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Reallocating the Clock: How public services are shaping women's time use in Europe

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Abstract

This paper studies the role of public services in shaping the housework of women and promoting their labour participation in Europe. We explore how public services can be a direct source of employment, notably through schools and hospitals and how they reduce the burden of unpaid labour through their 'defamilialisation' function. We have elaborated a novel database covering public service provision in 450 European regions, combined with data from the 2012 and 2016 European Quality of Life Surveys (EQLS). Employing a multilevel model analysis, we assess the influence of regional public service availability on women's time spent on paid and unpaid work. Our findings indicate that the availability of public care services is associated with a decrease in unpaid work hours, while other services emerge as a source of employment for women, significantly increasing their involvement in paid work. We also show that schools and hospitals seem to be associated with an increase in unpaid work, indicating that public services do not fundamentally change the gendered division of labour but are rather instruments for the reallocation of time.

JEL: J16, J21

Keywords: Women's time use, public services, regional analysis, local welfare states

1 Introduction

The role of the Welfare State in integrating women into the labour market has been extensively documented, highlighting its dual function as both an employer for women and a care provider. Through its provision of public care, the Welfare State theoretically alleviates women of domestic work burdens, potentially reshaping their time allocation to increased participation in the labour force. However, the current context of significant transformations in European Welfare States, particularly due to post-2008 crisis austerity policies, demands a nuanced understanding of the state's role in women's economic independence. Previous work has shown that austerity measures have disproportionately worsened women's economic situations by imposing budget cuts in public services—sectors predominantly employing women [Périvier, 2014, Rubery, 2015, Périvier, 2018]. These cuts have not only reduced working hours but also impacted the quality and availability of essential services, penalising women both as employees and beneficiaries [Hernes, 1987, Périvier, 2018]. This raises critical questions about the contemporary role of the public sector in supporting women's workforce participation in Europe.

Given these ongoing changes and their profound implications, it is essential to re-evaluate the Welfare State's role in facilitating women's labour market participation and access to public services.

In this paper, we explore the dual role of the State in shaping women's work by examining the relationship between regional-level public service provision and women's time allocation. Studying Welfare State implications at the regional level is crucial, as social policies are often decentralised aspects of the current Welfare State [Wollmann and Marcou, 2010, Martinelli et al., 2017]. While some studies have analysed the repercussions of this decentralisation on social inequalities [Rodríguez-Pose et al., 2010, Andreotti and Mingione, 2016, Coli and Pacini, 2019], there remains a notable gap in the analysis of local welfare states from a gender perspective. This raises the question of the impact of the decentralisation of welfare states on women's economic independence, particularly in terms of their integration into the labour market.

The intersection of state influence on the position of individuals between the market and domestic spheres has been a topic of considerable academic interest. By arguing the need to consider the gendered impact of economic policies on the paid and unpaid economy, Himmelweit

[2002] highlights the role played by public sector, which is the core of the interaction between the paid economy and the unpaid care economy. This particular position can be explained by the historic role of the public sector which has been pivotal in women's economic integration, as illustrated by Dahlerup [1987], Hernes [1987] notably through the institutionnalisation of unpaid care work. This importance remains remarkably pronounced nowadays, particularly in developed countries. According to [Garibaldi and Gomes, 2020] 70% of public-sector jobs in OECD countries are occupied by women, with education, health, and social work sectors being the majority of public sector employment [Anghel et al., 2011].

In addition, several studies underscore the positive impact of public services on women's reallocation of time to the paid economy, particularly in care services. Floridi et al. [2021] and Bartha and Zentai [2020] examine the role of long-term care, while Del Boca et al. [2008], Zoch [2020] focus on childcare facilities. Their findings demonstrate that care services significantly enhance women's ability to engage in paid work. However, most studies on the role of the public sector and women's time use do not differentiate by type of public services, often focusing primarily on childcare while underrepresenting schools, long-term care and hospitals due to a lack of comprehensive data. Additionally, these studies frequently overlook the regional level of analysis, which is crucial for understanding local welfare state dynamics [Andreotti and Mingione, 2016, Isakjee, 2017, Martinelli et al., 2017].

To address these gaps, we have built an original database that gathers information on the quantity of public services available at the NUTS-2 level in Europe[1]. This European-wide harmonized Public Services Availability Database (PSAD) facilitates regional comparative studies on European welfare states, contributing to the literature on welfare states at the local level, as many authors have suggested [Andreotti and Mingione, 2016, Isakjee, 2017, Martinelli et al., 2017].

Our analysis is based on two hypotheses found in the literature: the State takes on the burden of care work traditionally produced by women for free (H1), while at the same time offering them work opportunities, which has an impact on the number of paid hours worked (H2) [Hernes, 1987, Sainsbury, 1994].

This article aims to fill these gaps by contributing to the literature in several ways. Firstly,

[1]Data are mainly available for the period 2007-2016

we analyse the impact of regional public service provision on the gendered division of labour, focusing on women's time use. Our approach involves a two-level analysis that takes into account individual characteristics as well as regional and national contexts. To conduct this analysis, we use the European Quality of Life Survey (EQLS) data, which contains individual-level information on women's time allocation. Secondly, our analysis of the availability of public services provides a new perspective for assessing the generosity of regional welfare states beyond the often-studied monetary aspects, through the Public Services Availability Database (PSAD) we have developed. These original data will lead to a better understanding of social policies at regional level and provide useful insight on the often overlooked part of the Welfare-state, based on in-kind benefits and public services.

The rest of the paper is organized as follows. Section 2 discusses the theoretical background and hypotheses, focusing on the dual role of public services. Section 3 describes the data and provides descriptive statistics, detailing the Public Service Availability Database (PSAD) and time use data from the EQLS dataset. Section 4 outlines the econometric modeling. Section 5 presents the results on public services and women's time use Concluding remarks will be provided in Section 6.

2 Theoritical background and hypotheses

2.1 Public services : the dual "employee-user" status of women

Public services have played a determining role in the labour market integration of women, particularly through the expansion of the welfare state, which has led to a transfer of care activities from the household to the market economy [Dahlerup, 1987, Kolberg, 1991]. By professionalising care work, households are able to externalise at least partly these tasks, previously provided by women free of charge. The care sector is characterised by a predominance of women employees, who can therefore get earnings from those was previously non-market activities. For many authors, this professionalisation of care work remains the keystone of the analysis of social policies and welfare states from a gendered perspective [Lewis, 1992, Sainsbury, 1994, Orloff, 1996, Dauphin, 2010].

Nowadays, the public sector remains a major source of employment for women. Among OECD countries, it is the largest employer of women, and Education, Health and Social work

constitute the main areas of public employment [Garibaldi and Gomes, 2020, Anghel et al., 2011]. This role is particularly pronounced in Scandinavian countries [Anghel et al., 2011]. In Sweden, from 1963 to 1993, the employment rate of women in local government quadrupled, while it doubled for men [Rosen, 1996].

The high concentration of women in these sectors can be explained by two main factors. Firstly, occupational segregation is the most documented, as women are often better educated in caring for others, leading them to work mainly in the service sectors, and a large proportion of these jobs are in the public sector [Bettio et al., 2009]. Secondly, the public sector attracts women because it is perceived as less discriminatory, promotes work-life balance and generally offers better pay than the private sector [Lucifora and Meurs, 2006, Anghel et al., 2011, Gomes and Kuehn, 2019].

In addition to the direct channel represented by public services as an employer of women, social and family policies play a determinant role in shaping women's career trajectories and time allocation in general. Considering Welfare States, Del Boca et al. [2008] argue that, in Europe, a non-negligible part of the national differences in employment of women is explained by different national social policies, particularly the availability of care services in Western European countries. However, social policies do not seem to only affect women paid work but play a role in time allocation in general. Previous works discusse the question of social policies or public services on the gendered division of labour. Healy [2020] finds that a high level of social spending is associated with a reduction in men's and women's traditional behaviour regarding the division of labour within the household. Lightman and Kevins [2021] combine studies of social policies and family policies, arguing that the division of labour within the household results from gender norms but also from the level of income that allows outsourcing of unpaid work or not. They demonstrate that spending on social policies does not seem to affect the time spent on childcare and housework, and that only family policies have an impact on the use of women's time. Although we do not directly study the question of the gendered division of labour within the household, this paper seeks to contribute to undestanding the role of public services in reducing it. By examining the effect of public services on women's paid and unpaid work, we are looking at whether these services enable women to be released from

their assignment to the domestic economy, which is at the very core of the division of labour.

While the role of social policies in the women's employment is well documented in the literature, little is known about the role of the state using a broader definition of the welfare state, including benefits in kind and public services as all.

In addition to this lack of literature on the role of public services, to the best of our knowledge, there is no study focusing on the dual role of public services on women's work, i.e paid and unpaid work. However due to the importance of care public services in the release of women's unpaid work, we need to take a closer look at the mechanisms involved in the institutionalisation of care duties.

2.2 Specific effect of care public services on women with children and care duties

The role of public care services on women's time use has already been documented in the literature and remains of particular interest to us because it truly exemplifies the dual role of the state as employer of women and provider of care. In this respect, Stanfors et al. [2019] shows that the extensive social infrastructure in Sweden results in fewer men and women having to reduce their paid work because of their caring obligations, compared to the UK and Canada where public services are less present.

Although the interrelationship between time spent in paid and unpaid work is at the heart of studies on care services' effect on women's time use, to our knowledge, no article deals jointly with childcare services and care services for the elderly. In this paper, we will assess the role of public services on women's time use, going beyond childcare services, as other services such as long-term care, can also play a significant role.

Regarding childcare services, previous works have shown that a greater number of childcare services increases maternal employment [Brooks-Gunn et al., 1994, Hofferth, 1999, Vandell et al., 2000, Cascio, 2009]. Childcare services also reduce the gendered division of labour by narrowing the gender gap in childcare [Prince Cooke and Baxter, 2010, Cornwell et al., 2019].

More precisely, the availability of low-cost or free childcare services play a role on parents' employment by reducing the cost of work induced by the presence of children in the household [Blau, 2001, Blau and Currie, 2006]. It has also been shown that the extent to which public services are oriented toward a private market design can have differentiated impacts on the use of services and thus on the potential relief they can provide from domestic work. Van Lancker and Ghysels [2016] suggests that the more Early Childhood Education and Care (ECEC) services are socialised and under the responsibility of the State, the greater the use of these services will be. In contrast, market-based model faces criticism for often restricting access to affordable and high-quality ECEC [Bennett, 2004, Noailly and Visser, 2009, Penn, 2009].

It is important to keep in mind that the effect of childcare services varies greatly depending on the country or period studied [Morrissey, 2017]. Havnes and Mogstad [2011] investigates the effects of public childcare provision in Norway on maternal employment rates and find a significant correlation, but a low causal effect. In Italy for a period from 1991 to 1995, Del Boca [2002] shows that a 10% increase in childcare places increases the likelihood of employment for women by 0.296, which is still a relatively modest effect. But for 2009-2010, Brilli et al. [2016] find that a 1 percentage point increase in the availability of public childcare services in increases mothers' probability of employment by 1.3 percentage points. In Germany, after a rise of public-funded childcare slots in 2002, Greyer et al. [2014] find that participation in the labour market for mothers with a child under the age of 2 increased by 1.8%. However, the work of Zoch [2020] for Germany discusses the so-called "Matthew effect" [2] where the increase in childcare provision benefits particularly highly educated women, deepening social inequalities between women. However, Del Boca et al. [2008] does not find similar results at European level, as they found that childcare accessibility have a greater effect on less-educated women, due to their greater sensitivity to childcare costs, as they tend to have lower wages.

All these studies highlight the importance of public childcare services as a determining factor in women's employment. However, studies showing effects of care services on women's unpaid work are rare : to the best of our knowledge scholars treat the question of gender convergence [Prince Cooke and Baxter, 2010, Salin et al., 2018] or gender gap in the domestic economy [Neilson and Stanfors, 2014] but no study examines precisely the impact of long-term

[2] Matthew effect refers to the phenomenon where wealth and opportunities disproportionately accumulate to those already advantaged, perpetuating inequality. Here, the paper underlines the fact that childcare services can benefit to educated women while they are supposed to be a redistributive tool.

or childcare services on women unpaid work.

They also show how the national context can modify the magnitude of this effect. It seems more than relevant to examine whether we observe similar results when taking into account other aspects of the 'Welfare state' such as in-kind tranfers which can be at the interaction between social policy and family policy.

Another part of care work of women can be devoted to dependent people. This type of care constitutes an important barrier to paid work especially for women who are more likely to provide care inside and outside the household. Pavalko and Wolfe [2016] emphasise that 34% of midlife women are involved in care duties against 22% for midlife men and they are twice as engaged in care duties outside the household than men. This burden of care duties can drastically reduce women's labour supply. Johnson and Lo Sasso [2006] shows that women in charge of their parent in the long-term tend to reduce drastically their working hours, thus raising women's poverty [Wakabayashi and Donato, 2006]. Other studies showed that a higher provision of formal care by the public sector might reduce time spent on informal care by relatives, which is often done by women [Bookman and Kimbrel, 2011, Pinquart and Sörensen, 2006].This has been even more the case in the past years, since the recent pandemic [Feinberg et al., 2022].

