

# Recurrence of Sickness Absence Due to Depression after Returning to Work at a Japanese IT Company

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**Abstract:** There have been few epidemiological studies on recurrent sickness absence due to depression after returning to work (RTW). The objective of this study was to investigate the prognosis of workers who are RTW with depression in a Japanese company. This study employed a descriptive epidemiology study design. Subjects of this study were 540 employees who worked full-time and were registered in the Health Data System and returned to work from April 2002 to March 2008 after their first leave of absence due to depression. We investigated the recurrence of sickness absence due to depression after returning to work using the Kaplan-Meier survival curve method. During the 8.5 yr follow-up period, almost half of the RTW employees experienced recurrent sickness absence. There was a steep increase in recurrent rates the first two years after RTW, and 85.2% of total recurrence of sickness absence had occurred within three years after the index episode.

**Key words:** Depression, Prognosis, Return to work (RTW), Sickness absence, Recurrent sickness absence

## Introduction

Depression is a serious illness with a high recurrence rate, mortality, and suicide rate and a substantial loss of quality of life<sup>1</sup>. In recent papers, depression is recognized as important problems in developed countries<sup>2–6</sup>. Depression is one of the most important risk factors for suicide<sup>7</sup>. Especially in Japan, the number of suicides has increased rapidly over the last several decades, to over 30,000 in 1998 and has remained to the present<sup>7</sup>. According to the National Police Agency survey, 8,997 Japanese employees committed suicide in 2008<sup>8</sup>. Sickness absence due to depression has become an important occupational health problem with serious consequences for individuals as well

as companies<sup>9</sup>. Workplace costs per depressed individual amounted to \$3,032, which are the single largest category<sup>10</sup>. Depression imposes a substantial economic burden on Japanese society<sup>10</sup>.

There have been some studies on the incidence of sickness absence due to depression recently<sup>9, 11–14</sup>. There was no difference between female and male employees in the frequency of absence due to depression in Japanese survey<sup>2</sup>. Women had a higher risk of long-term (>8 wk) sickness absence with depression than men in Norway survey<sup>9</sup>. In Norway, sickness absence with depression increased between 1994 and 2000<sup>14</sup>. Depression is a long-lasting predictor of onset, duration and recurrence of sickness absence<sup>11</sup>.

In Japan, especially for tertiary prevention of occupational mental health, many Japanese companies have been introducing various return-to-work (RTW) systems recently, from the guidelines of RTW principles from the

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Ministry of Health, Labor and Welfare 2004 or psychiatric experts' opinions<sup>15</sup>). These include an RTW committee, reduced working time, and regular follow-up interview by occupational health staffs. Although RTW is generally considered to be directly related to recovery, the situation is usually more complex, because varying levels of symptom severity are loosely associated with patterns of sickness absence and work disability<sup>16</sup>). Recurrences after recovery from depression represent important problems for companies, employees, and occupational health staff<sup>17</sup>), because employees who returned to work after sickness absence due to depression are at increased risk of recurrent sickness absence<sup>18</sup>).

It seems that there has been more interest in follow-up for employees who returned to work after sickness absence due to depression in Japan<sup>15</sup>).

There have been few epidemiological studies on recurrent sickness absence due to depression after RTW<sup>18, 19</sup>). It is very important to predict when recurrent sickness absence due to depression will occur, because by knowing when recurrence will occur, occupational health staffs could know until when they should follow up RTW employees. The objective of this study was to investigate the prognosis of workers who RTW with depression in a Japanese company.

## Subjects and Methods

### *Study design*

This study employed a descriptive epidemiology study design.

### *Corporate profile*

Company A investigated in this study is one of the biggest data communication companies in Japan and is involved in various fields; regional and international telecommunication services (installing and maintaining telephones, faxes, telegrams, internet systems etc).

### *Sickness absence System*

The sickness absence system in company A is as follows; employees who are not working well or are suspected of having a mental disorder are recommended to see a psychiatrist early and to rest, by their immediate superior or occupational health staff.

