

Monitoring employment-related health inequalities in Europe

The case of unemployment and
precarious employment

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*Als meus avis,
l'àvia Palmira i l'avi Casimiro,
per tot el que m'heu transmès,
per la vostra confiança en mi i la vostra alegria,
però sobretot per donar-me esperança*

*Al Joan,
el meu company de viatge,
pel teu suport incondicional*

Agraïments

*A l'atzar agraeixo tres dons: haver nascut dona,
de classe baixa i nació oprimida.
I el tèrbol atzur de ser tres voltes rebel*

Maria-Mercè Marçal (1952- 1998)

Probablement poques frases poden descriure tan bé el context personal d'aquesta tesi com la divisa de Maria-Mercè Marçal. Vaig néixer dona i he observat de ben a prop l'opressió. Vaig néixer en una família de classe obrera, i n'he patit la desigualtat. Estimo la meva terra i la meva llengua i moltes vegades encara és difícil expressar-m'hi. És per aquest motiu que les següents línies no podien ser escrites de cap altra manera que en la meva llengua materna.

Aquesta tesi doctoral resumeix l'esforç intel·lectual d'un gran nombre de persones per entendre les desigualtats en salut generades en el sí del mercat laboral, especialment les desigualtats de gènere i de classe social. No obstant, en aquestes pàgines no s'hi troba tot el que he après, tot el que he descobert, el que m'ha fet patir i el que m'ha fet feliç durant aquests anys. I és perquè això no es troba només en els resultats científics, sinó sobretot es troba en la gent que ens acompanya.

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Abstract

This PhD dissertation aims to advance knowledge on monitoring employment-related health inequalities, focusing on arguably the two most relevant employment conditions in high-income regions like Europe, namely unemployment and precarious employment. In the conceptual part, a critical review is made in the fields of public and occupational health research regarding the monitoring of employment-related health inequalities. In the empirical part, three specific research exercises are made. In paper 1, an innovative proposal to disaggregate commonly used unemployment indicators to social subgroups is developed. From this analysis seven specifically vulnerable population subgroups arise. In papers 2 and 3, a concept-based set of indicators of precarious employment in Europe is created, using the most appropriate existing cross-national data. Findings show that, in general, women, workers without supervisory authority, those with fewer credentials, and those living in Eastern and Southern Europe suffer the highest levels of precarious employment. Furthermore, consistent associations with job dissatisfaction are found, as well as some associations with poor work-related health. In relation to these outcomes remarkable gender and country-patterns are found.

Resum

L'objectiu d'aquesta tesi doctoral és avançar en el coneixement sobre la vigilància de les desigualtats en salut relacionades amb l'ocupació, centrant-se en les dues condicions d'ocupació més rellevants en zones riques com Europa com són l'atur i la precarietat laboral. En la part conceptual, s'ha realitzat una revisió crítica en els camps de la salut pública i la salut laboral en relació a la seva vigilància. En la part empírica, s'han realitzat tres tipus de treballs d'investigació. En el primer article, s'ha desenvolupat una proposta innovadora desagregant en distints subgrups poblacionals els indicadors d'atur que habitualment s'utilitzen. En el segon i tercer article, s'ha creat un conjunt d'indicadors per mesurar la precarietat laboral a Europa, basat en una sòlida conceptualització de la precarietat i mitjançant l'ús de les millors dades europees disponibles. Els resultats mostren com, en general, les dones, les persones treballadores que no disposen d'autoritat per supervisar a altres treballadors, les que tenen poques credencials educatives, i aquelles que viuen als països de l'est i sud d'Europa, pateixen els nivells més alts de precarietat laboral. També s'han trobat associacions consistents entre la precarietat i la insatisfacció laboral, i en menor mesura, entre la precarietat i la mala salut relacionada amb la feina. En relació a aquests resultats, apareixen patrons de gènere i de país molt destacables.

Preface

This study is embedded in a new research line on monitoring employment-related health inequalities within the GREDS-EMCONET research group at the University Pompeu Fabra in Barcelona, and the Interface Demography Group of the Vrije Universiteit Brussel. The monitoring of social determinants of health and resulting health inequalities has become a topic of increasing interest among some public health authorities and scientists. This interest has grown in parallel to the increased interest in studying social determinants of health, because of persistent and growing social health inequalities. However, most social determinants of health remain outside surveillance systems and this area of public health remains limited or marginal within mainstream policy practice. Surveillance of social determinants of health is therefore a neglected but essential and challenging public health issue.

This dissertation departs from the experience of GREDS-EMCONET in conceptualizing employment conditions in relation to population health inequalities, and precarious employment in particular. To our knowledge, the present thesis represents the first doctoral dissertation aiming to advance knowledge about the monitoring of employment-related health inequalities focusing on two highly relevant employment conditions in Europe, namely unemployment and precarious employment. Today, other doctoral dissertations are being developed to broaden this line of research to

other employment conditions such as informal employment in high, middle and low-income countries.

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1. INTRODUCTION, JUSTIFICATION AND OBJECTIVES

“All diseases have two causes, one pathological,
the other political.”
Virchow, R. (1821–1902)

Population health is strongly influenced by social determinants such as education, work, income, and the living environment. These social and economic conditions shape individual and population health throughout the life course (CSDH, 2008; Solar & Irwin, 2010; Wilkinson & Marmot, 2003). Social determinants of health are unequally distributed according to the social structure of society, i.e. by social class, gender, ethnicity, migration status, etc. This unequal distribution is the main responsible for gradient-wise health inequalities, with the worst health in the most socially disadvantaged groups and on average improving health outcomes with every next step on the social ladder (Marmot, 2005). Social health inequalities are one of the most important public health problems of our times and they are expanding (Benach & Muntaner, 2005). Scientific evidence also shows that health inequalities can be reduced when appropriate public health and social policies and interventions are implemented. That is, if population health is considered by a given society as a valuable asset, attention must be directed to those economic and social policies that have been proven useful for attaining better population health (Raphael, 2006; Whitehead, 2007). As the policy discourses of many European countries and the European Union (Calvete Oliva, et al., 2010) are

indeed stressing the importance of improving health equity, addressing social determinants of health is arguably perhaps the most important current public health challenge in Europe. (Technical Committee for the priority of the Spanish Presidency on Monitoring SDH, 2010).

Knowledge on the association between social factors and unequal levels of health in the population is longstanding. However, the interpretation of their causes has changed throughout history. In this dissertation, using a political economy perspective, social health inequalities are understood as ultimately resulting from political processes and the distribution of power, prestige and resources among groups in society affecting the access to social determinants of health (Navarro, 2004; Solar & Irwin, 2010). In that regard, a distinction between *structural determinants of health inequality* and *intermediate social determinants of health* has been established. *Structural determinants* refer specifically to the interplay between the socioeconomic and political contexts and the resulting relations with structural mechanisms generating power differences (i.e. social class, gender, age, among others). These structural determinants, in turn, shape the distribution of the *intermediary determinants of health* such as housing, employment and working conditions, among many others (Comisión para Reducir las Desigualdades Sociales en Salud en España, 2010; Solar & Irwin, 2010).

Employment and working conditions have been considered key global social determinants of health (Benach, et al., 2007). Work, in

its broadest sense, has an important influence on population health and health inequalities, because work environments involve exposure to many factors that may potentially affect health. Moreover, the majority of the world's population is involved in work of some kind – and for those involved it is often one of the most important social institutions they are embedded in. In European countries, as most other industrialised countries, work is predominantly organized around wage-labour relationships. In western societies, wage-labour does not only provide daily sustenance for most people but it is also the main source of socialization. Research suggests that fair and efficient government policies on labour and welfare can reduce health inequalities that are generated by poor employment, working conditions and unemployment (Benach, Muntaner, Chung, et al., 2010).

The health impact of a specific job is determined by the nature of the work task and the related working conditions, the conditions of employment, and the prevailing employment relations (Benach, Muntaner, Solar, et al., 2010). Working conditions refer to the physical and psychosocial conditions of work. Employment conditions refer to the mutual agreement between employees and their employer in terms of contract, rewards and expectations. Finally, employment relations refer to the mutual power relations between employers and employees, both as collective or as individual actors (Benach, Muntaner, Solar, et al., 2010; Van Hoof & Huiskamp, 1989). From a power resource perspective, employment relations are the result of an asymmetrical power

relationship informed by the ownership of the productive assets by the employers (Wright, 1989). From the control over capital, employers derive a certain degree of authority over workers (Carchedi, 1977). However, a higher or lower degree of asymmetry depends on multiple other structural factors, like, the presence and strength of trade unions and collective bargaining, the existence of regulatory employment legislation and the degree of labour de-commodification and social protection (Barbash, 1989; Esping-Andersen, 1991).

Employment relations in Western European countries have undergone profound changes when comparing the *institutionalised* “Golden Age of Capitalism” (1940s-1970s) with the situation of around the turn of the 21st century. The socioeconomic order of the Golden Age is often characterized as ‘Fordism’: a distinct conjuncture of industrial mass production, mass consumption, public macro-economic intervention (Keynesianism) and the development of welfare states as the key mechanism of social redistribution (Esping-Andersen, 1991). During 30 years, this conjuncture allowed for increasing bargaining power of male workers, and the growth of a system of social and work-related security often labelled as the Standard Employment Relationship (SER). This dissertation aims to stress that the SER was based on a specific gender contract with a specific sexual division of paid and unpaid labour (Vosko, 2010). Moreover, this socioeconomic model developed with important cross-national differences regarding the extent of welfare spending and entitlement (Muntaner, Chung, et

al., 2010), as well as, cultural differences regarding dominant family models (Pfau-Effinger, 2004). These cross-national differences in terms of gender and social welfare development are key factors to understand labour market changes during the last decades.

The post-war socioeconomic order came to an end during the 1970s. A set of economic, political, ideological, technological and demographical forces led to changes in employment relations with important implications for the quality of jobs, employment conditions, unemployment provisions, and other forms of social protection. As a whole, the key consequences have been the diminished workers' bargaining power and social rights (Arnold & Bongiovi, 2013). Changing employment conditions have been characterized by the increase of unemployment, the increasing instability of contracts and unsustainability of wages, the diminishing of social protection and workers' control over working time, the capacity to reproduce one's skills and the lowering degree of collective representation and participation (Rodgers, 1989; Standing, 1999).

The worsening of employment conditions has been unequally distributed among the workers, both at the national level and in the international division of labour. Gender, social class and credentials, together with geographical location, have been key social mechanisms in the distribution of poor employment conditions and unemployment. Three main dimensions can explain

the increase of labour market inequalities and their cross-national differences (in extent and form). First, liberalization or re-commodification of the labour markets has occurred in each country but under different social coalitions; taking different forms and, more important, having different key implications for distributive outcomes (Thelen, 2012). Second, employers have provoked labour market segmentation, that is, the creation of a secondary labour market in those countries with a strong labour market regulation (Rubery, 2007). Third, the diminishing of collective power has left workers alone in the labour market with their social individual position to bargain (Vives, 2010).

Most of the changes in employment relations and consequent conditions in Europe that occurred during the last decades are potentially harmful for population health. And what is more relevant for this dissertation, they are potentially increasing health inequalities due to their unequal distribution and differential impact. An extensive literature associates unemployment with poor mental health, physical health (from self-reported physical illness to mortality), well-being, role functioning and unhealthy behaviours (Bartley, 1994; Dooley, et al., 1996; Dooley, 2003; Hammarström & Janlert, 2005; Mathers & Schofield, 1998). Apart from being unequally distributed, unemployment may have different health consequences depending on one's individual position in society and the social protection received (Artazcoz, et al., 2004; Benach, Solar, Vergara, et al., 2010; Rodriguez, et al., 1997). Different possible mechanisms of mediation between unemployment and poor health

have been elucidated. Having a job provides economic resources for sustenance (Nordenmark & Strandh, 1999), avoids uncertainty about future (Levi, 1997), and also gives the day a time structure, provides opportunities for social contact, contributes to status and personal identity for the individual and provides an opportunity to strive towards collective purposes and share experience (Jahoda, 1982).

However, for disadvantaged groups in the labour market, the changing employment conditions and relations have probably undermined the beneficial health effects of working (Dooley, 2003). Until today, changing employment conditions and their health consequences have been mostly studied partially. The recent attention to the study of employment conditions as a social determinant of health represents an important change for occupational health research since it broadens-up a too narrow focus on the psychosocial work environment as a source of work-related health problems (Benach, et al., 2007). Notwithstanding major advances in this field, knowledge on the different employment conditions is still limited.

One of the most-studied employment conditions has been the *instability of employment*. Various contributions have focused on the consequences for health and quality of life of those types of employment situations that differ from permanent employment (Bardasi & Francesconi, 2004; Benavides, et al., 2000; Quinlan, et al., 2001). Also a *perceptual approach* has been adopted here,

concentrating on the workers perception of job insecurity (De Cuyper & De Witte, 2007; Ferrie, et al., 2005). Other researchers have focused on *downsizing and organisational restructuring* and have addressed the imminent threats of job loss due to these restructuring processes (Kivimaki, et al., 2001; Vahtera, et al., 2004). Notwithstanding the importance of these contributions, they are in a certain way reductionist in the sense that the changing relations and conditions of employment are much broader than the stability of employment alone (Amable, 2006).

More recently, important key research on employment-related health inequalities has been developed thanks to the specific interest of a group of researchers from Barcelona led by Benach, Muntaner, Borrell and Artazcoz, as well as the Commission on Social Determinants of Health (CSDH) of the World Health Organization (WHO). More specifically, important improvements have been made regarding the conceptualization (Amable, 2006; Porthe, et al., 2010) and measurement (Vives, et al., 2010) of precarious employment, taking into account its multidimensional character. To grasp into the different characteristics of the precarisation of employment, Amable, Vives and other scholars from Pompeu Fabra University in Barcelona, Spain (GREDS-EMCONET research group), have developed an employment precariousness construct. It considers the degrading of the different characteristics of employment that are ideal-typically manifested in the SER. As such, employment precariousness can measure the extent of deviation of an actual employment arrangement from a golden

standard of “good employment”. The construct encompasses the following dimensions: (1) employment (in) stability or temporariness; (2) (insufficient) income; (3) the (lack of) workplace rights and social security benefits; (4) the (in) capacity to actually exercise the rights and benefits the worker is entitled; (5) the (absence of) collective bargaining over employment and working conditions; (6) informal relations or empowerment security – (including vulnerability and individual participation) (Amable, 2006; Vives, et al., 2010).

Unemployment and precarious employment are key employment conditions in Europe due to its magnitude and increasing prevalence, and also because of its unequal distribution in terms of gender, social class, credentials and country. Employment inequalities due to migration status have also considerably increased during last years; however, they are beyond the focus of this dissertation. Unemployment and precarious employment are arguably perhaps two of the most important social determinants of health and health inequalities in Europe. In that regard, unemployment has been identified as one of the 10 most important contributors to the total burden disease in the European Union (Diderichsen, et al., 1997). But also the important changes regarding employment and working conditions in Europe during last decades have put them high on the public health agenda. Furthermore, in terms of health effects, unemployment and precarious employment are highly interrelated. With the worsening of employment conditions, for some proportion of the reemployed

the new job that follows unemployment may not be the antidote to the toxic effects of unemployment (Dooley, et al., 1996). Moreover, the existing unemployment protection systems, modelled on the basis of the SER (with only temporary stints of unemployment), are nowadays ill-equipped to offer effective coverage in labour markets dominated by “atypical” and “flexible” employment (Clasen & Clegg, 2011). For these reasons, it is necessary to advance in the study of employment-related health inequalities. We need to improve knowledge on the social distribution and differential impact of unemployment and precarious employment over time and across countries. To achieve this goal, measurement improvements are desirable. Appropriate monitoring employment-related health inequalities will provide key information for developing more appropriate healthy, fair employment policies and the reduction of health inequalities (Benach, et al., 2012).

The recognition of surveillance/monitoring as a key tool for improving public health has a long tradition. It has been a central tool for intervention and policy making since many centuries. It consists of the ongoing, systematic collection, analysis, interpretation and dissemination of data regarding health-related events for use in public health action to reduce morbidity and mortality and to improve health (CDC, 2001). The information obtained is used to identify public health priorities, facilitate planning, trigger public health action and finally to evaluate the impact of policies and interventions (Thacker & Berkelman, 1992). Born to prevent the spread of infectious diseases, nowadays public

health surveillance has been broadened to chronic diseases, health-related behaviours and the environment, among others.

During the last years, monitoring of social determinants of health and health inequalities has become a topic of increasing interest to public health experts. Although not entirely developed, conceptually and practically, we can distinguish two important components: a political component and a research component. Politically, different national and international organizations have played an important role recommending equity monitoring to national authorities and setting standards for data collection and reporting (Calvete Oliva, et al., 2010; CSDH, 2008). Moreover, the perspective of “equity and health in all policies” has been introduced (Calvete Oliva, et al., 2010). From this perspective, policies from all sectors (not only the health sector) should systematically take into account the health implications of decisions in their own domains, seek synergies, and avoid harmful health impacts to improve health and health equity (Cook, et al., 2013). The field of epidemiologic research has contributed by increasing conceptual clarity, establishing differences between conventional public health surveillance (understanding conventional surveillance as the tool created for the control of infectious disease), and making evident some of the challenges involved by monitoring social determinants of health and related health inequalities (Braveman, 2003; Breilh, 2003; Sadana & Harper, 2011). Furthermore, some Public Health Services have introduced the practice of monitoring health inequalities and (few) social determinants of health in their

Health Observatories (Fitzpatrick & Jacobson, 2003; Lundgren, 2004).

In several European countries and in general in most western countries, work-related health monitoring schemes do exist. However, these schemes often focus on “traditional” aspects of occupational health such as occupational diseases, work injuries, and as a quite more innovative perspective, psychosocial risk factors. Moreover, they are often limited to mere descriptions of working conditions in the general working population. Less abundant are those monitoring schemes analyzing the contribution of working conditions to health inequalities among workers by stratifying their distribution over social and occupational categories, even less abundant are those including employment conditions (Benach, et al., 2012; Landsbergis, 2010; Landsbergis, 2003). Various researchers have stated the need of periodical in-depth monitoring employment and working conditions in order to assess their trends and analyze its contribution to health inequalities (Benach, et al., 2012; Landsbergis, 2010; Marmot, 2010).

A broad review of the state-of-the-art shows that knowledge of employment-related health inequalities remains limited or neglected, and their monitoring is limited to a few indicators of employment conditions, generally unemployment (Benach, et al., 2012). From the public health field, two important contributions exist to the advancement of knowledge about monitoring work and employment conditions: the Marmot’s “Fair Society Healthy Lives

Report” (Marmot, 2010) and the *WORKHEALTH* project (Kreis J & Bödeker, 2004). Notwithstanding these key precedents, there is a paucity of conceptual developments and a shortage in the development of indicators and the generation of data for the study and monitoring of employment-related health inequalities (Benach, et al., 2012).

This is especially true for “relatively” new phenomena in the labour market such as precarious employment. In that regard, different initiatives aimed to conceptualize and measure changes in the quality of employment and precarious employment exist from the field of sociology and industrial relations research (De Bustillo, 2011; Frade, et al., 2004; Ghai, 2003; Holman & McClelland, 2011; Leschke, et al., 2008; Tangian, 2007). However, with few exceptions, these measures consist of aggregated data; they are constructed with data available in different data systems; and most data systems do not include health data. This impedes the study of employment-related health inequalities, especially at the individual level. Notwithstanding these difficulties, a first experience measuring precarious employment at the individual level exists for Spain. It concerns the above cited Employment Precariousness Scale (Vives, et al., 2010). However it is necessary to achieve further advances in this field of knowledge. When we aim to monitor precarious employment health related inequalities in Europe, a set of indicators to measure precarious employment based on a solid conceptualization is desirable.

Moreover, there is a paucity of knowledge on the best way to disaggregate indicators considering social mechanisms of inequality and other related factors. Statistical averages hide distinct realities. If only national averages of social determinants and health indicators are monitored, that may not provide a complete representation of the changes in the population (Hosseinpoor, 2013). The national average of an indicator could remain constant over time, while certain population subgroups experience improvement in employment conditions and other see them deteriorating; it may even be possible to have improving national averages while within-country inequality increases. Moreover, when analyzing the impact of a social determinant on health, the average of the association may provide a wrong answer. Unemployment can have a low impact on women's health, hiding severe impact on specific groups of women. Monitoring employment-related health inequalities requires a closer look at patterns within subgroups of the population. Properly disaggregated indicators are essential to locate problems, design interventions and policies and allocate resources.

The existing efforts of conceptualization and measurement make unemployment available as an indicator in some health-related monitoring systems. However, it is generally disaggregated only by sex, age and geographic context. It is known that other social mechanisms of inequality such as social class, credentials and migration status are key mechanisms distributing unemployment and also explaining the differential impact on health among the

population. Moreover, social mechanisms of inequality intersect and interact, as gender, migration status, age, and social class are attenuating or reinforcing one another, producing heterogeneous results in distinct social positions (Juteau, 2003; Weber & Parra-Medina, 2003). Incipient studies in the public health field show how these intersections are key to understand the differential impact of employment conditions on health, increasing health inequalities (Artazcoz, et al., 2004). Thus, more information is needed on how best to disaggregate unemployment and poor employment conditions indicators according to the important mechanisms of social inequality and other related factors and to identify the most important groups to monitor.

To advance in the monitoring of precarious employment and unemployment related health inequalities in Europe, this study aims to achieve the following objectives:

- 1- To identify which population groups are most vulnerable to the mental health impact of unemployment considering the intersectionality of the most relevant social mechanisms of inequality and related factors (Paper 1).
- 2- To empirically test a new multidimensional construct for measuring precarious employment in a European existing database (Papers 2 and 3).

3- To analyze the social distribution of precarious employment in Europe (Paper 2).

4- To analyze the association of precarious employment, job dissatisfaction and poor work-related health and its differential impact according gender and country (Paper 3).

The chapters that follow are organized in the following manner. Chapter 2 offers a brief review of concepts and theories for the study of social determinants of health and social health inequalities. This chapter also aims to clarify the causal framework based on the political economy of health theory used here in order to explain health inequalities.

Chapter 3 identifies work and employment as key global determinants of health and health inequalities. From the political economy theory, a conceptual framework is presented which tries to make sense of the complex link between macro-social power relations, employment conditions and its impact on workers' health inequalities. This framework is based on the work of the Employment Conditions Network (EMCONET), a knowledge network born from the collaboration with the Commission on Social Determinants of Health (CSDH) of the World Health Organization (WHO). Next, the employment relations in Europe are historically contextualized. The aim is to highlight the major changes in employment relations and consequent conditions that could affect population's health and health inequalities. As stated above,

employment relations have undergone profound changes in the last decades, which is especially true for unemployment and precarious employment. Despite these changes, epidemiologic research has mostly focused on the nature of work tasks and lesser on the nature of employment relations and their consequences in terms of conditions. Thus, the last objective of this chapter is to set some light in the occupational health knowledge about unemployment and precarious employment, the two most relevant employment conditions in Europe.

Chapter 4 focuses on the need of monitoring the social determinants of health and their contribution to health inequalities and more specifically on the need of monitoring employment-related health inequalities. First, the chapter points out the importance of public health surveillance/monitoring as a central tool for public health policy. A historical overview regarding the use and evolution of public health surveillance and monitoring is presented. Second, political, research and practical advances in monitoring of social determinants of health and health inequalities are reviewed. Then the state-of-the-art of monitoring employment-related health inequalities is presented, and specific knowledge gaps and challenges are identified, to further review how precarious employment and unemployment have been conceptualized and measured. Challenges and limitations on monitoring precarious employment and unemployment related to health inequalities are identified. One of the objectives of this dissertation is to advance on some of these last limitations.

Chapter 5 introduces general aspects of materials and methods which are described in further detail in each of the manuscripts of the results section.

Chapter 6 presents the results of the three sub-studies in the form of published or to be published original research articles.

Chapter 7 discusses the research results, and summarizes the main conclusions and recommendations.

2. THE SOCIAL DETERMINANTS OF HEALTH INEQUALITIES: CONCEPTS AND THEORIES

2.1. The social determinants of health inequalities

The social determinants of health are the circumstances in which people are born, grow up, live, work, and age, as well as the systems put in place to deal with illness (CSDH, 2008; Solar & Irwin, 2010; Wilkinson & Marmot, 2003). A mother's social conditions will affect the intra-uterine health of an unborn child; education and environment conditions will shape health during childhood; working conditions, material assets, among others, will shape adult health; and income and other assets will affect health at old age – all of this in an accumulative way throughout the life course. Social determinants of health are unequally distributed according to the social structure. This unequal distribution is the main responsible for health inequalities, with worse health in the more socially disadvantaged groups (Whitehead, 1992) and following a gradient shape (Marmot, 2005). The size and the distribution of these social determinants of health are shaped by a wider set of forces: economics, social policies, and politics (CSDH, 2008).

Social health inequalities are one of the most important epidemic diseases of our times and they are expanding (Benach & Muntaner, 2005). Moreover, it is one of the greatest social injustices in contemporary affluent societies (Benzeval, et al., 1995). Therefore,

addressing social determinants of health in order to achieve more health equity is perhaps the most important current public health challenge in Europe and worldwide (Calvete Oliva, et al., 2010; CSDH, 2008).

Although scientific insights on the general relationship between social factors and health are longstanding, it is yet not precisely understood in causal terms. Furthermore, conceptual approaches to understand the causes of health inequalities largely vary. Consequently the policy imperatives necessary to reduce inequalities in health are not easily deduced from existing data (MEKN, 2007). Thus, scientific researchers aiming to describe and explain population's health are in the first place obliged to clarify the theories from which they depart. The aim of this chapter is to make explicit the theoretical and conceptual starting positions of this research.

2.2. Social health inequalities and their intersections

Social health inequalities are those systematic, unfair and avoidable differences in the health of groups occupying unequal social positions in society (Townsend, Davidson, Whitehead, eds., 1988; Whitehead, 1992). Social health inequalities are the result of different opportunities and resources related with health according to social class, gender, ethnicity, age, sexual orientation, among others (Krieger, et al., 1993). These can be labelled *axes of social*

health inequality, also called *social mechanisms of health inequality* in this dissertation.

The fact that people in different social circumstances experience amendable differences in health and life is unfair. “Health inequities” are a matter of social justice (Marmot, 2010). We specifically use the term “health inequities” as a normative concept to refer to the unjust differences in health between people of different social groups. The term “health inequalities” is used to refer to those observable differences between subgroups within a population that can be measured and monitored, and thus serve as an indirect means of evaluating health inequity (Peter & Evans, 2001; Whitehead, 1992).

In contemporary societies the main axes of social health inequality are social class, gender and ethnicity, migration status, age, education/credentials, territory and sexual orientation. In fact, axes of social health inequality are *social contingencies*: they vary in their importance and existence as mechanisms of resource allocation over time and context. This dissertation mainly focuses on gender, social class and credentials, which are arguably among the most important in contemporary affluent societies. These axes are briefly described in the following lines.

Gender refers to a social construct describing culture-bound conventions, roles, and behaviours, as well as relations between and among, women and men and boys and girls. Gender roles vary

across a continuum and both gender relations and biological expressions of gender vary within and across societies (Krieger, 2003). In many societies, gender constitutes a basis for discrimination, i.e. the unfairly different treatment of men and women because of their inclusion into a sex-group. Moreover, many women suffer systematic discrimination in access to power, prestige and resources (Krieger, 2001).

Social class is defined by relations of ownership and/or control over productive resources (i.e. physical, financial and organizational). From a Marxist point of view, social class is characterized by the inherent conflict between exploited workers and those who control the means of production (Muntaner, et al., 2010). An example is Wright's social class scheme that takes into account the ownership of the capital assets, control over organizational assets, and the possession of skills or credential assets (Wright, 1979).

Credentials are understood as socially valued skills and knowledge that are certified through education and experience, and may serve as a major mechanism of social resource allocation next to, but in relation with the ownership of capital assets (Vanroelen, et al., 2010; Wright, 1979).

An important point when considering the axes of social inequality is their intersectionality. This intersectionality supposes an approach that explores simultaneous intersections between aspects of social difference and identity (Springer, et al., 2012). Intersectionality

theory assumes that the various strands of social differentiation intersect and interact to reinforce one another, producing heterogeneous social categories and fluid boundaries (Juteau, 2003). The different dimensions of social life cannot be separated into discrete or pure strands (Hankivsky, 2012). The power relationships taking shape around these social axes of inequality mutually reinforce themselves and lead to the emergence of distinct systems of differentiation, exclusion and oppression resulting in a *matrix of domination* (Springer, et al., 2012; Weber & Parra-Medina, 2003). The central theoretical tenets of intersectionality include that human lives cannot be reduced to single characteristics, and human experiences cannot be accurately understood by prioritizing any one single social factor. Thus, there is not a predetermined or pre-hierarchical pattern between categories (Hankivsky, 2012). Intersectionality theory also recognizes the multidimensional and relational nature of social inequality. It also maintains that interactive processes between axes of inequality are influenced by both time and place (Hankivsky, 2012; Sen, et al., 2009).

Despite the long history and popularity in the humanities and social sciences, intersectionality theory has received little consideration in social epidemiology until few years ago. Today intersectionality is recognized as a valuable conceptual and research paradigm for furthering understanding of the complexity of health inequalities (Malmusi, 2013). It is recognized as an effective tool for examining how power and power relations are maintained and reproduced (Hankivsky, 2012); provides a powerful alternative way of

addressing questions about health inequalities that traditional approaches have been unsuccessful in answering (Weber & Parra-Medina, 2003). It also helps to obtain insight about who is affected and how, and provides a way to monitor and evaluate the impact of social determinants and of related policies on different subgroups (Sen, et al., 2009). Furthermore, the intersectional approach provides new ways of addressing policies to tackle inequality and disadvantage along multiple dimensions (Sen & Iyer, 2012). One of the most important limitations of intersectional analyses is that its methodology is still poorly developed (Springer, et al., 2012) and above all that its analysis requires access to pertinent health information that often does not exist (Hankivsky, et al., 2010).

2.3. Causal theories of health inequalities

Different theories have been invoked by social epidemiologists to elucidate the principles capable of explaining health inequalities. Some of these theories can be considered complementary to a certain extent. A key overarching aspect of these theories is their respective emphasis on different aspects of social and biological conditions shaping population health. More specifically, some of the theories focus on “proximal” or “immediate” factors (i.e. factors operating directly on, or within the body), while others focus on structural factors (i.e. the social relations and processes structuring and modifying the effects of the “proximal” risk factors) (Krieger, 2008). Theories also differ in the manner of integration between

social and biological explanations, which also affect their recommendations for policy action.

Some of the most relevant theoretical strands are psychosocial approaches, materialist theory, the political economy of health and the ecosocial standpoint. The psychosocial model proposes that discrimination based on the place occupied in the social hierarchy causes stress. The socially unequal settings force people constantly to compare their status, possessions and life circumstances with others. This stress causes a neuroendocrine response that produces disease (Karasek, 2008; Marmot & Wilkinson, 2001). The materialist theories propose that inadequacy in individual income levels leads to a lack of resources to cope with stressors of life producing ill health (MEKN, 2007). There is an important academic discussion between material versus psychosocial factors. Nevertheless, although this discussion may be important for research purposes as well as for the type of interventions to be considered, the dichotomy between both theories has been overdone (Macleod & DaveySmith, 2003). According to Muntaner (2004) the separation of the “material” from the “psychological” (i.e. mind from body) is not sustainable in contemporary science. In fact “material” is a proxy for physical, chemical, and biological exposures, while “psychosocial” exposures are also material. In addition both “psychosocial” and “material” exposures are socially determined, and both sets of exposures can affect population health (Muntaner, 2004). Thus, while all pathways can be separated for analytic purposes, in the real world most of these processes are

intertwined and ideally should be integrated in a comprehensive framework (Benach, et al., 2007).

The ecosocial approach and other emerging multi-level frameworks seek to integrate social and biological factors and a dynamic, historical and ecological perspective to develop new insights into determinants of population health, distribution of disease and social inequalities in health (Krieger, 2001). From this theory emerges Krieger's notion of "embodiment" describing how we incorporate biological influences from the material and social world, and that no aspect of our biology can be understood separately from knowledge of history and structural characteristics of society (Krieger, 1999; Krieger & Davey Smith, 2004).

It is at this last point that the social production of disease and political economy of health theories take the argument one step further (Navarro & Muntaner, 2004; Navarro, et al. 2006). These theories focus on the structural causes of health inequalities. Their central assumptions about capitalist priorities for accumulating wealth, power, prestige and material assets being achieved at the cost of disadvantaged groups in society are providing a powerful framework for understanding the structural causes of health inequalities. They are the economic and political institutions and decisions that create, enforce, and perpetuate economic and social privilege and inequality who are at the root of social health inequalities. From this approach, the interdependence of institutional and interpersonal manifestations of unjust power relations is examined. The political economy of health approach

overcomes a major downside of most other approaches to social determinants of health theory and research: their neglecting of the political, economical and social forces that drive the (re)production and distribution in the population of health determinants.

2.4. The conceptual framework of the Social Determinants of Health Inequalities

To explain the causes of health inequalities, in this dissertation I adopt the conceptual framework of the *Commission to Reduce Social Inequalities in Health in Spain (Comisión para Reducir las Desigualdades Sociales en Salud en España, 2010)* based on two previous frameworks for the interpretation of social health inequalities: that of Solar and Irwin (Solar & Irwin, 2010) and that of Navarro (Navarro, 2004) (See Figure 1). This framework assumes the political economy perspective. It is a clearly relational approach to the phenomenon of social inequalities in society. It differs from a stratification approach, as the former focuses on the dynamic and relational character of social inequalities as constantly (re)produced during human action, while the latter merely focuses on the social differences in a given community at a given time (Crompton, 2008). This dynamic character implies a non-deterministic conception of the causes of health inequality, leaving place for the transformative capacity of human action (Giddens, 1984). It also attaches with the intersectional premises of my research.

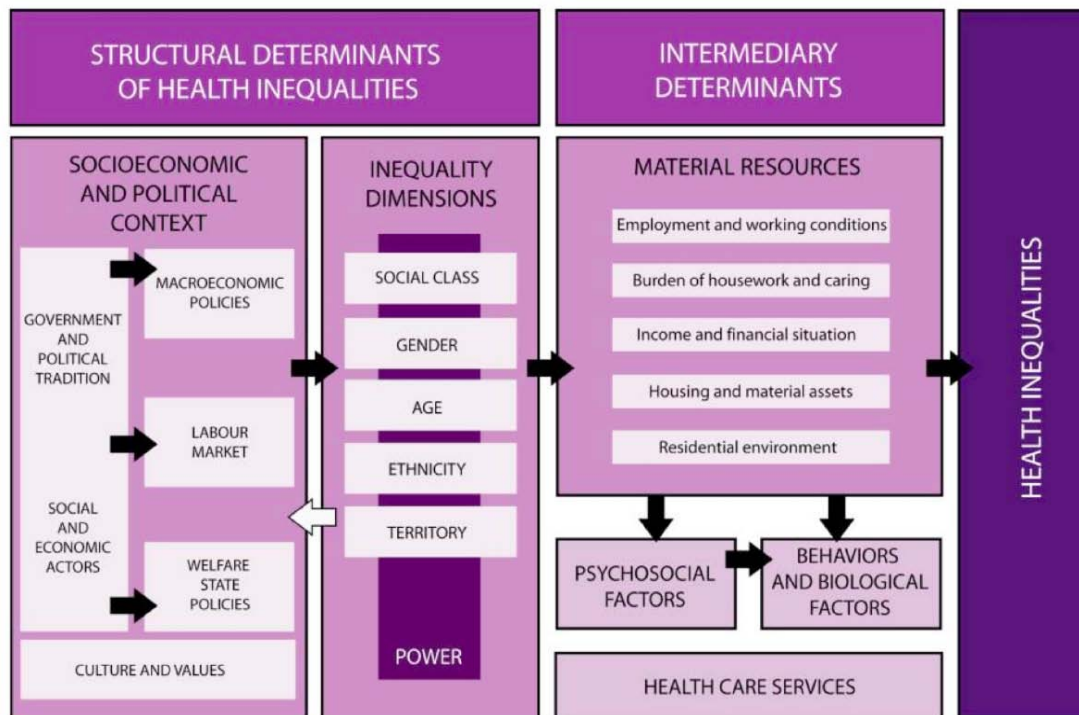


Figure 1. Social determinants of health inequalities conceptual framework. Commission to Reduce Social Inequalities in Health in Spain, 2010. (Comisión para Reducir las Desigualdades Sociales en Salud en España, 2010). Based on Solar and Irwin (Solar & Irwin, 2010) and Navarro (Navarro, 2004).

From the political economy perspective, social health inequalities are primarily understood as resulting from political processes and the distribution of power, prestige and resources among groups in society affecting the access to social determinants of health. According to this theory, and being one of the most important contributions of the model, this framework puts the focus on the different axes of social inequality (here called *inequality dimensions*) such as social class, gender, age, ethnicity and territory and mentions differential power as a factor underlying them all. The distribution of power is the central mechanism generating health inequalities. The axes of social inequality are influenced by and interact with the socioeconomic and political context. As a result, at the same time they are the consequences of this context and the causes of the reproduction of the distribution of power among population. Understanding the causal processes that underlie health inequalities requires understanding of how power operates in multiple dimensions of economic, social and political relationships (Solar & Irwin, 2010).

One of the most important key features of the conceptual framework adopted in this research is the distinction between the social factors that influence health, labelled as *intermediary determinants of health*, and the social processes that determine their unequal distribution in society, described as the *structural determinants of health*. Here, the *structural determinants* refer specifically to the interplay between the socioeconomic and political contexts and the resulting relations with structural

mechanisms generating social inequality (i.e. social class, gender, age, ethnicity and territory, among others). These structural mechanisms underlie the unequal distribution of the intermediate social determinants of health. The structural determinants mediate the access to social resources at every point in the causal chain (Graham, 2004). They are the central engines of society that generate power, wealth and social risks (Diderichsen, et al., 2001). They are the fundamental social causes of health inequality as they maintain an association with disease even when the intervening mechanisms change (Phelan, et al., 2004). Therefore, *structural determinants* will shape the distribution of the *intermediary determinants of health*, such as work, housing, access to food, etc. In turn, the distribution of the intermediary determinants will affect health distribution in society through different ways: directly (due to material reasons), through psychosocial factors, through health-related behaviours and biological factors. In addition also the “health services” are introduced as a separate field. The nature and design of health services have both a multiplier effect and a buffer effect on health inequality, depending on whether access, utilization and quality are lower, equal or higher (for equal need) for disadvantaged social groups (Comisión para Reducir las Desigualdades Sociales en Salud en España, 2010).

