The impact of the Spanish economic crisis on the duration of sickness absence

Research project

Masters Degree in Occupational Health – Universitat Pompeu Fabra

Guillem Murcia López

Co-directores del proyecto:

Jordi Delclós Clanchet, CiSAL-UPF-Barcelona, CIBER de Epidemiología y Salud Pública (CIBERESP), Division of Epidemiology, Human Genetics and Environmental Sciences. The University of Texas School of Public Health-Houston

Mònica Ubalde López, CiSAL-UPF-Barcelona, CIBER de Epidemiología y Salud Pública (CIBERESP)

Eva Calvo Bonacho, Ibermutuamur Madrid, Departamento de Proyectos Sanitarios (Corporación Mutua)

Tutor UPF:
Jordi Delclós Clanchet

BACKGROUND

Sickness Absence (SA) also known as Temporary Disability (TD) is recognized within the Spanish Social Security System as a situation where a worker cannot perform the functions of his/her regular work due to an injury or sickness. There are two types of SA, depending on the nature of the injury or sickness that caused it: those caused by an injury or sickness derived from the worker's job (work-related sickness absence, or WRSA) and those derived from other causes (non-work-related sickness absence, or NWRSA).

In both cases, duration in Spain for the recognized situation is limited to twelve months, which can be extended another six months if authorized by the Social Security System. Once this extended duration has elapsed, a worker can be discharged and return to his/her job or he/she can transition to permanent disability. This new process will take a maximum of three months, unless the National Social Security Institute (NSSI) considers there is still a chance he/she may fully recover in a short term period, in which case a new six month extension may be conceded. Thus, the maximum duration of a sickness absence status is 24 months.

Responsibility for certifying a non-work-related sickness absence belongs to the Spanish National Health System primary care physicians who see the worker (1). In the case of work-related sickness absences, those in charge of issuing them are by default occupational physicians from state mutual health insurance companies (known in Spain as *Mutuas de Accidentes de Trabajo y Enfermedades Profesionales de la Seguridad Social,* MATEPSS or *mutuas* for short), unless the company has arranged coverage directly with Social Security System management entities. In these cases, certification of a sickness absence episode is performed by National Health System doctors.

Historically, SA management was determined by the nature of the injury or sickness that caused it: *mutuas* assumed the responsibility of managing work-related sickness absences, whereas non-work-related ones were managed by the NSSI or the Navy Social Institute. Since 1995, however, *mutuas* are able to take responsibility for different aspects of non-work-related sickness absences, if the company has consulted beforehand with the workers' representatives.

Sickness absence may be considered as an overall indicator of the relationship between worker health and the tasks performed at the workplace (2-4). The same health problem can affect different workers generating or not an absence from the workplace depending on the specific tasks their occupation requires them to perform. In consequence, it can be of use to determine the general status of this interaction in a certain moment and social context. This is due to the fact that health, and in particular occupational health, is affected by a two level tier framework (Figure 1). At the top, the labor market, healthcare and social security systems comprise a “macro” level which sets the pace for economic, social and sanitary conditions. At a more “micro” or proximate level, there are specific workplace (level of organization, tasks assigned to the worker, their relationship with other coworkers, etc.), social (which autonomous community the worker lives in, his or her gender, civil status, whether he/she has children or not, and so on), and biological variables (age, sex, clinical diagnosis). All of these conditions should be considered dynamic and interacting. For example, the way the labour market is reshaped during and after an economic crisis might ultimately affect more workers from one sex or age group, such as the way unemployment has increased in younger male workers during the current Spanish economic crisis (5). In this way, a factor from the macro level might affect a social condition from the micro one, such as gender, in turn shaping or determining the chances of being employed, the tasks assigned at his or her job, or any other number of factors that end up influencing a specific worker’s health. Both levels end up generating risk and prognostic factors which affect the incidence and duration of SA episodes. At the bottom of the figure, we can see how these factors interact in a worker’s typical SA episode development stages.

As of this writing, the Eurozone is in the midst of a severe economic crisis, without precedent in its history as an economically coherent and interlinked entity. This crisis is particularly affecting southern European countries and Ireland, leaving its imprint on the social and political areas, and thus, severely changing the way the “macro” level of the previously mentioned framework behaves. In Spain, unemployment rate has skyrocketed, whereas gross domestic product (GDP) has sunk, generating a sense of gloom in the population and fertile ground for social unrest.

Scientific literature published until now suggests that economic crises can have different impacts on public health. Stuckler et al. found that periods of economic recession correlate with a rise in deaths due to alcohol-abuse and suicide, and a decrease in those due to road traffic accidents or drug abuse (6). Burström et al., focused on the delayed effects of the economic crisis in Sweden in the 1990s and the public response to them. They found that the number of episodes of limiting longstanding illnesses or disabilities rose during the studied period, particularly among manual female workers (7).

Economic crises are not events unrelated to the way society and institutions respond to them. With respect to the current crisis, different ways to tackle it, leading to different outcomes, have been proposed from political and social actors. The interdependency between public health, politics and specific policies studied by many researchers, recognizing the ways in which this crisis is affecting workers' health, is particularly relevant (8, 9). It provides us with a foundation on which to begin discerning those measures that institutions may adopt in order to promote well-being among its population. This is even truer during a particularly risky period for the most vulnerable sectors in that population. By assessing the way the economic crisis in Spain might be affecting the duration of SA episodes, better, more targeted public health, labor or social responses can be developed that address this one aspect of the crisis. In this case, our initial hypothesis stems in part from the work of Alberti et al. who studied both incidence and duration of non-work-related sickness absence in Catalonia between 2007 and 2010 (thus covering the transition from a pre-crisis to crisis period) (10). The authors noted a downward trend in median duration for non-work-related sickness absence over this time period. Median duration later appeared to have stabilized in 2010. If one considers that the downward trend in median duration of non-work-related SA episodes had already begun prior to 2007, we can hypothesize that, once the crisis was in full swing, it had countered this trend, lengthening SA duration. This could be attributed to a number of things. The most acute of these are both the stress and climate of uncertainty among workers due to the economic situation and institutional reforms purportedly intended to tackle the crisis. Among these were labor reform legislation passed to modify conditions of employment, including the weakening of collective bargaining, limitation of unemployment

compensation and lowering of wages (11, 12). Another reason could be that, counter to the intended use of sickness absence benefits where, instead of being viewed as a social protection, workers feel that taking time off might provide the employer with a reason for layoffs or worsening work conditions. In this sense, workers might avoid taking a leave, and continue to work despite being ill, a condition described as “presenteeism” (13). Presenteeism could have the unintended consequence of worsening the health condition, leading to longer SA duration. Thus, it is possible that the crisis led to fewer number of SA episodes (i.e., a lower incidence) but longer overall SA duration. Moreover, changes in the profile of the working population before and during the crisis could be impacting changes in SA duration. For example, if there has been a shift in the distribution of the working population by sex or age or economic activity setting, given that each of these factors can act as a determinant of SA incidence and duration, changes noted before and during the crisis could be linked to this shift in demographic profiles.

Thus, comparing changes in SA duration before and during the crisis, in association with changes in the above factors, could yield new knowledge, even if indirect, on the degree to which the crisis has affected this outcome. Consequently, our objective was to determine whether the duration of SA episodes, both work-related and non-work-related, has been affected by the economic crisis, and to what extent. We focused on assessing the effect of the crisis on SA episode duration as analyzing the change in incidence would have meant to obtain denominators by covariable for the populations covered by the *mutuas* and this information was not available. Our hypothesis was that the current economic crisis in Spain is affecting the duration of SA episodes, which is becoming longer, and examined this in a retrospective cohort of workers who had taken SA either before or during the crisis.

METHODS

Study design

This was a repeated cross-sectional analysis conducted in a dynamic cohort in 2006 and 2010.

Study population

To test our hypothesis, we worked with Corporación Mutua, a consortium of *mutuas* or state health insurance companies that covers the entire Spanish territory. Corporación Mutua includes the following *mutuas*: Mutua de Andalucía y de Ceuta-Cesma, Ibermutuamur, MAC-Mutua de Accidentes de Canarias, MC Mutual, Mutua Gallega, Mutualia, Solimat and Unión de Mutuas. As of 2012, Corporación Mutua was providing health insurance coverage for 402,441 companies and almost 3 million workers. We analyzed data on workers and their SA episodes (both work-related and non-work-related) for the years 2006 (before the crisis hit Spanish economy) and 2010 (when the country was already knee-deep in the recession). Each *mutua* was asked to retrieve data on certain variables for all SA episodes they had managed for their covered workers in these two years. Definitions for each variable were agreed upon, applied to the datasets by each *mutua,* followed by cleaning and deidentification before being sent to our research group.

Study variables

The dependent variable was defined as SA episode duration in days, calculated as the different between its beginning and finishing date plus one.
The main independent variable was year, considering 2006 as reflecting the period before the financial crisis and 2010 the year in which the crisis was fully instated.

Secondary independent variables were derived from the Corporación Mutua database:

- Sex (male, female).
- Age (in years).
- Autonomous community: territorial political and administrative divisions of Spain. There are a total of 17 autonomous communities.
- Social security status: self-employed or salaried worker (*Régimen de afiliación* in the Social Security System). In Spain, “salaried workers” include all of those who work linked to an employer through an employment contract, under their supervision. Likewise, “self-employed” includes workers who take part in an economic activity without being directly under the direction of any employer via a work contract. This

latter category of self-employed also includes some workers that are not self-employed, but are considered part of special statuses under Spanish labor law, so called "*regímenes especiales*", such as the status of agricultural workers or domestic housekeepers.

