

Work Absence Following COVID-19 Vaccination in a Cohort of Healthcare Personnel

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Objective: To identify rates of work absence following receipt of COVID-19 vaccine in a cohort of healthcare personnel (HCP). **Methods:** Short-term disability (STD) usage by HCP attributed to side effects of the COVID-19 vaccine was calculated for each vaccine manufacturer, job category, age group, and work region. Analysis was performed for the cohort of HCP during the initial vaccination campaign. **Results:** 4.1% of COVID-19 vaccinations generated a STD claim for lost work due to side effects, with increased STD rates after dose 2 than dose 1 (7.4% and 0.9%, respectively). Rates were higher for younger HCP and allied health staff. **Conclusions:** While side effects from mRNA vaccine dose 2 resulted in more work absence, statistically significant geographic differences in STD suggest cultural and staffing factors may impact HCP to utilize STD following vaccination.

Keywords: COVID-19, healthcare, side effects, vaccine, work absence

Three COVID-19 vaccines are now available in the United States and authorized for emergency use by the Food and Drug Administration following promising data in clinical trials.¹⁻³ Common side effects of the available vaccines include injection site pain, fatigue, headache, myalgias, fever, and chills. In clinical trials, side effects were evaluated for every participant and categorized as mild, moderate, or severe, using conventional definitions such that generalized symptoms categorized as severe required either use of prescription medication or impacted the patient's ability to attend work or school. Objectively measurable signs such as fever, erythema, and swelling are classified based upon value. Local symptoms may be classified as severe and yet not

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Clinical Significance: The results of this study demonstrated that work absence varied based on region despite widespread communication. This suggests that additional factors including culture and staffing may impact work absence and present opportunities to educate staff on normal side effects of vaccination to support decisions to safely come to work.

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Learning Objectives

- Discuss concerns within the healthcare community regarding staffing impacts related to side effects of COVID-19 vaccination.
- Summarize the new findings on post-vaccine side effects in one health system, including factors associated with higher versus lower rates of short-term disability (STD).
- Discuss the study implications for policies to increase to increase vaccine acceptance and reduce hesitancy in healthcare settings.

require time away from work or school. The impact of vaccine side effects on work attendance was not specifically reported.¹⁻³

In December 2020, the Centers for Disease Control and Prevention CDC implemented v-safe, a safety monitoring system specifically for the COVID-19 vaccination program. Participants voluntarily self-enroll and receive text messages with links to web surveys. During the first week after vaccination, v-safe participants are asked whether they experienced symptoms that caused them to miss work or school.⁴ In both clinical trials and the v-safe monitoring program, side effects occurred more frequently in adults under age 65 compared to older individuals. Side effects were consistently reported more often following the second dose of the mRNA vaccines compared to the first dose.

Occupational groups including healthcare personnel (HCP) and other frontline workers were prioritized for early vaccination to mitigate their risk of occupational infection and ensure the continuation of essential societal functions,⁵ yet limited data is available to estimate the impact on work attendance following vaccination. Among v-safe participants receiving the Janssen vaccine, 17% reported missing work due to side effects during the week following vaccination. The absence from work by this number of employees could have significant social and economic impacts.⁶ Data from v-safe on the frequency of side effects after mRNA vaccination have been published but information on the severity of symptoms and lost work time due to vaccine side effects have not yet been reported.^{4,7} We report on actual rates of work absence based upon short-term disability (STD) claims data following COVID-19 vaccination in a large cohort of HCP at a large, multi-site academic medical center.

METHODS

Setting and Subjects

Mayo Clinic consists of three main campuses located in Minnesota, Arizona, and Florida, and a health system of hospitals and outpatient clinics spanning southern Minnesota and western Wisconsin, employing approximately 72,000 HCP at all sites combined. COVID-19 vaccinations began in mid-December 2020 in a stratified fashion described previously.^{8,9} To ensure that concern about lost work time due to vaccine side effects did not pose a financial barrier to HCP vaccination, a temporary policy for STD was established allowing HCP to obtain paid time away if they were unable to work due to side effects following a dose of vaccine.