Most other models focusing on the social determinants of health have the tendency to conflate structural and intermediate determinants with a single label (mainly called “social determinants of health”) (Graham, 2004). However, the factors which lead to

general health improvement – improvements in the environment, good sanitation, good housing, etc. - do not always reduce health inequality. This is because the determinants of good health are not necessarily the same as the determinants of health inequalities (MEKN, 2007). Therefore, it is necessary to distinguish between intermediate factors that can cause population health improvements (and potentially also reduction of health inequalities) and those structural factors that are able to cause a reduction of health inequalities through the modification of relevant intermediary factors. As noted above, and according to the model applied here, the causes of health inequalities are linked to the access of power, resources and prestige. Blurring the distinction between them can feed the policy assumption that health inequalities can be diminished by policies that focus only on the *intermediary determinants of health*, forgetting to address the *structural determinants* (Graham, 2004). The ability to make this conceptual distinction is a major advantage of the framework adopted in this research.

3. EMPLOYMENT-RELATED HEALTH INEQUALITIES IN EUROPE

Employment and working conditions are considered key social determinants of health and health inequalities. They have a central role in nearly everyone's life given that it is the main source of sustenance and activity for the majority of the population (Benach, et al., 2007). Furthermore, employment contributes to socialization, being one of the main providers of social position in society. Employment developed in good conditions contributes to self-esteem and life satisfaction from the involvement in a collective effort (Doyle, et al., 2005). On the other hand, the job loss and the threat of losing it, as well as poor working (physical and psychosocial) environments and employment conditions can have serious negative effects on the worker's health, their family life, social life and also the well-being of other family members (Benach, et al., 2007; Dooley, et al., 1996). Moreover, from the macro-social perspective employment constitutes key relations in the distribution of power and wealth (Benach, et al., 2007)

Advantageous and adverse employment and working conditions are unevenly distributed among the population through different mechanisms or axes of social inequality (e.g. social class, gender, age, ethnicity, migration status, territory, and credentials) (Borg & Kristensen, 2000; Niedhammer, et al., 2008). Therefore and because of the causal health association of many of them, they also

contribute to health inequalities according to these axes of inequality (Diderichsen, et al., 2001).

This dissertation is focused on employment relations and employment conditions as key social determinants of health inequalities. It is the main aim of this chapter to explain the complex link between employment relations, employment conditions and its impact on workers' health inequalities framed within a conceptual framework based on the political economy and social epidemiological approach. Moreover, a brief overview of the historical changes in the employment relations in Europe during the last decades is given, while their consequences for current labour market inequalities are highlighted. Finally, the relations between employment conditions changes and population health as well as health inequalities are addressed.

3.1. Employment relations from a power resources perspective

Analytically, the health impact of a specific job is determined by the nature of the work task and the related working conditions, the conditions of employment, and the prevailing employment relations (Benach, Muntaner, Solar, et al., 2010). Working conditions refer to the physical and psychosocial conditions of work. Employment conditions refer to the mutual agreement between employees and their employer in terms of contract, rewards and expectations. Finally, employment relations refer to the mutual power relations

between employers and employees, both as collectivities and as individual actors (Benach, Muntaner, Solar, et al., 2010; Van Hoof & Huiskamp, 1989). 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 and conditions (Benach, et al., 2007).

From a broad perspective, employment relations (also called *industrial relations*) can be conceived as the dynamic social, economic, psychological and political relationships between workers and their employers (Kalleberg, 2011). Employment relations are intimately related to the axes of social inequality such as gender, race, age and other demographic characteristics of the labour force. Employment relations vary according to the relative power of employers and workers to exert control over tasks, to negotiate the conditions of employment and to terminate a job, among others (Kalleberg, 2011). In this dissertation, employment relations are conceptualised as an asymmetrical power relationship informed by the ownership of the productive assets by the employers of which capital derives a certain degree of authority over workers during the execution of their job (Carchedi, 1977; Wright, 1989).

According to Korpi's "power resources model" (Korpi, 2006), power resources are characteristics which provide actors with the ability to punish or reward other actors. Power resources can vary with regard to the magnitude of their domain (i.e. the number of people who are receptive to the particular type of rewards or

penalties), their scope (i.e. the various kinds of situation in which power resources can be used), the degree of scarcity of a particular type of power and their centrality (i.e. how essential the resource is for people in their daily lives). Power resources are also characterised by the extent to which power can be concentrated, the cost it involves using it and the extent to which this power can be used to initiate action. According to these characteristics of power, capital in most instances has more power than labour, making employment relations asymmetric.

In rich countries, and for the large majority of the working population, nearly all income is obtained through waged employment, making it an essential activity in their daily lives (Rubery & Grimshaw, 2003). Because of the intimate link between the possession of capital and the control over the means of production, employers have extensive power in deciding who they employ (Vives, 2010). On the other hand, most workers only dispose of their “human capital” (capacity to work and their skills) in order to increase their value on the labour market. Since everybody has some human capital, although important, it is generally not such a highly scarce resource (only in the case of very specific skills). Therefore, labour power from a collective point of view depends on their capacity of working-class mobilization, both in unions and parties. As a consequence, the strength of unions and the share of the labour force coverage by collective bargaining are the two main mechanisms of labour bargaining power (Korpi, 2006).

However, it has to be noted that mutual cultural values and practices, as well as macro-social institutional characteristics, make this class relationship not simple. That is, the employment relations asymmetry does not exclusively depend on labour and capital, but it depends on multiple other structural factors like supply and demand in the labour market, the product market, the existence of regulatory employment legislation, and the degree of labour de-commodification or social protection (Barbash, 1989; Esping-Andersen, 1991; Rubery & Grimshaw, 2003).

3.2. The causal process underlying employment-related health inequalities

The theoretical framework applied in this dissertation to explain how employment and working conditions affect health inequalities comprises the above cited ideas on employment relations. It is mainly based on the EMCONET model of employment relations and health inequalities (Muntaner, Chung, et al., 2010), with few adaptations (Figure 2). These adaptations intent to highlight the axes of social inequality (i.e. social class, gender, ethnicity, age and region) as relational factors that constantly interact and change with the socioeconomic and political context, creating different power structures at every time. It also highlights employment as both a structural determinant and an intermediate determinant of health inequalities. Moreover, also unpaid work (domestic and family-related work) is emphasized in its interaction with employment

conditions. These adaptations are inspired by the conceptual framework to understand the causal process of health inequalities developed by the Spanish Commission on Social Determinants of Health (Comisión para Reducir las Desigualdades Sociales en Salud en España, 2010).

Employment relations can be considered as structural determinants of health inequalities, as they constitute key relations in the distribution of power. Employment relations are derived from the interplay between economic labour market actors (i.e. capital and labour in its institutional sense), civil society actors and government (i.e. the political configuration in its historical moment) (Muntaner, Chung, et al., 2010). The main actors related to employment relations exercise power to articulate their interests through determining macroeconomic policies, labour market composition and regulation and the welfare state policies. As shown in Figure 2, the level of development of the welfare state, specific macroeconomic policies and the labour market regulation, in turn, also affect the (future) power of the actors. For example, a comprehensive welfare state increases workers' bargaining power (Korpi, 2006). The control over the welfare state and labour market regulation is fundamental to understanding employment relations, given that workers' welfare depends both on the functioning of the labour market and on social protection policies implemented by the state (Muntaner, Chung, et al., 2010). Both serve to increase the symmetry in power relations (by gender, social class, migration status, etc.) and therefore to diminish social inequalities.

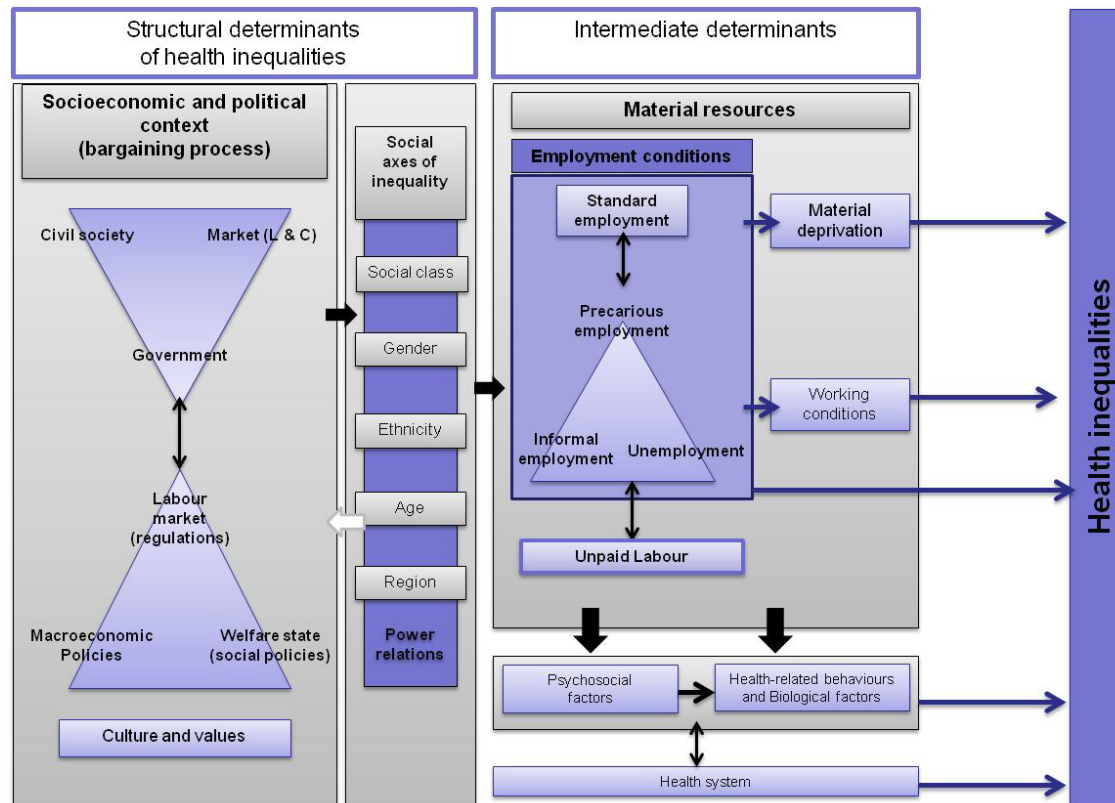


Figure 2. Employment and health inequalities conceptual framework.

In this framework I also highlight that employment relations are embedded in specific cultural and value settings. For example, family values have played an important role in the way that women were (are) inserted in the labour market, as well as on the quality of women's employment. Finally, it has to be noticed that this interplay of relations is time and place-dependent. They have changed over years and are different across countries. Historical changes in Europe and cross-national differences will be briefly explained in the following section, with a specific focus on social class and gender power relations.

Employment relations determine the employment conditions (i.e. standard employment, unemployment, precarious employment and informal employment) in which individual workers are embedded (Muntaner, Chung, et al., 2010). That is, the configuration of employment relations will strongly shape the collective and individual quality of employment conditions and their probability of unemployment spells. It will exert an important impact on the labour market regulation and social protection, as well as on the process and managerial organization of work, regarding both social relations of production and technological components (Rubery & Grimshaw, 2003). The forms of management and control over the workforce, together with the degree of employee's bargaining power will have key consequences in the daily experience of workers (Benach, et al., 2007). Among workers, the characteristics of employment and working conditions are unevenly distributed

alongside the axes of social inequality, contributing directly or indirectly to health inequalities.

In this framework unpaid household/caregiving work is explicitly considered as another sphere outside employment conditions. Nevertheless, unpaid labour is important for health inequalities, and more concretely for gender-related health inequalities (Artazcoz, et al., 2001). The sexual division of labour maintains that even when women enter employment, they will typically still have the main responsibility for childcare and housework (Bartley, et al., 1992). Consequently, the employment situation interacts with unpaid labour in the household sphere in terms of the total burden of work, the capacity to organize and combine both, and also the interaction of harmful exposures. Domestic work such as paid work involves the exposure to security risks, hygienic, ergonomic and psychosocial (Artazcoz, et al., 2001).

The last part of the framework shows how employment conditions are related to health inequalities through different pathways. First, employment conditions will impact health inequalities through material deprivation (e.g., nutrition, poverty, housing, income, etc.), when the income generated by employment is insufficient (e.g. in the case of unemployment). Second, they will impact health inequalities through the unequal distribution of harmful working conditions, i.e. physical, chemical, biological, ergonomic and psychosocial risk factors. Employment conditions and these potential consequences regarding working conditions and material

deprivation can have an important effect on health through psychosocial factors, health-related behaviours and biological or physiopathological pathways (Benach, Solar, Santana, et al., 2010). The nature and design of health services will have both a multiplier effect and a buffer effect on health inequality, depending on whether access, utilization and quality are lower, equal or higher (for equal need) for disadvantaged social groups (Comisión para Reducir las Desigualdades Sociales en Salud en España, 2010).

3.3. European employment relations from a historical perspective

European employment relations have undergone profound changes during the last decades. Especially in salaried employment the power balance between workers and employers became more asymmetrical since the 1970s. For a considerable amount of workers this led to a worsening of the employment conditions and the reduction of social protection, especially for the unemployed. These changes have been unevenly distributed, and have become a potential source of poor population health, but above all, a source of social health inequalities. The aim of this section is to show the changes in employment relations undergone in Europe from the WWII. Understanding historical changes in employment-related power relations is especially helpful to understand the causal process that underlines health inequalities.

a) The Golden Age Era of employment relations

During the 19th century employment conditions were characterized by low and unstable wages, unsecure jobs, no access to pensions or health insurance and arbitrary treatment on the job (Appelbaum, 2012). At that time, union struggles became quite common. After the WWII - although notable differences between countries existed (Esping-Andersen & Regini, 2000)- , a new socioeconomic order of the so-called “Golden Age of capitalism” was established, often characterized as “Fordism”: a distinct conjuncture of industrial mass production, mass consumption, public macro-economic intervention (Keynesianism) and the development of welfare states as the key mechanism of social redistribution (Esping-Andersen, 1991). This new socioeconomic order lasted symbolically until the oil crises of the 1970s.

The Fordist production regime was characterized by intense accumulation, monopolistic competition, high economic growth and relative social stability. The aim of this production system was to maximize productivity by reducing unit costs in order to create conditions under which luxury goods markets could be converted to markets of mass consumption (Rubery & Grimshaw, 2003). In terms of capital relations, this system was possible through the increase in economies of scale, market stability and incremental product innovation (Scott-Marshall, 2005). This mode of production fitted with semi-skilled labour which was subjected to a high division of labour (Taylorism) and tight managerial control (Rubery & Grimshaw, 2003), represented by the assembly line as the

primary mode of organizing production. As a negative consequence for workers, this system was physically demanding, required high levels of concentration, and could be excruciatingly boring (Womack, et al., 1990).

During the existence of the post-war compromise, contrasting interests between labour and capital started to partly converge. To increase productivity, employers needed a loyal and attached labour force. On the other hand, union's main concern was to raise and protect wages and jobs (Benach, et al., 2007). Although the infrastructure for class conciliation was hugely expensive, both employers and the state considered the investment in its expansion a highly efficient proposition (Scott-Marshall, 2005).

Labour unions emerged as strong guardians of the interest of labour and workers' bargaining power increased. Their power and the need of a social contract were reflected in the improvement of several employment conditions. Wages started rising, collective bargaining rights were extended, and employment regulations were substantially improved (Scott-Marshall, 2005). The convergence of interests between labour and capital facilitated the enactment of labour legislation (Benach, et al., 2007). Increasing labour power became also apparent from union representation in the workplace, which made workers more protected from arbitrary treatment (Appelbaum, 2012). Moreover, the emerging employment regulation, social protection and presence of union representation at the workplace empowered workers to avoid being exposed to

hazardous work environments and harmful employment conditions (Menéndez, et al., 2009).

Moreover, for the first time, full employment was a key public policy. Where Keynesian ideas had been accepted, the fight against unemployment and general redistributive policies had come to be seen as a responsibility of the political authorities, and no longer to be left only to the market. Social protection from unemployment increased employees' bargaining power, as workers' labour became (partly) de commodified. In sum, the salaried society got constituted. It was a new wage relation, through which a salary ceased to be solely considered as the payment for a specific task, but as a real means of sustenance for the entire nuclear family. Working place rights, access to social services outside of work (illness, accidents, retirement), wage accounting for periods of rests, regular schedules and predictable working times were gained through the salaried-relationship (Castel, 1997). These new employment conditions with the protections against unfair dismissals that lead employers to deploy their workforce more carefully, provided workers with a significant amount of certainty in life planning, well-being, as well as, healthier employment and working conditions (Scott-Marshall, 2005). The model of employment-related security was ultimately manifested as the postwar "Standard Employment Relationship" (SER), the normative model of employment in industrialized capitalist societies.

According to Vosko (2010, p.51), the SER is a regulatory architecture built upon the bilateral employment relationship, standardized working time (normal daily, weekly and annual hours), and continuous employment (permanency). The SER was extended primarily to male blue-collar workers and subsequently to white-collar workers (Vosko, 2010). The SER fulfilled its function partly through a “psychological contract”, that is, an unwritten contract which mainly contained assumptions and beliefs of the two parties (employers and employees), and which provided a stable understanding of what to expect in the future and guided efficient action without much need for practice (Rousseau, 1995). Moreover, the development of Internal Labour Markets provided workers with the prospect of career advancement, increasing wages and a transparent form of wage-setting and allocation of workers within the organization (Rubery, 1994).

b) Gender relations during the Golden Age Era

The SER was far from being equitable or universal since it applied mostly to male wage-earners, thus excluding workers outside the norm such as self-employed contractors and the majority of female employees (Vosko, 2010). In terms of gender, the exclusion of the majority of women from the SER was at least possible in large part thanks to the establishment of a new “gender contract”¹. This

¹ The “gender contract” is the normative and material basis around which sex/gender divisions of paid and unpaid labour operate in a given society (Vosko, 2010). The notion of a gender contract only refers to the division of labour, whereas other concepts such as the “gender system” (Pfau-Effinger, 2004) and

contract assumed a male breadwinner pursuing his professional life in the public sphere, with access to a full-time continuous employment relationship with a single employer and receiving a family wage. On the other hand, it assumed a female caregiver, performing unpaid work necessary for social reproduction, principally in a context of a heterosexual household. Consequently, women received their share in the social contract (social insurance, welfare state provisions) mainly through their spouse (Vosko, 2010) and most were economically dependent on their husbands.

Moreover, the male breadwinner/female caregiver contract pivoted on a dichotomous conception of time in which “time allocated to the employer in exchange for a wage” was defined as “time spent at work”; whereas time spent in the private spheres including social reproduction responsibilities was supposedly free (Vosko, 2010). This dichotomous conception of time has still nowadays important consequences, as it still makes invisible social reproduction tasks. Because of that division, at the moment when women became massively incorporated in the labour market, the total amount of working hours spend by w omen (both at work and at home), frequently remains underestimated (Artazcoz, et al., 2001; Artazcoz, et al., 2004).

In summary, although a sized percentage of workers benefited from the SER, inequalities in the labour market persisted, especially gender-related. The gender assumptions and cultural values about

the “gender order” (Connell, 1987) refer to broader patterns of relationships between men and women.

the appropriate role of women on the labour market served to make the selective function of the SER invisible and unproblematic.

c) The Post-Fordism Regime: the loss of bargaining power

The socioeconomic order that characterized the post-war years came to an end during the 1970s. A set of economic, political, technological and demographical forces led to changes in employment relations, undermining workers' bargaining power and transforming (or at least threatening) the labour standards achieved during the Fordist regime. This resulted in higher levels of "precarious employment" leaving workers in "vulnerable jobs" and in unemployment situations without social protection, unable to support themselves and their families.

The new macroeconomic situation was characterized by an economic crisis triggered by the oil shocks of the 1973 and 1979. Underlying causes were important inflationary tendencies, the increased global mobility of capitals², and the saturation of mass consumer markets leading to a decrease of profit gains (Scott-Marshall, 2005). In the policy domain, a key shift to neoliberal policies occurred in most of the countries (Navarro, 2004). The dominant concern of policy makers shifted from full employment

² Several authors agree that capital's increased global mobility and the need for flexibility can be considered as a reaction to the wave of struggles and strength of labour during the 1960s and 1970s (Castells & Portes, 1989; Hardt & Negri, 2009; Harvey, 2005).

and redistributive policies to a focus on price stability and competitiveness (i.e. overcoming Fordist labour market “rigidities”). Governments pursuing flexibility relaxed labour market regulations, easing the constraints to hiring and firing and limiting social security benefits. They also modified collective bargaining regulations limiting the bargaining power of unions and favouring the individualization of employment (Arnold & Bongiovi, 2013; Ferner & Hyman, 1998; Kalleberg, 2011). The retrenchment of state expenditures in the form of social welfare measures (Coburn, 2004), leaves individual’s life chances increasingly reliant upon the vicissitudes of markets and individual luck (Breen, 1997). In other words, without strong welfare states, recommodification of citizens appears. This worsens the position of unemployed workers, as benefits are the major income support for unemployed and other inactive. Moreover it also weakens workers’ bargaining position as they may have to accept jobs with less favourable employment and working conditions.

The weakening of the trade union as a regulatory institution and the dismantling of other mechanisms of collective worker empowerment also diminished workers’ bargaining power and rights (Arnold & Bongiovi, 2013) and increased the power asymmetry between capital and labour. Collective bargaining has suffered a strong neoliberal offensive (Arnold & Bongiovi, 2013). When barriers to the free movement of capital were removed, unions also became undermined (Arnold & Bongiovi, 2013). The international division of labour puts into competition workers from

industrialized countries with workers from the periphery, causing pressure towards degradation of employment and working conditions in the first group of countries. Without possibility of regulating the labour market at a worldwide level, collective bargaining of labour loses an important part of its power. Since the 1970s, trade union density has diminished in a lot of countries (ILO, 2004). Dismantling collective bargaining mechanisms such as collective agreements and social representation at workplace has negative consequences for workers' well-being. The weakening of collective agreements facilitates the introduction of individualized contracts, increasing employer's power rather than employee's preferences (Welch & Leighton, 1996).

The changes in labour market regulation and the undermined power of trade unions has facilitated the implementation of new managerial strategies. These strategies are mainly based on the flexibilization of the labour process, i.e. the employment relations and the organisation of work, to adapt to new consumer preferences, to cope with the new scenario of market uncertainty and intense competition and to reduce organizational economic risks (Vives, 2010). Based in the categorization of Atkinson (1984), mainly four types of flexibility strategies have been implemented: external numerical flexibility, internal numerical flexibility, functional flexibility and financial or wage flexibility. External numerical flexibility refers to the adjustment of the labour intake or the number of workers from the external market. This can be achieved by employing workers on temporary work or fixed-term contracts

or through the relaxation of employment protection legislation in order that employers can hire and fire permanent employees according to the firms' needs. Internal numerical flexibility is achieved by adjusting working hours or schedules of workers already employed within the firm, including part-time, flexi-time or flexible working hours (including night and weekend shifts), working time accounts, and overtime. Functional flexibility refers to the extent that employees can be transferred to different activities and tasks within the firm. Financial flexibility involves a shift from uniform and standardised pay structures towards more individualised systems incorporating a greater element of variability. These new managerial strategies defined as the "flexible firm" have spread non-standard forms of employment in most industrialised countries (Boyer, 1993) and segmented the labour force into a multi-skilled and functionally flexible but socially protected core and a disposable periphery with fewer labour rights (Benach, et al., 2007). Therefore it may be assumed that this model increased labour market inequalities.

Another key related managerial strategy to diminish production costs is outsourcing parts of the productive process. Large scale industries have externalized many non-core activities. This process has generated a shift from the industry to the service sector, by the fragmentation of large-scale industries and the creation of smaller specialized firms. Often these inter and intra firm relations are characterised by subordination and dependency, where smaller firms have absorbed greater portions of market risks and offer

worse employment conditions. In large parts of this service sector, female employment is particularly high. These women were often looking for a secondary (family) wage due to economic downturns and the worsening of male employment conditions, and immigration (Rubery, 2007). This has provided a secondary workforce. Complex organisation forms, such as subcontracting, also changed the notion of employer responsibility over the workers. Ambiguity regarding who is responsible for worker safety makes it difficult to enforce and monitor compliance with preventive practice and health and safety regulations (Vives, 2010).

In summary, the above-drawn mechanisms searching for flexibility have diminished workers' bargaining power and rights (Arnold & Bongiovi, 2013) and increased the power asymmetry between capital and labour. Labour's loss of power in front of capital can be shown in the major dimensions of employment conditions: the stability of contracts, dismissal protection; the security and sustainability of wages; the level and universality of social protection and social security benefits; control over working times; the capacity to reproduce one's skills (employability); and collective representation and participation (Rodgers, 1989; Standing, 1999). Moreover, and along with the general deterioration of the salaried relationship, an increase of labour market inequalities occurs. Labour market segmentation has privileged some workers and marginalized others. Much of the inequality runs according to gender, age and credentialed skills.

3.4. Cross-national differences in employment relations

The socioeconomic model of the Golden Age Era developed with important cross-national differences regarding the extent of welfare spending and entitlement (Muntaner, Chung, et al., 2010), as well as cultural differences regarding dominant family models (Pfau-Effinger, 2004). As they partially determine the nature of the employment relationship, variations according to employment regimes (Korpi, 1983), welfare regimes (Esping-Andersen, 1991) and their intersection with family models (Pfau-Effinger, et al., 2009) may be expected regarding the nature and consequences of the quality of employment conditions, political solutions to unemployment and the degree of workers' social protection. Thus, understanding cross-national variation in the initial situation is a key factor to understand variation in labour market changes and employment-related population health inequalities during the last decades.

An important amount of quantitative and historical-comparative studies have supported the conclusion that the differences regarding the extent of the welfare state could be explained by the relative success of left parties aligned with strong unions in shaping the democratic struggle (Esping-Andersen, 1991; Gallie, 2007; Korpi, 1983; Myles & Quadagno, 2002). This conclusion, however, has been criticized by the feminist social movement, who had a decisive contribution in the advancement of the welfare state in some countries. According to them, first policies breaking the male

breadwinner model and developing childcare/eldercare public services (in Nordic countries) cannot be explained by the struggles over the social wage for male breadwinners alone. Notwithstanding that, feminist contribution has been neglected by power resource theory because political female contribution was not exerted through traditional modes of operation, i.e. through parties, elections, trade unions or official bureaucracies (Skocpol, 1992). However, women's power resources can be found in the social movement, first, in the construction of a collective identity, in building cross-class and cross-party alliances that enable women's collectivities to speak for a majority constituency of their interests, and second, and as a consequence, introducing gender issues in the political agenda (Hobson & Lindholm, 1997).

a) Cross-national differences in employment and welfare regimes

Different attempts to classify countries according to working class mobilization and coordination with employers have been developed. Three of the most important are the varieties of capitalism (VofC) (Hall & Soskice, 2001), the employment regime (Korpi, 1983) and the welfare state typology (Bonoli, 1997; Castles, et al., 2010; Esping-Andersen, 1991; Fenger, 2007; Ferrera, 1996).

The VofC (Hall & Soskice, 2001) directs its attention to the importance of employer coordination as a core underlying feature distinguishing Liberal Market Economies (LMEs) and Coordinated

Market Economies (CMEs). The key difference between LMEs and CMEs is whether employers are capable of strategic coordination among themselves and with labour in order to achieve joint gains through cooperation (CMEs) or not (LMEs) (Hall & Soskice, 2001). According to this theory, countries with higher levels of employer coordination are usually more successful in achieving a viable combination of high efficiency and high solidarity. Those Coordinated Market Economies (CMEs) featuring national coordination typically score highest on most measures of equality (e.g. Scandinavian countries), whereas Liberal Market Economies (LMEs) tend to have the lowest scores (e.g. United Kingdom). Cases of “sector-coordinated CMEs” come in between (e.g. Germany) (Thelen, 2012).

Regarding employment regimes (Korpi, 1983), three principal types of employment regimes are distinguished. First, inclusive employment regimes in which organized labour has a strongly institutionalized participation in decision-making, increasing employees’ power in terms of employment and working conditions, and where employment policies are designed to extend rights as widely as possible among the workforce. Second, dualist employment regimes, where organized labour has only a consultative role in decision-making, resulting in a weaker organizational strength, and where a dualization of the workforce (core-periphery) exists. Organized labour also tends to draw its strengths primarily from a more easily mobilizable core workforce of employees in larger firms. The nature of employment regulation

will tend to reflect this providing strong employment protection, good employment conditions, and generous welfare support for the core workforce, but much poorer conditions for those on non-standard contracts (Gallie, 2007). Third, *market employment regimes* emphasize minimal employment regulation, assuming that employment levels and job rewards are self-regulated on the free market.

The employment regimes theory of Korpi (Korpi, 1983), was later included in Esping-Andersen's typology (Esping-Andersen, 1991). In his first typology, Esping-Andersen distinguished between liberal, corporatist and social democratic welfare states (Esping-Andersen, 1991). In liberal welfare-states, means-tested benefits, modest universal social transfers or modest social-insurance plans predominate. Entitlement rules are strict and often associated with social stigma. And the state encourages the market. In Corporatist regimes, the preservation of status differentials predominates, given that social rights are more attached to class and status in employment. In Social democratic regimes principles of labour de-commodification and universalism of social rights are extended, also to middle classes (Esping-Andersen, 1991).

Although based on different assumptions, these theories are highly interrelated. Employment and production regimes and welfare regimes are intrinsically related. In those countries with highly organized and strongly institutionalized labour (i.e. inclusive employment regimes), workers have the capacity to push for a

stronger welfare state. Moreover, Rubery and Grimshaw (2003) stated that welfare regimes affect job structures in two ways. First, and most directly, welfare regimes affect the amount of employment generated through the provision of public services. This depends on the size of welfare state expenditure and on its extent of orientation towards payment of social transfers to citizens or towards the provision of services. Second, through the decommodification mechanism, welfare states affect the quality of jobs, referring to the skills and tasks involved and to the level of wages. According to Esping-Andersen (Esping-Andersen, 1991) residual or neoliberal welfare regimes are associated with a much stronger development of so-called *junk jobs* in the private sector than in social democratic or corporatist regimes. Where low or limited unemployment benefits exist, workers may be more likely to accept low wage jobs, while those jobs may be rejected in more generous welfare regimes.

b) Cross-national differences in the gender division of labour

Important national differences also exist in the gender contract intrinsically related to cultural models of family and the development of welfare states. According to Pfau-Effinger (2004) such cultural models of the family include cultural values regarding the relationship of family members with the employment system, considerations about the adequate sphere for upbringing children and the adequate gender division of labour within the family. Pfau-

Effinger classified family models in the following types: the family economy model, the housewife model of the male breadwinner family, the male breadwinner/female part-time care-provider model, the dual (part-time) breadwinner/dual (part-time) care provider model, the dual breadwinner/external care model and the dual breadwinner/extended family care model. The cultural basis of the arrangement of work and family models, together with the degree to which welfare states support dominant models explain cross-national differences in how women combine formal employment and childcare/eldercare and household.

First state policies cultivating the dual breadwinning model emerged earlier in some Nordic countries, such as Denmark and Sweden, than in others during the Golden Age (Lewis & Åström, 1992). Moreover, cultural family models and the development of welfare states shaped the massive entrance of women in the labour market since the 1970s. The increase of women's labour force participation has occurred due to a variety of reasons. In some countries, especially those where the traditional family institution is stronger, the increase of the female labour force has been in most cases due to economic downturns. The cultural family model of the Conservative countries did not encourage women to enter the labour market but to stay at home (Orloff, 1993). However, economic downturns have broken the income capacity and security of the male-breadwinner model, making a second wage necessary. In other countries, such as the Scandinavian countries, the dual-earners model started to expand some years after the WWII, thus

incorporating women in the labour market earlier than in other countries. This early incorporation transformed the demand side of the welfare state by creating new needs, especially those related to the distribution of caring work for children and elderly. Thus, rising female employment was both a cause of the expansion of family-related social services (Huber & Stephens, 2000) and an effect. Those countries providing important public health services permit more easily the entrance of women in the labour market (Rubery & Grimshaw, 2003).

3.5. Labour market inequalities

The worsening of employment conditions, as well as the increase of unemployment rates, since the end of Fordism have been unequally distributed among workers both at the national level and in the international division of labour. Cross-national differences in those social institutions that employment relations are embedded in, can explain at least partially the increase of inequalities at both levels.

Three main dimensions can explain the increase of labour market inequalities and their cross-national differences (in extent and form). First, and according to Thelen (2012)³ liberalization or

³ Contrary to the idea that contemporary market pressures will drive a convergence in a most efficient single model of capitalism, defenders of the classic VofC see the divergent institutional arrangements characteristics of both LMEs and CMEs as relatively robust and resilient (Iversen & Soskice, 2009). On the other hand, the representatives of “liberalization” theory, perceived in contemporary developments an erosion of the arrangements that have distinguished the coordinated political economies in the past (Glyn, 2006;

recommodification of the labour markets has occurred in each country but under different social coalitions. Second, employers have provoked labour market segmentation, that is, the creation of a secondary labour market in those countries with a strong labour market regulation for “core” workers (Rubery, 2007). Third, the diminishing of collective power has let workers alone in the labour market bargaining process. In this process the only arguments they have are their individual social position and capacities (Vives, 2010). Again, although based in different assumptions, these theories are highly interrelated.

Liberal countries, traditionally with low levels of employer coordination (LMEs) have followed a deregulation trajectory of liberalization. Deregulation has occurred involving an active political dismantling of coordinating capacities on one of both sides of the class divide. Institutions and mechanisms for collective labour regulation have been explicitly set aside in favour of arrangements that re-impose the market (Thelen, 2012). Deregulation has deepened the asymmetry between labour and capital, leaving workers with less social protection and employment regulations, deepening the lack of social redistribution of wealth and power. Consequently, the diminishing of collective power has let workers even more alone in the labour market with only their individual attributes left to bargain. Therefore, it can be assumed that in these countries gender, education, age and migration status

Streeck, 2009). Thelen’s “varieties of liberalization” theory makes a proposal in between that partially incorporates the two hypotheses (Thelen, 2012).

(among other characteristics) have a crucial importance in the allocation of work and employment characteristics over the workforce.

In dualist countries, according to Thelen (2012) there has not been a direct attack on institutions for collective regulation. Traditional arrangements for labour-market insiders were often maintained but at the same time an unorganized and unregulated periphery was allowed to grow. This periphery is characterized by inferior status and protection. Dualization can take many forms - for example, it can occur by maintaining strong employment protections for regular workers while the number of atypical workers grows, or by continued centralization of bargaining but covering fewer sectors, etc. Following Rubery segmentation theories (Rubery, 2007), employers have provoked the existence of a wide secondary labour force, through a variety of managerial strategies. Employers in these countries have created jobs in the secondary labour market, for example by externalizing important parts of the productive process, such as the non-core competencies. This has permitted the creation of smaller specialized firms largely making use of the secondary labour force. These generally service sector companies are traditionally less unionized, have a younger and more female workforce, and are also places where immigrant workers are easily allocated. Thus, employers have found in the creation of a secondary labour market the way to make more flexible employment conditions. Moreover, in most of these countries the regulation of social protection was designed for standard contracts,

and has been extended only partially to other forms of employment (Clasen & Clegg, 2011). With a strong regulated part of the population and another part with the worse employment conditions, and low social protection, labour market inequalities are hugely increasing.

Finally, in Scandinavian countries, what Thelen (2012) called “socially embedded flexibilization” has occurred. Socially embedded flexibilization, also called flexicurity, involves a combination of market-promoting labour-market policies but combined with social programs designed to ease the adaptation of society, especially its weaker segments. Social protections remain strong but policy is organized less than before around protecting individuals dropping out of the market and more around facilitating their successful reintegration into it. They are premised on making workers more mobile, among others by offering training to ensure a high level of general skills. There is a “reorientation of the objectives traditionally pursued in the national tripartite bargaining” (Thelen, 2012), that is “a transition from negotiated wage restraint in the context of a more or less unwavering government commitment to full employment, toward the management of activation and human capital development in the context of non-accommodating macroeconomic policies” (Thelen, 2012).

3.6. Occupational health research on employment conditions

Most of the changes in employment relations occurred in Europe after the end of Fordism. Its consequent worsening of employment conditions, increasing of unemployment and erosion of social protection, are potentially harmful for population health. Furthermore, due to the increase of labour market inequalities, employment conditions are now probably one of the most important contributors to European population health inequalities. Notwithstanding these potential threats, occupational health research is still mostly focused on the “nature and content of work tasks” instead of the conditions of employment. The recent attention to the study of the nature of employment relations and their consequences in terms of employment conditions represents an important change for occupational health research (Benach, et al., 2010). Although there are some major advances in this field, knowledge on the different employment conditions is still uneven. Today, most of the occupational health research knowledge has been concentrated on the unemployment effects on population health, and to a lesser extent, health inequalities. Regarding the worsening of employment conditions, there is an increase of knowledge regarding job insecurity and the association of different types of contracts with health. However, few studies of precarious employment –as a multidimensional concept – exist, and the situation is still worse regarding its association with health inequalities. However, important advances have been made during the recent years.

a) Unemployment and health

There is an extensive literature that shows the association between being unemployed and various indicators of morbidity, mortality and health-related behaviours and to a lesser extent its contribution to health inequalities. Unemployment affects mental health, physical health, and produces a change in the behaviour of individuals (Dooley, et al., 1996; Dooley, 2003; Jahoda, 1982). Unemployment is also a cause of premature mortality because several studies show that unemployed people who previously had not developed any illness die younger than the general population (Mathers & Schofield, 1998; Voss, et al., 2004). The unemployed have lower levels of psychological well-being, developing symptoms of depression or anxiety, and a tendency towards self-harm and suicide (Chan, et al., 2007; Kposowa, 2001; Morrell, et al., 1994). Unemployed people are more likely to suffer from chronic diseases compared to employed people, especially cardiovascular disease (Mathers & Schofield, 1998). Regarding changes in health-related behaviours, several studies have found higher rates of alcoholism and smoking among the unemployed, as well as other unfavourable health habits (Bartley, 1994; Hamalainen, et al., 2005; Hammarstrom, 1994).

