awards and 1,354 additional conversions to full DI. Multiplying these increments by the mean pre-reform wage (3,243 € per month), together with the relevant replacement rates (70% for new awards and the 35 percentage point differential between full and partial DI), yields an increase in DI benefit expenditures of about 66.4 million euros per year.

The reform also reduced employment earnings. The DiD estimate implies an average earnings loss of 164 € per month per treated individual, which, when multiplied by the annualized affected population and the 37% effective tax-and-contribution rate, results in an estimated 1.64 million euros per year in lost fiscal revenue. Together, these components generate approximately 19.7 million euros per year in additional fiscal costs.

	DiD Estimates	Individuals (annualized)	Rate/ Duration	Salary/ wage	Euro (mio./year)
Panel A: DI benefit expenditures					
Additional DI awards	6.5pp	1,760	0.70	3,243€/m	47.9
Higher DI benefits (partial→full)	5.0pp	1354	0.35	3,243€/m	18.4
Subtotal DI cost increase		3,114			**66.4**
Panel B: Lost labor earnings and revenue					
Lost tax revenue	164€	27,075	0.37		19.7
Total costs					**86.1**
Panel C: Administrative savings					
Fewer standard assessments	15.8pp	4,278	5 hrs	50€/hr	-1.1
Subtotal savings					**-1.1**
Net fiscal effect					**85.0**

Notes: DiD estimates are taking from Tables 3, 4 and 5. The total number of treated individuals in the 8 months period is 18,050 aged 60 and over, which we annualize to 27,075 individuals. The individuals in column 2 are the product of the coefficient with this number. Column 3 shows the benefit rate (0.7 and 0.35) and a 37% effective tax-and-contribution rate. For the savings we assume 5 hours per assessment. Column 4 shows the monthly average salary of the sample and applies a gross hourly wage of 50 euros for a physician. The final column shows the fiscal effect in millions of euros. Negative values denote savings.

Table 8: Annualized fiscal effects of the DI reform

Administrative savings from lower assessment costs are marginal by comparison. The reduction in standard medical assessments—an annualized decline of 4,278 assessments—combined with an assumed assessment duration of five hours and an average physician wage of 50 € per hour, yields administrative savings of roughly 1.07 million euros per year.

Overall, the additional DI expenditures and lost tax revenues due to the reform substantially exceed the administrative savings, producing a net fiscal cost of approximately 85 million euros per year.

5.6 Sensitivity analyses

Table 9 explores the robustness of our main research design which follows Equation 1, and compares these to our benchmark outcomes in column 1. We consider using a regression discontinuity (RD) method instead of the DiD (column 2), narrowing the age selection (column 3), including a set of controls (column 4), and applying winsorization to the labor earnings and work hours variables (column 5).

In light of the strict age cutoff of the reform, another obvious candidate for effect estimation would be to use a regression discontinuity instead of a DiD design. We do so following Cattaneo et al., 2019 using a local linear regression (polynomial of degree one), with a triangular kernel, and mean-squared error optimal bandwidth selection. As an advantage of the RD approach, we then no longer need the parallel-trends assumption to hold. A downside, however, is that our estimates become less precise and more local: compliers to the reform become limited to individuals close to the age cutoff of 60 at EWT. Although most of the outcome variables show results that are well in line with those obtained

	Main	RD regression	Ages 57–62	Inclusion Controls	Earnings/hours winsorized
DI application rate	0.012^{**}	0.032	0.017^{**}	0.012^{**}	
DI award rate	0.065^{***}	0.054^{**}	0.066^{***}	0.065^{***}	
Benefit types					
Partial DI (share)	-0.050^{***}	-0.032^{***}	-0.048^{***}	-0.050^{***}	
Full temporary DI	-0.064^{***}	-0.074^{***}	-0.066^{***}	-0.064^{***}	
Full permanent DI	-0.044^{***}	-0.049^{***}	-0.038^{***}	-0.044^{***}	
Full temporary DI: fast-track	0.223^{***}	0.207^{***}	0.218^{***}	0.223^{***}	
Employment outcomes					
Labor earnings	-164.005^{***}	-117.644	-125.231^{***}	-161.170^{***}	-159.312^{***}
Work hours	-3.925^{***}	-4.195	-3.872^{***}	-3.829^{***}	-3.000^{***}
Employment (fraction)	-0.021^{***}	-0.029	-0.025^{***}	-0.021^{***}	
Observations	128 172	35 443	78 113	128 172	128 172