Overall, only a few studies assess the role of care for relatives other than childcare in women's time use, due to the lack of data on this topic. More specifically, data on the provision of public services beyond social policies tends to be scarce and is therefore an under-studied aspect of the welfare state.

Floridi et al. [2021] are the only study to address the effect of long term care services provision at regional level in Europe. They focus mainly on socio-economic inequalities and not specifically on time use of women. They show that long term care beds could encourage the combination of formal and informal care, without having an effect on exclusive use of (in)formal care. They show the presence of inequalities in socio-economic status in the use of mixed care (both formal and informal) are lower in the more defamilialised long-term care systems. The poorest people are more likely than the richest to combine informal and formal home care in regions with low long-term care services.

The availability and the use of formal care services can also be influenced by social norms.

Naldini et al. [2016] provided evidence that areas with relatively strong norms towards intergenerational care obligations are associated with lower availability of care services, coupled with reduced labour market attachment for women.

In regards to this literature, we could expect to show a significant effect of public service availability in shaping the time use of women, particularly women with children and/or dependent relatives. More globally, anticipate that all public services are associated with an increase in women's paid work through direct channel, as they represent a important part of job opportunities and through an indirect chanel due to this release of unpaid work permitted by care services (H1). We also expect to find that care public services are associated with a decrease of unpaid work (H2), as it would partially substitute for women caring responsabilities.

Nevertheless, one of the main difficulties encountered when addressing the question of public services in economics is the absence of a precise and harmonised definition for all countries. Conceptions of public services vary from one country to another. A common feature remains the decentralisation of the Welfare State and the involvement of local administrations in the provision of public services. This is what Martinelli et al. [2017] call the "vertical division of authority". In this way, local administrations play a central role in the delivery of public services [Wollmann and Marcou, 2010]. This decentralisation is leading to greater territorial inequalities in the provision of public services, which tends to challenge the universalism of European welfare state models [Martinelli et al., 2017]. In order to consider these disparities in terms of provision, we believe in the necessity to construct a harmonised database to study public services at regional level to fully apprehend the effects of Welfare State in time use allocation for women.

3 Data and descriptive statistics

3.1 The Public Service Availability Database (PSAD)

3.1.1 Database construction

To examine the influence of the availability of public services at regional level, we developed the Public Service Availability Database (PSAD)[3]. The PSAD contains data from 20 European countries, primarily spanning the years 2011-2012 and 2015-2016 [4].

We gathered comprehensive data on various public services, including the number of childcare establishments, which include nurseries and kindergartens, the number of primary schools, the number of hospital beds and the number of long-term care beds across 170 regions. In order to allow comparative analysis we harmonised the public service provision in Europe according to 2 pillars: i) who provides the public service and how is it structured and ii) who it targets.

Concerning the first axis, public services have a dual definition: they can be described as "public" based on the status of their producer, i.e. central, local or any other public administration, or based on the general interest mission they fulfil independently of their legal status [Van den Abeele, 2005]. In EU countries, the conception of public services corresponds to a combination of these two definitions: the service may be considered to be public in terms of the mission it carries out, regardless of the entity providing it, but the State remains involved in the delivery of this service, either through financing, delegation or through the accessibility it must ensure [Boual, 2007].

In order to facilitate the harmonisation of our data, we opt for the same vision of public services: we therefore collected data that not only represent the public establishments that provide the service, but also private providers. In the rest of this section, we present the characteristics of the four public services included in our analysis, and present how we integrated these in our database.

This database contains information on the availability of childcare services, long-term care for the elderly and the presence of schools and hospitals at regional level in Europe. The

[3]The Public Service Availability Database (PSAD) is available upon request from the authors.
[4]See Appendix A.2 for more informations on the data collected for each countries

information for this database was sourced from Eurostat for hospital and long-term care bed counts, and from national statistical institutes for childcare and school variables. Informations on schools were harmonised at the European level using the Eurydice documentation.

Early Childhood Education and Care (ECEC) is defined as the *"provision for children from birth through to primary education that is subject to a national regulatory framework"*[5]. It concerns only centre-based provision including public, private and voluntary providers. Some countries divide the ECEC into two different structures depending on the age of the child (generally around 3 years old), while in other countries there is a single structure which cares for the child before compulsory school age[6]. For greater consistency, we have included all childcare facilities in our analysis, regardless of age.

Concerning primary schools, two conceptions of school coexist: single structure and common core curriculum. The first one corresponds to system where primary and lower secondary education (i.e, all compulsory schooling) are dispensed in the same establishment, while the second one consists of two differentiated structures for each level of compulsory schooling (see Appendix A.2 for more details). Based on the definition of public services that we retain, our database includes private and public primary schools. We opt for the same approach for hospitals and long-term care services.

Regarding hospitals and long-term care providers, these are considered as primary providers of health care[7], regardless of the provider's status [OECD et al., 2017].

The care sector remains highly fragmented, with a variety of assistance and care structures. There are two main types of formal assistance: residential and in-home care. This complicates the availability's identification of in-home care services. Due to the lack of information and similarly to Floridi et al. [2021], we only consider long-term care in residential homes which represents the most defamiliarised form of long-term care according to the authors.

For the second axis of the harmonisation work, we collected demographic data representing total population by age groups at NUTS 2 level from Eurostat[8], enabling us to focus on different age groups as potential users of these services for the corresponding year. Using these infor-

[5]since Eurydice, European network on national education system
[6]Appendix A.1 for more details.
[7]System of Health Accounts recognized also a social dimension in long-term care services
[8]See the dataset here.

mations, we computed ratios representing the number of public services per 10,000 inhabitants potentially eligible for these services (see Table 1). These ratios allow us to account for the size of the region and to contextualise the availability of public services in relation to potential demand. The age groups used to calculate ratios for childcare services and primary schools were determined using information provided by Eurydice on European education systems. As for the ratio for long-term care beds, given our focus on residential care homes for people with very low levels of autonomy, we selected the average number of years in good health after the age of 65 in Europe (i.e. around 8 years). Thus, the age group assigned to residential care beds is those aged 73 or over.

This allows us to propose a harmonised database, aiming at comparative studies of local welfare state and the provision of public services provision at regional level in Europe.

Country	**Childcare ser.**	**Primary schools**	**Hospital beds**	**LTC beds**
Bulgaria	until 7	from 7 to 11	total pop.	73 or over
Cyprus	until 6	from 6 to 12	total pop.	73 or over
Czech Rep	until 6	from 6 to 11	total pop.	73 or over
Estonia	until 7	from 7 to 16	total pop.	73 or over
France	until 6	from 6 to 11	total pop.	73 or over
Finland	until 7	from 7 to 13	total pop.	73 or over
Germany	until 6	from 6 to 10	total pop.	73 or over
Greece	until 6	from 6 to 12	total pop.	73 or over
Hungary	until 6	from 6 to 10	total pop.	73 or over
Iceland	until 6	from 6 to 16	total pop.	73 or over
Italy	until 6	from 6 to 11	total pop.	73 or over
Luxembourg	until 6	from 6 to 12	total pop.	73 or over
Norway	until 6	from 6 to 12	total pop.	73 or over
Poland	until 7	from 7 to 11	total pop.	73 or over
Portugal	until 6	from 6 to 15	total pop.	73 or over
Rep of Serbia	until 6	from 6 to 11	total pop.	73 or over
Romania	until 6	from 6 to 15	total pop.	73 or over
Spain	until 6	from 6 to 12	total pop.	73 or over
Switzerland	until 6	from 6 to 12	total pop.	73 or over
Turkey	until 6	from 6 to 10	total pop.	73 or over

Table 1: Age groups used to calculate the ratios of public services to the target population

3.1.2 PSAD: Descriptive statistics

In this section, we present some descriptive statistics based on our database that we have developed. We produced four maps on Childcare facilities (ECEC), primary schools, hospital

beds, and long-term care beds, in order to provide a better picture of public services provision at NUTS-2 level in Europe. We show the distribution of these public services for the year 2016, the most recent year used in this analysis. We match 2011/12 and 2016 public service data with time-use data for our analysis (see Section 3.2).

The cartographic method used to produce these maps is the quartile method, it involves equal distribution of observations in each groups, which explain the wide spread present in the last category. We choose this categorisation according to the distribution of our data. For the four services, we observe different trends in terms of territorial presence of public services.

Regarding childcare services in Figure 1, we observe significant territorial inequalities both between and within countries. There are notable inequalities between Northern countries (Iceland, Norway) and Southern countries (Turkey, Romania), with less pronounced intra-territorial differences. Conversely, while continental countries show fewer disparities in the presence of childcare services, they have a greater regional inequalities, particularly marked in Spain and Germany, where the distinction between Eastern and Western Germany is still visible.

Concerning the availability of primary schools, Figure 2 illustrates a relatively more uniform distribution of schools across European countries despite intra-country disparities that appear to be present in all European countries. We find relatively high concentration of schools per 1,000 children in France, Poland and Norway, while the ratios are much smaller in Spain and Bulgaria.

For hospital beds represented by the Figure 3, we observe large inequalities both between countries and within countries. Central European countries seem to have a higher provision of hospital beds compared to peripheral countries. In countries such as Germany or Spain, the distribution of bed seem to be quite heterogeneous between regions. Especially in Spain, where the ratio is very low in large parts of the territory, while it very high in certain part of the country.

Finally for long term care services, in contrary to other services, Figure 4 shows a more equal distribution inside country, but it clearly indicates a distinction between Northern and Western countries with Southern and Eastern countries.

The data collected confirms the existence of local welfare states in terms of the provision

of public services. These disparities confirm the importance of studying this at regional level, allowing us to take a step further cross-country differences, as the regional aspect of public services is often overlooked in this literature.

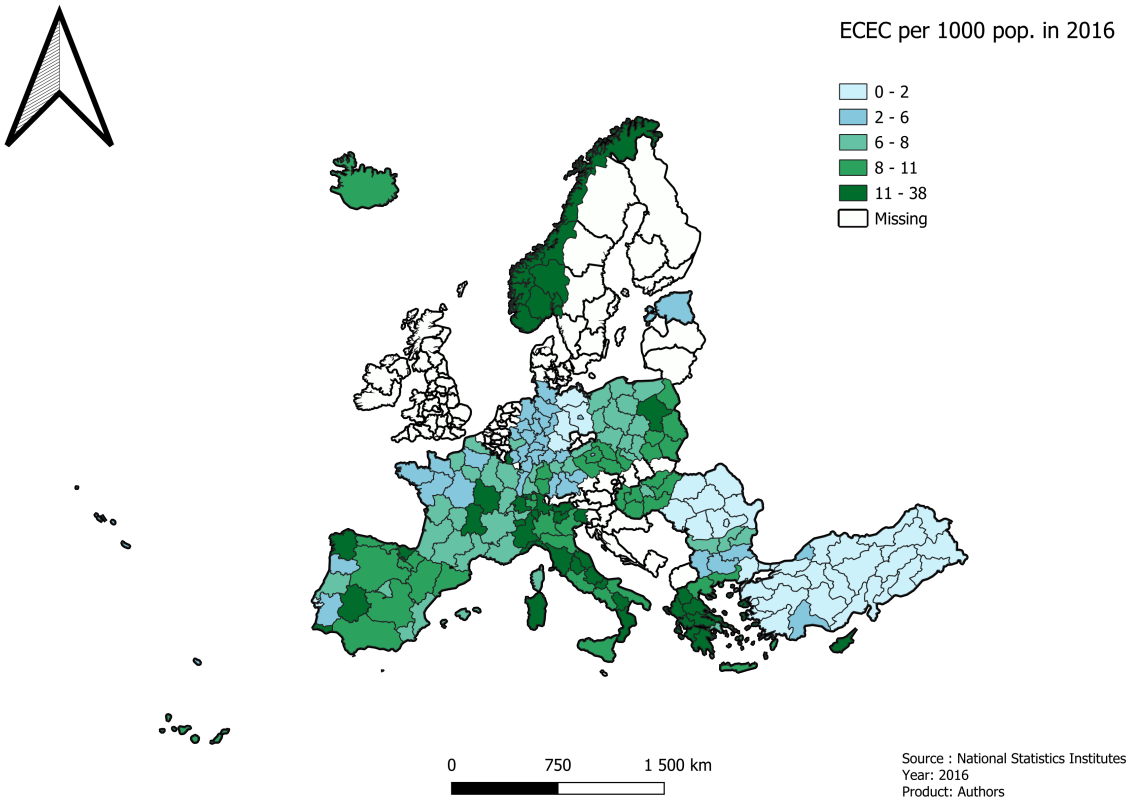

Figure 1: Number of childcare facilities per 1000 children under compulsory school age in 2016