Historically, three main theoretical traditions can be found attempting to explain the effects of unemployment on public health: first, the biomedical tradition focusing on physiological mechanisms to explain the correlation between physical circumstances and pathological phenomena; second, the

sociological tradition mainly focusing on material circumstances creating restrictions for human development; and third, the psychological tradition focusing on the individual perception, learning, motivation, and its impact on health (Janlert & Hammarström, 2009).

Economic deprivation theory is the classical sociological model. According to this theory, unemployment leads to a deterioration of the economic situation which worsens the prerequisites for good health (Nordenmark & Strandh, 1999). Unemployed people are at risk of lacking food, adequate housing and clothing. These studies followed a tradition from older investigations of poverty and ill-health. In that sense, the impact of unemployment on health can be modified or alleviated by giving the unemployed support for subsistence. The type of support and its extent depends on the social protection system of each country. The type and extent are potential modifiers of the effect of unemployment on health (Rodriguez, et al., 1997; Rodriguez, 2001).

The psychosocial theory (or stress model) focuses on the uncertainty about the future employment status which may act as a stressor that produces physiological changes, including an increased risk of acquiring unhealthy behaviours. The stress model attempts to relate social stimuli to the health effects using physiological mechanisms as intermediating factors (Levi, 1997). In this model, coping and social support can moderate the stress reaction of unemployment (Levi, 1997).

The control model is related to the demand-control model of Karasek (2008) and social stress theory (Pearlin, 1989). Theories of control state that feeling in control of the environment is crucial to respond to a situation of unemployment. In the demand-control model unemployment can be regarded as a passive work situation, with low control and low demands in relation to working-life (Rotter, 1966). In the locus of control theory, unemployed can blame themselves for their lack of employment or blame external forces beyond one's own control. When they blame themselves, they will feel that they cannot control the situation.

The social support model alleges that unemployment leads to greater social isolation which in turn can have direct effects on health. At the same time, according to the buffer model, having social support once unemployed can act as a shield against the stress of being unemployed (Thomas, et al., 1980).

Jahoda's latent functions model is one of the best-known (Jahoda, 1982). Latent functions of employment include giving the day a time structure, providing opportunities for social contact, contributing to status and personal identity for the individual, and providing an opportunity to strive towards collective purposes and shared experience (Janlert & Hammarström, 2009). Unemployment means a lack of these functions, probably resulting in ill-health.

The impact of unemployment on health is not the same for all subgroups of the population. Numerous studies have shown that unemployment is not equally distributed among the economically

active population, being more prevalent among the most disadvantaged social groups, such as manual workers, women, youth and ethnic minorities (Bartley & Ferrie, 2001; Mathers & Schofield, 1998). The uneven distribution of unemployment in society contributes to the social gradient in health (Kasl & Jones, 2000). Moreover, the health impact of unemployment is not evenly distributed according to the social axes of inequality - some can be deemed more vulnerable. Moreover, health consequences can also be modified according to social benefits coverage for unemployment and family composition among other circumstances (Artazcoz, et al., 2004; Benach, et al., 2007). An extant resume of the scientific knowledge on the differential impact of unemployment according to axes of inequality and other contributing factors is provided in the first paper of this dissertation (p.116).

b) Precarious employment and health

The way in which contemporary employment arrangements and their health consequences has been addressed in empirical research varies greatly. In general, empirical research addressing employment relations and conditions is conceptually underdeveloped with a few exceptions. Although some of the new employment arrangements (generally known as “flexible employment”) may be beneficial for some workers (Booth, et al., 2002; de Graaf-Zijl, et al., 2011), for the most part of the population

contingent/atypical/flexible employment arrangements tend to erode the quality of employment conditions. The most used approaches to contemporary employment arrangements in social epidemiology are: (1) the *legal/temporary employment* approach, (2) *perceived job insecurity* approach, (3) the *organisational restructuring and downsizing* approach, and (4) *multidimensional approaches* to precarious employment.

The legal or temporary employment approach focuses on the health consequences of legal types of employment that differ from the SER-reference (Bardasi & Francesconi, 2004; Goudswaard & Andries, 2002; Quinlan, et al., 2001). It includes all forms of non-permanent contracts, such as fixed-term, temporary agency work and on-call work (Ferrie, et al., 2008). In general temporary workers report more frequently perceived job insecurity than permanent workers (Catalano, et al., 1986; Virtanen, et al., 2003), worse working conditions (Aronsson, et al., 2002; Goudswaard & Andries, 2002), receive less training and less information on working environment and on health and safety, and they are less represented in health and safety committees (Goudswaard, et al., 2000). Therefore, they have more risk of occupational injuries (Patussi, et al., 2008; Virtanen, et al., 2005). Moreover, they experience less sickness absence (Tompa, et al., 2008; Virtanen, et al., 2005) which has been attributed to sickness presenteeism (Johns, 2010). Findings for psychological ill health (Bardasi & Francesconi, 2004; Kim, et al., 2008; Kim, et al., 2006; Louie, et al., 2006; Quesnel-Vallée, et al.) and self-reported health (Bardasi & Francesconi, 2004; Kim, et al., 2012; Louie, et al., 2006; Rodriguez, 2002; Virtanen, et al.,

2004) are mixed. Mixed findings can however be explained by the large heterogeneity among types of temporary and contractually flexible employment (differences in the measure of exposure) and by the heterogeneity between countries regarding the levels of social protection and workers' rights and the specific meaning of atypical employment types (Bielenski, 1999).

The job insecurity approach is based on the subjective perception of uncertainty of involuntary job loss (De Cuyper & De Witte, 2007; Ferrie, et al., 2005). This perception may arise from objective circumstances that may pose a threat to the continuity of one's job, but it can also arise from the interpretation of external factors such as an economic crisis, the labour market situation, etc. In contrast with unemployment which is mainly an acute stressor, job insecurity is rather a chronic one. Job insecurity has been associated with several psychological outcomes and well-being, such as poor mental health and job dissatisfaction (De Witte, 1999; Virtanen, et al., 2002) and physical health such as coronary heart disease (Ferrie, et al., 2013) and self-rated health (Burgard, et al., 2012).

Objective imminent threats of job loss may come due to restructuring processes in organizations such as a merger, privatization, outsourcing or workplace closure, which generally involve a workforce reduction or "downsizing" (Kivimaki, et al., 2001; Quinlan & Bohle, 2009; Vahtera, et al., 2004). These processes involve an imminent threat of job loss, that is, workers are exposed to a stressful factor. This is the anticipation phase of unemployment (Joelson & Wahlquist, 1987). Downsizing processes

have a potential health impact for those who lose their jobs as well as for those who remain in their jobs, that is, the “survivors”. Studies on major organisation change have shown restructurings that affect employment to have a negative impact on physical and mental health (Ferrie, et al., 2008; Ferrie, et al., 2005; Ferrie, et al., 2007). Regarding the survivor group, they generally suffer an intensification of work, increase of job strain and effort-reward imbalances, in addition to sustained job insecurity (Vives, 2010). This results in poor physical health such as cardiovascular mortality (Vahtera, et al., 2004). A growing body of international evidence indicates that downsizing and related forms of organisational restructuring are having profound adverse effects on worker safety (Quinlan, 2007; Quinlan & Bohle, 2009).

The three types of studies have the shared characteristic that they are focused on the single dimension of instability of employment. The multidimensional precarious employment approach goes beyond the contract-related or employment instability dimension. This broader conceptual approach should also include other important characteristics of the degrading of SER-employment, like low social protection, unsustainable wages or low worker representation (Amable, et al., 2001; Benach, et al., 2002; Benach, et al., 2007)

Precarious employment as a multidimensional construct can be seen as a conceptual attempt to grasp into the broader changes occurring in the field of employment at the turn of the 21th century. Several authors have proposed multidimensional approaches to precarious

employment. Rodgers (Rodgers, 1989) identifies four dimensions of precarious employment: (1) uncertainty of continuing work, (2) limited control over work, (3) limited legal and social protection, (4) income inadequacy. Standing (Standing, 1999) refers to seven forms of employment security which characterize SER-employment in the Fordist labour market: (1) labour market security, i.e., adequate employment opportunities, (2) employment security, i.e., protection against arbitrary dismissal, (3) job security, i.e., opportunities for employability, (4) work security, i.e., workplace rights, (5) skill reproduction security, i.e., training and skill development, (6) income security and (7) representation security, i.e., protection of collective voice.

Very few studies have analysed the relationship between precarious employment and health from such a multidimensional approach. In Canada, Scott-Marshall and Tompa (Scott-Marshall & Tompa, 2011; Tompa, et al., 2007) developed an eight-dimensional model of precarious employment including Rodgers's four dimensions plus other related dimensions such as work-role status uncertainty, risk of exposure to physical hazards, social support at work, and training and career advancement opportunities. They demonstrated that workers exposed to low earnings, unpaid overtime hours, absence of pension coverage, and manual work, were at increased risk of reporting poor health outcomes. Contrarily to their hypothesis, non-unionized workers showed a lower risk of poor health (Scott-Marshall & Tompa, 2011).

Lewchuk's et al. (2004) proposed the employment strain model, inspired by psychosocial job stress models like Karasek's job strain model (Karasek, 1990). This model describes employment arrangements characterized by a combination of (a) "employment relationship uncertainty", or uncertainty over work schedules and the continuity, terms, and conditions of future employment; (b) "employment relationship effort", or effort in finding and keeping employment or balancing the demands of multiple jobs; and (c) poor "employment relationship support", support from formal organizations such as unions, from co-workers and from friends and family (Lewchuk, et al., 2008). Results show that job insecurity and temporariness are associated with poor health, only when individuals reported also uncertain employment prospects and expend effort to minimize this uncertainty (Lewchuk, 2004).

Quinlan et al. also related temporary employment to their "Pressures, Disorganization and Regulatory Failure" model (Quinlan, et al., 2001; Underhill & Quinlan, 2011) in order to explain relations with occupational health and safety. Economic and reward pressures constrain safe work practices; disorganisation refers to the lack of commitment of the employer towards stable employment, resulting in less experienced workers, and lower training and supervision; regulatory failure refers to the weakening of and limited access to worker rights. Relations between the PDR-model and job insecurity, low control over the work process and working hours, poor social protection and benefits, low income, and the decoupling of the worker-employer relationship have been described (Quinlan, et al., 2001).

Another approach is the validated GREDS-EMCONET employment precariousness construct and scale (EPRES) (Amable, 2006; Porthe, et al., 2010; Vives, 2010). EPRES overcomes the limitations of one-dimensional indicators which solely address employment insecurity or instability, by incorporating other relevant dimensions. EPRES is based on a consistent conceptualization of precarious employment (Amable, 2006) firmly based in a *power resource* perspective (Korpi, 2006). According to EPRES the precarisation of employment is identified as this process of weakening of the salaried employment relationship as a consequence of labour deregulation and flexibility, and the resulting increase of asymmetry in power relations (Amable, 2006). The asymmetry of power is translated into increasing vulnerability of workers and the degrading of employment conditions, especially in the most vulnerable segments of the labour market (Vives, 2010). Based on Rodgers's four dimensions (Rodgers, 1989) and on qualitative research performed in Spain (Amable, 2006), the construct comprises: temporariness (employment instability), powerlessness or disempowerment (individualized vs. collective bargaining), vulnerability (worker defenselessness to unacceptable workplace practices), low or insufficient wages, limited rights (suboptimal entitlement to social security benefits and worker rights); and incapacity to exercise rights (powerlessness, in practice, to exercise workplace rights and entitlement). In Spain, the Employment Precariousness Scale (Vives, 2010) showed that poor mental health increased in a gradient-wise manner in relation with rising employment precariousness. In addition, young, immigrant,

manual and female workers exhibit an increased prevalence and severity of exposure to employment precariousness (Vives, et al., 2011). Qualitative research conducted in Spain among Spanish and immigrant workers (Porthe, et al., 2009) tends to confirm this finding.

We propose four pathways linking employment conditions to health (Vanroelen, et al. *working paper*). First of all, an association through the *reproductive sphere* of the household and private life, as a consequence of material deprivation caused by unsustainable employment conditions and the incapacity to plan ahead. Recent qualitative research suggests a close relationship between precarious employment and private life situations, such as a precarious family income, insufficient access to social services, being single or having a partner in an equally precarious employment situation (Amable, 2006; Clarke, et al., 2007; Vosko, 2006). In addition, the incapacity to plan ahead and to make plans for life and family are considered to cause a specifically stressful situation, not only for the workers in precarious employment themselves, but also for the other members of their family (M. Amable, 2006; Clarke, et al., 2007).

The three other pathways are running through the *productive sphere*. The first consists on the psychosocial reactions evoked by breaches in the psychological contract with the employer, the experience of imbalanced efforts and rewards regarding the pursued of employment, uncertainty, powerlessness, limited future prospects

or the denial of a worker-identity. An important line of research in this regard is constituted by psychological contract (PC) theory (De Cuyper & De Witte, 2008). The central assumption is that specifically a disjunction between the expectation and presupposed agreements, on the one hand and the actual employment situation, on the other hand, causes stress for employees (Cuyper, et al., 2008).

The second pathway through the productive sphere is the overrepresentation of hazardous physical and psychosocial working conditions and inadequate prevention and protection in precarious forms of employment. Research comparing standard and non-standard employment contracts has clearly shown an overall picture of more adverse health-related physical (e.g. physically demanding workloads, toxic exposures) and psychosocial (low control, low social support, sometimes work intensity) working conditions in non-standard employment contracts (Benach, et al., 2004; Goudswaard & Andries, 2002; Letourneux, 1998).

A final pathway linking precarious employment arrangements with outcomes of health and well-being is the pathway of social relations at work. The quality of broader informal social relationships among employees, formal and informal support from co-workers and superiors and the social dynamics within teams are affected by (differences between) employment statuses of employees. Associations between (precarious) employment arrangements and broader social relations between employees and with superiors have

yet not been tested often in quantitative empirical research (Byoung-Hoon & Frenkel, 2004). However, the results of qualitative research on precarious employment (and non-standard or flexible employment) have repeatedly shown the work floor social consequences of these employment arrangements. A number of authors have demonstrated the higher experience of discriminatory, unsupportive, exclusionary and alienating social relations with superiors and co-workers in non-standard employment arrangements (Amable, 2006; Clarke, et al., 2007; Hannif & Lamm, 2005; Vosko, 2006).

3.7. The importance of unemployment and precarious employment in Europe: some conclusions

This chapter has shown how employment relations have undergone important changes since the end of Fordism. After the WWII European employment protection systems (labour market regulations and welfare states) were established based on the premises of the SER and the male-breadwinner model. Important changes that developed after the oil shocks have changed the status quo on the labour market. High unemployment has been a reality together with the worsening of employment conditions, and the increase of vulnerability of workers in front of employers. Although with important cross-national differences, these conditions have been unevenly distributed among the population increasing labour market inequalities.

Occupational health research has shown that both unemployment and precarious employment are a threat to population health and health inequalities. Some studies report that finding a new job might be an antidote to the toxic experience of unemployment (Dooley, et al., 1996). However, with the worsening of employment conditions, for some proportion of the reemployed, the new job that follows unemployment may be hazardous, unsatisfactory, insecure, low-paid or stressful; in other words, precarious (Dooley, et al., 1996). On the other hand, having a precarious employment may not be the stepping stone to another better job, but to reiterative spells of unemployment. Making things worse, the existing unemployment protection systems, modelled on lifelong, full-time and stable employment with only temporary stints of unemployment, are nowadays ill-equipped to offer effective coverage in labour markets dominated by “atypical” and “flexible” employment (Clasen & Clegg, 2011). Thus, for some workers linking several temporary contracts, part-time or other atypical forms of jobs, may entail an unemployment period without benefits. Being unemployed without benefits has been proved to be a particularly negative experience for health (Rodriguez, et al., 1997), especially increasing poor mental health among the most vulnerable population groups according to the intersection of social axes of inequality (Artazcoz, et al., 2004).

The European changes of employment relations have had an important - although cross-nationally varied - impact on both unemployment and precarious employment. Nevertheless, still few systems of information are available to monitor their trends, to

know the most affected population subgroups and to assess the contribution of labour market inequalities on population health inequalities.

4. MONITORING EMPLOYMENT-RELATED HEALTH INEQUALITIES

Public health surveillance and monitoring are considered essential tools for intervention and policy making. Public health surveillance was originally developed for the control of infectious diseases, but today its principles have also been applied to other public health problems such as chronic diseases and occupational and traffic injuries (Thacker & Berkelman, 1992). Many countries already collect data on social determinants of health dispersed across different information systems typically designed for other purposes (CSDH, 2008). However, most social determinants of health remain outside surveillance systems and this area of public health remains limited or marginal within mainstream policy practice. Surveillance of social determinants of health is therefore a neglected but essential and challenging public health issue. The aim of this chapter is first to define public health surveillance, detail its uses and briefly review its historical evolution. Second, we present the main political and research advances on the monitoring of social determinants of health and health equity. Third, we proceed to review the state-of-the-art regarding the monitoring of employment-related health inequalities, specifically reviewing those existing measures to monitor unemployment and precarious employment as key employment conditions in Europe.

4.1. Public health surveillance: definition, uses and historical evolution

a) Definition and uses

Public health surveillance is one of the cornerstones of public health practice. It is a key tool for disease prevention, public resource allocation and the evaluation of public policies (Halperin, et al., 1992; Stroup, et al., 2004). The word “surveillance” is derived from French and signifies “to watch over”, referring to the close monitoring of the occurrence of selected health conditions (and lately of health-related events) in the population (Stroup, et al., 2004). The definition of public health surveillance has historically evolved together with the evolution of the main epidemiologic paradigms (Choi, 2012). Today there are several slightly different definitions of public health surveillance. One of the most-cited definition is the one of the Centers for Disease Control and Prevention (CDC). According to this definition, public health surveillance is the “*ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health*” (CDC, 2001).

Notwithstanding its evolution and differences between definitions, two main characteristics differentiate public health surveillance from other types of research: it is *ongoing* and *linked to intervention* (Choi & Pak, 2001; Thacker & Berkelman, 1992). That is, there is a

requirement for repeated studies over time of the same phenomenon, involving systematization and continuity of data collection. More importantly, it also aims to be relevant in decision-making processes. In that regard, some authors claim that no public health surveillance system is complete without being linked to action (Thacker & Berkelman, 1992; World Health Organization, 1968). Other authors have been careful to distinguish surveillance from direct responsibility for control activities (or public health interventions) and from epidemiologic research, although recognizing the important interplay among epidemiologic studies, surveillance and public health interventions (Choi, 2012). For example Langmuir stated “that the surveillance officer should be the alert eyes and ears of public health authorities and he should advice regarding control measures (public health interventions) needed, but the decision and the performance of the actual control operations must remain with the properly constituted health authority” (Langmuir, 1971, p. 684).

Public health surveillance systems can serve many purposes. One of the most traditional uses of public health surveillance has been the detection of new outbreaks⁴ or epidemics. The quicker outbreaks

⁴ According to the WHO a disease outbreak is “the occurrence of cases of disease in excess of what would normally be expected in a defined community, geographical area or season. An outbreak may occur in a restricted geographical area, or may extend over several countries. It may last for a few days or weeks, or for several years. A single case of a communicable disease long absent from a population, or caused by an agent (e.g. bacterium or virus) not previously recognized in that community or area, or the emergence of a previously unknown disease, may also constitute an outbreak and should be reported and investigated”. (http://www.who.int/topics/disease_outbreaks/en/).

can be detected, the more effectively disease prevention and control programs can prevent further morbidity and mortality. It has also been used to provide information of the natural history of disease. In general, public health surveillance is useful to (1) assess the health status of the population; (2) determine the distribution and spread of specific illnesses, including also inequalities in this spread; (3) measure the burden of a disease or other health-related event, including changes in related factors, (4) identify the population at increased risk, and (5) identify new or emerging health concerns. In terms of intervention, it is used to evaluate its impact, to identify public health priorities, to facilitate planning and to trigger public health action. And finally, it is useful to generate hypotheses and stimulate research (CDC, 2001; Stroup, et al., 2004; Thacker & Berkelman, 1992).

b) Historical evolution of public health surveillance

Recognition of surveillance as a key tool for improving public health has a long tradition and made a clear historical evolution. It parallels the conceptual evolution of public health and the causes of mortality and morbidity considered relevant at specific times. First public health actions related to surveillance were carried out during the 14th Century in Europe to prevent the spread of infectious diseases, when Venetian Republic authorities decided to control the landing of persons infected by the bubonic plague. During the 16th Century first legislation for surveillance was implemented in Rhode

Island, the USA, when reporting of contagious diseases became enforced by law.

With modernisation and industrialisation, the Sanitary Reform Movement led to systems of monitoring and rudimentary regulations to prevent pollution in the streets and public water in Europe. Edwin Chadwick used surveillance data to demonstrate the link between poverty and disease. William Farr, who is recognized as the founder of the modern concepts of surveillance, concentrated his efforts on collecting vital statistics, assembling and evaluating data, and reporting them to health authorities and to the general public. At the same time, Lemuel Shattuck proposed to standardize causes of morbidity and mortality and to collect data systematically stratified by age, sex, occupation, socioeconomic status and location (Cwikel, 2006). Social inequality and the living conditions of the working class - malnutrition, overcrowded houses without water, electricity or drainage, long working hours, unhealthy behaviours, etc. - were understood as the main causes of some diseases by several hygienists of that time. Notwithstanding this early recognition of social factors and social inequality as important origins of disease, soon, public health surveillance changed its focus towards the control of infectious diseases while adopting an individualistic approach.

During the late 19th Century and most part of the 20th Century epidemiology was focused on Germ theory, i.e. single agents related one to one to specific diseases. In that context the preventive

approach was mainly aimed at interrupting disease transmission (Susser & Stein, 2009). Consequently, public health surveillance systems became conceptually and technically improved to this purpose. Until the mid 20th Century, the term surveillance was restricted to the field of communicable diseases. However, the increasing burden of chronic diseases in the overall population led to discussions about the need to expand surveillance to chronic diseases. This was reflected on the 1968 World Health Assembly which broadened the concept.

During last decades public health surveillance systems to monitor chronic diseases and associated risk factors have been developed. Most of the conceptual frameworks underlying these surveillance systems fit within the dominant metaphor of the “web of causation” as the conceptual model for understanding health and their causes (Krieger, 2008; Krieger, 2001). Thus, health-related behaviours surveillance systems have proliferated. Health-related behaviours fit perfectly into a model of conventional surveillance, based on “proximal” risk factors which are ostensibly amendable to control by individuals and public health professionals. Furthermore, public health surveillance also has been expanded to other risk factors, such as environmental and occupational health risks.

The expansion of public health surveillance systems from infectious diseases to chronic diseases and related risk factors has not been free of limitations and difficulties. Three aspects of chronic diseases make surveillance, based on the model of infectious diseases, more

difficult. First, the latency between a precipitating event or exposure and the eventual chronic disease; second, the multifactorial aetiology of many chronic diseases which increases the difficulty to make a linkage between exposure, risk factors, interventions and outcomes; and third, the typical pattern of progression of chronic disease running through various stages implies that also disease surveillance needs to take that into account (Thacker & Berkelman, 1992).

To sum up, most of the modifications in public health surveillance since the late of 19th century have been focused on incorporating new disease outcomes and associated risk factors. They have seldom concentrated on introducing new approaches to monitoring public health, neither on new approaches to understand public health. The reasoning behind this preoccupation with “proximal” causes is the alleged wisdom that public health surveillance as a tool is only meaningful when resulting in information useful for (immediate) action. “Proximal” causes are easily amendable to action without raising deeper questions about the structure and organisation of society. Therefore, public health surveillance at the turn of the 21st century can be criticised for having become a public health tool that conceptually and methodologically fragments the object of study (population health) and de-contextualises it socially and historically, as it is the case with the risk-factor epidemiological approach (Breilh, 2003).

The recent attention to the health equity monitoring and social determinants of health (SDH) represents an important change for public health surveillance since it broadens-up a too narrow focus on the monitoring of health-outcomes and associated “proximal” risk factors. Notwithstanding major advances in this field, most of the social determinants of health remain outside surveillance systems, most of the health equity systems are still focused mainly on the distribution of health outcomes and accessibility to the health care system.

4.2. Monitoring social determinants of health and health inequalities

The monitoring of SDH and resulting health inequalities has become a topic of increasing interest among some public health authorities and scientists. This interest has grown in parallel to the increased interest in studying social determinants of health, because of persistent and growing social health inequalities. An important trigger was the publication of the “Black Report” during the early 1980s (Townsend, Davidson, & Whitehead, 1988).

Public health authorities, both governmental and non-governmental, have played an important role in broadening the scope of public health surveillance by recommending equity monitoring to national authorities and setting standards for data collection and reporting (CSDH, 2008). Renewed efforts towards the institutionalizing of an operational health equity surveillance system are seen from the late

1990s onwards (Braveman, 2003). Three key reports from public health authorities (world-wide and European) can be considered exemplary for the renewed claims for monitoring of SDH and health equity: the 2008 report of the WHO Commission of Social Determinants of Health (CSDH, 2008), the 2010 report of the Ministry of Health and Social Policy for the Spanish Presidency to the European Union (Calvete Oliva, et al., 2010) and the 2010 EuroHealthNet report (EuroHealthNet, 2010).

The report of the Commission on SDH contains, as one of the strategic recommendations, the need to monitor health inequalities at global, regional and national level and to assess trends in relation to social determinants of health. According to the recommendations of the Commission, monitoring health systems should contain data on the most important SDH which should be collected and analysed together with health data. The surveillance system should provide data on a range of SDH along the causal pathway, from daily living conditions (e.g. working and employment conditions) to more structural drivers of health inequities (e.g. socio-political context) (Solar & Irwin, 2007). The system should be structured so that it is possible to follow time-trends on SDH separately for men and women and for different social strata. The logic underlying the Commission's recommendations is to be able to apply interventions and evidence-based policy more effectively in order to improve overall population health and to reduce inequalities (CSDH, 2008).

The Spanish Ministry of Health and Social Policy established for the Spanish Presidency of the European Union «Innovation in Public Health: monitoring social determinants of health and reduction of health inequalities» as one of its priorities for the first semester of 2010 (Technical Committee for the priority of the Spanish Presidency on Monitoring SDH, 2010). By choosing this priority, the Spanish Ministry aimed to contribute to moving forward a political agenda towards the monitoring of SDH at both the European and national level. In order to achieve its objectives, the Spanish Presidency organised a series of events where policy makers and technical experts discussed and exchanged experiences from an intersectoral perspective. One of the most relevant meetings was the one at the employment, social policy, health and consumer affairs (EPSCO) Council. In this meeting, the European health ministers came to a common agreement on the importance of finding mechanisms that can be helpful to reduce the socially determined health inequalities in the EU and agreed on possible strategies for working further on the monitoring of SDH (Council of the European Union, 2010). The Council of European Union invited the European Commission and the member states to optimize the existing national data sources to obtain a regular overview of the health impact of their main policies, with special emphasis on obtaining information related to SDH. It also recommended reviewing previous work done on data collection and analysis from the point of view of health equity and developing a limited set of objective, comparable, politically relevant and applicable key

indicators on the social determinants of health inequalities in order to support policy action (Council of the European Union, 2010).

The EuroHealthNet is an active network of national and regional public health and health promotion institutes in all EU Member States established in 1998. Based on the recommendation of the WHO Commission on Social Determinants of Health explained above (CSDH, 2008), the EuroHealthNet (2010) reviewed the data resources available at EU and national level. The objective of the report was to provide a brief overview of the data collected and indicators that are available to monitor health inequalities and socio-economic determinants of health. Although it is a very broad report, it is a good starting point to do an in-depth analysis of each European available database.

At the national level, the Swedish Public Health authorities have been one of the first in developing a public health surveillance system including social determinants of health and health inequalities (Hogstedt, et al., 2004). The overarching aim of Sweden's national public health policy is to create societal conditions that will ensure good health, on equal terms, for the entire population. Public authorities at all levels should be guided by public health objectives at 11 policy domains, covering the most important social determinants of health. The Swedish public health department states that the benefit of using measurable determinants is that they enable to evaluate progress. This in turn supports political decision-making as determinants can be influenced by

certain types of policy measures. Health in working life is one of these 11 domains. For each policy domain a set of indicators is selected. Inclusion criteria of indicators are, among others, their availability, a strong correlation with health indicators and their capacity for being disaggregated for as many social mechanisms of inequality as possible (Hogstedt, et al., 2004; Lundgren, 2004; Lundgren, 2008).

In parallel to political recommendations, several contributions that improve the monitoring of social determinants of health and health equity can be derived from the public health research field. These contributions range from the attempt to change the epidemiological paradigm of public health surveillance, to technical questions on how to link data.

First, some critiques to the “conventional” epidemiological approach of public health surveillance, as well as some efforts to change it, have been made, especially from the critical epidemiology field. According to them, historical lessons on the development of conventional public health surveillance have shown that most public health tools for monitoring remain under the main epidemiological paradigm. It conceptualizes health as an individual process assumed by the negative effect (or disease risk) caused by multiple risk factors. According to this logic, identifying the aetiology is the base of prevention. With such an approach, there is always the risk of focusing primarily on pathogenic health-related behaviours, resulting in blaming the victim and casting the

structural roots of disease into oblivion. Thus, official information systems are usually describing isolated disease factors, and associated morbidity outcomes, instead of analyzing the generative processes that make part of the complex determination of health (Breilh, 2003). There is the risk that the dominant model is applied to the monitoring systems of social determinants of health and health equity. Consequently, data on social determinants of health might be collected, analyzed and interpreted omitting history and socio-political context, not taking into account that we live in a process of social interaction where values and relationships are constantly changing (Susser & Watson, 1962). Following these critiques, Breilh promotes a new approach for health monitoring based on the potentialities of the new conceptual and practical framework of critical epidemiology (Breilh, 2003).

Second, important efforts have been done to rethink the usefulness of monitoring SDH and health equity. The Measurement and Evidence Knowledge Network (MEKN) of the World Health Organization (WHO) (MEKN, 2007), has emphasized that monitoring social determinants of health and health inequalities should be useful for determining the magnitude of the problems, their temporal evolution and the most affected groups in society. Monitoring of SDH can also be used to assess entry points for interventions and assess the impact of policies and prioritize the use of public resources (MEKN, 2007; Scott-Samuel, 1998). In relation to the last point, several scientific reports promote new health monitoring systems as a way to identify the need for multisectoral

coordination of policies to improve population health and health equity. That is, action derived from the monitoring of SDH should involve not only the domain of public health policy, but it should stimulate multisectoral action (Calvete Oliva, et al., 2010; Cook, et al., 2013). Today, several studies are showing how policies outside the sanitary system, such as employment or fiscal policies, have more impact on population health equity than specific disease treatments (Stuckler & Basu, 2013)

Also very interesting is the proposal of Braveman et al. (2003) to promote the departure of health equity systems from the exclusive domain of public authorities, to convert it into an advocacy tool. Monitoring systems should be particularly valuable to policy-makers but especially for grassroots groups. According to her, monitoring equity and their social determinants of health must serve to advocacy, to maintain pressure on policy-makers when necessary. It is recognized that information in itself, no matter how technically sound, will not produce greater equity. Equity is a profound political issue. “Thus pursuing equity will require swimming against the tide of prevailing forces, who may feel threatened by efforts to achieve a more equitable distribution of society’s benefits” (Braveman, 2003). Moreover, from such a conception the essential goal of monitoring is no longer uniquely to prevent disease, but from now on is also fundamentally an ethical goal, based on human rights: “It is an ethical responsibility and consonant with principles of human rights to give special priority to action on important public-health problems that differentially affect

those with fewer resources and/or greater obstacles to addressing problems on their own” (Braveman, 2003).

Third, new conceptual frameworks have been presented to guide the development of approaches to monitoring equity in health. However, most of them are focused only on healthcare as the social determinant of health inequality (Braveman, 2003; Hosseinpoor, 2013). In this sense the more innovative proposal is the recent published “Marmot Review” (Marmot, 2010). In this proposal Marmot and colleagues listed the types of indicators appropriate for monitoring processes, outputs and outcomes in each of the areas of action (i.e. each specific social determinants of health), on the basis of the conceptual approach and recommendations identified in the report (Marmot, 2010).

Fourth, some incipient research efforts have been developed in order to select the most important SDH to be monitored, based on the evidence. One of the most important contributions in that sense is also the “Marmot Review” (Marmot, 2010) report for England, but also the report on monitoring social determinants of health from an expert group for the Spanish Presidency of the European Union in 2010 (Hernandez Aguado, 2010). In this report also the need of having better data on the axes of social inequality is claimed (Hernandez Aguado, 2010, p. 30).

Fifth, some researchers have begun to consider the technical challenges when collecting data for monitoring social determinants

related to health inequalities. Sadana and Harper (Sadana & Harper, 2011) have noticed that information systems are not designed to generate, link, synthesize or disseminate data and information on social determinants of health and health outcomes in the public domain, especially by relevant categories of social position. Institutional mechanisms, technical norms, and appropriate incentives to share data are needed to enable linking existing micro-data from different sectors, ensuring public access for analysis, and improving new data collection systems. Linking micro-data from different sectors, together with better theories of health and disease distribution that integrate biological, social and political processes, would permit to (1) describe and analyze pathways across a complex set of social determinants being related to health outcomes, and (2) to attribute causality to evaluate the impact of different policies or programs at different geographical levels, outside the health system, on health outcomes (Sadana & Harper, 2011).

Others have proposed to take advantage of the existing social indicators and tools for reporting on social well-being (“social reports”) to support a policy agenda aimed at addressing the SDH to improve health equity (Pega, et al., 2010).

Furthermore, we have to take into account the large efforts and advances made regarding the measurement of health inequalities (Kunst, et al., 2001; Mackenbach, et al., 2008; Regidor, 2004a; Regidor, 2004b). Inequality is a complex and ambiguous concept that can be measured and conveyed using a variety of statistical

techniques (Hosseinpoor, 2013). When approaching the task of measuring health inequalities, a first step involves calculating mean values of health across disaggregated subgroups. This provides a starting point for visual inspection of the health indicators across subgroups (Hosseinpoor, 2013). However, only this first step on disaggregating indicators poses many conceptual and methodological challenges. The first challenge is to decide the most important axes of social inequality for understanding health inequalities in each society and how to measure them. Moreover, we know that various strands of social inequality intersect and interact to reinforce one another, producing heterogeneous social categories and fluid boundaries (Juteau, 2003). Thus, probably to properly disaggregate indicators, an intersectional approach is necessary. The intersectional approach is useful to obtain insight about who is affected and how, and provides a way to monitor and evaluate the impact of social determinants and of related policies on different subgroups (Sen, et al., 2009) (See Chapter 2, pp.20-24).

Summing up, all of these contributions, although fragmented, are key contributions to advancement in the monitoring of social determinants of health and related health inequalities. In light of this review, we can conclude that SDH monitoring systems should achieve at least four basic requirements:

First, to depart from a conceptual framework from which to analyze data derived from the system. This framework should incorporate a historical and socio-political view of health processes,

understanding that people live in a constant social interaction which influences health and well-being (See Chapter 2).

Second, there is a need to have the most appropriate indicators of each social determinant of health. The selection of data and creation of indicators represent a fundamental step in the construction of monitoring systems. The process of constructing indicators consists of connecting abstract concepts to empirical reality. The construction of indicators can be data, policy or concept driven. The first are constructed according to the availability of data, the second according to the policy objectives and the third according to a conceptual framework. Although, most of time, the construction of indicators are data or policy driven, they are often less preferable than those with an underlying clear and widely accepted conceptual framework. A concept-driven selection process should result in more theoretically sound indicators (Cobb & Rixford, 1998; Cobb & Rixford, 1998; Etches, et al., 2006; Lundgren, 2004; Noll, 2002). Concept driven indicator construction is based on two main steps. The first step is conceptualization, that is, a theoretical reflection by which the main dimensions of the concept are defined (Berger-Schmitt & Noll, 2000). The second phase consists of the constructing, that is, the process of translating conceptual indicators into directly observable variables through the availability of data (Noll, 2002). Moreover, ideal indicators are characterized by their validity, sensitivity, specificity, feasibility, reliability and sustainability, understandability, timeliness, and comparability (Pencheon, 2008)

Third, ideal indicators are also those having the capacity of being stratified by subpopulations (Pencheon, 2008). When we are interested in measuring social inequalities, we need to disaggregate indicators according to the social axes of inequality. More interestingly, is the “new” intersectional approach of the social axes of inequality (See Chapter 2, p.20-24). It comes up as a possible new approach to disaggregate indicators of social determinants in order to monitor specific subpopulations.

Finally, as pointed out previously by Sadana (Sadana & Harper, 2011), if these systems have to be a reality, we need all kinds of data, including social indicators, data on social axes of inequality, and health indicators together in the same database. This database should be representative at the population level, while also having enough statistical power to stratify the data and allow for periodical monitoring.

4.3. Monitoring employment-related health inequalities⁵

Employment relations and conditions, together with working conditions, have been considered as one of the key social determinants of health which should be monitored in relation to

⁵ Most of the information of this section is published in Benach, J. Puig-Barrachina, V., Vives, A. et al. The challenge of monitoring employment-related health inequalities. *J Epidemiol Community Health* (2012). doi:10.1136/jech-2012-201103. (See appendix for a complete version of the publication).

health inequalities (CSDH, 2008; Hernandez Aguado, 2010; Marmot, 2010) (See also Chapter 3 for further reasoning on its importance as social determinants of health inequalities). Actually, in several European countries work-related health monitoring schemes do exist. These schemes often focus on “traditional” aspects of occupational health such as occupational diseases, work injuries, and as a quite more innovative perspective, psychosocial risk factors, together with the mere description of working conditions. Less abundant are those monitoring schemes analyzing the contribution of working conditions to health inequalities among workers by stratifying their distribution over social and occupational categories, even less abundant are those including employment conditions (Benach, et al., 2012; Landsbergis, 2010; Landsbergis, 2003). Various researchers have stated the need of periodical in-depth monitoring of employment and working conditions in order to assess their trends and analyze its contribution to health inequalities (Benach, et al., 2012; Landsbergis, 2010; Marmot, 2010).

During the last years there has been an increasing awareness that the characteristics of work and employment do have a major impact on public health, causing considerable costs to society. Because of that, new proposals on work-related monitoring systems from a public health perspective have been developed (Lavis, et al., 2001). The idea of these monitoring systems is to include indicators for policy impact analysis to provide insight in the associations between work and health. The underlying idea is to provide the

necessary knowledge for changing the influencing factors and improving population health. In that regard, and for different reasons, three recent studies in the public health field can be considered as the most important precedents to the employment-related monitoring of health inequalities: the experts' report for the monitoring of SDH of the Spanish Presidency of the EU-2010 (Hernandez Aguado, 2010), the Marmot's Review report (Marmot, 2010) and the WORKHEALTH project of the European Commission (Kreis J & Bödeker, 2004).

