Received: 26 January 2023 | Revised: 9 October 2023 | Accepted: 19 October 2023

DOI: 10.1111/nhs.13063

RESEARCH ARTICLE

Nursing & Health Sciences WILEY

A decade beyond the economic recession: A study of health-related lifestyles in urban and rural Spain (2006–2017)

Jesús García-Mayor PhD | Antonio Moreno-Llamas PhD | Ernesto De La Cruz Sánchez PhD

Public Health and Epidemiology Research Group, San Javier Campus, University of Murcia, San Javier, Spain

Correspondence
Ernesto De La Cruz Sánchez, Public Health and Epidemiology Research Group, San Javier Campus, University of Murcia, C/ Santa Alicia, s/n, San Javier, Murcia 30720, Spain.
Email: erneslacruz@um.es

Abstract

The 2008 economic recession may have affected health-related indicators differently depending on the living environment. We analyze health-related indicators in Spain using data from four Spanish health surveys (2006, 2011, 2014, and 2017, 95 924 individuals aged ≥16 years). In 2006–2011, physical activity decreased among men and women, while in 2006–2017, physical activity only decreased among urban women. Daily vegetable intake, except in rural women, increased in 2006–2011 but decreased in 2006–2017 in all groups. Smoking decreased among urban women in 2006–2011 and 2006–2014 but only decreased among men, and even increased among rural women, in 2006–2017. In 2006–2017, obesity increased among men and urban women, good self-rated health status increased in all groups and flu vaccination declined. Blood pressure and cholesterol control decreased in urban women in 2006–2011 but increased in 2006–2017 in all groups, as well as mammographic and cytological control. Our findings highlight the differential impact of the economic recession on health-related lifestyles according to sex and place of residence, underscoring the need for targeted health policies to address evolving health disparities over time.

KEYWORDS
diet, economic recession, physical activity, preventive health care, self-perceived health, smoking

Key points

- In the long term (2006–2017), health indicators varied by place of residence and sex, including decreased physical activity in urban women, increased obesity in urban and rural men and urban women, and higher smoking rates in rural women.
- The socioeconomic and political context affected health indicator trends: in contrast to long-term period (2006–2017), short-term period (2006–2011) showed variations in key indicators, including physical activity, vegetable intake, blood pressure, cholesterol, and smoking.
- Surveillance and monitoring trends of health-related indicators according to sex and place of residence are important to avoid health disparities.

1 | INTRODUCTION

Ensuring equitable health is a current public health policy challenge: avoiding exposure to disease and managing prevention strategies effectively lead to lower health care costs and greater population well-being (Avanzas et al., 2017). Major noncommunicable diseases have an unequal population distribution according to geographic characteristics due to a myriad of complex and interrelated factors (Voigt et al., 2019). People differ in health according to socioeconomic, demographic, and geographical factors, leading to long-term health outcomes inequalities (Debiasi & Dribe, 2020).

Rural areas are characterized by growing geographical isolation (Williams et al., 2022). The population exodus from these rural areas to cities and suburbs is leading to a decrease in infrastructure and basic services due to economic globalization, emigration, and aging (Williams et al., 2022). The lack of public resources in rural areas increases the need to cover the large distance to receive medical care and access basic public services, which, together with the existence of transportation barriers, hinder their accessibility for rural inhabitants (World Health Organization, 2021). On the other hand, in the urban environment, there may be more incentives to make use of certain public services (Murimi & Harpel, 2010). Furthermore, the difficulties faced by rural residents not only affect their health through the use of medical services but may also compromise health-related lifestyle behaviors (Gray et al., 2019; Moreno-Llamas et al., 2021).

2 | BACKGROUND

Urban residents are generally considered to be in poorer health than those in rural areas due to exposure to city stress, air pollution, and higher consumption of psychoactive substances (O'Reilly et al., 2007). However, in some developed countries, mortality rates and poor health are higher in rural areas (Kulshreshtha et al., 2014; Monnat & Beeler Pickett, 2011). The health-related lifestyle behaviors and access to health services may be responsible for the higher mortality rates and poor health observed in these regions (Alston et al., 2017; Chandak et al., 2019; De la Cruz-Sánchez & Aguirre-Gómez, 2014; Lindroth et al., 2014). In some European countries, smoking rates are higher in urban than in nonurban areas and are associated with urban population density (Bommelé et al., 2022; Idris et al., 2007). However, internationally, there is a higher likelihood of hazardous alcohol consumption and alcohol-related harm in rural areas (Friesen et al., 2022). In addition, rural inhabitants document lower leisure-time physical activity (De la Cruz-Sánchez & Aguirre-Gómez, 2014) and worse eating habits due to the need to cover greater distances to purchase food, as well as limited food resources in their households (Dean & Sharkey, 2011). The rural patterns of physical activity and diet may contribute to the rising body mass index in rural areas being the main driver of the global obesity epidemic in the adult population (Bixby et al., 2019). Similarly, according to preventive health care use, rural women are more vulnerable to the risk of breast cancer diagnosis compared with urban women (Chandak et al., 2019), and there is evidence that women in rural areas report a lack of attendance for cytological check (Allen-Leigh et al., 2017).

In Spain, some initiatives have been enacted to improve the situation of rural areas over the last two decades, such as Law 45/2007 for the sustainable development of the rural environment, which promotes access to quality basic services and guarantees the provision of quality specialized health care to all rural areas (Boletín Oficial del Estado (BOE), n.d.). But in the same period, European countries experienced an economic recession, a period with important changes that affected both the economy and social structures (Escolar-Pujolar et al., 2014).

The economic crisis significantly impacted the proportion of mental health-related illnesses, rates of suicides, public spending on health services, and the social dimension of health problems mainly in countries that adopt strict austerity measures such as Greece or Spain (Backhaus et al., 2022). In addition, the impact of the economic recession on economic activity and employment in Spain resulted in the percentage of people at risk of poverty increasing more substantial compared with the Eurozone mean, although, in the long-term, these differences have been narrowing (Lacuesta & Anghel, 2020). The economic crisis not only revealed significant disparities in economic and social consequences in the different European countries but also territorial disparities within countries (Groot et al., 2011). The growth of the economies during the years before the economic recession was most pronounced in urban areas with capital metro regions; however, these urban areas were the hardest hit during the economic crisis and that which experienced the sharpest contractions in employment (Dijkstra et al., 2015). In Spain, the onset of the economic crisis had a different impact on the percentage of people living in poverty in rural and urban areas; a more pronounced increase was observed in urban areas (Eurostat, 2019). Therefore, the economic recession may have influenced health, lifestyle behaviors, and preventive health care use in the middle and long term differently depending on the territorial environment.

Studies addressing the effects on health-related indicators of the economic recession in rural and urban areas during the last decade are scarce. Monitoring changes in health-related indicators among urban and rural population contribute to promoting equity in health policies. Here we aim to estimate the trends in self-rated health status, body mass index (BMI), health-related lifestyle behaviors, and preventive health care use before, during, and after the 2008 economic crisis (i.e., from 2006 to 2017) based on the place of residence in Spain.

3 | METHODS

3.1 | Data sources

We employed microdata of the Spanish population (aged ≥16 years) from the Spanish National Health Surveys (SNHS) in 2006 ($n = 29\,478$) (data collected from June 2006 to June 2007), 2011 ($n = 20\,884$) (data collected from July 2011 to June 2012), and 2017 ($n = 22\,903$) (data collected from October 2016 to October 2017), and the 2014 European Health Interview Survey (EHIS) for Spain ($n = 22\,659$) (data collected from January 2014 to February

2015). We considered the use of four health surveys from Spain to compare health-related indicators before (2006), during (2011), and after (2014 and 2017) the period of economic recession. The surveys are carried out by the Spanish Ministry of Health and Social Policy in collaboration with the National Institute of Statistics and follow the same methodological process: these surveys are divided into 50 provincial subsamples and use stratified cluster sampling that considers, firstly, the census sections; secondly, households; and thirdly, one individual from each household. Census sections are selected within each stratum with a probability proportional to their size, while households and individuals are randomly selected to ensure representative samples by age and sex (established from the latest available official census). Response rates were 94.1% in 2006, 89.6% in 2011, 74.6% in 2014, and 74.0% in 2017. More details about these surveys could be found elsewhere (Ministerio de Sanidad Consumo y Bienestar Social, n.d.).

