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A Follow-Up Study on Return to Work in the Year After Reporting an Occupational Injury Stratified by Outcome of the Workers' Compensation System

Marianne Rudbeck, PhD, Jens Peter Johansen, MD, and Øyvind Omland, PhD

Objective: The aim of this study was to compare return rates to work between different groups according to the decision from the workers' compensation. **Method:** Register data on disability benefits were used to describe return rates to work in Kaplan–Meier curves and association with decision on compensation claims. Disability benefits were granted by the municipalities independently of any compensation claim if sick-listed. **Results:** Claimants with ongoing claims were the group with the largest proportion remaining on disability benefits. Claimants with rejected claims returned to work at the same rate (occupational disease) or slower (industrial accident) than claimants with recognized claim without compensation the subsequent year and at a faster rate after decision. **Conclusion:** Compensation claims and proceedings of the workers' compensation system probably increase time to return to work; other factors such as health and social difficulties, however, may explain some of these differences.

Keywords: disability benefit, occupational health, return to work, workers' compensation system

It has been known for many years that workers' compensation policies influence both recovery from the injury and that worker's compensation claimants have a poorer prognosis for returning to work than noncompensated people.[1–3] Even many years after the work injury, the probability of receiving disability benefits is increased,[4] and stressful experiences in the compensation claim process have been demonstrated to be correlated with poor long-term recovery.[5] Most studies on occupational injuries have focused on the individual level.[3,4,6–8]

Only few studies have focused on the period after compensation claim.[5] It has been described that only few factors could predict return to paid work with having paid work at baseline as the most important factor.[9] Health according to the process of grant of disability pension has been described with an increase in symptoms around the time of disability pension award and a subsequent return toward pre-award levels.[10] The study concluded that possible explanations might include temporary adverse health effects from the process itself, the beneficial effect of being removed from harmful work conditions, and recovery after increasing health problems leading up to disability pension award.[10] Thus, factors associated with health or return to work after a workers' compensation claim are only sparsely known.

Compensation policies and workers' compensation claim systems differ nationally.[11] In Denmark, compensations include permanent future disability, wage loss, death, and medical expenses. The workers' compensation system in Denmark does not include current sick leave benefits or other similar disability benefits. Instead, regardless of the compensation claim, the municipality grants in accordance with national law current benefits to all the sick-listed after 4 weeks. This separation between grant of compensation in the workers' compensation system and grant of disability benefits enables us partly to separate the effect of the workers' compensation system on return to work.

We are not aware of studies that primarily analyze return rate to work in relation to decision from the workers' compensation system independently from grant of sick leave benefits or similar disability benefits.

This study aimed to compare the return rates to work in the year after reporting a compensation claim due to either an occupational disease or an industrial accident and to analyze whether the claimants' return rate to work differed, especially after decision from the National Board on the basis of the independency between granting disability benefits and injury compensation.

METHODS

Study Design and Population

We included claimants who reported an occupational disease or industrial accident to the National Board of Industrial Injuries January 1 till December 31, 2014. The Board provided the registered injuries, decisions, and time of decision within the subsequent year for each claim. We included all claimants ($N = 39{,}961$) with a first-time report of an occupational injury; after exclusion of claimants younger than 18 years, older than 60 years, with missing data, or on permanent benefits, 30,732 claimants were included in the analyses (Fig. 1). Claimants older than 60 years were excluded to ensure that participants still had several years left on the labor market because the Danish state pension is available for everyone from age 65 to 67 years. Claimants ($n = 1854$) with more than one claim were included with date of first report.

Approximately 0.79% of the Danish workers report an occupational disease every year and the same mount report an industrial accident.[12] In 2014, the National Board of Industrial Injuries reported an average process time of 5.9 months from claim to decision.[13] The process time depends on the time it takes to require the necessary health information, information from employer, and the employees' workload at the National Board. The Board decides whether the injury is work-related, if so, a compensation is granted according to the extent of the injury, information from health experts, and instructions of extent of harm.

