

## Paper 1

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## Social Inequalities in Health

### MONITORING SOCIAL DETERMINANTS OF HEALTH INEQUALITIES: THE IMPACT OF UNEMPLOYMENT AMONG VULNERABLE GROUPS

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Abstract: Surveillance of social determinants of health inequalities is an essential but still underdeveloped issue in public health. Existing research has identified unemployment as an important social determinant of health inequalities. This cross-sectional study investigates the impact of unemployment on mental health outcomes among vulnerable groups, using the 2006 Catalan Health Survey (N = 8,591). The authors estimate the prevalence ratios and differences (excess of prevalence) for poor mental health in the unemployed and employed, with 95 percent confidence intervals. After taking into account the interactions among social mechanisms of inequality and related factors, the authors identified seven vulnerable groups to monitor. Primary findings indicate that unemployment has a greater adverse effect on the mental health of male manual workers, single mothers, main-earner women, and manual workers without

unemployment benefits for both sexes. Findings support the need to devote more research to the surveillance of unemployment as a social determinant of health inequalities, to identify additional unemployment indicators, and to consider how various social mechanisms of inequality interact with each other to produce health inequalities among vulnerable groups.

Population health is strongly influenced by social determinants, in that such social factors shape how much a given population is exposed to risks and protective factors for physical and mental health throughout the life course. These social determinants include educational credentials, employment and working conditions, food safety, health care, housing quality, neighborhood characteristics, income, and social exclusion (1, 2). Social determinants of health are the major factors responsible for health inequalities (2), defined as health differences between populations that are deemed avoidable and unfair (3). Moreover, these determinants are unequally distributed among groups occupying unequal positions in society, including social class and gender, for example. Whereas social determinants of health focus on the population's health as a whole, social determinants of health inequalities refer to the distribution of health among different social groups (4).

Surveillance of social determinants of health and social determinants of health inequalities (SDHIs) should be priorities in public health research and practice. Public health surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health actions aimed to reduce morbidity and mortality and to improve health (5). Historically, surveillance systems have been created with the aim of controlling infectious diseases and have evolved over time to include the surveillance of chronic diseases, occupational injuries, and lifestyles (6). Despite the acknowledged

importance and benefits of maintaining surveillance systems for SDHIs, it remains a relatively underdeveloped issue in public health. Effective action to reduce health inequalities requires timely data and accurate information to monitor not only health inequalities but also SDHIs. To meet this need, the World Health Organization (WHO) Commission on Social Determinants of Health recommended that countries should establish national health equity surveillance systems with routine data collection on SDHIs, including employment variables (2). Likewise, the Spanish Ministry of Health and Social Policy established the strategy “Innovation in Public Health: Monitoring Social Determinants of Health and Reduction of Health Inequalities” as a top priority for the Spanish presidency of the European Union in the first semester of 2010 (7). According to the Commission on Social Determinants of Health, if these systems were available, they would be key instruments for advocacy purposes and would support coherent policymaking and inform effective interventions. These systems are essential for determining which social determinants are most responsible for producing health inequalities, monitoring this association over time, and identifying the most vulnerable and affected groups. Such surveillance systems can also be used to assess entry points for intervention, evaluate the impact of policies, and prioritize the use of public resources (8). While the Commission on Social Determinants of Health points out the importance of monitoring SDHIs, it lacks any discussion on which indicators should be monitored (9).

To date, the integration of social determinants of health into current health information systems has been limited. Moreover, theoretical reflection on which social determinants should be included in health surveillance systems and how to relate this information with health inequalities has been scarce. This leads to a pressing need to address two emerging surveillance issues: first, which indicators to develop and select for SDHI monitoring and how to do so, and second, how to disaggregate indicators and which specific groups should be followed over time. Carefully selecting and regularly reviewing core indicators are vital steps toward creating an effective surveillance system and can be viewed as the backbone of any responsive monitoring system (10).

In this study, we view employment and working conditions as important SDHIs, given their central roles in nearly everyone's life. These conditions are unequally distributed among the population through different social mechanisms (e.g., social class, gender, age, ethnicity, migration status, and territory), which generate inequalities in wealth, power, and culture, all of which contribute to health inequalities (11, 12). While working conditions have received considerable attention as a social determinant of health, and to a lesser extent of health inequalities, researchers rarely focus on employment relations, that is, "the power relations between employers and employees and the level of social protection that employees can count on" (13, 14).

Unemployment and precarious employment are two conditions that significantly affect population health and health inequalities in rich countries, due to their prevalence and health impact (15). Though unemployment has been found to be negatively associated with mental health, physical health (from self-reported physical illness to mortality), well-being, role functioning, and unhealthy behaviors (16–18), there is a lack of both theoretical models and empirical research on possible mediating mechanisms between unemployment and ill-health. Proposed causal pathways include economic deprivation models, the stress theory of unemployment, and the social support model. The economic deprivation model links the health effects of unemployment directly to financial problems (19). Stress theory emphasizes how the uncertainty about one's future work situation acts as a stressor that leads to physiological changes, risky health behaviors, and consequently, poorer health (20). The social support model focuses on how unemployment leads to increased social isolation that either directly affects health or decreases the buffering effect of social support (13).

