

Original

Assessment of the magnitude of geographical variations in the duration of non-work-related sickness absence by individual and contextual factors



Isabel Torá-Rocamora^{a,b,c,*}, José Miguel Martínez^{c,d}, David Gimeno^{c,d,e}, Constança Alberti^f, Josefina Jardí^f, Rafael Manzanera^g, Fernando G. Benavides^{c,d}, George Delclos^{c,d,h}

^a Department of Epidemiology and Evaluation, IMIM (Hospital del Mar Medical Research Institute), Barcelona, Spain

^b Red de investigación en servicios de salud en enfermedades crónicas (REDISSEC), Spain

^c Center for Research in Occupational Health (CiSAL), Department of Experimental and Health Sciences, Universitat Pompeu Fabra, Barcelona, Spain

^d CIBER in Epidemiology and Public Health, Barcelona, Spain

^e Southwest Center for Occupational and Environmental Health, Division of Epidemiology, Human Genetics and Environmental Sciences, The University of Texas School of Public Health, San Antonio Campus, San Antonio, Texas, USA

^f Institut Català d'Avaluacions Mèdiques i Sanitàries, Departament de Salut, Generalitat de Catalunya, Barcelona, Spain

^g Medical and Health Care Services Division, Mutual Midat Cyclops (MC MUTUAL), Barcelona, Spain

^h Southwest Center for Occupational and Environmental Health, Division of Epidemiology, Human Genetics and Environmental Sciences, The University of Texas School of Public Health, Houston, Texas, USA

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ABSTRACT

Objective: To examine variation in the duration of non-work-related sickness absence (NWRSA) across geographical areas and the degree to which this variation can be explained by individual and/or contextual factors.

Methods: All first NWRSA episodes ending in 2007 and 2010 were analyzed. Individual (diagnosis, age, sex) and contextual factors (healthcare resources, socioeconomic factors) were analyzed to assess how much of the geographical variation was explained by these factors. Median NWRSA durations in quartiles were mapped by counties in Catalonia. Multilevel Cox proportional hazard regression models with episodes nested within counties were fitted to quantify the magnitude of this variation. The proportional change in variance (PCV), median hazard ratios (MHR) and interquartile hazard ratios (IHR) were calculated.

Results: We found a geographical pattern in the duration of NWRSA, with longer duration in northwestern Catalonia. There was a small, but statistically significant, geographical variation in the duration of NWRSA, which mostly decreased after adjustment for individual factors in both women (PCV = 34.98%, MHR = 1.09, IHR = 1.13 in 2007; PCV = 34.68%, MHR = 1.11, IHR = 1.28 in 2010) and men (PCV = 39.88%, MHR = 1.10, IHR = 1.27 in 2007; PCV = 45.93%, MHR = 1.10, IHR = 1.25 in 2010); only in the case of women in 2010 was there a reduction in county-level variance due to contextual covariates (PCV = 16.18%, MHR = 1.12, IHR = 1.32).

Conclusions: County-level variation in the duration of NWRSA was small and was explained more by individual than by contextual variables. Knowledge of geographic differences in NWRSA duration is needed to plan specific programs and interventions to minimize these differences.

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Evaluación de la magnitud de la variabilidad geográfica en la duración de la incapacidad temporal por contingencia común por factores individuales y contextuales

RESUMEN

Objetivo: Examinar la variabilidad de la duración de la incapacidad temporal por contingencia común (ITcc) entre áreas geográficas y el grado en que factores individuales y/o contextuales la explican.

Métodos: Se analizaron los primeros episodios de ITcc finalizados en 2007 y 2010. Se evaluó la variabilidad geográfica explicada por factores individuales (diagnóstico, edad, sexo) y contextuales (recursos sanitarios, socioeconómicos). Se representó gráficamente la duración mediana por comarcas de Cataluña. Se

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* Corresponding author. Department of Epidemiology and Evaluation IMIM (Hospital del Mar Medical Research Institute) C/Doctor Aiguader 88. 08003 Barcelona. Spain. Tel.: +34 933160776; fax: +34 933160410.

E-mail address: isatr10279@gmail.com (I. Torá-Rocamora).

cuantificó la variabilidad geográfica de la duración de la ITcc entre comarcas ajustando modelos de regresión multinivel de riesgos proporcionales, con episodios anidados en comarcas. Se calculó el porcentaje de cambio de la varianza (PCV), el razón de riesgo mediano (RRM) y razón de riesgo intercuartílico (RRI).

Resultados: Se encontró un patrón geográfico en la duración de la ITcc, con mayor duración en el noroeste de Cataluña. La variabilidad geográfica de la duración de la ITcc fue, aunque no elevada, estadísticamente significativa, y disminuyó después de ajustar por factores de nivel individual en mujeres (PCV = 34.98%, RRM = 1.09, RRI = 1.13 en 2007; PCV = 34.68%, RRM = 1.11, RRI = 1.28 en 2010) y hombres (PCV = 39.88%, RRM = 1.10, RRI = 1.27 en 2007; PCV = 45.93%, RRM = 1.10, RRI = 1.25 en 2010); y solo en el caso de las mujeres en 2010 hubo una reducción de la varianza debido a los factores contextuales (PCV = 16.18%, RRM = 1.12, RRI = 1.32).