Danish workers should report an occupational injury to the National Board of Industrial Injuries within 9 days after the injury was sustained, which are done by filling out a form on the website. If doctors or dentists suspect an occupational injury, they have to

From the Department of Social Medicine, Aalborg University Hospital, Aalborg, Denmark (Dr Rudbeck), and Department of Occupational Medicine, Aalborg University Hospital, Aalborg, Denmark (Drs Johansen, Omland).

MR conceived and prepared the study, conducted the analyses, and drafted the manuscript. JPJ and ØO contributed to the study preparation and manuscript revision. All authors approved the final manuscript.

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Address correspondence to: Marianne Rudbeck, PhD, Socialmedicinsk Enhed, Aalborg University Hospital, Havrevangen 1, DK – 9000 Aalborg, Denmark (magrr@rn.dk).

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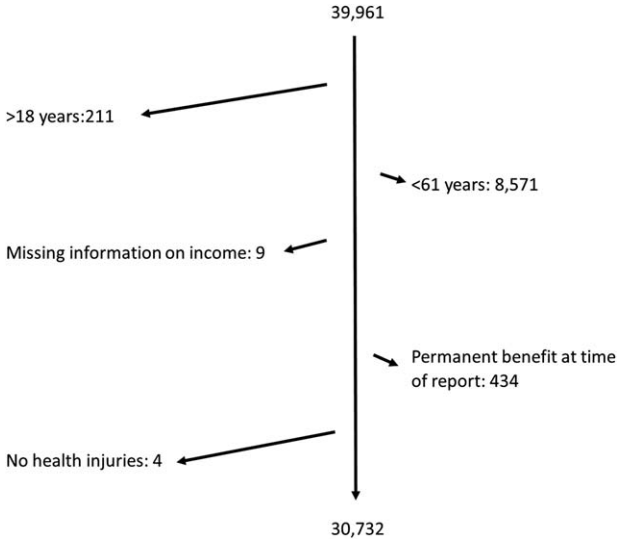

FIGURE 1. Flow chart illustrating the exclusion criteria.

report the injury to the National Board of Industrial Injuries. An occupational injury is either an industrial accident or an occupational disease. An accident is an unfortunate incident or exposure that occurs suddenly or within 5 days. An occupational disease is due to exposures over a relatively long time. An occupational disease can be reported up to a year after sustaining the injury or gaining awareness of the injury.[14]

We used the National Board's five categories regarding financial compensation: claims recognized with financial compensation, claims recognized without financial compensation, ongoing claims, claims closed without final decision, and rejected claims. The Board recognizes the claim if the injury is work-related. If the injury is acknowledged as causing more than 5% harm, the claimant receives financial compensation in accordance with the degree of harm and reduced functionality. The group of claimants with recognized claims who did not receive financial compensation, thus, includes claimants with a recognized work claim rated as causing less than 5% harm. Claims closed without a final decision may include claimants who decided not to go forward with their claim.

Data on disability benefits, including sick leave benefit, were extracted using the patient's personal number in the DREAM register.[15] These data were linked by the patient's personal number to data from the National Board of Industrial Injuries. The Danish Ministry of Employment operates the DREAM register, which contains weekly information on all social welfare payments provided to the Danish population since 1991. The DREAM database has proven useful for follow-up analyses of social and economic consequences of diseases.[16] Type of transfer payment was recorded for a full week, even if a person had only received the benefit for a day. Part-time benefits were recorded as full-time benefits. The week after report was used as employment status at time of the report. The register only contains data on sick leave if the duration of the illness exceeds 4 weeks (the first 4 weeks are paid by the employer). However, the sick leave benefits were recorded from day one, if the workers at the beginning of their sick leave already received unemployment or temporary disability benefits. When ill, all individuals can receive sick leave or other disability benefits from the municipality. The municipality must promote rehabilitation and return to work after 4 weeks of sick leave, regardless of the compensation claim. If ill with a worker's compensation claim, however, the municipality may just prolong the worker's sick leave benefits without further intervention.[17]

The existing Danish rules on sick leave and other disability benefits enable the municipalities to use different types of benefits with different compensation fees. Ill claimants with an ongoing worker's compensation claim are entitled to some type of benefits throughout their illness. Changes in the previous years favor the use of other disability benefits with lower financial compensation, over the sick leave benefits. We find that aggregated disability benefits may therefore be best suited to describe the income of claimants without earnings. We use the term disability benefit, as aggregated disability benefits including sick leave benefits, temporary benefits, and permanent benefits; so, benefits for abled claimants, for example, employment benefits and educational support, were not included. In Denmark, people usually receive benefits if not at work, and not receiving benefits is therefore a proxy of having returned to work.

