

Issues in Labor Statistics

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Work absences due to bad weather: analysis of data from 1977 to 2010

Major weather events capture the public's attention, certainly among those who may be subject to the adverse weather and must prepare for it, but also because most people are fascinated by the power of nature. At their worst, events such as blizzards, hurricanes, tornados, and floods create life-threatening conditions that can lead to tragedy. On a more mundane level, they often result in temporary school and business closures and absences from work.

Information on weather-related work absences is available from the Current Population Survey (CPS), the monthly survey of U.S. households that provides the national unemployment rate and other labor force information. Although the CPS does not capture all work absences that are due to weather events, it provides a limited, yet interesting, look at how weather can affect the labor force.

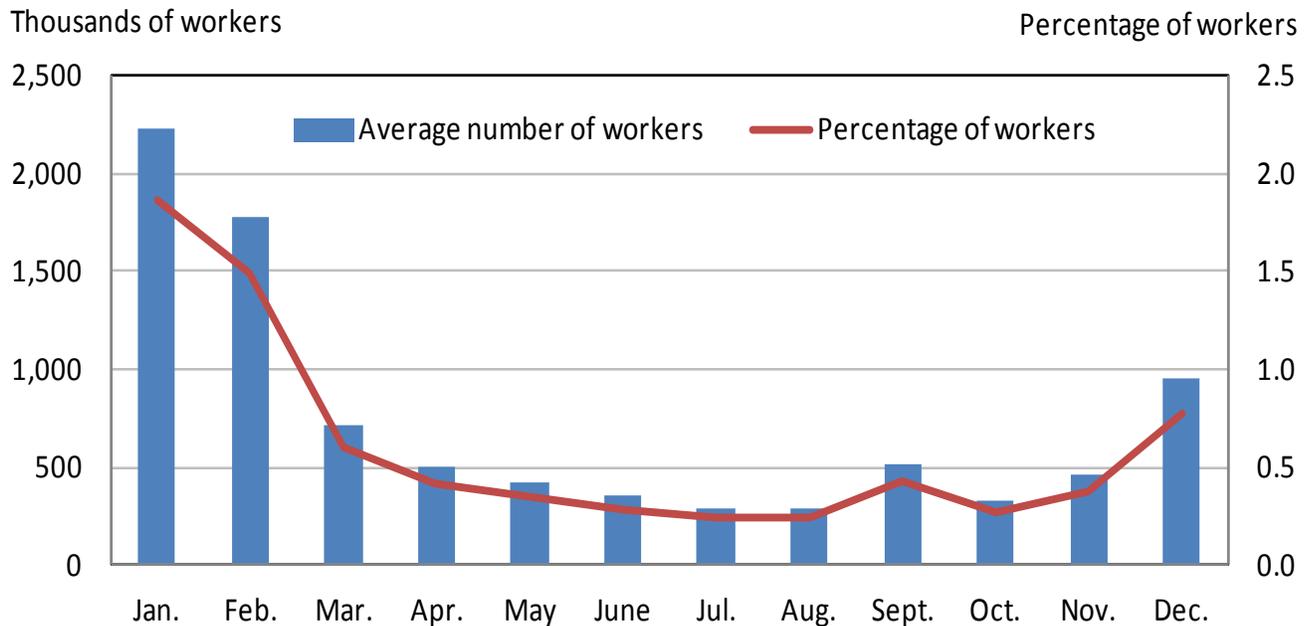
The key limitation with using the CPS to identify the effects of weather on work absences—a purpose for which it was not designed—is the strictly defined weeklong survey reference period.¹ Survey respondents' employment and absence status is based on their work activities during this single week. If a weather event occurs outside the reference week or at the very

end of the week, related work absences will not be reflected in the survey. Nonetheless, major weather events that are captured in the survey provide an excellent means of evaluating the impact of adverse weather on work attendance, identifying the type of weather that results in the most work absences, and locating the most significant specific weather events registered in the CPS.²

For the analysis that follows, two monthly CPS data series were summed to provide a broad estimate of weather-related work absences. One series reflects the number of workers (both full and part time) who were absent from work for the entire reference week because of bad weather. The other series reflects the number of full-time workers (those who usually work 35 or more hours per week) who worked fewer than 35 hours during the reference week, again because of bad weather. To evaluate weather-related absences over time, the combined number of absences from the two series was calculated as a percentage of the total number of employed persons in order to create a national weather absence rate.³ These data reflect the broadest scope of CPS employment, including both agricultural and nonagricultural workers, the self-employed, wage and salary workers, private household workers, and unpaid workers in family businesses.