Notes: Estimates under alternative specifications. Column 1 reproduces the main analysis. Column 2 reports regression discontinuity (RD) estimates from local linear regressions with a triangular kernel and optimal bandwidths. Column 3 restricts the sample to ages 57–62, Column 4 adds controls for gender, registration type, and age, and Column 5 uses earnings winsorized at the 0.5^{th} and 99.5^{th} percentiles and hours at the 99.5^{th} percentile. Robust standard errors are in parentheses. Significance levels: $^{***}\,p < 0.01$, $^{**}\,p < 0.05$, $^{*}\,p < 0.1$.

Table 9: *Sensitivity of treatment effect estimates to different specifications*

from the DiD model, responses may be different for individuals close to retirement. Most notably, we see that the effect on labor earnings is much lower for the RD specification: a reduction in monthly labor earnings of almost €117 compared to €164 under the DiD that holds for 60-65 years of age.

To widen our perspective, we therefore re-run our DiD model while allowing for treatment effects that differ by age (60, 61, 62, 63, and 64 years at EWT). The results are shown in Appendix A Table A4. In line with the RD results, we then find a treatment effect for those aged 60 that is very similar to the RD estimate, namely -€118. Similar patterns emerge for work hours and the dummy for employment: the treatment effect for individuals aged 60 closely resembles the RD estimate. This suggests that the RD results are driven by age heterogeneity. We therefore retain the DiD approach as our benchmark, which also yields more precise estimates.

Our results remain robust against the other specifications shown in Table 9. Column 3 reports the estimates including only individuals aged 57-62 rather than 55-64. As a result, we relax the parallel-trends assumption to some extent. The DI application and award estimates remain statistically significant and similar in magnitude, at 1.7 and 6.6 percentage points, respectively. The effects on the different DI types are virtually the same as in the main specification. However, the coefficient for labor earnings is smaller than in the main analysis, at €125 per month compared to €164. This aligns with the finding that the DiD treatment effects for employment differ by age: younger workers (<63) experience a lower drop in labor earnings than older workers (63 and 64) (see Appendix A Table A4). Column 4 reports the DiD results, including three additional controls: gender, age at EWT, and type of

registration (42 weeks or Sickness Benefits Act). The DI application, DI award and DI types estimates are virtually equivalent.

Finally, column 5 reports the results on labor earnings and work hours one year after potential DI receipt using winsorized values. That is, we replaced values below the 0.5^{th} and 99^{th} percentile by the 0.5^{th} and 99.5^{th} percentile values, respectively, while we restricted values above the 99.5^{th} percentile for work hours since the lowest value was zero hours. The estimated labor earning response remains significant at the 1% level, and the effect size only drops marginally to 159 euros compared to 164 euros. The effect on work hours decreases slightly to 3.0 compared to 3.9.

6. Conclusion

This paper examines the ex-ante application and ex-post employment effects in the Netherlands of reducing the DI screening for older workers, along with increased access to full rather than partial DI benefits. We exploit the fact that there is a sharp cutoff at the age of 60, which gave access to this so-called 'fast-track procedure', allowing for a difference-in-differences approach to obtain causal effects. Using unique administrative data from the Dutch Social Insurance Institute on long-term sick-listed workers, we disentangle mechanical from behavioral effects, showing how reduced screening shaped both DI inflows and labor supply near retirement.

Our results indicate small ex-ante effects of the reform in terms of additional DI applications by older workers, particularly in the initial months following the implementation of the fast-track procedure. DI applications only rose by 1.2 percentage points, whereas the mechanical impact of reduced screening amounted to 6.5 percentage points. Given the strong sickness monitoring and mandatory reintegration activities, it thus seems that, at least in the first year of reduced screening, behavioral effects were limited. This contrasts with the behavioral responses in the labor supply of older workers that we find. One year after potential DI receipt, monthly labor earnings drop by 164 euros, hours worked by almost 4, and employment by 2.1 percentage points. These findings align with both extensive and intensive margin crowd-out measures of DI benefits, which is consistent with existing evidence. The ex-post moral hazard effects are caused by reduced work incentives from two sources: individuals who would not have otherwise qualified for any type of DI, and individuals who would otherwise have qualified only for partial DI. Specifically, around one-third of those initially awarded partial benefits switched to full benefits.