The Danish Data Protection Agency approved this study (J-no. 2012–41–09589).

Statistics

We used Stata (StataCorp LP, Texas) IC 13.1 to conduct the analyses. We used risk differences (RDs) to demonstrate the percentage remaining on benefits after a year. We used survival analyses (Kaplan–Meier) of the claimants' time of report until time of return to work. The Kaplan–Meier analyses included claimants on benefits at the time of claim; the claimants were excluded at time of return to work. The individual date of recognition or rejection from the Board separated the claimants taking part in the analyses after decision. Statistical association between curves were described by a log rank test ($P < 0.05$) with the group "recognized without financial compensation" as the reference, because this group was expected to be the healthiest group. This study does not account for possible confounders, such as the severity of injury/health problems, which possibly increases the time to return to work. The study only compares return rates of different groups to each other in the subsequent year and after decision by the National Board.

RESULTS

Approximately 35% of the claimants received sick leave benefits at the time of report and approximately 41% received any kind of disability benefits (including sick leave benefits). These were after a year reduced to approximately 15% and 29%, respectively. The mean age was 43 years and there were no gender differences in the study population (Table 1). However, the claimants who reported an occupational disease were older and predominantly women (Table 1).

Occupational Disease

The claimants with a recognized occupational disease claim without compensation had in general the lowest risk of receiving sick leave benefits and any disability benefits at the time of report and after a year (Table 1). This group also included the fewest remaining on benefits (Table 1). The claimants with ongoing claims after a year had the highest risk of receiving benefits and the highest risk of remaining on benefits (28%) (Table 1).

The Kaplan–Meier figures (Fig. 2) demonstrate the rate at which different groups returned to work the subsequent year (Fig. 2A) and after recognition or rejection by the National Board of Industrial Injuries (Fig. 2B). Claimants who return to work were excluded continuously. The claimants with ongoing claims returned to work at the same rate as claimants with recognized claims without compensation. The claimants with rejected claims returned to work at the same rate as claimants with recognized claim without compensation in the subsequent year and at a faster rate after the decision (Fig. 2).

TABLE 1. Number (%) of Claimants Who Received Disability Benefits After Reporting an Occupational Injury According to the Decision of the National Board of Industrial Injuries

	Number	Women/ Men	Mean Age [95% CI]	Sick Leave Benefit at Report	Sick Leave Benefit After 1 Year	RD*	Any Disability Benefit at Report	Any Disability Benefit After 1 Year	RD*
Occupational disease	15,645 (100)	57.18/42.82	44.42 [44.25–44.58]	6,068 (42.35)	2,049 (15.95)	18.22	7,384 (47.20)	4,776 (30.53)	23.08
Recognized with financial compensation	1,052 (6.72)	47.34/52.66	42.46 [41.75–43.17]	183 (19.93)	103 (12.50)	13.07	317 (30.13)	323 (30.70)	22.05
Recognized without financial compensation	480 (3.07)	37.92/62.08	43.04 [41.92–44.17]	62 (14.52)	49 (12.25)	8.20	115 (23.96)	127 (26.46)	15.21
Ongoing	3,217 (20.56)	44.08/55.92	43.80 [43.42–44.19]	1,038 (36.19)	595 (22.87)	21.55	1,387 (43.11)	1,201 (37.33)	27.73
Closed without final decision	665 (4.25)	71.28/28.72	44.16 [43.35–44.98]	268 (43.37)	61 (10.66)	11.81	315 (47.37)	149 (22.41)	16.09
Rejected	10,231 (67.39)	62.30/37.70	44.89 [44.69–45.09]	4,517 (47.56)	1,241 (14.69)	18.57	5,250 (51.32)	2,976 (29.09)	22.55
Industrial accident	15,087	42.47/57.33	42.31 [42.12–42.49]	3,876 (28.34)	1,900 (14.76)	13.19	5,285 (35.03)	4,030 (26.71)	18.58
Recognized with financial compensation	2,160 (14.32)	36.25/63.75	43.75 [43.28–44.21]	675 (33.38)	274 (14.17)	13.40	813 (37.64)	496 (22.96)	17.28
Recognized without financial compensation	2,838 (18.81)	37.91/62.04	41.55 [41.11–42.00]	384 (15.03)	167 (6.80)	4.31	667 (23.50)	527 (18.57)	10.05
Ongoing	4,223 (27.99)	41.56/58.44	42.53 [42.19–42.88]	1,632 (42.40)	895 (24.97)	22.45	2,006 (47.50)	1,512 (35.80)	27.02
Closed without final decision	249 (1.65)	46.18/53.82	43.70 [42.22–45.19]	18 (7.93)	14 (6.64)	4.85	40 (16.06)	45 (18.07)	11.24
Rejected	5,617 (37.23)	47.69/57.31	41.90 [41.60–42.20]	1,167 (23.23)	550 (11.73)	10.91	1,759 (31.32)	1,450 (25.81)	17.37
Total study population	30,732	49.96/50.04	43.38 [43.26–43.1]	9,944 (35.51)	3,949 (15.36)	15.76	12,669 (41.23)	8,806 (28.65)	20.87