First, the most important contribution of the first report (Hernandez Aguado, 2010) is to highlight employment conditions as one of the key aspects when implementing a SDH monitoring system to reduce health inequalities. In this expert report, Johannes Siegrist recommends monitoring four specific employment and working conditions that are potentially harmful to health: 1) unemployment and precarious employment, 2) low-paid jobs, 3) jobs that involve physical, biological, or chemical health risks or those with an increased risk of injury, and 4) jobs in harmful psychosocial environments. There is also a claim in favour of local, national and international labour surveys, such as the European Working Conditions Survey, as key tools for monitoring. These surveys are supposed to be useful tools only when applied measures are valid and conceptually sound. However, the chapter does not include a conceptual framework for understanding employment and working conditions and their relation with health inequalities. Furthermore, it does not contain specific indicators to measure unemployment and

precarious employment, as well as, a proposal to disaggregate them in population subgroups. The chapter emphasizes *socioeconomic position* as the main axis of social inequality in labour market, but it does not refer to gender or migration status as other main contributors to health inequalities in the European labour market.

Second, also in Marmot's "Fair Society Healthy Lives" report, employment and work are also identified as a key social determinant and as important policy objectives for improving population health equity of England (Marmot, 2010). Marmot's approach of monitoring is focused on policy objectives. According to the report, the priority objectives for England regarding employment should be to 1) improve access to good jobs and reduce long-term unemployment across the social gradient, 2) make it easier for people who are disadvantaged in the labour market to obtain and keep work, and 3) improve quality of jobs across the social gradient. The recommendations are: 1) to encourage, incentivize and – where appropriate – enforce the implementation of measures to improve the quality of work across the social gradient, 2) and to develop greater security and flexibility in employment by prioritizing greater flexibility of retirement age, and incentivizing employers to create or adapt jobs that are suitable for lone parents, carers, and disabled people. According to these objectives and recommendations in following his specifically designed monitoring framework to evaluate policies and related health outcomes, a proposal of several indicators is made. As an example, one of the objectives to pursue is to reduce involuntary

part-time, temporary or contract working. This is a policy-driven way to create indicators according to the recommendations; however, the report is based on scientific evidence. Today, a set of Marmot's indicators has been implemented by the London Health Observatory (LHO) (<http://www.lho.org.uk/>), and by the Public Health Outcome Framework (PHOF) data tool, part of the public health strategy of the English Government (<http://www.phoutcomes.info/>). The integration of the Marmot indicators in the LHO is a pioneering experience of incorporating social determinants of health in a Basket of Health Inequality Indicators. However, regarding the long list of employment indicators proposed, for the moment only young people not in employment, education or training (NEET) is introduced as an indicator in PHOF and LHO.

Third, the *WORKHEALTH* project can be considered as one of the most relevant projects to the “Establishment of indicators for work-related health monitoring in Europe from a public health perspective” (Kreis & Bödeker, 2004). This project, launched by the European Commission in 2002, is aimed to provide an overview of the health status of the labour force. According to it, findings should be useful to determine action, set priorities and make recommendations to improve work-related health. Relevant policies were selected based on their influence for the workplace setting and the resulting outcomes in terms of health. The quality of job and also health inequalities related to work were included as key policy domains. Based on these policy domains, a comprehensive set of

work-related indicators available in different European datasets were selected. Notwithstanding of its important contributions in terms of trespassing classical conceptualizations of occupational health and getting it closer to a public health perspective, important limitations keep existing. It lacks a theoretical framework for understanding health and their causes, and more specifically for understanding health inequalities produced by employment and working conditions. A-theoretical indicators are purely descriptive (Esping-Andersen, 2000), and we can thus improve this approach. Moreover, the construction/selection of indicators was first policy-driven and secondarily data driven, with the disadvantages that it entails, as previously discussed.

Also Lavis et al. (2001) provided evidence-based recommendations for work-related population health indicators. Drawing on a framework of work-related experiences, they systematically reviewed studies that assess the associations between these experiences and health and reviewed related measures at the population level that could be used as indicators. Based on their results, Lavis et al. recommended the following indicators for which data are (according to them) routinely collected: unemployment rate, long-term unemployment rate and permanent lay-off rate, insecurity associated with pending job loss, with possible major organizational change, and with actual major organizational change, and job strain.

Furthermore, the public health field cannot ignore other important contributions in terms of conceptualizing employment conditions and creating employment indicators outside its own field. The labour market has been one of the main objects of study of other disciplines such as sociology of work, political sciences, economic sciences and industrial relations research.

a) Unemployment measures

Although being unemployed is a situation which, in principle, is easy to understand, several indicators regarding the unemployment situation exist. An unemployed person is someone who is willing to work but is unable to find a job. Of course, as Garrido and Toharia argue “this general statement may be qualified in various ways, for example, by imposing some condition about being willing to work “at the going wage”, as economists usually do, or about the way in which job search is carried out” (Garrido & Toharia, 2004). Although it is not the purpose of this chapter to do an in-depth review of different measurements of unemployment, in the following I will provide some of the most important definitions and measures.

Unemployment is defined as follows in the Resolution concerning statistics of the economically active population, employment, unemployment and underemployment, adopted by the Thirteenth International Conference of Labour Statisticians (Geneva, 1982): (1) The “unemployed” comprise all persons above a specified age who during the reference period were: (a) “without work”, i.e. were

not in paid employment or self-employment, (b) currently available for work, i.e. were available for paid employment or self-employment during the reference period; and (c) “seeking work”, i.e. had taken specific steps in a specified reference period to seek paid employment or self-employment (LABORSTA - ILO).

Many countries around the world, including, the European Union, have adopted this definition as their guideline to measure unemployment. Most of them, as well, use sample household surveys to determine unemployment figures. However, the precise way in which the concepts above are translated into precise questions aimed at extracting the correct information from individuals varies from country to country. The most difficult question refers to job search. The practice here seems to be varied and no unique procedure is followed (Garrido & Toharia, 2004).

Regulation 1897/2000 of the European Commission defines unemployment in a pretty standard way, following the classical ILO conventions. According to this definition, an unemployed person is one without work during the reference week, currently available for work and actively seeking work during the 4-week period ending with the reference week. The most important specificities are those regarding the way of “seeking a job”. For the European Commission actively seeking work (i.e. taking specific steps in the four week period ending with the reference week to seek paid employment or self-employment or those who found a job to start later) includes: a) having been in contact with a public employment

office to find work, whoever took the initiative (renewing registration for administrative reasons only is not an active step), b) having been in contact with a private agency (temporary work agency, firm specialising in recruitment, etc.) to find work, c) applying to employers directly, d) asking among friends, relatives, unions, etc., to find work, e) placing or answering job advertisements, f) studying job advertisements, g) taking a recruitment test or examination or being interviewed, h) looking for land, premises or equipment, i) applying for permits, licences or financial resources. Education and training are considered as ways of improving employability but not as methods for seeking work. Therefore, this regulation is making an important distinction between active seekers and passive seekers, being the latter not counted as unemployed.

Following this definition, different indicators of unemployment are calculated such as: i) *the unemployment rate*, i.e. the number of people unemployed as a percentage of the labour force. The labour force is the total number of people employed and unemployed. ii) *The long term unemployment rate*, i.e. the share of those unemployed since 12 months or more in the total number of active persons in the labour market. Active persons are those who are either employed or unemployed. iii) *The long term unemployment share*, i.e. the share of the unemployed persons since 12 months or more in the total number of the unemployed; iv) *The very long term unemployment rate*, i.e. the share of those unemployed since 24 months or more in the total number of active

persons in the labour market (EUROSTAT -European Commission, 2013).

Other related indicators also exist to supplement these unemployment rates: i) *Underemployed part-time workers*, i.e. those persons working part-time who wish to work additional hours and are available to do so. Part-time work is recorded as self-reported by individuals. ii) *Persons seeking work but who are not immediately available*, i.e., the sum of persons neither employed nor unemployed who: (a) were actively seeking work during the last 4 weeks but not available for work in the next 2 weeks; or (b) found a job to start in less than 3 months and are not available for work in the next 2 weeks; or (c) found a job to start in 3 months or more; or (d) were passively seeking work during the last 4 weeks and are available for work in the next 2 weeks. iii) *Persons available to work but not seeking*, i.e. those persons neither employed nor unemployed who want to work, are available for work in the next 2 weeks but are not seeking work (EUROSTAT -European Commission, 2013).

How important it is to determine the precise magnitude of the unemployed population is a matter of debate. One may argue that the dividing line between unemployment and inactivity is a blurred one, and that what really matters is the distinction between employment and “non-employment” (Garrido & Toharia, 2004).

b) Quality of employment and precarious employment measures

The situation regarding the conceptualization and measurement of the quality of employment and precarious employment is radically different from that of unemployment. No official definitions exist regarding the concept of quality of employment and precarious employment. However, there is a growing literature dedicated to conceptualising “job quality” or “quality of work” (Gallie, 2007) or also “decent work” (Ghai, 2003) and “fair employment” (Benach & Muntaner, 2007). Two recently published reviews – Holman and McClelland (2011) and Muñoz de Bustillo and colleagues (De Bustillo, 2011) – have described this emerging field. A main trait of the job quality approaches is their orientation towards multiple dimensions and subdimensions defining the quality of jobs. Often, however, conceptual distinctions between “intrinsic work task characteristics” and “employment characteristics” remain blurred (e.g. Tangian, 2007). The same holds for the distinction between “job characteristics” and “workers’ characteristics”, such as well-being (e.g. Leschke, et al., 2008) or between “conditions” and “perceptions about conditions” of employment (e.g. EUROFOUND, 2012). Finally, many of these approaches – such as the Laeken Indicators of the European Commission (Davoine, et al., 2008) – are more developed for country-comparative aims, and less for investigating individual workers’ situation.

Moreover, a closely related literature exists attempting to conceptualize and measure precarious employment from a

multidimensional perspective. As explained in Chapter 3, Rodgers (1989) was one of the first authors conceptualizing precarious employment, as well as Standing (1999). Following this conceptualization also an important effort was made in the European Union to conceptualize and measure precarious employment in its different dimensions (ESOPE project) (Frade, et al., 2004).

The lack of official conceptualizations and measurement for precarious employment makes our effort to monitor it as a social determinant of health inequalities even more difficult. Moreover, the above mentioned measures, with few exceptions, consist of aggregated data; they are constructed with data available in different data systems; and most data systems do not include health indicators. This impedes the study of employment-related health inequalities, especially at the individual level. Notwithstanding these difficulties, a first experience measuring precarious employment at the individual level exists for Spain. It concerns the previous cited Employment Precariousness Scale (Vives, et al., 2010) (See Chapter 3, pp.73-74). This is a promising tool; however, for monitoring purposes in the European labour market, there still specific surveys do not exist to measure it regularly.

4.4. Conclusions

The monitoring of social determinants of health and related inequalities is a challenging key tool for increasing health equity. As seen in Chapter 3, employment conditions are key social

determinants of health inequalities. Although in several European countries work-related health monitoring schemes exist, few of them contemplate the most important employment conditions in Europe, that is, unemployment and precarious employment. The existing efforts of conceptualization and measurement make unemployment available as an indicator in some health-related monitoring systems. This is not the case for precarious employment. In order to advance in the monitoring of employment-related health inequalities in Europe, in Chapter 3 we have done an effort to conceptualize the causal relations between employment and health inequalities. However, we still need conceptually sound measures for precarious employment. In this case a promising approach is to depart from a solid concept of precarious employment (Amable, 2006; Vives, 2010) to construct a set of indicators using an existing European survey, as suggested by Siegrist and other researchers (Hernandez Aguado, 2010). Furthermore, to measure both unemployment and precarious employment related to health inequalities, we need to know how to disaggregate these indicators. Here the intersectional approach has been revealed promising for this purpose (Juteau, 2003; Weber & Parra-Medina, 2003).

Thus, the following empirical articles are aimed to achieve these two objectives: to construct new indicators for measuring precarious employment related to health inequalities in a European existing database, and to improve the way of disaggregating precarious employment and unemployment indicators through an intersectional approach.

5. METHODS

This thesis is based on data from two different surveys: the Catalonian Health Survey-2006 and the European Working Conditions Survey-2005. Data analyses and the description of the variables are discussed in detail on the research papers and are not repeated in this chapter.

5.1. The Catalonian Health Survey-2006

The Catalonian Health Survey (2006) includes a representative sample of the non-institutionalized population of Catalonia, a region in the northeast of Spain with about 7.5 million inhabitants. The Catalonian Health Survey is an instrument of the Health Department of the Government of Catalonia that provides information on perceptions of population health and other health-related problems, health risk factors and health-related behaviours, health services use, demographic characteristics, family environment and housing. The sample design is complex with the aim to guarantee the representativeness also in small geographic areas. The sample size is defined based on 36 health regions considering the population size, the number and volume of each government municipalities. Participants were randomly selected through a multiple-stage random sampling strategy. In the first stage municipalities are selected so that they are representative for the various sizes of the municipalities and their characteristics in terms of sex and age distribution. The second stage determines the

number of people interviewed in each municipality using simple random sampling. The selection of individuals is done by a process of simple random extraction from the Population Register of Catalonia, with a random control to ensure the structure by sex and age (Mompert-Penina, et al., 2011).

In the 2006 edition 18,126 non-institutionalized persons were interviewed, of which 15,926 adults were aged 15 years or more. We restricted our study to the active population, that is, those people who are employed or unemployed but looking actively for a job. We also decided to restrict our population in term of age. Only people between 25 and 64 years-old were included. We decided not to include people younger than 25 because 85% 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. Thus, we finally selected 8,591 participants.

5.2. The European Working Conditions Survey-2005

The European Working Conditions Survey (EWCS) 2005 is a representative survey containing information on working conditions, demographics, household characteristics, socioeconomic indicators and work-related health. The sample of the EWCS is representative for the persons in employment (employees and self-employed) during the fieldwork period in each of the countries covered. In each country, the EWCS sample followed a multi-stage,

stratified and clustered design with a “random walk” procedure for the selection of the respondents at the last stage (except for Belgium, Netherlands, Sweden and Switzerland, where the selection of the respondents was made using a phone register). All interviews were conducted face-to-face in the respondent’s own household. The sampling design had the following stages: 1. Stratification of primary sampling units (PSUs) according to region and urbanisation level. 2. Random selection of starting addresses within each PSU: within each stratum, each PSU was randomly assigned an address from which the “random walk” would start. 3. “Random walk” procedure for the selection of the household. Once a household was selected, it could not be substituted even if there was nobody at home, until four attempts to contact the interviewee had been unsuccessful (at different times and days). 4. Selection of the interviewee within the household: of all persons in employment it was the person whose birthday was the latest that was interviewed.

Three types of weighting have been applied to the data in order to enhance the representativeness of results. First, a selection probability weighting: the “random walk” selects households and within households, respondents. This has the unintended consequence of giving more probability of selection to respondents living in smaller households. This has been corrected by applying selection probability weights. Second, non-response (or post-stratification) weighting: different types of eligible respondents have different response rates, which can lead to biased estimations. The usual way to minimise this effect is to generate a weight that

corrects the biased response rates for some key variables, so that the bias is minimised. This requires knowing the real population figures for the variables used for producing these non-response weights: in this case, it was assumed that the figures of the European Labour Force Survey (LFS) are the real figures, to generate a weight that adjusts these results to the results of the LFS for the following variables: sex, age, region, occupation, and sector. Third, cross-national weighting: this final step in the weighting is applied in order to be able to do cross-national estimations. The weights of all respondents in each country are multiplied by the proportion that this country represents in the total employed population in the respective cross-national area (Parent-Thirion, et al., 2007).

On the edition of 2005 almost 30,000 European in employment aged 15 and over from 31 countries were interviewed (all EU-27 Member States plus Croatia, Norway, Turkey and Switzerland). Since our study focuses on precarious employment among wage-earners in the EU, we excluded the self-employed, the armed forces, non-EU-27 inhabitants and respondents outside the 15-65 range of age. The final sample for the descriptive study of precarious employment (paper 2) comprises 21,415 participants. For the second study of precarious employment (paper 3) and its association with job dissatisfaction and health, we limited our sample to people with an employment contract. Thus, the final sample for paper 3 comprises 19,387 individuals.

6. RESULTS

Paper 1. Monitoring social determinants of health inequalities: the impact of unemployment among vulnerable groups.

Paper 2. Measuring Employment Precariousness in the European Working Conditions Survey: The Social Distribution in Europe.

Paper 3. How does precarious employment relate to health and job satisfaction in Europe? A gender and cross-national perspective.

Paper 1

Puig-Barrachina V, Malmusi D, Martínez JM, Benach J.
[Monitoring social determinants of health inequalities: the impact of unemployment among vulnerable groups.](#)
International Journal of Health Services, Volume 41, Number 3,
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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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and Joan Benach

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 Catalonian 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)
MEN						
<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)
WOMEN						
<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 ^a % (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, %
MEN						
<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 ^a % (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, %
WOMEN						
<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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Paper 2

Puig-Barrachina V, Vanroelen C, Vives A, Martínez JM, Muntaner C, Levecque K, Benach J, Louckx F. [Measuring employment precariousness in the European Working Conditions Survey: the social distribution in Europe](#). *Work*. 2014;49(1):143-61

Measuring Employment Precariousness in the European Working Conditions Survey: The Social Distribution in Europe

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Abstract

Background: Precarious employment is becoming an increasingly important social determinant of health inequalities among workers. The way in which contemporary employment arrangements and their health consequences are addressed in empirical research is mostly based on the contract-related or employment instability dimension. A broader conceptual approach including various important characteristics of the degrading of employment conditions and relations is needed.

Objective: The general objective of this paper is to empirically test a new multidimensional construct for measuring precarious employment in an existing database. Special focus is on the social distribution of precarious employment.

Methods: A subsample of 21,415 participants in the EU-27 from the Fourth European Working Conditions Survey-2005 was analysed. A cross-sectional study of the social distribution of precarious employment was conducted through the analysis of proportional differences according to gender, social class and credentials for the European Union as a whole and within each country. The 8 dimensions of the Employment Precariousness Construct were represented by 11 indicators.

Results: In general, women, workers without supervisory authority, those with fewer credentials, and those living in Eastern and Southern European countries suffer the highest levels of precarious

employment. Exceptionally, men, workers with supervisory authority and those with the highest credentials suffer the highest levels of long working hours, schedule unpredictability and uncompensated flexible working times.

Conclusions: This article offers the first validation for an innovative multidimensional conceptualisation of employment precariousness applied to the analysis of existing survey data, showing the unequal distribution of precarious employment across the European labour force. This set of indicators can be useful for exposure surveillance of precarious employment.

Keywords Precarious employment · Health inequalities · Monitoring · Gender · Social class

1. Introduction

There has been a steady de-standardisation of employment conditions in western countries since the end of the “Golden Age” of industrial mass production (1945-1975) [1]. During these years, the Fordist Standard Employment Relationship (SER) model, i.e., full-time -approximately 40 hours per week-, full-year and permanent employment, for the male breadwinner prevailed [2]. The economic, political and ideological conflicts of the 1970s led to the emergence of a new employment paradigm. This new paradigm favours non-standard or flexible employment arrangements⁶ [2], and the deregulation of the SER [3]. Consequently, employment conditions in some segments of the labour market have degraded and can be considered as forms of “precarious employment” [4].

Precaious employment can be considered as a major dimension of a much broader phenomenon of social precariousness. The latter refers to the social factors that erode people’s resources and capacities and raise their risk of marginalization [5]. Precarious employment, in turn, is considered a key determinant of social health inequalities [6]. Social health inequalities refer to those health differences which are unnecessary and avoidable but, in addition, are also considered unfair and unjust [7]. The major factors responsible for social health inequalities are the political, economic, cultural and environmental conditions within societies,

⁶ We use “employment arrangements” to point at both employment conditions and social relations, and their mutual interplay in specific job situations.

which determine the risk of people getting ill, their ability to prevent sickness, or opportunities to have access to the right treatment. These conditions are called the social determinants of health [8]. Work plays a major role in most people's lives [9]; employment and working conditions are prominent social determinants which have been repeatedly shown to be health-related. Finally, because most of work and employment conditions are unequally distributed by social class, gender, education, ethnicity, etc., these conditions also make a substantial contribution to social health inequalities [10].

It is the general objective of this paper to empirically test a new multidimensional construct for measuring employment precariousness in Europe via an existing database, the European Working Conditions Survey (EWCS) and to assess and discuss the social distribution of its constituting indicators.

1.1. Conceptualizing and measuring precarious employment

The quality of work can be represented in four separate domains: *job content*, i.e., worker's degree of autonomy and control over their jobs; *working conditions*, i.e., physical and psychosocial demands of work; *employment conditions*, i.e., the mutual agreement between employees and their employer over the terms of their contracts, rewards and expectations; and finally, *employment relations*, i.e., the mutual relations between employers and employees [11]. Employment relations are in essence an asymmetrical power relationship, intrinsically related to the Marxist concept of social

class [12]. In this paper, precarious employment is approached from a *power resources* perspective [13]: it refers to (asymmetrical) employment relations and related employment conditions. Given that the SER model was conceived as a fairly balanced employment relationship [14] it serves as a point of reference, from which to assess diverging characteristics of employment.

The way in which contemporary employment arrangements and their health consequences has been addressed in empirical research varies greatly. Most of the approaches are focused on one single dimension of precarious employment: the instability of employment. This instability is often measured by focusing on the health consequences of *types of employment* situations that differ from the permanent type of employment contract, which was typical for the SER model [15]. Also a *perceptual approach* has been adopted, focussing on the workers perception of job insecurity [16,17]. A third approach focuses on *downsizing* and addresses the imminent threats of job loss due to restructuring processes in organizations [18]. In contrast, other approaches to precarious employment go beyond the contract-related or employment instability dimensions, including other important (objective) characteristics of the degrading of SER-employment, like low social protection, unsustainable wages, or low worker representation [6,19].

Several authors have proposed multidimensional approaches to precarious employment. Rodgers [4] identifies four dimensions of

precarious employment: (1) uncertainty of continuing work, (2) limited control over work, (3) limited legal and social protection, (4) income inadequacy. Standing [3] referred to seven forms of employment security which characterize SER-employment in the Fordist labour market: (1) labour market security, i.e., adequate employment opportunities, (2) employment security, i.e., protection against arbitrary dismissal, (3) job security, i.e., opportunities for employability, (4) work security, i.e., workplace rights, (5) skill reproduction security, i.e., training and skill development, (6) income security and (7) representation security, i.e., protection of collective voice. Other authors have taken into consideration both approaches in building their own concepts of precarious employment [20-22]. However in some cases these conceptualizations also incorporate aspects of working conditions and the content of work, which may be considered undesirable from a conceptual point of view.

It is our purpose to focus on a multidimensional concept based only on employment conditions and relations inspired by the Employment Precariousness Construct developed by Amable and other scholars from Pompeu Fabra University in Barcelona, Spain [19,23,24] and the Employment Conditions Network (EMCONET) –a knowledge network for the Commission on Social Determinants of Health of the World Health Organization [6]. This multidimensional construct of precarious employment has its roots in Rodgers' original framework [4] and is primarily designed for epidemiological studies. Amable [23] defined precarious

employment as *the weakening of the wage relation as a consequence of labour flexibility and the resulting asymmetry in power relations* (p. 126). According to this author, accounting for multiple dimensions of the transformations in salaried society identifies precarious employment as a social process that undermines one of the foundations of the post-war societies: the SER-model [23]. The Employment Precariousness Construct [19, 23] encompasses six dimensions: instability of employment or temporariness, low income, lack of workplace rights and social protection, the incapacity to actually exercise the rights and benefits workers are entitled to, the absence of collective bargaining over employment and working conditions and vulnerability.

Based on the Employment Precariousness Construct, an Employment Precariousness Scale (EPRES) has been developed and tested empirically on a sample of Spanish employees [25]. Results of the first empirical studies relating the EPRES scale to outcome measures of worker's health and well-being have shown some clear associations with poor mental health [26]. Adverse mental health is shown to increase in a gradient-wise manner in relation with rising employment precariousness [23].

For this study, we have adopted the Employment Precariousness Construct with some adaptations because of conceptual considerations. Because precarious employment should consider the degrading of the different characteristics of employment that are typically manifested in the SER model, we adopted two additional

dimensions from Standing's model [3]: lack of training possibilities and skill development and low control over working times. Working time was already proposed as a new dimension for the Employment Precariousness Construct in a previous review among migrant workers [24].

1.2. Social class, credentials and gender as social mechanisms of health inequalities

The assumption that precarious employment is related to axes of social inequalities makes it a determinant of social health inequalities. In social epidemiology, health inequalities are traditionally explained through two main pathways: socially differential exposure to health-related risks and protective factors (mainly social determinants of health) and differential vulnerability to these factors (effect modification) [27]. The axes of social inequalities determine people's social position, which is related to the availability of their economic, cultural, and social standing and determine their access to valuable health-related social resources, privileges and opportunities [28]. Social class and credentials are clear examples of axes of social inequalities that are affecting health [29]. However, "ascribed social positions" such as gender, sexual orientation or ethnicity are also related to health inequalities to the extent that these positions are related to fewer opportunities. Specifically gender remains an important element of social stratification [30] with regard to flexible and non-standard employment conditions [31].

In this paper we specifically address *the differential exposure to precarious employment* according to social class, credentials and gender. Social class is considered here from a relational, rather than a stratification perspective which is most often adopted in social epidemiology [28]. The relational approach focuses on the dynamic character of social inequalities as constantly (re)produced during human action, while a stratification approach focuses on the social differences in a given community at a given time [12]. Credentials are understood as socially valued skills and knowledge that are certified through education and experience, and may serve as a major mechanism of social resource allocation [29].

A final key point is the interaction between mechanisms of health inequalities. It has been shown that social class, credentials and gender are intertwined [32]. As a consequence, different gender-related class patterns in health can be expected. Therefore in this study, an intersectional approach [32-34] is applied through investigating the social distribution of precarious employment by social class and credentials stratified by gender.

Aim and hypothesis

The central focus of this study is the social distribution, in the European workforce, of 11 indicators which together make up a multidimensional measure of employment precariousness. The 11 indicators are the result of the adaptation of the Employment Precariousness Construct to the 2005 European Working Conditions Survey. As a first step, the distribution of employment

precariousness according to social class, credentials and gender is analyzed. Then, gender-stratified results of the social class and credentials distributions are shown. Finally, the geographic distribution of employment precariousness is assessed.

Our main hypothesis was that employment precariousness is unequally distributed among the European labour force according to gender, social class and credentials. More concretely, it is expected that a higher proportion of respondents in a socially disadvantaged position, i.e., women, workers without authority, and unskilled employees, will predominate in the most precarious category of each indicator. Moreover, different gender patterns for employment precariousness can be expected by social class as well as by credentials. Regarding specific country distributions, higher levels of precarious employment are expected to be found in southern and eastern European countries.

2. Methodology

2.1. Survey design

The Fourth European Working Conditions Survey (EWCS), conducted in 2005 was the basis for this study. The EWCS contains information on working conditions, demographics, household characteristics, socioeconomic indicators and work-related health. The EWCS 2005 was conducted to obtain a representative sample of people in paid work aged 15 and over (employees and self-employed) through multi-stage, stratified, random sampling [35]. Almost 30,000 European workers were interviewed in 31 countries

(all EU-27 Member States plus Croatia, Norway, Turkey and Switzerland). In our analyses however, only wage-earners from the EU-27 member states have been included (N= 21,415 participants). Note that response rates varied considerably between participating countries [35].

2.2. Measures

Based on the information available in the EWCS, 11 indicators were constructed representing the dimensions of employment precariousness that have been described above. A brief definition of the dimensions and the construction of precariousness indicators are available in Table 1.

The *social class* indicator is based on a Neo-Marxist theoretical framework [28]. On theoretical grounds, three possible class positions can be defined among wage-earners: *managers*, those who make strategic decisions over the means of production; *supervisors*, those who have a certain authority over the work of others or the policy of their organization; and *workers*, those without authority over the work of others. The social class indicator is constructed from two variables: “people supervising the work of others” and the International Standard Classification of Occupations (ISCO). Legislators and senior officials, corporate managers, managers of small enterprises, with or without supervising functions were classified as *managers*; other occupations with supervising functions were classified as *supervisors*; and the remaining respondents were classified as *workers*.

The *credentials* indicator was constructed from two variables: educational attainment based on the International Standard Classification of Education (ISCED) and the ISCO. Employees with low education, e.g., primary education or lower secondary education (except for workers in precision, handicraft, craft printing and related trades) and those who combine higher secondary education with un/semi-schooled manual, non-manual routine, educational or healthcare occupations are classified as unskilled employees. Schooled manual employees, professionals and managerial employees with higher educational attainment, as well as manual, non-manual routine, educational and healthcare workers with a higher non-university educational attainment are in the semi-skilled category. Finally, professionals and managerial employees with non-university higher education and all respondents with a university degree are classified as experts. In this way, the indicator of credentials also takes into account credentials achieved through experience during an occupational career [29].

2.3. Statistical Analysis

The social distribution of precarious employment was obtained through the analysis of the proportions of employees within the 11 precarious employment indicators according to social class, credentials and gender (Table 2). The distribution of precarious employment indicators according to social class and credentials was also stratified by gender (Tables 3 and 4). In addition, the proportion of employees in each precariousness indicator was

computed for each individual country separately (Table 5). The most precarious category of each indicator is described in Table 5 - except for the contract indicator where the least precarious category “indefinite contract” is shown. Countries are ordered according to a modified Esping-Andersen typology of welfare states [36,37]: social democratic, conservative-corporatist, southern, liberal, former-USSR, post-communist European and developing welfare state. The last three categories correspond to the eastern countries according to Fenger’s classification [37]. In Table 5, countries in the highest quartile of the distribution for each indicator are highlighted. Finally, the distribution of employees according to social class, gender and credentials was computed for each individual country (data available on request). Due to the unequal selection probabilities and differential non-response rates across the various socio-demographic segments of the labour force, case weighting was required within each country. In addition, cross-country weights were used to obtain a reliable distribution for the whole sample [35]. Statistical analyses were conducted using Stata 11.0 [38].

3. Results

The overall (EU-27) social distribution of employment precariousness indicators by gender, social class and credentials is shown in Table 2. Table 3 and 4 show the overall distribution of the employment precariousness indicators according to social class and credentials stratified by gender. Table 5 shows the distribution of

the employment precariousness indicators by country, ordered according to the above cited typology.

3.1. Employment instability

For the *type of contract* indicator in the overall sample, women showed a lower percentage of indefinite contracts (77%) than men (80.7%). Considerable differences were found in the social class distribution of this indicator. A lower proportion of workers (77%) had indefinite contracts when compared to supervisors and managers (87.5 and 87.8% respectively). The proportion of unstable contracts was lower among expert employees (2.7%) than among semi-skilled (7.7%) and unskilled employees (8.7%).

For social class stratified by gender (Table 3), we found several differences. While the proportion of indefinite contracts was similar among male and female workers and supervisors, a notable difference was found between male (90.4%) and female managers (81.8%) ($p < 0.001$). In particular, female managers were more likely to have temporary contracts lasting one year or more (11.2%) when compared to male managers (3.6%). For credentials, the greatest difference between men and women was found in the expert-category, followed by unskilled workers, with male experts having a highest percentage of indefinite contracts in both cases (See Table 4).

Country-specific analyses showed that Cyprus, Greece, Ireland, Malta, Poland, Spain and the United Kingdom had the lowest

percentages of indefinite contracts (Table 5). Moreover, Spain, Greece and Italy were the countries exhibiting the largest gender differences. For instance, the proportion of indefinite contracts among Spanish men was 74.3%, while only 56.3% among women. Again, the largest differences according to social class (comparing workers to managers) were found in Spain, Malta, Greece and Italy. Also for credentials, Cyprus, Spain, Greece and Ireland were exhibiting the greatest level of inequality between the highest and the lowest categories.

3.2. *Low income level*

Large inequalities were found in the gender, social class, and credentials distribution of *country-specific relative income*. Women, workers without supervisory responsibilities, and less-educated employees presented the lowest percentages of well paid jobs. For instance, only 13% of male employees declare working in a very low paid job, compared to 36.7% of female employees, and only 4.9% of managers, compared to 27.9% of workers. A similar pattern can be seen for credentials.

We found strong associations between *country-specific relative income*, social class and credentials for both women and men. Absolute differences in the proportion of “very low paid jobs” between female workers and managers (40% - 10.1%) and unskilled and expert women (48.1% - 9.2 %) were more pronounced than between male workers and managers (15.6% - 2.7%) and unskilled and expert male employees (16.8%- 3.4%).

Cyprus, Ireland, Lithuania, Luxembourg, the Netherlands, Portugal and the United Kingdom had the largest proportions of very low paid jobs ($\geq 27\%$). The general European pattern of income by gender, social class, and credentials was reproduced in all countries individually. It is remarkable that in most of European countries, more than 50% of semi-skilled employees and more than 60% of unskilled employees were in low-paid or very low-paid jobs.

Slight differences were found in the gender distribution of *non-wage benefits*. In the overall figures, women were less likely to receive benefits (9.9%) than men (12.2%). However, greater differences were found by social class and credentials: supervisors, managers, and employees with higher credentials had a higher probability of receiving benefits. Regarding social class for instance, 24.4% of managers received benefits, compared to 14.2% of supervisors and 9.8% of workers.

Gender-stratified analyses showed some important differences between men and women. While the difference in the overall proportion of women and men receiving *non-wage benefits* was small, this difference increased when comparing male managers to female managers (27.3% vs. 18%). Within genders, small credentials-related differences were found among women (8% unskilled; 10% semi-skilled; 12.1% experts) and unskilled and semi-skilled male employees (10.8% vs. 10.7%), while expert employees had a clearly higher chance of receiving benefits (19%).

Generally, a low proportion of workers reported receiving such benefits, the lowest being in Estonia, Lithuania, Poland, Portugal, Slovenia, Spain and the UK. Regarding gender, in those countries where differences were statistically significant, women had less chances of receiving benefits than men. This was the case in France, Greece, Ireland, Italy, Luxembourg, Malta and the UK. Differences by social class and credentials were statistically significant in half of the countries. For those with significant differences, the overall EU-27 pattern was largely replicated.

3.3. Lack of rights and social protection

Small differences were found in the overall gender, social class and credentials distribution of the *health and safety information* indicator. According to social class, workers were less informed (84.1%) than supervisors (90.7%) and managers (91%). Regarding credentials, unskilled (84.5%) and semi-skilled employees (84.7%) were less informed than experts (88.4%).

Luxembourg, Malta, France, Belgium, the Netherlands and Spain were the countries with the highest percentage of employees (>5%) who were not at all informed about health and safety risks related to the performance of their job. A significant gender difference was seen in France, where women were less informed than men (77.1% men vs. 71.3% women were well or very well informed). Regarding social class, managers were the best informed in nearly all countries, but these differences were statistically significant in

only a few countries. The same pattern holds for credentials. (See Tables 2 and 4).

3.4. Incapacity to exercise rights

From a gender point of view, a higher percentage of men compared to women declared working *uncompensated flexible working times*. By social class, managers had the highest probability of working uncompensated flexible working times (42.4%), followed by supervisors (30%) and workers (20.9%). Looking at credentials, those who declared a higher percentage of uncompensated flexible working times were experts (29.8%), compared to semi-skilled and skilled employees (21.7% both).

From the analysis stratified by gender, it can be seen that percentages of uncompensated working flexible times increased gradually among both male and female employees according to social class, the increase being slightly steeper for men. Regarding credentials, almost no differences were found between unskilled and semi-skilled employees among men or women. No statistically significant differences were found between female semi-skilled and expert employees (19.6% vs. 21.7%), while there was a significant difference between the same categories for men (23.3% vs. 37.7%). Thus, credentials showed stronger associations for men than for women.

This gender pattern is maintained in the majority of the countries, however most country-specific associations were not statistically

significant. Regarding the social class distribution by countries, three different patterns were seen. First, a pro-high pattern: meaning that in these countries managers more often worked uncompensated flexible working times. This was the case in Denmark (80% of managers, 39% of supervisors, 20.6% of workers), Finland (50% of managers, 45.5% of supervisors, 14.6% of workers), but also in Belgium, Germany, France, the Netherlands, Sweden, Malta, and Poland. Second, in some countries the supervisors were those with the highest proportion of uncompensated, flexible working times: i.e., Italy and Luxembourg. Third, there were countries where these differences were not statistically significant for social class (Spain, Greece, Estonia, Romania, Slovenia, Portugal, Bulgaria, Cyprus, Latvia and Lithuania). For credentials a double pattern was found. There were countries where having more credentials was related to a higher probability of working uncompensated flexible times, i.e., Belgium, Germany, Denmark, Finland, France, Ireland, the Netherlands and Sweden. In other countries having fewer credentials was associated with a higher probability of working uncompensated flexible times. This was the case in the Czech Republic, Spain, Greece, Latvia, Malta, Portugal, Bulgaria and Romania.

3.5. Absence of collective bargaining

No significant gender differences were seen for *self-determination over the work schedule*. However, this indicator followed a clear social class pattern in which only 30% of workers had certain freedom to set their working time, compared to 44% of supervisors

and 62% of managers. For credentials, slight differences were found between unskilled and semi-skilled employees (30.7% vs. 29.5%), while experts had a higher percentage (49.5%).

Gender-stratified analyses showed significant gender differences in the social class pattern. While a slightly higher proportion of female than male workers and supervisors indicated having some freedom to determine their work schedule, male managers showed clearly higher percentages than female managers (65.6% vs. 54.4%). A similar pattern existed for the distribution of credentials stratified by gender.

The countries with a higher percentage of employees without any freedom to determine their work schedules were Bulgaria, Cyprus, Greece, Hungary, Malta, Portugal and Romania. It was noted that this indicator fluctuated over a very wide range: Bulgaria was the country with the highest percentage of employees without freedom to determine their work schedules and Sweden the lowest (92.1% vs. 35.9%). The gradient of social class was maintained in all countries, except for Germany, France, Hungary and Bulgaria.

3.6. Imbalanced interpersonal power relations

Only small gender differences were seen for the indicator *communication and participation with superiors*. Women were slightly overrepresented in jobs with low participation. Analyzed by social class, workers were overrepresented in the category with the least participation (26.8% - supervisors 11.4% - and managers

9.8%). The same pattern existed for credentials: 29.4% among unskilled, compared to 24.6% among semi-skilled and 14.1% among experts. No significant differences were found when the results of social class and credentials were stratified by gender.