- Episode type (*tipo de contingencia*): depending on the sickness or injury that caused the SA episode: those derived from the worker's job (WRSA), and those that are not (NWRSA).
- Economic activity: industry, construction and service sectors, coded using the CNAE-2009 (*Código Nacional de Actividades Económicas* – Spanish National Economic Activity Code).
- Occupational social class, coded using the CNO-2011 (*Clasificación Nacional de Ocupaciones* – Spanish National Occupation Classification).
- Type of contract: permanent (indefinite) or temporary, as defined by Spanish labor legislation.
- Average daily salary (*base reguladora* – salary base derived from the worker's wage and time contributing to the Spanish Social Security System, and used to calculate the wage replacement he/she is entitled to during SA episodes), in Euros. Divided into three groups: from 1 to 35, 36 to 55 and more than 55 euros.
- Diagnosis group, as defined by the International Classification of Diseases, 9th edition.

Statistical analysis

We first performed a quality review of the variables included in the data set, gauging their level of completeness, to evaluate whether to include them in the statistical analysis. We arbitrarily excluded any variables that had more than 60% of missing data.

Next, we conducted a descriptive analysis of the dependent and independent variables, stratified by year, social security status, and whether the SA was work-related or non-work related for the years 2006 and 2010. Continuous variables were summarized using measures of central tendency (25th, 50th [i.e., median] and 75th percentiles). Categorical variables were summarized as frequencies and percentages.

We next performed an exploratory, unadjusted analysis of the difference in SA duration between 2006 and 2010 through the creation and comparison of survival curves using the Kaplan-Meier method, with a log-rank test used to examine statistical significance.

Crude, bivariate and multivariate analyses were performed using Cox proportional hazards modeling. For these models, the dependent variable was SA duration and the main independent variable was year (with 2006 as the reference category). Outcome estimates were expressed as the hazard ratio (HR) and corresponding 95% confidence intervals (95% CI), which gives us the instantaneous rate ratio of case closure. A HR>1 indicates a shorter time to closure (shorter duration), whereas a HR<1 indicates a longer time to closure (longer duration). Models were stratified by episode type (NWRSA and WRSA) and sex. After examining the crude HR, bivariate analyses were performed, in which the relationship between year and SA duration was adjusted for each of the secondary independent variables. Those variables (with a p value equal or less to 0.20) in the bivariate analysis were retained in the final multivariate models.

The statistical analyses were performed using Stata, version 11 (StataCorp, College Station, Texas).

Ethical implications

The Corporación Mutua database we received was deidentified. We did not receive any information on the identity of reviewing physicians, individual workers or companies. A confidentiality document specifically prepared for this project was signed by all involved parties. None of the authors declared any conflict of interests.

RESULTS

In 2006 and 2010, there were 737,268 and 755,233 episodes of SA, respectively. Overall, most cases were non work-related (74.1% versus 25.9%) and occurred among salaried employees (91.7%). Self-employed workers made up a very small percentage of the total (8.3%). There were more cases in men (60.1%) than women (39.9%).

When we examined the level of data completeness, occupational social class had more than 60% missing values, and was excluded from further analyses. With respect to the remaining variables, type of contract also showed a high percentage of missing values, composing more than 34.6% of its total. Likewise, diagnosis group exhibited a large number of missing values, amounting to 22.3% of its total. There were also differences (at times, large) in the degree of completeness when comparing the two study years. Thus, for example, the diagnosis for salaried workers NWRSA episodes was missing in 51% of cases in 2006, but in only 9% of cases in 2010. This degree of missing information was more noticeable among the self-employed, given that their total numbers were small to begin with.

Figures 2a and 2b graphically present the difference in SA duration by year and episode type (NRWSA and WRSA, respectively). In both cases, the general pattern seen is one of longer duration in 2010 as compared to 2006. Table 1 summarizes the distribution of SA duration by year and episode type (work-related or non-work-related), for each of the main independent variables in salaried workers. Between 2006 and 2010, the proportion of females with an SA episode increased and there was a shift towards an older working population. By economic activity sector, episodes in agriculture increased but, more notably, construction showed a marked decline in the number of cases. The distribution of type of contract also suffered a noticeable change from 2006 to 2010. While permanent contract worker episodes stayed roughly the same, temporary contracts dropped in number.

Overall, the unadjusted median duration for WRSA increased between the two years. This seemed less evident in NWRSA, where changes were inconsistent, mostly not changing or increasing slightly, with a few instances of decreases. However, the spread tended to be broader, as evidenced by increases in the 25^{th} and, especially, 75^{th} percentile values.

By sex, median duration was shorter for men than women. However, for both NWRSA and WRSA, this difference had decreased by 2010.

Both NWRSA and WRSA duration increased with age, except for the oldest (>64) age group; however there were few people in this group. This pattern was similar for both 2006 and 2010.

Differences between autonomous communities in Spain show that, by 2010, NWRSA duration had either increased or not changed in most, with the exception of Catalonia, Canarias and Melilla, which decreased. Melilla experienced a sharp decrease, but the number of episodes was very small. In contrast, WRSA duration increased in most autonomous communities, except for Cantabria and the Basque Country, which remained unchanged, and Ceuta, where it decreased slightly, but again based on very few episodes.

Analysis by economic activity sector showed that, for NWRSA, duration either decreased slightly or did not change for agriculture, industry or the services sector. Construction, on the other hand, showed an increase in median duration, from 9 days in 2006 to 11 days in 2010, in the face of a greater than 50% decrease in total number of episodes. For WRSA, there was a general increase in duration, except for industry which did not change between the two study years.

Temporary contract workers saw both a slight decrease in median duration of NWRSA episodes and an increase in WRSA. With respect to average daily wage, in 2006 NWRSA median duration decreased as daily wage increased, but this pattern was not as consistently observed for WRSA.

In 2006 the most common diagnoses leading to a NWRSA episode were musculoskeletal, respiratory, ill-defined conditions and infectious diseases. However, over 50% of episodes in that year did not have a diagnosis listed. The situation was much improved in 2010, when over 95% of cases had a diagnosis. The relative ranking of leading diagnoses was similar in both years, though, except for an increase in respiratory diseases (which were generally of short duration). For WRSA, data were much more complete; injuries and musculoskeletal disorders made up over 80% of episodes in both years. In terms of duration, mental health disorders and neoplasms had the longest median durations.

Table 2 shows the distribution of SA duration, either work-related or non-work-related, for self-employed workers. Within this much smaller group, there were important differences with respect to salaried workers. Overall, duration was much longer as compared to salaried workers. Self-employed workers showed increases in median duration for both types of SA, but this was much greater for NWRSA (from 40 to 47 days) than for WRSA (from 16 to 17 days).

Although patterns were similar for sex, age, and autonomous community, they were different for economic activity. Specifically, median duration either did not change or increased in all sectors, for both NWR and WR episodes, with the exception of WR episodes in industry, which decreased slightly. The amount of missing information for contract type was high, over 70% in both years, making this variable uninterpretable in this group of workers. Among self-employed workers, musculoskeletal disorders were the conditions most often leading to a NWRSA, in both years. The longest durations were found for mental disorders and neoplasms in both 2006 and 2010. Data on diagnosis were not available in 33% of cases in 2006, but this improved to less than 5% by 2010. For WRSA in self-employed workers, injuries and musculoskeletal disorders were the most common diagnoses. Respiratory illnesses (a single case, lasting 116 days) in 2006 and mental and circulatory disorders in 2010 had the longest durations, but collectively represented less than 1% of all WRSA.

Tables 3 and 4 present the crude, bivariate and final multivariate models, in which sickness absence duration in 2010 is compared to the referent year 2006 for both NWRSA (Table 3) and WRSA (Table 4), stratified by sex. In all instances, the crude HRs were statistically significant, with the risk of a longer SA duration being greater in 2010 than in 2006, except for NWRSA episodes in women. Adjusted for each independent variable resulted in statistically significant HRs, so all of these variables were retained in the final multivariate models.

Table 3 presents the final multivariate models for WRSA by sex and year, mutually adjusted for all covariables. The risk of a longer SA duration was significantly greater for men in 2010 (HR 0.97; 95% CI, 0.96-0.98), whereas in women it was more likely to be shorter (HR 1.02; 95% CI, 1.01-1.03).

Likewise, Table 4 summarizes the same analysis for WRSA. Both men and women saw the risk of having longer episodes increase in 2010 with respect to 2006, although this was more noticeable in men (HR 0.88; 95% CI, 0.87-0.89) than in women (HR 0.92; 95% CI, 0.90-0.93). In summary, the final models suggest that the risk of a longer SA duration was significantly greater in 2010, for both NWRSA and WRSA, by sex, except for NWRSA in women where it was more likely to be shorter.