Given that unemployment is unevenly distributed among the working population, disproportionately affecting women, young people, manual workers, and ethnic minorities (21), unemployment might also produce unequal health outcomes. Accordingly, individuals experience varying degrees of vulnerability to the health consequences of unemployment, depending on their social position and other social factors such as unemployment benefit coverage (13, 22, 23). In other words, different social positions defined along

lines of gender, social class, ethnicity, age, migration status, and/or territory lead to different probabilities of being exposed to unemployment, and specific exposures have differential impacts on health, depending on the presence of other risk factors and/or conditions (24).

Despite such evidence, few surveillance or monitoring initiatives related to SDHIs have incorporated unemployment indicators into routine data-collection procedures. In cases where unemployment is monitored, it often appears as a population average or is disaggregated only by gender and age, thereby overlooking other important social mechanisms of inequality, possible interactions, and contributory risk factors. Knowledge of what constitutes an effective surveillance system of SDHIs and how to select appropriate indicators remains limited. Moreover, more information is needed on how best to disaggregate indicators and identify the most important groups to monitor. This study aims to fill these knowledge gaps by identifying a set of useful indicators for monitoring unemployment over time. Indicators are derived from the analysis of the most important groups to be monitored, while taking into account the differential impact of unemployment on health due to the social mechanisms of inequality, contributory risk factors, and their interactions. Before proceeding to our analyses, we provide a comprehensive review of the extant literature on unemployment and health inequalities.



## LITERATURE REVIEW

A number of indicators and groups vulnerable to the differential impact of unemployment on health emerged from our review. These groups can be organized along the following social mechanisms of inequality: social class, gender, age, geographic location, ethnicity, immigration status, and unemployment characteristics—type of benefits and joblessness duration.

### *Social Class*

Studies focused on social class generally find a greater impact of unemployment among manual workers and lower socioeconomic groups defined by occupation, education level, or income (21, 22, 25, 26). These results are attributed to the groups' greater exposure to unemployment (27), lower reemployment prospects among the unskilled, less financial resources to cushion the effects of unemployment, and health selection (21). Psychological distress is found to be associated with manual social classes, despite manual workers being financially equally or better off after becoming unemployed (25). The impact of unemployment on health by social class differs according to gender and family roles, with higher rates among married men in manual classes compared with non-manual classes. Married women with no nurturing roles in non-manual classes had worse health compared with their manual-class counterparts (22). One study, however, found no differential effect of unemployment on depression and physical health according to education (28).

### *Gender*

Transitions from paid employment to unemployment have detrimental effects on mental health for both men and women (26, 29–31), especially when role configurations for men and women are similar (30). Some studies show that the unemployment and health effects are stronger for men than for women (21, 26, 31). Gender differences are also observed between unemployment, health, and family situation. Marital (or cohabiting) status and being the main earner interacts with gender to put single mothers and married men in a more vulnerable position for poor health, especially if men are not the main earners. Among single individuals, unemployment's impact is similar for men and women. However, for married individuals, unemployment has a worse impact among men, due to their traditional role as breadwinners (22, 32). For men, being the main earner moderated the effect of losing their own job (33). Single mothers form a specific vulnerable group, often exposed to unemployment and several other health risks that interact to produce higher rates of susceptibility (34). Residing in a jobless household represents no additional disadvantage after controlling for income (35).

### *Age*

Unemployment has a stronger effect among older individuals (33, 36–39). According to Banks's review (32), researchers have found a U-shaped association between age and poor mental health during unemployment, with the youngest and the oldest groups having

better mental health than the intermediate age groups, probably due to differences in role responsibilities throughout the life cycle. The youngest and oldest groups assume fewer family commitments. On the other hand, when young individuals (16 to 21 years old) are compared with adults (25 to 30 years old), a stronger association with poor psychological health is found among the youngest group of men and women (40). The effect of a given individual's unemployment on mortality risk gradually decreases with increasing age (41).

### *Geographic Location*

The associations between unemployment, health, and geographic location have been understood using three main conceptual approaches. First, health differences between urban and rural settings and the long-term effects of unemployment on health have been assessed, with no significant differences between the two settings (42). However, unemployed rural individuals tend to be unemployed for longer periods, older, and less educated, and to have lower incomes. Second, research has examined the health effects of unemployment according to neighborhood contexts. In regions or neighborhoods with higher unemployment rates, unemployed workers have better psychological health (32, 43); however, in terms of mortality risk (41) and perceived health (44), the health effects of unemployment were negligible. Third, unemployment has been examined at national levels to determine its impact on health. Evidence suggests that health differences between the unemployed and employed are larger when unemployment

levels are high and job availability is low (28, 45). Other research finds similar mortality levels associated with downsizing in periods of low and high unemployment (46), and mortality ratios among unemployed subjects are higher at a time of low national unemployment (47).