France, Germany, Italy, Luxembourg, Poland, Portugal and Spain were the countries with higher scores in the most precarious category. Gender differences were only statistically significant in Greece, Malta, Ireland, the Netherlands, Portugal and Italy, where women were more exposed, especially in the latter two countries. The country-specific distribution by credentials is similar to the overall pattern.

3.7. Lack of training opportunities

Training opportunities did not show any gender differences. According to social class, a clear gradient appeared in the overall analyses: managers received more training opportunities than supervisors and supervisors more of these opportunities than workers (66.6%, 57.5% and 43.3% successively). The same pattern was seen for credentials: 65.4% of the experts declared having received some kind of training, compared to only 43.7% of the semi-skilled employees and 38.7% of the unskilled employees.

When analyzing results for social class and credentials stratified by gender, the same patterns existed. Female supervisors had slightly more training opportunities than male supervisors, and male managers had slightly more opportunities than female managers. A similar pattern was seen with credentials.

The analyses by country showed that Bulgaria, Greece, Hungary, Italy, Portugal, Romania and Spain were countries where, in general, the least training opportunities were offered. Higher percentages of training opportunities were found among women in Denmark, Estonia and Lithuania. According to social class, in some countries supervisors were receiving more training than managers, e.g., Belgium, Germany, and Hungary. In other countries no statistically significant differences existed (e.g., Austria, Finland and Greece). The distribution of training opportunities by credentials showed the same pattern in each country, being statistically significant ($p \leq 0.001$) throughout. The biggest differences in the percentage of training opportunities between experts and semi-skilled employees were seen in Austria, Cyprus, the Czech Republic, Germany, Lithuania, Latvia and Slovenia.

3.8. Low control over working times

Differences were found in the gender distribution of *schedule unpredictability*, with men being overrepresented in the most precarious response group. Social class and credential-related differences were also seen for this item. It must be noted that supervisors were those with the highest (most precarious) score for “schedule changes known on the same day”. The same held for semi-skilled employees in the distribution of credentials.

When analyzing the results of social class stratified by gender, we found that female workers and supervisors had lower percentages in

comparison to male workers and supervisors for “schedule changes known on the same day”. This percentage was however equivalent among female and male managers. For credentials, percentages of “schedule changes known on the same day” were lower for all female categories, compared to male.

Slovakia, Romania, Portugal, Luxembourg, Finland, Denmark and Cyprus had the highest proportion of respondents in the most precarious category. Few countries showed statistically significant differences by gender (e.g., Belgium, Germany, and Finland), social class (e.g., Austria, Belgium and Germany) and credentials (e.g., Austria, Denmark and Finland).

The indicator of *part-time employment* showed that women had a higher frequency of voluntary and involuntary part-time employment than men. Regarding social class, more workers (6.9%) than supervisors (3.2%) and managers (0.8%) declared that they had to work (involuntary) part-time. Also, according to credentials, a higher percentage of semi-skilled and unskilled employees reported having to work part-time, compared to experts.

Looking to the gender-stratified analyses, the highest percentages of voluntary and involuntary part-time work were concentrated among male and female workers. Regarding credentials, no significant differences were found in the distribution of part-time work among male employees. In contrast, credentials had a high impact on the distribution of part-time employment among women: 13% of expert

employees, compared to 20.5% and 18.8% of the semi-skilled and unskilled employees, respectively, reported being voluntarily in part-time employment. Also involuntary part-time employment was seen in 5.8% of the experts, compared to 11% and 10.8% among semi-skilled and unskilled female employees.

The same gender pattern for involuntary-part time employment was evident in all European countries, except Finland, Bulgaria and Romania. The countries with the highest inequalities for this item were Germany, Spain, Greece, Italy, the Netherlands, Malta and Sweden. However, regarding social class, only Ireland, the Netherlands, Poland, the United Kingdom and Bulgaria followed this pattern of statistically significant over-representation of workers ($p < .05$). The pattern of credentials was significantly reproduced in 10 of the 27 countries.

Long working hours were performed in a higher percentage of men than women (20.3% vs. 9.6%), and by managers as opposed to supervisors and workers (30.3% vs. 16.7% and 11.1%, respectively). No statistically significant differences were found in relation to credentials. When analyzing the results of social class stratified by gender, the social class gradation was apparent among both men and women, however women always had lower scores in each category.

When analyzing the results by country, two different patterns were evident. Among Nordic and central European countries such as

Germany, Denmark, the Netherlands, Sweden and the United Kingdom, experts were overrepresented in the category “working more than 45 hours”. Among southern and eastern European countries, this was also the case for unskilled, followed by semi-skilled employees. However, these results must be interpreted with caution as these differences were not statistically significant for 12 of the 27 participating countries. Regarding social class, these two patterns were not so clear. However, in those countries where differences were statistically significant, managers tended to work longer hours.

4. Discussion

In this paper the Employment Precariousness Construct was applied to the data of the Fourth European Working Conditions Survey (2005). Applying this construct to existing databases is promising for labour market monitoring purposes. Results of the analyses confirm our main hypothesis. Employment precariousness was clearly unequally distributed across the European labour force according to gender, social class and credentials. Women, workers without supervisory authority, supervisors, and less-skilled employees showed the highest prevalence of the most precarious response category for the majority of the indicators. The only exceptions were long working hours, uncompensated flexible working times and schedule unpredictability. Different social class and the patterns of credentials patterns were found by gender. Several indicators, although not all, showed a clear country pattern,

with Southern and Eastern European countries exhibiting the least favourable scores.

The higher accumulation of disadvantages in women and lower socioeconomic categories regarding work and employment characteristics is in line with other published studies [20,26,29,39]. In Standing's recent work [40], employees with generally unfavourable employment characteristics were described as a "new social class", the "*precariat*", characterized by their lack of seven forms of labour-related security [3,40].

4.1 Gender distribution of employment precariousness

Precairous employment was deeply gendered [31]. Women were especially overrepresented in the most precarious income category and work more in part-time employment. Part-time work, both voluntary and involuntary is related to other disadvantages relative to the employment situation: (1) most frequently, part-time employment fails to provide sufficient earnings to meet subsistence needs, thereby reinforcing the dependence of women on the earnings of their partners [2]; (2) entitlement to social protection and benefits, such as unemployment benefits, is sometimes restricted to people working more than a minimum number of hours, as at present, eligibility levels for benefits are often framed within the context of the male-breadwinner SER-Model potentially leading to insufficient coverage for other types of employees [2,31]; (3) part-time employees are more likely than full-time employees to experience more limited opportunities for training and promotion

within the organization [2]; (4) they are more often treated as “more disposable” and are more affected by temporal flexibility arrangements aimed at meeting employers’ preferences [2]. Consequently, all these factors reinforce gender inequalities inside and outside labour markets.

4.2 Socioeconomic distribution of employment precariousness

Social class followed a clear gradient in which workers scored worse in nearly all aspects of precarious employment, followed by supervisors. Also expert employees score better than semi-skilled and unskilled employees for all aspects of precarious employment. Specific attention should be paid to the intermediate position of supervisors. In contrast with the indicator for credentials, the social class indicator cannot be considered as ordinal: workers, supervisors and managers have distinct positions in the labour process. Frequently, the position of supervisors combines the negative aspects of both workers and owners. Among some precarious employment indicators that are most frequent in workers, supervisors fared more poorly than managers; and among some indicators that were most frequently seen in managers, supervisors fared more poorly than workers. The latter is clearly the case of schedule unpredictability, where supervisors had the worst scores. According to the E.O. Wright’s [41] thesis of “contradictory class position” supervisors hold a squeezed position, combining the limited decision-making authority of workers and the responsibilities typically beard by managers. In other words, supervisory positions may turn into responsible jobs with low

autonomy, leading to an unclear status and limited resources to meet the expectations attached to their jobs. This may be contributing to poor physical and mental health outcomes previously reported for supervisors, compared to non-supervisory workers [28,29,42].

4.3 Exceptions to the general pattern of distribution

Three indicators of employment precariousness were more concentrated among men, managers and highly skilled employees: uncompensated flexible working times, long working hours and schedule unpredictability. These features of employment appear to be characteristic of high status jobs that often are associated with high monetary and non-monetary rewards, such as career advancement [43]. However, regarding their job content, experts, managers and supervisors are often found to have more quantitative and emotional demands, overtime work and sudden schedule changes than lower skilled employees and workers without authority [29]. Working time insecurity may have grown for managers and experts, who are expected to work long hours and during their leisure time, often to remain competitive and to advance in their careers [3]. Such an employment pattern may be related to the notion of “over commitment” which – in turn – may pose increased risks to their health and well-being [44]. As a result, there is a need to question whether the over-commitment faced by employees in high-status jobs should not also be seen as a “contextual” element of (precarious) employment.

4.4. Country distribution of employment precariousness

As hypothesised, Eastern and Southern European countries were those with the highest level of employment precariousness according to most of the dimensions. In addition, they were the countries with the highest inequalities by gender, social class and credentials. Both regions are characterized by an underdeveloped welfare regime with limited unionization and worker protection. In the Southern case, this is the consequence of preceding authoritarian right-wing regimes, and in Eastern Europe, of the transition from Soviet communism to liberal capitalism. However, also important gender inequalities were found in the Netherlands, Germany, Luxembourg, Sweden, France and the UK for involuntary part-time employment and very low income, which are probably related to each other.

More interesting is the double pattern in Europe found for long working hours and uncompensated flexible working times. In countries with the lowest percentages of uncompensated flexible working hours, i.e. Nordic and Central European countries, managers and expert employees were those reporting working the longest hours and not being monetarily rewarded for their overwork. In contrast, in the countries with the highest percentages of long working hours and uncompensated flexible working times, i.e., Eastern and some Southern European countries, those with fewer credentials were the employees reporting the longest hours and the highest percentages of uncompensated working times. Consequently, in Southern and Eastern European countries all of the

characteristics of employment precariousness predominantly affect employees with fewer credentials and those without authority over other workers. In contrast, in Nordic and Central European countries there appears to be a type of employment configuration where employees with high credentials and authority have jobs characterized by overall beneficial employment conditions and relations in combination with intensive working hours and uncompensated flexible working times. These jobs resemble the category of highly flexible, high skilled and independent workers which Standing [40] describes as “proficians”.

4.5. Health consequences of employment precariousness

Previous research has shown that precarious employment is associated with poor health [19,23]. A recent study showed how Canadian employees exposed to several dimensions comparable to those in the Employment Precariousness Construct, i.e. low earnings, unpaid overtime hours, and absence of social benefits, are at increased risk of reporting poor health [22]. These studies are a first confirmation that precarious employment, conceptualized as a multidimensional construct, is a social determinant of health. Given the unequal distribution of precarious employment [19,23] our findings also confirm the status of precarious employment as a determinant of social health inequalities. In that regard, it is also important to consider interactive effects between the social position and the (precarious) employment position of employees. Different health consequences may arise depending on whether people affected by employment precariousness are obliged to take

precarious jobs because of the absence of alternatives or whether they can manage the situation of having a precarious job [45]. There is a lack of research regarding the differential vulnerability to employment precariousness. For example, we still do not know whether men and women suffer the same health effects when both are exposed to precarious employment. Menéndez et al. [46] hypothesised a greater effect on women's health due to several reasons, e.g. the gendered division of household work and different layers of labour market discrimination. Furthermore, research on employment conditions has shown a differential health impact of unemployment according to social characteristics such as gender and social class, and an interaction between both [32,34].

4.6 Limitations and recommendations

This research is the first validation of a set of indicators to measure the Employment Precariousness Construct in the EWCS. Nevertheless, some limitations need to be addressed, and suggestions to improve the monitoring of employment precariousness in surveys are made. An important limitation was the number of missing values for the income indicator (11.6%). The social distribution of these missing values is rather homogeneous by social class, credentials and gender, while relatively heterogeneous by country: Nordic countries being those with the lowest percentages of missing values and the United Kingdom the country with the highest percentage (32.5%), followed by Austria (23.1%). A second limitation is related to the secondary nature of our analysis and the consequent lack of direct questions to construct

some of the dimensions of the construct. For example, extra questions providing information about rights and social protection (e.g., having pension rights, maternity or paternity leave, unemployment benefits) and collective representation (e.g., trade union affiliation, coverage of collective bargaining) would be desirable. The “*lack of rights and social protection*” dimension could only be measured by the “information on health and safety” indicator, understanding that the right of receiving information –in this case on health and safety – is the first premise to be able to exercise rights. Final consideration has to be given to the introduction of the *low control over working times* dimension in the Employment Precariousness Construct. It is not completely clear to what extent this dimension is defining employment conditions and relations or the organization of work tasks. However, as most of the changes related to working time have been accompanied by a change or a weakening of working times regulation, we believe it should be considered an aspect of employment precariousness [47].

4.7 Final remarks

The adaptation of the Employment Precariousness Construct to the data available in the 2005 European Working Conditions Survey allowed us to measure employment precariousness in Europe in a multidimensional way. The results of this research provide the first validation of a measurement approach for employment precariousness via proxy-indicators available in existing surveys.

This approach is important since it allows for monitoring employment precariousness on a regular basis in the European context. Currently, the expansion of precarious employment in the European Union, in the context of the economic crisis, makes it a serious public health issue, which should be adequately and periodically measured. Repeating these analyses in different editions of periodic data collections such as the EWCS-2010 will allow researchers to document trends in employment precariousness. A further step will be the creation of an overall score based on the indicators reported in this article. Since overall indicators are easier to interpret for stakeholders and easier to incorporate in a monitoring system this will facilitate the task of monitoring. When possible, interactions with social background indicators, such as social class, gender, ethnicity, and migration should be analysed, as such intersectional approaches provide an excellent insight into inequalities [33].

The development of surveillance systems monitoring employment conditions is a priority for reducing work-related health inequalities and working towards more sustainable employment [10]. Some early efforts at monitoring social determinants of health exist; however most of them include few indicators of employment – generally unemployment or employment rates [34]. Further development of employment-health-equity surveillance systems would provide researchers and policy makers with more sensitive information of the impact of employment policies on health and well-being [10].

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Table 1. Construction of indicators for measuring Employment Precariousness in the EWCS-2005.

Dimension	Indicator	Indicator construction	Categories
Employment instability: Type and duration of employment contract, reflecting the degree of certainty of continuing work. Short contracts prevent workers from planning ahead in their personal or professional lives.	Type of employment contract	a- Type of employment contract	1) Indefinite contract
		b- Contract duration for fixed-term contracts.	2) Fixed-term contract, ≥ 1 year, or unspecified 3) Fixed-term contract of less than 1 year 4) Temporary employment agency contract 5) No contract.
Low income level: Income from wages is considered to be insufficient when it does not cover regular or unexpected expenses [19].	Country-specific relative income	Income from the main job, disregarding number of hours worked, additional (second) jobs, other redistributive income transfers or the total household income.	1) Well paid job (above the country specific median), 2) Low paid job (in the second lowest quartile), 3) Very low paid job (in the lowest quartile).
	Benefits in nature	"Does your remuneration include advantages of other nature, for instance medical services, access to shops, etc?."	1) Mentions receiving benefits in nature 2) Does not mention receiving benefits in nature.
Lack of rights and social protection: Workplace rights provide non-wage employment benefits (e.g. holidays, sick leave...).	Information on health and safety	"Regarding the health and safety risks related to the performance of your job, how well informed would you say you are?"	1) Very well and well informed, 2) Not very well informed and 3) Not at all informed.

Table 1. Continuation

Dimension	Indicator	Indicator construction	Categories
<p>Incapacity to exercise rights:</p> <p>It complements previous dimension. Workers powerlessness to exercise their rights may be due to lack of knowledge about their rights as well as implicit or explicit threats of job loss or wage cuts [24].</p>	Uncompensated flexible working times	<p>a- Number of usual hours worked per week, in main paid job;</p> <p>b- Working one or more Sundays per month;</p> <p>c- Extra payments for additional hours for work/overtime</p> <p>d- Extra payments compensating for Sunday work.</p>	<p>1) Doing overwork (> 40 hrs a week) and/or on Sunday, but not being compensated for it</p> <p>2) Not doing overwork and/or Sunday work, or being compensated for it.</p>
<p>Absence of collective bargaining (or formal relations):</p> <p>Focuses on the erosion of the power of organized labour and a shift towards more "individually negotiated employment relations" [19].</p>	Self-determination over work schedule	"How are your working time arrangements set?"	<p>1) Worker can determine working hours with certain freedom: a) can choose between several fixed work schedules; b) can adapt within certain limits; c) working hours entirely determined by himself</p> <p>2) "Working hours are set by the company with no possibility for changes".</p>
<p>Imbalanced Interpersonal power relations (or vulnerability):</p> <p>Refers to informal power relations of authority and discrimination, reflecting unbalanced workplace relations. [19,23].</p>	Communication and participation with superiors	<p>"Over the past 12 months, have you, or not..?" (yes=0 ; no=1)</p> <p>a- Had a frank discussion with your boss about your work performance?;</p> <p>b- Been consulted about changes in the organization of work and/or your working conditions?;</p> <p>c- Been subjected to regular formal assessment of your work performance?;</p> <p>d- Discussed work-related problems with your boss?</p>	Sum scale ranging from 0-4 is calculated where 0 is the value for all positive aspects of communication and participation and 4 for all negative aspect.

Table 1. Continuation

Dimension	Indicator	Indicator construction	Categories
<p>Lack of training:</p> <p>The decline of internalized career structures has increased the need for individuals to acquire the necessary skills on their own [48], which is a potential source of inequality.</p>	Training paid/provided by the employer	<p>"Over the past 12 months, have you undergone any of the following types of training to improve your skills or not?"</p> <p>Training paid for or provided by your employer: On-the-job training (co-workers, supervisors)</p>	<p>1) Having received training:</p> <p>2) Not having receiving such training.</p>
<p>Low control over working times:</p> <p>Working time flexibility has been imposed as one of the roads towards more flexibility in work organization. Employees working unsocial hours find it often harder to combine work and family and social life and tend to experience more health related problems [24, 49].</p>	Schedule unpredictability	<p>a- How are your working time arrangements set?</p> <p>b- "Do changes to your work schedule occur regularly?" (only asked to workers who choose between several fixed work schedules or who have no possibility to change schedule).</p> <p>c- "How long before are you informed about these changes?"</p>	<p>1) No sudden unpredictable changes (a) worker can adapt the schedule within certain limits or worker can entirely determined the schedule himself, b) They are set by the company with no possibility for changes or worker can choose between several fixed work schedules and employer informs the changes in the schedule several weeks in advance.</p> <p>2) Changes known from several days in advance;</p> <p>3) Changes known the day before;</p> <p>4) Changes known the same day</p>
	(Involuntary) part-time employment	<p>a- "Do you work part-time or full time?"</p> <p>b- "How many hours would you like to work?" (Involuntary= wants to work longer hours).</p>	<p>1) Full-time job,</p> <p>2) Voluntary part-time job,</p> <p>3) Involuntary part-time job.</p>
	Long working hours	<p>a- "How many hours do you usually work per week in your main job?" (intensive: ≥ 45 hours)</p>	<p>1) Non intensive;</p> <p>2) Intensive.</p>

Table 2. Distribution of employment precariousness indicators by gender, social class and credentials for all EU-27 in 2005

Dimension	Indicator	Category	Gender			Social class				Credentials			
			Male	Female	P-value	Workers	Supervisors	Managers	Unskilled	Semi-skilled	Experts	P-value	
			%	%		%	%	%	%	%	%	%	
Employment instability	Type of employment contract	Indefinite contract	80.7	77	<0.001	77	87.5	87.8	<0.001	77.4	77.4	85.5	<0.001
		Fixed term ≥ 1year	7.3	10.1		8.9	6.9	5.9		8.2	8.8	8.6	
		Fixed term <1year	3.2	4.1		4.3	0.9	0.3		3.8	3.9	2.6	
		Temporary agency	1.9	1.8		2	1.4	0.5		1.9	2.3	0.7	
		No contract	7	7		7.8	3.3	5.5		8.7	7.7	2.7	
Low income level	Country-specific relative income	Well paid jobs	64.6	35.2	<0.001	44.9	75.3	85.4	<0.001	40.6	46.3	78.9	<0.001
		Low paid jobs	22.4	28.1		27.2	16.1	9.7		27.3	27.7	14.8	
		Very low paid jobs	13	36.7		27.9	8.7	4.9		32.1	26	6.4	
		Benefits in nature											
Low income level	Benefits in nature	Receiving benefits	12.2	9.9	0.005	9.8	14.2	24.4	<0.001	9.4	10.4	15.7	<0.001
		Not receiving benefits	87.8	90.1		90.2	85.8	75.6		90.6	89.6	84.3	
Lack of rights and social protection	Information on health an	Very well/well	85.9	84.6	0.015	84.1	90.7	91	<0.001	84.5	84.7	88.4	0.016
		Not very well	10.6	10.5		11.3	7.6	7.3		10.9	11	8.8	
		Not at all	3.4	4.9		4.6	1.7	1.7		4.7	4.3	2.8	
Incapacity to exercise rights	Uncompensated flexible working times	No flexible times or compensated	73.6	80.1	<0.001	79.1	70	57.6	<0.001	78.3	78.3	70.2	<0.001
		Uncompensated	26.4	19.9		20.9	30	42.4		21.7	21.7	29.8	

Table 2. Continuation

Dimension	Indicator	Category	Gender			Social class				Credentials			
			Male	Female	P-value	Workers	Supervisors	Managers	Unskilled	Semi-skilled	Experts	P-value	
			%	%		%	%	%	%	%	%	%	
Absence of collective bargaining	Self-determination over schedule	Yes, the worker	33	35	0.098	30.2	44.1	62.2	<0.001	30.7	29.5	49.5	<0.001
		No, the company	67	65		69.8	55.9	37.8		69.3	70.5	50.5	
Imbalanced interpersonal power relations	Communication & participation with superiors	0 negative points	19.6	19.4	0.023	17.2	31	30.1	<0.001	14.9	19	29.1	<0.001
		1 negative points	20.5	18.7		18.3	26.5	26.2		18.9	18.6	23.8	
		2 negative points	21	19.1		20	19.2	24.1		19.6	19.5	21.8	
		3 negative point	16.1	16.9		17.7	11.9	9.7		17.2	18.3	11.3	
		4 negative points	22.8	25.8		26.8	11.4	9.8		29.4	24.6	14.1	
Lack of training	Paid or provided by the €	Yes	46.3	46.1	0.867	43.4	57.5	66.6	<0.001	38.7	43.7	65.4	<0.001
		No training	53.7	53.9		56.7	42.5	33.4		61.3	56.3	34.6	
Low control over working times	Schedule unpredictability	No schedule changes	78.6	81.5	<0.001	80	77.6	85.5	0.012	78.5	78.6	85.4	<0.001
		Changes several days before	7.4	8.6		8.4	7.2	4.2		8.9	7.9	6.6	
		Changes the day before	6.8	5.7		6.4	6.7	3.7		6.8	7.1	3.6	
		Changes on same day	7.2	4.1		5.3	8.5	6.6		5.8	6.4	4.4	
	Part-time employment	Full-time	94	72	<0.001	81.8	91.6	93.6	<0.001	82	83.2	88.5	<0.001
		Voluntary Part-time	3.2	18.2		11.3	5.2	5.6		11.4	10.2	8	
	Intensive working times	Involuntary Part-time	2.8	9.8		6.9	3.2	0.8		6.7	6.6	3.5	
		Non intensive	82.6	92.3	<0.001	88.9	83.3	69.7	<0.001	88.1	86.4	87	0.26
		Intensive	17.4	7.7		11.1	16.7	30.3		11.9	13.6	13	

Table 3. Distribution of employment precariousness indicators by social class and gender for all the EU-27 in 2005.

Dimension	Indicator	Category	Men				Women			
			Social class				Social class			
			Workers	Supervisors	Managers	P-value	Workers	Supervisors	Managers	P-value
		%	%	%		%	%	%		
Employment instability	Type of employment contract	Indefinite contract	78.1	88.1	90.4	<0.001	75.8	86.2	81.8	0.001
		Fixed term ≥ 1year	7.9	6	3.6		10	8.6	11.2	
		Fixed term <1year	3.9	0.9	0.1		4.7	1.1	0.6	
		Temporary agency	2.2	1.2	0.1		1.9	1.7	1.6	
		No contract	7.9	3.8	5.8		7.7	2.4	4.9	
Low income level	Country-specific relative income	Well paid jobs	58.6	82.9	93.5	<0.001	31.5	60.1	66.7	<0.001
		Low paid jobs	25.8	13	3.8		28.5	22.3	23.2	
		jobs	15.6	4.2	2.7		40	17.6	10.1	
Low income level	Benefits in nature	Receiving benefits	10.3	15	27.3	<0.001	9.2	12.6	18	0.016
		Not receiving benefits	89.7	85	72.7		90.8	87.4	90	
Lack of rights and social protection	Information on health an	Very well/well	84.6	90.4	92	0.002	83.6	91.2	88.5	0.026
		Not very well	11.4	7.8	7		11.1	7.3	8.2	
		Not at all	3.9	1.8	1		5.3	1.6	3.3	
Incapacity to exercise rights	Uncompensated flexible working times	No flexible times or compensated	76.8	67	55.2	<0.001	81.4	75.5	63	<0.001
		Uncompensated	23.2	33	44.8		18.6	24.5	37	
Absence of collective bargaining	Self-determination over schedule	Yes, the worker	27.6	43.5	65.6	<0.001	32.9	45.3	54.4	<0.001
		No, the company	72.4	56.5	34.4		67.1	54.7	45.6	

Table 3. Continuation

Dimension	Indicator	Category	Men				Women			
			Social class			P-value	Social class			P-value
			Workers	Supervisors	Managers		Workers	Supervisors	Managers	
%	%	%	%	%	%	%				
Imbalanced interpersonal power relations	Communication & participation with superiors	0 negative points	17	29.8	29.1	<0.001	17.5	33.5	32.6	<0.001
		1 negative points	18.5	27.3	28.4		18	25.1	21	
		2 negative points	21.1	20.6	21.8		18.9	16.4	29.5	
		3 negative point	17.4	11.9	9.4		17.9	11.9	10.4	
		4 negative points	26	10.4	11.3		27.7	13.2	6.5	
Lack of training	Paid or provided by the €	Yes	42.8	55.8	67.9	<0.001	43.8	60.8	63.5	<0.001
		No training	57.2	44.2	32.1		56.2	39.2	36.5	
Low control over working times	Schedule unpredictability	No schedule changes	78	78.5	86.2	0.085	82.1	76.1	83.6	0.152
		Changes several days before	8	6.6	3.9		8.8	8.6	5	
		Changes the day before	7.3	5.7	3.2		5.5	8.4	4.9	
		Changes on same day	6.8	9.2	6.7		3.7	6.9	6.5	
	Part-time employment	Full-time	93.1	96.5	98.3	0.003	70.2	82	82.5	<0.001
		Voluntary Part-time	3.7	1.8	1.5		19.1	11.8	15.2	
	Intensive working times	Involuntary Part-time	3.2	1.7	0.2		10.7	6.2	2.3	
		Non intensive	84.7	79.2	66	<0.001	93.1	91.1	78.2	<0.001
	Intensive	15.3	20.8	34		6.9	8.9	21.8		

Table 4. Distribution of employment precariousness indicators by credentials and gender for all the EU-27 in 2005.

Dimension	Indicator	Category	Men			<i>P-value</i>	Women			<i>P-value</i>
			Credentials				Credentials			
			<i>Unskilled</i>	<i>Semi-skilled</i>	<i>Experts</i>		<i>Unskilled</i>	<i>Semi-skilled</i>	<i>Experts</i>	
%	%	%	%	%	%	%				
Employment instability	Type of employment contract	Indefinite contract	79.4	78.7	88.3	<0.001	75.2	75.8	82.5	<0.001
		Fixed term ≥ 1year	6.7	8	6.1		9.9	9.7	11.1	
		Fixed term <1year	3.8	3.3	1.6		3.7	4.6	3.7	
		Temporary agency	1.8	2.4	0.4		2	2.1	0.9	
		No contract	8.3	7.6	3.5		9.2	7.8	1.8	
Low income level	Country-specific relative income	Well paid jobs	57.5	60.6	88.9	<0.001	23	28.8	69	<0.001
		Low paid jobs	25.7	25.4	7.6		28.9	30.5	21.8	
		Very low paid jobs	16.8	14	3.4		48.1	40.7	9.2	
Low income level	Benefits in nature	Receiving benefits	10.8	10.7	19	<0.001	8	10	12.1	0.014
		Not receiving benefits	89.2	89.3	81		92	90	87.9	
Lack of rights and social protection	Information on health an	Very well/well	85.5	85	89.8	0.02	83.3	84.3	87	0.018
		Not very well	10.4	11.9	7.1		11.4	9.9	10.5	
		Not at all	4.1	3.1	3.1		5.3	5.8	2.5	
Incapacity to exercise rights	Uncompensated flexible working times	No flexible times or compensated	75.9	76.7	62.3	<0.001	80.7	80.4	78.3	0.411
		Uncompensated	24.1	23.3	37.7		19.3	19.6	21.7	
Absence of collective bargaining	Self-determination over schedule	Yes, the worker	29	26.9	54.5	<0.001	32.5	32.7	44.3	<0.001
		No, the company	71	73.1	45.5		67.5	67.3	55.7	

Table 4.Continuation

Dimension	Indicator	Category	Men				Women			
			Credentials			<i>P-value</i>	Credentials			<i>P-value</i>
			<i>Unskilled</i>	<i>Semi-skilled</i>	<i>Experts</i>		<i>Unskilled</i>	<i>Semi-skilled</i>	<i>Experts</i>	
%	%	%	%	%	%	%				
Imbalanced interpersonal power relations	Communication & participation with superiors	0 negative points	14.6	20.4	27.3	<0.001	15.1	17.4	30.9	<0.001
		1 negative points	19.4	19.1	26.2		18.3	18	21.2	
		2 negative points	22.2	19.5	21.7		16.9	19.6	21.8	
		3 negative point	15.9	18.5	10.9		18.6	18	11.6	
		4 negative points	27.9	22.6	13.9		31.1	27	14.4	
Lack of Training	Paid or provided by the e	Yes	40.2	43.2	66.1	<0.001	37	44.4	64.6	<0.001
		No training	59.8	56.8	33.9		63	55.6	35.4	
Low control over working times	Schedule unpredictability	No schedule changes	78.6	75.5	85.7	<0.001	78.4	82.6	85	0.019
		Changes several days before	7.5	8	5.7		10.5	7.7	7.5	
		Changes the day before	6.7	8.4	3.3		6.9	5.4	4	
		Changes on same day	7.3	8.1	5.3		4.2	4.2	3.5	
	Part-time employment	Full-time	94.1	93.6	95.5	0.168	68.7	70.2	81.2	<0.001
		Voluntary Part-time	3	3.3	3.3		20.5	18.8	13	
		Involuntary Part-time	2.9	3.1	1.2		10.8	11	5.8	
Intensive working times	Non intensive	84	82.2	81.2	0.367	92.5	91.7	93.2	0.371	
	Intensive	16	17.8	18.8		7.5	8.3	6.8		

Table 5. Percentage of the most precarious category* of the employment precariousness indicators in each of the EU-27 countries in 2005. Countries are ranked according to their percentage of precariousness in each indicator.

	Employment instability	Low income level		Lack of rights and social protection	Incapacity to exercise rights	Absence of collective bargaining	Imbalanced interpersonal power relations	Lack of training	Low control over working time		
	Indefinite contracts (%)	Income -very low paid jobs (%)	No benefits in nature (%)	Not at all informed (%)	Uncompensated flexible working times (%)	No self-determination over schedule (%)	4 negative points communication (%)	No training opportunities (%)	Changes on schedule on the same day (%)	Involuntary part-time (%)	Long working hours (> 45)
Denmark	80,67	25,11	79,58	4,43	26,15	43,53	13,33	45,48	8,34	4,86	9,38
Finland	82,57	17,32	76,69	0,66	18,62	49,95	6,69	22,66	7,89	4,25	5,89
Sweden	86,90	19,83	80,37	3,03	23,66	35,92	13,47	28,34	4,66	8,07	8,52
Austria	83,03	23,82	85,08	3,06	11,14	57,40	22,39	43,53	4,38	2,68	6,65
Belgium	90,00	21,33	69,82	6,86	22,08	58,53	16,41	40,00	3,80	5,69	7,73
France	85,95	21,86	78,03	8,67	14,93	60,69	27,79	60,70	6,86	5,59	4,02
Germany	87,60	23,70	90,12	2,60	14,32	61,80	30,11	55,18	5,46	5,49	8,08
Ireland	58,74	27,38	82,15	3,19	22,22	62,96	16,29	42,86	5,43	4,91	10,97
Luxembourg	90,96	27,59	72,36	10,08	15,53	61,86	26,11	46,80	10,25	4,80	7,34
Netherlands	79,67	27,21	88,54	5,81	20,81	40,64	5,59	52,40	1,98	9,49	6,22
United Kingdom	69,22	32,21	94,59	2,25	31,75	60,29	21,63	36,54	6,07	6,98	13,77
Greece	59,17	22,62	90,56	7,12	33,08	85,82	15,46	64,06	6,77	5,71	28,77
Italy	80,55	26,57	90,46	4,39	13,93	68,09	31,13	65,64	1,91	6,60	10,87
Portugal	75,97	28,25	91,72	4,43	23,53	86,27	40,20	68,67	7,42	3,25	12,52
Spain	66,96	22,47	96,24	5,11	27,19	79,33	29,29	69,78	4,83	7,51	15,41
Cyprus	45,92	31,08	79,30	3,83	24,95	88,41	23,70	62,32	8,74	1,02	14,96
Malta	50,39	25,05	82,91	7,45	23,91	83,46	8,71	45,07	1,56	3,87	18,74

Table 5. continuation

	Employment instability	Low income level		Lack of rights and social protection	Incapacity to exercise rights	Absence of collective bargaining	Imbalanced interpersonal power relations	Lack of training	Low control over working time		
	Indefinite contracts (%)	Income - very low paid jobs (%)	No benefits in nature (%)	Not at all informed (%)	Uncompensated flexible working times (%)	No self-determination over schedule (%)	4 negative points communication (%)	No training opportunities (%)	Changes on schedule on the same day (%)	Involuntary part-time (%)	Long working hours (x> 45)
Bulgaria	72,50	21,35	88,87	3,71	38,94	92,15	10,12	69,05	4,39	3,77	26,28
Czech Republic	82,75	23,03	81,50	1,78	29,20	73,55	18,69	43,24	6,06	1,10	21,19
Hungary	81,30	23,08	91,44	1,48	29,19	85,14	13,21	67,32	6,02	4,17	20,05
Poland	70,37	20,85	95,32	3,71	37,50	78,75	25,91	45,86	6,78	9,05	24,66
Slovakia	83,77	20,57	88,82	1,56	28,86	78,28	19,59	34,25	9,89	1,94	22,70
Slovenia	76,31	19,66	92,91	3,54	23,87	71,61	13,90	44,16	5,75	1,14	16,57
Estonia	84,73	27,02	92,41	1,30	29,03	69,13	10,89	38,24	6,85	2,39	12,52
Latvia	84,44	26,62	85,77	3,10	40,15	79,06	10,56	44,20	3,12	1,69	23,36
Lithuania	83,11	29,73	97,14	1,40	31,54	81,66	7,12	52,00	4,65	3,79	18,04
Romania	85,88	17,71	87,24	4,07	39,93	84,78	21,83	71,90	16,10	4,91	36,77



*except for the contract indicator –shown the less precarious category.

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Paper 3.

How does precarious employment relate to health and job satisfaction in Europe? A gender and cross-national perspective

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Abstract:

In this article the association of precarious employment with work-related health and job satisfaction in the EU-27 is studied. For this purpose an adaptation through proxy-indicators of a multidimensional employment precariousness construct is applied to the data available in the European Working Conditions Survey - 2005. We hypothesize an increase of job dissatisfaction and poor work-related health among precarious workers, a stronger association in those countries with less egalitarian employment policies and a less developed welfare state, and a stronger association among women, especially within less egalitarian countries. Our results show consistent associations for precarious employment indicators with job dissatisfaction. However, fewer indicators are associated with poor work-related health. Most of these associations are not significant in Social-democratic countries. An important gender pattern is found for the lack of control over working time dimension. Women are more sensitive to changes in the work schedule and men to long working hours, especially in those countries with less strong social protection systems and stronger family traditional roles. These results are especially relevant for the evaluation of the health inequalities impact of new labour market policies.

Introduction

Employment relations are key social determinants of health and health inequalities, as well as the broader work-related quality of life (Benach et al. 2007, De Cuyper, De Witte 2007). In western countries, employment relations have undergone profound changes since the end of the “Golden Age” (1945-1975), with its typical Standard Employment Relationship (SER) for male breadwinners. The recent attention to the study of the nature of employment relations broadens-up a too narrow focus on the psychosocial work environment as a source of work-related health problems (Benach et al. 2007). Notwithstanding major advances in this field, knowledge on the different employment conditions is still limited.

One of the most-studied employment conditions has been the instability of employment. Various contributions have focused on the consequences for health and well-being of those types of employment situations that differ from permanent employment (Quinlan, Mayhew & Bohle 2001, Bardasi, Francesconi 2004, Benavides et al. 2000). Also a perceptual approach has been adopted here, concentrating on the workers perception of job insecurity (De Cuyper, De Witte 2007). Other researchers have focused on organisational downsizing and have addressed the imminent threats of job loss due to restructuring processes (Quinlan 2007). Notwithstanding the important contribution of these approaches, they are reductionist in the sense that the changing relations and conditions of employment are much broader than the stability of employment alone (Amable 2006).

Precarious employment can be seen as a conceptual attempt to grasp into broader changes occurring in the field of employment at the turn of the 21st century (Rodgers 1989, Frade, Darmon & Laparra 2004). It goes beyond the employment instability dimension, including other important aspects of the degrading SER-model, like lower social protection and representation, unsustainable wages, or temporal de-standardisation (Rodgers 1989, Standing 1999, Benach, Muntaner 2007). In that regard, some multidimensional approaches to measure precarious employment exist (Frade, Darmon & Laparra 2004, Tompa et al. 2007). Few of these have been related with health or well-being (two exceptions: (Tompa et al. 2007, Vives 2010, Scott-Marshall, Tompa 2011)), and even fewer conducted in a European context (one exception of that is Vives et al. study on Spanish population (Vives 2010)).