Because this work includes the use of anonymized data belonging to secondary databases, there are no participants who may be exposed to the risk of harm or discomfort, as well as no personal data as established in the EU Regulation 2016/679 and Royal Decree-Law 5/2018 regarding the processing of personal data and the free movement of data. Therefore, all research activities elaborated in this work comply with the legal laws of the European Union and Spain and with ICMJE ethical research guidelines.

3.2 | Measures

Participants were asked about their leisure-time physical activity habits and were classified as active (i.e., (1) engage in light physical activity such as walking, gardening, gentle gymnastics, low exertion games and the like; (2) moderate physical activity such as cycling, gymnastics, aerobics, running, swimming; or (3) intense physical activity such as soccer, basketball, cycling or competitive swimming, judo, karate or the like) or inactive (i.e., leisure time is spent in an almost completely sedentary manner: reading, watching television, going to the movies, etc.). This question has been used throughout the historical series of national health surveys, so it allows the assessment of secular trends. In addition, it has previously been validated as an instrument to be used in large-scale studies (Moreno-Llamas et al., 2020). Tobacco use was also self-reported, based on the following question "Can you tell me if you currently smoke?" The question had four options: (a) daily smokers, (b) occasional smokers, (c) former smokers, and (d) never smokers. Smoking was defined as people being daily or occasional smokers. Alcohol use was also self-reported and based on use in the last 2 weeks (yes or no). We also considered four diet patterns based on food frequency during the last week, which could determine the risk of all-cause mortality (Alvarez-Alvarez et al., 2018): daily fruit intake, daily vegetable intake, daily pastries and sweets intake, and daily soft drink intake. Dietary patterns were dichotomized (yes or no).

As health outcomes, self-rated health status in the last 12 months was evaluated as (1) very good, (2) good, (3) fair, (4) bad, or (5) very bad. Based on these five categories, the self-rated health status was categorized as good (good or very good) or poor (fair, bad, or very bad) (Manor et al., 2000). In addition, we also reported BMI. This variable was classified according to World Health Organization (World Health Organization, 2000) as overweight/obesity (BMI ≥25 kg/m^2) and obesity (BMI ≥30 kg/m^2), ranges currently used in epidemiological studies on obesity based on BMI (Caballero, 2019).

We also considered factors related to preventive health care use: flu vaccination in the previous year, blood pressure check at least once in a lifetime, cholesterol profile check at least once in a lifetime, and, specifically for women, mammography and cytology at least once in a lifetime. All variables were dichotomized (yes or no).

Sociodemographic variables considered were sex, age, residence place, employment status (working, unemployed, retired, homemaker or other situation), marital status (single, married or other situation), social class, and educational attainment. The population size of municipalities is the indicator used by the national health surveys to classify the population into urban and rural areas: we dichotomized between <10 000 inhabitants (rural places) and ≥10 000 inhabitants (urban places), which is also the definition used in Spain for the harmonized definition of cities and rural areas (Dijkstra & Poelman, 2014). Social class was based on the 2012 proposal of the Working Group on Social Determinants of Health of the Spanish Society of Epidemiology (Domingo-Salvany et al., 2013): high social class (class of service: I–II), middle social class (intermediate class: III), and low social class (working class: IV-VI). Educational attainment was classified according to the International Standard Classification of Education (ISCED, 2012): high education (short-cycle tertiary education or bachelor's, master's or doctoral level: levels 5–8), middle education (upper secondary education or post-secondary nontertiary education: levels 3 and 4), and primary or no education (less than primary, primary education, or lower secondary education: levels 0–2).

3.3 | Statistical analysis

We described the sociodemographic variables according to sex and survey year (Table S1). Secondly, the sociodemographic characteristics of the population by sex, place of residence, and survey year were described. To estimate the differences in the proportions of the sociodemographic characteristics between each of the survey years, by place of residence and sex, we used the post hoc testing following Pearson's chi-square test (χ^2 test) with Bonferroni correction. Subsequently, we calculated age-adjusted prevalences (%) and 95% confidence intervals (95% CI) of health-related indicators (i.e., health-related lifestyle behaviors, self-rated health status, weight status, and preventive health care use) by sex, place of residence, and survey year. These sex-specific age-adjusted prevalences were conducted from a direct method of standardization considering the 2006 urban population as a reference. Then, for the study of the magnitude of the effect on the probability of the health-related indicators analyzed over time, multivariate logistic regression models were fitted, estimating odds ratios (OR) and 95% CI, using as dependent variables the health-related indicators and independent variable the survey year. The reference for the survey year variable was the period before the economic crisis (2006; OR = 1). These analyses were stratified by sex and place of residence and adjusted for

confounding variables (age, social class, education, employment status and marital status). Statistical significance was established using the Wald statistic and set at a p-value < 0.05. Data were analyzed using SPSS 25.0 (IBM Corp., Armonk, NY, USA).

4 | RESULTS

4.1 | Sociodemographic and health-related characteristics in the study period

Our analysis encompassed four population-based surveys conducted between 2006 and 2017, comprising a total of 95 924 participants aged 16 years and above from Spain. In Table 1, in the long term (period 2006–2017), the percentage of urban men (+4.4%, $p < 0.001$) and urban and rural women (+6.3%, $p < 0.001$ in urban women; +4.1%, $p < 0.001$ in rural women) aged ≥65 years increased significantly. In general, in the two areas analyzed, there was a decrease in men (−13.8% in urban men; −21.9% in rural men) and women (−15.5% in urban women; −21.3% in rural women) with primary education or less ($p < 0.001$ in all groups) and an increase in low occupational social class (+6.1% and +16.8% in urban and rural men, respectively; +4.9% and +16.1% in urban and rural women, respectively; $p < 0.001$ in all groups). We also showed an increase in unemployment for men (+4.7% in urban men; +7.0% in rural men) and women (+4% in urban women; +4.1% in rural women) in both areas ($p < 0.001$ in all groups), as well as a decrease in married women in urban (−6.7, $p < 0.001$) and rural areas (−4.9%, $p < 0.001$). In contrast, the population of married urban men increased (+3.3, $p = 0.002$).

Among men and women in both areas analyzed, daily intake of fruit, pastries, and sweets and sugary soft drinks, alcohol use and flu vaccination decreased significantly in the long term ($p \leq 0.002$); self-rated health status, blood pressure, cholesterol, mammography, and cytological control increased ($p < 0.001$); and obesity and overweight/obesity did not change ($p > 0.05$) (Figures 1 and 2). However, differences by sex and place of residence were also observed in long-term trends (Figure 1): smoking only declined significantly among men (−5.9%, $p < 0.001$ in urban men; −4.9%, $p < 0.001$ in rural men), physical activity among rural men (+6.6%, $p < 0.001$ in rural men), and daily vegetable intake increased among rural dwellers (+8.6%, $p < 0.001$ in rural men; +7.9%, $p < 0.001$ in rural women). Further details on sex-specific age-adjusted prevalence values can be found in Table S2.

4.2 | Adjusted odds ratios estimating health-related indicators before, during, and after the economic recession

4.2.1 | Health-related lifestyle behaviors

Based on the magnitude of differences over time in health-related indicators (Tables 2 and 3), the ORs adjusted for sociodemographic variables indicated that the probability increased in physical activity in rural men in the long term (OR = 1.136, 95% CI 1.015–1.271). However, decreased in urban women (OR = 0.943, 95% CI: 0.891–0.997). In both areas analyzed, a lower daily fruit intake was also observed, as well as daily vegetable intake, daily pastries and sweets intake, daily soft drink intake and alcohol use in men (Table 2) and women (Table 3). Smoking declined significantly among urban and rural men (OR = 0.801, 95% CI 0.747–0.859 and OR = 0.877, 95% CI 0.777–0.990 in urban and rural men, respectively) but was higher among rural women (OR = 1.156, 95% CI 1.008–1.326).

Despite the long-term trends, during 2006–2011, physical activity decreased in all the groups analyzed, but to a greater extent in women (OR = 0.735, 95% CI 0.679–0.780 and OR = 0.670, 95% CI 0.603–0.744 in urban and rural women, respectively); daily vegetable intake increased, except in rural women (OR = 1.080, 95% CI 0.973–1.199); and we also observed a decrease in urban women smokers in 2006–2011 (OR = 0.897, 95% CI 0.836–0.963) and 2006–2014 (OR = 0.873, 95% CI 0.815–0.935).