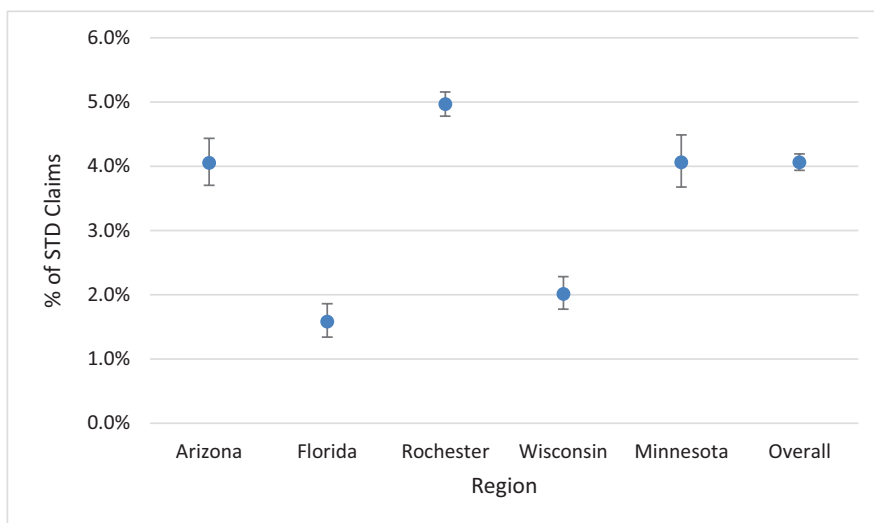


FIGURE 1. Vaccination short-term disability claim rate by region.

HCP could claim the STD benefit if they met the following criteria: receipt of a COVID vaccine in the past 7 days, symptoms consistent with known vaccine side effects such as fever, injection site pain, myalgias, headache, and/or fatigue that were severe enough the HCP felt unable to work. The paid benefit consisted of 100% wage replacement for up to 3 days with no waiting period. Application for STD was accepted through a web-based application and severity of symptoms was based upon the HCP’s self-report without a requirement for medical evaluation or documentation.

Deidentified data on STD claims following COVID-19 vaccine administration among HCP was provided by Recovery and Claims, Mayo Clinic’s in-house administrator, and included dose number, vaccine brand received, HCP age bracket, region, and job group. Data on vaccination was provided by Occupational Health Services and included vaccine dose number, brand, date, age, region, and job group. Within our HCP cohort, those applying for STD following vaccine doses between December 17, 2020 and February 28, 2021 were analyzed. A total of 47,318 HCP received dose 1 and 44,357 received dose 2 during this period for a total of 91,675 vaccine doses received among HCP. The remaining HCP had not yet received a first dose of vaccine during the study period when the STD benefit was available. Of note, the difference in the number of HCP who had received dose 1 but not dose 2 is attributed to the first dose vaccinations administered within a month prior to the study end date where staff would not yet be eligible for dose 2.

Statistical Analysis

Job categories were defined as Office Worker, Clinician, Allied Health, and Support Staff. Office Workers included administrative and clerical staff. Clinicians included staff physicians, house staff (residents and fellows), advance practice nurses, and physician assistants. Allied Health included nurses, nursing aides, social workers, therapists, and medical technicians. Support Staff included groups such as custodial staff, linen services, parking attendants, and skilled craftsmen. Regions were identified based on the employee work location. Minnesota-based employees were divided into Rochester and Minnesota groups, to support analysis of STD utilization of HCP based at the main campuses in Rochester where the largest number of HCP work compared with those working in regional health system hospitals and clinics elsewhere in Minnesota. All other employees were grouped into a state based on their work location (Wisconsin, Florida, Arizona).