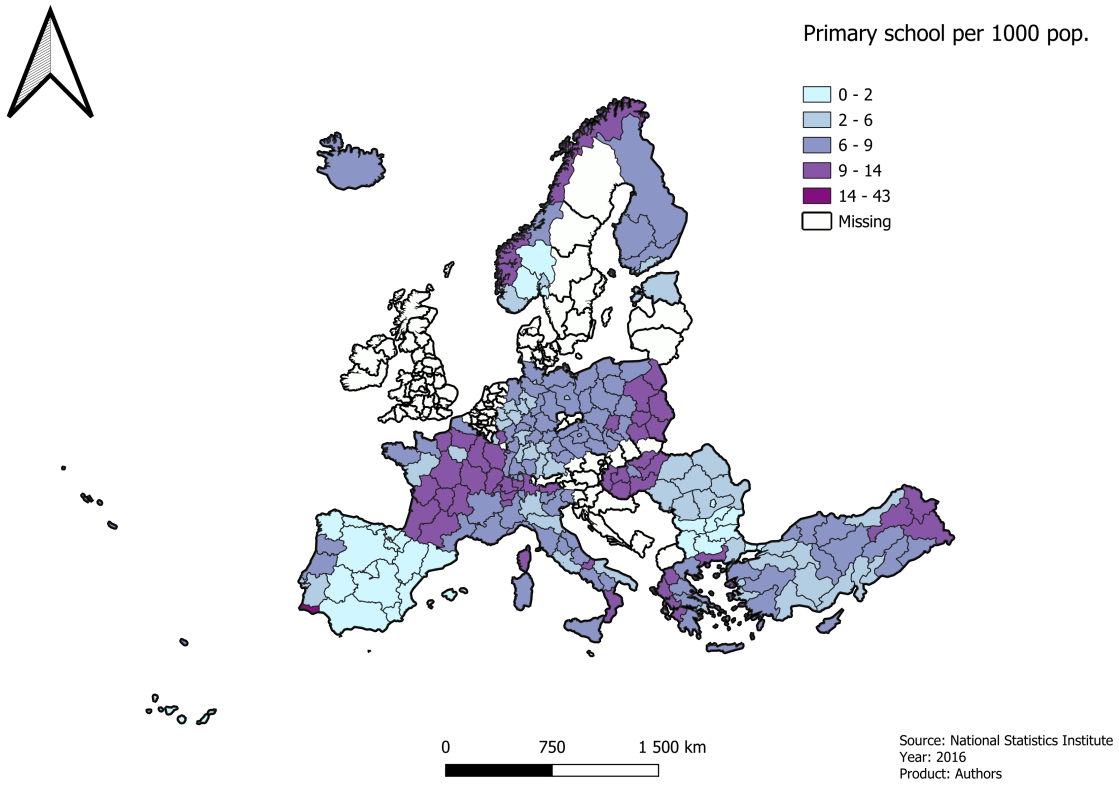

Figure 2: Number of primary schools per 1000 primary school-age children in 2016

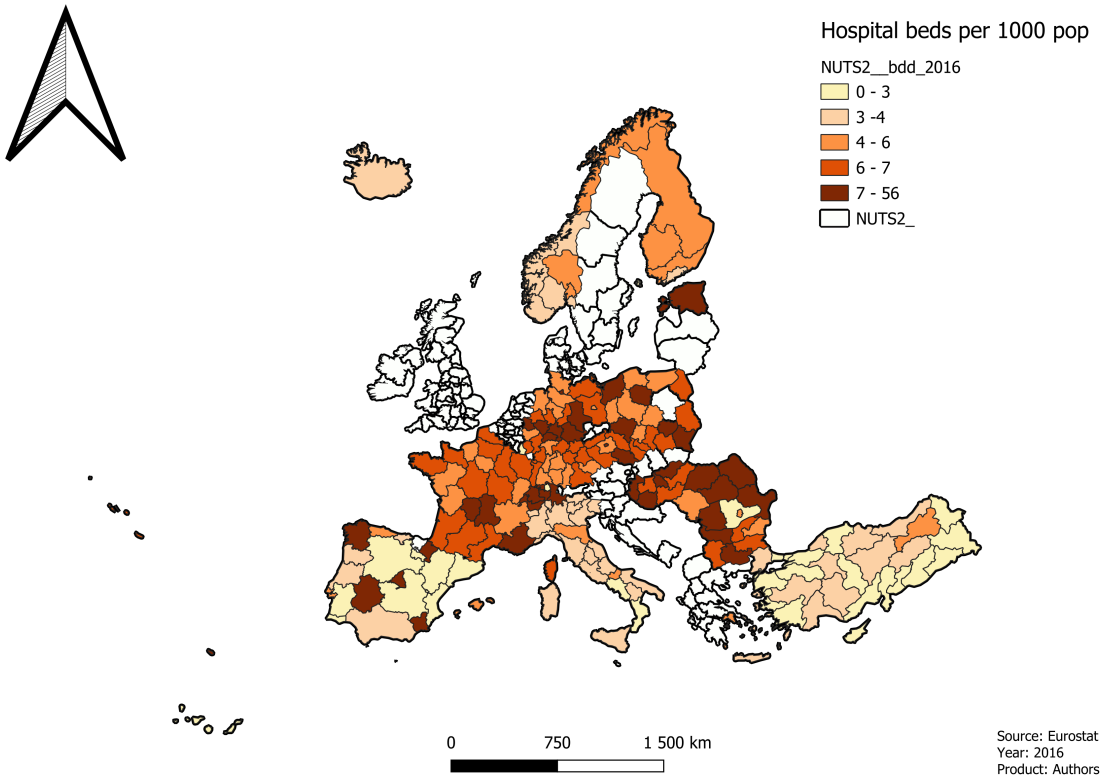

Figure 3: Number of hospital beds per 1000 inhabitants in 2016

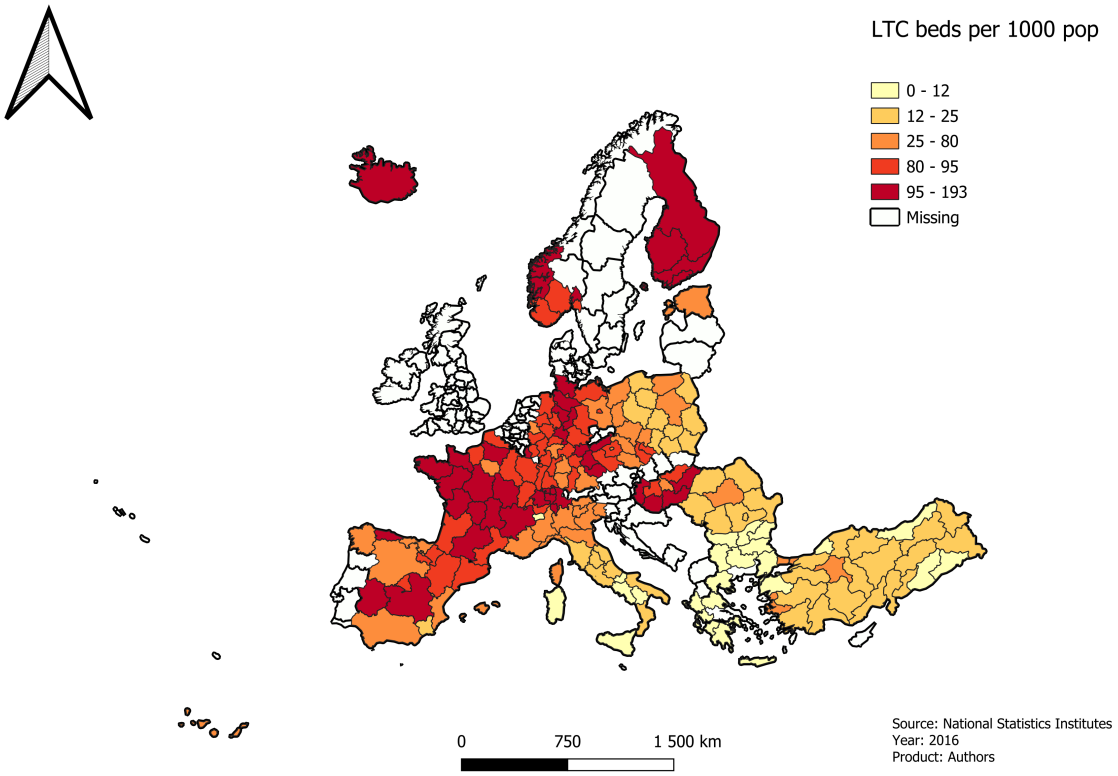

Figure 4: Number of long term care beds per 1000 people aged 73 or over in 2016

3.2 Time use data

3.2.1 EQLS dataset

In this paper we combine existing time use data with our original database. We study 14 countries such as Bulgaria, Czech Republic, Estonia, France, Germany, Greece, Hungary, Iceland, Italy, Luxembourg, Poland, Romania, Spain, and Turkey representing around 173 NUTS-2 regions.

For this analysis, we use the European Quality of Life Survey (EQLS) database from Eurofound. EQLS examines both the objective circumstances of European citizens' lives and how they feel about those circumstances and their lives in general. EQLS provides detailed information on time use of individuals, such as time spent on paid work and unpaid work, detailed by type of chores. This series consists of outputs from the EQLS 2016, the fourth edition of the survey [Eurofound, 2017]. The survey was first carried out in 2003. We use the last two waves of the survey, the Year 2012 and Year 2016. EQLS 2012 and 2016 covered a total of 34

and 33 countries [9] respectively. Based on information on time allocation, we created a variable of weekly time spent in both paid and unpaid work, for women and men separately. For paid work, we selected variables related to the declared number of hours worked in the main job along with the number of hours worked in any additional job. Regarding unpaid work, we accounted for the number of hours spent looking after children and grandchildren, the number of hours spent looking after a disabled or dependent person and the number of hours spent on domestic tasks. All these variables are expressed in hours per week.

Table 2 summarises how we harmonised the EQLS variables to construct our dependent variables.

Dependant variables	**Label**	**EQLS2012**	**EQLS2016**
Paid Work Hours	Hours worked in main job	Y16_Q14	Y16_Q14
	Hours worked in additional job	Y16_Q16	Y16_Q16
Unpaid Work Hours	Hours spent to care for children or grandchildren	Y11_Q37a	Y16_Q43a + Y16_Q43b
	Hours spent to care for disabled people	Y11_Q37c	Y16_Q43d + Y16_Q43e
	Housework Hours	Y16_Q43c	Y16_Q43c

Table 2: List of time-use variables in EQLS

For our analysis, we also incorporated traditional socio-demographic control variables, namely age, level of education, and household income from the EQLS database. Additionally, we included household-related variables that could impact the time allocation of women, namely the number of children under 18 years old in the household, presence of a partner, employment status of respondent, and partner.

3.2.2 Time use: descriptive statistics

In this section, we provide a broad picture of time allocation patterns for women and men in our sample, in order to assess the extent to which men and women are unequal in terms of

[9] EQLS 2012: Covered 34 countries, EU27 and 7 candidate or pre-accession countries: Croatia, North Macedonia (formerly FYROM), Iceland, Kosovo, Montenegro, Serbia and Turkey. EQLS 2016: Covered 33 countries, EU28 and 5 candidate countries of Albania, North Macedonia (formerly FYROM), Montenegro, Serbia and Turkey. See Appendix 3 for more details on sample characteristics used in this study.

labour market participation and time spent on housework.

Figures 5 and 6 present the distribution of hours spent in paid and unpaid work respectively for women. We have excluded respondents with an inconsistent number of hours (more than 160 hours per week). From Figure 5, we can observe a clear over-representation of women out of the labour market. The second largest category is represented among women working full-time (approximately 40 hours per week). We also observe a significant share of women declaring working around 20-30 hours per week.

Regarding unpaid work, represented by Figure 6, we also find an over-representation of women declaring doing zero hours of unpaid work. This is mainly explained by women without children, thus declaring spending no time caring for children and/or relatives, but also reporting 0 hours of housework. The distribution of hours spent in unpaid work is much less concentrated, in comparison to paid work, for which two groups emerged more clearly (not working at all or working full-time). This illustrates that unpaid work affects women more generally, whether they have children or not, and whether they work for pay or not.