Conclusiones: La variabilidad geográfica de la duración de la ITcc fue pequeña y explicada principalmente por los factores de nivel individual. El conocimiento de las diferencias geográficas en la duración de la ITcc es necesario para planificar programas e intervenciones específicas para reducir al mínimo estas diferencias.

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Introduction

Non Work-related Sickness Absence (NWRSA) represents a high economic, social and health care burden,^{1–3} is determined by multiple factors and its geographical variations may be of great magnitude and could determine its duration.^{4,5} In addition to the inciting pathology, both individual factors, such as age and gender, and contextual factors related to the groups or geographical areas to which individuals belong, such as socioeconomic circumstances, labor market forces, the organization and quality of the health care delivery system, and the benefits structure, may play important roles as determinants of NWRSA duration.⁶ Several publications have already pointed out some geographical effects in the duration of NWRSA of individual factor, such as management of episodes, social security system or economic sector in the duration of NWRSA.^{4,6,7} But few have pointed out geographical variations of contextual factors, such as employment status, socioeconomic status, or medical practice.^{7–9} Assessing how much of the geographical variability in the duration of NWRSA is explained by these factors can inform resource allocation and the design of interventions and strategies to improve case management.

There is a general lack of studies that simultaneously assess both individual and contextual level factors in relation to NWRSA duration. The analysis of the NWRSA determinants is further hampered by a multiplicity of interacting causes, making it difficult to systematically approach the phenomenon. To circumvent part of these limitations, data from various sources could be combined and analyzed using multilevel statistical models.^{6,10–12} While a growing number of epidemiology studies apply multilevel regression analysis to the investigation of associations between individual and contextual factors on health outcomes,¹³ few have studied the effect of health variations between geographical regions regardless of the outcome and even fewer studying variability in survival analysis with duration.^{14–16}

The current global financial crisis which began in 2007 affected the global economy, and spread fast around the world,¹⁷ but in Spain began to become aware from 2008 and its consequences have been extended over time to the present. The economic recession has resulted in a substantial increase in unemployment and its consequences have affected not only politically but also affected the economic, social and health system.¹⁸ For example, with the economic crisis, in Spain the labour market collapsed, creating conditions of economic hardship for many ordinary people, and tax revenues also fell sharply, leading to a budget deficit of 12% of GDP in 2009. This situation then led to budget cuts, and many areas of public spending as health system were affected.¹⁹ Understanding the geographical variations in NWRSA duration due to contextual factors taking into account two different periods in relation to the financial crisis will be more relevant knowledge.

In Catalonia, an autonomous community in Spain, the health needs of all citizens are covered through a public national health care system. NWRSA episodes are certified by primary care physicians in the national health system, and recorded electronically. Case management of a NWRSA episode, including wage replacement benefits, is performed either by the Social Security system or mutual insurance companies (mutuas) that collaborate with the Social Security system. The main responsibility for certifying a NWRSA episode rests on the primary care physicians of the social security System, who establish the start and end dates of the absence. Physicians of the mutual insurance companies can only suggest the end of an episode, based on their evaluation of the case. The existence of this electronic registry offers a unique opportunity to advance our knowledge of the determinants of NWRSA duration, and examine their temporal difference. The general aims of this study were to examine the magnitude of the geographical variability in NWRSA duration across Catalonia and which individual and/or contextual factors may explain this variability, for two specific years, 2007 and 2010, in order to analyze the influence of the financial crisis.

Methods

Data sources and variables

Data were obtained on all first sickness absence episodes ending in the years 2007 and 2010 in Catalonia, two years which may reflect two distinctly different periods in relation to the global financial crisis, which began in Spain around 2008 and currently still continues. All NWRSA episodes of more than three days' duration are initially certified by a primary care provider of the national health service and electronically registered by the Catalan Institute of Medical and Health Evaluations (ICAMS, by its Catalan acronym), which provides for 100% capture of all cases. Regarding individual-level data, for each episode we obtained data on start and end dates (from which we computed the duration of the episode), sex, age, 19 economic activity branches according to the International Standard Industrial Classification of All Economic Activities, Rev.4 (Available at: <http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27>), 21 group diagnosis codes according to the International Classification of Diseases, 10th Revision (ICD-10), the entity responsible for case management (National Institute of Social Security or a mutual insurance company), employment status (salaried or self-employed) and 41 non-overlapping homologated territorial demarcations, also known as comarcas similar to counties (Available at: <http://web.gencat.cat/ca/temes/catalunya/coneixer/>).

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