4.3 | Self-rated health status and body mass index

Good self-rated health status increased in all groups analyzed in the long term (OR = 1.242, 95% CI 1.151–1.340 and OR = 1.264, 95% CI 1.117–1.432 in urban and rural men, respectively; OR = 1.349, 95% CI 1.268–1.435 and OR = 1.330, 95% CI (1.187–1.489) in urban and rural women, respectively), as well as obesity in men (OR = 1.135, 95% CI 1.040–1.239 and OR = 1.171, 95% CI 1.019–1.345 in urban and rural men, respectively) and urban women (OR = 1.138, 95% CI 1.050–1.234).

4.4 | Preventive health care use

In both areas analyzed, we report a lower proportion of flu vaccination and greater blood pressure check and cholesterol check in the long term in men (Table 2) and women (Table 3). Mammography check and cytology check were higher in both urban and rural women (OR = 1.299, 95% CI 1.220–1.382 and OR = 1.468, 95% CI 1.341–1.640 for mammography in urban and rural women, respectively; OR = 1.455, 95% CI 1.361–1.556 and OR = 1.617, 95% CI 1.440–1.816 for cytology in urban and rural women, respectively).

Despite long-term trends, in the period 2006–2011, blood pressure check (OR = 0.831, 95% CI 0.735–0.940) and cholesterol check (OR = 0.892, 95% CI 0.813–0.979) decreased in urban women.

5 | DISCUSSION

We found, in all the groups analyzed, an increase in the good self-rated health status and preventive health care use, except for the flu vaccine, which decreased, and a decrease in the daily intake of fruit, vegetable, pastries, and sweets, as well as sugary soft drink and alcohol use in the long term. However, we also found trends in health-

TABLE 1 Descriptive analysis of sociodemographic variables by sex, place of residence, and survey year (2006, 2011, 2017 SNHS, and 2014 EIHS for Spain).

	Men								Women							
	2006		2011		2014		2017		2006		2011		2014		2017	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
	N (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)
Age groups																
16–24	211 (6.4)	837 (10)	142 (5.9)	630 (8.8)	124 (4.8)	571 (7.2)	159 (6.1)	584 (7.4)	247 (5.2)	873 (6.7)	144 (5.6)	617 (7.1)	122 (4.6)	614 (6.4)	136 (5)	580 (6.0)
25–34	443 (13.5)	1358 (16.2)	304 (12.6)	1038 (14.5)	227 (8.8)	956 (12.1)	211 (8.1)	814 (10.3)	590 (12.5)	2067 (15.7)	293 (11.4)	1122 (12.8)	245 (9.3)	1076 (11.2)	210 (7.7)	1014 (10.5)
35–44	624 (19)	1846 (22.1)	462 (19.1)	1562 (21.8)	488 (18.9)	1747 (22.2)	403 (15.5)	1596 (20.2)	810 (17.2)	2654 (20.2)	405 (15.8)	1522 (17.4)	461 (17.5)	1863 (19.5)	424 (15.6)	1726 (17.8)
45–55	529 (16.1)	1401 (16.8)	407 (16.8)	1345 (18.8)	526 (20.4)	1501 (19)	492 (18.9)	1520 (19.2)	681 (14.5)	2242 (17.1)	367 (14.3)	1455 (16.6)	439 (16.7)	1610 (16.8)	454 (16.7)	1648 (17)
56–64	459 (14)	1124 (13.4)	380 (15.7)	1086 (15.2)	445 (17.2)	1254 (15.9)	521 (20)	1349 (17.1)	753 (16)	1894 (14.4)	350 (13.6)	1357 (15.5)	383 (14.6)	1487 (15.5)	447 (16.4)	1592 (16.4)
≥65	1021 (31.1)	1792 (21.4)	722 (29.9)	1501 (21)	770 (29.8)	1854 (23.5)	816 (31.4)	2034 (25.8)	1625 (34.5)	3397 (25.9)	1006 (39.2)	2667 (30.5)	977 (37.2)	2919 (30.5)	1052 (38.6)	3121 (32.2)
Occupational social class																
High social class (I-II)	383 (11.8)	1866 (22.6)	274 (11.4)	1488 (21.2)	295 (11.5)	1736 (22.3)	253 (9.8)	1641 (21)	548 (11.9)	2683 (21.1)	281 (11.6)	1653 (20)	305 (12)	1977 (21.4)	254 (9.8)	1857 (19.9)
Middle social class (III)	953 (29.3)	2014 (24.4)	307 (12.8)	1375 (19.5)	325 (12.7)	1619 (20.8)	373 (14.5)	1561 (20)	1377 (29.9)	3068 (24.1)	368 (15.2)	1709 (20.7)	362 (14.2)	1921 (20.8)	412 (15.9)	1901 (20.4)
Low social class (IV-VI)	1916 (58.9)	4364 (52.9)	1819 (75.8)	4171 (59.3)	1937 (75.8)	4439 (57.0)	1953 (75.7)	4606 (59)	2679 (58.2)	6970 (54.8)	1773 (73.2)	4910 (59.4)	1877 (73.8)	5329 (57.8)	1927 (74.3)	5561 (59.7)
Educational attainment																
High education	248 (7.6)	1605 (19.3)	181 (7.5)	1209 (16.9)	236 (9.1)	1613 (20.5)	224 (8.6)	1581 (20)	388 (8.3)	2211 (16.9)	184 (7.2)	1334 (15.3)	341 (13)	2070 (21.6)	318 (11.7)	2067 (21.4)
Middle education	1138 (34.7)	3487 (41.9)	1233 (51.1)	4154 (58.2)	1233 (47.8)	4117 (52.2)	1446 (55.6)	4340 (55)	1342 (28.6)	4650 (35.6)	1204 (47)	4696 (53.8)	994 (37.8)	4049 (42.3)	1267 (46.5)	4514 (46.6)
Primary education or less	1890 (57.7)	3227 (38.8)	999 (41.4)	1777 (24.9)	1111 (43.1)	2153 (27.3)	932 (35.8)	1976 (25)	2956 (63.1)	6199 (47.5)	1174 (45.8)	2692 (30.9)	1292 (49.2)	3450 (36.1)	1138 (41.8)	3100 (32)
Employment status																
Working	1763 (53.8)	4976 (59.7)	916 (40.1)	3372 (48.8)	1109 (43)	3880 (49.2)	1195 (45.9)	4027 (51)	1530 (32.6)	5355 (40.9)	830 (36.0)	3451 (42.6)	950 (36.2)	3989 (41.7)	910 (33.4)	3787 (39.1)
Unemployed	138 (4.2)	496 (6.0)	272 (11.9)	848 (12.3)	302 (11.7)	960 (12.2)	292 (11.2)	844 (10.7)	267 (5.7)	939 (7.2)	229 (9.9)	817 (10.1)	249 (9.5)	1076 (11.2)	266 (9.8)	1085 (11.2)
Retired	1266 (38.6)	2347 (28.2)	929 (40.7)	2157 (31.2)	1009 (39.1)	2499 (31.7)	918 (35.3)	2288 (29)	1381 (29.4)	3046 (23.3)	1083 (47)	3158 (38.9)	1251 (47.6)	3827 (40)	844 (31)	2558 (26.4)
Homemaker	7.0 (0.2)	7.0 (0.1)	118 (5.2)	319 (4.6)	80 (3.1)	279 (3.5)	7.0 (0.3)	18 (0.2)	1342 (28.6)	3169 (24.2)	120 (5.2)	461 (5.7)	118 (4.5)	410 (4.3)	545 (20)	1586 (16.4)
Other	105 (3.2)	509 (6.1)	48 (2.1)	217 (3.1)	80 (3.1)	265 (3.4)	190 (7.3)	720 (9.1)	177 (3.8)	592 (4.5)	43.0 (1.9)	221 (2.7)	59 (2.2)	267 (2.8)	158 (5.8)	665 (6.9)
Marital status																
Single	1064 (32.4)	2713 (32.5)	780 (32.3)	2306 (32.2)	744 (28.8)	2301 (29.2)	789 (30.3)	2205 (28.0)	792 (16.8)	2856 (21.8)	502 (19.6)	2199 (25.2)	473 (18)	2259 (23.6)	460 (16.9)	2249 (23.3)
Married	1875 (57.1)	4797 (57.5)	1370 (56.7)	4103 (57.3)	1535 (59.5)	4738 (60.1)	1510 (58.1)	4796 (60.8)	2825 (60.1)	7234 (55.3)	1339 (52.2)	4167 (47.7)	1401 (53.5)	4648 (48.6)	1500 (55.2)	4658 (48.2)
Other	342 (10.4)	827 (9.9)	266 (11)	746 (10.4)	300 (11.6)	839 (10.6)	302 (11.6)	883 (11.2)	1086 (23.1)	3000 (22.9)	723 (28.2)	2362 (27.1)	747 (28.5)	2652 (27.7)	758 (27.9)	2754 (28.5)

Note: Residence place (urban and rural areas) was estimated from the number of inhabitants of the municipalities of residence, according to the population census of each year.