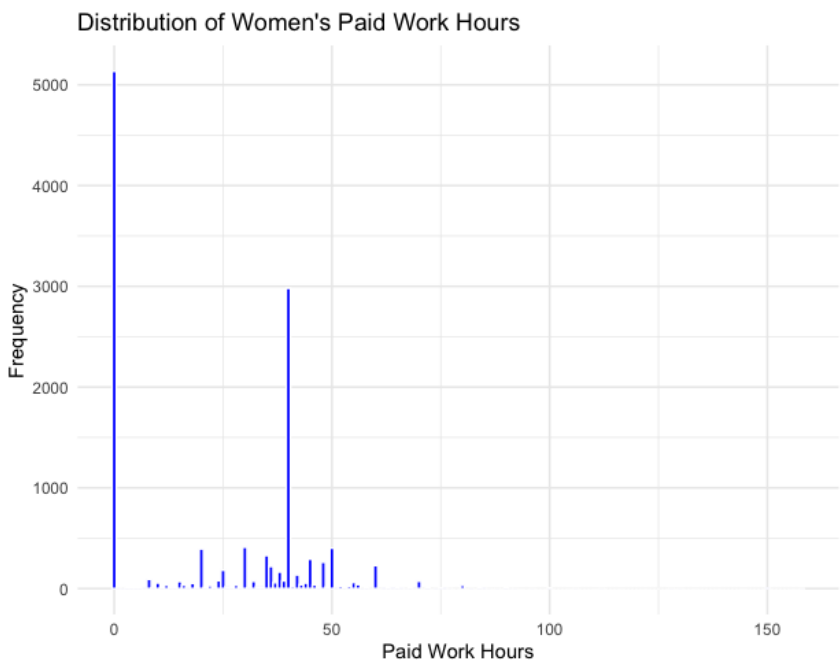

Figure 5: Distribution of Women's paid work hours (pooled 2012, 2016 data)

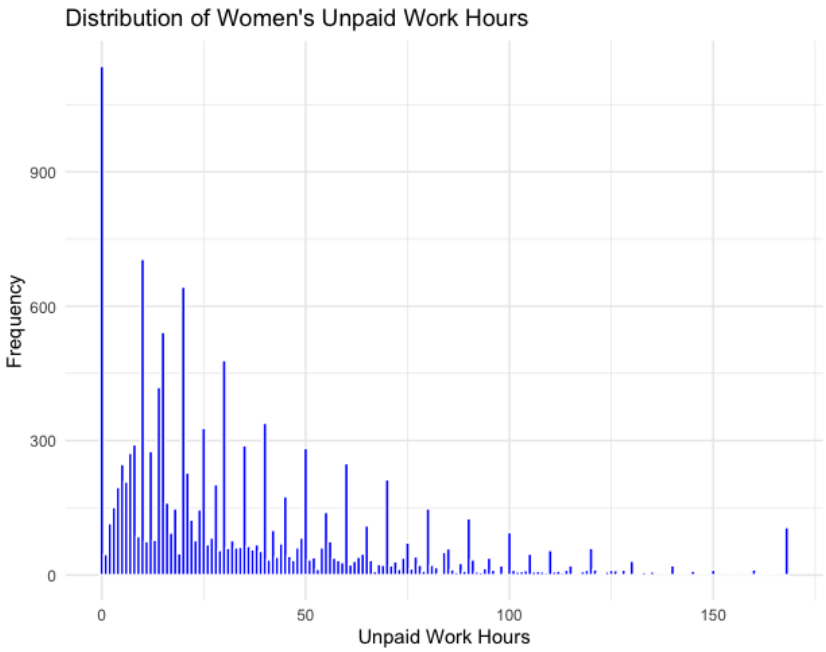

Figure 6: Distribution of Women's unpaid work hours (pooled 2012, 2016 data)

Regarding the gender differences between men and women in terms of time use, Figure 7 shows the trends in time spent in both paid and unpaid hours of work by gender and age. The graph highlights how persistent the gendered division of labour is. Women still spend more time in domestic sphere than men while the latter are much stronger labour market attachment than women. This gendered division is intensified for women in age of parenting, where unpaid work reaches its higher level before decreasing until the entry of women in the "sandwich generation" (i.e. the age of having grandchildren and dependent parents). At the same time, midlife women's paid work decreases drastically. Taking into account this trend, we assume that public services might play a more important role on women having children or having dependent relatives than on women without care responsibilities.

However the rise of unpaid work for midlife women can also be explained by intergenerational transfers from young mother integrated in the labour market to their mothers [Cardia and Ng, 2003]. Public services facilitating women's employment can also involve these transfers from one generation to another.

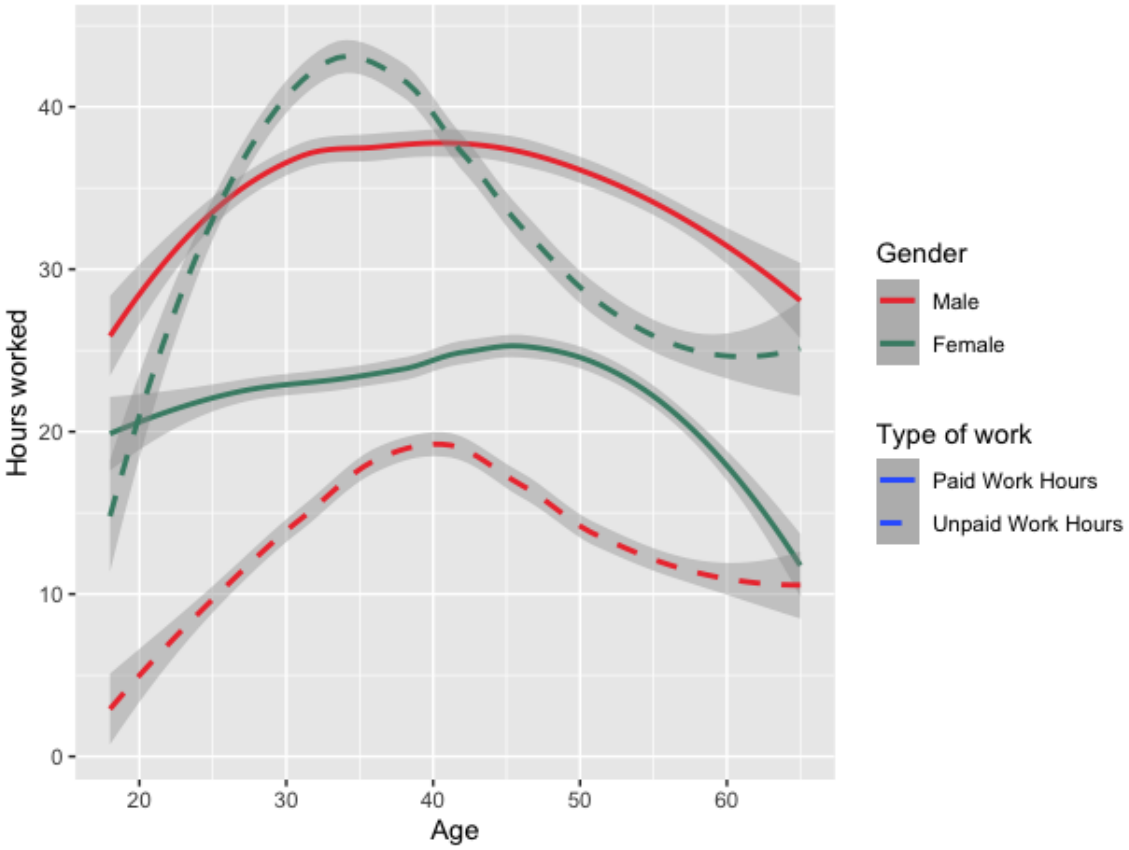

Figure 7: Trends in paid work and unpaid work by age and gender

Looking now at the decomposition of unpaid work by types of activities in Figure 8, this confirms the importance of childcare in women's unpaid work, while the second time expense item is related to housework. This result has an important implication regarding the subject of our study: public services might outsource only care activities, not housework. Considering Figure 8, we expect that the reduction of unpaid work directly through public services will encounter a floor-effect. Housework can be outsourced only through the market, which means that income, in addition to gender, must be considered as determinant of the gendered division of labour. For the rest of the paper, we will study the implication of public services on unpaid work overall, which is the sum of time spent in the three areas described in Figure8.

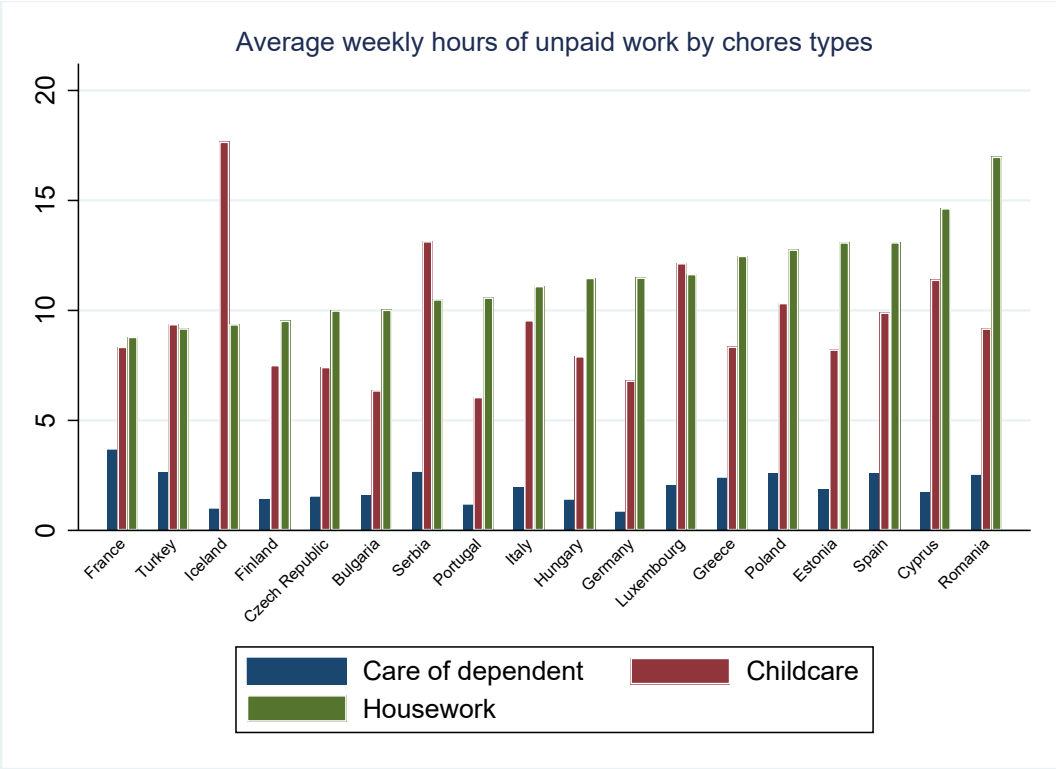

Figure 8: Average weekly hours spent on unpaid work by chores types (pooled 2011 2016 data)

Table 3 presents the descriptive statistics of our main variables of interest for the empirical strategy. From this Table, we can observe again that on average, women spend more hours dedicated to unpaid work than paid work. The average weekly hours of work for the entire sample is only 23.40, while they spend on average 10 hours extra on unpaid work. In our sample, we have a majority of women at secondary level of education, having children and having a partner. For women having a partner, they tend to work full-time on average. Finally, the majority of women are employed in our sample (63%).

Table 3: Sample descriptive statistics

Variable	Observations	Mean	SD	Min	Max
Hours paid_work	12093	23.40	21.35	0.00	158.00
Hours unpaid_work	12093	34.01	32.71	0.00	168.00
Age	12093.00	42.27	11.45	18.00	65.00
Education level[10]	12093.00	2.14	0.57	1.00	3.00
Number of children	12093	0.65	0.96	0.00	7.00
Having a partner	12093	0.67	0.47	0.00	1.00
Partner's working hours	8115	35.00	21.22	0.00	100.00
Urban area	12093	0.53	0.50	0.00	1.00
Monthly equ. disposable income	9440	1203.39	1789.06	0.00	51020.41
Being employed	12093.00	0.63	0.48	0.00	1.00

Notes: For Education level, this variable takes the value of 1: Primary education; 2: Secondary education; 3: Tertiary education. Partner's working hours is the descriptive only for women declaring having a partner.

3.3 Regional and country-level controls

Alongside the regional-level information on public services provision, we consider several factors that may shape the time allocation of women.

We included regional unemployment rate from Eurostat[11] database, to take into account for the local labour market conditions and how it might affect women's employment and time use.

At the national level, we have included variables that reflect the family policies implemented in each country[12]. We decided to focus on parental and paternity leave and exclude maternity leave, which is often justified on the grounds of the mother's health. By excluding maternity leave, we focus on family policies that uniquely affect childcare, which we consider allows us to take into account the family norms present in the country. We base our variable on the International Review of Leave Parental and Related Research of 2012 and 2016 [Moss, 2010, Koslowski et al., 2016] Using this report, we included variables relating to the generosity and duration of parental leaves. We include the number of weeks of well-paid parental leave (including parental, maternity and paternity leave). A well-paid leave is defined by the European Commission as paid at 66% of previous earnings or more We also include the length of paternity leave (in day) in each country. These variables enable us to approach the family values that

[11]See Eurostat database here.
[12]See Appendix A.3 for more details

the State defends in its policy, but do not allow us to account for the norms of individuals in the country, since we do not retain information on the use of paternity leave.

4 Econometric modelisation

For this study, we account for the hierarchical structure of our data, namely that individuals are clustered within regions at NUTS 2 level and therefore share similar regional characteristics, that might affect their outcomes. To do so, we employ a hierarchical model, also called multilevel or mixed-models. Considering the hierarchical structure of our data allows us for a better understanding of the influence of the individual's environment on their behaviour. The main interest of these models is to relax the assumption of independence of observations, by accounting for dependency of the different respondents sharing similar context, so that different variances can be observed from one group to another. Due to the independence of observations that is violated in this case, using standard modelisation could lead to biased estimates and Type I errors [Peugh, 2010]. This model fits our study, as the patterns of women's time allocation is expected to vary according to different regions and countries, characterised by different policies that might affect time use.