The frequency of STD usage after dose 1 and dose 2 of the vaccine was calculated for each vaccine manufacturer, job category,

age group, and geographic region. A contingency analysis was performed for each scenario to compare the difference in STD usage following dose 1 and dose 2. HCP who utilized the STD after dose 1 remained eligible for the STD paid leave if they experienced significant side effects impacting work following dose 2. For each contingency analysis, a chi-square test was used to determine if the distribution of STD usage differed across manufacturer, region, age group, or job category. As STD claims data were deidentified and available in aggregate for defined subpopulations, multivariable regression was not feasible.

All statistical analyses were performed using a standard software package (JMP Pro 14.1.0. SAS Institute Inc.). This study was granted exempt status by the Mayo Clinic Institutional Review Board, IRB number 20-007051.

RESULTS

Within the specified period, a total of 47,318 HCP received dose 1 and 44,357 received dose 2 for a total of 91,675 vaccine doses received among HCP. Overall, 4.1% of COVID-19 vaccinations generated an STD claim for lost work due to vaccine side effects (Fig. 1), with more HCP filing a claim after dose 2 than dose 1 (7.4% and 0.9%, respectively) (Table 1). No statistically significant difference in STD claim rate was observed between mRNA brands

TABLE 1. Vaccination Short-Term Disability Claims Rate by State and Dose

| Region | Dose | # of vaccines | STD % | Lower 95% CI | Upper 95% CI |
|-----------|------|---------------|-------|--------------|--------------|
| Arizona | 1 | 5881 | 1.19% | 0.94% | 1.50% |
| Florida | 1 | 4773 | 0.34% | 0.21% | 0.54% |
| Rochester | 1 | 26308 | 1.00% | 0.88% | 1.12% |
| Wisconsin | 1 | 6071 | 0.51% | 0.36% | 0.72% |
| Minnesota | 1 | 4665 | 0.97% | 0.72% | 1.29% |
| Overall | 1 | 47698 | 0.89% | 0.81% | 0.98% |
| Arizona | 2 | 5348 | 7.20% | 6.54% | 7.92% |
| Florida | 2 | 4140 | 3.02% | 2.54% | 3.59% |
| Rochester | 2 | 25064 | 9.13% | 8.78% | 9.50% |
| Wisconsin | 2 | 5754 | 3.60% | 3.15% | 4.11% |
| Minnesota | 2 | 4442 | 7.32% | 6.59% | 8.12% |
| Overall | 2 | 44748 | 7.44% | 7.20% | 7.69% |

TABLE 2. COVID-19 Vaccines and Short-Term Disability Claims

| Age Group | Dose | Vaccines Administered | Percent of Vaccinations Resulting in an STD Claim | Lower 95% CI | Upper 95% CI |
|-----------|------|-----------------------|---|--------------|--------------|
| 16–55 | 1 | 36798 | 1.02% | 0.92% | 1.12% |
| 56–64 | 1 | 8534 | 0.48% | 0.35% | 0.65% |
| 65+ | 1 | 2366 | 0.34% | 0.17% | 0.67% |
| 16–55 | 2 | 34421 | 8.40% | 8.11% | 8.70% |
| 56–64 | 2 | 8061 | 4.85% | 4.42% | 5.34% |
| 65+ | 2 | 2892 | 1.63% | 1.22% | 2.15% |

after dose 1 or after dose 2 (see Supplemental materials, <http://links.lww.com/JOM/A988>, *P* value for dose 1 across brands .2278, *P* value for dose 2 across brands .94). Statistically significant differences in STD claims rates were observed across regions, with lower claims rates in Florida and Wisconsin compared to Arizona and Minnesota (Table 1).

There was a statistically significant difference in STD claim rates across age groups for both dose 1 and dose 2 of the vaccine (Table 2). HCP aged 16 through 55 years had the highest claim rate, followed by those aged 56 to 64 years, with HCP over age 64 having the lowest claim rate (1.02%, 0.48%, and 0.34% after dose 1 and 8.40%, 4.85%, and 2.12% after dose 2, respectively.) (Table 2)

There was a statistically significant difference in STD claim rates across job categories for both dose 1 and dose 2 of the vaccine. Compared to office workers, clinicians had a lower STD claim rate and both allied health and support staff had higher rates (Table 3).