### *Ethnicity*

Few studies have examined race/ethnicity-related health differences associated with unemployment, with most being published in the United States, where such scholarship has a long and established history. Banks's review (32) found no differences between black and white respondents, after four weeks of unemployment, in anxiety, financial strain, or concern about being unemployed; however, white respondents reported lower well-being in terms of depression and general distress. No racial/ethnic differences were found after 12 months of continuous unemployment. Other work has compared workers from closing auto plants and non-closing plants, finding an interaction between race/ethnicity and education: less educated black unemployed workers were the most highly distressed, and more educated black unemployed workers were not appreciably distressed (48). Brown and colleagues' study (26) concluded that the effect of unemployment on frequent mental distress was greater among black non-Hispanics than among white non-Hispanic individuals.

### *Immigration*

Research suggests that immigrant status results in occupying an inferior position in the labor market (49), and refugee background leads to an even more precarious position (50). Institutional discrimination and residential segregation limit immigrants' social mobility, which then leads to fewer and lower quality opportunities for employment (51). An Australian study showed that unemployment is significantly associated with poor mental health for immigrants, and the direction of causality runs from labor force status to poor mental health rather than the reverse (52). Moreover, this study found that persons immigrating for humanitarian reasons scored higher on the 12-item version of the General Health Questionnaire (GHQ-12) than did all other immigrant groups. Migrants who arrived in Sweden between 1980 and 1989 showed substantially increased risks of self-reported longstanding psychiatric illness when compared with native Swedes. Unemployment among immigrants increases the risk of psychiatric illness and has been found to explain the difference in prevalence of psychiatric illness between immigrants and natives (53, 54). Elkeles and Seifert (49) found that employed native Germans and immigrants did not differ with respect to their health satisfaction, but unemployed foreign workers were much less satisfied with their health than unemployed natives. However, it was unclear whether the poor health of unemployed migrants was due to unemployment or due to the selection process.

### *Unemployment Benefits*

Unemployment benefits buffer the adverse effects of unemployment on health and interact with gender, social class, and family situation (22, 55) to produce differential effects. This protective effect, however, varies according to the type of benefits received. A comparison of permanent employees and unemployed subjects in Finland revealed a health gradient according to type of benefits. Those most likely to experience poor health were the unemployed with low incomes, followed by the “subsidy unemployed,” then those who received compensation income (55). U.S. and European research also supports this health advantage for those receiving compensation benefits and finds that welfare or means-tested benefits are not sufficient to reduce the risk of poor health (56–58).

### *Unemployment Duration*

European research finds that health often deteriorates as the duration of unemployment increases (59). Unemployment has an adverse effect on both physical working capacity and mental health, depending on the duration of unemployment (60). Long-term unemployed individuals suffer more depressive mood episodes (61, 62), experience lower levels of health satisfaction (33), and exhibit more emotional problems (36). Unemployment is also related to mortality in a dose-response manner among individuals under 60 years old (41). In contrast, North American studies do not find differences in mental distress according to duration of unemployment (26, 39).

We empirically tested the impact of these unemployment indicators on mental health inequalities with the aim of identifying which groups are most vulnerable to poor health. We hypothesize that the groups most vulnerable to the differential impact of unemployment on health are distributed along social mechanisms of inequality: social class, gender, age, ethnicity, and immigration status.

## METHODS

### *Design*

This cross-sectional study analyzes the impact of unemployment on mental health inequalities. Data are from the 2006 Catalan Health Survey, which includes a representative sample of the non-institutionalized population of Catalonia, a region in the northeast of Spain with about 7.5 million inhabitants. Participants were randomly selected through a multiple-stage random sampling strategy. The official survey definition of active population includes currently working and unemployed individuals between the ages of 16 and 64; however, our study population includes only the active population aged between 25 and 64 ( $N = 8,591$ ). We restricted our sample to those 25 and older because 85 percent of the under-25 active population in the survey were living with parents, which could have potentially distorted estimates of the impact of unemployment benefits or family situation variables.

### *Independent Variables*

*Employment status* was conceptualized into two values: unemployed and employed (reference group). Participants not currently working but actively seeking a job were considered unemployed in the survey. Detailed comparisons were carried out by stratifying the unemployed group by unemployment benefit (yes or no) and duration of unemployment. To minimize reverse causality, we excluded unemployed people who declared they left their last job for health reasons ( $n = 76$ ) (22).

*Age* was categorized in 10-year groups.

*Social class* was separated into non-manual and manual occupational categories, according to respondents' current or most recent occupation and occupational situation in the household (to distinguish participants with a second source of income derived from household resources).

*Gender*—men and women were considered separately in all analyses.