DISCUSSION

We conducted this study to determine whether the financial crisis that began affecting Spain around 2008 could have had an impact on patterns of sickness absence duration. Although we are lacking more "direct" measures of the crisis, such as unemployment rates, the rising deficit or decreases in gross domestic product, we posited that certain determinants of SA could indirectly reflect the consequences of the crisis. Notable findings in our study, between the two study years, were changes in the demographics of workers with a sickness absence and in the directionality of the duration, depending on the determinant. In this regard, by 2010, the proportion of salaried women filing for a NWRSA sickness absence had increased to near parity with men (and up to a third of WRSA episodes), and the age distribution saw a decrease in the youngest age groups. There were fewer workers in construction and fewer temporary contracts. These changes affected median duration.

Overall, the risk of longer SA episode duration for men in both NWR and WR episodes increased in 2010, although for women this was only the case in WR episodes. Risk of longer NWRSA episode duration for women actually decreased from 2006 to 2010. Although we were unable to obtain denominators by covariable for the populations covered by the *mutuas*, which limited our ability to calculate changes in the incidence of sickness absence, the decrease in number of cases, coupled with an increase in the WRSA and male NWRSA duration, could indicate that cases resulting in time lost from work were more severe during the crisis. There is evidence that the incidence of sickness absence decreased since the beginning of the crisis (10, 14). Thus, it is not unreasonable to think that a lower incidence and greater severity of cases might account for a part of the increase in duration of cases. It can also be argued that, at least in part, some of this pattern could be explained by "presenteeism", i.e., workers either waiting until a condition worsened before taking an SA, or be more willing to return to work before fully recovering, which could explain the shortening of NWR SA episodes for women (Table 3). This could be due to the labour reforms passed by both the current and previous governments, which are perceived as increasing the precariousness on many workers and their higher chances of facing redundancy (15). A different view of the issue could include the possibility of sickness benefits being overutilized or even abused by

some workers, overextending the duration of the episodes, due to a perception that their jobs might have become precarious as a consequence of the economical and social climate. On the other hand, since 2006 the number of workers covered by mutuas has increased, while that of INSS has decreased. Previous studies have shown that episodes managed by the INSS had longer median durations than those managed by *mutuas* (4). This is, of course, speculative; further studies, especially those allowing a detailed examination of incidence of SA and its trends during the full period of the economic crisis would be needed to verify or refute this possibility. Varying combination of all of these reasons could be playing a role. However, caution is warranted in ascribing specific reasons for the observed changes in SA duration between 2006 and 2010, as our study was not specifically designed to assess causes of these differences.

Most notably, in the case of women, the previously described longer SA durations as compared to men, essentially disappeared. Moreover, once adjusted for other covariates, the HRs for women actually favored shorter durations as compared to men, in contrast to most prior studies (16, 17). As this change is not due to any other variable included in the study, other explanations might arise. A likely contributing factor is the change in the proportion of episodes in female workers, becoming more similar proportion to those in men. Current evidence shows unemployment rates in Spain have seen a reversal in its proportion among sexes during the crisis, becoming higher among male workers aged 16 to 34 and older than 55, than among their female equivalents. Permanent contracts for women were, in fact, consistently on the rise from 2006 to 2010, while temporary contracts for both sexes and permanent ones for men decreased (5). An alternative explanation for the shortening of episode duration among women could also be better case management by mutuas of short-term SA episodes, possibly by intervening in shortening waiting times for diagnostic tests or treatment.

As we pointed out before, a possible explanation for the increase in duration of SA episodes could be the perception by the worker of the precariousness of his job. This could also lead us to think that, as women did not experience such a rise in unemployment and saw an increase in the number of permanent contracts, that perception of precariousness did not take root in

them to the same level as it did on men. Therefore, risk of WRSA episodes being longer was smaller in women than on men, and in the case of NWRSA it had actually decreased from 2006.

The decrease in construction episodes is probably a reflection of the change in labor dynamics in Spain due to the nature of the economic crisis. The construction sector, once the spearhead of the “Spanish economic miracle” was affected by the dramatic fall, from 2008 to 2010, of Spanish investment in housing, which decreased by 41% (18). National data shows that workers in the sector decreased from over 2 million workers in 2006 to around 1.2 million by 2010. In that same time period, work-related accidents (many of which historically involve the construction sector) also decreased in number (5). The decrease in episodes for both NWRSA and WRSA in our study is consistent with this decrease. More surprising, however, is the increase in NWR episodes in agriculture, which could simply reflect a shift in the population coverage by the *mutuas* in this time period, but should be verified. Other possible explanations for this increase in the agricultural sector include *mutuas* registering and following more episodes, either due to a true increase in accidents or illnesses in this sector or to better monitoring of short-term (e.g., <15 days) episodes.

In contrast to salaried workers, self-employed workers experienced greater variability in NWRSA sickness absence duration before and during the crisis. Whereas NWRSA duration either did not change or decreased slightly in salaried workers, among the self-employed there was a marked increase. Changes in WRSA were more similar in the two employment types. This might be explained by the different working conditions and legal status of SA benefits for self-employed workers. Making use of SA for a self-employed worker means that, in many cases, he/she has to close their own small business or office, losing clients. In some cases, this is not even feasible, as the business requires their presence to keep it running. When sick leave is taken, self-employed workers may be forced to pay for a substitute to cover for them or simply not open. Consequently, there is less incentive to make use of SA unless the severity of the illness warrants it; this, in turn, is reflected in a longer SA durations.

Our results by diagnosis groups show that mental disorders and neoplasms are among those with the longest median durations, consistent with previous studies (19, 20). This, together with an increase in their number of NWRSA episodes, is consistent with other studies focusing on mental illness and economic crises (21, 22). In particular, a recent study in Spanish primary care centers showed, during the same time period, an increase in visits for mental health disorders (23).

NWRSA circulatory disease cases at least doubled in 2010 as compared to 2006, for both salaried and self-employed workers (Table 1), suggesting workers may be experiencing more mental and circulatory disorders during the crisis. WRSA episodes with these same diagnoses experienced an increase in their duration, though the small number of cases complicates more detailed analysis (especially with respect to mental disorders).

It thus could be argued that the greater number of episodes belonging to these diagnosis groups we observed could be seen parallel to the higher mortality for some specific causes observed in some, but not all, studies. In this sense, our results for circulatory diseases could be compared to the findings of Stuckler et al. and Brenner of an increase in heart disease mortality during banking crises or economic recessions (24, 25). Likewise, our findings for mental disorders could be put into context of studies describing a possible surge in suicides during these periods (6, 26, 27). On the other hand, the relationship between crises and mortality has been the object of previous studies, with inconsistent results.

Thus, while all cause mortality may not be affected by economic crises, some specific diseases and cause-specific mortality may increase during these periods (28, 29). Other studies, however, have found that mortality runs countercyclically to economic indicators such as unemployment and thus, crises decrease total mortality, with the opposite effect during periods of economic growth (30-32), specifically increasing heart attack fatalities (33).

One finding that suggests that certain workers may wait to begin a sickness absence until the condition is more severe is the difference in median duration for NWRSA due to respiratory illnesses between salaried (5 days) and self-employed workers (15 days). There is not likely to be a physiologic reason for this difference, nor are differences in data completeness likely to explain it

since there were no changes in these figures between 2006 and 2010 despite much better completeness of the diagnosis data in 2010. A different explanation could be that self-employed workers are less likely to take leave from work for self-limited short-term illnesses than salaried workers. Alternatively, given the higher degree of autonomy among self-employed workers, it may be easier for them to harmonize longer SA periods with their job, or possibly to abuse the system by receiving SA benefits while continuing to work. Future studies should explore this in greater detail.

Moreover, the increase in number of SA episodes in different diagnosis groups and reduction in missing values in that variable could be explained either by *mutuas* improving their episode registration procedures from 2006 to 2010, as we pointed out before, or due to an increase in several specific conditions covered by those groups, and a decrease in the relative frequency of less severe, shorter-lasting conditions (which in 2006 could have been missing a diagnosis). This could be interpreted under the light of those studies claiming that specific pathologies and health problems do worsen under economic crises (6, 28, 29). In Greece, a country whose recession is more advanced than Spain's, health prospects would not be getting better with the current economic climate, but rather could be much worse, with increases in self-reported poor health, suicides, difficulties in going to a doctor or dentist despite feeling that it was necessary and sickness benefits decreasing (34). Comparisons between our results and these studies should be done with caution, as one cause these authors ascribe to negative health effects is the increase in unemployment caused by crises. Our study, instead, focuses on persons who are employed (and, hence, can take a sickness absence) and have health coverage.

The shortening of episode duration in temporary contract salaried workers, even while small, is also relevant because, as the Spanish labor market is highly polarized in a two-tier model between temporary and permanent contract workers (35), these temporary contract workers have been some of the hardest hit by the crisis (36). Thus, the fact that between 2006 and 2010 temporary salaried workers experienced a drop in the median duration of their NWRSA episodes, while permanent contract workers saw no change, could be explained in two ways. On one hand, temporary contract salaried workers could have become more aware of the precariousness of their

situation, and be less likely to take a sickness absence or more likely to return to work sooner. On the other hand, this could be due to the rapid decline of jobs in sectors that in Spain are associated with temporary contracts, especially construction.