*Risk difference defined as the percentage remaining on benefits after a year.

Industrial Accident

The claimants with a recognized accident claim without compensation had in general the lowest risk of both sick leave benefits and disability benefits and both at report and 1 year after (Table 1), except for the claimants whose claims were closed without a final decision.

The claimants with an ongoing claim had the highest risk of benefits 1 year after reporting an injury and the highest risk of remaining on benefits after 1 year (27%). The percentage of claimants with rejected claim on benefits after 1 year was also high (26%) and 17% remained on benefits after 1 year.

The Kaplan–Meier and the log rank tests confirmed that claimants with ongoing accident claims returned to work at a slower rate than claimants with recognized accident claims without compensation (Fig. 3). The claimants with a rejected claim or a recognized claim with compensation also returned to work at a slower rate the subsequent year from the National Board. After the decision, the claimants with a recognized claim with compensation returned to work at the same rate as the claimants with a recognized claim without compensation. The claimants with a rejected claim returned, however, to work at a faster rate than the claimants with recognized claim.

Comparing the Progress of Occupational Disease Claim and Accident Claim

The risk of rejection was much higher when reporting an occupational disease (67%), opposed to an accident claim (37%) (Table 1). The percentage of ongoing claims after a year was surprisingly high for accident claims (28%) compared with occupational disease claims (21%). The overall difference between the claimants with an occupational disease claim and an accident claim was that the percentage on benefits with an accident claim were almost always lower both at the time of report and after a year (Table 1). A higher percentage of claimants with recognized accident claims return to work than claimants with recognized occupational diseases. The claimants with an ongoing claim had the very highest risk of both receiving benefits after a year and remaining on benefits.

DISCUSSION

One-third of the claimants were not at work a year after reporting an occupational injury, and one-fifth had remained on benefit a year after report. Comparison of the return rates to work demonstrated that the claimants with rejected claims returned fully to work at a faster rate than the claimants with recognized claims, but only after the National Board of Industrial Injuries had rejected the claim. The claimants with ongoing claims had less success in fully returning to work despite of or because of the fact that almost half of them received disability benefits at the time of report.