### *Dependent Variable*

The dependent variable was health outcome. Health was measured using mental health status and was defined as “poor” with a score higher than 2 on the GHQ-12 (63). This cut-off score is



recommended by the questionnaire's authors (64) and has been used in similar studies (22). We used the GHQ-12 as our measuring instrument for its ability to detect breaks in normal mental functioning, rather than lifelong traits (22).

### *Data Analysis*

We estimated the prevalence ratio and difference (excess of prevalence) for poor mental health in unemployed and employed persons, with 95 percent confidence intervals (95% CI). Prevalence ratios and differences were computed using a generalized linear model from the binomial family and logarithmic and identity link functions, respectively (65). To identify the most robust unemployment indicators in our sample, we also calculated the population attributable risk (66). We multiplied the unemployment prevalence by the prevalence differences between unemployed and employed individuals. All analyses were carried out using Stata 9 (67).

## RESULTS

Sociodemographic characteristics of the study sample, according to sex, are shown in Table 1. Table 2 shows the prevalence ratios (PR), and Table 3 shows the excess of prevalence (EP) of poor mental health in unemployed and employed persons in different groups, defined by gender, social class, age, and family situation.

### *Social Class*

In men, a stronger association between unemployment and poor mental health was found in the manual group (PR = 2.60; 95% CI 1.73–3.90) than in the non-manual group (PR = 2.19; 95% CI 1.07–4.50). An almost 10 percent excess of prevalence of poor mental health was observed among unemployed manual workers (EP = 9.63; 95% CI 3.68–15.58), compared with just over 6 percent among unemployed non-manual workers (EP = 6.24; 95% CI –1.82 to 14.29). Among women, a stronger association was found in the manual group (PR = 1.23; 95% CI 0.85–1.77) than in the non-manual group (PR = 1.07; 95% CI 0.62–1.85); however, neither finding was statistically significant. Excess of prevalence of poor mental health among unemployed manual-class women was 3.21 percent (95% CI –2.91 to 9.32), compared with 0.75 percent among their non-manual counterparts (95% CI –5.50 to 9.27).

### *Gender and Family Situation*

In terms of gender and family situation, a stronger association between poor mental health and unemployment was found in men (PR = 2.50; 95% CI 1.76–3.55) than in women (PR = 1.22; 95% CI 0.90–1.64), including the EP of poor mental health among exposed individuals (men, EP = 8.45; 95% CI 3.73–13.17; women, EP = 2.65; 95% CI –1.73 to 7.03). The impact was higher for unemployed men who were sharing their home with other earners

(PR = 3.54; 95% CI 2.04–6.15). Conversely, the impact of unemployment on mental health among women was higher among main earners (PR = 1.41; 95% CI 0.93–2.14). Excess prevalence of poor mental health among this group was 6.21 percent (95% CI –2.38 to 14.79), increasing to 14.10 percent (95% CI 1.03–27.16) when unemployed main-earner women did not receive benefits.

Regarding marriage or cohabiting status (data not shown; available on request), the health impact was higher among single women, especially if they had children under 15 years old (PR = 1.67; 95% CI 0.76–3.70). The excess of prevalence of poor mental health among this group was 12.6 percent (95% CI –10.9 to 36.04), and was especially high compared with married women with children (EP = –0.01%; 95% CI –6.3 to 6.3). Among men, the highest prevalence ratio was among those married or cohabiting without children (PR = 2.62; 95% CI 1.49–4.62), with an EP of poor mental health of 8.15 percent (95% CI 1.13–15.18).

### *Age*

Among men, the highest prevalence ratio was found in the 45 to 54 age group (PR = 3.56; 95% CI 1.82–6.98), who experienced the highest excess of prevalence (EP = 13.38; 95% CI 1.67–25.08). Among women, the highest prevalence ratios were among the oldest groups (45 to 54 and 55 to 64 years old) (see Table 3). The highest excess of prevalence was found among the oldest group (EP = 7.40;

95% CI -6.04 to 20.84). No clear age-related pattern of poor mental health due to unemployment was observed.

### *Unemployment Benefits*

Stronger associations between unemployment and poor mental health were found among men and women who did not receive unemployment benefits, when analyzing both overall and within all categories of interactions (Table 3). Men sharing their home with other earners yet not receiving benefits were 5.4 times (95% CI 2.77–10.60) more likely to suffer from poor mental health than their employed counterparts. This likelihood fell to 2.39 times (95% CI 1.02–5.58) for men who received benefits. Similar interactions were found among both manual and non-manual unemployed workers. Excess prevalence among unemployed manual workers without benefits was 12.95 percent (95% CI 2.81–23.08). Among women, the impact of unemployment on mental health was limited to those not receiving benefits (PR = 1.48; 95% CI 1.02–2.15) in both manual (PR = 1.48; 95% CI 0.93–2.36) and non-manual (PR=1.41; 95% CI 0.74–2.71) social class groups. The highest relative impact for unemployed women not receiving benefits was among main earners (PR = 1.94; 95% CI 1.21–3.09) and the 45 to 54 age group (PR = 2.14; 95% CI 1.15–3.99). Excess of prevalence among the main earner group not receiving benefits was 14.10 percent (95% CI 1.03–27.16).