In our case, we implement a two-level model, being at individual level i, nested at regional j with our dependent variable being the time spent on paid work and unpaid work separately. Based on Gelman and Hill [2006] among other, the general model can be written as:

$$y_{ij} = \beta_1 Hospitals_j + \beta_2 LTcare_j + \beta_3 Childcare_j + \beta_4 Schools_j + \beta x'_{ij} + \nu_j + \epsilon_{ij} \qquad (1)$$

with y_{ijk} being the outcome variable, in our case, the number of hours spent both in paid work, and in unpaid work separately, for an individual i in a region j. β_1 to β_4 are the coefficients associated to the four public services variables identified by the PSAD database, being at regional level j. x'_{ijk} is the set of other covariates at individual level presented above, such as gender, age, relationship status, number of children, education, and urbanisation. ν_{ij} and ν_i being the random effects at regional and country levels respectively, as these models

allow us to have level-specific random effects to capture the differences individuals nested in different regions. ϵ_{ij} represents the residuals at individual level.

As our outcome variables correspond to either time spent in unpaid and paid work, measured in hours per week, we employ a Poisson regression, more adapted to count data than a simple linear model. As presented in Section 3.2.2, a large share of individuals are working 0 hours, especially for paid work for women. To account for the over-representation of zeros in our data, we adopt a Zero-inflated Poisson (ZIP) regression method. We estimate a multilevel ZIP[13] for both paid and unpaid work based on Kassahun et al. [2014] and Tawiah et al. [2020]. With our dependent variable Y_{ij} defined as follow:

$$Y_{ij} = \begin{cases} 0 & \text{with probability } \pi_{ij}, \\ f_i(Y_{ij}|b_{1i}, \xi, \theta_{ij}) & \text{with probability } 1 - \pi_{ij}, \end{cases} \tag{2}$$

where $f_i(Y_{ij}|b_{1i}, \xi, \theta_{ij})$ represents the Poisson function used for non-zero observations depending on random effects at individual level b_{1i}, covariates θ_{ij} at individual and regional level associated to ξ coefficients. The marginal mean and variance are, respectively :

$$E(Y_{ij}|b_{1i}, \xi, \theta_{ij}) = \theta_{ij}\kappa_{ij}(1 - \pi_{ij}), \tag{3.1}$$

$$\text{Var}(Y_{ij}|b_{1i}, \xi, \theta_{ij}) = \theta_{ij}\kappa_{ij}(1 - r_{ij}) \left[1 + \theta_{ij}\kappa_{ij}(\pi_{ij} + \frac{1}{\alpha})\right]. \tag{3.2}$$

We find the traditional Poisson model where the marginal mean is equal to the variance but both are weighted by the probability to have a non-zero observation. However as it is commonly the case our data do not follow a Poisson distribution due to the over-dispersion. Thus, the variance is inflated by the α parameter to take into account this overdispersion, with π_{ij} representing the zero-inflated part or both. Through this model we manage the three features of our data: the over-representation of zeros, the over-dispersion of non-zero values and the hierarchical structure.

[13] We run the model using the glmmTMB command in R

5 Results

5.1 Public services and women time use

Tables 4 and 5 show the results of different Zero-Inflated Poisson models for time use of women, splitted by time spent on paid work and unpaid work respectively. Model 1 presents a regression modelling the relationship between public services and women (un)paid work. Model 2 shows the results of the model augmented for individual or household characteristics such as family structure, level of education, income, and labour market status. In model 3, we add other country or regional level controls that could be relevant for explaining time use of women, especially regional unemployment rate and parental leave policies at national level. We compute the average marginal effects (AME) for a selection of variables of interest, based on the full specification from Model 3, both for paid (Figure 9) and unpaid work (Figure 10). For all three models, we find statistically significant effects of certain public services on women's paid and unpaid work, which remain consistent even after controlling with additional variables. We find strong and significant effects especially in explaining unpaid work of women.

5.1.1 Effects on paid work

Table 4 shows the results obtained for paid work. We find that an increase in the number of hospital beds and primary schools is significantly associated with an increase in the number of paid work hours for women. Looking at the marginal effects from Figure 9, we show that for each additional hospital bed in a region, it is associated with an increase in working-time by 0.70 hour per week, or 42 minutes per week. For primary school, one unit, which is measured by an additional school in the region, raises women's paid work by 2.5 hours per week. We also find a positive effect of childcare services in Model 1 and 2, but this effect is not significant when controlling for parental leave policies. This suggests that the positive effect of the availability of childcare is then entirely captured by the generosity of social policies regarding access to parental leave. It therefore seems that it is the combination of childcare provision and the generosity of parental leave that is decisive in women's employment. These results are consistent with studies showing a positive effect of childcare services on maternal employment [Del Boca et al., 2008], but also how the generosity and access to parental leave allow women to

maintain their labour market attachment when becoming a parent. Overall, our results are in line with the literature showing how the public sector play a key role in women integration to the labour market [Kolberg, 1991, Mandel and Semyonov, 2006, Anghel et al., 2011, Rubery, 2013]. We capture here how the presence of public services can be a driver of employment and labour market access for women, mainly through the presence of hospitals, which seem to confirm our hypothesis that the public sector plays this employer role for women (H1). However, the provision of other services that supplement women's care, such as childcare and care for dependent persons, does not significantly influence the time spent on employment.

Regarding the role of individual characteristics, our analysis further show that the presence of children in a household decreases the time allocated to paid work by 2.64 hours per week. This is consistent with findings that, following childbirth, it is predominantly women who either reduce their working hours or exit the labour market (for a recent overview of the child penalty across countries, see Kleven et al. [2023], Goldin [2021], Angelov et al. [2016] among others). We found that having a partner is decreasing hours of work for women by 2.94 hours on average. This might be explained by the fact that having a partner leads to different working arrangements where the women is often the secondary earner with a weaker labour market attachment [Becker, 1973, Shelton and John, 1993, Domínguez-Folgueras, 2013, McClelland et al., 2014]. We will show from our results on unpaid work that both having a partner and having children is associated for more housework burden for women, thus affecting also their paid work.

Table 4: Public services provision and paid work: Multilevel Zero-Inflated Poisson

	Paid Work Model 1	Paid Work Model 2	Paid Work Model 3
(Intercept)	3.5136***	3.6174***	3.5819***
	(0.0299)	(0.0332)	(0.0370)
Long-term care	0.0020	0.0026	−0.0008
	(0.0027)	(0.0026)	(0.0027)
ECEC	0.0824*	0.0887**	0.0682
	(0.0349)	(0.0342)	(0.0351)
Hospitals	0.0247*	0.0271**	0.0285**
	(0.0098)	(0.0098)	(0.0098)
Primary Schools	0.0411	0.0521	0.1022**
	(0.0336)	(0.0330)	(0.0352)
Age		−0.0006**	−0.0006**
		(0.0002)	(0.0002)
Secondary		−0.0600***	−0.0611***
		(0.0130)	(0.0130)
Tertiary		−0.0512***	−0.0522***
		(0.0132)	(0.0132)
Nb of respondent's minor child in HH		−0.0459***	−0.0457***
		(0.0026)	(0.0026)
Partner's worked hours		0.0024***	0.0024***
		(0.0002)	(0.0002)
Having a partner		−0.1203***	−0.1199***
		(0.0074)	(0.0074)
Subjective urbanisation		0.0040	0.0038
		(0.0046)	(0.0046)
Regional unemployment rate			0.0028
			(0.0016)
Well-paid weeks of parental leave			0.0042***
			(0.0009)
Days of paternity leave			−0.0196*
			(0.0090)
Wave 4	0.0260***	0.0232***	0.0217***
	(0.0049)	(0.0050)	(0.0057)
Zero model: (Intercept)	−0.5232***	−0.5232***	−0.5232***
	(0.0205)	(0.0205)	(0.0205)
AIC	73394.2702	72755.5823	72732.8841
Log Likelihood	−36689.1351	−36362.7911	−36348.4420
Num. obs.	10228	10228	10228
Num. groups: Code	173	173	173
Var (count model): Code (Intercept)	0.0423	0.0398	0.0404

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

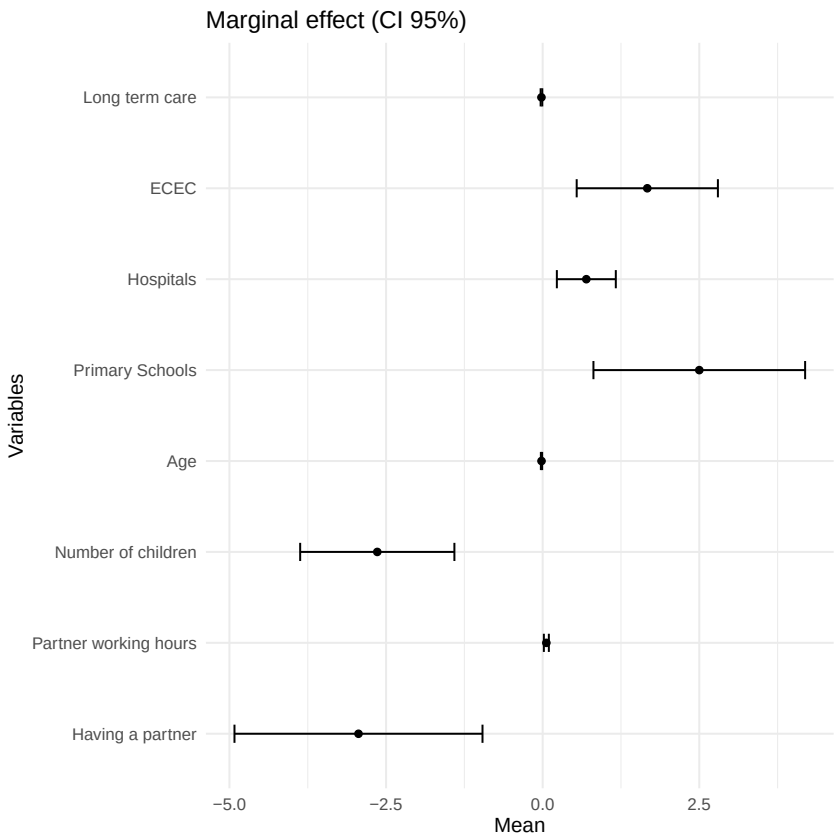

Figure 9: Pulic services and paid work: Marginal effects (Model 3

5.1.2 Effects on unpaid work

Concerning the role of public services on unpaid work hours in Table 5, we find more significant effects that remain consistent across all specifications. Especially, we find that the prevalence of long-term care services and childcare services is associated with a decrease in unpaid work for women. This is consistent with the hypothesis that the outsourcing of these tasks by public services enables women to be relieved of domestic work (H2). We confirm what Addabbo et al. [2012] find for Italy or Fontana and Elson [2014], Amarante et al. [2023] for Latin America countries concerning women's unpaid work and childcare services. However, to the best of our knowledge, it is the first time that a paper finds a negative relation between women's unpaid work and long-term care services.

More precisely, looking at the AME in Figure 10, any additional bed available in long-term care is associated with a decrease of approximately 43 minutes of unpaid work for women (-0.73). We find significant and quite substantial effects of the presence of childcare services on time spent in unpaid work for women, as any additional childcare establishment present in the region is associated with a decrease by 4.37 hours of unpaid work per week for women. In light of these results, a higher provision of formal care, both for children and dependent persons, by the public sector might reduce the time spent on informal care spent by relatives, which is often done by women [Bookman and Kimbrel, 2011, Pinquart and Sörensen, 2006]. This is even more true in the past years, due to the recent pandemic [Feinberg et al., 2022]. It also appears that the outsourcing of childcare is more obvious than that of care for the elderly. This result can be explained by the fact that the increase in childcare provision is often associated with measures to reduce the cost of childcare (subsidies, guaranteed or free places), which is not necessarily the case for long-term care, which remains a high cost for families. The lower amplitude of the effect of long-term care beds is also in line with Floridi et al. [2021], which showed an increase in the use of mixed care but no effect on the use of formal care. We can assume that this effect is captured in these results.

We note, though, that hospitals that are considered a source of paid work for women also appear to be associated with an increase in unpaid work of 2.79 hours. This implies that the increase in paid work that seem to be made possible by the presence of hospitals does not translate into a reduction in unpaid work at the same time. Similarly, the presence of primary schools is associated with high time spent on unpaid work for women. This illustrates that

time spent in unpaid and paid work are not perfectly substitutable, as an increase in women's working time does not necessarily lead to a decrease in unpaid work. We can argue here that even when women seem to benefit from the presence of public services in terms of paid work, they still tend to face this so-called 'second shift' after work. These results therefore show that the 'user-employee' position that women hold with regard to public services does not influence the role of public service in their allocation of time in general. While at first sight these results may seem counter-intuitive, there are several possible explanations.

Glazer [1988] argues that policies to reduce hospital budgets have led to a partial transfer of care work for sick people from hospitals to the household, notably with the development of out-patient stays and incentives to shorten the length of hospital stays. As the length of stays can depend on geographical proximity of patients to the hospital, the less likely they are to be hospitalised [Goodman et al., 1997, Lin et al., 2002]. Thus, the rise of unpaid work associated with the rise of hospital might be partly explained by this mechanism.

A similar trend towards parental involvement in children's schooling can be observed in the case of single and low-income mothers [Standing, 1999]. Moreover, school remains a service that is difficult to adapt to women's work schedules. Thus, the burden of unpaid work induced by schooling, particularly when it comes to bringing and/or picking up children from school, may depend on the development of other public services such as after-school services or the public transport infrastructure, particularly in rural areas. It is possible that the results obtained for the schools are actually driven by the degree of rurality of the region, which would induce a greater load of unpaid work and as individuals, particularly parents, are inevitably confronted with school, this may explain the difference in magnitude between these two results.