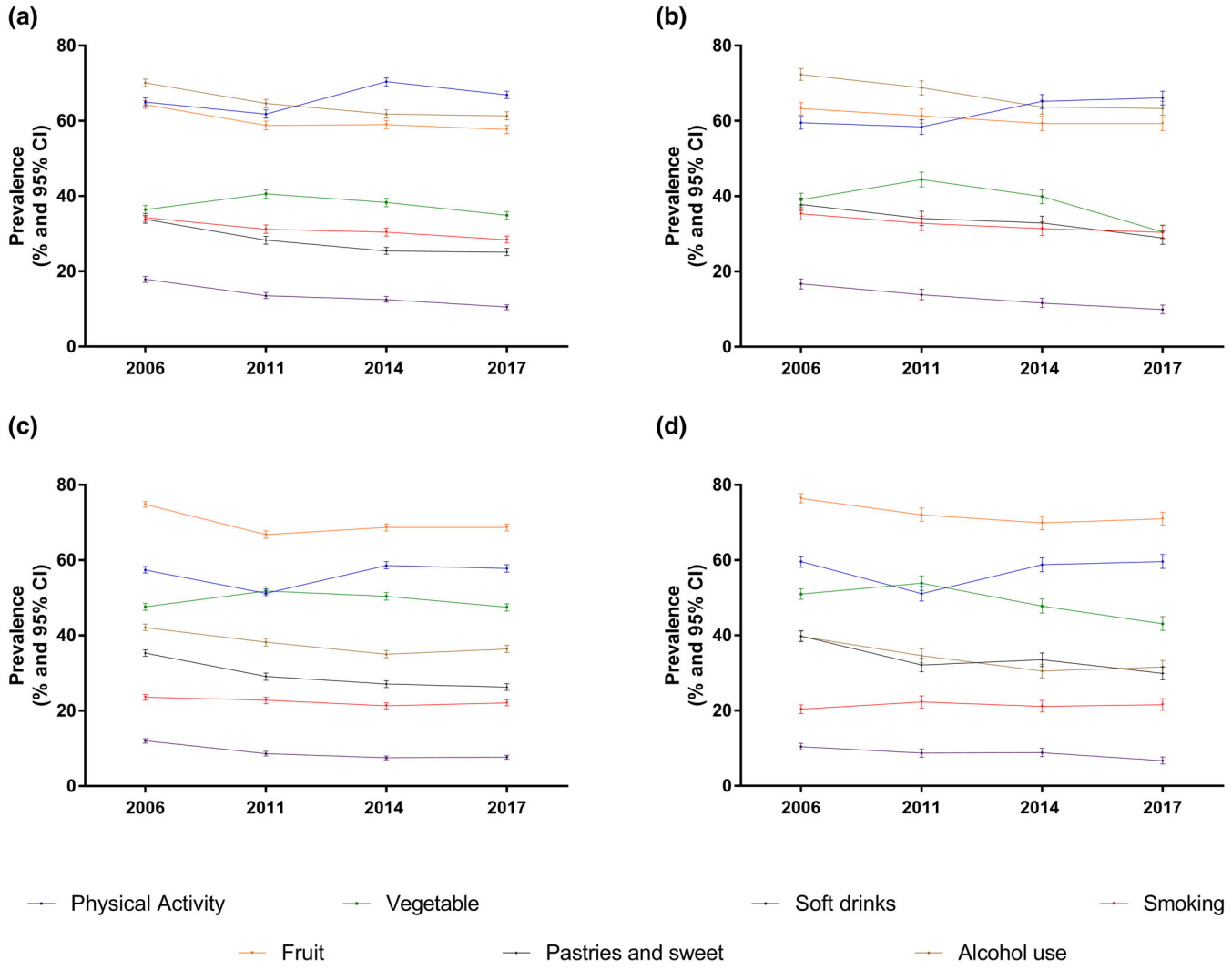

FIGURE 1 Sex-specific age-adjusted prevalence of health-related lifestyles by place of residence and sex from 2006 to 2017 (2006, 2011, 2017 SNHS, and 2014 EIHS for Spain). Urban men (a); rural men (b); urban women (c); rural women (d). Error bars indicate 95% CI.

related indicators that differ by place of residence and sex during the analyzed period: in the long term, we observed a decrease in physical activity in urban women and an increase in rural men; an increase in obesity in urban and rural men and urban women; and a decrease in smoking in men and an increase in rural women. In addition, we observed an effect of the socioeconomic and political context on the trends in the health-related indicators analyzed: despite long-term trends, in the period 2006–2011, physical activity decreased in all groups analyzed; daily vegetable intake increased, except for rural women; and blood pressure check and cholesterol check decreased in urban women. Furthermore, smoking decreased in urban women in 2006–2011 and 2006–2014.

Compared with before the economic downturn, we complement studies showing an improvement in self-rated health status during the economic recession in Spain (Regidor et al., 2014), also showing an increase after the economic recession in all groups analyzed. The trends in self-rated health status could be related to lower smoking among men, lower alcohol use, and discretionary food intake, and higher use of preventive health services in the study period. Moreover, these improved health-related indicators observed here could contribute to the results showing a decline in mortality rates during and after the crisis period (Regidor et al., 2019).

Nevertheless, in the long term, we observed a decrease in the daily fruit and vegetable intake, recommended indicators for preventing chronic diseases such as cardiovascular disease, coronary heart disease, cancer, and stroke, as well as all-cause mortality (Aune et al., 2018). These long-term trends may have influenced the increase in obesity observed in certain population groups analyzed. Some studies warn that rural inhabitants living in industrialized countries have increased their BMI more exponentially than urban inhabitants in the last decades, suggesting an integrated approach to rural dietary patterns that improve access to healthy and fresh food (Bixby et al., 2019). However, we observed a significant increase in obesity among both urban and rural men and urban women, with the rate of increase ranging from 14% to 17% for these population groups.