Without being able to fully affirm that the changes in duration and duration determinants observed between 2006 and 2010 are due to the crisis, our results do raise a number of interesting questions. On the other hand, there are several limitations that could have also biased some of these findings. The first has to do with the representativeness of the study population and our ability to generalize findings to the general Spanish working population. The data set was pieced together based on data provided by several different *mutuas*, each with different insured populations, data collection procedures and levels of data completeness, all of which could have caused some selection bias. Second, there could have been some degree of misclassification (information) bias due to the large number of missing values for certain variables (e.g., diagnosis, contract type) in 2006, some of which had improved by 2010. Third, since 2007 Spanish legislation recognizes the special status of economically dependent self-employed workers (those who are managers of their own job but are economically dependent on a single client) (37). This group may be unique within the category of self-employed workers, with different SA durations as compared to the rest of the group, and could be influencing some of the findings. Unfortunately, we did not have data that allowed us to differentiate this subgroup.

It is also true that our analysis is based on two single years, 2006 and 2010. We have not been able to evaluate what happened in the years 2007 to 2009 to better assess trends that could solidify (or refute) some of our results. Moreover, 2010 was not the peak year of the Spanish economic crisis, as unfortunately the crisis, as of this writing, may continue to worsen before it improves.

Economic crises, as multifactorial processes, have many dimensions and determinants, and we cannot affirm we were able to capture its evolution with the data at our disposal. We can only attempt to indirectly assess its effect via some available surrogate variables. Unmeasured variables could certainly be contributing to some degree of confounding.

Inability to obtain denominators by covariables for the population covered by the *mutuas* meant that the change, if any, in the incidence of SA episodes could not be calculated.

Nonetheless, there is a paucity of studies on the effects the current economic crisis has had on both work-related and non-work-related SA episodes in the formal economy. Our study sheds some light on this, as the large number of episodes in our database makes for a robust sample of the working population, covering all Spanish autonomous communities. We hope our study will help generate empirical data, and deeper analyses of existing data, on the evolution of SA episodes in Spain as a result of the economic crisis, especially if it is possible to obtain denominators for the population covered by *mutuas* as it would allow the analysis to determine if the economic crisis has affected incidence of SA episodes. There is a gap in the literature regarding the effects the crisis is having on SA usage in Spanish workers. Concerns about how the crisis affects worker's health for the worse loom, echoing issues in the ways that other countries' situations have developed, as previously pointed out regarding Greece, but also commenting on the current changes in the Spanish healthcare system (38).

With regard to these concerns, our study is useful in two ways: it could lead to more efficient management of SA episodes, as *mutuas* continue to learn more about the nature of SA episodes as they relate to different variables, thus assessing where to focus their attention and efforts to improve occupational health. It could also help physicians during the follow up of SA episodes, potentially guaranteeing the best possible recovery for the worker, his/her safe reincorporation to work, and that the job will not become a risk for the worker's health. Additionally, the results of our study may enable us to explain the ways that different social security statuses and labor regulations can influence collective worker behavior, especially in those aspects dealing with health and its protection.

REFERENCES:

(1) Real Decreto 575/1997, de 18 de abril, por el que se regulan determinados aspectos de la gestión y control de la prestación económica de la Seguridad Social por incapacidad temporal. 1997 (BOE núm. 98, de 24 de abril de 1997).

(2) Marmot M. Social determinants of health inequalities. Lancet 2005;365(9464):1099-1104.

(3) Marmot M, Feeney A, Shipley M, North F, Syme S. Sickness absence as a measure of health status and functioning: from the UK Whitehall II study. J Epidemiol Community Health 1995;49(2):124-130.

(4) Torá Rocamora II, Martínez Martínez JMJ, Delclos Clanchet JJ, Jardí Lliberia JJ, Alberti Casas CC, Serra Pujadas CC, et al. [Duration of work absence attributable to non work-related diseases by health regions in catalonia]. Revista española de salud pública 2010;84(1):61-69.

(5) Benavides, FG, Boix, P, Rodrigo, F y Gil, JM (Coordinadores). Informe de salud laboral, España 2001-2010. Barcelona: CISAL-UPF, 2013.

(6) Stuckler D, Basu S, Suhrcke M, Coutts A, McKee M. The public health effect of economic crises and alternative policy responses in Europe: an empirical analysis. The Lancet 2009;374(9686):315-323.

(7) Burström B, Nylén L, Barr B, Clayton S, Holland P, Whitehead M. Delayed and differential effects of the economic crisis in Sweden in the 1990s on health-related exclusion from the labour market: A health equity assessment. Soc Sci Med 2012.

(8) Navarro V, Muntaner C, Borrell C, Benach J, Quiroga A, Rodriguez-Sanz M, et al. Politics and health outcomes. Lancet 2006 Sep 16;368(9540):1033-1037.

(9) Beckfield J, Krieger N. Epi + demos + cracy: linking political systems and priorities to the magnitude of health inequities--evidence, gaps, and a research agenda. Epidemiol Rev 2009;31:152-177.

(10) Albertí C, Jardí J, Manzanera R, Torá I, Delclós J, Benavides F. Incapacidad temporal por enfermedad común y accidente no laboral en Cataluña, 2007-2010. Archivos de prevención de riesgos laborales 2012;15(2):86-89.

(11) Real Decreto-ley 10/2010, de 16 de junio, de medidas urgentes para la reforma del mercado de trabajo. 2010 (BOE núm. 147, de 17 de junio de 2010).

(12) Real Decreto-ley 3/2012, de 10 de febrero, de medidas urgentes para la reforma del mercado laboral. (BOE núm. 36, de 11 de febrero de 2012).

(13) Johns G. Presenteeism in the workplace: A review and research agenda. J Organ Behav 2010;31(4):519-542.

(14) Fernández-Labandera Ramos C. Estudio epidemiológico de los accidentes y enfermedades profesionales durante el periodo 2006 a 2010 en Ibermutuamur. Inédito.

(15) Parga S, Lagos M. Un primer balance laboral de cien días de Gobierno Rajoy Los recortes y la reforma laboral, letales para el empleo. Informes de la fundación 2012 5-12.

(16) Sampere M, Gimeno D, Serra C, Plana M, López JC, Martínez JM, et al. Return to work expectations of workers on long-term non-work-related sick leave. J Occup Rehabil 2012;22(1):15-26.

(17) Ubalde-López M, Delclos GL, Calvo E, Benavides FG. Influence of New Secondary Diagnoses on the Duration of Non–Work-Related Sickness Absence Episodes. Journal of Occupational and Environmental Medicine 2013;55(4):460-464.

(18) Carballo-Cruz F. Causes and consequences of the Spanish economic crisis: Why is the recovery taking so long? Panoeconomicus 2011;58(3):309-328.

(19) Delclós J, Plana M, García S, Vila D, López López JC, Benavides FG, et al. Duración de la incapacidad temporal por contingencia común por grupos diagnósticos. Archivos de prevención de riesgos laborales 2010;13(4):180-187.

(20) Delclós J, Gimeno D, Torá I, Martínez JM, Manzanera R, Jardí J, et al. Distribución de la duración de la incapacidad temporal por contingencia común por diagnóstico médico (Cataluña, 2006-2008). Gaceta Sanitaria 2012.

(21) Houdmont J, Kerr R, Addley K. Psychosocial factors and economic recession: the Stormont Study. Occup Med (Lond) 2012 Mar;62(2):98-104.

(22) Lee S, Guo W, Tsang A, Mak ADP, Wu J, Ng KL, et al. Evidence for the 2008 economic crisis exacerbating depression in Hong Kong. J Affect Disord 2010 10;126(1–2):125-133.

(23) Gili M, Roca M, Basu S, McKee M, Stuckler D. The mental health risks of economic crisis in Spain: evidence from primary care centres, 2006 and 2010. Eur J Public Health 2012 Apr 19.

(24) Brenner MH, Mooney A. Economic change and sex-specific cardiovascular mortality in Britain 1955–1976. Soc Sci Med 1982;16(4):431-442.

(25) Stuckler D, Meissner CM, King LP. Can a bank crisis break your heart? Globalization Health 2008;4.

(26) Barr B, Taylor-Robinson D, Scott-Samuel A, McKee M, Stuckler D. Suicides associated with the 2008-10 economic recession in England: Time trend analysis. BMJ (Online) 2012;345(7873).

(27) Reeves A, Stuckler D, McKee M, Gunnell D, Chang S-, Basu S. Increase in state suicide rates in the USA during economic recession. The Lancet 2012.

(28) Stuckler D, Basu S, Suhrcke M, Coutts A, McKee M. Effects of the 2008 recession on health: A first look at European data. The Lancet 2011;378(9786):124-125.

(29) Suhrcke M, Stuckler D. Will the recession be bad for our health? It depends. Soc Sci Med 2012;74(5):647-653.

(30) Tapia Granados JA. Recessions and Mortality in Spain, 1980–1997. European Journal of Population 2005;21:393–422.

(31) Granados JAT. Increasing mortality during the expansions of the US economy, 1900–1996. Int J Epidemiol 2005;34(6):1194-1202.

(32) Ruhm CJ. Are recessions good for your health? The Quarterly Journal of Economics 2000;115(2):617-650.

(33) Ruhm CJ. A healthy economy can break your heart. Demography 2007;44(4):829-848.

(34) Kentikelenis A, Karanikolos M, Papanicolas I, Basu S, McKee M, Stuckler D. Health effects of financial crisis: Omens of a Greek tragedy. Lancet 2011;378(9801):1457-1458.

(35) Polavieja JG. Temporary Contracts and Labour Market Segmentation in Spain: An Employment-Rent Approach. European Sociological Review 2003;19(5):501-517+i.