Besides time transfers between the paid and unpaid economy, it is also possible to explain the rise in unpaid work associated with services that promote women's integration into the market economy by intergenerational time transfers, notably between mothers and grandmothers: grandparenting is positively associated with women's labour supply [Dimova and Wolff, 2011, Aassve et al., 2012].

Interestingly, having a partner is associated with increased in time spent on unpaid work by 30 minutes (0.5 hours), meaning that while the presence of their partner could act as a support, it seems to actually increase the amount of time women spend doing unpaid work,

highlighting that in comparison to single individuals, living with a partner is actually a source of increased unpaid work. Other studies already showed similar results, the study of South and Spitze [1994] showed that in comparison that cohabiting individuals (even without children) spent more time on unpaid work than single. Baxter et al. [2008] also showed that while the time spent on unpaid work for men is invariant to transition to marriage, it actually increase for women. We also show that length of parental leave, along with the length of paternity leave do not have a significant impact on both paid and unpaid work for women. This reflects the low take-up of paternity leave in many countries, when available. It appears that in most of the countries studied, there are no existing paternity leave policies. However, our indicator of "well-paid parental leaves" seems to be associated with higher paid work for women, showing that having access to parental leave that is sufficiently paid enables mothers to participate in the labour market.

The heterogeneity analysis discussed in Section 5.2 will provide further explanations of the mechanisms involved, in particular by digging deeper into how our results differs by age group and household composition.

Table 5: Public services provision and unpaid work: Multilevel Zero-Inflated Poisson

	Unpaid work Model 1	Unpaid work Model 2	Unpaid work Model 3
(Intercept)	3.3522***	3.5811***	3.5353***
	(0.0455)	(0.0402)	(0.0429)
Long-term care	−0.0338***	−0.0179***	−0.0212***
	(0.0040)	(0.0035)	(0.0038)
ECEC	0.0309	−0.0349	−0.1280**
	(0.0480)	(0.0440)	(0.0488)
Hospitals	0.0311**	0.0727***	0.0817***
	(0.0110)	(0.0109)	(0.0110)
Primary schools	0.6357***	0.3548***	0.4637***
	(0.0493)	(0.0448)	(0.0528)
Age		−0.0069***	−0.0069***
		(0.0002)	(0.0002)
Secondary		−0.0254***	−0.0300***
		(0.0071)	(0.0071)
Tertiary		−0.0625***	−0.0686***
		(0.0084)	(0.0084)
Nb of respondent's minor child in HH		0.2723***	0.2731***
		(0.0019)	(0.0019)
Partner's worked hours		0.0016***	0.0016***
		(0.0001)	(0.0001)
Having a partner		0.1738***	0.1728***
		(0.0062)	(0.0062)
HH Equivalised Income		0.0000	0.0000
		(0.0000)	(0.0000)
Subjective urbanisation		−0.0696***	−0.0704***
		(0.0043)	(0.0043)
Employed		−0.3316***	−0.3334***
		(0.0046)	(0.0046)
Well-paid weeks of parental leave			−0.0003
			(0.0012)
Days of paternity leave			0.0636***
			(0.0076)
Wave 4	−0.1187***	−0.0294***	−0.0307***
	(0.0049)	(0.0050)	(0.0050)
Zero model: (Intercept)	−2.6049***	−2.6049***	−2.6049***
	(0.0442)	(0.0442)	(0.0442)
AIC	213384.0124	168426.3331	168355.5052
Log Likelihood	−106684.0062	−84196.1665	−84158.7526
Num. obs.	7991	7991	7991
Num. groups: Code	172	172	172
Var (count model): Code (Intercept)	0.1735	0.1069	0.1218

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

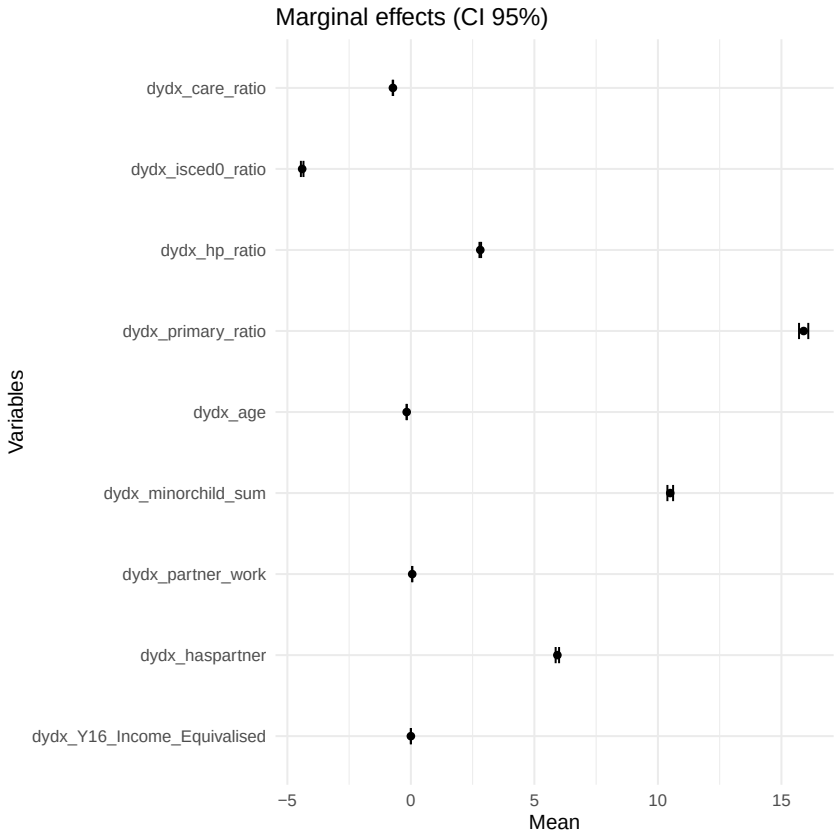

Figure 10: Pulic services and unpaid work: Marginal effects (Model 3)

5.2 Heterogeneity analysis: the role of age and family composition

As discussed above, public services might affect differently women according to their household composition, relationship status or age group. In this section, we are exploring our results in more depth to shed light on how the effects discussed above might differ by age, but also with the presence of children in the household.

Looking at the results for paid work by age cohort in Table 6[14], we find that women are affected differently by public services throughout their lives.

The positive effects of public services on paid work mainly concerns women aged 35 or over. Long-term care services appear to be associated with increased time spent on paid working hours for women aged between 35 and 54 years old, namely women at age of having children and potentially in advanced stage of their career.

The positive effect of hospitals on paid work for women that we showed in Section 5.1

[14]For more details on the full model for age, see Table A.4 in the Appendix section.

seem to be mainly driven by the situation of women aged 55 to 64 years old. We also find that primary schools are a source of paid work for the older-age subgroup. These results are consistent with Anghel et al. [2011], showing that the average age in the public sector is greater than in the private sector, public services thus being a more important source of employment for older people.

Among the 18-24 years-old group, public services do not affect their time allocation significantly. Only hospitals are associated with a decline in women's unpaid work while long-term care services are associated with a decrease of paid work. The weak relationship between public services and time allocation for younger women is not very surprising as they are less likely to have a child or a dependent person to care, and are less likely to work in the public sector than their elders [Anghel et al., 2011].

For the 25-34 generation, public services appear to be primarily a source of domestic work discharge for this age group, more so than a source of employment. Our findings show that both long-term and childcare services have a downward impact on their unpaid work, whereas school seems to be a source of domestic labour.

We also observe a decline in domestic work associated with childcare services for women between the ages of 35 and 54. These results underline the importance of care public services on the release of unpaid burden for this group, likely to live with partners and have children. As shown in Figure 7, this age group experiences a substantial increase in unpaid work and bears the heaviest domestic workload. This suggests potential for reducing unpaid work within this subgroup, likely facilitated by the availability of public services.

Concerning unpaid work by women aged 55 to 64 years old, long-term care services reduce their domestic activity, and ECEC establishments have a positive effect on unpaid work hours. This mechanism is consistent with the literature, as this generation, sometimes called the 'sandwich generation' [Miller, 1981, Williams, 2004, DeRigne and Ferrante, 2012], referring to the situation where women are on age to both have grandchildren and dependent parents, is facing higher chances of caring for relatives. Our results indicate that these women are more responsive to care services than other subgroups. However they partially release 55-64 women's unpaid work. The rise of unpaid work associated with the rise of ECEC and schools can confirm the idea of intergenerational time transfers.

As discussed in the main results in Section 5.1, the presence of children and partner is

associated with an increase in time spent on unpaid work and decreased paid work, across all age groups. This effect confirms the key role of family sphere in the domestic economy.

Table 7 shows the results obtained by subgroups of women according to the number of children. By cross-checking the results with age, we confirm the crucial effect of children in the allocation of women's working time.

We observe again the negative effect of long-term care services, regardless of having children or not, even though not significant for women with 3 or more children. This might be due to the fact that they had less room for care of other dependent relatives, being already in large families.

Hospitals seem to be a source of employment for women without minor children only, even though it has an ambiguous effect on their time use as it increases their unpaid work as well. The effects are similar to older women in Table 6, which are likely to be the same population as those without children. These two services appear to favour the employment of women in the sandwich generation who no longer have dependent minor children but are of grandparenting age. Given the demographics of this population, the women in this group may be more likely to care for school-age children, confirming the idea of intergenerational transfers of time between mothers and grandmothers. They are also likely to support relatives or partner with declining health, explaining why hospitals are a source of unpaid work only for this category of the population. This seems to be confirmed by the finding that having a partner increases the level of unpaid work for women without minor children, whereas being in a couple reduces women's unpaid work hours for women having one or two children.

Regarding childcare service, we show that it is strongly associated with reduced time spent on unpaid work only for women having 1-2 children. Our general results showed in Table 5 are mainly driven by the situation of this subgroup. This result can be explained in two ways. First, access to these services may be more expensive for large family, and domestic worktime may also be more difficult to divide between the various children, making the effect of these services less significant for women with 3 or more children. Second, given the downward demographic trend in fertility, large families may be more likely to have stronger family norms as Adsera [2006] or Vogl and Freese [2020] shown and therefore be less inclined to outsource care work . The results obtained for family policies tend to confirm this explanation: family policies that favour

dual-caregiver models only reduce the unpaid work of women with between 1 and 2 children, but have no effect and even encourage unpaid work for women with 3 or more children.

These results confirm that public care services discharge women from care and housework, with various effect according to the type of service and the characteristics of the women.

Table 6: Analysis by age group : selected coefficients

18-24 y/o	Paid work 18-24 y/o	Unpaid work 25-34 y/o	Paid work 25-34 y/o	Unpaid work 25-34 y/o	Paid work 35-54 y/o	Unpaid work 35-54 y/o	Paid work 55-64 y/o	Unpaid work 55-64 y/o
(Intercept)	3.8747***	2.8612***	3.5285***	2.8033***	3.5036***	4.0570***	3.5625***	3.3884***
	(0.1808)	(0.2015)	(0.0729)	(0.0912)	(0.0629)	(0.0610)	(0.0800)	(0.1271)
Long-term care	−0.0221***	−0.0114	−0.0081*	−0.0396***	0.0079*	−0.0016	−0.0078**	−0.0339***
	(0.0062)	(0.0123)	(0.0032)	(0.0081)	(0.0040)	(0.0044)	(0.0027)	(0.0060)
ECEC	−0.0615	0.0367	0.0023	−0.5806***	0.0685	−0.2408***	0.0143	0.2181*
	(0.0763)	(0.1713)	(0.0379)	(0.1170)	(0.0493)	(0.0621)	(0.0332)	(0.0956)
Hospitals	−0.0020	−0.3961***	0.0506	−0.0118	0.0253	−0.0452**	0.0367*	0.1764***
	(0.0410)	(0.0764)	(0.0258)	(0.0346)	(0.0157)	(0.0160)	(0.0181)	(0.0233)
Priamry schools	−0.0202	0.0431	0.0113	1.1516***	0.0558	0.1647**	0.0792*	0.0988
	(0.0726)	(0.1530)	(0.0395)	(0.1141)	(0.0506)	(0.0600)	(0.0349)	(0.0802)
Age	0.0122	−0.0053	0.0021	0.0014	0.0004	−0.0134***	−0.0011	−0.0060***
	(0.0068)	(0.0066)	(0.0016)	(0.0015)	(0.0008)	(0.0007)	(0.0011)	(0.0012)
Secondary education	−0.1638**	0.0993*	0.0738*	−0.0251	−0.0668***	−0.0448***	−0.0903***	−0.1006***
	(0.0513)	(0.0393)	(0.0331)	(0.0145)	(0.0199)	(0.0111)	(0.0252)	(0.0163)
Tertiary education	−0.2745***	−0.1052	0.0907**	−0.1038***	−0.0574**	−0.1264***	−0.0772**	−0.2652***
	(0.0541)	(0.0574)	(0.0334)	(0.0168)	(0.0202)	(0.0126)	(0.0259)	(0.0202)
Nb of respondent's minor children in HH	−0.1436***	0.4694***	−0.0458***	0.3027***	−0.0488***	0.2515***	−0.0190	0.3413***
	(0.0246)	(0.0157)	(0.0062)	(0.0042)	(0.0037)	(0.0028)	(0.0117)	(0.0092)
Partner's worked hours	0.0006	0.0026***	0.0053***	0.0046***	0.0027***	0.0007***	0.0015***	−0.0006*
	(0.0011)	(0.0006)	(0.0004)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0003)
Having a partner in HH	−0.0055	0.5260***	−0.2591***	0.2373***	−0.1412***	0.0897***	−0.0680***	0.2318***
	(0.0495)	(0.0352)	(0.0198)	(0.0147)	(0.0121)	(0.0097)	(0.0117)	(0.0114)
Subjective urbanisation	−0.0012	0.0107	−0.0203*	0.0060	0.0204**	−0.0662***	−0.0044	−0.1321***
	(0.0227)	(0.0249)	(0.0100)	(0.0089)	(0.0071)	(0.0065)	(0.0087)	(0.0096)
Wave 4	0.0262	0.0181	−0.0007	−0.1233***	0.0229**	−0.0299***	0.0680***	−0.0361**
	(0.0231)	(0.0300)	(0.0110)	(0.0103)	(0.0088)	(0.0075)	(0.0107)	(0.0117)
AIC	3911.7947	7233.1066	16383.9686	44092.1155	31187.7033	71009.2956	19873.8148	36481.8278
Log Likelihood	−1937.8974	−3597.5533	−8173.9843	−22027.0577	−15575.8517	−35485.6478	−9918.9074	−18221.9139
Num. obs.	623	474	2329	1852	4218	3331	2994	2283
Num. groups: Code	133	125	163	159	171	169	166	162
Var (count model): Code (Intercept)	0.0500	0.4529	0.0243	0.3569	0.0713	0.1439	0.0135	0.1623