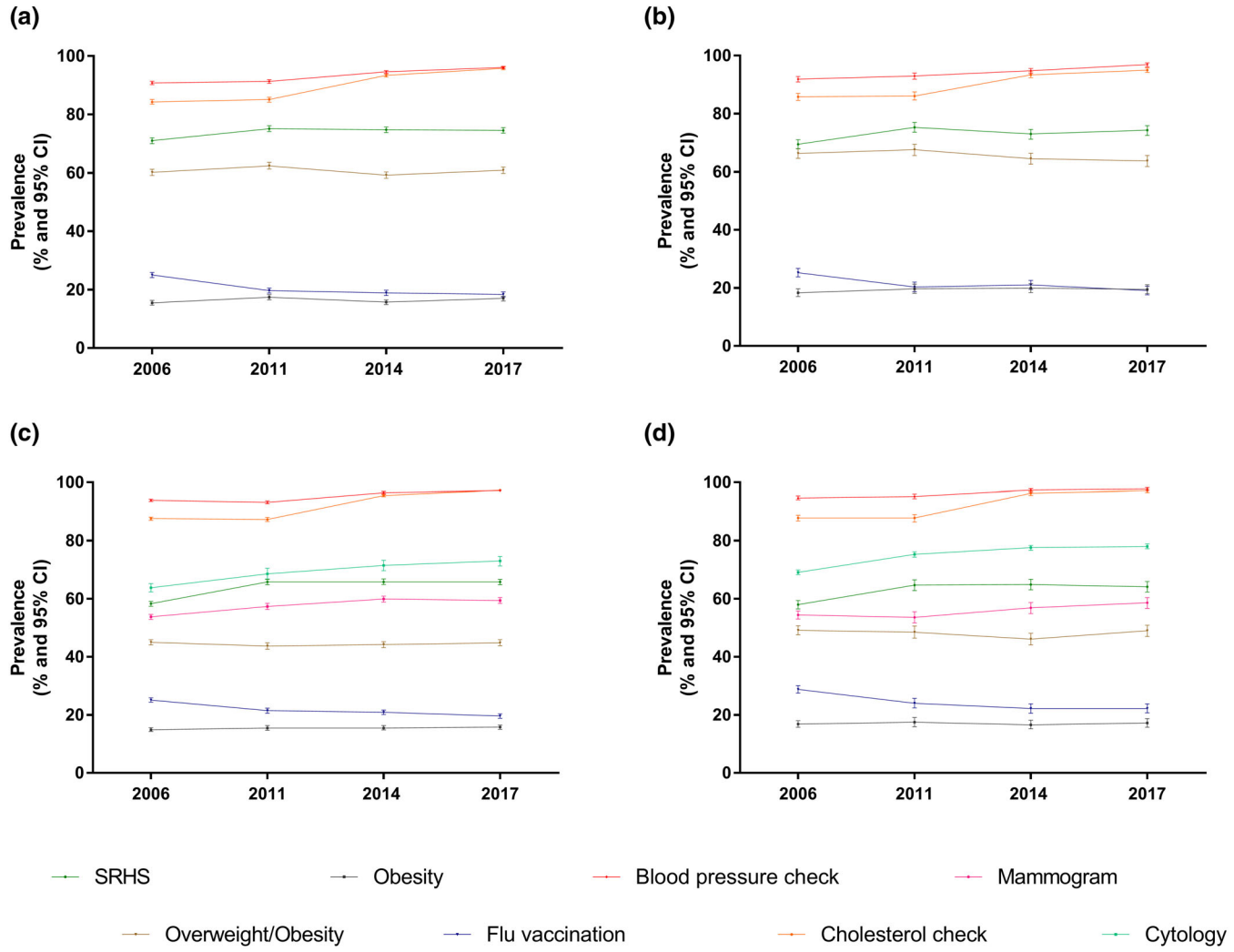

FIGURE 2 Sex-specific age-adjusted prevalence of self-rated health status, body mass index, and preventive health care use by place of residence and sex from 2006 to 2017 (2006, 2011, 2017 SNHS, and 2014 EIHS for Spain). Urban men (a); rural men (b); urban women (c); rural women; (d) error bars indicate 95% CI.

Therefore, an integrated approach that considers the increase in obesity among urban and rural Spanish populations seems necessary.

In the rise of obesity, it is important to consider also the trends in physical activity observed during and after the economic downturn, as well as the different trends according to the place of residence. Thus, a clear decrease in physical activity was found during the economic recession in all groups, mainly among women, which could be related to available leisure time and working hours (Kulic et al., 2021). In this context, the economic recession could have conditioned many unemployed or homemaker women to work to compensate for the loss of family income in Spain, which led to significant changes in their leisure time due to additional responsibilities (Legazpe & Davia, 2019). This increased demand and workload on women has also been observed recently in the COVID-19 (coronavirus disease of 2019) pandemic in Germany (Mutz & Reimers, 2021). In addition, after the economic recession, a long-term decline in physical activity among urban women was also observed. Based on European literature, our results in urban populations in the long term could be associated with the effects of urbanization on total physical activity in this population (Boakye et al., 2023).

Our results reinforce, considering the long-term reduction of smoking among urban and rural men, and in urban women in the short and middle term, that smoking cessation policies (Law 28/2005 and Law 42/2010) or tobacco tax increases were effective in reducing smoking in Spain (Kelly et al., 2018; Villalbi et al., 2019). However, these policies may not be as effective, across all population groups or over time, given the increase in smoking among rural women, and the absence of significant differences among urban women in the long term.

In preventive health care use, blood pressure check and cholesterol check declined in the period 2006–2011 only in urban women, which could be related to the austerity measures adopted during the economic recession and the financial difficulties of the period analyzed in Spain (Oliva et al., 2018); and/or, as has been observed in other parts of the world, the impact of lack of accessibility and supplier-level barriers (Loftus et al., 2018) experienced to a greater extent by this population group. However, in the long term, the

TABLE 2 Logistic regression (OR and 95% CI) of health-related indicators according to the place of residence among men (SNHS 2006, 2011, 2017, and EHIS 2014).

	Physical activity	Daily fruit intake	Daily vegetable intake	Daily pastries and sweets intake	Daily soft drink
Urban men					
2011	0.825 (0.770–0.884)***	0.762 (0.711–0.817)***	1.161 (1.085–1.242)***	0.736 (0.685–0.790)***	0.718 (0.652–0.790)***
2014	1.209 (1.130–1.295)***	0.755 (0.706–0.808)***	1.059 (0.992–1.331)	0.658 (0.614–0.706)***	0.687 (0.625–0.755)***
2017	1.043 (0.975–1.116)	0.710 (0.663–0.760)***	0.898 (0.840–0.960)**	0.641 (0.597–0.688)***	0.562 (0.508–0.621)***
Rural men					
2011	0.830 (0.742–0.930)***	0.866 (0.769–0.976)*	1.217 (1.088–1.362)**	0.754 (0.671–0.846)***	0.817 (0.689–0.968)*
2014	1.111 (0.994–1.241)	0.781 (0.696–0.879)***	0.992 (0.889–1.106)	0.757 (0.677–0.847)***	0.691 (0.581–0.822)***
2017	1.136 (1.015–1.271)*	0.757 (0.674–0.851)***	0.634 (0.566–0.711)***	0.599 (0.533–0.672)***	0.581 (0.484–0.698)***
	Smoking	**Alcohol use**	**Good SRHS**	**Overweight/Obesity**	**Obesity**
Urban men					
2011	0.897 (0.836–0.963)***	0.763 (0.711–0.818)***	1.312 (1.212–1.420)***	1.137 (1.059–1.221)***	1.186 (1.083–1.298)***
2014	0.873 (0.815–0.935)***	0.672 (0.628–0.719)***	1.276 (1.183–1.377)***	0.965 (0.902–1.032)	1.044 (0.956–1.140)
2017	0.801 (0.747–0.859)***	0.671 (0.627–0.718)***	1.242 (1.151–1.340)***	1.047 (0.977–1.211)	1.135 (1.040–1.239)**
Rural men					
2011	0.937 (828–1.059)	0.890 (0.789–1.005)	1.464 (1.286–1.666)***	1.127 (0.993–1.278)	1.198 (1.038–1.382)*
2014	0.906 (0.804–1.021)	0.715 (0.637–0.802)***	1.264 (1.118–1.430)***	0.945 (0.839–1.065)	1.184 (1.033–1.357)*
2017	0.877 (0.777–0.990)*	0.719 (0.640–0.808)***	1.264 (1.117–1.432)***	0.945 (0.845–1.077)	1.171 (1.019–1.345)*

	Flu vaccination	Blood pressure check	Cholesterol check
Urban men			
2011	0.612 (0.557–0.671)***	1.012 (0.897–1.142)	1.016 (0.922–1.120)
2014	0.565 (0.517–0.618)***	1.702 (1.488–1.946)***	2.698 (2.399–3.035)***
2017	0.557 (0.510–0.609)***	2.659 (2.278–3.104)***	4.901 (4.246–5.658)***
Rural men			
2011	0.618 (0.531–0.720)***	1.066 (0.848–1.340)	0.980 (0.823–1.166)
2014	0.656 (0.567–0.758)***	1.554 (1.207–2.000)***	2.349 (1.901–2.902)***
2017	0.599 (0.483–0.648)***	2.612 (1.936–3.523)***	3.759 (2.934–4.816)***

Note: Overweight/Obesity: body mass index ≥25 kg/m^2. Obesity: body mass index ≥30 kg/m^2.
Abbreviation: SHRS, self-rated health status.
*<0.05;
**≤0.01;
***<0.001.

results are encouraging because the use of preventive health services increased in all groups analyzed, except for flu vaccination. In this study, we analyzed the Spanish population aged 16 and over. However, our results are related to the decreasing trends in the population aged 65 years and older in the period 2009–2014 for flu vaccination in Spain (Dios-Guerra et al., 2017). This decrease could be due to the loss of confidence in vaccination against influenza after the 2009 (H1N1) pandemic, as observed in Italy (Pariani et al., 2015).