On the basis of monthly averages of these weather-related absences from 1977 to 2010,⁴

Chart 1. Average number and percentage of workers who missed work because of bad weather, by month



NOTE: The data shown here are derived from published CPS data series and include agricultural and nonagricultural workers, the self-employed, wage and salary workers, private household workers, and unpaid workers in family businesses.

SOURCE: U.S. Bureau of Labor Statistics, Current Population Survey (CPS), monthly averages, 1977–2010

the winter months are those in which workers are most likely to be absent because of bad weather; the summer months are the least likely. (See chart 1.) January had the highest weather absence rate, with an average of 1.9 percent of workers with an absence, followed by February at 1.5 percent, and December at 0.8 percent. This observation is perhaps not surprising, given that January is, on average, the coldest month of the year in virtually all of the states and weather can be severe throughout a large section of the

country in that month.

Examining average absences for calendar years from 1977 through 2010 makes it clear that the years recording a high weather absence rate were those in which severe winter weather occurred. (See chart 2.) Notably high annual weather-related absence rates (in which 1 percent or more of workers had absences) were observed in 1977–78, 1982, 1994, and 1996.

In the full monthly data series of weather-related absences, several specific weather

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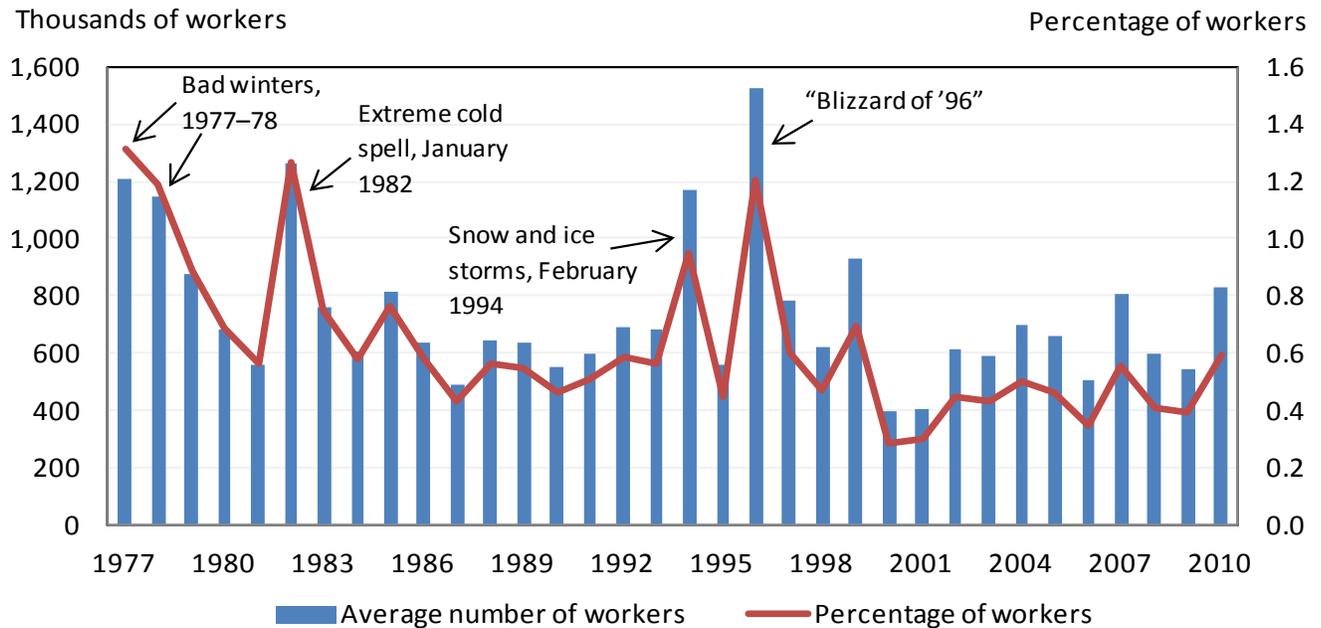
events stand out, all of them winter storms. (See table 1.) The January “Blizzard of ’96” recorded the most weather-related absences, with 10.1 percent of workers (or about 12.5 million) affected. From January 6 to January 8, 1996, the eastern United States—in particular, the major cities along the east coast—was hit with cold temperatures and a huge accumulation of snow. Snowfall from this storm surpassed or approached record levels in several metropolitan areas. The National Weather Service estimated that the entire eastern third of the country was affected to some degree by this storm.⁵ The