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 7: Analysis by number of children in the household: selected coefficients

	Paid work No children	Unpaid work No children	Paid work 1-2 children	Unpaid work 1-2 children	Paid work 3+ children	Unpaid work 3+ children
(Intercept)	3.6683***	2.6730***	3.5148***	5.1440***	0.6238	4.4543***
	(0.0396)	(0.0614)	(0.0622)	(0.0575)	(0.3620)	(0.1298)
Long-term care	−0.0057*	−0.0033	−0.0022	−0.0260***	0.0342	0.0009
	(0.0026)	(0.0049)	(0.0041)	(0.0059)	(0.0336)	(0.0106)
ECEC	0.0446	0.0723	0.0098	−0.3063***	0.2162	−0.1416
	(0.0318)	(0.0606)	(0.0539)	(0.0875)	(0.2707)	(0.1362)
Hospitals	0.0421***	0.1212***	0.0138	0.0343	0.1516	−0.3024***
	(0.0114)	(0.0154)	(0.0195)	(0.0175)	(0.3902)	(0.0900)
Primary schools	0.0806*	0.2623***	0.0983	0.3886***	0.0380	0.4641***
	(0.0332)	(0.0641)	(0.0530)	(0.0843)	(0.4179)	(0.1321)
Age	−0.0017***	0.0046***	0.0011*	−0.0200***	0.0041	−0.0111***
	(0.0002)	(0.0003)	(0.0005)	(0.0004)	(0.0032)	(0.0014)
Tertiary education	−0.0689***	−0.1756***	−0.0357	−0.0715***	0.1271	−0.0967**
	(0.0167)	(0.0139)	(0.0243)	(0.0120)	(0.0749)	(0.0308)
Having a partner in	−0.0108*	0.2135***	−0.0742***	0.0580***	−0.1462***	−0.1422***
	(0.0052)	(0.0069)	(0.0090)	(0.0074)	(0.0434)	(0.0216)
Well-paid weeks of parental leaves	0.0038***	0.0130***	0.0040**	−0.0103***	0.0823***	0.0078
	(0.0009)	(0.0017)	(0.0015)	(0.0015)	(0.0153)	(0.0054)
Days of paternity leave	−0.0083	0.1059***	−0.0189	−0.0532***	0.1685	0.2888***
	(0.0098)	(0.0106)	(0.0162)	(0.0110)	(0.1936)	(0.0336)
Zero model: (Intercept)	−0.5869***	−2.2450***	−0.4073***	−2.8078***	0.1593	−3.0669***
	(0.0261)	(0.0484)	(0.0338)	(0.0804)		(0.2347)
Employed		−0.4145***		−0.2747***		−0.2621***
		(0.0074)		(0.0065)		(0.0183)
HH Equivalised income		0.0000*		0.0000***		0.0000*
		(0.0000)		(0.0000)		(0.0000)
AIC	46909.6816	81266.8812	24461.1986	60256.2264		8328.8171
Log Likelihood	−23438.8408	−40616.4406	−12214.5993	−30111.1132		−4147.4086
Num. obs.	6414	4927	3639	2882	524	427
Num. groups: Code	171	169	170	166	120	112
Var (count model): Code (Intercept)	0.0253	0.1483	0.0727	0.1615	2.2015	0.3169

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

6 Concluding remarks

The aim of this paper is to explore the dual role of the state, as employer and care provider, in the integration of women into the labour market, focusing particularly on the provision of public service on women's allocation of time between paid and unpaid work. The study highlights how public services, such as education, health, childcare and long-term care, can lighten the burden of women's domestic work and reshape their time allocation towards increased their labour force participation. This analysis is based on Public Services Availability Database (PSAD), a harmonised database assessing the quantity of public services available at NUTS2 level in Europe, created for the purposes of this paper.

We test two main hypotheses, being that care public services be associated with relieved women's unpaid workload (H1) and this reduction stimulates their paid work, additionnaly to the fact that these services constitute direct source of job opportunities (H2). Our results show that public services influence women's time allocation significantly, but this influence varies according to the type of public service and the type of work considered.

Hospitals and primary schools appear to have a positive impact on the number of hours worked by women in the labour market, underlining the important role of the public sector in integrating women into the labour market. On the other hand, the availability of childcare and long-term care services has a significant negative effect on the time spent by women in unpaid domestic work.

We did a more in-depth analysis by age, relationship status, and number of children, showing that a reduced unpaid work is associated with long-term care and childcare is mainly driven by women above 55 years old, as well as 25-34 years-old women with 1 or 2 children. Concerning the effect of long-term care on paid work, midlife women without children seem to be the more reactive. Finally, schools increase the unpaid work for women in age of having children. Moreover, our analysis confirms the role of household composition in women's time use. Having a partner favours the time spent in domestic economy.

Overall, we partially confirm our two hypotheses : we observe a direct channel of education and hospitals on women's paid work but no direct channel for care services. In addition,

we observe that care services decrease the burden of women's unpaid work, while school and hospital may be a potential source of unpaid work. These effects vary taking into acount the age and the number of minor children of the woman in the household.

As previously noted, public services do not fundamentally challenge the gendered division of labour. While care services effectively reduce women's domestic workload, the fact that institutions like schools and hospitals—key drivers of women's integration into the market economy—also contribute to unpaid work highlights the complexity of reducing gender disparities in labour. Women remain disproportionately involved in non-market activities, suggesting that public services function more as tools for reallocating time rather than as mechanisms for fundamentally challenging the gendered division of labour. Nonetheless, this does not diminish the importance of recognizing their critical role in supporting women's economic integration.

Although this paper does not present a causal analysis, it provides an initial overview of the role public services play in women's economic integration, considering both European and national differences in service provision. This is the first study to analyse these public services simultaneously and at the regional level. To deepen our understanding of the mechanisms driving the results, we advocate for the development of longitudinal time-use data at the European level.

This paper focuses on the quantity of public services provided, but other indicators should be considered, such as accessibility of these services in terms of costs, and the working conditions in hospitals and schools. These factors can significantly impact both the number of hours worked and individuals' positions in the labour market. In this regard, we aim to expand our database to include indicators on the quality and accessibility of these services, providing a deeper understanding of both the service quality and the employment opportunities generated by the State.

The Public Service Availability Database (PSAD) constitutes a very valuable aspect of our analysis. We therefore want to contribute to the literature on local welfare states, where territorial inequalities in public services are a feature of their emergence. Local welfare states and public services are insufficiently integrated into gendered analyses of the welfare state. Using our PSAD database, future research will explore regional differences in welfare states and their

role in women's economic independence.

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A Appendix

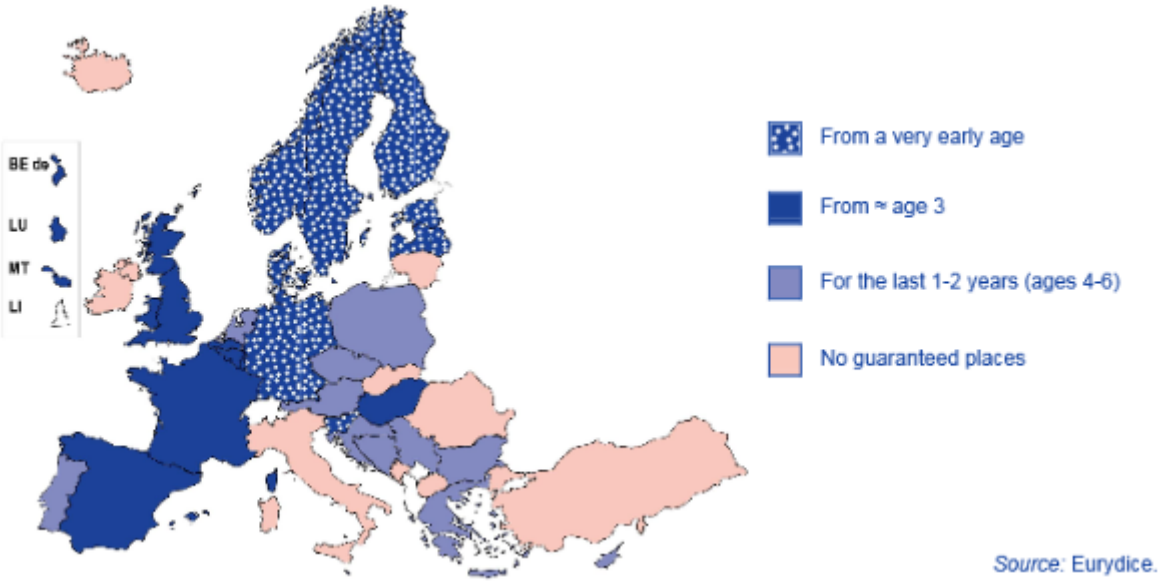

Figure A.1: Age from which a place in ECEC is guarateed in 2015/2016
Source: Figure from Eurydice report "Structural indicators on early childhood education and care in Europe – 2016"

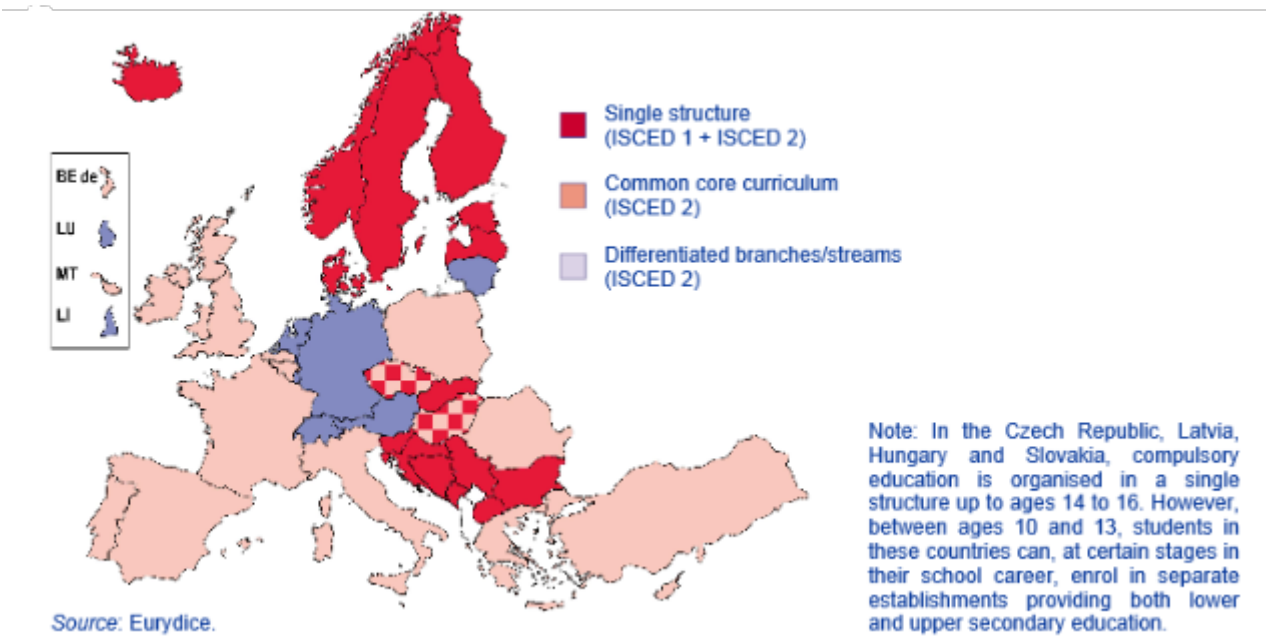

Figure A.2: Main models of primary and secondary education (ISCED1-2) in europe in 2015-2016
Source: Figure from Eurydice report "The structure of the European education systems 2015/16 "