5.1 | Limitations

To our knowledge, this is the first study that has investigated time trends in these outcomes by residence place after the economic recession in Spain. Nevertheless, the absence of longitudinal follow-up of the same population in the survey design prevents us from establishing a cause–effect relationship in the present study. Consequently, the data presented herein should be interpreted within the context of a comparative analysis employing various cross-sectional surveys conducted at different time periods but utilizing a similar methodology. In addition, there may be a recall bias due to the use of self-report measures to assess outcomes. It should be noted that alcohol use is based on regular use and not on excessive use due to the characteristics of the surveys. However, this assessment may be appropriate because any amount of alcohol is related to all-cause mortality, specifically cancer (GBD 2016 Alcohol Collaborators, 2018). It is important to acknowledge that the variables pertaining to preventive health care utilization may not accurately reflect the prevailing preventive practices of the population at present. However, it is worth noting that these indicators are standardized across various health

TABLE 3 Logistic regression models (OR and 95% CI) of the health-related indicators according to the place of residence among women (SNHS 2006, 2011, 2017, and EHIS 2014).

	Physical activity	Daily fruit intake	Daily vegetable intake	Daily pastries and sweets intake	Daily soft drink
Urban women					
2011	0.735 (0.679–0.780)***	0.636 (0.595–0.679)***	1.127 (1.064–1.194)***	0.722 (0.678–0.768)***	0.669 (0.605–0.741)***
2014	0.992 (0.938–1.050)	0.686 (0.643–0.731)***	1.062 (1.005–1.222)*	0.664 (0.626–0.705)***	0.611 (0.553–0.679)***
2017	0.943 (0.891–0.997)*	0.674 (0.632–0.718)***	0.938 (0.888–0.992)*	0.639 (0.602–0.679)***	0.647 (0.585–0.714)***
Rural women					
2011	0.670 (0.603–0.744)***	0.772 (0.682–0.874)***	1.080 (0.973–1.199)	0.694 (0.622–0.775)***	0.829 (0.684–1.005)
2014	0.910 (0.821–1.008)	0.679 (0.603–0.764)***	0.835 (0.755–0.924)***	0.755 (0.679–0.838)***	0.854 (0.708–1.029)
2017	0.966 (0.871–1.071)	0.680 (0.603–0.766)***	0.675 (0.609–0.747)***	0.619 (0.556–0.689)***	0.669 (0.547–0.819)***
	Smoking	**Alcohol use**	**Good SRHS**	**Overweight/Obesity**	**Obesity**
Urban women					
2011	0.922 (0.859–0.990)*	0.755 (0.711–0.802)***	1.314 (1.231–1.402)***	1.004 (0.941–1.072)	1.174 (1.076–1.279)***
2014	0.839 (0.783–0.898)*	0.644 (0.607–0.683)***	1.339 (1.258–1.424)***	0.996 (0.936–1.059)	1.103 (1.106–1.196)*
2017	0.941 (0.879–1.007)	0.699 (0.660–0.741)***	1.349 (1.268–1.435)***	1.022 (0.961–1.088)	1.138 (1.050–1.234)**
Rural women					
2011	1.020 (0.886–1.175)	0.748 (0.668–0.837)***	1.245 (1.108–1.400)***	1.051 (0.932–1.186)	1.118 (0.961–1.301)
2014	1.013 (0.883–1.164)	0.615 (0.550–0.688)***	1.307 (1.607–1.463)***	0.862 (0.770–0.966)*	1.008 (0.874–1.163)
2017	1.156 (1.008–1.326)*	0.653 (0.584–0.730)***	1.330 (1.187–1.489)***	0.974 (0.869–1.091)	1.081 (0.939–1.246)
	Flu Vaccination	**Blood Pressure check**	**Cholesterol check**	**Mammographic Check**	**Cytological Check**
Urban women					
2011	0.762 (0.704–0.825)***	0.831 (0.735–0.940)***	0.892 (0.813–0.979)***	1.175 (1.101–1.253)***	1.194 (1.114–1.279)***
2014	0.722 (0.670–0.778)***	1.664 (1.442–1.920)***	2.976 (2.634–3.362)***	1.261 (1.185–1.342)***	1.332 (1.246–1.424)***
2017	0.622 (0.577–0.671)***	2.312 (1.976–2.704)***	5.507 (4.737–6.401)***	1.299 (1.220–1.382)***	1.455 (1.361–1.556)***
Rural women					
2011	0.736 (0.641–0.846)***	1.068 (0.819–1.393)	0.966 (0.811–1.150)	0.966 (0.891–1.114)	1.175 (1.044–1.322)**
2014	0.602 (0.527–0.688)***	1.983 (1.442–2.727)***	3.567 (2.772–4.591)***	1.211 (1.086–1.352)**	1.313 (1.712–1.472)***
2017	0.575 (0.503–0.658)***	2.532 (1.801–3.560)***	4.836 (3.653–6.401)***	1.468 (1.341–1.640)***	1.617 (1.440–1.816)***

Note: Overweight/Obesity: body mass index ≥25 kg/m^2. Obesity: body mass index ≥30 kg/m^2.
Abbreviation: SHRS, self-rated health status.
*<0.05;
**≤0.01;
***<0.001.

surveys and can offer valuable insights into the extent of national coverage during the specified time period. Finally, due to the limitation of the health surveys used, it has not been possible to consider the complexity and the diversity of the demographic and economic structures of each environment.

6 | CONCLUSIONS

Our findings highlight the differential impact of the economic recession on health-related lifestyles according to sex and place of residence, underscoring the need for targeted health policies to address evolving health disparities over time. Health policies that consider health-related indicators by place of residence, addressing disparities over time, are needed to promote healthier and more equitable living environments. Future research directions could consider the lifestyle and health of people living in both urban and rural locations by age and socioeconomic groups. It is also a potential line of research to consider the characteristics of urban and rural municipalities (in terms of resources, accessibility, or environmental features) and their influence on health and lifestyle.

7 | RELEVANCE AND IMPLICATIONS

Based on long-term trends, the fact that smoking among rural women increased significantly and has not declined significantly among urban women may indicate the measures implemented are not enough in

some population groups. Therefore, health policies should consider the different trends in smoking according to the degree of urbanization and suggest effective policies to promote smoking cessation (or non-initiation) mainly among women.

On the other hand, given the decline in physical activity among urban women in the long term, it is also important that urban mobility policies include urbanization plans that increase walking and cycling both to work and for leisure activities. These measures can help create active, healthier, and more livable communities in Europe (Nieuwenhuijsen, 2020). In addition, it is important to consider that women may have more difficulties to practice leisure physical activity due to gender inequalities in living and working conditions, especially in a context where the economy is suffering (Mutz & Reimers, 2021).

Our results suggest an integrated approach to prevent and control the increase in obesity in the Spanish population. It is important to consider the decreasing trends in the daily consumption of fruit and vegetable observed, together with the monitoring of other healthy eating habits and physical activity, due to the implication in the risk of obesity (García-Mayor et al., 2022). Based on it, we propose the need for comprehensive strategies that encourage the motivation of families toward these behaviors, the creation of healthy environments, and the promotion of health education from a global perspective.

Finally, considering the decline in flu vaccination, it is suggested some of the factors that stand out for not getting flu vaccination are the lack of recommendations and the fact that the flu vaccine is considered unnecessary, with physicians being the main source of information, followed by the traditional media and the public administration (Prada-García et al., 2022). Therefore, physicians must be properly informed about flu vaccination so that they can actively educate their patients. In addition, some studies from Europe, conducted in a context after the period analyzed, indicate that the COVID-19 pandemic had no positive effect on the flu vaccination acceptance rate, generating discrepancies among health workers (Gagneux-Brunon et al., 2021). Therefore, loss of confidence in flu vaccination remains an ongoing problem that requires further analysis of concerns about this vaccine in different population groups.

AUTHOR CONTRIBUTIONS

Jesús García-Mayor: Conceptualization; investigation; funding acquisition; writing – original draft; methodology; validation; visualization; writing – review and editing; formal analysis; data curation. **Antonio Moreno-Llamas:** Conceptualization; investigation; funding acquisition; methodology; validation; visualization; formal analysis; data curation. **Ernesto De La Cruz Sánchez:** Conceptualization; investigation; funding acquisition; writing – original draft; methodology; validation; visualization; writing – review and editing; formal analysis; data curation; supervision.

ACKNOWLEDGMENTS

The authors thank the Spanish Ministry of Health, Consumption and Social Welfare for the availability of data from the Spanish National Health Survey and the European Health Interview Survey. The analyses and content of this work are the sole responsibility of the authors who sign it.