Several policy implications can be drawn from our findings. First, employer and worker obligations inherent in the Gatekeeper Protocol during the sick leave period appear to have deterred additional DI applications. Extending sick leave to complete the two-year waiting period was not without cost, for either employers or workers. This was particularly relevant for permanent workers, for whom employer responsibilities continue until the end of the two-year sickness period.

A second implication is that earnings crowd-out effects from increased access to DI benefits were substantial. Even though recipients obtained full DI benefits, many of the newly awarded claimants still had considerable earnings capacity. From a welfare perspective, this reveals a disconnect: while older workers generally have lower employment rates and are often considered in need of extra income support, the targeted group of long-term sick-listed elderly might have continued working, possibly until retirement, without the fast-track procedure. In practice, the reform thus created a new route into early retirement for long-term sick-listed workers with remaining work capacity, marked by weaker work incentives and earlier labor market exit. This development raises policy concerns, as it

reduces labor supply activation efforts aimed at older workers and may have implications for the pension sector's transition to a new system.

Another channel through which the measure affects the pension system concerns the supplementary disability pensions (WIA-hiaat and WIA-excedent) provided by pension funds. The shift toward full disability benefits has two implications. First, the need for supplementary payments to top up partial disability benefits decreases. Second, the higher inflow into full temporary disability benefits increases the number of employees eligible for WIA-excedent benefits, making these supplementary schemes more costly, particularly for higher-wage workers.

Heterogeneity analysis further shows that the behavioral effects were almost entirely driven by women. This may reflect gender-specific labor market prospects, but it also suggests that women were particularly deterred by the uncertainty and scrutiny of medical screening under the regular procedure. If so, their increased DI entry under the fast track may reflect lower administrative barriers rather than purely moral hazard.

Finally, while the fast-track procedure successfully reduced waiting times and the demand for insurance physicians, it also weakened work incentive. From an administrative perspective, the reform added another layer of complexity to an already intricate Dutch sickness and disability system with multiple categorical schemes (Koning & Lent, 2024). By introducing an optional new pathway into DI, the fast track increased the number of benefit routes and choices available to employers and workers. That raises the question of whether decisions were always well-informed and aligned with long-term policy objectives.

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Appendices

A Additional analyses

	DI applications	DI awards
Treatment × Placebo 1	-0.003	0.003
	(0.008)	(0.008)
Treatment × Placebo 2	0.000	-0.004
	(0.008)	(0.007)
Number of observations	92729	92729

Table A1: *Placebo DiD results for DI applications and awards*

Notes: Placebo DiD estimates using pre-reform data, with May 2019 and May 2020 as placebo treatment dates. Dependent variables are DI application (col. 1) and DI award (col. 2). Only the coefficients of the treatment × post interactions are reported; the model also controls for treatment status, post status, and a dummy for spells starting in 2020.

	35-80 DI	80-100 DI	Full DI	Full DI through fast-track
Treatment × Placebo 1	0.000	0.007	-0.005	0.000
	(0.004)	(0.005)	(0.006)	(0.000)
Treatment × Placebo 2	-0.003	-0.011**	0.009	0.000
	(0.004)	(0.005)	(0.006)	(0.000)
Number of observations	92,729	92,729	92,729	92,729

Table A2: *Placebo DiD analyses on DI benefit types*

Notes: This table reports the DiD placebo analysis that is run on the pre-measure data, with May 2019 and May 2020 as placebo treatment dates. The dependent variables are dummies for the different types of DI: 35-80 DI (column 1), 80-100 DI (column 2), full DI (column 3) and 80-100 DI through the fast-track measure (column 4). Only the treatment effects of the interaction terms are reported. The full model also includes the treatment dummy and the post dummy separately, as well as a dummy for first year of sick leave in 2020.

	Labor earnings	Work hours	Employment dummy
Treatment × Placebo 1	6.490	1.967	0.014*
	(38.961)	(1.233)	(0.008)
Treatment × Placebo 2	6.328	0.251	0.008
	(38.368)	(1.242)	(0.008)
Number of observations	92729	92729	92729

Table A3: *Placebo DiD results for DI benefit types*

Notes: Placebo DiD estimates using pre-reform data, with May 2019 and May 2020 as placebo treatment dates. Dependent variables are DI benefit types: partial DI (35–80, col. 1), full temporary DI (80–100, col. 2), full DI (col. 3), and full temporary DI via fast-track (col. 4). Only coefficients of the treatment × post interactions are reported; the model also controls for treatment status, post status, and a dummy for spells starting in 2020.