It is the main goal in this paper to study the association of precarious employment with work-related health and job satisfaction in the EU-27. Our second objective is to study the intersection between precarious employment, gender and country types in relation with these outcomes.

To study the different dimensions of precarious employment in relation with health and job satisfaction we use, following earlier work of Amable et al. (2006), a concept that is firmly based in a *power resource* perspective (Korpi 2006). The precarisation of employment is identified as the process of weakening of the salaried employment relationship as a consequence of increasing asymmetry in power relations between workers and employers (Amable 2006).

The asymmetry of power is translated into increasing vulnerability of workers and the degrading of employment conditions, which have been unequally distributed among workers, both at the national and the international level (Arnold, Bongiovi 2013).

We aim to grasp into the different characteristics of the precarisation of employment through the adaptation of the employment precariousness construct, developed by Amable and other scholars from Pompeu Fabra University in Barcelona, Spain (Amable 2006, Vives 2010, Porthe et al. 2010), consisting of 7 dimensions: 1) employment instability, 2) low income level, 3) lack of rights and social protection, 4) lack of training, 5) low control over worktime, 6) absence of collective bargaining and 7) imbalanced interpersonal power relations.

1.1. Precarious employment, health and job satisfaction

Very few studies have analysed the relationship between precarious employment and health and job satisfaction from the above-drawn multidimensional approach. In Canada, Scott-Marshall and Tompa (Tompa et al. 2007, Scott-Marshall, Tompa 2011) demonstrated that workers exposed to low earnings, unpaid overtime hours, absence of pension coverage, and manual work, were at increased risk of reporting poor health outcomes. Contrarily to their hypothesis, non-unionized workers showed a lower risk of poor health (Scott-Marshall, Tompa 2011). Also in Canada, Lewchuk's et al. proposed the employment strain model (Lewchuk 2004) an expansion of the

Karasek's job strain model (Karasek 2008). In this model, job insecurity and temporariness, were associated with poor health, only when individuals reported also uncertain employment prospects and expend effort to minimize this uncertainty. In Spain, the Employment Precariousness Scale (EPRES) of Vives et al. (Vives et al. 2011) showed that poor mental health increased in a gradient-wise manner in relation with rising employment precariousness. In addition, young, immigrant, manual and female workers exhibited an increased prevalence and severity of exposure to employment precariousness (Vives et al. 2011).

Other attempts have been made to measure precarious employment from a multidimensional approach, classifying employment arrangements according to their degree of precariousness (Quinlan 2007, Vosko 2010, Louie et al. 2006).

None of these multidimensional approaches to precarious employment study the relationship with job satisfaction, with the exception of the EPRES. On the other hand, the relationship between temporary employment and job satisfaction is well-studied. Results until now have been inconclusive (De Cuyper et al. 2008). Some studies establish higher job satisfaction among permanent workers than among temporary workers (Benavides et al. 2000) while others find the opposite pattern (De Cuyper, De Witte 2007). Still others do not find significant differences (Krausz 2000). The same applies for the relationship between "flexible work arrangements" such as part-time work: some studies are finding higher satisfaction among full-time workers (Benavides et al. 2000),

while others find the opposite pattern (Bardasi, Francesconi 2004, Possenriede, Plantenga 2011). These differences could respond to an incomplete measurement of precarious employment.

In any case, the level of job satisfaction has been demonstrated to be an important factor influencing workers' health, being strongly associated with psychological problems and to a lower extent, also with physical illness (Faragher, Cass & Cooper 2005). Moreover, job satisfaction can be seen as a mediator in the relationship between job insecurity and psychological well-being (Handaja, De Witte 2007) Thus, knowledge is required on the association between precarious employment and job satisfaction.

1.2. The modifying role of employment and welfare regimes

The nature of the employment relationship is determined by the institutional and legislative structures characterising labour market and the welfare state, while it is also embedded in other social institutions such as family. Variations according to employment regimes (Korpi 1983) and welfare regimes (Esping-Andersen 1991) may be expected regarding the nature and consequences of precarious employment. Employment regimes theory underlines the importance of employment policies and the power of organized labour within particular countries (Gallie 2007), as key mechanisms of social redistribution. Welfare state regimes theory underlines the importance of social rights and protection as an effective way to decommodify labour and also as key mechanism of social

redistribution. The employment regimes theory of Korpi, was later included in Esping-Andersen's (Esping-Andersen 1991) broader welfare state typology. Thus, employment regimes and welfare regimes are highly interrelated.

Three principal models of employment regimes are distinguished. First, *inclusive employment regimes* in which organized labour has a strongly institutionalized participation in decision-making, increasing employees' power in terms of employment and working conditions, and where employment policies are designed to extend rights as widely as possible through the population, and social policies through the welfare state have a redistributive aim. It is associated with the *Social democratic welfare regime*, and represented by Nordic countries, such as Denmark, Finland and Sweden. Second, *dualist employment regimes* are those where organized labour has only a consultative role in decision-making, resulting in a weaker organizational strength, and where a dualization of workforce (core-periphery) exists. It is associated with *Conservative welfare regimes* represented by countries such as Austria, France and Germany, and *Southern* (Ferrera 1996) represented by countries such as, Spain, Italy and Portugal. Third, *market employment regimes* emphasize minimal employment regulation, assuming that employment levels and job rewards are self-regulated on the free market. It is associated with *liberal welfare regime* and represented by Great Britain and Ireland, being the second a one a discussed mixed country with characteristics of the dualist employment regime and the market employment.

Based on these models it can be assumed that countries with a long tradition of unionisation and strong social protection and employment regulations will experience a lower prevalence of precarious employment, and lower inequalities among working population. Contrarily, countries in dualist employment regimes are expected to increase profoundly inequalities in their labour markets. Although labour market flexibilization and employment precarisation may affect all jobs, countries following segmentalist strategies, generate large secondary labour markets, where less privileged workers are allocated (Rubery 2007). Market-mediated employment relationships are expected to be those less egalitarian, as workers experience a lower degree of power, and they will differ in their vulnerability depending on their personality dynamics, levels and kinds of education, age, family responsibilities and type of occupation and industry.

Beyond the social distribution of precarious employment, the relationship between precarious employment and health is expected to be modified by the employment and welfare regimes. In a similar way as generous unemployment benefits buffer poor health among unemployed workers (Puig-Barrachina et al. 2011, Artazcoz et al. 2004), stronger social and employment protection schemes in more egalitarian welfare states could have a health-protective effect for people in precarious employment (Kim et al. 2012).

Thus, it is our second hypothesis that the association of precarious employment with job dissatisfaction and work-related poor health will be stronger in liberal, corporatist and southern countries, that is,

those with weaker organized labour, less egalitarian employment policies and a less developed welfare state.

1.3. Precarious employment and gender

Precarious employment is highly gendered (Vosko 2010). Several studies have shown that women are overrepresented in precarious jobs (Vives et al. 2011, Vosko 2010, Puig-Barrachina, et al., 2013). However, few studies have analyzed whether gender modifies the association between precarious employment and well-being (Vives 2010). Such effect modification can be expected from the observation that female workers fall in the intersection of two unequal power relationships: the employment relationship (as characterised above) and the still prevailing patriarchal gender relationships. The gender division of paid and unpaid work places women in a disadvantaged relationship, as women still have to face most of the family and household responsibilities (Pascall, Lewis 2004). Moreover, in many countries, labour market regulation, employment protection and associated social protection are still strongly based on the male breadwinner model of lifelong full-time employment - a model that is far less suitable for large parts of the female labour force. Moreover, women are less unionized and less covered by collective agreements and collective bargaining, when compared to men (Menéndez et al. 2007). Thus, the interaction of gender- and employment-related power asymmetries could lead to a stronger association between precarious employment and well-being among women (Vives 2010, Menéndez et al. 2007).

Consequently, we hypothesise that overall the association between precarious employment, poor work-related health and job dissatisfaction will be stronger among women, especially in those dimensions more related to the double burden, such as the lack of control over working time (hypothesis 3).

However, from a cross-national perspective, important variations regarding the gender division of paid and unpaid work and female's bargaining power are exhibited between countries. These factors are assumed to depend strongly on employment and welfare regimes settlements, as well as on country-specific family structures and cultural values (Pfau-Effinger 2004). Inclusive employment regimes/ Social-democratic welfare states generally encourage the double earner model, through development of work-family policies making it easier for women to enter and remain in the labour market (Pfau-Effinger 2004). In contrast, in dualist employment regimes/ Conservative-corporatist and Southern welfare states, public provision to assist women to combine paid work and the family is more rudimentary, and women's social benefits are often based on the employment of the main family breadwinner (Pascall, Lewis 2004). This model tends to support traditional family structures. In market oriented or liberal regimes, provision in terms of work-family support is highly restricted leaving household division of labour more open as market-informed opportunity choices. Eastern countries have been considered hybrid systems, with some features of liberal regimes and some structural elements of the conservative-corporatist welfare state models (Klenner, Leiber 2010).

It is our fourth hypothesis that the association of precarious employment with work-related poor health and job dissatisfaction will be stronger for women in less egalitarian countries compared with women in Social-Democratic countries (hypothesis 4).

Methodology

Data

Data for the present study were drawn from the European Working Conditions Survey (EWCS) 2005, a representative survey containing information on working conditions, demographics, household characteristics, socioeconomic indicators and work-related health. The EWCS 2005 contains a cross-national, multi-staged, stratified, random sample of persons in employment aged 15 and over (employees and self-employed). Almost 30,000 European workers from 31 countries were interviewed (all EU-27 Member States plus Croatia, Norway, Turkey and Switzerland). Since this study focuses on precarious employment among wage-earners in the EU, we excluded self-employed, people without an employment contract, the armed forces, non-EU-27 inhabitants and respondents outside the 15-65 age range. The final sample comprises 19,387 individuals.

Measures

Outcomes. Relations with two different outcomes are analysed: poor work-related health and job dissatisfaction. Work-related health is based on the question “Does your work affect your health, or not?” with two response categories (yes/no). This indicator has

been used elsewhere (Jones et al. 2011, Artazcoz et al. 2013, ECHIM 2012). Job satisfaction is based on the question “On the whole, are you very satisfied, satisfied, not very satisfied or not at all satisfied with working conditions in your main paid job?”. Based on the initial responses a dichotomous variable was constructed where negative responses (not very satisfied, not at all satisfied) are contrasted with positive responses (satisfied and very satisfied).

Precarious employment dimensions. We adapted the employment precariousness construct (Amable 2006, Vives 2010) to the information available in the EWCS 2005. Our adapted construct encompasses the following dimensions:

Employment instability. This dimension is represented by type of contract, based on two questions “What kind of employment contract do you have?” and “What is the exact duration of the contract in number of years and months?”. These initial variables were combined into four mutually exclusive categories: indefinite contract (reference category), fixed-term contract of 1 year or more, fixed-term contracts of less than 1 year, temporary employment agency contracts.

Low income level. This dimension is measured using a single question “Presently, what is on average your net monthly income from your main paid job?”. The answer is shown to the respondent as a scale of 10 income bands, specifically constructed for each country. The income bands match with the deciles of the income

from employment distribution in each country (EUROFOUND 2006). In this study, respondents with an income above the median are considered as the reference category and contrasted with the below-median deciles as separate categories, considering the 1st decile as the worst situation.

Lack of rights and social protection. This dimension of precarious employment is based on one question which is considered as a "proxy-indicator": "Regarding the health and safety risks related to the performance of your job, how well informed would you say you are?" "Very well informed" and "well informed" are considered as the reference category and are contrasted with the categories "not very well informed" and "not at all informed".

Low control over work time. This dimension is represented by four indicators: *regularity*, *schedule predictability*, *working during weekends* and *working long hours*. The *regularity* was constructed as the sum of 3 questions: *work the same number of hours every day*, *the same number of days every week* and *have fixed starting and finishing times* (chronbach's alpha 0.67). Those who answered "yes" in all questions received 0 points (high regularity), being the category of reference. Also schedule unpredictability was constructed through three questions: *how are your working time arrangements set?*; *Do changes to your work schedule occur regularly?*; *How long before are you informed about these changes?* Respondents who can adapt their schedule within certain limits or who can entirely determine the schedule themselves, those

who do not experience changes or whose schedule changes are planned several weeks in advanced are put together in the category coded as 1 (reference category). Respondents who cannot determine their schedules and for whom imposed schedule changes are known from several days before receive a code of 2. Those in the same situation with changes known the day before receive a code of 3. Finally, those knowing their imposed schedule changes only the same day receive a code of 4. The working during weekends' indicator is constructed through summing the number of days mentioned in two questions: *How many times a month do you work on Saturdays?* and *How many times a month do you work on Sundays?*. Responders who never work during weekends are coded 1 (reference category). Those working three days or less per month during weekends are coded 2, and those working more than three days per month during weekends are coded 3. *Working long hours* is measured as the number of hours worked per week: working 40 hours or less is coded 1 (reference category), working between 41 and 48 hours is coded 2, and working more than 48 hours is coded 3.

Lack of training is measured by a single question: "Over the past 12 months, have you undergone any of the following types of training to improve your skills or not?" Training paid for or provided by your employer; On-the-job training (co-workers, supervisors) (yes=0 ; no=1). Those having received some training are considered the category of reference.

Absence of collective bargaining is measured as: “How are your working time arrangements set?”. Respondents who can determine their working hours entirely by themselves, who can adapt it within certain limits or who can choose between several fixed work schedules are coded 1 (reference category). Respondents whose hours are set by the company with no possibility for changes are coded 2.

Imbalanced interpersonal power relations are represented by an indicator measuring communication and participation with superiors, which is composed of four questions: “Over the past 12 months, have you, or not...? 1) Had a frank discussion with your boss about your work performance?; 2) Been consulted about changes in the organization of work and/or your working conditions?; 3) Been subjected to regular formal assessment of your work performance?; 4) Discussed work-related problems with your boss? (all coded as 0=yes; 1=no, and summed). It is interpreted as a categorical variable and 0 is the reference category.

Control measures:

Several variables of control were introduced in the models: age using a four category variable (24 years or younger, 25-39, 40-54, 55 or older); the country of the respondents; (physical) working conditions (i.e. ergonomic risk and ambient risks); and job content variables based on the Karasek model (Karasek 2008) (i.e. job control and psychosocial demands).

Country typology. Countries are grouped according to an adaptation of the Esping-Andersen typology (Esping-Andersen 1991), which was expanded to include all EU-27 countries (Ferrera 1996, Fenger 2007). They were classified in: Conservative-Corporatist (Austria, Belgium, Germany, France, the Netherlands and Luxembourg); Liberal (United Kingdom and Ireland); Social-Democratic (Denmark, Finland, and Sweden); Southern European (Cyprus, Greece, Spain, Italy, Malta and Portugal) and Eastern European (Czech Republic, Hungary, Estonia, Lithuania, Latvia, Poland, Slovenia, Slovakia, Bulgaria and Romania).

Analysis

First, gender differences in the distribution of the independent variables were tested through bivariate analyses at the overall European level and for each category of the country typology (Table 1). Second, logistic regression models were fitted in order to test the association of the precarious employment dimensions with poor work-related health and job dissatisfaction for the EU-27 as a whole (Table 2). For each outcome, three models were calculated: age and country-adjusted effects of the single precarious employment indicators (model 1); age, country and mutually adjusted effects of the precarious employment indicators (model 2); effects of the precarious employment indicators additionally adjusted for job content and working conditions (model 3). All models are stratified by gender. Third, the same models are stratified by country group and gender (Table 3). For this last table, only model 3 is shown. In the tables, Odds ratios (ORs), p-values

and 95% Confidence Intervals (95% CIs) are shown. Due to the unequal selection probabilities and differential non-response rates across the various socio-demographic segments of the labour force, case weighting was applied. In addition, cross-country weights were used to obtain a reliable distribution for the whole sample (Parent-Thirion et al. 2007). All analyses were performed using Stata 11.1 (StataCorp LP 2009).

Results

Table 1 presents the proportion of individuals exposed to poor work-related health, job dissatisfaction and the indicators of precarious employment, according to gender and type of country. At the European level men report a higher prevalence of poor work-related health (men 36.9%; women 31.4%) and job dissatisfaction than women (men 18.4%, women 16.1%). Gender differences are maintained in the analyses stratified by country type, with the exception of Social-democratic countries for both outcomes, and Conservative countries for job dissatisfaction. Eastern and Social-democratic countries are those with the highest proportion of poor work-related health. Southern and Eastern countries are those with highest proportions of job dissatisfaction.

Table 2 presents the associations of precarious employment with poor work-related health and job dissatisfaction at the European level. Consistent associations between low income level, lack of information on health and safety and long hours (>48h) with job dissatisfaction are found among both men and women. For lack of

self-determination over schedule indicator (collective bargaining dimension) a statistically significant association only exists for men; and for regularity index for women. Type of contract, lack of training and communication and participation with superiors present a less consistent pattern. Regarding employment instability measured by type of contract, male workers show an increase of job dissatisfaction when they are employed in fixed term contracts shorter than one year. Women employed in fixed term contracts independently on their duration show higher job dissatisfaction, in the first model only.

Consistent statistically significant associations for lack of information on health and safety, working long hours and working during weekends with poor work-related health are found for men and women, as well as working long hours and self-determination over the schedule only for men and regularity only for women.

Few gender differences are found for the associations with both outcomes. For low income women show higher odds ratios with job dissatisfaction in the lowest deciles of income (3rd, 2nd and 1st), while men in the intermediate deciles (5th and 4th). Also few gender differences are found regarding the different indicators of lack of control over working time dimension.

Table 3 shows the job satisfaction analyses stratified by type of country and gender. The clearest country differences are found in relation with (low) income level. Low income is only significantly

associated with job dissatisfaction among female Southern workers and (male and female) Eastern workers. Eastern men in the lowest decile of income show a 2.75 times higher odds of reporting job dissatisfaction than Eastern men belonging to the reference category. Eastern women in the lowest income decile show a 3.96 times higher odds of job dissatisfaction than those in the reference category. In general, the strongest association between low income and job dissatisfaction is found among female Eastern European workers. Moreover, the relationship between the availability of health and safety information and job dissatisfaction is strongest in Conservative countries, for both men and women. An association for regularity on working times and satisfaction is found among female Eastern European and Conservative workers, and for working during weekends only among female Eastern European workers. Long working hours is associated with job dissatisfaction among liberal workers (men and women), Southern men and Eastern European women.

Table 4 s hows the association of the different dimensions of precarious employment and poor work-related health stratified by type of country and gender. The most notable finding is that for the Social-democratic countries hardly any statistically significant association with the dimensions of precarious employment exists. The only one exception is not being well informed on health and safety for women. Type of contract and low income level do not present any statistically significant association with poor health in none of the country groups (exceptions: one category of type of

contract among female workers from Southern countries and one category of income among female workers from Liberal countries). Lack of information on health and safety is statistically significant for all countries. A statistically significant association is found for long working hours and work-related poor health for Liberal men, Southern and Eastern, being the most consistent for workers in Liberal countries. Moreover, a statistically significant association is found for working during weekends for Southern women and Eastern European men.

DISCUSSION

The purpose of this study was to investigate the relationship of a set of precarious employment indicators with job satisfaction and work-related health in Europe. The second purpose was to study whether gender and type of country are acting as effect modifiers of these relationships. For this purpose an adaptation through proxy-indicators of the employment precariousness construct (Amable 2006, Vives 2010) was applied to the data available in the European Working Conditions Survey. This multidimensional approach to employment conditions and relations is very promising for monitoring the public health and worker well-being consequences of labour market characteristics.

Confirming our first hypothesis, findings indicate that most of the precarious employment dimensions are related with job dissatisfaction. Fewer dimensions were associated with work-related poor health. Similar findings were made by Vives (Vives

2010), also showing job satisfaction to exhibit the highest correlation with precarious employment, among a range of other outcomes. Job dissatisfaction could constitute an important indirect pathway relating employment precariousness to poor health, since dissatisfied workers are under more pressure and stress, which in turn are potential threats to health (Broding et al. 2010).

Concerning the separate dimensions of precarious employment, Marshall et al. (Scott-Marshall, Tompa 2011) showed - similar to our findings - that non-standard contracts were not related to more adverse health. These results on multidimensional approaches to precarious employment place the findings of studies only focused on temporariness in a more nuanced perspective.

Also supporting our findings is a lack of workers' rights and social benefits (measured as unpaid overtime work and absence of pension coverage) to be associated with poor health (Scott-Marshall, Tompa 2011). Lewchuk's employment strain model (Lewchuk 2004) showed earnings uncertainty and schedule unpredictability being related with poor self-reported health and tension at work.

We failed to find a strong association between the dimension of imbalanced interpersonal power relations (measured through communication and participation with superiors indicator), job satisfaction and work-related health. These interpersonal power relations are ideally conceptualised as vulnerability to relations of authority from employers to workers, and as a lack of employee

discretion in the form of participation in decision-making. Vulnerability is then manifested as a perception of incapacity as a worker to generate appropriate responses to (feelings of) unfairness, while participation is related to structural empowerment at the workplace through communication, support, information, and other resources which offer workers opportunities to be involved in the decision-making process (Kanter 1993). In our data however, no proxy measure for vulnerability could be identified. The analyses are thus only based on a measure of structural empowerment. Other studies on structural empowerment have shown that more empowered workers are more committed to their jobs, feel a sense of control and autonomy and experience more job satisfaction, less stress and less burnout, all of them possible causes of poor health (Laschinger et al. 2004).

Precarious employment and country types

Our findings partially support that the type of country modifies the association of precarious employment with job satisfaction and work-related health. Associations are generally stronger in less egalitarian countries. Our results show that precarious workers in Scandinavian countries, when compared with their non-precarious counterparts, were more likely to enjoy equal job satisfaction and work-related health status, than in other types of countries, although with few exceptions. On the other hand, precarious workers in Eastern and Southern European countries were more likely to suffer higher rates of job dissatisfaction and poor work-related health than non-precarious workers. Similar results were found in a recent

review focusing on the differential impact of perceived job insecurity, downsizing and atypical employment contracts from a cross-national perspective (Kim et al. 2012).

Although changes in employment relationships are widespread along European countries and also the diminishing of workers' bargaining power due to globalization may be considered a general pattern, Social-democratic countries show the lowest prevalence of most precarious employment indicators, and the least unequal distribution of these indicators by gender, social class and educational credentials (Puig-Barrachina et al. 2013). In addition to these previous findings, this study points out that countries of the egalitarian Social-democratic type also appear to buffer the effect of precarious employment on well-being. In most Social-democratic countries, a strategy of flexicurity has been implemented. In these countries, trade unions have participated in negotiating on the nature of introduced flexibility (Rubery, Grimshaw 2003). However, the main achievement has been to better safeguard security, i.e. employment security and social security, at the same time as enhancing labour market flexibility. It is probably this social protection floor, together with the improvement in employability through gains in life-long training that is better protecting workers in precarious employment from job dissatisfaction and above all poor health.

On the other hand, in those countries with strong labour market regulations, employers have used the secondary labour market with

its most precarious employment conditions as a tool for achieving flexibility (Rubery 2007). Most of the jobs created in the secondary labour markets are service sector jobs. In these jobs there is typically less trade union opposition, since it are relatively non-unionized sectors. It is specifically in these sectors where a lot of women have been employed of whom it is known that they are less empowered as workers as well (Arnold, Bongiovi 2013, Rubery 2007). The higher precarious jobs being over proportionally held by less empowered social groups, together with a weakened social protection could explain the stronger relation between precarious employment and health inequalities in dualist countries.

Precarious employment and gender

Our results show few gender differences at the European level. Different gender patterns are found in the lack of control over working time indicators and collective bargaining. Women show consistent associations for schedule unpredictability with job dissatisfaction and poor work-related health, as well as for lack of regularity with job dissatisfaction. Meanwhile, men show stronger associations for long working hours with poor work-related health, as well as lack of self-determination over work schedule with job dissatisfaction and poor work-related health.

First, self-determination over the work schedule grasps into the erosion of power of organized labour, since it makes workers able to impose minimal employment conditions on wage levels, working times, schedules, etc. (Mückenberger 1989). Collective bargaining

has been historically and culturally more closely linked to men than women - who have been often excluded from trade unions (Menéndez et al. 2007). The lack of bargaining power can convey as a symbol of low status at work for men, which can adversely affect their self-esteem and dignity, leading to poorer health (Brooker, Eakin 2001).

Second, a possible explanation for the differential gender patterns on working time indicators can be found in the still prevailing sexual division of work. Despite the dramatic increase of women in the labour market, they are overrepresented in part-time jobs (Puig-Barrachina et al. 2013) while there has been no significant change in the distribution of domestic work even when both partners are working (Bartley, Popay & Plewis 1992). Moreover, in families with young children, there are gender differences in work hours allocated to flexible and inflexible housework with men doing less and women doing more time-inflexible household work (Artazcoz et al. 2013). The lower “work-centrality” in still a lot of women’s life and the differential allocation of flexible and inflexible housework could explain why women’s satisfaction and health are more affected by indicators related to work schedule flexibility. On the other hand, the still prevailing male-breadwinner model in some countries, considering women’s salary as a secondary wage, would explain men working long hours having a negative impact on their health, especially when financial stress exists (Artazcoz et al. 2013).

It is noteworthy that family policies and social protection, as well as the cultural values regarding family roles, modify these results, which accords with our hypothesis (hypothesis 4). No gender differences exist in job satisfaction and work-related health in Social democratic countries where a dual-earner family model prevails. Regularity affects female's work satisfaction in Conservative and Eastern European countries. Working long hours shows a stronger association with health for male workers from Liberal countries, Southern Europe and Eastern Europe. In a previous study (Puig-Barrachina et al. 2013) we found that in the Eastern and Southern countries most indicators of precarious employment did not only have the highest prevalence, but were also the most unequally distributed from a gender perspective. Consequently, in Eastern and Southern countries a number of disadvantages tends to accumulate: higher exposure to precarious employment, but also less-protective employment and welfare state policies, as well as more problematic family structures and cultural values from the point of view of gender equity in employment.

In Eastern countries under state socialism, employment among women became accepted and was supported through comprehensive public childcare (Klenner, Leiber 2010). Thus a double earner family existed, however neither the gender-specific division of labour nor the traditional male role were questioned, placing an extreme double burden on most women (Klenner, Leiber 2010). With the end of socialism, women in employment were probably more strongly affected by the dismantling of these public services.

Women had to take multiple regular, atypical and informal jobs, had to pay for private childcare and elderly care, and obviously started facing the double burden (Klenner, Leiber 2010). These factors could explain why low income and low control over working times are the most clearly related dimensions of precarious employment when looking at job dissatisfaction and poor work-related health for women in Eastern countries.

These results have important policy consequences when new employment regulations have to be taken. Different consequences on gender will appear depending on the strategy of market flexibilization. Making working schedules more flexible might have important consequences for job satisfaction and health among women in those countries where still a traditional family model prevails, and where no public care infrastructure exists.

Limitations and recommendations

First of all, it should be mentioned that there is room for improvement regarding the measurement of precarious employment through proxy indicators. To achieve that, secondary data should improve their ability to measure precarious employment. We have to move on towards an integrated measure of precarious employment for survey research. However, still a major problem is determining the mutual weight of the different dimension of precarious employment in relation to workers' health and quality of life. In that regard theoretical and methodological progress is needed, although this paper intends to provide a basis for further

discussion. Regarding the indicators used, it should also be mentioned that common variance effects may arise as a consequence of both dependent and independent variables being self-reported. However, while the outcomes are perceptual, the independent indicators of precarious employment were - although being self-reported - purposefully selected in order to rule out merely perceptual questions as much as possible.

Second, regarding employment-related health inequalities, we need to advance with regard to approaches centred on the intersectionality of different key dimensions, such as gender, social class or ethnicity, while being aware of country-level effect modification as well. For example, the nature of gender inequalities may be highly dependent of family composition and earnings structure, social class, ethnicity and country of residence (Puig-Barrachina et al. 2011, Artazcoz et al. 2004).

Further research on the consequences of precarious employment should also pay attention to life course effects, e.g. effects related to old-age. The use of cross-sectional data implies that we can only interpret the result as a “snap shot” based on the moment when the survey was conducted. Thus, we cannot measure the long-term effects of degrading employment arrangements which may be significant: for example the consequences of fragmented careers on poverty or social protection at retirement age, especially for single women. Moreover, the cross-sectional nature of the data prohibits firm statements on causality. The relations between precarious

employment with job satisfaction and work-related health should be interpreted as mere associations.

Finally, the scope of this article is limited to precarious employment situations of individuals in formal wage employment. However, other individual labour market situations such as self-employment and informal employment may be considered as precarious as well. Further research is needed to be able to monitor the degrading employment arrangements of these collectives.

Final remarks

Relaxation of protective regulations and the individualization of employment relations contribute to the exacerbation of power imbalances between workers and management which has potential population health inequalities consequences. This study shows the differential association of precarious employment situations with job satisfaction and work-related health according to gender and country type. These results have key policy implications when evaluating the health impact of new labour market policies. In those countries with traditional family values and few public services for caring, policies addressed to flexibilize working schedules can have a negative effect on women. On the other hand, in the same countries decreasing salaries might imply long working hours among male workers, and the obligation to look for a second job.

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Table 1. Distribution of the work-related poor health, job dissatisfaction and precarious employment indicators at the European level by sex and country group. Fourth European Working Conditions Survey, 2005

	UE-27 (n=1,9526)			Social democratic (n=2,702)			Liberal (n=1,346)			Conservative- corporatist (n=4,751)		Southern (n=3,129)		Eastern European (n=7,598)				
	Men	Women		Men	Women		Men	Women		Men	Women	Men	Women	Men	Women			
Mean age (SD)	39.3	39.2		41.1	41.3		39.6	39.0		39.8	39.6	38.5	37.8		38.5	39.0		
	%	%		%	%		%	%		%	%	%	%		%	%		
<i>Work-related poor health</i>	36.9	31.4	<0.00	48.7	50.6	0.434	25.6	20.9	0.168	26.9	22.5	0.031	43.4	34.9	0.003	55.5	49.2	0.001
<i>Job dissatisfaction</i>	18.4	16.1	0.018	11.7	14.5	0.076	10.0	7.4	0.228	12.6	13.6	0.492	28.1	21.4	0.008	26.3	23.1	0.042
Type of contract																		
<i>Indefinite contract</i>	87.1	82.8	<0.00	89.4	85.2	0.070	83.0	79.5	0.665	91.9	87.7	0.001	84.2	73.6	<0.001	82.4	82.9	0.925
<i>Fixed term ≥ 1year</i>	7.6	10.8		5.2	7.6		13.5	16.2		4.3	8.4		8.0	12.9		10.9	11.0	
<i>Fixed term <1year</i>	3.3	4.4		4.2	6.0		0.6	1.0		1.9	2.2		5.2	11.1		5.4	4.8	
<i>Temporary agency</i>	2.0	1.9		1.2	1.2		2.9	3.3		1.9	1.6		2.5	2.5		1.3	1.3	
Low income level																		
<i>Well paid - above the country</i>	69.3	40.0	<0.00	69.4	49.9	<0.001	59.0	24.0	<0.001	78.5	43.6	<0.001	74.4	50.1	<0.001	48.7	30.0	<0.001
<i>Low paid - 5th decile</i>	10.0	12.0		8.4	9.7		10.9	7.7		8.5	13.7		10.2	12.8		12.7	10.9	
<i>Low paid - 4th decile</i>	6.1	9.3		7.1	8.6		7.5	9.0		3.6	9.2		5.9	8.2		10.4	10.8	
<i>Low paid - 3th decile</i>	4.5	9.2		5.9	11.1		6.4	8.3		1.9	8.3		3.4	7.0		10.3	12.9	
<i>Low paid -2nd decile</i>	4.3	9.4		4.2	6.6		3.2	6.4		2.7	7.4		3.1	8.6		10.1	17.2	
<i>Low paid -1st decile</i>	5.8	20.1		5.0	14.2		13.0	44.6		4.7	17.7		3.1	13.3		7.9	18.2	
Lack of information on H&S																		
<i>Very well/well informed on health and safety</i>	86.0	85.1	0.011	87.6	89.3	0.619	89.8	92.4	0.384	85.4	82.2	0.073	80.8	79.4	0.080	90.9	90.0	0.316
<i>Not very well</i>	10.8	10.2		9.4	8.1		8.4	5.5		10.4	11.6		16.3	15.3		6.8	6.8	
<i>Not at all</i>	3.2	4.7		3.0	2.6		1.9	2.1		4.2	6.2		2.9	5.4		2.3	3.3	
Schedule predictability																		
<i>No changes before</i>	79.0	81.4	<0.00	84.2	82.7	0.201	81.1	86.3	0.243	77.6	77.6	0.003	82.6	86.2	0.145	74.4	80.9	<0.001
<i>Changes known the day before</i>	6.5	5.6		4.5	5.0		5.0	2.9		6.5	6.8		6.5	4.4		8.2	6.2	
<i>Changes known the same day</i>	7.0	4.2		6.9	5.9		6.7	5.7		6.8	3.3		4.7	3.1		10.8	5.6	

Weighted percentages. P-values compare men and women in each countries typology

Table 1. Continuation.

	UE-27 (n=19,526)		Social democratic (n=2,702)			Liberal (n=1,346)			Conservative- corporatist (n=4,751)			Southern (n=3,129)		Eastern European (n=7,598)				
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women				
	39.3	39.2	41.1	41.3	39.6	39.0	39.8	39.6	38.5	37.8	38.5	39.0						
Mean age (SD)	%	%	%	%	%	%	%	%	%	%	%	%	%	%				
regularity index																		
<i>very regular - 0 points</i>	48.8	52.4	<0.001	31.2	29.2	0.101	41.1	56.4	0.001	46.9	45.1	<0.001	58.5	62.4	<0.001	50.5	61.5	<0.001
<i>1 point</i>	17.8	22.4		24.3	29.5		19.5	18.5		17.6	27.3		15.5	16.6		18.3	18.5	
<i>2 points</i>	19.5	16.7		29.6	28.2		25.0	15.0		21.7	17.8		12.3	16.1		17.3	12.9	
<i>very irregular - 3 points</i>	14.0	8.6		15.0	13.1		14.4	10.1		13.8	9.8		13.7	5.0		14.0	7.1	
long hours																		
<i>≤40</i>	73.6	87.6	<0.001	75.0	91.0	<0.001	68.0	90.3	<0.001	81.1	94.0	<0.001	73.7	87.4	0.000	60.1	71.4	<0.001
<i>>40- ≤48</i>	13.5	7.9		14.7	5.8		12.9	5.3		10.8	3.9		15.1	8.1		17.4	18.5	
<i>>48</i>	13.0	4.5		10.3	3.2		19.1	4.4		8.1	2.1		11.2	4.5		22.5	10.1	
Work weekends (days)																		
<i>Never</i>	48.7	54.1	<0.001	52.3	54.9	0.002	41.6	60.2	<0.001	53.6	52.9	0.018	51.8	55.0	0.035	38.2	50.9	<0.001
<i>≥1- ≤3</i>	24.9	18.7		27.8	20.7		26.8	11.7		26.9	22.7		19.1	13.4		26.1	19.8	
<i>>3</i>	26.4	27.3		20.0	24.3		31.7	28.0		19.5	24.4		29.1	31.6		35.7	29.3	
Lack of training																		
<i>Not receiving</i>	53.0	52.2	0.568	32.3	29.2	0.179	33.2	32.2	0.798	55.3	55.2	0.944	65.5	66.0	0.873	51.2	53.6	0.200
Lack of self-determination over schedule																		
<i>Impossible self-determination</i>	66.7	65.8	0.454	40.4	42.7	0.352	60.7	60.3	0.930	60.0	56.3	0.111	75.5	79.0	0.164	81.6	83.2	0.260
Communication & participation with superiors																		
<i>0 negative points</i>	20.2	20.3	0.059	29.0	31.6	0.708	31.1	34.5	0.921	18.5	16.9	0.388	12.5	11.2	0.096	23.4	22.2	0.073
<i>1 negative point</i>	20.7	19.3		25.2	25.9		19.8	19.4		20.8	18.4		18.5	16.3		22.8	22.1	
<i>2 negative points</i>	21.1	19.2		19.7	19.1		17.4	15.7		20.4	20.0		24.8	20.8		20.7	18.6	
<i>3 negative points</i>	16.1	16.4		14.2	12.7		13.6	13.4		16.1	17.3		17.7	18.3		16.4	16.2	
<i>4 negative points</i>	21.9	24.9		11.8	10.7		18.1	17.1		24.2	27.5		26.5	33.4		16.7	20.9	

Table 2. Association of the precarious employment indicators with job dissatisfaction and poor work-related health by sex. Fourth European Working Conditions Survey, 2005

	JOB DISSATISFACTION											
	Men (n= 6,632)						Women (n=7,964)					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Type of contract												
<i>Indefinite contract</i>	1		1		1		1		1		1	
<i>Fixed term ≥ 1year</i>	1.47	0.98 2.20	1.33	0.89 1.98	1.33	0.87 2.02	1.46	1.00 2.13	1.26	0.83 1.90	1.16	0.76 1.76
<i>Fixed term <1year</i>	1.95	1.19 3.20	1.96	1.16 3.33	2.27	1.35 3.79	1.65	1.07 2.56	1.00	0.63 1.58	0.93	0.57 1.52
<i>Temporary agency</i>	1.57	0.79 3.10	1.14	0.57 2.26	0.89	0.43 1.85	1.64	0.83 3.23	1.02	0.54 1.91	0.99	0.48 2.02
Low income level												
<i>Well paid - above the country median</i>	1		1		1		1		1		1	
<i>Low paid - 5th decile</i>	1.91	1.34 2.72	1.64	1.14 2.36	1.53	1.06 2.20	1.68	1.16 2.44	1.56	1.07 2.27	1.37	0.92 2.03
<i>Low paid - 4th decile</i>	2.15	1.39 3.31	1.74	1.17 2.59	1.55	1.04 2.32	1.49	0.99 2.23	1.32	0.88 1.99	0.99	0.65 1.53
<i>Low paid - 3th decile</i>	2.75	1.79 4.23	1.85	1.15 2.96	1.63	1.02 2.60	2.26	1.52 3.34	2.07	1.36 3.15	1.62	1.06 2.47
<i>Low paid - 2nd decile</i>	1.89	1.16 3.09	1.46	0.82 2.59	1.31	0.76 2.26	2.33	1.62 3.35	2.12	1.43 3.15	1.73	1.16 2.58
<i>Low paid - 1st decile</i>	2.16	1.35 3.46	1.64	0.97 2.78	1.57	0.89 2.77	2.28	1.63 3.19	1.92	1.33 2.77	1.64	1.12 2.40
Lack of information on H&S												
<i>Very well/well informed on health and safety</i>	1		1		1		1		1		1	
<i>Not very well</i>	3.62	2.56 5.12	3.07	2.19 4.29	2.82	2.02 3.94	4.67	3.39 6.44	4.48	3.20 6.26	4.12	2.89 5.86
<i>Not at all</i>	8.71	5.22 14.52	7.78	4.67 12.98	6.58	3.96 10.93	6.66	4.42 10.02	5.88	3.92 8.82	5.24	3.35 8.21
Schedule unpredictability												
<i>No changes</i>	1		1		1		1		1		1	
<i>Changes known several days before</i>	1.20	0.76 1.90	1.06	0.69 1.63	0.95	0.62 1.45	1.05	0.68 1.61	0.80	0.51 1.27	0.75	0.45 1.25
<i>Changes known the day before</i>	1.59	1.06 2.40	1.23	0.77 1.96	1.05	0.67 1.67	2.31	1.46 3.65	1.84	1.11 3.04	1.46	0.87 2.45
<i>Changes known the same day</i>	1.68	1.11 2.53	1.30	0.85 1.99	1.13	0.73 1.74	1.90	1.26 2.88	1.67	1.04 2.68	1.19	0.70 2.00
Regularity index												
<i>very regular - 0 points</i>	1		1		1		1		1		1	
<i>1 point</i>	1.50	1.11 2.04	1.39	1.02 1.89	1.40	1.03 1.92	1.39	1.04 1.85	1.44	1.06 1.98	1.49	1.07 2.09
<i>2 points</i>	0.93	0.67 1.27	1.00	0.69 1.44	1.10	0.75 1.60	1.15	0.85 1.56	1.16	0.83 1.62	1.26	0.89 1.79
<i>very irregular - 3 points</i>	1.10	0.76 1.58	1.03	0.69 1.54	1.11	0.73 1.67	1.77	1.20 2.62	1.79	1.15 2.78	1.71	1.07 2.72

Model 1. Odds ratios and confidence intervals adjusted by age and country employment indicators

Model 2. Odds ratios and confidence intervals adjusted by age, country and all precarious employment indicators.