CONFLICT OF INTEREST STATEMENT

The authors declare that there is no conflict of interest or financial financing of any kind.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

ORCID

Jesús García-Mayor https://orcid.org/0000-0002-7212-1974
Antonio Moreno-Llamas https://orcid.org/0000-0003-0168-4806
Ernesto De La Cruz Sánchez https://orcid.org/0000-0002-4718-7058

REFERENCES

Allen-Leigh, B., Uribe-Zúñiga, P., León-Maldonado, L., Brown, B. J., Lörincz, A., Salmeron, J., & Lazcano-Ponce, E. (2017). Barriers to HPV self-sampling and cytology among low-income indigenous women in rural areas of a middle-income setting: A qualitative study. *BMC Cancer*, *17*(1), 734. https://doi.org/10.1186/s12885-017-3723-5

Alston, L., Peterson, K. L., Jacobs, J. P., Allender, S., & Nichols, M. (2017). Quantifying the role of modifiable risk factors in the differences in cardiovascular disease mortality rates between metropolitan and rural populations in Australia: A macrosimulation modelling study. *BMJ Open*, *7*(11), e018307. https://doi.org/10.1136/bmjopen-2017-018307

Alvarez-Alvarez, I., Zazpe, I., Pérez de Rojas, J., Bes-Rastrollo, M., Ruiz-Canela, M., Fernandez-Montero, A., Hidalgo-Santamaría, M., & Martínez-González, M. A. (2018). Mediterranean diet, physical activity and their combined effect on all-cause mortality: The Seguimiento Universidad de Navarra (SUN) cohort. *Preventive Medicine*, *106*, 45–52. https://doi.org/10.1016/j.ypmed.2017.09.021

Aune, D., Keum, N., Giovannucci, E., Fadnes, L. T., Boffetta, P., Greenwood, D. C., Tonstad, S., Vatten, L. J., Riboli, E., & Norat, T. (2018). Dietary intake and blood concentrations of antioxidants and the risk of cardiovascular disease, total cancer, and all-cause mortality: A systematic review and dose-response meta-analysis of prospective studies. *The American Journal of Clinical Nutrition*, *108*(5), 1069–1091. https://doi.org/10.1093/ajcn/nqy097

Avanzas, P., Pascual, I., & Moris, C. (2017). The great challenge of the public health system in Spain. *Journal of Thoracic Disease*, *9*(Suppl 6), S430–S433. https://doi.org/10.21037/jtd.2017.04.59

Backhaus, I., Hoven, H., Di Tecco, C., Iavicoli, S., Conte, A., & Dragano, N. (2022). Economic change and population health: Lessons learnt from an umbrella review on the great recession. *BMJ Open*, *12*(4), e060710. https://doi.org/10.1136/bmjopen-2021-060710

Bixby, H., Bentham, J., Zhou, B., Di Cesare, M., Paciorek, C. J., Bennett, J. E., Taddei, C., Stevens, G. A., Rodriguez-Martinez, A., Carrillo-Larco, R. M., Khang, Y.-H., Soric, M., Gregg, E. W., Miranda, J. J., Bhutta, Z. A., Savin, S., Sophiea, M. K., Iurilli, M. L. C., Solomon, B. D., & Collaboration, N. C. D. R. F. (2019). Rising rural body-mass index is the main driver of the global obesity epidemic in adults. *Nature*, *569*(7755), 260–264. https://doi.org/10.1038/s41586-019-1171-x

Boakye, K., Bovbjerg, M., Schuna, J., Jr., Branscum, A., Varma, R. P., Ismail, R., Barbarash, O., Dominguez, J., Altuntas, Y., & Anjana, R. M. (2023). Urbanization and physical activity in the global prospective urban and rural epidemiology study. *Scientific Reports*, *13*(1), 290.

Boletín Oficial del Estado (BOE). (n.d.). *Ley 45/2007, para el desarrollo sostenible del medio rural*. https://www.boe.es/eli/es/l/2007/12/13/45/con

Bommelé, J., Walters, B. H., van Dorsselaer, S., & Willemsen, M. C. (2022). Outdoor smoking as a nuisance to non-smokers: The case for smoke-free outdoor public spaces in dense urban areas. *Tobacco Prevention & Cessation*, *8*, 8–9. https://doi.org/10.18332/tpc/145502

Caballero, B. (2019). Humans against obesity: Who will win? *Advances in Nutrition*, *10*(suppl_1), S4–S9. https://doi.org/10.1093/advances/nmy055

Chandak, A., Nayar, P., & Lin, G. (2019). Rural-urban disparities in access to breast cancer screening: A spatial clustering analysis. *The Journal of Rural Health*, *35*(2), 229–235. https://doi.org/10.1111/jrh.12308

De la Cruz-Sánchez, E., & Aguirre-Gómez, L. (2014). Health related lifestyle and preventive medical care of rural Spanish women compared to their urban counterparts. *Journal of Immigrant and Minority Health*, *16*(4), 712–718. https://doi.org/10.1007/s10903-013-9911-8

Dean, W. R., & Sharkey, J. R. (2011). Rural and urban differences in the associations between characteristics of the community food environment and fruit and vegetable intake. *Journal of Nutrition Education and Behavior*, *43*(6), 426–433. https://doi.org/10.1016/j.jneb.2010.07.001

Debiasi, E., & Dribe, M. (2020). SES inequalities in cause-specific adult mortality: A study of the long-term trends using longitudinal individual data for Sweden (1813–2014). *European Journal of Epidemiology*, *35*(11), 1043–1056.

Dijkstra, L., Garcilazo, E., & McCann, P. (2015). The effects of the global financial crisis on European regions and cities. *Journal of Economic Geography*, *15*(5), 935–949.

Dijkstra, L., & Poelman, H. (2014). Regional Working Paper 2014. A Harmonised Definition of Cities and Rural Areas: The New Degree of Urbanisation. European Comission Directorate-General for Regional and Urban Policy: Working Paper.

Dios-Guerra, C., Carmona-Torres, J. M., López-Soto, P. J., Morales-Cané, I., & Rodríguez-Borrego, M. A. (2017). Prevalence and factors associated with influenza vaccination of persons over 65 years old in Spain (2009-2014). *Vaccine*, *35*(51), 7095–7100. https://doi.org/10.1016/j.vaccine.2017.10.086

Domingo-Salvany, A., Bacigalupe, A., Carrasco, J. M., Espelt, A., Ferrando, J., & Borrell, C. (2013). Proposals for social class classification based on the Spanish National Classification of occupations 2011 using neo-Weberian and neo-Marxist approaches. *Gaceta Sanitaria*, *27*(3), 263–272. https://doi.org/10.1016/j.gaceta.2012.12.009

Escolar-Pujolar, A., Bacigalupe, A., & San Sebastian, M. (2014). European economic crisis and health inequities: Research challenges in an uncertain scenario. *International journal for equity in health*, *13*, 59. https://doi.org/10.1186/s12939-014-0059-5

Eurostat, E. U. (2019). People at risk of poverty or social exclusion.

Friesen, E. L., Bailey, J., Hyett, S., Sedighi, S., de Snoo, M. L., Williams, K., Barry, R., Erickson, A., Foroutan, F., Selby, P., Rosella, L., & Kurdyak, P. (2022). Hazardous alcohol use and alcohol-related harm in rural and remote communities: A scoping review. *The Lancet Public Health*, *7*(2), e177–e187. https://doi.org/10.1016/S2468-2667(21)00159-6

Gagneux-Brunon, A., Detoc, M., Bruel, S., Tardy, B., Rozaire, O., Frappe, P., & Botelho-Nevers, E. (2021). Intention to get vaccinations against COVID-19 in French healthcare workers during the first pandemic wave: A cross-sectional survey. *The Journal of Hospital Infection*, *108*, 168–173. https://doi.org/10.1016/j.jhin.2020.11.020

García-Mayor, J., Moreno-Llamas, A., & De la Cruz-Sánchez, E. (2022). How socioeconomic status affects weight status through health-related lifestyles: A latent class analysis. *European Journal of Cardiovascular Nursing.*, *22*, 730–744. https://doi.org/10.1093/eurjcn/zvac101

GBD 2016 Alcohol Collaborators. (2018). Alcohol use and burden for 195 countries and territories, 1990-2016: A systematic analysis for the global burden of disease study 2016. *Lancet*, *392*(10152), 1015–1035. https://doi.org/10.1016/S0140-6736(18)31310-2

Gray, M. S., Judd, S. E., Sloane, R., Snyder, D. C., Miller, P. E., & Demark-Wahnefried, W. (2019). Rural-urban differences in health behaviors and outcomes among older, overweight, long-term cancer survivors in the RENEW randomized control trial. *Cancer Causes & Control*, *30*(4), 301–309. https://doi.org/10.1007/s10552-019-01141-x

Groot, S. P. T., Möhlmann, J. L., Garretsen, J. H., & de Groot, H. L. F. (2011). The crisis sensitivity of European countries and regions: Stylized facts and spatial heterogeneity. *Cambridge Journal of Regions, Economy and Society*, *4*(3), 437–456.