We expected the claimants with recognized claims that did not include financial compensation to be the healthiest claimants, and thereby be the ones with highest return to work, because their disease or accident was recognized, but had not affected the claimants to a degree that demanded financial compensation. Their percentage of time on disability benefits was low at the time of reporting the claim, which may confirm they were a rather healthy group of claimants. However, they returned to work at the same rate as claimants with recognized claims that did include financial compensation. We had expected a higher return rate for workers with recognized claims without financial compensation both in the subsequent year and after the decision. The duration of a claim has been demonstrated to increase stress and has been correlated with poor long-term recovery.[5] Stress due to claims and especially to the duration of claims may explain our findings of the high percentage of time on long-term disability benefits among those with ongoing claims. Expectations of recovery or compensation may likewise be an explanatory factor of this finding.[18,19] Studies have demonstrated that claimants with poor general health at the time of claim improve over time, and have explained that if the unintended negative effects of the disability assessment process exist, then they not only play a role at the first

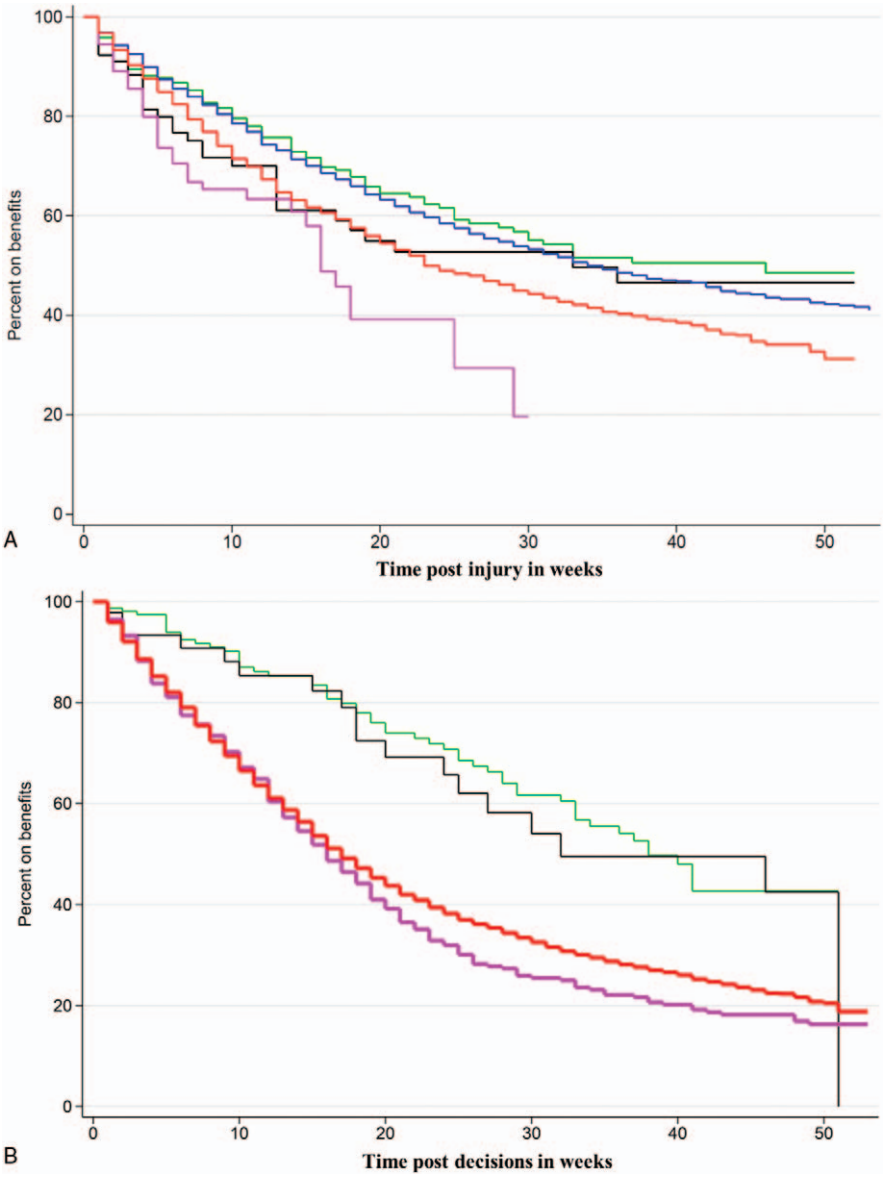

FIGURE 2. Kaplan–Meier curves for time on disability benefits (weeks) in the first year after reporting an occupational disease stratified by decision on workers' compensation claim. (A) In the subsequent year. (B) After decision; Closed without final decision ($P < 0.001$), Rejected ($P < 0.01$). Bold lines are significantly different from reference line. Recognized without financial compensation (reference) (black). Recognized with financial compensation (green). Claim ongoing (blue). Closed without final decision (pink). Rejected (red).

disability assessment but also at reassessment once benefit is awarded.[9] In the present study, we could not differentiate whether other possible health problems, social difficulties, unfulfilled expectations, or other reasons could explain these differences; however, it is unlikely, as we only compare return rates.