Table 1. Top weather-related work absence events in the Current Population Survey, 1977–2010

Period	Percentage of workers with work absences	Weather event
January 1996	10.1	“Blizzard of ’96”
January 1982	9.5	Extreme cold spell
January 1977	6.2	Extreme cold spell
February 1994	6.1	Snow and ice storms
January 1978	5.0	Heavy snowfall
February 2010	4.8	“Snowmageddon”

National Climatic Data Center assessed the Blizzard of ’96 as “extreme,” the highest rating on their Northeast Snow Impact Scale (NESIS).⁶ The second-most-significant weather event in

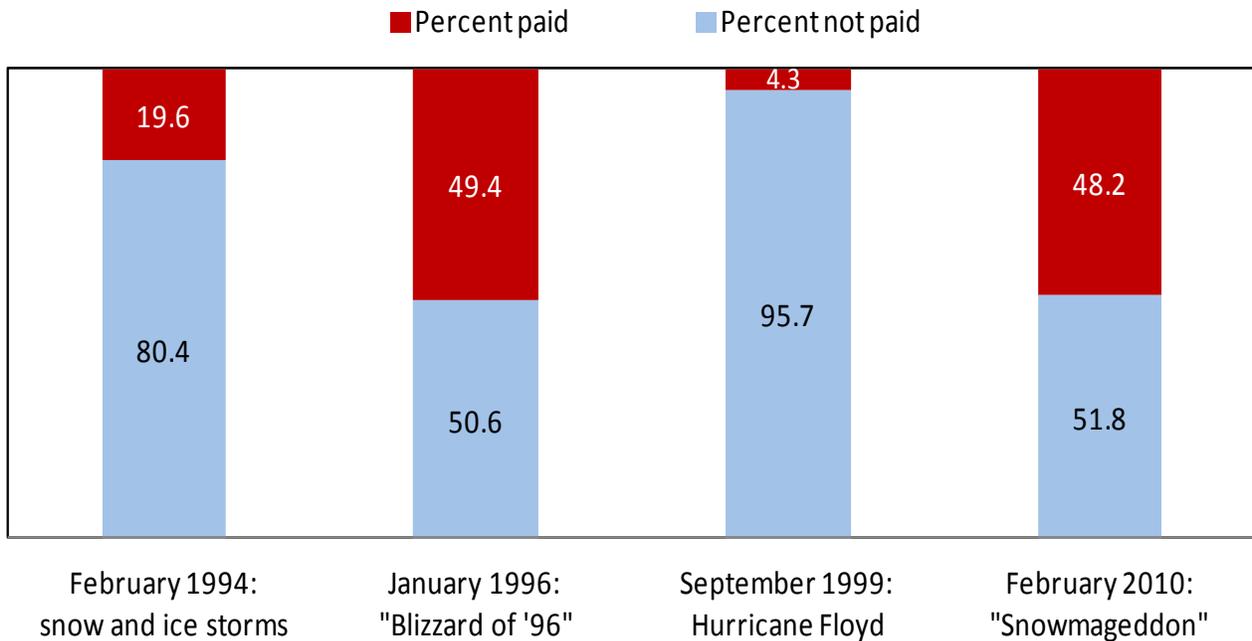
Chart 2. Number and percentage of workers who missed work because of bad weather, annual averages, 1977–2010



NOTE: The data shown here are derived from published CPS data series and include agricultural and nonagricultural workers, the self-employed, wage and salary workers, private household workers, and unpaid workers in family businesses.