Idris, B. I., Giskes, K., Borrell, C., Benach, J., Costa, G., Federico, B., Helakorpi, S., Helmert, U., Lahelma, E., Moussa, K. M., Ostergren, P.-O., Prättälä, R., Rasmussen, N. K., Mackenbach, J. P., & Kunst, A. E. (2007). Higher smoking prevalence in urban compared to non-urban areas: Time trends in six European countries. *Health & Place*, *13*(3), 702–712. https://doi.org/10.1016/j.healthplace.2006.11.001

ISCED. (2012). *International standard classification of education: ISCED 2011*. United Nations Educational, Scientific and Cultural Organization (UNESCO), UNESCO Institute for Statistics.

Kelly, B. C., Vuolo, M., Frizzell, L. C., & Hernandez, E. M. (2018). Denormalization, smoke-free air policy, and tobacco use among young adults. *Social Science & Medicine*, *211*, 70–77. https://doi.org/10.1016/j.socscimed.2018.05.051

Kulic, N., Dotti Sani, G. M., Strauss, S., & Bellani, L. (2021). Economic disturbances in the COVID-19 crisis and their gendered impact on unpaid activities in Germany and Italy. *European Societies*, *23*(sup1), S400–S416.

Kulshreshtha, A., Goyal, A., Dabhadkar, K., Veledar, E., & Vaccarino, V. (2014). Urban-rural differences in coronary heart disease mortality in the United States: 1999-2009. *Public Health Reports*, *129*(1), 19–29. https://doi.org/10.1177/003335491412900105

Lacuesta, A., & Anghel, B. (2020). Population at risk of poverty or social exclusion in Spain, according to the European council definition. *Banco de Espana Article*, *7*, 20.

Legazpe, N., & Davia, M. A. (2019). Women's employment and childcare choices in Spain through the great recession. *Feminist Economics*, *25*(2), 173–198.

Lindroth, M., Lundqvist, R., Lilja, M., & Eliasson, M. (2014). Cardiovascular risk factors differ between rural and urban Sweden: The 2009 northern Sweden MONICA cohort. *BMC Public Health*, *14*, 825. https://doi.org/10.1186/1471-2458-14-825

Loftus, J., Allen, E. M., Call, K. T., & Everson-Rose, S. A. (2018). Rural-urban differences in access to preventive health care among publicly insured Minnesotans. *The Journal of Rural Health*, *34*(Suppl 1), s48–s55. https://doi.org/10.1111/jrh.12235

Manor, O., Matthews, S., & Power, C. (2000). Dichotomous or categorical response? Analysing self-rated health and lifetime social class. *International Journal of Epidemiology*, *29*(1), 149–157. https://doi.org/10.1093/ije/29.1.149

Ministerio de Sanidad Consumo y Bienestar Social. (n.d.). *Encuesta Nacional de Salud de España*. https://www.sanidad.gob.es/estadEstudios/estadisticas/encuestaNacional/home.htm

Monnat, S. M., & Beeler Pickett, C. (2011). Rural/urban differences in self-rated health: Examining the roles of county size and metropolitan adjacency. *Health & Place*, *17*(1), 311–319. https://doi.org/10.1016/j.healthplace.2010.11.008

Moreno-Llamas, A., García-Mayor, J., & De la Cruz-Sánchez, E. (2020). Concurrent and convergent validity of a single, brief question for physical activity assessment. *International Journal of Environmental Research and Public Health*, *17*(6), 1989. https://doi.org/10.3390/ijerph17061989

Moreno-Llamas, A., García-Mayor, J., & De la Cruz-Sánchez, E. (2021). Urban-rural differences in trajectories of physical activity in Europe from 2002 to 2017. *Health & Place*, *69*, 102570. https://doi.org/10.1016/j.healthplace.2021.102570

Murimi, M. W., & Harpel, T. (2010). Practicing preventive health: The underlying culture among low-income rural populations. *The Journal of Rural Health*, *26*(3), 273–282. https://doi.org/10.1111/j.1748-0361.2010.00289.x

Mutz, M., & Reimers, A. K. (2021). Leisure time sports and exercise activities during the COVID-19 pandemic: A survey of working parents. *German Journal of Exercise and Sport Research*, *51*(3), 384–389.

Nieuwenhuijsen, M. J. (2020). Urban and transport planning pathways to carbon neutral, liveable and healthy cities; a review of the current evidence. *Environment International*, *140*, 105661.

Oliva, J., González, B., Barber, P., Peña, L. M., Urbanos, R., & Zozaya, N. (2018). *Crisis económica y salud en España*. Consum y Bienestar Soc: Minist Sanidad.

O'Reilly, G., O'Reilly, D., Rosato, M., & Connolly, S. (2007). Urban and rural variations in morbidity and mortality in Northern Ireland. *BMC Public Health*, *7*, 123. https://doi.org/10.1186/1471-2458-7-123

Pariani, E., Amendola, A., Piatti, A., Anselmi, G., Ranghiero, A., Bubba, L., Rosa, A. M., Pellegrinelli, L., Binda, S., Coppola, L., Gramegna, M., & Zanetti, A. (2015). Ten years (2004-2014) of influenza surveillance in northern Italy. *Human Vaccines & Immunotherapeutics*, *11*(1), 198–205. https://doi.org/10.4161/hv.35863

Prada-García, C., Fernández-Espinilla, V., Hernán-García, C., Sanz-Muñoz, I., Martínez-Olmos, J., Eiros, J. M., & Castrodeza-Sanz, J. (2022). Attitudes, perceptions and practices of influenza vaccination in the adult population: Results of a cross-sectional survey in Spain. *International Journal of Environmental Research and Public Health*, *19*(17), 1–12. https://doi.org/10.3390/ijerph191711139

Regidor, E., Barrio, G., Bravo, M. J., & de la Fuente, L. (2014). Has health in Spain been declining since the economic crisis? *Journal of Epidemiology and Community Health*, *68*(3), 280–282. https://doi.org/10.1136/jech-2013-202944

Regidor, E., Mateo, A., Barrio, G., & de la Fuente, L. (2019). Mortality in Spain in the context of the economic crisis and austerity policies. *American Journal of Public Health*, *109*(7), 1043–1049. https://doi.org/10.2105/AJPH.2019.305075

Villalbi, J. R., Suelves, J. M., Martinez, C., Valverde, A., Cabezas, C., & Fernandez, E. (2019). Smoking control in Spain: Current situation and priorities. *Revista Espanola de Salud Publica*, *93*, e1–e16.

Voigt, M., Ordanovich, D., Viciana Fernandez, F., Ann Cilek, L., Canovas Balboa, R., & Ramiro Farinas, D. (2019). Urban environment and mortality differentials in Spain. *Population Space and Place*, *25*(4), 1–11. https://doi.org/10.1002/psp.2239

Williams, T., Lakhani, A., & Spelten, E. (2022). Interventions to reduce loneliness and social isolation in rural settings: A mixed-methods review. *Journal of Rural Studies*, *90*, 76–92.

World Health Organization. (2000). *WHO Technical Report Series 894: Obesity: Preventing and Managing the Global Epidemic*. World Health Organization.

World Health Organization. (2021). *Primary Health Care on the Road to Universal Health Coverage: 2019 Global Monitoring Report*. World Health Organization.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: García-Mayor, J., Moreno-Llamas, A., & De La Cruz Sánchez, E. (2023). A decade beyond the economic recession: A study of health-related lifestyles in urban and rural Spain (2006–2017). *Nursing & Health Sciences*, *25*(4), 700–711. https://doi.org/10.1111/nhs.13063