Most studies on workers' compensation claims have been clinical studies about outcome of intervention, for example, surgery and how compensation claims affect outcome or recovery.[3–10,20,21] This study focused on the separate effects of a not-recognized workers' compensation claim, and how it may affect return to work, regardless of independent disability grants from the municipality. Many studies have demonstrated that a workers' compensation claim prolongs recovery and return to work. Our results probably confirm this, most profoundly the different return rates in rejected accident claims; claimants with rejected claims returned to work at a slower rate in the subsequent year and at a higher rate after decision than the healthiest group with recognized claims. This indicates that claimants with rejected accident claims could be as healthy as the group with recognized claims without compensation, as they were able to increase return to work as fast as they did after the decision; noticeably, they had unchangeably possibilities of disability benefits if they still were ill.

Ill claimants with ongoing workers' compensation claims are entitled to receive sick leave benefits or a similar disability benefit from the municipality for as long as the National Board of Industrial Injuries has not resolved the claim. The municipality is entitled to assist on return to work as soon as possible regardless of any ongoing work claim. We, therefore, might expect that claimants with rejected claims return to work at the same rate the subsequent year and after the decision, and not at a higher rate after the decision, as we have demonstrated. Similarly, a high percentage of claimants with ongoing claims still received disability benefits 1 year after report of the claim. Due to our present results, we could hypothesize that it might be difficult for some claimants to return to work if they felt encouraged or obliged to demonstrate sequelae or remain disabled to receive compensation from the National Board of Industrial Injuries, as least we found that far more claimants with recognized claims with financial compensation had returned to