Model 3. Odds ratios and confidence intervals adjusted by age, country, job content, working conditions and all precarious employment indicators .

Table 2. Continuation

JOB DISSATISFACTION													
	Men (n= 6,632)						Women (n=7,964)						
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3		
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	
Long hours													
<i>≤40</i>	1		1		1		1		1		1		1
<i>>40-≤48</i>	0.93	0.67 1.29	1.01	0.72 1.43	0.94	0.67 1.31	1.05	0.77 1.44	0.93	0.65 1.34	0.93	0.63 1.38	1.38
<i>>48</i>	1.55	1.13 2.13	1.52	1.08 2.15	1.53	1.07 2.18	2.43	1.58 3.74	1.90	1.20 3.00	1.59	1.01 2.50	
Work weekends (days)													
<i>Never</i>	1		1		1		1		1		1		1
<i>≥1-≤3</i>	1.20	0.91 1.60	1.19	0.88 1.61	1.08	0.79 1.47	1.47	1.10 1.96	1.25	0.90 1.73	0.95	0.67 1.34	1.34
<i>>3</i>	1.51	1.16 1.98	1.24	0.91 1.68	1.14	0.83 1.55	1.75	1.36 2.26	1.29	0.97 1.71	0.99	0.73 1.34	
Lack of training													
<i>Receiving</i>	1		1		1		1		1		1		1
<i>Not receiving</i>	1.34	1.05 1.70	1.12	0.87 1.44	0.99	0.77 1.28	1.30	1.03 1.64	1.06	0.83 1.35	1.06	0.82 1.37	
Lack of self-determination over schedule													
<i>Self-determination</i>	1		1		1		1		1		1		1
<i>Impossible self-determination</i>	2.20	1.68 2.88	1.91	1.41 2.58	1.51	1.11 2.06	0.20	1.88 0.00	1.44	1.08 1.91	1.15	0.84 1.57	
Communication & participation with superiors													
<i>0 negative points</i>	1		1		1		1		1		1		1
<i>1 negative point</i>	1.10	0.77 1.57	1.04	0.73 1.49	1.04	0.72 1.50	1.18	0.83 1.67	1.07	0.74 1.55	1.10	0.75 1.61	
<i>2 negative points</i>	1.49	1.02 2.18	1.33	0.91 1.96	1.30	0.88 1.92	1.23	0.87 1.74	1.00	0.69 1.44	1.00	0.64 1.48	
<i>3 negative points</i>	1.74	1.19 2.56	1.44	0.97 2.12	1.41	0.95 2.10	1.48	1.03 2.13	1.30	0.88 1.92	1.22	0.80 1.84	
<i>4 negative points</i>	1.69	1.14 2.49	1.22	0.80 1.85	1.24	0.82 1.89	1.27	0.90 1.80	0.93	0.65 1.35	0.93	0.64 1.36	

Table 2. Continuation

POOR WORK-RELATED HEALTH																		
	Men (n=6570)									Women (n=7,900)								
	Model 1			Model 2			Model 3			Model 1		Model 2		Model 3				
	OR	95% CI		OR	95% CI		OR	95% CI		OR	95% CI	OR	95% CI	OR	95% CI			
Type of contract																		
<i>Indefinite contract</i>	1			1			1			1			1					
<i>Fixed term ≥ 1year</i>	1.01	0.72	1.41	0.91	0.64	1.30	0.94	0.65	1.34	1.28	0.92	1.78	1.20	0.86	1.67	1.10	0.77	1.58
<i>Fixed term <1year</i>	1.03	0.65	1.62	1.00	0.62	1.61	1.16	0.67	1.98	0.78	0.53	1.15	0.67	0.45	1.01	0.70	0.46	1.05
<i>Temporary agency</i>	0.96	0.52	1.78	0.77	0.41	1.45	0.55	0.26	1.17	0.87	0.44	1.72	0.90	0.44	1.88	0.82	0.37	1.81
Low income level																		
<i>Well paid - above the country median</i>	1			1			1			1			1			1		
<i>Low paid - 5th decile</i>	1.22	0.90	1.66	1.17	0.87	1.59	0.99	0.70	1.39	0.91	0.68	1.20	0.94	0.70	1.25	0.79	0.58	1.07
<i>Low paid - 4th decile</i>	1.04	0.72	1.51	1.01	0.68	1.50	0.84	0.55	1.28	1.14	0.81	1.63	1.12	0.81	1.55	0.85	0.60	1.20
<i>Low paid - 3th decile</i>	1.74	1.18	2.56	1.53	1.00	2.32	1.10	0.73	1.67	1.05	0.73	1.51	1.06	0.73	1.53	0.82	0.58	1.15
<i>Low paid - 2nd decile</i>	1.05	0.69	1.60	1.02	0.66	1.56	0.85	0.55	1.32	1.06	0.78	1.43	1.10	0.80	1.51	0.80	0.57	1.13
<i>Low paid - 1st decile</i>	0.99	0.62	1.59	0.92	0.54	1.57	0.84	0.42	1.66	0.67	0.52	0.87	0.67	0.51	0.89	0.51	0.37	0.70
Lack of information on H&S																		
<i>Very well/well informed on health and safety</i>	1			1			1			1			1			1		
<i>Not very well</i>	1.97	1.45	2.66	1.81	1.33	2.46	1.66	1.19	2.31	2.02	1.50	2.71	2.14	1.60	2.85	1.99	1.43	2.77
<i>Not at all</i>	4.20	2.46	7.17	4.07	2.51	6.61	3.53	2.11	5.90	2.70	1.80	4.06	3.00	2.00	4.51	2.51	1.62	3.88
Schedule unpredictability																		
<i>No changes</i>	1			1			1			1			1			1		
<i>Changes known several days before</i>	1.03	0.71	1.49	0.79	0.54	1.16	0.61	0.41	0.90	1.81	1.25	2.63	1.52	1.05	2.21	1.37	0.93	2.04
<i>Changes known the day before</i>	2.10	1.47	3.00	1.59	1.09	2.30	1.29	0.88	1.88	2.46	1.61	3.74	1.99	1.32	3.02	1.46	0.94	2.28
<i>Changes known the same day</i>	1.84	1.28	2.64	1.38	0.96	1.99	1.03	0.69	1.54	2.49	1.57	3.95	2.04	1.29	3.24	1.45	0.81	2.59
Regularity index																		
<i>very regular - 0 points</i>	1			1			1			1			1			1		
<i>1 point</i>	1.10	0.86	1.41	0.90	0.70	1.15	0.96	0.74	1.26	1.28	1.00	1.64	1.08	0.85	1.39	1.07	0.82	1.40
<i>2 points</i>	1.30	1.00	1.68	1.12	0.85	1.49	1.40	1.04	1.88	1.35	1.03	1.77	1.08	0.81	1.46	1.08	0.79	1.49
<i>very irregular - 3 points</i>	1.40	1.03	1.89	1.03	0.73	1.45	1.19	0.83	1.70	1.48	1.08	2.04	1.11	0.79	1.56	0.97	0.67	1.41

Table 2. Continuation

	POOR WORK-RELATED HEALTH											
	Men (n=6570)						Women (n=7,900)					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Long hours												
<i>≤40</i>	1		1		1		1		1		1	
<i>>40-≤48</i>	1.47	1.10 1.96	1.44	1.07 1.93	1.22	0.91 1.65	0.93	0.70 1.23	0.73	0.53 1.00	0.69	0.48 0.98
<i>>48</i>	2.06	1.56 2.70	1.73	1.28 2.34	1.67	1.23 2.28	1.92	1.24 2.97	1.29	0.83 2.02	1.02	0.61 1.70
Work weekends (days)												
<i>Never</i>	1		1		1		1		1		1	
<i>≥1-≤3</i>	1.40	1.11 1.78	1.28	1.00 1.63	1.09	0.84 1.42	1.58	1.24 2.01	1.43	1.10 1.86	1.09	0.82 1.43
<i>>3</i>	2.07	1.65 2.59	1.72	1.34 2.20	1.65	1.26 2.16	1.75	1.39 2.19	1.56	1.23 1.99	1.11	0.84 1.45
Lack of training												
<i>Receiving</i>	1		1		1		1		1		1	
<i>Not receiving</i>	0.92	0.76 1.12	0.94	0.76 1.15	0.73	0.58 0.91	0.73	0.60 0.88	0.81	0.66 1.00	0.79	0.63 1.00
Lack of self-determination over schedule												
<i>Self-determination</i>	1		1		1		1		1		1	
<i>Impossible self-determination</i>	1.60	1.29 1.99	1.73	1.37 2.19	1.36	1.05 1.75	1.17	0.94 1.46	1.25	0.99 1.56	1.08	0.84 1.38
Communication & participation with superiors												
<i>0 negative points</i>	1		1		1		1		1		1	
<i>1 negative point</i>	1.03	0.77 1.36	1.02	0.77 1.37	1.04	0.77 1.42	0.97	0.73 1.28	0.97	0.73 1.29	0.96	0.71 1.29
<i>2 negative points</i>	0.89	0.67 1.19	0.83	0.62 1.12	0.81	0.59 1.11	0.94	0.70 1.27	0.93	0.69 1.25	0.91	0.66 1.25
<i>3 negative points</i>	0.98	0.72 1.33	0.89	0.65 1.22	0.93	0.65 1.32	0.86	0.64 1.16	0.94	0.70 1.26	0.86	0.63 1.18
<i>4 negative points</i>	0.78	0.57 1.06	0.69	0.50 0.97	0.76	0.53 1.08	0.51	0.38 0.68	0.53	0.38 0.73	0.50	0.35 0.71

Table 3. Association of the precarious employment indicators with job dissatisfaction by sex and country group. Fourth European Working Conditions Survey, 2005

	Social-democratic		Liberal		Conservative		Southern		Eastern											
	men (n=1,109)		women (n=1,302)		men (n=431)		women (n=513)		men (n=1,622)		women (n=1,793)		men (n=1,189)		women (n=1,163)		men (n=2,281)		women (n=3,185)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Type of contract																				
<i>Indefinite contract</i>																				
<i>Fixed term ≥ 1year</i>	0.65	0.20 2.08	1.14	0.52 2.49	0.65	0.09 4.53	0.57	0.06 5.21	1.71	0.64 4.62	2.53	1.17 5.50	2.43	1.05 5.59	0.59	0.27 1.26	1.29	0.75 2.22	0.93	0.58 1.47
<i>Fixed term <1year</i>	3.01	1.22 7.46	1.05	0.44 2.48	#	#	5.98	1.91 18.68	0.53	0.09 3.11	2.15	0.85 5.43	0.87	0.42 1.80	1.61	0.87 2.98	1.00	0.58 1.74	1.00	0.58 1.74
<i>Temporary agency</i>	7.05	0.86 57.88	0.75	0.07 7.61	0.81	0.06 10.82	0.41	0.04 4.45	1.76	0.58 5.34	0.45	0.13 1.58	0.89	0.25 3.19	2.00	0.38 10.50	0.66	0.18 2.45	1.38	0.42 4.53
Low income level																				
<i>Well paid - above the country median</i>																				
<i>Low paid - 5th decile</i>	2.40	1.11 5.18	0.72	0.36 1.43	9.93	1.85 53.24	4.48	0.73 27.66	1.51	0.81 2.79	1.35	0.67 2.71	2.02	0.91 4.48	1.12	0.55 2.30	0.98	0.59 1.60	1.74	1.08 2.81
<i>Low paid - 4th decile</i>	0.91	0.38 2.20	0.38	0.16 0.88	0.89	0.11 7.51	0.42	0.06 3.01	2.21	0.76 6.43	0.65	0.22 1.92	1.13	0.48 2.63	0.85	0.33 2.15	2.46	1.46 4.15	2.46	1.56 3.87
<i>Low paid - 3th decile</i>	2.45	1.06 5.67	0.57	0.26 1.23	2.68	0.41 17.50	#	#	0.25	0.05 1.34	1.06	0.44 2.58	1.43	0.43 4.80	3.64	1.55 8.56	2.26	1.33 3.85	2.07	1.36 3.14
<i>Low paid - 2nd decile</i>	2.05	0.64 6.55	0.75	0.31 1.80	#	#	6.51	0.99 42.70	0.59	0.19 1.83	1.37	0.52 3.61	0.90	0.18 4.37	2.52	1.21 5.25	1.35	0.79 2.31	2.62	1.72 3.98
<i>Low paid - 1st decile</i>	1.22	0.41 3.61	0.86	0.43 1.71	1.78	0.12 26.98	2.35	0.63 8.76	2.28	0.52 10.02	1.00	0.45 2.21	0.69	0.18 2.69	2.82	1.28 6.20	2.75	1.44 5.24	3.96	2.57 6.09
Lack of information on H&S																				
<i>Very well/well informed on health and safety</i>																				
<i>Not very well</i>	1.00	0.41 2.40	2.24	1.13 4.43	#	#	9.65	2.50 37.23	2.72	1.54 4.80	7.44	3.86 14.32	2.18	1.16 4.09	4.54	2.55 8.07	4.91	2.91 8.28	1.71	1.08 2.69
<i>Not at all</i>	8.29	2.63 26.14	3.46	1.19 10.08	#	#	8.48	3.97 18.12	9.88	4.63 21.06	3.44	1.51 7.86	3.76	1.45 9.72	2.07	0.83 5.12	5.04	2.16 11.76	5.04	2.16 11.76
Schedule predictability																				
<i>No changes</i>																				
<i>Changes known several days before</i>	1.54	0.65 3.67	1.61	0.78 3.33	2.79	0.37 21.20	0.03	0.00 0.46	0.83	0.39 1.76	0.79	0.34 1.86	0.92	0.35 2.42	1.33	0.46 3.82	1.24	0.70 2.21	0.73	0.44 1.23
<i>Changes known the day before</i>	1.08	0.36 3.23	1.22	0.58 2.56	1.35	0.16 11.25	7.93	1.61 39.07	0.75	0.33 1.71	2.59	1.06 6.34	1.94	0.78 4.82	0.56	0.15 2.12	1.01	0.58 1.75	1.02	0.65 1.61
<i>Changes known the same day</i>	0.83	0.34 2.01	1.84	0.95 3.58	0.86	0.10 7.28	0.91	0.12 6.61	1.81	0.80 4.08	0.51	0.17 1.50	0.91	0.32 2.61	2.72	0.85 8.73	1.23	0.69 2.20	1.60	0.92 2.78
Regularity index																				
<i>very regular - 0 points</i>																				
<i>1 point</i>	1.66	0.89 3.07	0.95	0.53 1.69	7.90	1.53 40.91	3.08	0.93 10.13	1.56	0.84 2.92	2.96	1.51 5.81	1.36	0.73 2.52	0.79	0.42 1.48	0.81	0.53 1.23	1.15	0.81 1.63
<i>2 points</i>	1.51	0.80 2.87	1.14	0.64 2.04	1.25	0.22 7.10	1.57	0.16 15.51	1.14	0.50 2.58	1.24	0.56 2.74	1.64	0.75 3.62	1.03	0.48 2.18	0.78	0.48 1.27	1.49	1.00 2.20
<i>very irregular - 3 points</i>	1.21	0.56 2.61	1.50	0.72 3.12	#	#	2.79	0.59 13.23	1.01	0.41 2.46	2.69	1.01 7.20	0.93	0.37 2.33	0.84	0.30 2.34	0.76	0.45 1.29	2.07	1.23 3.50

Odds ratios adjusted by age, country, job content, working conditions and all the precarious employment indicators

Not enough data

Table 3. Continuation

	Social-democratic		Liberal		Conservative		Southern		Eastern													
											men (n=1,109)		women (n=1,302)		men (n=431)		women (n=513)		men (n=1,622)		women (n=1,793)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Long hours																						
<i>≤40</i>	1		1		1		1		1		1		1		1		1		1		1	
<i>>40-≤48</i>	0.64	0.31 1.30	0.99	0.43 2.29	0.17	0.01 1.91	0.24	0.01 4.42	0.77	0.37 1.62	1.51	0.29 7.89	1.11	0.54 2.30	0.78	0.39 1.54	1.04	0.71 1.52	1.08	0.77 1.52	1.08	0.77 1.52
<i>>48</i>	0.75	0.26 2.13	0.67	0.17 2.67	11.63	2.25 60.24	7.68	1.39 42.49	1.10	0.45 2.67	0.78	0.18 3.30	2.47	1.18 5.17	1.74	0.72 4.21	1.20	0.78 1.87	1.83	1.13 2.99	1.83	1.13 2.99
Work weekends (days)																						
<i>Never</i>	1		1		1		1		1		1		1		1		1		1		1	
<i>≥1-≤3</i>	0.95	0.53 1.68	0.86	0.53 1.41	2.68	0.47 15.27	1.07	0.27 4.25	1.00	0.55 1.82	0.76	0.37 1.56	1.61	0.79 3.28	0.65	0.28 1.49	0.89	0.61 1.31	1.45	1.02 2.06	1.45	1.02 2.06
<i>>3</i>	0.78	0.37 1.63	0.58	0.32 1.05	0.76	0.20 2.95	0.65	0.16 2.71	1.47	0.75 2.91	0.68	0.35 1.31	0.90	0.51 1.59	0.94	0.54 1.63	1.18	0.78 1.77	1.10	0.77 1.58	1.10	0.77 1.58
Lack of training																						
<i>Receiving</i>	1		1		1		1		1		1		1		1		1		1		1	
<i>Not receiving</i>	1.14	0.63 2.04	0.95	0.60 1.50	9.94	1.49 66.23	0.63	0.18 2.21	0.79	0.48 1.30	1.40	0.83 2.36	0.96	0.57 1.63	0.73	0.43 1.25	1.17	0.85 1.61	1.14	0.85 1.53	1.14	0.85 1.53
Lack of self-determination over schedule																						
<i>Self-determination</i>	1		1		1		1		1		1		1		1		1		1		1	
<i>Impossible self-determination</i>	0.93	0.55 1.59	1.00	0.66 1.51	#		0.93	0.24 3.66	1.70	0.96 3.00	1.41	0.80 2.49	2.20	1.13 4.28	0.78	0.40 1.51	0.79	0.50 1.27	1.40	0.95 2.06	1.40	0.95 2.06
Communication & participation with superiors																						
<i>0 negative points</i>	1		1		1		1		1		1		1		1		1		1		1	
<i>1 negative point</i>	1.40	0.77 2.55	1.37	0.80 2.32	0.34	0.06 1.86	0.43	0.16 1.19	1.09	0.50 2.37	1.75	0.72 4.24	0.65	0.26 1.63	1.00	0.38 2.62	1.38	0.87 2.20	1.06	0.72 1.57	1.06	0.72 1.57
<i>2 negative points</i>	0.74	0.35 1.56	1.75	0.94 3.25	3.34	0.51 22.03	0.45	0.08 2.45	0.93	0.41 2.13	1.09	0.47 2.52	1.21	0.53 2.77	0.91	0.35 2.40	1.37	0.86 2.16	1.66	1.11 2.48	1.66	1.11 2.48
<i>3 negative points</i>	0.61	0.26 1.42	2.15	1.06 4.36	0.85	0.09 8.45	0.08	0.01 0.62	1.36	0.60 3.09	2.13	0.89 5.10	1.20	0.52 2.81	1.19	0.39 3.59	1.68	1.03 2.75	1.38	0.88 2.15	1.38	0.88 2.15
<i>4 negative points</i>	0.86	0.35 2.11	0.86	0.37 2.01	1.81	0.24 13.86	0.05	0.00 0.49	0.94	0.39 2.27	1.59	0.67 3.77	1.30	0.57 2.96	0.48	0.19 1.22	1.38	0.81 2.34	1.98	1.28 3.04	1.98	1.28 3.04

Table 4. Association of the precarious employment indicators with poor work-relate health by sex and country group. Fourth European Working Conditions Survey, 2005

Type of contract	Social-democratic				Liberal				Conservative				Southern				Eastern					
	men (n=1,099)		women (n=1,290)		men (n=431)		women (n=519)		men (n=1,604)		women (n=1,778)		men (n=1,184)		women (n=1,158)		men (n=2,272)		women (n=3,155)			
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI		
<i>Indefinite contract</i>	1		1		1		1		1		1		1		1		1		1			
<i>Fixed term ≥ 1year</i>	0.58	0.29	1.18	1.35 0.73	2.49	0.39 0.06	2.50		#		0.86	0.37 1.99	1.33	0.67 2.65	1.76	0.80 3.84	1.24	0.63 2.43	1.08	0.68 1.72	0.73 0.45	1.19
<i>Fixed term <1year</i>	0.77	0.35	1.69	0.74 0.40	1.37		#		1.99	0.71 5.55	2.04	0.70 5.92	0.33	0.08 1.33	1.74	0.61 4.95	0.39	0.19 0.80	0.70	0.34 1.43	1.07	0.60 1.92
<i>Temporary agency</i>		#		0.24 0.03	1.67	2.34	0.30 18.36	2.62	0.21 33.23	0.51	0.19 1.40	1.77	0.58 5.45	0.68	0.16 2.97	1.24	0.29 5.32	0.31	0.08 1.20	0.38	0.10 1.45	
Low income level																						
<i>Well paid - above the country median</i>	1		1		1		1		1		1		1		1		1		1		1	
<i>Low paid - 5th decile</i>	0.83	0.48	1.44	1.57 0.95	2.59	0.83 0.16	4.46		#		1.70	0.98 2.96	0.81	0.47 1.41	0.83	0.38 1.84	0.70	0.36 1.33	0.66	0.42 1.04	0.91	0.59 1.39
<i>Low paid - 4th decile</i>	1.21	0.54	2.71	0.84 0.48	1.46	1.83 0.43	7.71	0.12	0.02 0.65	0.89	0.28 2.76	0.87	0.41 1.83	0.57	0.25 1.30	0.71	0.36 1.39	0.90	0.53 1.52	0.84	0.55 1.29	
<i>Low paid - 3th decile</i>	0.50	0.25	0.99	0.72 0.41	1.28	0.47 0.09	2.53	0.74	0.23 2.38	0.81	0.22 3.03	0.80	0.39 1.63	2.31	0.83 6.44	0.75	0.37 1.54	1.05	0.65 1.68	0.72	0.47 1.10	
<i>Low paid - 2nd decile</i>	1.27	0.38	4.20	0.91 0.46	1.82	1.21 0.17	8.67	1.21	0.35 4.22	0.46	0.17 1.26	0.84	0.37 1.90	1.14	0.40 3.27	0.48	0.22 1.07	0.81	0.49 1.34	0.98	0.65 1.48	
<i>Low paid - 1st decile</i>	1.24	0.55	2.77	0.90 0.50	1.61	0.19 0.04	0.85	1.07	0.28 4.14	4.00	0.93 17.29	0.33	0.17 0.61	0.23	0.05 0.98	0.52	0.23 1.18	0.81	0.42 1.57	0.65	0.42 1.02	
Lack of information on H&S																						
<i>Very well/well informed on health and safety</i>	1		1		1		1		1		1		1		1		1		1		1	
<i>Not very well</i>	0.91	0.49	1.67	1.95 1.02	3.72	8.60	2.12 34.80	0.00	0.00 0.00	1.91	1.06 3.45	1.99	1.14 3.48	1.56	0.86 2.83	1.88	1.07 3.30	1.18	0.70 2.00	1.73	1.06 2.82	
<i>Not at all</i>	2.26	0.63	8.20	1.40 0.59	3.35		#		4.74	1.09 20.69	3.32	1.57 7.04	2.62	1.28 5.37	3.72	1.58 8.77	1.81	0.83 3.92	6.67	2.19 20.28	3.20	1.44 7.09
Schedule predictability																						
<i>No changes</i>	1		1		1		1		1		1		1		1		1		1		1	
<i>Changes known several days before</i>	1.25	0.54	2.92	1.19 0.62	2.29	0.17 0.04	0.69	0.81	0.14 4.82	0.45	0.22 0.92	1.59	0.83 3.03	0.39	0.17 0.92	1.60	0.53 4.82	1.49	0.81 2.75	1.04	0.65 1.66	
<i>Changes known the day before</i>	0.75	0.30	1.85	1.23 0.68	2.25	2.25 0.50	10.21	6.48	1.39 30.14	1.03	0.49 2.19	1.91	0.88 4.15	1.80	0.80 4.05	1.12	0.31 4.11	1.82	1.11 2.99	1.18	0.72 1.94	
<i>Changes known the same day</i>	1.67	0.86	3.24	1.14 0.63	2.08	3.70	1.02 13.48	2.56	0.62 10.53	0.83	0.39 1.75	2.66	0.54 13.14	0.54	0.21 1.36	0.92	0.30 2.86	1.40	0.87 2.26	0.79	0.40 1.52	
Regularity index																						
<i>very regular - 0 points</i>	1		1		1		1		1		1		1		1		1		1		1	
<i>1 point</i>		#		0.76 0.51	1.11	0.33 0.07	1.43	0.53	0.20 1.39	1.32	0.77 2.27	0.79	0.46 1.35	0.97	0.52 1.79	1.69	0.93 3.06	1.14	0.78 1.68	1.25	0.90 1.72	
<i>2 points</i>	1.11	0.71	1.72	0.88 0.58	1.34	0.58 0.20	1.69	0.29	0.10 0.87	2.05	1.16 3.63	0.97	0.49 1.90	1.51	0.77 2.98	1.41	0.71 2.81	1.25	0.81 1.94	1.46	1.00 2.13	
<i>very irregular - 3 points</i>	0.64	0.36	1.15	0.80 0.47	1.36	0.51 0.09	2.97	0.57	0.21 1.57	2.26	1.12 4.57	0.60	0.29 1.24	1.22	0.59 2.54	2.36	0.87 6.38	0.71	0.44 1.15	1.26	0.74 2.13	

Odds ratios adjusted by age, country, job content, working conditions and all the precarious employment indicators

Not enough data

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7. DISCUSSION

This dissertation aimed to advance knowledge on monitoring employment-related health inequalities, focusing on arguably the two most relevant employment conditions in high-income regions like Europe, namely unemployment and precarious employment. This thesis reviews existing public health surveillance tools and presents new ones for monitoring employment-related health inequalities in a rich region. This includes a) trespassing the “dominant biomedical approach” of public health surveillance by taking into account the history and socio-political context and the process of social interaction, b) a critical review on the field of public health surveillance and occupational health research to advance in the monitoring of employment-related health inequalities, c) the use of innovative ways to disaggregate indicators according to the intersection theory, and d) the development of new tools of measurement (in the case of precariousness).

The first two points are addressed in the conceptual chapters, where also a theoretical framework to relate employment relations and health inequalities is presented. The last three points are presented through three research papers. In paper 1, an innovative proposal was developed of how to disaggregate commonly used unemployment indicators through the use of an intersectional approach. In papers 2 and 3, an indicator set for precarious employment in Europe was created and validated by adopting the

conceptual framework of employment precariousness to existing cross-national data.

In this chapter we discuss all the contributions and potentials of this work by reviewing its results in an integrated manner. The discussion consists of four sections: first, a summary of the most relevant findings. Secondly, we discuss the main strengths and limitations of this dissertation. Thirdly, we present the research challenges and policy implications associated to our findings. Finally, the main conclusions and recommendations derived from this dissertation are highlighted.

7.1. Main findings and contributions

a) Using an intersectional approach to improve the monitoring of unemployment

It is widely known that average indicators hide important social and public health realities (Hosseinpour, 2013). For example, when only national averages of health indicators are monitored, a comprehensive representation of the (social) distribution of health and changes in the population may be neglected. The national average of an indicator could remain constant over time, while certain population subgroups experience improvements in health and other populations subgroups see their health deteriorating. Actually, it is even possible to have an improvement in the national averages of health indicators (e.g. life expectancy) while within-

country inequality increases (Hosseinpoor, 2013). However, one of the fundamental questions that averages pose is how to disaggregate indicators in order to obtain more accurate information for some given purposes, i.e., in our case, to diminish health inequalities related to a key social determinant of health such as unemployment. A state-of-the-art review on unemployment has shown that when monitored for public health purposes, indicators are generally disaggregated by gender, age, and region/territory (Dirección General de Salud Pública, Consejería de Sanidad de Asturias, 2013; Fitzpatrick & Jacobson, 2003), with some exceptions such as the Swedish National Institute of Public Health (<http://www.fhi.se/>) also reporting “employment rates”⁷ disaggregated by lone and coupled mothers (Burstrom, 2011). In general this disaggregation (by gender, age, etc.) provides valuable information to describe patterns of unemployment or other employment conditions such as precarious employment. However, other important social patterns in (un)employment may be hidden.

The first main contribution of this dissertation is to provide an alternative way to disaggregate indicators of unemployment. Vulnerable subgroups arise from the differential impact of unemployment on health according to the intersection of different social axes of inequality and other related social factors, such as the

⁷ The Organization for Economic Co-operation and Development defines the employment rate as the employment-to-population ratio. This is a statistical ratio that measures the proportion of the country's working-age population (ages 15 to 64 in most OECD countries) that is employed. This includes people that have stopped looking for work. The International Labour Organization states that a person is considered employed if they have worked at least 1 hour in "gainful" employment in the most recent week (OECD, 2010).

unemployment benefits or the family composition. This novel approach to disaggregate unemployment was for the first time implemented in Catalonia, a north-eastern region of Spain. It shows seven specific groups being the most vulnerable to the health impact of unemployment: main-earner unemployed women, main-earner unemployed women not receiving benefits, main-earner women who are long-term unemployed, long-term unemployed women from the manual class, unemployed men from the manual class, unemployed men from the manual class who are not receiving benefits, and long-term unemployed men from the manual class. Inevitably, since this is a time and place specific approach, subgroup indicators cannot be universally generalized and can change over time. As explained in Chapter 3, the impact of employment conditions on health inequalities through various social mechanisms (axes of social health inequality) will depend on societal institutions (McLeod, et al., 2012). Therefore, it is quite probable that the repetition of this exercise in other countries with labour market, welfare state and family characteristics similar to Spain would result in similar subgroup indicators. Moreover, social relations are dynamic and change over time. This implies that if taking into account an intersectional approach, necessarily the same exercise has to be repeated over time. The repetition also will inform us whether the relations between unemployment and health inequalities are changing. A “systemic approach” on the labour market and health inequalities probably will provide some causal explanations.

The main innovations regarding the disaggregation of the unemployment indicator used in this study are two-fold. First, it is a demonstration of an empirical analysis of the differential impact of unemployment using the intersectional approach for monitoring purposes. The intersectional approach focuses on the idea that fundamental axes of social inequality are intrinsically intertwined, that they mutually constitute and reinforce one another, creating complex social locations (Springer, et al., 2012) (See Chapter 2 for further explanation). Other attempts have been shown to understand the processes of interaction between social class and gender patterns regarding unemployment (Artazcoz, et al., 2004). This approach has also been used for the study of the social distribution of precarious employment (paper 2), and for understanding the differential impact of precarious employment in relation with poor work-related health and job dissatisfaction (paper 3). However, the lack of research and information regarding precarious employment did not permit the same level of refinement in the disaggregated analyses as is the case with unemployment. Second, the analysis reflects a comprehensive understanding of employment conditions and their impact on health inequalities. We depart from the assertion that employment relations are asymmetrical power relations that interact with gender and other axes of inequality such as the place of origin, age and class. These relations are embedded in specific social contexts conformed by political institutions such as the employment regimes, the welfare state and labour market regulation, as well as cultural institutions, such as the family values about the role that each person plays in the family and in society. All the pieces of this

puzzle dynamically interact, changing over time and place, leading to a specific matrix of power or domination, with specific results on health. Without this “systemic approach” of understanding employment-related health inequalities, intersectionality-informed quantitative studies using stratification techniques would not provide such a comprehensive knowledge.

b) Building new indicators to monitor precarious employment in Europe

One of the fundamental impediments for properly monitoring employment-related health inequalities is the lack of appropriate indicators and data. Certainly in a (cross-national) European context, there is a lack of indicators for precarious employment health inequalities surveillance beyond standard indicators, such as the percentage of temporary contracts. Such a single indicator, although informative, may also be highly misleading. For example, during the current economic crisis the share of temporary employment in the Spanish labour market has fallen rapidly and is currently its lowest in 20 years (26% by the end of 2011), reflecting a deep deterioration in the labour market conditions rather than a decrease in the prevalence of precarious employment (Benach, et al., 2012). A broad set of indicators selected based on a theory-informed concept grasping into multiple dimensions of precarious employment may overcome the limitations of single indicators. Such conceptually-driven set of indicators was constructed out of

the available information in a European dataset. A first advantage of this approach is that it provides a more general understanding of (the quality of) workers' employment conditions, and its relation with well-being and health. Second, adopting this alternative approach to an available dataset measuring employment in the European countries overcomes the lack of data specifically designed to measure precarious employment in relation to health.

- The construction of a precarious employment indicator set based on the EWCS-2005

The European Working Conditions Survey is a promising dataset for monitoring employment-related health inequalities as it contains data on employment, health and socio-economic indicators. One of the most important strengths of the construction of the precarious employment indicator set lies in its strong conceptual basis. This conceptualization of precarious employment and its measurement, devised for epidemiological and public health research, arises from previous work conducted by Gredes-Emconet members (Amable, 2006; Benach & Muntaner, 2007; Benach, et al., 2007; Kim, et al., 2012; Menéndez, et al., 2007; Porthe, et al., 2009; Porthe, et al., 2010; Vives, 2010).

The confirmation of the hypotheses on social distribution and differential impact are a first external validation of the indicators. We can also confirm a high degree of theoretical and content validity as the indicators created in the EWCS cover quite satisfactorily, although not completely, the dimensions of the

concept. In some cases there is a gap between the theoretical dimensions of precarious employment the availability of appropriate data in the EWCS to measure them. This is, for example, the case for the entitlement to employee rights, their capacity to exercise them and collective bargaining, in which cases we use proxies of the concepts to measure them. In the case of collective bargaining measure it is done using the indicator of “working times setting procedures”. Working hours are one of these typical issues of the employment relationship that can be individually either collectively negotiated in organizations (Leede, et al., 2007). However this indicator does not correct for specific characteristics of the content of work. In some situations the nature of specific job contents and work processes are considerably limiting workers’ capacity of determining their working hours. Direct questions on trade union affiliation, coverage of collective agreement or the presence of a committee or workers representative would improve the measurement of collective bargaining.

In the case of the capacity to exercise rights it was our first decision to measure it also through the indicator of “unpaid exceptional working hours”, as an example of the declining of workplace rights. Across the European Union there is an increasing expectancy for workers to work extra hours and unsocial hours without wage compensation (Rubery & Grimshaw, 2003). Some countries are removing the premiums paid for extra hours and unsocial hours and are establishing single rates which makes work on exceptional hours cheaper for employers. However, in other situations, unpaid

extra hours may result from the unwillingness on the part of the employer to carry out their legal obligations (Tucker, 2002). More detailed questions regarding workers rights and social benefits would contribute to the goal of grasping into the different aspects of precarious employment, as well as, a set of questions asking the capacity to exercise these rights.

The set of indicators presented in paper 3 is slightly different from those in paper 2. This responds to the need of a continuous process of validation of indicators and measurement instruments which works through successive validation studies and through successive applications of the measures for research purposes (Vives, 2010). After confirming that the first set of indicators was consistent in both conceptual terms and social distribution, a second validation was performed through a factorial analysis, a correlation analysis and a reliability analysis. The results of these tests made us apply some changes in the indicators and the dimensions they represented. The main changes in the indicators between paper 2 and paper 3 are the following:

First, we decided to eliminate the indicator for “benefits in nature” from the dimension of low income level. This is informed by the insight that this item is only discriminating between better paid jobs. Since our study is concerned with precariousness at the bottom of the labour market we decided to leave benefits in nature out. Second, the indicator for “uncompensated flexible working times” was also eliminated, and consequently “the incapacity to exercise

rights” dimension disappeared due to the lack of proxy indicators in the data. Although this indicator was conceptually sound, its construction was partially based on the same question than the indicator for “intensive working times”, that is, the number of usual hours worked per week. This caused problems for the multivariate analyses in paper 3. Third, two additional indicators for control over working times were included: a regularity indicator and an item regarding working during weekends. Our first aim was to construct a composed indicator for this dimension. The indicator for part-time employment was, however, working in the opposite direction than others indicator on working times, posing limitations for the association analysis with health. Therefore, we finally decided to exclude it for the study of the associations between precarious employment and health. We finally also decided to show the results indicator by indicator rather than in a composed indicator, since this provided more insightful results.