DISCUSSION

Consistent with clinical trial data showing lower rates of side effects in older adults, we found a higher rate of vaccine side effects resulting in absence occurred in adults under age 55, and the incidence of absence and STD utilization decreased with age. In addition, utilization of this benefit for paid time away was eight times higher after the second dose of mRNA vaccine compared to the first dose. This trend toward higher rates of side effects following the second dose of vaccine was expected based on clinical trial data. The availability of a policy to support payments in the event of work absence following vaccination may increase vaccine acceptance and reduce hesitancy, especially with receiving the second dose of the COVID-19 vaccine.

The regional differences in utilization of the STD benefit were not expected as institutional policies supporting STD utilization for side effects after vaccination were standardized across all sites. Our team hypothesizes that this difference may be due to awareness (or lack thereof) of the temporary benefit in some regions due to dissemination of communication. While broad communication was available across all sites, we learned that in the regions where we found STD utilization to be lower, more opportunities for

in-person question and answer sessions with staff may have been available and wall posters where the vaccines were given more prominently displayed the expected symptoms after vaccination and when it was safe to come to work. These efforts to ensure employees felt comfortable coming to work and having their coworkers come to work may have reduced the STD utilization among those sites. Sites, where STD utilization was lower, were also smaller sites where increased staffing demands may have resulted in HCP being reluctant to miss work due to lack of backup coverage for direct patient care duties. In addition, some sites encouraged HCP to schedule vaccine appointments the day before time off to reduce any work unit staffing issues which may have reduced the need for STD utilization at those sites.

Differences between clinicians and other occupational groups were not surprising. The lowest rate of utilization for the STD benefit was among clinicians. These are professionals who have high decision latitude, are salaried, and are less likely to need to report lost time for wage replacement. In addition, clinicians may be more inclined to continue to work despite significant side effects in an environment where there was a critical staffing need specific to their skill set. In cases where clinical care would not be impacted, clinicians would have the ability to work remotely or adjust administrative tasks during the post-vaccine period if severe vaccine-related side effects occurred. STD utilization was higher in allied health staff who often have more physically demanding jobs and who may be unable to complete essential functions of their jobs due to vaccine side effects. These frontline workers are often paid hourly and need to closely account for lost work time through a timecard. The office staff had utilization rates between that of clinicians and frontline allied health staff. Many administrative office positions are working remotely which may make it less necessary to take time away from work due to vaccine side effects. Staff in administrative positions (rather than clinical positions) who normally work on campus may also have more flexibility to request to work at home with moderate symptoms where a front line worker may not be able to do so without impacting staffing ratios for direct patient care.

The long-term economic impact of COVID-19 vaccination among healthcare workers is likely to far outweigh the costs

TABLE 3. Vaccination-Related Short-Term Disability Claim Rate by Occupational Groups

| Job Type | Dose | Vaccines Administered | Percent of Vaccinations Resulting in an STD Claim | Lower 95% CI | Upper 95% CI |
|----------------|------|-----------------------|---|--------------|--------------|
| Allied health | 1 | 22215 | 1.20% | 1.07% | 1.35% |
| Clinicians | 1 | 10226 | 0.11% | 0.06% | 0.19% |
| Office Workers | 1 | 8803 | 0.52% | 0.39% | 0.70% |
| Support staff | 1 | 6074 | 1.61% | 1.33% | 1.96% |
| Allied health | 2 | 20880 | 10.19% | 9.79% | 10.61% |
| Clinicians | 2 | 9810 | 1.34% | 1.13% | 1.58% |
| Office Workers | 2 | 8061 | 5.30% | 4.83% | 5.81% |
| Support staff | 2 | 5606 | 11.22% | 10.42% | 12.07% |

associated with offering 1 to 3 paid days if side effects occur. Vaccinated healthcare workers will have fewer days away due to future COVID exposure and/or COVID infection compared to unvaccinated healthcare workers, which will be of direct benefit to patients.