### *Duration of Unemployment*

Long-term unemployment increased the likelihood of poor mental health among most of the groups. This was especially true among long-term unemployed men in the manual class (PR= 2.91; 95% CI 1.46–5.80), men sharing their home with other earners (PR = 6.60; 95% CI 3.09–14.10), main-earner women (PR = 1.79; 95% CI 1.03–3.11), and manual-class women (PR = 1.57; 95% CI 0.98–2.49). Long-term unemployment increases the prevalence of poor mental health, with a higher impact among those in the manual class. Main-earner women who were unemployed for more than 1 year and men sharing their home with other earners were the most vulnerable groups.

### *Selection of Specific Unemployment Indicators*

The groups most exposed to unemployment in the survey population allow us to further refine the selection of the most vulnerable groups. As revealed in the 2006 Catalonian Health Survey, unemployment was more prevalent among women, manual social classes (both sexes), main earners (both sexes), and those aged 45 to 54 (both sexes). We combined information on unemployment prevalence (see Table 3) with excess of prevalence of poor mental health due to unemployment and obtained an approximation of population attributable risk (data not shown in table). The excess of prevalence of poor mental health in the

population is much higher among manual-class groups, for both men (0.18% non-manual vs. 0.54% manual) and women (0.04% non-manual vs. 0.30% manual). Although PR and EP confirmed that men sharing their home with other earners represented a specific vulnerable group, their unemployment prevalence was small. After taking into account population size, attributable frequency of poor mental health is similar among main-earner men and men sharing their home with other earners (0.37% main earners vs. 0.34% other earners). Attributable frequency of poor mental health increases with age among men. Among women, the analysis confirms that main earners are the most vulnerable group in the Catalan population (0.58% main earners vs. 0.02% other earners). We could also observe a pattern due to age, not valid for the 35 to 44 years group.

## DISCUSSION

This study tests the impact of unemployment indicators on mental health inequalities among potentially vulnerable groups and evaluates the usefulness of these indicators for monitoring unemployment over time as a social determinant of health inequalities. Monitoring unemployment as a SDHI needs to take into account social mechanisms of inequality (e.g., social class, gender and its relation to family situation, and immigration) and other contributory risk factors (e.g., unemployment benefits and duration of unemployment). In our study, social class, gender and

its relation to family situation, unemployment benefits, and duration of unemployment were found to be key SDHIs.

Unfortunately, immigration status could not be analyzed, due to limitations in the data; unemployment prevalence was higher among immigrants than among natives, but its effect on mental health was inconclusive. Further research on immigration is needed, using other data sources, to extend the results of our analyses.

After taking into account the interactions among social mechanisms of inequality and related factors among the most vulnerable groups, we found seven groups of unemployment indicators, four for women and three for men. The selected indicators for women were: main-earner unemployed women or unemployed single mothers; main-earner unemployed women not receiving benefits; main-earner women who are long-term unemployed; and long-term unemployed women from the manual class. The selected indicators for men were: unemployed men from the manual class; unemployed men from the manual class not receiving benefits; and men from the manual class who are long-term unemployed.

Men sharing their homes with other earners had a specific vulnerability to unemployment, but it does not explain any particular social inequality other than a pattern of gender. Men and women were considered separately in all analyses and in the final indicators because of their different patterns of employment, with women spending considerable periods of their life in full-time non-

employment roles. Thus the experiences of women are related to their work and family roles (25, 31). As expected, single mothers or main earners were the group of women most affected by the impact of unemployment on mental health (34), since marriage buffers the effects of unemployment (22). Conversely, we did not expect the highest impact of unemployment on mental health to be among men who shared a home with other earners, usually their partners. Because financial problems are one of the main causal pathways of illness for the unemployed (19), we expected main earners of both genders to be most vulnerable. Romeu Gordo (33) found a similar result among men. This unexpected finding might reflect the adverse effects among men when women occupy the primary breadwinner roles in the household.

After adjusting for the prevalence of unemployment, we considered three additional indicators: manual-class unemployed women; older unemployed men; and older unemployed women. Unemployed men sharing a home with other earners were excluded because of the small population size. As expected, the prevalence of unemployment in our study population was higher among women, the manual class, and older workers. With the exception of young workers, who usually experience a higher burden of unemployment, our results were consistent with other studies (21, 22).



### *Strengths and Limitations of the Study*

To the best of our knowledge, this is the first study to develop a list of indicators with the aim of monitoring unemployment as a SDHI. The report of the WHO Commission on Social Determinants of Health indicated the need to collect data on health inequalities, analyze them by socioeconomic and regional groups, and obtain information on the differential distribution of social determinants of health. However, the commission did not mention the need to develop indicators after assessing their differential impact on health and interactions among multiple sources of disadvantage, as we have done in this study.