Their immediate superiors ask them to submit a psychiatrist's certificate to be certified for sickness absence. An employee with depression has to submit a psychiatrist's certificate (archives) which says "this employee needs to

rest." Certificates from psychiatrists can be admitted for sickness absence due to depression. His or her immediate superior receives the document and sends a copy to the occupational health center. After confirming the name of the employee, the diagnosis, the comment from the psychiatrist that the employee needs to rest, and the duration of sickness absence on the certificate, the occupational physician (OP) registers this information in the Health Data System of this company. If an employee is taking their first sickness absence due to depression, the OP registers it as "first leave" according to company regulations.

Sickness absence in company A is of two types; "byokikyuka" (means short sickness absence: BY), and "kyusyoku" (means long sickness absence: KY), according to human resources regulations. Employees who submit a psychiatrist certificate are registered as BY. When the duration of sickness absence exceeds the human resource standard, the employee is registered as KY. The human resource standard which should be regarded as KY is 3 months for 0–9 yr duration of employment, 6 months for 10–19 yr, and 1 yr for 20 yr, respectively.

### *Return to Work System*

Regarding the process of RTW, firstly, employees must submit their psychiatrist's certificate which says, for example "this person can return to work from December 24". After submitting the certificate for RTW, employees need to have an occupational physician interview. As a rule, the employee, the immediate superior, and the OP attend the interview for work adjustment. An employee with BY can return to work after the OP interview. An employee with KY needs to be judged by the RTW committee twice. The first RTW committee judges whether an employee with a psychiatric disorder can work during the observation period, usually 3 months. Based on the OP's and superior's report of the situation during the observation period, such as attendance, appearance, motivation for RTW, attitude to job, interpersonal relationships with superiors and colleague, endurance for job and so on, the second committee can judge whether this employee can return to work. After passing this committee twice, employees can return to work. The definition of the RTW day is the day when OPs decide as appropriate as for employees' RTW after OP interview or RTW committee.

Recurrent sickness absence due to depression is also defined only by a psychiatrist's certificate.

### *Subjects*

The number of employees who worked for this com-

pany on a full-time basis from 2002 to 2010 was about 68,000. Of these employees, subjects were collected from the company register, searching for all employees who satisfied both inclusion and exclusion criteria. Employees who were registered in the Health Data System and returned to work from April 1, 2002 to March 31, 2008 after their first sickness absence due to depression (F3; ICD-10, based on a psychiatrist’s certificate) were included.

This criterion meant that this study population did not include employees who had had previous episodes of psychiatric disorder before April 1, 2002, and employees who were absent because of schizophrenia, anxiety disorder, eating disorder, adjustment disorder, alcohol dependency and other mental disorder except F3 (ICD-10).

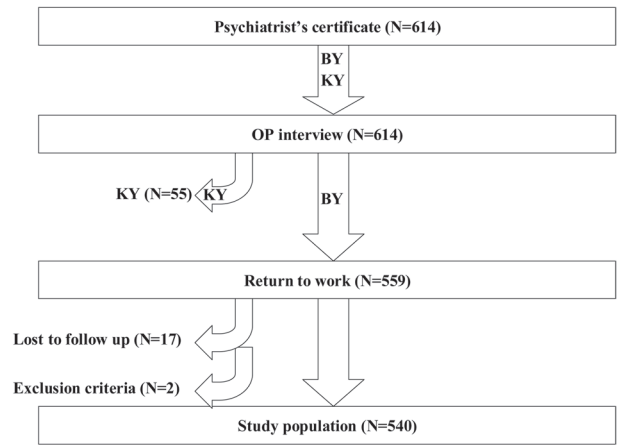
Of the employees who filled the inclusion criteria, we excluded employees who satisfied the following exclusion criteria:

- KY employees, because the criteria for RTW differs between BY employees and KY employees.
- employees whose data for the day at loss to follow-up were totally unknown after returning to work (for the Kaplan-Meier survival curve, we needed to know the day at loss to follow-up, such as the day of being transferred, registering, sickness absence due to other diseases).
- employees who were diagnosed with maniac disorder by a psychiatrist’s certificate.
- employees who had other factors that caused secondary depression, such as interferon therapy for hepatitis C or post-partum depression before April 1, 2002.