	Labor earnings	Work hours	Employment dummy
Age 60 × Post	-118.208**	-4.237**	-0.026**
	(55.793)	(1.881)	(0.011)
Age 61 × Post	-88.000	-2.586	-0.011
	(53.986)	(1.678)	(0.011)
Age 62 × Post	-128.785**	-2.840	-0.024**
	(57.078)	(1.795)	(0.011)
Age 63 × Post	-217.862***	-5.233***	-0.025**
	(55.586)	(1.623)	(0.011)
Age 64 × Post	-258.575***	-4.264***	-0.018*
	(50.441)	(1.592)	(0.010)
Number of observations	128,172	128,172	128,172

Table A4: *DiD treatment effects on employment outcomes one year after EWT by age*

Notes: DiD estimates of heterogeneous treatment effects by age on employment outcomes. Only coefficients of the treatment × post interactions are reported; the model also controls for age dummies, post status, and a dummy for spells starting in 2020. Heteroskedasticity-robust standard errors in parentheses. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

B Sick leave and reintegration details

Payment and coverage During sick leave, employers are legally obliged to pay at least 70% of pre-disability earnings Y^{pre} for a maximum of 104 weeks. In specific cases, the National Social Insurance Institute (NSII, in Dutch UWV) pays sick-leave benefits under the Sickness Benefits Act (*Ziektewet*) and assumes the role that would otherwise rest with the employer (for example when a fixed-term contract expires during sickness or due to pregnancy). In Ziektewet cases, the UWV rather than the employer is responsible for reintegration during the sick-leave period.

Gatekeeper Protocol: timeline and required documents The Gatekeeper Protocol structures reintegration effort with fixed checkpoints and written records:

- **Week 6 (assessment by occupational physician).** An occupational physician draws up a medical issue analysis describing functional limitations, remaining work capacity and reintegration goals.
- **Week 8 (action plan).** Within two weeks after the assessment, employer and employee prepare a written action plan that allocates tasks and sets interim targets (e.g., work adjustments, hours, training).
- **Weeks 8–42 (monitoring).** Employer and employee monitor progress and adjust the plan as needed; contacts and interventions are logged.
- **Week 42 (NSII notification).** The employer files a 42-week absence notification with the NSII, formally registering the ongoing sick-leave spell.
- **Week 52 (first-year review).** Employer and employee must evaluate progress against the plan and record updated agreements.
- **Week 104 (DI gateway).** If recovery has not occurred, a *reintegration report* is compiled. This report summarizes activities and outcomes during sick leave and includes the occupational physician's medical assessment. It serves as the basis for DI application.

Compliance checks and sanctions Before any DI assessment, an NSII vocational expert reviews the reintegration report for compliance with Gatekeeper requirements. If the report is inadequate—indicating insufficient reintegration effort—the NSII may *extend* the sick-leave period (up to a maximum of twelve additional months), effectively sanctioning non-compliance. On the other hand, when the NSII has paid sick-leave benefits under the Ziektewet, no employer-submitted reintegration report exists, so this specific compliance check is not applied.

Implications for measurement The fixed checkpoints (weeks 6, 8, 42, 52 and 104) create common event moments across cases and define the end-of-waiting-time (EWT) boundary at week 104, i.e. two years after the start of the sickness period.

C Benefit schedules and work incentives

The Dutch disability insurance system distinguishes three main benefit types: partial DI (35–80% assessed disability), full temporary DI (80–100%), and full permanent DI (80–100%). Each type follows a specific benefit formula that shapes work incentives through earnings thresholds and implicit tax rates. The formulas below use the following notation: Y^{pre} denotes pre-disability earnings (the baseline wage before sickness), Y_t current earnings at time t, and $R = (1-d)\,Y^{pre}$ residual earning capacity implied by disability degree d. WML_t is the statutory monthly minimum wage, and $\beta(d)$ a flat-benefit factor applied in the partial DI continuation phase.

Partial DI (35–80%). Wage-related phase:

$$B_t^{\text{partial,w}} = \begin{cases} \gamma_t\, Y^{pre} - 0.70\, Y_t, & \text{if } Y_t \le 0.65\, Y^{pre}, \\ 0, & \text{if } Y_t > 0.65\, Y^{pre}, \end{cases} \tag{A1}$$

with $\gamma_t = 0.75$ in the first three months and $\gamma_t = 0.70$ thereafter. Duration ranges from three months to two years depending on work history. Benefits decline by €0.70 for each additional euro of earnings and end if income exceeds 65% of Y^{pre}.