SOURCE: U.S. Bureau of Labor Statistics, Current Population Survey (CPS), annual averages, 1977–2010.

Chart 3. Pay status of nonagricultural wage and salary workers with weather-related absences during selected weather events, 1994–2010



NOTE: These data exclude agricultural workers, the self-employed, private household workers, and unpaid workers in family businesses.

SOURCE: U.S. Bureau of Labor Statistics, special tabulations from the Current Population Survey (CPS).

the data series occurred in January 1982, when 9.5 percent of workers (9.3 million) missed work because of extreme cold and winter weather conditions. From January 10 to January 12, a massive arctic air mass moved down from Canada and brought severe cold to the eastern two-thirds of the country. Record low temperatures were recorded in a number of cities. Many southern states experienced freezing rain and ice.

Several other major winter weather systems, in January of 1977 and 1978 and in February

1994 (involving 5.5, 4.6, and 7.4 million workers, respectively), resulted in work absence rates between 5.0 percent and 6.2 percent.

On the basis of these monthly and annual observations, winter weather conditions and events clearly result in the most weather-related work absences, as measured by the CPS. One reason is that winter storm systems can affect much larger geographic areas than other weather events do, spreading over a greater expanse of the North American continent than a hurricane,

for example. In addition, winter weather systems can bring a wide range of conditions that make transportation difficult and sometimes nearly impossible: heavy snowfall, freezing rain and ice, and high winds that can blow snow and reduce visibility. When such systems hit the major metropolitan areas of the Midwest and the eastern seaboard, for example, they can cause significant disruption to transportation and business activities among a sizable population.

Aside from winter weather, Hurricane Floyd, in September 1999, was the only other event to register a noticeable spike in absences in the CPS data.⁷ The storm and subsequent flooding over part of the east coast caused 2.7 percent of workers (3.6 million) to be absent from work.⁸

When weather-related absences occur, one question that arises is, Do workers receive pay for their time away from work? To address this issue, special tabulations of weather-related absences among nonagricultural wage and salary workers were created for recent years and selected weather events; these data reflect only workers who were absent for the entire reference week.⁹ An examination of such data for 2004–2009 (years for which there were no major weather events in the CPS data series) shows that, generally speaking, most weather-related absences in a given month are likely to be unpaid. During major weather events, however, the pay status of absent workers is less predictable. Chart 3 shows special tabulations of the proportion of

unpaid and paid absences for four major weather events since 1994. During Hurricane Floyd in September 1999, for example, the vast majority with weather-related absences were not paid for their time away from work. Among winter weather events, most workers absent during the February 1994 snow and ice storms did not get paid. During the historic blizzards in January 1996 and in February 2010, however, nearly half received pay. (Research into possible reasons for the variations in pay status was beyond the scope of this article.)

On the basis of these special tabulations, one cannot automatically assume that most nonagricultural wage and salary workers will go without pay during major weather events. This caveat should serve as a caution to those who would use the weather-absence data from the CPS to project or evaluate over-the-month changes in nonfarm payroll employment from the BLS Current Employment Statistics Survey (CES) survey—a monthly survey of employers that counts paid employees only.¹⁰ There are other reasons to be cautious about using the data this way as well. First, unlike CPS data, CES survey data are not restricted to a single reference week. Workers are counted in the CES if they received pay for any part of their employer's pay period that includes the 12th of the month: a single-week period, a 2-week period, or even a monthlong period. Second, the published CPS weather-absence series that is

available to the public includes self-employed workers, a group not in the scope of the CES survey, and it includes both those with paid and those with unpaid absences. Only those who were not paid and who were absent for the entire pay period would be excluded from the monthly CES employment estimates. Consequently, one can assume that the published CPS weather-absence data will show a greater impact from weather events than would actually register in the CES nonfarm payroll employment series.¹¹

In sum, CPS data indicate that weather-related work absences are most likely to result from winter weather, with January, February, and December, respectively, averaging the most absences. The highest weather absence

rates measured from CPS data have all been associated with winter storms, most notably the January “Blizzard of ’96.” Recent data show that nonagricultural wage and salary workers who miss a full week of work because of bad weather typically go without pay for the time off. Data observations from a few historic weather events, however, indicate that there have been instances when many workers did receive pay for absences during a major storm.