- The social distribution of precarious employment in Europe

Paper 2 contributes to knowledge about the prevalence and social distribution of precarious employment by country, taking into account the intersection of selected social axes of inequality (i.e., social class, gender, credentialed skills and geographical location). A first set of eleven indicators to measure precarious employment through the European Working Conditions Survey – 2005 was created. The validation of the hypothesis on the social distribution

of precarious employment in Europe represents a first validation of the set of indicators created.

This study showed how precarious employment in 2005 was unequally distributed across the European labour force according to gender, social class and credentials. Women, workers without supervisory authority, supervisors, and less-skilled employees showed the highest prevalence for the most precarious response category of most of the indicators.

The only exceptions to the pattern of inequality were “long working hours”, “uncompensated flexible working times” and “schedule unpredictability”. These employment conditions were more prevalent among men, managers and highly skilled employees. The higher prevalence of long working hours among men can be explained by a strong male breadwinner model still existing, especially in countries such as Great Britain. The existence of a strong male breadwinner model, where women’s incomes are secondary to men’s, together with family financial stress, could force men to work long hours (Artazcoz, et al., *Submitted*). Moreover, a cultural tradition on working long hours could be playing a role (Burchell, et al., 2002). Also, working time insecurity may have grown for managers and highly skilled workers, who are expected to work long hours and during their leisure time, often to remain competitive and to advance in their careers (Standing, 1999).

The intersection between location (country of residency) as a geographical axis of inequality, and gender, credentialed skills and social class reveals an interesting double pattern in Europe. In countries with the lowest prevalence of uncompensated flexible working hours among the whole population, i.e. Nordic and Central European countries, managers and expert employees were those reporting working the longest hours and not being financially rewarded for their overwork. In contrast, in the countries with the highest prevalence of long working hours and uncompensated flexible working times, i.e., Eastern and some Southern European countries, those with fewer credentials were the employees reporting the longest hours and the highest percentages of financially uncompensated working times. This is a clear demonstration of the strength of intersectional analyses.

More general, the intersection of the social axes of inequality shows important results for social inequalities in Europe. First, the distribution of precarious employment according to gender, social class and credentials turns out to be the most unequal in those countries with the highest prevalence of precarious employment in the whole population. This assertion has important implications when considering the possible burden of health inequalities attributable to precarious employment.

Second, the results on the configuration of precarious employment might make us hypothesize that long working hours, schedule unpredictability and uncompensated flexible hours do not represent

characteristics of precarious employment in the Nordic countries, if precariousness is studied as a phenomenon occurring at the bottom of the dual labour market. Although not necessarily precarious, they could represent another configuration of the quality of employment different from the SER. In other studies aimed to construct a typology of jobs according to the quality of employment, these profiles of jobs have arisen as “portfolio jobs”. This type of job is characterised by overall beneficial employment conditions and relations, but with some exceptions: long working hours and uncompensated flexible working times are more prevalent (Van Aerden, et al., 2013). These jobs resemble the category of highly flexible, high skilled and independent workers which Standing describes as “proficians” (Standing, 2011). Such a privileged category of employees belonging to the core labour market has been detected before in empirical research (Vanroelen, et al., 2010) and has also previously been described as a group of employees that is most of all affected by work intensification (Parent-Thirion, et al., 2007). On the one hand, work intensification among these workers has been explained as an expression of work-related over commitment, partly due to personality characteristics (Siegrist, 2002) and partly in return for high extrinsic rewards such as pay and career development (Rousseau, 1995). On the other hand, as Van Aerden et al. argue (Van Aerden, et al., 2013) the intensive efforts of these workers can be an inevitable consequence of high performance management systems, in which long hours are the implicit norm (Murray, 2002). Working long hours may therefore appear less as a deliberate choice, but rather as a ‘ price’ the

employees have to pay for their privileged position in the labour market (Burchell, et al., 2002).

- The association of precarious employment with work-related poor health and job dissatisfaction in Europe

A next question regarding precarious employment relevant to health equity monitoring is whether it is differently associated with health across groups in different social positions. This is also an indirect way of validating whether these new measures work properly. Precarious employment may express itself differently in different groups of workers, that is, some characteristics of precarious employment may be more relevant to the health situation of certain social groups compared to others (Vives, 2010). Paper 3 contributes to this issue by posing two questions: (1) is there a relation between the indicators of precarious employment and health and the well-being of workers?; (2) are there social patterns in this health association according to the key axes of social inequality? The level of job satisfaction has been demonstrated as an important factor influencing workers' health, being strongly associated with psychological problems and to a lower extent, also with physical illness (Faragher, et al., 2005). Moreover, job satisfaction can be seen as a mediator in the relationship between job insecurity and psychological well-being (Handaja & De Witte, 2007). The use of a set of indicators to measure the different dimensions of precarious employment provides information on the gender and social class patterns regarding the differential vulnerability to precarious employment and its components.

Paper 3 shows how most of the precarious employment indicators are related with job dissatisfaction, although fewer with work-related poor health. Results differ by type of country, with generally speaking stronger associations in less egalitarian countries. Only precarious workers in Scandinavian countries, when compared with their non-precarious counterparts, are more likely to enjoy equal job satisfaction and work-related health status. This is not the case in countries not belonging to the Social-democratic type. These results suggest two different interpretations. First, Social-democratic countries have a satisfactory social protection system that prevents their population being exposed to higher chances for ill-health and job dissatisfaction when they are in precarious employment. In most Social-democratic countries, a strategy of flexicurity has been implemented. In these countries, trade unions have participated in negotiating on the nature of introduced flexibility (Rubery & Grimshaw, 2003). Second, since the prevalence of precarious employment in Social-democratic countries is still low in comparison with other countries, precarious jobs may be understood as temporary stepping stones to a better job, making them less difficult to cope with in psychosocial terms (Schmid, 2002). Obviously, without a composite indicator we are not able to measure a degree of severity of precarious employment. A lower degree of severity of precarious employment (understood as less dimensions of the employment relation being precarious) in Social-democratic countries could also explain why no differences in

health and satisfaction appear between standard and precarious workers in these countries.

The two studies on precarious employment in Europe lead to important conclusions for social health inequalities. First, the prevalence of precarious employment is unevenly distributed between European countries. Second, in those countries where a higher prevalence exists in most of the indicators, gender, social class and skill-related inequalities are higher. Third, the association of most of precarious employment indicators with job dissatisfaction is stronger in these countries, while the same holds for the indicators of work-related poor health.

7.2. Strengths and limitations

a) Strengths

Probably, the biggest innovation and at the same time challenge of this dissertation lies in the idea of widening the scope and improving the analysis of public health surveillance and monitoring. This field has been long dominated by a strong tradition of biomedical studies, focused basically on communicable diseases, chronic diseases, and health-related behaviours.

The strong tradition of biomedical studies on public health surveillance hinders the expansion of this field towards the social determinants of health and its contribution to health inequalities. Remaining under the main epidemiological paradigm, most of the

conceptual frameworks for public health surveillance still conceptualize health as an individual process assumed by the negative effect (or disease risk), caused by multiple risks factors. Thus, official information systems with monitoring purposes are usually reporting disease outbreaks, as well as, isolated disease risk factors (“proximate risk factors”), and associated morbidity outcomes (Breilh, 2003). More advanced systems report health inequalities, generally associated to the accessibility to health services (Hosseinpour, 2013). Moreover, regarding the methodology, preponderance of statistics and technology and epidemiological analysis of the data still prevails. Therefore, data is collected, analyzed and interpreted independently from the specific historical and socio-political context, not taking into account that we live in a process of social interaction where values and relationships are constantly changing (Breilh, 2003; Susser & Stein, 2009). With such an approach, there is always the risk of focusing intervention primarily on pathogenic health-related behaviours, casting the structural roots of disease into oblivion, as well as forgetting a health equity perspective.

Monitoring social determinants of health and its contribution to health inequalities, first changes the focus on the object of the study from the disease (or result on health) to the structural cause of disease. Second, data must be gathered on social determinants, social axes of inequality and related health outcomes in the same system (Sadana & Harper, 2011). Third, health outcomes generally associated with social determinants, such as unemployment or

precarious employment, are not acute diseases, do not appear as outbreaks, and tend to involve latency between exposure and disease. These characteristics complicate their monitoring. Moreover, a lot of the diseases related to social determinants such as occupational stress are mental diseases, which are more difficult to detect, and not always reported. These illnesses have multiple causal pathways and modifier effects.

Therefore, even when monitored, the health outcomes of social determinants of health inequalities do not generate alarm among public health authorities, such as for example an outbreak of influenza. In general worsening (mental) health as a result of deterioration in employment conditions goes unnoticed by the authorities. Moreover, public health prevention strategies derived from the monitoring of social determinant of health imply higher political commitment and intersectoral interventions (Calvete Oliva, et al., 2010; Cook, et al., 2013) (See Subsection on policy implications, pp. 287-290).

Monitoring social determinants of health and its contribution to health inequalities has been recently encouraged by public health organizations (Burstrom, 2011; Calvete Oliva, et al., 2010; CSDH, 2008; Pega, et al., 2010). Researchers have also been encouraged to debate and support collaborative efforts including consensus building on what types of measures use for monitoring social determinants of health and how to measure the magnitude of inequality in health outcomes (Sadana & Harper, 2011).

The present thesis is one of the first doctoral dissertations aimed to open this field of knowledge. It firmly states that when monitoring social determinants of health related to inequalities we cannot ignore historical and socio-political context of the social determinants monitored (Breilh, 2003), and that we need to consider processes of social interaction. These must be premises for our monitoring frameworks (See Chapters 2 and 3). This dissertation presents a conceptual framework to understand the causal relationship between employment relations and conditions and health inequalities. It represents a useful framework for further development and future implementation of an employment-related health inequalities monitoring system. Furthermore, it also provides a descriptive analysis on employment-related cross-national historical changes, necessary to conceptualize later on the employment conditions to be measured and monitored. It provides further understanding on labour market inequalities, being this explanation also useful to understand the causal relations between employment and health inequalities.

Second, it states the need to create/ select indicators based on solid conceptualizations. This implies gathering efforts from different fields of knowledge. For example, regarding labour market and employment conditions, lots of efforts have been done to conceptualize and measure the quality of employment from different social fields of knowledge such the sociology of labour, political science and labour market economy (e.g. Frade, et al.,

2004; Gallie, 2007) (See Chapter 4, pp. 106-108). These measurements generally face several limitations when applied to the public health field, because they have not been thought for health reasons. However, when we aim for an effective monitoring of social determinants related to health inequalities, the only possible way is to join the efforts of these multiple fields of knowledge (Pega, et al., 2010). In that regard, this dissertation presents a new set of precarious employment indicators overcoming the two main limitations: a lack of solid conceptualization (Amable, 2006; J. Benach & Muntaner, 2007; Benach, et al., 2007; Kim, et al., 2012; Menéndez, et al., 2007; Porthe, et al., 2009; Porthe, et al., 2010; Vives, 2010) and a lack of data. This approach constitutes a potential strength for measuring precarious employment, as well as other employment conditions such as informal employment, as it takes advantage of the rich potential of yet available data, without remaining stuck in conceptual limitations.

Third, this dissertation encourages the disaggregation of indicators based on an intersectional approach, rather than only one-axis of social health inequalities. The main innovation in that regard is to select subpopulation groups based on the differential impact on health of employment conditions. The selection of these groups is informed by quantitative studies using stratification techniques, together with a broader understanding of employment and health inequalities based on other methodologies and fields of knowledge. Using this intersectional approach we are able to determine the most

affected population subgroups regarding each social determinant, time and place.

Finally, it has to be highlighted that besides being a step further in monitoring employment-related health inequalities, the three articles provide further knowledge on the relationship between unemployment and precarious employment and health inequalities. This is especially relevant for precarious employment. Although during last years knowledge on the relationship between precarious employment and health has increased, few efforts have been done regarding the differential impact on health inequalities. The articles 2 and 3 provide key knowledge on its distribution and differential impact in the European Union.

b) Limitations

This study is not without limitations and results must be interpreted accordingly. The first important limitation was the lack of similar studies facing the monitoring of social determinants in relation to health inequalities. This represents an important strength according to its originality, but also a limitation as no theoretical and practical guides existed.

Another key methodological limitation to the analyses lies in the availability of data. For the purpose of disaggregating indicators, the lack of information on axes of social inequality in some cases and the lack of sufficient observations in other cases to reach

statistical power, limited our empirical analysis of disaggregation to a few social axes. This was the case for both unemployment and precarious employment studies. Regarding unemployment, the literature review informed that migration status is a key axis of social inequality in European countries today. The reduced number of survey participants in some groups, such as immigrants, was problematic. For the purpose of creating indicators of precarious employment the limitation lies in the gap between the theoretical dimensions of precarious employment and the availability of appropriate data in the EWCS to measure them (e.g. the entitlement to employee rights or collective bargaining). Thus, in some cases only rough proxies of the concepts are available in the analyses. Furthermore other indicators such as income need to be wider, including the annual salary instead of monthly salary, additional bonuses not being reported, and the family context.

There is, indeed, the problem of missing values, as a general problem in survey research on income. However, further analyses on the social distribution for missing values on income show that in our data the pattern of the missing values was rather homogeneous by social class, credentials and gender. The distribution is only quite heterogeneous by countries.

It should also be underlined that precarious employment and unemployment act like “communicating vessels” across which workers move at different times, potentially having accumulative effects on health. In the current study it was not possible to capture these dynamic trajectories and their effect. Longitudinal datasets are

more adequate. Moreover, the use of cross-sectional data implies that we can only interpret the results as a “snap shot” based on the moment when the survey was conducted. Thus, we could not measure the long-term effects of poor employment conditions. Furthermore, cross-sectional studies always pose limitations in the sense of reverse causation when measuring associations with health.

7.3. Research challenges and policy implications

Monitoring social determinants related to health inequalities is a very new and still underexplored topic in public health. This makes it an open-door to future research full of challenges. I will briefly explain some of the most important challenges that we face in terms of monitoring employment-related health inequalities, as well as in terms of the overall monitoring of social determinants of health. In the last part of this section, I will do a reflection on policy implications.

a) Research challenges

In terms of immediate future research the challenges are two-fold. First, there is an urgent need to extend the disaggregated analysis of the association between employment conditions and health (inequalities) according to axes of social inequality. In employment and health research, more “systemic approaches” should be adopted in order to understand how employment conditions are related with the socioeconomic and political context and the social axes of inequality in a specific time and place. This also implies that

researchers - in addition to statistical data analyses - should turn to other types of research such as qualitative, historical and political comparative research geared to understanding mechanisms and pathways explaining the relations found.

Second, there is also an urgent need to continue studying the validity of the set of indicators for measuring precarious employment and others following the same conceptualization. We should investigate whether the findings in this research are consistent across other samples, using different proxies of the dimensions of precarious employment and in different contexts. Moreover, and regarding the measurement of precarious employment, one of the key future research challenges is the construction of a composite indicator. However, several pros and cons exist. The most important advantage to use a composite indicator is its usefulness in summarizing data and information for decision-makers and advocacy agents. This approach could be particularly valuable for drawing comparisons between countries, regions and specific social groups and also to report trends over time. On the other hand, multiple disadvantages arise, as technically speaking the construction of a synthetic indicator is challenging, due to the need to weight and combine different variables. (Hosseinpoor,2013).

A third promising alternative in order to monitor precarious employment indicators is to create a typology of employment arrangements based on the set of indicators. First results on the

typological approach appear to be promising (Van Aerden, et al., 2013).

A key issue on the research agenda in terms of monitoring employment-related health inequalities concerns the importance of incorporating a dynamic perspective towards employment conditions. Technically speaking, this is translated in the monitoring of employment trajectories and their relations with health. Today, we are able to know how many people are unemployed and their socio-demographic characteristics. With recent improvements on the conceptualization and measurement of precarious employment (Puig-Barrachina et al. 2013; Vives, et al., 2010), soon we should be able to know how many people are working in precarious conditions and their social distribution. However, we do not know really know the relation between (precarious) employment careers and health (inequalities).

It can be expected that people following the "stepping-stone" career pattern of starting in precarious employment and growing to more stable employment, experience different health consequences than those who remain trapped in precarious employment. Moreover, finding a new job might be the antidote to the toxic experience of unemployment. However, for some proportion of the reemployed who enter into a precarious job may even exacerbate the poor health of unemployed people (Dooley, et al., 1996). Precarious employment can lead to illnesses owing to unfavourable working conditions, and resulting health problems may in turn lead to unemployment (Broding, et al., 2010). That is, the interplay

between precarious employment and unemployment, as well as informal employment, may be generating vicious cycles animated by causation and health-selection: both may be cause and consequence of poor health, and are causally linked to each other (Vives, 2010). Also particular combinations between (precarious) employment, unemployment and other forms of inactivity may lead to different outcomes in terms of health and well-being. That is, the health effects of unemployment depend not only from the experience of unemployment itself, but also from the character of post-unemployment labour trajectories. In turn, the health effects of post-unemployment labour market trajectories depend not only on the strength of employment and unemployment protection, but also on other features of the institutional environment (McLeod, et al., 2012). Today, there is an important gap of knowledge on the health consequences of these trajectories, with few exceptions (Metcalf, et al., 2003; Virtanen, et al., 2005).

The availability of a typology of employment trajectories included in an information system will allow us to monitor them over time and to know their contribution to health inequalities. From a gender point of view, it is extremely important to include in the configuration of such trajectories also unpaid (household) work. Furthermore, this typology would be extremely useful when implementing and evaluating new labour market policies.

Finally, the monitoring of employment-related health inequalities has to be broadened to other types of countries and employment conditions. The development of global employment-related health

inequalities surveillance systems, with an emphasis on middle- and low-income countries, is needed. Due to different socioeconomic and political contexts, middle and low-income countries should focus on informal employment, precarious employment, child labour and bonded labour as the most important employment conditions to monitor. For example, informal employment is a global phenomenon of growing importance characterized by work that is performed outside of labour legislation, taxation, social protection or entitlement to employment benefits such as retirement pensions. Although present in every country, these employment conditions are especially present in low-income countries, where it currently represents over two-fifths of the gross domestic product (Benach, et al., 2012; Unanue, Tarafa, Benach, Muntaner, *submitted*).

b) Policy implications

Public health surveillance and monitoring is a key tool for policy intervention and evaluation. That is, the process of monitoring should not stop with the simple reporting of data, but must be translated into action (Hosseinpoor, 2013). Data obtained from monitoring systems on social determinants of health has a wide range of political uses. First, from the advocacy perspective, it can be used to attract policymakers' attention by showing the existence of a hitherto unknown problem. It can also be applied to benchmarking exercises, i.e. showing that problems in a specific region or social group are larger than elsewhere. Additionally, it can also be used to attract the attention of civil society to lobby for

government/policy action or to promote social action. Second, policy makers can use knowledge to assess the situation and decide which areas are priorities for action. They can identify entry points for policy and assess the impact of new policies on social health inequalities and evaluate those already implemented (Calvete Oliva, et al., 2010; CSDH, 2008; MEKN, 2007). Stakeholders should also take into account inequality aspects to plan their policy agenda with two key public health strategies in mind: one to improve population's health and another to reduce health inequalities (Rose, 1992).

Furthermore, advancing on the monitoring of social determinants of health inequalities represents a step-further towards “health in all policies” (HiAP). HiAP is an approach to public policies across sectors that systematically takes into account the health implications of decisions, seeks synergies and avoids harmful health impacts, in order to improve population health and health equity (Cook, et al., 2013). This approach emphasizes the consequences of public policies on the social determinants of health, and aims to improve the accountability of policy-makers for health impacts at all levels of policy-making - not only in the field of public health policy, but also - for example - in the field of employment policies (Cook, et al., 2013). One of the main conducive conditions for HiAP is the availability of information on the health situation of the affected population, including distributional data on health, and the causes of ill health, data on potential health threats and on policies and interventions beyond the health sectors. That is, it implies having

resources that enable the follow up of policies' impacts on the social determinants of health and resulting health inequalities. Social determinants of health monitoring systems play a key role in this regard.

Today, it is more necessary than ever to dispose of knowledge and data with regard to health and health inequalities, given the important pressures to make labour markets more flexible throughout Europe. Such strategies are often put forward as solutions for the current unemployment crisis. The economic recession of 2008 is having a significant impact on labour market inequalities. The crisis is highlighting the polarization of the labour force: workers at the periphery of the labour force have been the first to be affected by employment cuts, with the core labour force remaining protected, at least initially. However, when the crisis has deepened the latter also have started to be affected (Vaughan-Whitehead, 2011). Regardless of cross-national variation, not only unemployment rose, but general employment conditions worsened (Vaughan-Whitehead, 2011). Evidence from previous economic downturns suggests that there will be short term and long term health effects, and that social health inequalities are likely to widen (Bloomer, et al., 2012). Government policies, especially labour market and welfare state policies play a key role in exacerbating or mitigating the health impact of this economic decline, particularly for the most socially disadvantaged (Bloomer, et al., 2012; Martin McKee, et al., 2010; Stuckler & Basu, 2013). Until today, the political answer adopted by most European countries has been a

package of austerity measures, including welfare state retrenchment (Shahidi, et al., 2011; Stuckler & Basu, 2013). This is especially the case for Southern European countries. In these countries precarious employment related inequalities have been demonstrated to be one of the highest already in 2005 (Puig-Barrachina et al., 2013). The consequences of current socio-economic policies for population health and health inequalities can be devastating. There is an urgent need to evaluate these policies from a public health point of view.

Health is an important value for population, it is key to their well-being and happiness. Good health is an essential resource for achieving individual's goals and aspirations but also society's social and economic goals. Health inequalities show the result of the unjust distribution of primary goods, as they are the result of a particular political, economic and social constellation. Thus, understanding social justice as the equity in the distribution of benefits and burdens in a society (Freidl, et al., 2007), social inequalities in health are an excellent indicator of social justice. In that sense, health inequality should be an essential indicator for evaluating "social progress".

7.4. Conclusions and recommendations:

The main conclusions that emerge from the studies included in this dissertation are the following:

- Public health surveillance and monitoring is still mainly dominated by a strong tradition of biomedical studies, focused basically on communicable and chronic diseases, and health-related behaviours. Remaining under the main epidemiological paradigm, most of the conceptual frameworks for public health surveillance still conceptualize health as individual process mainly caused by multiple risks factors.
- Although the monitoring of social determinants of health and health inequalities has become a topic of increasing interest in the last years, most social determinants remain outside public health surveillance systems and this important public health area remains limited or marginal.
- Employment relations and employment conditions are key structural and intermediate social determinants of health inequalities. Several changes in employment relations and consequent conditions that occurred during the last decades in Europe are potentially harmful for health inequalities. Very important employment conditions in relation with health in Europe are arguably unemployment and precarious employment. However, few indicators of these employment conditions are included in current public health monitoring systems. There is an

important gap of knowledge on the availability, selection, and disaggregation of these indicators.

- The surveillance of employment-related health inequalities is necessary to determine their magnitude, evolution over time and most affected populations. The monitoring of employment-related health inequalities is also important for two additional reasons: to identify potential policy entry-points, and to assess the impact of policies and interventions.
- The measurement of gains in health equity should be based on employment conditions that are relevant to the contexts in which they are placed, such as indicators of unemployment and precarious employment in the case of Europe.
- Following an intersectional approach, the disaggregation of unemployment indicators in the Catalan population shows that social class, gender and its relation to family situations are key social axes of inequality. Moreover, unemployment benefits and the duration of unemployment are key contributory social factors.
 - Seven vulnerable subgroups arise from the differential impact of unemployment on health according to the intersection of different social axes of inequality and related social factors: main-earner unemployed women, main-earner unemployed women not receiving benefits, main-earner women who are long-term unemployed, long-term unemployed women from the manual class, unemployed men from the manual class,

unemployed men from the manual class who are not receiving benefits, and long-term unemployed men from the manual class.

- These population subgroups should be monitored together with other more general population groups (i.e., groups disaggregated by age, sex, educational credentials, etc.)
- Our process of monitoring follows a time and place specific approach. Such an approach is adopted since subgroup indicators cannot be universally generalized because they vary over time and place. However, it is quite probable that the repetition of this exercise in other countries or regions with labour market, welfare state and family characteristics similar to Catalonia or Spain would result in similar subgroup indicators.
- Intersectional theory is an innovative approach helpful to disaggregate indicators of employment conditions in subpopulation groups for monitoring purposes. It not only allows us to know more precisely the social distribution of employment conditions but also their differential health impact.
- The adaptation of a precarious employment construct to the European Working Conditions Survey shows at which extent precarious employment is unequally distributed across the European labour force according to gender, social class and educational credentials.

- Women, workers without supervisory authority, and less-skilled employees show the highest prevalence for the most precarious response category of most of the indicators. The only exceptions are long working hours, uncompensated flexible working times and schedule unpredictability.
- Workers living in Eastern and Southern Europe suffer the highest levels of precarious employment.
- The intersection of the social axes of inequality reveals important variation in social inequalities throughout Europe. The distribution of precarious employment according to gender, social class and credentials turns out to be the most unequal in those countries with the highest prevalence of precarious employment in the wage-employed population. This assertion has important implications when considering the possible burden of health inequalities attributable to precarious employment.
- Most dimensions of precarious employment are associated with job dissatisfaction, as well as some associations with poor work-related health.
 - Type of country (according to labour market characteristics, welfare state development and family culture) modifies the association of precarious employment with job satisfaction and work-related health. These associations are generally stronger in less egalitarian countries.

- Different gender patterns are found regarding the lack of control over working time and collective bargaining dimensions. Women show consistent associations for schedule unpredictability with job dissatisfaction and poor work-related health, as well as for lack of regularity with job dissatisfaction. Men show stronger associations for long working hours with poor work-related health, as well as lack of self-determination over their work schedule with job dissatisfaction and poor work-related health.
- The adaptation of a conceptually sound set of precarious employment indicators to an existing data base is very promising for monitoring the health and worker well-being consequences of labour market characteristics. It takes the advantage of the rich potential of yet available data, without remaining stuck in conceptual limitations.

Recommendations:

- Transdisciplinary Public Health research should play a key role in developing monitoring systems including social determinants of health inequalities. Different initiatives aimed to conceptualize and measure changes in employment conditions exist from the field of sociology and industrial relations research. These approaches from other fields are very promising for the social epidemiology field.

- To monitor precarious employment through European labour market surveys more precisely, additional information and indicators on the entitlement to employee rights, their capacity to exercise them and collective bargaining should be included. Databases should always include health indicators on the most important axes of social inequality.
- From a research perspective, it is needed to broaden the study of monitoring employment-related health inequalities to employment trajectories and their relation with health and health inequalities. An example includes the need to be able to monitor long-term effects of poor labour market trajectories.
- It is also needed the development of global employment-related health inequalities surveillance systems, with an emphasis on middle and low-income countries and other employment conditions, such as informal work, child labour and bonded labour.
- From a policy perspective, results from monitoring employment-related health inequalities should be used to make sure that newly implement labour market policies are based on scientific evidence about their impact on health and well-being. Only such an approach can be to evaluate the health impact of existing labour market interventions.
- When monitoring social determinants of health related to inequalities we need to avoid using a straightforward risk-factor approach. Thus, we first need a conceptual framework to

understanding the causal relationships between each social determinant and its consequences on health inequalities. Second, this conceptual framework should not ignore the historical and socio-political contexts of the social determinants being monitored.

APPENDIX I: Paper 4.

Benach, J., Puig-Barrachina V., Vives, A., Tarafa, G., Muntaner, C. [The challenge of monitoring employment-related health inequalities.](#) *J Epidemiol Community Health* 2012;66:1085-1087 doi:10.1136/jech-2012-201103

The challenge of monitoring employment-related health inequalities

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THE SURVEILLANCE OF SOCIAL DETERMINANTS OF HEALTH

Social determinants of health are major factors responsible for a population's health and health inequalities.¹ Public health surveillance was originally developed for the control of infectious diseases, but today its principles have also been applied to other public health problems such as chronic diseases and occupational and traffic injuries.² Many countries already collect data on social determinants of health, dispersed across different information systems typically designed for other purposes. However, most social determinants of health remain outside surveillance systems

and this area of public health remains limited or marginal within mainstream policy practice. Surveillance of social determinants of health is therefore a neglected but essential and challenging public health issue. The WHO Commission on Social Determinants of Health strongly recommended the creation of National Health Equity Surveillance Systems, with routine data collection on the social determinants of health and health equity, and investment in training of policy-makers and health practitioners in equity monitoring and health equity impact assessment.¹ Such investment was given further priority by international organisations and member states through the adoption of a World Health Assembly Resolution on social determinants of health in May 2009, and further reaffirmed in the Rio Political Declaration on Social Determinants of Health in October 2011.³ Likewise, the former Spanish Minister of Health and Social Policy launched ‘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 2010.⁴ In spite of these initiatives, however, today there is no comprehensive surveillance system capable of globally or nationally monitoring social determinants and their relationship with health inequalities. Employment and working conditions are key areas of social determinants of health research agenda.⁵ This paper describes the importance, gaps and challenges in developing employment-health-equity surveillance systems.

MONITORING EMPLOYMENT CONDITIONS

Employment and working conditions are prominent determinants of health because work and employment relations play a major role in most people's lives.⁶ Because they are unequally distributed by social class, gender, ethnicity/race or migrant status, these conditions also make a substantial contribution to health inequalities.⁷ While working conditions have received considerable attention as social determinants of health and, to a lesser extent, of health inequalities,⁸ researchers have rarely focused on employment relations, that is, the power relations between employers and workers and the level of social protection that workers can count on. The employment conditions knowledge network of the Commission on Social Determinants of Health classified employment conditions into six main categories: unemployment, precarious employment, informal employment, child labour, slavery/bonded labour, and full-time permanent employment, and found that countries whose governments favour fair employment and decent work policies also tend to have better health indicators and lower health inequalities.⁷ However, knowledge on those employment-related health inequalities remains limited or is neglected, and their monitoring over time is limited to a few indicators of employment conditions and for economic -not public health- purposes.

Surveillance gaps: precarious employment, informal employment and migration as examples

Precarious employment encompasses unstable employment, individual-level bargaining over employment conditions (or not bargaining at all), low wages and economic deprivation, limited workplace rights and social protection, vulnerability and unbalanced workplace power relations, and powerlessness to exercise workplace rights.⁹ Today there is a lack of indicators for precarious employment surveillance beyond standard indicators, such as the percentage of temporary contracts,¹⁰ which can turn out to be highly misleading. In fact, during the current economic crisis the share of temporary employment in the Spanish labour market has fallen rapidly and is currently at its lowest in 20 years (26% by the end of 2011), reflecting a deep deterioration in labour market conditions rather than a decrease in the prevalence of precarious employment. The recent development of an Employment Precariousness Scale, a theory-based multidimensional questionnaire specifically devised for epidemiological studies¹¹ is a promising tool for overcoming these limitations and measuring precariousness in different populations. For example, one study found that the overall prevalence of employment precariousness in Spain in 2005 reached 48%, being highest among women, immigrants, youth and manual workers. Based on the employment precariousness construct and taking advantage of the wealth of readily-available data,¹² a set of proxy indicators could be created for precarious employment surveillance. A good example is the European Working Conditions

Survey, applied every 5 years. Early efforts have been made to apply the concept of employment precariousness to the European Working Conditions Survey data.¹² Although with limitations, this will allow showing its social distribution and health impact across countries, both cross-sectionally and over time.

Informal employment is a global phenomenon of growing importance, characterised by work that is performed outside of labour legislation, taxation, social protection or entitlement to employment benefits such as pensions. Although present in every country, this employment condition is especially present in low-income countries, where it currently represents over two-fifths of the gross domestic product. Currently, the International Labour Organization gathers data on informal employment, but this information is limited.¹³ First, countries can insert their questions on informal employment within one of multiple survey types, rendering data not necessarily comparable between countries. Second, countries can differ in their definitions of informal employment, geographical areas and branches of economic activity covered, informal enterprise cut-off size, registration criteria, criteria for inclusion or exclusion of secondary jobs in the informal sector, age limits, and whether or not to include professional or technical activities, among other criteria.¹⁴ So, while it is estimated that informal employment represents 41% of total employment, meaning nearly two billion people only in low income countries,¹⁵ there is a lack of reliable prevalence estimations concerning informal employment and its impact on health and health

inequalities, especially in rural settings and poor countries. Efforts must be made to standardise an informal employment definition in low-income countries, capable of capturing informal jobs within and outside the informal economy. Indeed, the development of informal employment health-related inequalities surveillance systems will require extensive collaboration between national statistical offices, researchers and policy makers.¹³

Employment and working conditions faced by most migrant workers are dangerous to their health. With ‘globalisation’, investments, and labour has been increasingly mobile.⁶ International migrants were estimated at 214 million in 2010, of which about 90% are migrant workers and their families.¹⁶ In 2009, 40% of EU residents were born outside the European Union.¹⁷ The ‘pull’ of workers trying to access higher wage labour markets is compounded by the ‘push’ factor of corporations seeking less regulated labour markets.¹⁸ A major gap in international migration research is the lack of consistent, comparable data across countries. More global health surveillance and socio-epidemiologic analyses of migration are needed to render employment conditions prominent in migration policy.¹⁹ A key challenge concerns the need for high quality data and information systems, including reliable estimates of international migration flows, national level data on the incidence and magnitude of migration, migrant workers’ employment and working conditions and health status.¹⁴ Today most countries lack adequate national systems to monitor key occupational health problems among migrants and most official and unofficial statistics

do not disaggregate migratory flows by age, gender, ethnicity or social class. Governments and health agencies should establish adequate information systems and research plans to gather data on migration processes and hard-to-reach or undocumented migrants. Oversampling of migrant workers and data-pooling are two approaches that can be used to address the statistical instability introduced by the small numbers of migrant workers in many studies. Overcoming these data problems will help to obtain better estimates of injuries, mortality and morbidity, and to properly monitor the evolution of immigrants, their health inequalities and health policy and prevention programmes.

CHALLENGES

A general goal, and the most challenging one, is the development of global employment-related health inequalities surveillance systems, with an emphasis on middle-and low-income countries. Such systems must aim at overcoming the difficulties inherent to cross-country comparisons that arise from the diversity of forms of employment and working conditions, the ensuing barriers to reaching universally standardised definitions and the lack of available data. Unlike existing data systems, which often only present country-level health averages, a key feature of such monitoring systems should be to present the data stratified by social groups. Researchers and policy makers would therefore be able to know whether the country's health averages are concealing large health differences between groups, and be able to formulate policies and interventions that are more equitable.⁶ Moreover, researchers

would be able to study the differential exposure to socially patterned risks and differential vulnerability-effect modification to these factors across groups. Both, differential exposure and effect modification are the main hypotheses to explain health inequalities.²⁰ Second, and when possible, interactions between social strata as determined by social class, gender, ethnicity, age and migration status could be analysed, as intersectional approaches provide an excellent insight on health inequalities.^{21 22} Specifically, for analysing gender inequalities due to employment conditions, family characteristics and household chores should be taken into account, as health inequalities cannot be understood without a work-family interaction insight.^{6 23} Third, surveillance should be inclusive and cover all the population connected to employment: from standard employees to persons exclusively dedicated to reproductive labour and disabled persons. Fourth, some attention should be paid to choosing the most appropriate measures for health inequalities.²⁴ Finally, the most appropriate definitions and indicators for employment conditions such as precarious and informal employment have to be formulated, based on a theoretical conceptualisation for health purposes, and not exclusively for economic purposes.

Today knowledge of what constitutes the most appropriate indicators for monitoring employment conditions in different social contexts, and the methods to choose them, remain limited to traditional labour market outcomes such as unemployment²⁵ but are very scarce for other employment conditions. To date, only a few

countries have introduced data on employment conditions -mainly unemployment -in their public health surveillance systems, Sweden and the UK, being two good examples.²⁵ In spite of these limitations, ongoing employment and working conditions-related surveys are promising tools to monitor employment-related health inequalities. However, to be useful, these surveys must be representative of the population and large enough to analyse inequalities by gender, socioeconomic position and immigration status, they must be repeated over time (eg. every other year) in order to evaluate time trends and include health indicators to analyse the impact of employment conditions. However, the greatest challenge regarding ongoing surveys is being able to apply valid and conceptually sound measures, as exemplified above with the employment precariousness concept.^{11 12}

CONCLUDING REMARKS

The surveillance of health-related employment conditions is necessary to determine their magnitude, evolution over time and most affected populations. The monitoring of employment health-related inequalities is important for two main reasons: to identify potential policy entry-points, and to assess the impact of policies and interventions. The measurement of gains in health equity should be based on indicators that are relevant to the contexts in which they are placed, and take into account the varying levels of information available in different countries and regions. Governments and health agencies should establish adequate surveillance information systems to gather public health data associated with fundamental

employment conditions such as precarious employment, informal employment and other extreme forms of hazardous employment such as slavery (at least 12 million people worldwide) or child labour (about 250 million), paying special attention to the social mechanisms of inequality.⁶ In addition, special efforts should be made to develop new sensitive indicators more able to capture the whole impact of the economic recession in high-income countries on the population's health. These systems can become key tools to support evidence-based policy-making, effective interventions and advocacy. Surveillance systems can be used to determine entry-points for intervention, evaluate the impact of policies, and prioritise the use of public resources. These systems should be comprehensible, user friendly and accessible to researchers such as epidemiologists, health professionals, policy-makers, experts and the general public.

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APPENDIX II: Other products of this work

Other co-authored papers

Vanroelen C, Vives A, **Puig-Barrachina V**, Van Aerden K, Ferrer O, Belvis F, De Witte H, Benach J. *The quality of employment conditions and employment relations in Europe. Secondary Analyses of the Fifth European Working Conditions Survey*. European Foundation for the Improvement of Living and Working Conditions, [in Press].

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Conferences

Puig-Barrachina V, Vanroelen C, Vives V, Martínez JM, Julià M, Muntaner C, Levecque K, Benach J, Louckx F. “Precariedad Laboral en Europa: Medición de un constructo multidimensional con la encuesta europea de condiciones de trabajo” (*Precarious employment in Europe: Measuring employment precariousness construct in the European Working Conditions Survey*). Oral communication. XXX Reunión Científica de la Sociedad Española de Epidemiología (*XXX Scientific Meeting of the Spanish Society of Epidemiology*). October 2012, Santander, Spain.

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