Country	Single structure	Two structures or more
Austria		x
Belgium		x
Bulgaria		x
Croatia	x	
Cyprus		x
Czechia		x
Estonia	x	
Finland	x	
France		x
Germany		x
Greece		x
Hungary		x
Iceland	x	
Ireland	x	
Italy		x
Latvia		x
Lithuania		x
Luxembourg		x
Malta		x
Norway	x	
Poland		x
Portugal		x
Romania		x
Slovakia		x
Serbia	x	
Spain		x
Sweden		
Switzerland		x
Turkey		x

Table A.1: Countries by number of ECEC structures

Country	Period	ECEC	School	Hospital	Long-term care
Austria	2008-2016			x	x
Belgium	2011-2016			x	x
Bulgaria	2011-2016	x	x	x	x
Croatia	2011-2016		x		
Cyprus	2011-2016	x	x	x	
Czechia	2011-2016		x	x	
Estonia	1995-2016	x	x	x	x
Finland	2009-2016		x	x	x
France	2009-2016	x	x	x	x
Germany	2007-2020	x	x	x	x
Greece	2013-2016	x	x	x	x
Hungary	1999-2022	x	x	x	x
Iceland	2011-2016	x	x	x	x
Ireland	2011-2016		x	x	x
Italy	2009-2016	x	x	x	x
Latvia	2011-2016	x		x	x
Lithuania	2011-2016		x	x	x
Luxembourg	2011-2016	x	x	x	x
Malta	2011-2016		x	x	x
Norway	2010-2016	x	x	x	x
Poland	1995-2021	x	x	x	x
Portugal	2011-2016	x	x	x	
Romania	2010-2016	x	x	x	x
Slovakia	2011-2016		x		
Serbia	2010-2016	x	x	x	
Spain	2009-2016	x	x	x	x
Sweden	2011-2016		x	x	x
Switzerland	2011-2016	x	x	x	x
Turkey	2013-2021	x	x	x	x

Table A.2: Periods and public services collected in the PSAD by country

Country	Year	Well-paid weeks of parental leave	Duration of paternity leave (days)
Bulgaria	2012	0.0	2.000000
Czech Republic	2012	24.0	0.000000
Estonia	2012	14.3	0.000000
Finland	2012	6.1	3.000000
France	2012	0.0	2.000000
Germany	2012	14.0	0.000000
Greece	2012	0.0	0.285714
Hungary	2012	24.0	1.000000
Iceland	2012	9.0	0.000000
Italy	2012	0.0	0.000000
Luxembourg	2012	0.0	0.285714
Poland	2012	0.0	1.000000
Romania	2012	24.0	2.000000
Serbia	2012	0.0	0.000000
Spain	2012	0.0	2.000000
Switzerland	2012	0.0	0.000000
Turkey	2012	0.0	0.000000
Bulgaria	2016	0.0	2.000000
Czech Republic	2016	39.0	0.000000
Estonia	2016	14.5	2.000000
Finland	2016	6.1	9.000000
France	2016	0.0	2.000000
Germany	2016	12.0	0.000000
Greece	2016	0.0	0.285714
Hungary	2016	24.0	1.000000
Iceland	2016	9.0	0.000000
Italy	2016	0.0	0.285714
Luxembourg	2016	0.0	0.285714
Poland	2016	7.4	2.000000
Romania	2016	24.0	0.714286
Serbia	2016	0.0	0.000000
Spain	2016	0.0	2.100000
Switzerland	2016	0.0	0.000000
Turkey	2016	0.0	1.071429

Table A.3: Details on family policies control variables according to Internation Review on Leave Parental and Related Research
For paternity length, we calculate a mean between public and private sectors

	18-24 y/o PWH	18-24 y/o UWH	25-34 y/o PWH	25-34 y/o UWH	35-54 y/o PWH	35-54 y/o UWH	55-64 y/o PWH	55-64 y/o UWH
(Intercept)	3.9842***	2.8312***	3.5487***	2.8050***	3.5358***	4.0336***	2.5794***	3.3346***
	(0.2106)	(0.2006)	(0.0801)	(0.0909)	(0.0693)	(0.0611)	(0.1542)	(0.1184)
Long term care	−0.0138	−0.0117	−0.0063	−0.0393***	0.0047	−0.0028	0.0048	−0.0349***
	(0.0074)	(0.0122)	(0.0036)	(0.0080)	(0.0043)	(0.0044)	(0.0124)	(0.0061)
ECEC	−0.0968	0.0540	0.0023	−0.5737***	0.0705	−0.2390***	0.8527***	0.2324**
	(0.0835)	(0.1710)	(0.0406)	(0.1164)	(0.0517)	(0.0625)	(0.1381)	(0.0897)
Hospitals	−0.0135	−0.4109***	0.0487	−0.0121	0.0523**	−0.0463**	0.1081***	0.1774***
	(0.0651)	(0.0764)	(0.0318)	(0.0346)	(0.0181)	(0.0160)	(0.0293)	(0.0229)
Primary schools	−0.0120	0.0673	0.0112	1.1446***	0.0626	0.1598**	−0.0340	0.1148
	(0.0849)	(0.1524)	(0.0441)	(0.1137)	(0.0537)	(0.0602)	(0.1634)	(0.0803)
Age	0.0095	−0.0024	0.0011	0.0013	−0.0010	−0.0134***	−0.0025	−0.0061***
	(0.0082)	(0.0066)	(0.0019)	(0.0015)	(0.0009)	(0.0007)	(0.0013)	(0.0012)
Secondary	−0.2399***	0.0819*	0.0607	−0.0221	−0.0531*	−0.0459***	−0.0407	−0.1127***
	(0.0577)	(0.0389)	(0.0354)	(0.0144)	(0.0217)	(0.0111)	(0.0334)	(0.0162)
Tertiary	−0.3461***	−0.1199*	0.0765*	−0.0996***	−0.0354	−0.1337***	−0.0206	−0.2871***
	(0.0640)	(0.0569)	(0.0357)	(0.0167)	(0.0221)	(0.0125)	(0.0342)	(0.0200)
Respondent's minor children in HH	−0.1524***	0.4736***	−0.0424***	0.3034***	−0.0515***	0.2514***	−0.0169	0.3408***
	(0.0268)	(0.0155)	(0.0070)	(0.0042)	(0.0042)	(0.0028)	(0.0136)	(0.0092)
Partner's worked hours	0.0023*	0.0029***	0.0057***	0.0045***	0.0027***	0.0007***	0.0009**	−0.0006**
	(0.0012)	(0.0006)	(0.0005)	(0.0002)	(0.0003)	(0.0002)	(0.0003)	(0.0002)
Having a partner in HH	−0.0893	0.5012***	−0.2882***	0.2392***	−0.1476***	0.0968***	−0.0366**	0.2438***
	(0.0548)	(0.0346)	(0.0230)	(0.0146)	(0.0135)	(0.0097)	(0.0136)	(0.0114)
HH Equivalised income	0.0000	−0.0002***	0.0000**	−0.0000	0.0000	−0.0000	0.0000*	−0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Regional unemployment rate	−0.0074		0.0013		−0.0014		0.0300***	
	(0.0053)		(0.0027)		(0.0025)		(0.0046)	
Well paid weeks of parental leave	−0.0006	0.0072	0.0033*	−0.0008	0.0047***	−0.0069***	0.0020	0.0074**
	(0.0029)	(0.0059)	(0.0014)	(0.0022)	(0.0014)	(0.0015)	(0.0030)	(0.0026)
Days of parternity leave	−0.0202	0.1237***	−0.0083	0.1833***	0.0525***	−0.0123	−0.0603*	−0.0332
	(0.0306)	(0.0316)	(0.0155)	(0.0166)	(0.0144)	(0.0109)	(0.0304)	(0.0174)
Unemployed		−0.0173		0.2299***		0.1518***		0.1693***
		(0.0383)		(0.0135)		(0.0111)		(0.0154)
Wave 4	0.0068	0.0023	−0.0013	−0.1232***	0.0295**	−0.0253***	0.0969***	−0.0363**
	(0.0299)	(0.0298)	(0.0124)	(0.0103)	(0.0099)	(0.0075)	(0.0159)	(0.0115)
Zero model: (Intercept)	−0.2583**	−1.7310***	−0.4956***	−2.4327***	−0.7385***	−2.8231***	−0.4410***	−2.7461***
	(0.0925)	(0.1289)	(0.0478)	(0.0852)	(0.0370)	(0.0753)	(0.0466)	(0.0878)
AIC	3022.1248	7273.1755	13384.5671	44134.1950	24636.7545	71327.5130	15144.1076	36764.9629
Log Likelihood	−1493.0624	−3618.5877	−6674.2835	−22049.0975	−12300.3772	−35645.7565	−7554.0538	−18364.4814
Num. obs.	475	475	1857	1857	3334	3334	2288	2288
Num. groups: Code	125	125	159	159	169	169	162	162
Var (count model): Code (Intercept)	0.0552	0.4512	0.0260	0.3538	0.0735	0.1453	0.9859	0.1647

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table A.4: Analysis by age group

	No child PWH	No child UWH	1-2 children PWH	1-2 children UWH	3 or more PWH	3 or more UWH
Intercept	3.6683***	2.6730***	3.5148***	5.1440***	0.6238	4.4543***
	(0.0396)	(0.0614)	(0.0622)	(0.0575)	(0.3620)	(0.1298)
Long-term care	−0.0057*	−0.0033	−0.0022	−0.0260***	0.0342	0.0009
	(0.0026)	(0.0049)	(0.0041)	(0.0059)	(0.0336)	(0.0106)
ECEC	0.0446	0.0723	0.0098	−0.3063***	0.2162	−0.1416
	(0.0318)	(0.0606)	(0.0539)	(0.0875)	(0.2707)	(0.1362)
Hospitals	0.0421***	0.1212***	0.0138	0.0343	0.1516	−0.3024***
	(0.0114)	(0.0154)	(0.0195)	(0.0175)	(0.3902)	(0.0900)
Primary schools	0.0806*	0.2623***	0.0983	0.3886***	0.0380	0.4641***
	(0.0332)	(0.0641)	(0.0530)	(0.0843)	(0.4179)	(0.1321)
Age	−0.0017***	0.0046***	0.0011*	−0.0200***	0.0041	−0.0111***
	(0.0002)	(0.0003)	(0.0005)	(0.0004)	(0.0032)	(0.0014)
Secondary	−0.0735***	−0.0044	−0.0451	−0.1471***	0.2094**	−0.0912***
	(0.0164)	(0.0113)	(0.0241)	(0.0103)	(0.0728)	(0.0244)
Tertiary	−0.0689***	−0.1756***	−0.0357	−0.0715***	0.1271	−0.0967**
	(0.0167)	(0.0139)	(0.0243)	(0.0120)	(0.0749)	(0.0308)
Having a partner in HH	−0.0108*	0.2135***	−0.0742***	0.0580***	−0.1462***	−0.1422***
	(0.0052)	(0.0069)	(0.0090)	(0.0074)	(0.0434)	(0.0216)
Subjective urbanisation	0.0085	−0.0880***	0.0042	−0.0636***	−0.0801*	−0.0402*
	(0.0057)	(0.0069)	(0.0081)	(0.0060)	(0.0321)	(0.0172)
Regional unemployment rate	0.0043*		0.0021		0.0484**	
	(0.0017)		(0.0026)		(0.0152)	
Well paid weeks of parental leave	0.0038***	0.0130***	0.0040**	−0.0103***	0.0823***	0.0078
	(0.0009)	(0.0017)	(0.0015)	(0.0015)	(0.0153)	(0.0054)
Days of paternity leave	−0.0083	0.1059***	−0.0189	−0.0532***	0.1685	0.2888***
	(0.0098)	(0.0106)	(0.0162)	(0.0110)	(0.1936)	(0.0336)
Wave 4	0.0198**	−0.1034***	0.0352***	0.0328***	−0.0628	−0.0334
	(0.0067)	(0.0077)	(0.0104)	(0.0073)	(0.0733)	(0.0247)
Zero model: (Intercept)	−0.5869***	−2.2450***	−0.4073***	−2.8078***	0.1593	−3.0669***
	(0.0261)	(0.0484)	(0.0338)	(0.0804)		(0.2347)
Employed		−0.4145***		−0.2747***		−0.2621***
		(0.0074)		(0.0065)		(0.0183)
HH Equivalised income		0.0000*		0.0000***		0.0000*
		(0.0000)		(0.0000)		(0.0000)
AIC	46909.6816	81266.8812	24461.1986	60256.2264		8328.8171
Log Likelihood	−23438.8408	−40616.4406	−12214.5993	−30111.1132		−4147.4086
Num. obs.	6414	4927	3639	2882	524	427
Num. groups: Code	171	169	170	166	120	112
Var (count model): Code (Intercept)	0.0253	0.1483	0.0727	0.1615	2.2015	0.3169

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table A.5: Statistical models