In addition to reducing vaccine hesitancy, the temporary STD benefit helped to facilitate consistent day-to-day volumes within mass vaccination clinics. HCP confidence that they would not incur lost wages if they missed work due to vaccine side effects reduced demand for vaccination appointments prior to scheduled time away such as on Fridays. Similar implications for mass vaccination clinics would be important for other worksites that operate 7 days per week like grocery stores, factories, and timing/staggering to avoid adverse productivity impact.

Strengths

A main strength of our study is that it reports objective lost time and productivity attributed to COVID vaccine side effects in an occupational cohort using the utilization of a temporary paid STD benefit as a surrogate for lost time. Consistency with published clinical trial outcomes comparing age groups and dose number lends credibility. Although we were administering mRNA vaccines, the absence rates were less than those reported in the v-safe data for Janssen, which may indicate that we had less reporting bias than the v-safe system which relies upon individuals to voluntarily report side effects and lost work time.

Limitations

While there was a widespread communication campaign to ensure healthcare workers were aware of both the normal side effects of the COVID-19 vaccine as well as the opportunity for paid time away from work if they experienced side effects severe enough to prevent them from working, utilization of the STD benefit would not have captured all lost time due to side effects. Some staff may have taken a paid time off day or a paid sick day utilizing pre-existing mechanisms. Employees may also have sought accommodations with their supervisors to work from home or flex shifts to allow them to treat their symptoms without utilizing the paid STD benefit.

In addition, we were not able to conduct multivariable regression due to the availability of aggregate data only for subgroup analysis. While paid time off could be an incentive to overreport symptoms, this seems unlikely to have occurred given the consistency between the pattern of STD claims observed and side effect trends in clinical trials, as well as our lower rate of STD utilization compared to self-reported rates of work absence following Janssen vaccine. In addition, analysis of work absence after vaccination correlated with prior COVID infection would be of interest. Recently published information from another healthcare institution demonstrated that prior COVID infection was correlated with increased side effects after dose 1 of an mRNA vaccine, but not dose 2.¹⁰ We were unable to corroborate these findings in the current study due to the availability of aggregate STD data only for subgroup analysis. Greater than 20 unions are represented across the enterprise sites. While union representation may have impacted STD utilization, we were unable to correlate work absence to organized labor representation in the current study.

The positive economic impacts of COVID vaccination are significant if difficult to quantify. While there is a recognizable cost in STD utilization due to vaccination, there is a clear upside in maintaining a healthy and productive workforce and reopening economies. It is estimated that, as of April, 2021, the direct, attributable, business cost of COVID-19 to U.S. employers—those only resulting from employee benefits, disability pay, sick leave wages, and fees for other insurance, has totaled over \$50B.¹¹ While there has been a pervasive negative impact upon business revenue, not all industries have been affected equally, with travel and hospitality being disproportionately

impacted over others that were deemed essential and where remote work was possible.^{12,13} An upside, however, is that employee vaccination has been demonstrated to result in both financial and health benefits to the workforce. Studies surrounding influenza vaccination programs demonstrated overall decreases in absenteeism, and return on investment in proportion to vaccine coverage and vaccination rates.^{14,15} With good vaccine coverage of current variants of SARS-CoV-2, achieving high vaccination rates among employees has the potential to be financially impactful and have positive effects for employers who support vaccine uptake.

CONCLUSION

Less than 5% of HCP in our cohort utilized a paid leave benefit following COVID-19 vaccination with lower utilization among clinicians, after the first vaccine dose, and with increasing age. The lower rate of utilization in clinicians correlates with prior research on STD utilization among salaried staff during influenza season showing a lower absenteeism rate in salaried staff compared to hourly staff.¹⁵ Increased opportunity for education in person enhanced widespread communication and appeared to decrease STD utilization rates in some sites. Despite anticipated absenteeism after vaccination, strategies that increase vaccination rates, such as generous STD policies, can mitigate economic losses from COVID-19 infection and exposures in the long term and promote safety in the healthcare setting.

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