(36) Rocha F. La crisis económica y sus efectos sobre el empleo en España. Gaceta sindical: reflexión y debate 2012(19):67-90.

(37) Ley 20/2007, de 11 de julio, del Estatuto del trabajo autónomo. (BOE núm. 166, de 12 de julio de 2007).

(38) Legido-Quigley H, Otero L, Parra Dl, Alvarez-Dardet C, Martin-Moreno JM, McKee M. Will austerity cuts dismantle the Spanish healthcare system? BMJ: British Medical Journal 2013;346.

(39) Benavides G, Ruíz-Frutos C, García A. Salud laboral: conceptos y técnicas para la prevención de riesgos laborales. 2ª edición ed. Barcelona: Masson; 2000.

Figure 1: Sickness absence determinant factors conceptual framework.

Adapted from Benavides et al. (39).

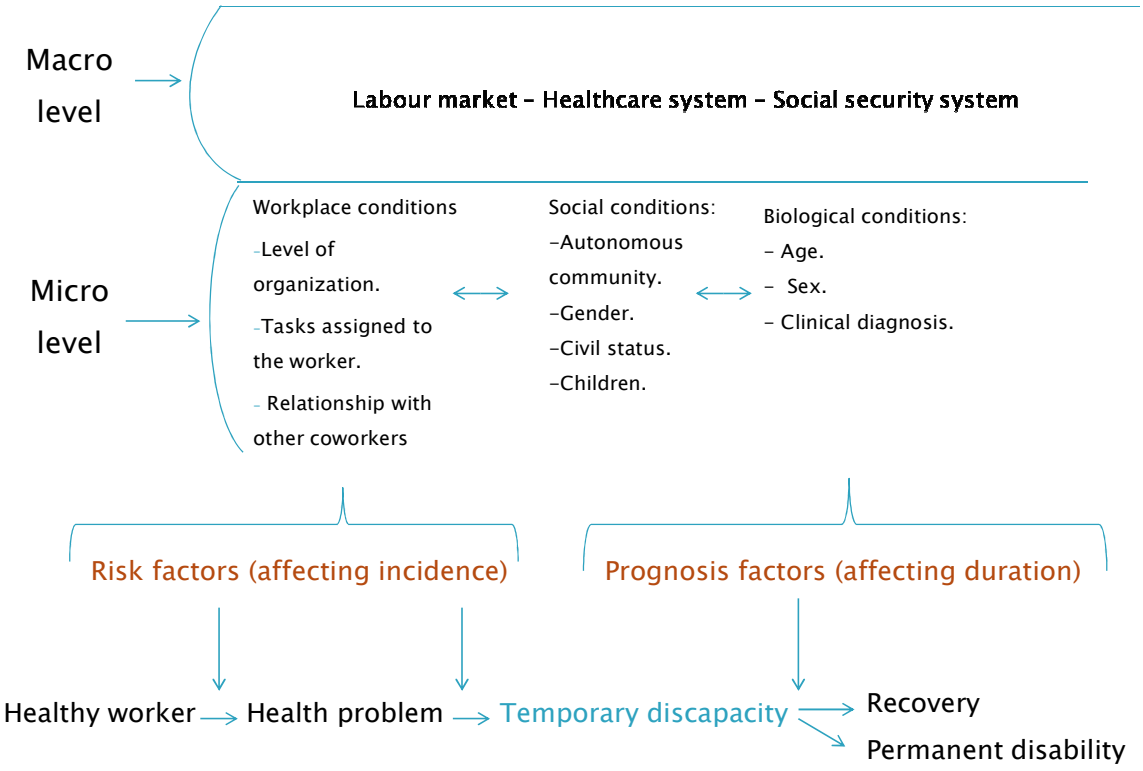

Figure 2a: Return to work probability by type of sickness absence for the years 2006 and 2010: non-work related. Corporación Mutua.

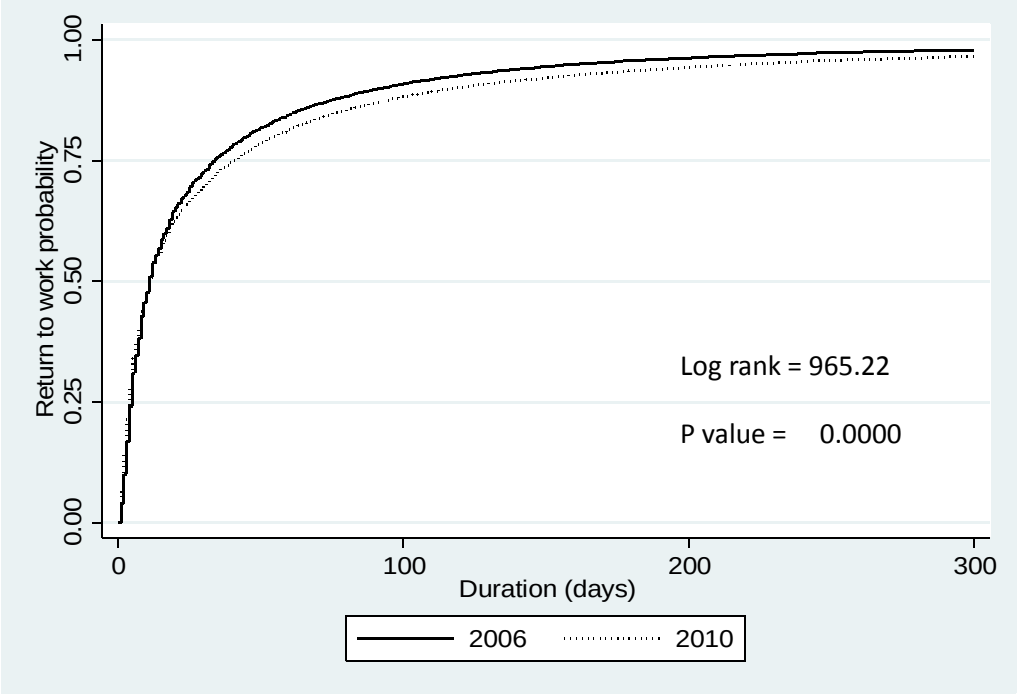

Figure 2b: Return to work probability by type of sickness absence for the years 2006 and 2010: work related. Corporación Mutua.

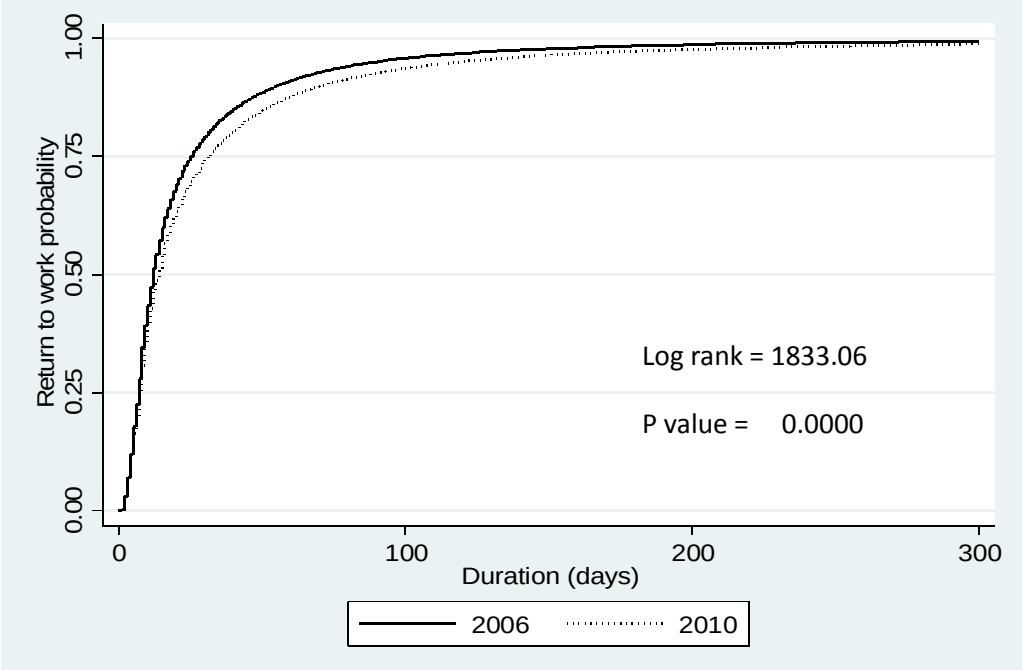

Table 1. Duration of sickness absence in salaried workers, years 2006 and 2010.