Early efforts at monitoring such indicators exist both in Sweden and in England. In 2003, Sweden adopted a new public health policy that emphasized the need to monitor social determinants of health (68). To identify factors that affect population health trends, the National Institute of Public Health proposed a series of indicators for surveillance, including the percentage of long-term unemployed people. To be included, indicators must strongly correlate with health outcomes, and data must be stratified by sex, age, type of family, different geographic levels, socioeconomic group, and ethnicity (69). In England, to monitor trends in health inequalities and their social determinants, the Department of Health, through the London Health Observatory, developed a set of local indicators including unemployment (70). Nevertheless, none of these efforts

analyzed which unemployment indicators would be the most useful for a health inequality surveillance system.

Limitations of our study include the danger of reverse causation. We reduced reverse causation effects by excluding individuals who declared they had left their last job for health reasons (22). The reduced number of survey participants in some groups, such as immigrants, was also problematic. Social class was measured using only two categories (manual and non-manual) instead of three, due to data limitations. As a measure of mental health, the GHQ-12 is known to have a high capacity to detect breaks in normal mental functioning, rather than lifelong traits, making it useful for cross-sectional studies. However, it is still necessary to assess the impact of unemployment on other health outcomes, since this may have important implications in the final selection of indicators. Finally, we analyzed unemployment as an isolated employment dimension. The exposure to unemployment, however, interacts with the distribution and characteristics of other employment conditions such as precarious and informal employment. An approach taking into account these other dimensions would encompass more workers, reflecting more precisely the labor market of a given country.

### *Generalization and Applicability*

The impact of unemployment on health inequalities through various social mechanisms will depend on the labor market and social

situation of each country. Labor market characteristics vary according to the country's position in the world-system, based on global income distribution and labor market institutions establishing employment relations and compensation factors that serve to ease the impact of employment relations on population health. For wealthy countries, this means a similar level of development of the welfare state. Thus, in principle, the indicators selected in this study are generalizable to other wealthy countries with labor market characteristics similar to those of Spain, and with corporatist conservative labor institutions (71). Future research should take into account the unemployed group size to allow a final selection of indicators. Our findings should be replicated in these and other wealthy countries, using different databases, to assess whether results are similar to those obtained in our study. Obviously, it is also very important to rethink and test the choice of indicators for middle- and low-income countries.

This study has produced a list of theoretical indicators. To put them into practice, however, operational indicators must be created. For that purpose, the availability of relevant sources of information, the definition of unemployment, and specific methods to build each indicator must be known. Unemployment varies in each country, and its definition changes over time to suit the political and technical purposes of governments. For example, unemployment definitions often leave out a large number of people who would like to work but are prevented even from looking for work—for example, women who could work if childcare services were

adequate (72). To build our indicators, we also need to select the best denominator, such as unemployed, active, or general population. Consideration should also be paid to variables that measure social mechanisms of health inequality, which are not available in the information systems in some countries. Research and Policy Implications Surveillance of SDHIs should not be limited to the differential distribution of social determinants of health in some predetermined groups. For example, unemployment surveillance should go beyond the percentage of unemployment experienced by the population separated by sex and age, which are the groups most typically monitored. SDHIs have a differential impact on population health depending on multiple sources of disadvantage that work together to influence health, as we have shown in this study.

Monitoring SDHIs requires taking into account the differential impact of determinants of health among populations. We need to know which social mechanisms of inequality and contributory risk factors related to the social determinant matter the most, how they work, and for which groups which social factor is more important. In this sense, interactions are essential to understanding the health changes among different groups over time. As Weber and Parra-Medina theorized, intersectional approaches provide “a powerful alternative way of addressing questions about health disparities that traditional approaches have been unsuccessful in answering” (73). Obtaining insight about who is affected, and how, provides a way to monitor and evaluate the impact of the social determinant in

question and of related policies and programs on different subgroups (74).

### *Final Remarks*

As mentioned by the WHO Commission on Social Determinants of Health (2), the development of health equity surveillance systems is an important priority in the reduction of health inequalities. Reported here is the first exploratory study on monitoring unemployment as a social determinant of health inequalities after assessing their differential impact on health, which also tries to overcome some of the limitations of the commission's report (9). Today, there is an urgent need to extend these analyses to other employment indicators, to explore in depth other mechanisms of health inequality such as immigration or race/ethnicity, and to replicate the studies in other countries.

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Table 1. Socio-demographic characteristics of the study sample according to sex.