Figure 1 shows the pathway to RTW in this study population. First of all, 614 employees submitted a psychiatrist’s certificate from April 1, 2002 to March 31, 2008. Of the 614 employees, 74 were excluded: 55 who were KY employees, 17 whose data for the day at loss to follow-up were totally unknown after RTW, 2 who had had other factors causing secondary depression, such as interferon therapy for hepatitis C or post-partum depression. We regarded 540 employees as the study population for analysis.

*Censoring criteria*

The period of sustaining working without relapses was expressed by using Kaplan-Meier survival curves. The starting day of the well interval was the day of RTW after the index episode in the Health Data System. The ending day of the well interval was the first day of recurrent sickness absence due to depression certified by psychiatrists, or the day of censoring: the day of follow-up (September 30, 2010), the day of resigning, the day of being trans-



**Fig. 1. The pathway to RTW in this company and study population.** BY: short sickness absence. KY: long sickness absence. Employees who submit a psychiatrist certificate are first registered as BY. When the duration of sickness absence exceeds the human resource standard, the employee is registered as KY. The human resource standard line which should be regarded as KY is 3 months for 0–9 yr’ duration of employment, 6 months for 10–19 yr, and 1 yr for 20 yr, respectively.

ferred to another company, the day of maternity leave, or the day of sickness absence due to other diseases except depression certified by physicians, such as malignancy, hernia, gastric ulcer and so on.

We collected the data of whether the study population had recurrent sickness absence due to depression since the day of RTW to September 30, 2010. After RTW, 35 employees were censored: 2 due to lumber disk hernia, 3 due to maternity leave, 11 transferred to other companies, 14 resigned, 1 due to alcoholism, 1 due to ischemic heart disease, and 3 due to benign or malignant disease during the 8.5 yr follow-up period. These 35 employees were analyzed from the day of RTW to the censored day.

*Statistical analysis*

The Kaplan-Meier survival curve for recurrent sickness absence was used, and recurrence rates were calculated. The proportion of recurrent sickness absence in each period after RTW was shown as follows.

$$\text{Proportion of recurrent sickness absence (\%)} = \frac{\text{No. of persons who had recurrent sickness absence in each period after RTW}}{\text{No. of the total employees who had recurrent sickness absence}} \times 100$$

It is useful to examine recurrence of sickness absence in different time periods after RTW, because it is expected

**Table 1. Characteristics of this study population**

		total N=540	male N=455 (84.3%)	female N=85 (15.7%)
Age (yr)	(mean $\pm$ SD)	41.7 $\pm$ 8.7	41.8 $\pm$ 8.4	39.3 $\pm$ 10.1
Duration of employment (yr)	(mean $\pm$ SD)	20.3 $\pm$ 10.5	20.8 $\pm$ 10.1	17.8 $\pm$ 12.2
Age at entering the company (yr)	(mean $\pm$ SD)	21.1 $\pm$ 3.7	21.0 $\pm$ 3.7	21.6 $\pm$ 3.9
Duration of first sickness absence (days)	(mean $\pm$ SD)	94.6 $\pm$ 67.2	95.0 $\pm$ 69.3	92.4 $\pm$ 55.1

The duration of employment and the age at entering the company were included with 28 (male 21, female 7) missing data, with 28 missing data, respectively.

**Table 2. The cumulative recurrent rate for the total study population and the proportion of recurrent sickness absence**

	1	2	3	4	5	6	7	8
Cumulative recurrent rate (%)	28.3	37.7	42	44.7	47.1	49.3	49.3	49.3
Proportion of recurrent sickness absence (%)	57.4	76.5	85.2	90.7	95.5	100	100	100

for us to know how long occupational health professionals should follow up RTW employees. Data were analyzed using IBM SPSS ver.19.0 software for Windows.