Variable	Non-work related sickness absence				Work related sickness absence			
	2006		2010		2006		2010	
	N (%)	MD (P25-75)	N (%)	MD (P25-75)	N (%)	MD (P25-75)	N (%)	MD (P25-75)
Sex								
Male	263,423 (58.31)	9 (4 -25)	270,940 (49.96)	9 (4 -29)	173,932 (74.51)	12 (7 -24)	99,176 (70.35)	13 (7 -30)
Female	178,266 (39.46)	11 (5 -34)	270,479 (49.88)	10 (4 -36)	49,990 (21.41)	15 (8 -29)	41,720 (29.59)	15 (8 -33)
Missing	10,104 (2.24)	11 (5 -34)	851 (0.16)	5 (2 -10)	9,520 (4.08)	11 (6 -24)	75 (0.05)	15 (6 -45)
Age group								
<25	70,814 (15.67)	7 (4 -17)	43,874 (8.09)	6 (3 -17)	37,705 (16.15)	10 (6 -18)	11,533 (8.18)	11 (7 -22)
25-34	168,532 (37.3)	8 (4 -24)	183,431 (33.83)	7 (3 -25)	77,304 (33.11)	11 (6 -22)	40,664 (28.85)	12 (7 -26)
35-44	112,461 (24.89)	10 (5 -29)	160,348 (29.57)	9 (4 -30)	60,576 (25.95)	13 (7 -27)	41,435 (29.39)	14 (7 -31)
45-54	63,722 (14.1)	14 (6 -41)	99,964 (18.43)	12 (5 -43)	38,872 (16.65)	15 (8 -32)	31,628 (22.44)	16 (8 -37)
55-64	33,710 (7.46)	19 (8 -61)	51,495 (9.5)	19 (7 -71)	17,938 (7.68)	17 (9 -38)	14,585 (10.35)	18 (9 -47)
>64	2,554 (0.57)	14 (5 -46)	3,158 (0.58)	16 (5 -48)	1,047 (0.45)	13 (7 -30)	1,126 (0.8)	16 (8 -38)
Autonomous community								
Galicia	9,736 (2.15)	13 (6 -41)	12,738 (2.35)	16 (7 -54)	5,446 (2.33)	14 (8 -29)	4,318 (3.06)	16 (9 -36)
Asturias	5,003 (1.11)	11 (4 -35)	7,240 (1.34)	12 (4 -50)	4,176 (1.79)	16 (8 -35)	4,308 (3.06)	18 (8 -43)
Cantabria	3,319 (0.73)	10 (4 -32)	3,537 (0.65)	10 (4 -35)	1,542 (0.66)	16 (8 -33)	1,161 (0.82)	16 (8 -34)
País Vasco	46,179 (10.22)	10 (5 -32)	52,887 (9.75)	10 (4 -33)	25,234 (10.81)	15 (8 -32)	17,679 (12.54)	15 (8 -33)
Cataluña	64,275 (14.23)	9 (4 -26)	108,179 (19.95)	7 (3 -23)	38,555 (16.52)	12 (7 -23)	22,039 (15.63)	13 (7 -28)
Valencia	65,106 (14.41)	12 (6 -34)	43,465 (8.02)	16 (7 -54)	29,828 (12.78)	13 (8 -27)	13,580 (9.63)	16 (8 -37)
Murcia	24,515 (5.43)	12 (5 -33)	24,470 (4.51)	13 (5 -47)	13,138 (5.63)	14 (8 -32)	8,783 (6.23)	18 (9 -42)
Andalucía	52,196 (11.55)	10 (4 -29)	57,072 (10.52)	10 (4 -36)	37,530 (16.08)	11 (6 -22)	18,082 (12.83)	13 (7 -29)
Baleares	3,867 (0.86)	9 (4 -24)	4,262 (0.79)	9 (4 -30)	1,949 (0.83)	10 (6 -19)	1,132 (0.8)	12 (6 -24)
Canarias	17,154 (3.8)	11 (4 -32)	17,969 (3.31)	9 (4 -31)	10,304 (4.41)	12 (7 -30)	6,926 (4.91)	13 (7 -33)
Navarra	5,597 (1.24)	5 (3 -16)	5,847 (1.08)	5 (2 -17)	1,802 (0.77)	11 (6 -20)	1,099 (0.78)	14 (8 -29)
La Rioja	4,286 (0.95)	5 (3 -14)	2,747 (0.51)	7 (3 -25)	1,503 (0.64)	11 (6 -25)	713 (0.51)	14 (8 -29)
Aragón	4,463 (0.99)	8 (4 -22)	5,968 (1.1)	8 (3 -24)	1,725 (0.74)	13 (8 -25)	1,145 (0.81)	16 (8 -37)
Castilla León	23,887 (5.29)	10 (4 -27)	29,675 (5.47)	11 (4 -37)	9,481 (4.06)	13 (7 -27)	7,230 (5.13)	14 (7 -33)

La Rioja	4,286 (0.95)	5 (3 -14)	2,747 (0.51)	7 (3 -25)	1,503 (0.64)	11 (6 -25)	713 (0.51)	14 (8 -29)
Aragón	4,463 (0.99)	8 (4 -22)	5,968 (1.1)	8 (3 -24)	1,725 (0.74)	13 (8 -25)	1,145 (0.81)	16 (8 -37)
Castilla León	23,887 (5.29)	10 (4 -27)	29,675 (5.47)	11 (4 -37)	9,481 (4.06)	13 (7 -27)	7,230 (5.13)	14 (7 -33)
C Madrid	87,769 (19.43)	8 (4 -23)	119,069 (21.96)	8 (3 -26)	34,733 (14.88)	10 (6 -21)	21,698 (15.39)	11 (6 -24)
Castilla la Mancha	19,952 (4.42)	9 (4 -27)	21,291 (3.93)	11 (4 -34)	9,901 (4.24)	11 (6 -22)	8,284 (5.88)	12 (7 -28)
Extremadura	5,089 (1.13)	12 (5 -35)	5,175 (0.95)	15 (6 -46)	3,685 (1.58)	12 (7 -24)	2,116 (1.5)	14 (8 -31)
Ceuta	1,901 (0.42)	9 (4 -24)	1,815 (0.33)	11 (4 -29)	552 (0.24)	17 (8 -45)	560 (0.4)	15 (8.5 -31)
Melilla	25 (0.01)	24 (12 -41)	62 (0.01)	12 (4 -40)	30 (0.01)	12 (5 -22)	20 (0.01)	37 (16 -63)
Missing	7,474 (1.65)	9 (5 -25)	18,802 (3.47)	11 (5 -29)	2,328 (1)	12 (7 -24)	98 (0.07)	17 (9 -65)
Economic activity (CNAE-2009)								
Agriculture	156,192 (34.57)	10 (4 -28)	259,010 (47.76)	9 (4 -30)	89,312 (38.26)	12 (7 -24)	58,872 (41.76)	14 (8 -30)
Industry	64,021 (14.17)	8 (4 -24)	50,077 (9.23)	8 (3 -32)	34,206 (14.65)	12 (7 -26)	16,665 (11.82)	12 (7 -30)
Construction	47,912 (10.6)	9 (4 -24)	22,204 (4.09)	11 (4 -41)	42,803 (18.34)	11 (6 -22)	12,372 (8.78)	12 (7 -31)
Service	171,585 (37.98)	11 (4 -31)	187,543 (34.58)	10 (4 -35)	59,708 (25.58)	13 (7 -29)	41,245 (29.26)	15 (8 -34)
Missing	12,083 (2.67)	13 (6 -42)	23,436 (4.32)	9 (4 -29)	7,413 (3.18)	13 (8 -27)	11,817 (8.38)	13 (7 -28)
Occupational social class								
Data available	122,797 (27.18)	10 (4 -30)	113,107 (20.86)	13 (4 -51)	207,748 (88.99)	12 (7 -25)	117,757 (83.53)	14 (8 -31)
Missing	328,996 (72.82)	10 (4 -28)	429,163 (79.14)	8 (4 -28)	25,694 (11.01)	11 (6 -22)	23,214 (16.47)	13 (7 -31)
Type of contract								
Permanent	193,645 (42.86)	11 (5 -32)	193,305 (35.65)	11 (4 -36)	104,691 (44.85)	13 (7 -27)	77,012 (54.63)	14 (8 -32)
Temporary	137,337 (30.4)	9 (4 -24)	84,101 (15.51)	8 (4 -27)	109,516 (46.91)	11 (7 -23)	47,983 (34.04)	13 (7 -29)
Missing	120,811 (26.74)	9 (4 -28)	264,864 (48.84)	8 (3 -32)	19,235 (8.24)	12 (6 -25)	15,976 (11.33)	14 (7 -33)
Average daily salary								
1-35 €	134,911 (29.86)	12 (5 -36)	122,638 (22.62)	12 (5 -42)	68,592 (29.38)	12 (7 -25)	22,931 (16.27)	15 (8 -32)
36-55 €	172,904 (38.27)	9 (4 -26)	188,751 (34.81)	11 (4 -39)	106,790 (45.75)	12 (7 -24)	54,428 (38.61)	14 (8 -32)
>55 €	136,617 (30.24)	8 (4 -24)	228,593 (42.15)	7 (3 -23)	57,005 (24.42)	13 (7 -28)	63,528 (45.06)	13 (7 -29)
Missing	7,361 (1.63)	8 (4 -20)	2,288 (0.42)	4 (2 -7)	1,055 (0.45)	8 (4 -14)	84 (0.06)	20 (5 -78)