	MEN	n%
<i>Social class</i>		
Non-manual class	2,168	45.2
Manual class	2,628	54.8
<i>Family situation</i>		
Main earners	2,287	47.45
Other earners	2,533	52.55
<i>Immigration status</i>		
Native	4,326	91.15
Immigrant	420	8.85
<i>Age</i>		
25–34	1,510	31.33
35–44	1,442	29.92
45–54	1,157	24
55–64	711	14.75
<i>Total</i>	4,820	100
WOMEN		
<i>Social class</i>		
Non-manual class	1,944	53
Manual class	1,724	47
<i>Family situation</i>		
Main earners	1,030	27.88
Other earners	2,665	72.12
<i>Immigration status</i>		
Native	3,382	93.19
Immigrant	247	6.81
<i>Age</i>		
25–34	1,297	35.1
35–44	1,129	30.55
45–54	871	23.57
55–64	398	10.77
<i>Total</i>	3,695	100

**Table 2**  
Prevalence ratios of poor mental health according to employment status, by sex and social mechanisms of inequality, from the Catalonian Health Survey 2006

	Employment	Unemployment	Unemployment with benefits	Unemployment without benefits	Unemployment <1 yr	Unemployment >1 yr
	PR	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)
<b>MEN</b>						
<i>Social class</i>						
Non-manual class	1	2.19 (1.07–4.50)	1.86 (0.72–4.81)	2.87 (0.99–8.26)	2.22 (0.96–5.16)	2.25 (0.60–8.37)
Manual class	1	2.6 (1.73–3.90)	2.24 (1.29–3.88)	3.15 (1.81–5.49)	2.24 (1.34–3.73)	2.91 (1.46–5.80)
<i>Family situation</i>						
Main earners	1	1.88 (1.19–2.96)	1.87 (1.06–3.32)	1.89 (0.93–3.83)	2.04 (1.21–3.46)	1.43 (0.56–3.67)
Other earners	1	3.54 (2.04–6.15)	2.39 (1.02–5.58)	5.42 (2.77–10.6)	2.36 (1.08–5.15)	6.6 (3.09–14.10)
<i>Age</i>						
25–34	1	1.93 (0.92–4.03)	2.23 (0.86–5.77)	1.63 (0.54–4.92)	1.92 (0.87–4.24)	— —
35–44	1	2.7 (1.34–5.45)	1.4 (0.37–5.34)	4.29 (1.98–9.28)	2.76 (1.22–6.26)	1.54 (0.24–10.02)
45–54	1	3.56 (1.82–6.98)	3.54 (1.55–8.13)	3.59 (1.26–10.2)	2.64 (1.03–6.78)	5.47 (2.30–12.99)
55–64	1	2.39 (1.17–4.88)	1.87 (0.77–4.54)	4.4 (1.57–12.31)	2.35 (0.89–6.15)	2.61 (1.00–6.79)
<i>Total</i>	1,00	2.5 (1.76–3.55)	2.17 (1.35–3.48)	3.03 (1.85–4.95)	2.28 (1.47–3.52)	2.8 (1.52–5.16)

*Note:* PR, prevalence ratio of poor mental health relative to employed workers in each group

Table 2. Continuation

	Employment	Unemployment	Unemployment with benefits	Unemployment without benefits	Unemployment <1 yr	Unemployment >1 yr
	PR	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)
<b>WOMEN</b>						
<i>Social class</i>						
Non-manual class	1	1.07 (0.62–1.85)	0.72 (0.28–1.86)	1.41 (0.74–2.71)	1.28 (0.69–2.38)	0.53 (0.14–2.07)
Manual class	1	1.23 (0.85–1.77)	1.02 (0.59–1.74)	1.48 (0.93–2.36)	0.97 (0.55–1.70)	1.57 (0.98–2.49)
<i>Family situation</i>						
Main earners	1	1.41 (0.93–2.14)	0.87 (0.40–1.85)	1.94 (1.21–3.09)	1.08 (0.56–2.08)	1.79 (1.03–3.11)
Other earners	1	1.03 (0.67–1.57)	0.99 (0.55–1.80)	1.06 (0.59–1.92)	1.09 (0.64–1.88)	1.03 (0.53–2.00)
<i>Age</i>						
25–34	1	1.43 (0.86–2.38)	1.25 (0.62–2.54)	1.68 (0.84–3.34)	1.52 (0.87–2.67)	1.44 (0.50–4.12)
35–44	1	0.58 (0.27–1.28)	0.42 (0.11–1.60)	0.73 (0.28–1.87)	0.22 (0.31–1.51)	0.95 (0.41–2.20)
45–54	1	1.53 (0.89–2.63)	0.97 (0.38–2.49)	2.14 (1.15–3.99)	1.3 (0.61–2.77)	2.1 (1.03–4.27)
55–64	1	1.54 (0.79–3.01)	1.37 (0.48–3.94)	1.67 (0.74–3.76)	1.63 (0.47–5.68)	1.22 (0.48–3.10)
<i>Total</i>	1	1.22 (0.90–1.64)	0.96 (0.60–1.53)	1.48 (1.02–2.15)	1.11 (0.73–1.69)	1.38 (0.90–2.13)