Continuation phase:

$$B_t^{\text{partial,c}} = \begin{cases} \beta(d)\, WML_t, & \text{if } Y_t < 0.50\, R, \\ 0.70\, Y^{pre} - 0.70\, Y_t, & \text{if } 0.50\, R \le Y_t \le 0.65\, Y^{pre}, \\ 0, & \text{if } Y_t > 0.65\, Y^{pre}. \end{cases} \tag{A2}$$

The requirement to earn at least 50% of residual capacity to regain the wage-related formula creates strong incentives to return to work.

Full temporary DI (80–100%).

$$B_t^{\text{full temp}} = \begin{cases} 0.70\, Y^{pre} - 0.70\, Y_t, & \text{if } Y_t \le 0.65\, Y^{pre}, \\ 0, & \text{if } Y_t > 0.65\, Y^{pre}. \end{cases} \tag{A3}$$

The formula mirrors the wage-related phase of partial DI but without the 50% residual-capacity requirement. Benefits therefore end only when earnings exceed 65% of Y^{pre}. Reassessments are possible but rare, so the effective work requirement is weaker than under partial DI.

Full permanent DI (80–100%).

$$B_t^{\text{full perm}} = \begin{cases} 0.75\, Y^{pre} - 0.70\, Y_t, & \text{if } Y_t \le 0.20\, Y^{pre}, \\ 0, & \text{if } Y_t > 0.20\, Y^{pre}. \end{cases} \tag{A4}$$

This scheme is slightly more generous at low earnings but cuts off benefits when earnings exceed 20% of Y^{pre}, leaving little scope for work. Awards are permanent, with no reassessment.

Implications of the fast track. The fast-track reform assigns eligible older workers directly to full temporary DI. For individuals who would otherwise have entered partial DI, this implies weaker work incentives because the 50% residual-capacity condition is removed. For those who would otherwise have received full permanent DI, the switch increases the earnings threshold from 20% to 65% of Y^{pre}, modestly expanding the scope for work. On balance, the reform reduces incentives for partially disabled workers to use their residual capacity but increases them slightly for those who would otherwise have been classified as fully and permanently disabled.

D Data cleaning and selection

We start from a merged dataset that includes all 42-week notifications for permanent employees plus all sick leave spells for non-permanent employees who were at least nine months sick-listed between 2019 and 2024. This dataset has been merged with the DI application register data. We select all unique sick leave spells from the merged sick leave registers and DI application data. If sick leave spells overlap, we select the earliest sick leave spell; this deletes only 3.3% of the total number of sick leave spells. We merge this dataset with the labor income register of the NSII, which contains all jobs that an individual had in the 2019 to 2024 period. We keep total wage income and total hours from all jobs. We also record the largest job for each calendar year, which is defined as the one with the highest number of hours. The job sector recorded per year is based on this job. Moreover, we merge the personal characteristics to this data set: date of birth, date of death if applicable, and gender.

After merging all files, we clean the data and exclude inconsistent information. That is, we start with 1,472,992 unique sick leave spells or DI applications, but 150,536 of these observations only have information on a DI application, without any records on the sick leave spell. We therefore delete these. As a result, all observations involve sick leave spells of which we know whether a DI application was made. Any DI applications without sick leave spells recorded are taken out.

We next restrict the time period and distinguish two samples. The first sample, of sick leave spells that were not affected by the fast-track measure (the post-measure sample), consists of sick leave spells with a starting date between September 30, 2018 and September 30, 2020. The second sample, the post-measure sample, consists of sick leave spells that started on or after May 1, 2021 but not after December 31. 2021. Any sick leave spells that did not start according to these time restrictions are removed, which leaves us with 505,496 sick leave spells.

Finally, we remove i6,890 observations due to missing or incorrect information: no labor income data although recorded as employee (128), no date of birth recorded (3,465), observations with conflicting information, i.e., sick leave spells with 60+ measure record before October 2022 or for individuals < 60 (14), or no gender recorded (11). The last step is to apply the final age restriction: we consider only individuals who are at least 55 and not older than 65 at their EWT are considered. This leads to to a final tally of 128,172 observations.

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