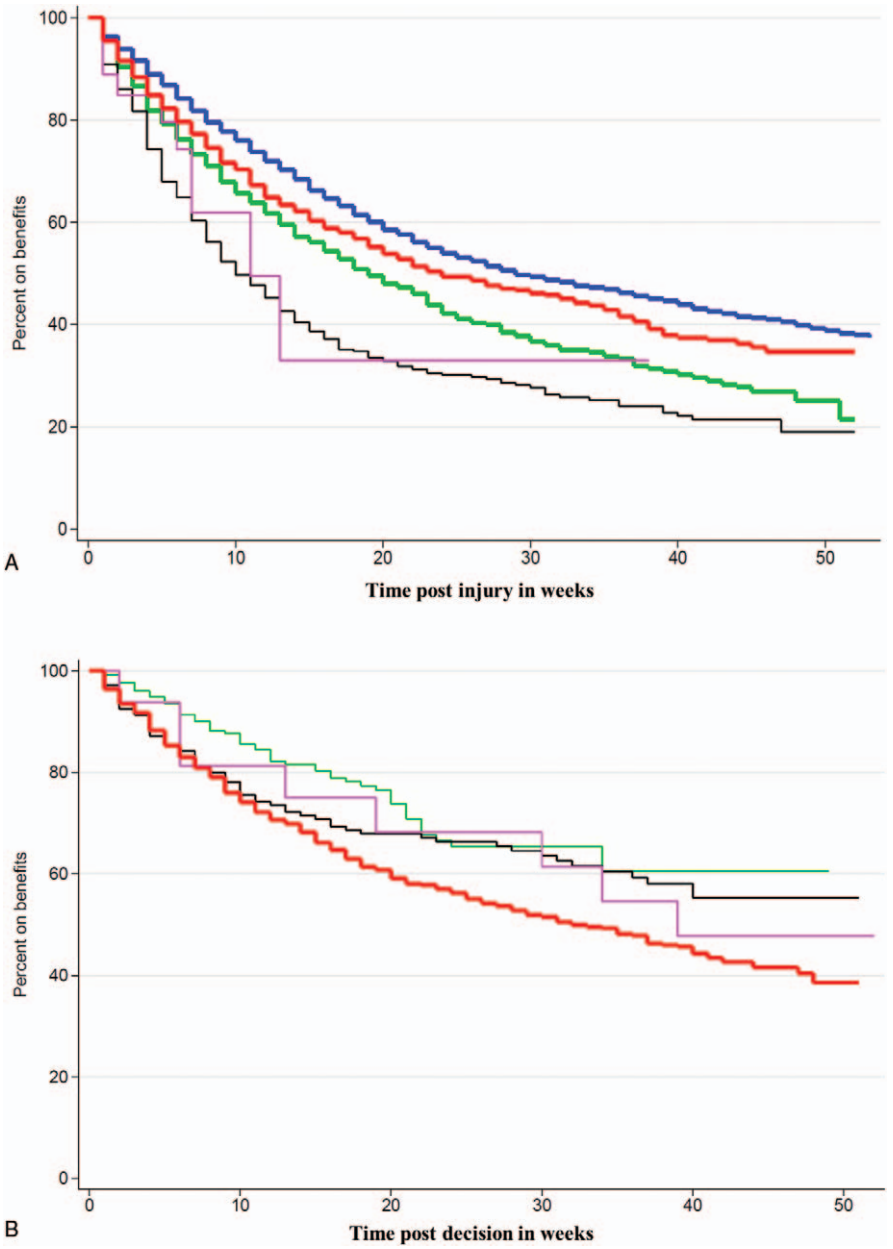

FIGURE 3. Kaplan–Meier curves for time on disability benefits (weeks) in the first year after reporting an industrial accident stratified by decision on workers' compensation claim. (A) In the subsequent year. (B) After decision; Recognized with financial compensation ($P < 0.001$), Ongoing ($P < 0.001$), Rejected ($P < 0.001$) (B) After decision; Closed without final decision; Rejected ($P < 0.05$). Bold lines are significantly different from the reference line. Recognized without financial compensation (reference) (black). Recognized with financial compensation (green). Claim ongoing (blue). Closed without final decision (pink). Rejected (red).

work. However, we do not know about other difficulties that impaired their ability to return to work. Due to our present results, we could hypothesize that claimants whose claims have been ongoing for a long time have not received the proper help to return to work in time and therefore remained on sick leave benefits or similar disability benefits. Thus, the compensation system may seem to somehow maintain disabilities. Our study demonstrated that possible occupational injury and decisions on occupational compensation claims could negatively influence full return to work; this finding is in line with studies on return to work and recovery, economy, or compensation policies.[4,5,22,23]

The strength of this register study is the uniform data collection of both disability benefits and outcome of workers' compensatory claims. Compensation from the workers' compensation system is totally separated from disability grants from the municipalities and granted independently. This allows us to look separately at the effect of workers' compensation claims on return to work without influence from the authorities' grants of current disability benefits. However, we do not know the reasons why workers received the disability benefits; the benefits might be due to other health issues or to social issues other than the occupational injury. We do not know whether, for example, claimants with ongoing claims had more sever or complex injury as reason for the unsolved claim which independently may increase the time it takes to return to work. We cannot conduct any analyses on part-time return to work, as part-time benefits are registered only as full-time benefits. Our conclusions, therefore, only concern full return to work. The start of an occupational disease may be difficult to determine, and the disease likely evolves for some time before a report is filed to the National Board of Industrial Injuries. Therefore, the claimants with occupational disease may have had more difficulty returning to work than the claimants with a sudden accident, which is illustrated by the lower number of disability benefits with accident claims than with occupational disease claims. Risk of

absence due to sickness varies but has been reported to be rather high in the general population.[24,25] It has also been reported that claimants with occupational disease had medical, occupational, and social characteristics before notification that differed from those of nonclaimants.[26] It is also likely to characterize our population.

CONCLUSION

Workers' compensation claims and proceedings in the National Board of Industrial Injuries probably increase the time it takes to full return to work, especially for claimants with rejected or ongoing claims; other factors such as health implications, social difficulties, or other reasons, however, may explain some of these differences. Further studies on this would be interesting.

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