Table 3

Excess of prevalence of poor mental health according to employment status by sex and social mechanisms of inequality from the Catalonian Health Survey 2006

	Unemployment EP <sup>a</sup> % (95% CI)	Unemployment with benefits EP % (95% CI)	Unemployment without benefits EP % (95% CI)	Unemployment <1 yr EP % (95% CI)	Unemployment >1 yr EP % (95% CI)	Unemployment prevalence, %
<b>MEN</b>						
<i>Social class</i>						
Non-manual class	6.24 (-1.82–14.29)	4.52 (-4.62–13.65)	9.76 (-5.91–25.44)	6.39 (-3.24–16.02)	6.53 (-8.82–21.87)	2.86
Manual class	9.63 (3.68–15.58)	7.46 (0.31–14.62)	12.95 (2.81–23.08)	7.44 (0.82–14.07)	11.48 (-3.31–23.29)	5.59
<i>Family situation</i>						
Main earners	6.15 (0.39–11.91)	6.1 (-1.19–13.40)	6.22 (-2.96–15.39)	7.29 (0.02–14.56)	3.01 (-6.35–12.37)	6.08
Other earners	11.34 (3.10–19.57)	6.18 (-2.67–15.04)	19.68 (4.09–35.28)	6.07 (-1.94–14.08)	24.96 (3.28–46.63)	3
<i>Age</i>						
25–34	4.74 (-2.28–11.77)	6.31 (-4.29–16.92)	3.22 (-5.88–12.32)	4.72 (-2.84–12.28)	-17.62 (-97.64–62.41)	4.77
35–44	11.03 (-0.82–22.87)	2.62 (-9.47–14.70)	21.3 (0.57–42.04)	11.38 (-2.86–25.63)	3.53 (-15.11–22.16)	2.84
45–54	13.38 (1.67–25.08)	13.29 (-1.42–28.00)	13.52 (5.64–32.69)	8.57 (-4.05–21.19)	23.34 (-0.35–47.05)	3.72
55–64	7.88 (-1.04–16.79)	4.95 (-4.04–13.95)	19.32 (-5.25–43.88)	7.65 (-4.64–19.94)	9.13 (-4.39–22.65)	8.3
<i>Total</i>	8.45 (3.73–13.17)	6.58 (0.93–12.22)	11.44 (3.27–19.61)	7.2 (1.77–12.63)	10.15 (0.66–19.64)	4.46

Note: EP, excess prevalence of poor mental health relative to employed workers in each group.

Table 3. Continuation

	Unemployment EP <sup>a</sup> % (95% CI)	Unemployment with benefits EP % (95% CI)	Unemployment without benefits EP % (95% CI)	Unemployment <1 yr EP % (95% CI)	Unemployment >1 yr EP % (95% CI)	Unemployment prevalence, %
<b>WOMEN</b>						
<i>Social class</i>						
Non-manual class	0.75 (-5.50-9.27)	-2.99 (-10.37-4.39)	4.41 (-5.33-14.15)	2.96 (-5.44-11.35)	-4.97 (-12.79-2.85)	5.45
Manual class	3.21 (-2.91-9.32)	0.24 (-7.36-7.84)	6.67 (-2.76-16.09)	-0.47 (-8.04-7.11)	7.86 (-2.03-17.40)	9.22
<i>Family situation</i>						
Main earners	6.21 (-2.38-14.79)	-2.03 (-12.03-7.97)	14.1 (1.03-27.16)	1.26 (-9.34-11.86)	11.96 (-2.54-26.45)	9.32
Other earners	0.28 (-4.56-5.13)	-0.09 (-6.63-6.45)	0.68 (-6.27-7.64)	10.41 (-5.51-7.59)	0.35 (-7.21-7.90)	6.6
<i>Age</i>						
25-34	4.76 (-3.01-12.53)	2.75 (-6.86-12.36)	7.45 (-5.00-19.90)	5.69 (-3.47-14.86)	4.82 (-11.67-21.31)	6.86
35-44	-5.32 (-11.44-0.79)	-7.42 (-14.98-0.15)	-3.52 (-12.44-5.39)	-10.05 (-15.78,-4.31)	-0.62 (-10.85-9.59)	7.09
45-54	6.61 (-3.35-16.57)	-0.32 (-11.68-11.05)	14.23 (-1.76-30.22)	3.78 (-8.32-15.87)	13.65 (-4.44-3.17)	7.35
55-64	7.4 (-6.04-20.84)	5.1 (-14.35-24.55)	9.07 (-8.79-26.95)	8.57 (-18.82-35.97)	3.02 (-12.31-18.34)	9.8
<i>Total</i>	2.65 (-1.73-7.03)	-0.49 (-5.98-5.00)	5.88 (-0.75-12.51)	13.47 (-4.27-6.96)	4.65 (-2.52-11.83)	7.36

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