#### Ethics approval

This study was approved by the Medical Ethics Committee of Dokkyo Medical University.

## Results

#### Basic characteristics of the study population

The basic characteristics of the participants are shown in Table 1.

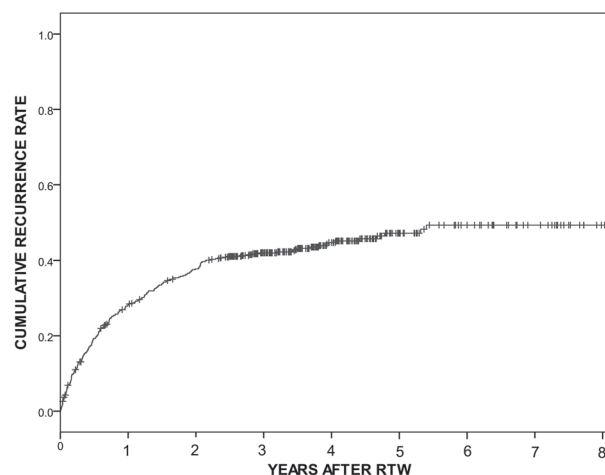
The total population was 540 employees, 455 male (84.3%). Mean age was about 41 yr old, and the duration of employment was about 20 yr. The duration of the first sickness absence due to depression was about 3 months.

#### Prognosis of the employees with depression after RTW

During the follow-up period, 36 women (42.4%) and 199 men (43.7%) experienced recurrent sickness absence.

The cumulative recurrent rate for the total study population was shown in Table 2.

The Kaplan-Meier survival curve for recurrent sickness absence was shown in Fig. 2. As visualized in Fig. 2, there was a steep increase in recurrent rates the first two years after RTW, and 85.2% of total recurrence of sickness absence had occurred within three years after the index episode. Recurrent sickness absence was, however, evident as long as 8 yr after the index episode and by the end of follow-up, almost half of the employees (49.3%) had experienced recurrent sickness absence.



**Fig. 2. Cumulative recurrence rates by Kaplan-Meier estimate (total population).**

## Discussion

In occupational health, there have been few studies on the prognosis of employees with depression using survival analysis. To our knowledge, this is the first study to show the recurrence rate of sickness absence due to depression after RTW, showing that about 50% RTW employees had recurrent sickness absence during the 8.5 year follow up period and most of the recurrences were concentrated in the three years after RTW.

This study was in line with previous clinical studies reporting that mental disorders have high recurrence rates<sup>20–23</sup>.

This result showed there were no gender differences in

recurrence of depression, in line with other studies<sup>17, 18, 20</sup>).

In the field of psychiatry, there have been many studies into recurrence after recovery for common mental disorders using survival analysis<sup>1, 20–26</sup>. Compared with previous studies, the recurrence rate among our study population was much better than in these hospital patient studies<sup>20–22</sup>).

As compared with general population studies, our recurrent curve after RTW was slightly worse<sup>1, 24, 26</sup>. It is not generally so easy for patients with depression to keep working after RTW. That may affect the differences of the recurrent rates after recovery.

To our knowledge, only one study, the Dutch Post and Telecom study, has investigated recurrence after sickness absence due to depression in a working population<sup>19</sup>). The results of the present study were similar, reporting that 48% of employees with sickness absence due to depression at baseline had recurrent episodes during 4 yr follow-up<sup>19</sup>). As it is known that RTW employees often are not fully recovered from their depressive symptoms<sup>27</sup>), depression may be associated with recurrent sickness absence.

However, the present study has not examined recurrence rates of mental disorders, but rather recurrence rates of sickness absence due to depression, which is a functional outcome of depression. Sickness absence is a complex and multi-causal phenomenon, and there is no unified theory or consensus regarding the impact of depression on recurrence of sickness absence<sup>11</sup>). This study in occupational health is quite difficult to compare to studies in the field of psychiatry. And studies on the prognosis of depression are difficult to compare due to differences in methodology<sup>28</sup>). In order to analyze the prognosis of employees with depression after RTW, further epidemiological studies will be needed, especially for occupational health.