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Notes

¹ In most months, the survey reference period is the calendar week (Sunday through Saturday) that includes the 12th of the month; it is modified on occasion to avoid major holidays that could impede data collection. For example, the current practice is that the December reference week cannot extend beyond December 13. Also, the November reference week is moved a week earlier if Thanksgiving falls during the week that includes the 19th of the month, when survey interviews would otherwise be conducted.

² Severe weather events in less populated areas obviously will not reflect as many work absences as those which occur in more densely populated parts of the country. All of the weather-related absence data produced by the Bureau of Labor Statistics (BLS) from the CPS are at the national level; BLS has not developed regional or state estimates of this type.

³ The CPS does not collect weather-related absence information on part-time workers (those who usually work fewer than 35 hours per week) who missed some work, but not the entire week. Therefore, part-timers who worked fewer hours than usual because of bad weather are not represented in the absence data in this analysis. Those who were absent for the entire reference week are included.

⁴ This portion of the analysis covers the period back to 1977 because that is the first year for which data are readily available for a full calendar year.

⁵ Blizzard of ’96 Service Assessment (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather

Service, December 1996), <http://www.nws.noaa.gov/om/assessments/pdfs/bz-mrg.pdf>.

⁶ See the National Climatic Data Center’s NESIS webpage at <http://www.ncdc.noaa.gov/snow-and-ice/nesis.php> for more information. The NESIS scale provides a numerical value assessment to “high-impact” snowstorms in the Northeastern United States. The values are influenced by the geographic area covered by the storm, the amount of snow, and the size of the population directly affected.

⁷ Hurricane Katrina, the devastating storm that struck New Orleans and the Gulf Coast region, occurred outside the CPS reference period, making landfall in Louisiana on August 29, 2005. For more information about the special circumstances related to survey data for this historic weather event, see “Effects of Hurricane Katrina on the Current Population Survey,” <http://www.bls.gov/katrina/cpscesquestions.htm#2>, and Lawrence S. Cahoon, Diane E. Herz, Richard C. Ning, Anne E. Polivka, Maria E. Reed, Edwin L. Robison, and Gregory D. Weyland, “CPS Program Response: The Current Population Survey Response to Hurricane Katrina,” *Monthly Labor Review*, August 2006, pp. 40–51, <http://www.bls.gov/opus/mlr/2006/08/art4full.pdf>.

⁸ Note that Hurricane Floyd struck relatively late in the survey reference week, hitting the North Carolina coast on Thursday, September 16.

⁹ The CPS gathers information about whether workers who were absent

**Work absences due to bad weather:
analysis of data from 1977 to 2012**

from their jobs for the entire reference week received pay for any of the time off. BLS has not previously tabulated the pay status for weather-related absences; the data presented in this section are special tabulations done specifically for the analysis presented here. These particular data were restricted to those who worked in nonagricultural wage and salary jobs and excluded the self-employed, private household workers, and unpaid workers in family businesses.

¹⁰ Some data users who follow major weather events erroneously assume

that the number of persons who were absent for the CPS reference week because of bad weather (as measured by the CPS and published by BLS) are workers who would not be counted as employed in the CES survey for that month. That is not necessarily so, as described in the preceding narrative.

¹¹ For a general summary of the conceptual and methodological differences in the CPS and CES employment measures, see “Monthly Employment Situation Report: Quick Guide to Methods and Measurement Issues,” <http://www.bls.gov/bls/empsitquickguide.htm>.