Diagnosis group (ICD9)								
Infectious	22,856 (5.06)	5 (3 -14)	63,123 (11.64)	4 (2 -11)	762 (0.33)	45 (21 -69)	680 (0.48)	58 (34 -91)
Neoplasms	3,073 (0.68)	49 (17 -154)	8,341 (1.54)	45 (14 -207)	5 (0)	66 (53 -175)	8 (0.01)	75 (1 -362)
Endrocrine	1,557 (0.34)	19 (8 -50)	3,169 (0.58)	14 (6 -45)	106 (0.05)	7 (3 -10)	5 (0)	29 (23 -40)
Blood diseases	382 (0.08)	42 (18 -81)	837 (0.15)	31 (11 -74)	-	-	-	-
Mental disorders	14,999 (3.32)	50 (18 -118)	34,048 (6.28)	39 (12 -119)	96 (0.04)	35 (17 -113)	137 (0.1)	55 (19 -163)
Nervous system	8,634 (1.91)	13 (5 -39)	20,767 (3.83)	10 (4 -30)	3,893 (1.67)	5 (3 -12)	2,407 (1.71)	6 (3 -18)
Circulatory system	5,081 (1.12)	35 (14 -90)	10,894 (2.01)	30 (11 -91)	322 (0.14)	45 (17 -131)	309 (0.22)	120 (29 -243)
Respiratory system	30,867 (6.83)	5 (3 -9)	70,698 (13.04)	5 (3 -8)	107 (0.05)	23 (7 -82)	141 (0.1)	29 (10 -149)
Digestive system	13,916 (3.08)	11 (4 -39)	36,315 (6.7)	5 (2 -20)	205 (0.09)	45 (27 -63)	175 (0.12)	38 (22 -56)
Genitourinary system	5,205 (1.15)	14 (6 -33)	12,829 (2.37)	11 (5 -26)	27 (0.01)	9 (7 -21)	11 (0.01)	10 (4 -20)
Complicated pregnancy	9,404 (2.08)	45 (19 -82)	18,960 (3.5)	40 (15 -83)	7 (0)	9 (8 -15)	8 (0.01)	16 (9 -40)
Skin	3,795 (0.84)	15 (7 -36)	7,502 (1.38)	11 (5 -26)	912 (0.39)	12 (6 -22)	548 (0.39)	11 (6 -24)
Musculoskeletal system	41,041 (9.08)	20 (8 -62)	97,549 (17.99)	16 (7 -54)	60,914 (26.09)	12 (7 -23)	44,552 (31.6)	13 (7 -28)
Congenital anomalies	463 (0.1)	36 (14 -95)	863 (0.16)	27 (9 -82)	29 (0.01)	15 (8 -34)	53 (0.04)	15 (6 -34)
Perinatal period	462 (0.1)	46 (27 -70)	466 (0.09)	32 (15 -64)	10 (0)	14 (9 -21)	15 (0.01)	15 (8 -44)
Ill-defined conditions	31,074 (6.88)	8 (4 -20)	53,687 (9.9)	6 (3 -16)	391 (0.17)	10 (6 -17)	301 (0.21)	10 (6 -23)
Injuries, poisoning	26,634 (5.9)	23 (10 -54)	45,545 (8.4)	19 (9 -52)	132,820 (56.9)	12 (7 -26)	88,816 (63)	14 (8 -32)
Supplementary factors (V codes)	1,318 (0.29)	26 (9 -56)	6,818 (1.26)	13 (5 -43)	954 (0.41)	14 (8 -26)	440 (0.31)	14 (7 -38)
External causes (E codes)	231 (0.05)	15 (6 -33)	1,524 (0.28)	9 (4 -16)	69 (0.03)	6 (4 -11)	38 (0.03)	8.5 (5 -35)
Missing	230,801 (51.09)	8 (4 -18)	48,335 (8.91)	6 (3 -15)	31,813 (13.63)	12 (7 -27)	2,327 (1.65)	13 (7 -30)
Total	451,793 (100)	10 (4 -28)	542,270 (100)	9 (4 -32)	233,442 (100)	12 (7 -25)	140,971 (100)	14 (7 -31)

Table 2. Duration of sickness absence in self-employed workers, years 2006 and 2010.

Variable	Non-work related sickness absence				Work related sickness absence			
	2006		2010		2006		2010	
	N (%)	MD (P25-75)	N (%)	MD (P25-75)	N (%)	MD (P25-75)	N (%)	MD (P25-75)
Sex								
Male	27,129 (58.73)	36 (18 -78)	38,956 (59.51)	43 (19 -101)	4,181 (71.81)	16 (9 -35)	5,296 (81.1)	17 (9 -39)
Female	16,856 (36.49)	49 (22 -105)	26,315 (40.2)	53 (22 -121)	1,202 (20.65)	17 (10 -35)	1,219 (18.67)	18 (10 -41)
Missing	2,207 (4.78)	46 (20 -102)	190 (0.29)	32 (10 -145)	439 (7.54)	15 (9 -27)	15 (0.23)	17 (8 -69)
Age group								
<25	2,414 (5.23)	29 (14 -63)	1,751 (2.67)	32 (14 -68)	616 (10.58)	13 (8 -26)	477 (7.3)	12 (8 -24)
25-34	13,378 (28.96)	33 (16 -69)	13,962 (21.33)	36 (16 -79)	1,589 (27.29)	14 (8 -30)	1,716 (26.28)	15 (8 -33)
35-44	13,254 (28.69)	36 (18 -78)	19,500 (29.79)	40 (18 -89)	1,945 (33.41)	16 (9 -33)	2,210 (33.84)	16 (9 -37)
45-54	10,000 (21.65)	49 (23 -109)	16,616 (25.38)	52 (23 -125)	1,127 (19.36)	20 (11 -42)	1,402 (21.47)	21 (10 -49)
55-64	6,627 (14.35)	67 (31 -153)	12,456 (19.03)	74 (32 -179)	510 (8.76)	23 (11 -47)	666 (10.2)	23 (12 -59)
>64	519 (1.12)	73 (32 -151)	1,176 (1.8)	69 (34 -147)	35 (0.6)	23 (12 -36)	59 (0.9)	18 (11 -41)
Autonomous community								
Galicia	2,035 (4.41)	54 (25 -107)	2,675 (4.09)	56 (26 -121)	88 (1.51)	23 (12 -50)	134 (2.05)	28 (15 -49)
Asturias	1,067 (2.31)	42 (19 -88)	1,824 (2.79)	53 (21 -118)	306 (5.26)	17 (10 -43)	405 (6.2)	16 (8 -39)
Cantabria	790 (1.71)	41 (19 -86)	936 (1.43)	44 (19 -87)	44 (0.76)	21 (15 -43)	37 (0.57)	22 (12 -37)
País Vasco	5,774 (12.5)	40 (19 -85)	7,372 (11.26)	36 (16 -81)	300 (5.15)	19 (12 -39)	256 (3.92)	17 (8 -38)
Cataluña	4,510 (9.76)	39 (18 -84)	6,316 (9.65)	40 (18 -97)	111 (1.91)	20 (10 -38)	154 (2.36)	18 (9 -38)
Valencia	9,336 (20.21)	42 (21 -95)	12,061 (18.42)	54 (25 -137)	1,761 (30.25)	16 (9 -35)	1,493 (22.86)	18 (10 -42)
Murcia	3,688 (7.98)	47 (22 -92)	6,326 (9.66)	62 (28 -147)	962 (16.52)	15 (9 -33)	1,014 (15.53)	16 (9 -35)
Andalucía	8,233 (17.82)	46 (20 -97)	11,911 (18.2)	50 (22 -106)	881 (15.13)	16 (8 -35)	1,269 (19.43)	16 (9 -37)
Baleares	310 (0.67)	36 (18 -83)	366 (0.56)	39 (18 -111)	14 (0.24)	17 (9 -39)	21 (0.32)	10 (6 -18)
Canarias	1,117 (2.42)	53 (22 -126)	1,407 (2.15)	58 (25 -142)	192 (3.3)	21 (10 -46)	343 (5.25)	14 (8 -38)
Navarra	325 (0.7)	29 (15 -66)	493 (0.75)	30 (13 -68)	15 (0.26)	12 (7 -40)	11 (0.17)	18 (7 -72)
La Rioja	352 (0.76)	26 (13 -66)	452 (0.69)	38 (17 -80)	22 (0.38)	15 (8 -23)	24 (0.37)	22 (13 -60)
Aragón	533 (1.15)	29 (15 -66)	785 (1.2)	42 (18 -99)	14 (0.24)	18 (14 -33)	22 (0.34)	46 (19 -65)