Referring to the Kaplan-Meier recurrence curve in this retrospective cohort, the incidence of recurrent sickness absence declined over the years after RTW; recurrence was concentrated most frequently in the first year, followed by the second year. This tendency was in line with previous studies<sup>19, 21</sup>). Based on the results of this study, relapse prevention consultations are recommended for at most 5 yr, while other studies recommended for a period of 3 yr after RTW years<sup>29</sup>).

Occupational health staff should refer to this recurrent curve, to prevent relapses after RTW. This study may help prevent relapses due to depression, by showing that the occupational health professionals should follow up RTW employees for about 3 yr.

Clinical treatment alone may be insufficient to reduce

the individual and economic impact of mental disorders in the workplace<sup>13</sup>). Studies researching the prognosis of employees with depression are quite important for occupational health professionals.

### *Strengths*

There are three strengths of this study. Firstly, the number of subjects was more than 500 employees for recurrent sickness absence, higher than in previous studies, which ranged from 71 to 431 subjects<sup>1, 20–24, 26</sup>), except the Dutch study<sup>19</sup>). Secondly, the follow-up period (2.5 to 8.5 yr) in this study was comparatively longer than in previous studies<sup>1, 15–20, 22</sup>). Thirdly, the follow-up rate was 96.9%, which was generally quite high<sup>1, 19–24, 26</sup>). The reason for the high follow-up rate may be that all the information on sickness absence is registered in the data system according to company regulations.

Many companies in Japan have been introducing RTW systems recently according to psychiatric experts' opinions or guidelines from the Ministry of Health, Labor and Welfare in 2004, but there have been few epidemiological studies of recurrent sickness absence due to depression after RTW. The study gives rise to knowledge which may be helpful in preventing relapses.

### *Limitations*

There are several limitations of this study to note. First, as a diagnosis of depression, we used certificates submitted by different psychiatrists in daily clinical practice. It is therefore necessary to check the validity of their diagnosis, although it may be safe to assume that they use the ICD-10 diagnosis of a single depressive episode in their daily clinical practice with sufficient precision<sup>30</sup>). Second, we could not reject the existence of comorbidities of depression. Occupational physicians register one diagnosis per one absence episode, but employees among this population may have other psychiatric disorders<sup>31</sup>). Third, we need to pay attention when generalizing the results of this study to other IT companies and other fields of work, whether this study is representative for the companies in other fields of work, as the subjects were all full-time workers employed by a large Japanese IT company. In addition, we did not know the number of employees who had episodes of sickness absence due to depression but left the company without showing willingness to RTW. Fourth, we cannot completely rule out all the employees who had previous episodes of psychiatric disorder before the follow-up period, because there can be some employees who had had previous episodes of psychiatric disorder before working



in this company and had no episode after employed. Fifth, as we don't have such data that can become a comparison group, such as individuals without depression, it is impossible to gain knowledge on whether recurrent sickness absence is more or less common among individuals with depression compared to individuals with other health problems.

#### Future Tasks

While the RTW process itself is rarely studied<sup>32)</sup>, as future tasks, predictors of recurrent sickness absence should be investigated in order to draft a strategy for preventing relapses after RTW. The three following predictors may be included: disorder-related factors (diagnosis, level of depressive symptoms, duration of the disorder), personal factors (gender, age, marital status, recovery expectations, educational level), and environmental factors (job demand, supervisory support, and co-worker support)<sup>33)</sup>.

#### Conclusion

During the 8.5 year follow-up period, almost half of the RTW employees experienced recurrent sickness absence. There was a steep increase in recurrent rates the first two years after RTW, and 85.2% of total recurrence of sickness absence had occurred within three years after the index episode. This study may help prevent relapses due to depression, by showing that the occupational health professionals should follow up RTW employees for about 3 years.

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