La Rioja	352 (0.76)	26 (13 -66)	452 (0.69)	38 (17 -80)	22 (0.38)	15 (8 -23)	24 (0.37)	22 (13 -60)
Aragón	533 (1.15)	29 (15 -66)	785 (1.2)	42 (18 -99)	14 (0.24)	18 (14 -33)	22 (0.34)	46 (19 -65)
Castilla León	1,798 (3.89)	32 (16 -71)	2,740 (4.19)	41 (18 -102)	587 (10.08)	14 (8 -31)	632 (9.68)	14 (8 -33)
C Madrid	3,693 (7.99)	30 (14 -67)	5,183 (7.92)	35 (15 -87)	136 (2.34)	14 (8 -27)	200 (3.06)	18 (9 -39)
Castilla la Mancha	1,415 (3.06)	33 (16 -73)	2,809 (4.29)	42 (18 -109)	165 (2.83)	12 (8 -22)	351 (5.38)	19 (8 -40)
Extremadura	868 (1.88)	39 (19 -88)	1,430 (2.18)	47 (23 -105)	146 (2.51)	24 (11 -39)	149 (2.28)	23 (12 -54)
Ceuta	142 (0.31)	32 (12 -77)	134 (0.2)	36 (17 -99)	1 (0.02)	60 (60 -60)	7 (0.11)	15 (10 -160)
Melilla	2 (0)	4 (4 -4)	3 (0)	44 (11 -210)	-	-	-	-
Missing	204 (0.44)	35 (15 -104)	238 (0.36)	15 (8 -33)	77 (1.32)	13 (8 -22)	8 (0.12)	21 (16 -34)
Economic activity (CNAE-2009)								
Agriculture	16,537 (35.8)	38 (18 -80)	32,321 (49.37)	46 (20 -106)	2,931 (50.34)	16 (9 -35)	3,129 (47.92)	18 (10 -40)
Industry	2,472 (5.35)	39 (16 -88)	2,322 (3.55)	49 (21 -116)	769 (13.21)	14 (8 -33)	978 (14.98)	13 (7 -32)
Construction	6,484 (14.04)	34 (16 -74)	5,320 (8.13)	48 (21 -118)	392 (6.73)	14 (8 -30)	301 (4.61)	19 (10 -41)
Service	16,849 (36.48)	44 (19 -96)	18,704 (28.57)	48 (20 -115)	577 (9.91)	18 (10 -39)	800 (12.25)	19 (9 -45)
Missing	3,850 (8.33)	60 (27 -151)	6,794 (10.38)	43 (18 -95)	1,153 (19.8)	16 (9 -35)	1,322 (20.25)	17 (9 -38)
Occupational social class								
Data available	9,433 (20.42)	43 (20 -86)	14,455 (22.08)	61 (28 -152)	4,974 (85.43)	16 (9 -35)	4,553 (69.72)	17 (9 -39)
Missing	36,759 (79.58)	40 (18 -90)	51,006 (77.92)	43 (19 -99)	848 (14.57)	15 (8 -33)	1,977 (30.28)	16 (9 -38)
Type of contract								
Permanent	3,263 (7.06)	35 (15 -78)	1,373 (2.1)	44 (14 -190)	2,624 (45.07)	17 (9 -36)	2,215 (33.92)	17 (9 -39)
Temporary	6,352 (13.75)	46 (22 -110)	8,651 (13.22)	49 (23 -129)	1,819 (31.24)	15 (9 -31)	1,844 (28.24)	15 (8 -36)
Missing	36,577 (79.18)	40 (19 -88)	55,437 (84.69)	46 (20 -105)	1,379 (23.69)	17 (10 -35)	2,471 (37.84)	18 (10 -40)
Average daily salary								
1-35 €	38,844 (84.09)	42 (20 -89)	2,626 (45.10)	48 (22 -109)	2,626 (45.1)	18 (10 -37)	2,942 (45.05)	20 (10 -44)
36-55 €	3,507 (7.59)	47 (19 -112)	1,579 (27.12)	56 (25 -141)	1,579 (27.12)	16 (9 -33)	1,664 (25.48)	17 (9 -39)
>55 €	3,556 (7.7)	23 (8 -70)	1,493 (25.64)	19 (6 -63)	1,493 (25.64)	14 (8 -32)	1,790 (27.41)	13 (7 -33)
Missing	285 (0.62)	12 (4 -32)	124 (2.13)	19 (6.5 -63)	124 (2.13)	8 (5 -15)	134 (2.05)	11 (6 -20)

Diagnosis group (ICD9)								
Infectious	2,077 (4.5)	46 (22 -86)	3,880 (5.93)	45 (19 -86)	18 (0.31)	25 (9 -61)	19 (0.29)	55 (33 -78)
Neoplasms	638 (1.38)	99 (47 -245)	1,635 (2.5)	116 (42 -327)	-	-	1 (0.02)	17 (17 -17)
Endrocrine	242 (0.52)	43 (23 -105)	509 (0.78)	48 (24 -109)	6 (0.1)	20 (17 -24)	-	-
Blood diseases	54 (0.12)	68 (35 -135)	140 (0.21)	55 (31 -135)	1 (0.02)	14 (14 -14)	-	-
Mental disorders	1,835 (3.97)	104 (48 -194)	4,245 (6.48)	111 (47 -268)	-	-	1 (0.02)	168 (168 -168)
Nervous system	1,044 (2.26)	50 (23 -109)	2,341 (3.58)	45 (19 -115)	137 (2.35)	6 (4 -12)	162 (2.48)	7 (4 -15)
Circulatory system	941 (2.04)	75 (35 -160)	2,170 (3.31)	67 (31 -186)	10 (0.17)	43 (28 -106)	16 (0.25)	113 (28 -235)
Respiratory system	1,443 (3.12)	15 (7 -32)	3,094 (4.73)	15 (7 -32)	1 (0.02)	116 (116 -116)	2 (0.03)	28 (8 -47)
Digestive system	1,436 (3.11)	46 (27 -75)	2,998 (4.58)	41 (20 -74)	18 (0.31)	52 (24 -85)	16 (0.25)	37 (29 -50)
Genitourinary system	574 (1.24)	39 (20 -70)	1,181 (1.8)	38 (18 -75)	-	-	-	-
Complicated pregnancy	1,175 (2.54)	56 (33 -92)	1,852 (2.83)	54 (28 -97)	-	-	-	-
Skin	405 (0.88)	34 (18 -70)	833 (1.27)	31 (15 -63)	20 (0.34)	11 (5.5 -14)	32 (0.49)	15 (8.5 -30)
Musculoskeletal system	8,880 (19.22)	60 (27 -113)	20,191 (30.84)	57 (25 -123)	1,657 (28.46)	15 (9 -31)	1,966 (30.11)	16 (9 -33)
Congenital anomalies	94 (0.2)	65 (38 -139)	186 (0.28)	68 (32 -180)	-	-	5 (0.08)	7 (5 -20)
Perinatal period	64 (0.14)	50 (32 -85)	86 (0.13)	41 (26 -65)	-	-	-	-
Ill-defined conditions	2,728 (5.91)	24 (12 -50)	4,031 (6.16)	27 (12 -70)	12 (0.21)	12 (11 -16)	25 (0.38)	9 (6 -17)
Injuries, poisoning	6,973 (15.1)	46 (25 -85)	11,355 (17.35)	45 (22 -92)	3,702 (63.59)	17 (9 -36)	4,200 (64.32)	18 (9 -42)
Supplementary factors (V codes)	210 (0.45)	42 (23 -89)	815 (1.25)	41 (18 -100)	12 (0.21)	16 (10 -54)	7 (0.11)	15 (5 -19)
External causes (E codes)	61 (0.13)	40 (19 -104)	188 (0.29)	31 (15 -67)	2 (0.03)	8.5 (1 -16)	3 (0.05)	10 (7 -31)
Missing	15,318 (33.16)	28 (15 -67)	3,731 (5.7)	27 (14 -69)	226 (3.88)	21 (12 -36)	75 (1.15)	21 (10 -42)
Total	46,192 (100)	40 (19 -89)	65,461 (100)	47 (20 -109)	5,822 (100)	16 (9 -35)	6,530 (100)	17 (9 -39)

Table 3. Comparison of non-work related sickness absence duration in 2010, as compared to 2006 for women and men. Corporación Mutua.

	Men			Women		
	HR	**95% CI**	**p**	**HR**	**95% CI**	**p**
Crude	0.90	0.90 - 0.91	<0.0001	1.00	0.99 - 1.00	<0.0001
Individually adjusted for						
Age group	0.95	0.95 - 0.96	<0.0001	1.04	1.03 - 1.05	<0.0001
Autonomous community	0.89	0.89 - 0.89	<0.0001	0.98	0.97 - 0.98	<0.0001
Economic activity (CNAE-2009)	0.89	0.89 - 0.90	<0.0001	0.98	0.98 - 0.99	<0.0001
Type of contract	0.90	0.89 - 0.90	<0.0001	0.97	0.96 - 0.97	<0.0001
Average daily salary	0.88	0.88 - 0.88	<0.0001	0.97	0.96 - 0.98	<0.0001
Diagnosis (ICD9)	1.04	1.04 - 1.05	<0.0001	1.10	1.10 - 1.11	<0.0001
Social security status	0.93	0.92 - 0.93	<0.0001	1.00	1.00 - 1.01	<0.0001
Multivariate analysis	0.97	0.96 - 0.98	<0.0001	1.02	1.01 - 1.03	<0.0001

Table 4. Comparison of work related sickness absence duration in 2010, as compared to 2006 for women and men. Corporación Mutua.

	Men			Women		
	HR	**95% CI**	**p**	**HR**	**95% CI**	**p**
Crude	0.86	0.86 - 0.87	<0.0001	0.92	0.91 - 0.93	<0.0001
Individually adjusted for						
Age group	0.89	0.89 - 0.90	<0.0001	0.95	0.94 - 0.96	<0.0001
Autonomous community	0.86	0.86 - 0.87	<0.0001	0.93	0.91 - 0.94	<0.0001
Economic activity (CNAE-2009)	0.86	0.85 - 0.87	<0.0001	0.91	0.90 - 0.92	<0.0001
Type of contract	0.88	0.87 - 0.89	<0.0001	0.92	0.91 - 0.94	<0.0001
Average daily salary	0.86	0.86 - 0.87	<0.0001	0.92	0.91 - 0.94	<0.0001
Diagnosis (ICD9)	0.86	0.85 - 0.87	<0.0001	0.90	0.89 - 0.91	<0.0001
Social security status	0.87	0.86 - 0.88	<0.0001	0.92	0.91 - 0.93	<0.0001
Multivariate analysis	0.88	0.87 - 0.89	<0.0001	0.92	0.90 - 0.93	<0.0001