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Geographic inequalities in accessibility of essential services

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Geographic inequalities in accessibility of essential services

People's ability to access essential services is key to their labour market and social inclusion. An important dimension of accessibility is *physical* accessibility, but little cross-country evidence exists on how close people live to the services facilities they need. This paper helps to address this gap, focusing on three types of essential services: Public Employment Services, primary schools and Early Childhood Education and Care. It collects and maps data on the location of these services for a selection of OECD countries and links them with data on population and transport infrastructure. This allows to compute travel times to the nearest service facility and to quantify disparities in accessibility at the regional level. The results highlight substantial inequalities in accessibility of essential services across and within countries. Although large parts of the population can easily reach these services in most countries, some people are relatively underserved. This is particularly the case in non-metropolitan and low-income regions. At the same time, accessibility seems to be associated with the potential demand for these services once accounting for other regional economic and demographic characteristics.

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1. Introduction

People's ability to access essential services is a prerequisite for their labour market and social inclusion and an important determinant of their well-being (Baptista and Marlier, 2020[2]). Essential services can be defined as services that are critical to preserving life, health, public safety and basic societal functioning. Besides its impact at the individual level, accessibility of essential services has an important role in promoting social citizenship and societal resilience (OECD/EC-JRC, 2021[3]; OECD, 2021[4]; Eurofound, 2022[5]).

For these reasons, accessibility of essential services lies at the centre of the employment and social policy agenda in many OECD countries. In the 2018 OECD Ministerial Meeting on Social Policy, Ministers highlighted the need to ensure that social services "address the needs and expectations of beneficiaries" (OECD, 2018[6]). The 2022 OECD Employment and Labour Ministerial Meeting highlighted the commitment of OECD Ministers to improving the "accessibility and responsiveness" of employment services to help jobseekers and companies in the transition to greener jobs. Ministers also committed to providing "accessible and affordable care systems" to reduce gender gaps in employment, pay and career progression (OECD, 2022[7]). At the EU level, Principle 20 of the European Pillar of Social Rights underscores that all people have the right to access essential services of good quality and calls for the provision of support for those in need to access such services (European Commission, 2018[8]).

Meanwhile, in several OECD countries, population groups living in economically lagging or declining regions have recently expressed publicly, and in some cases quite vocally, discontent with their economic and social situation. A – perceived or real – deterioration in the accessibility of essential goods and services has been a key element of this dissatisfaction, together with broader factors such as poor labour market outcomes, rising costs of living, soaring fuel prices and lack of political influence (OECD, 2022[9]). Recent examples have been the *gilets jaunes* protests in France, which started in 2018, the 2019 protests in Chile against increases in public services' prices, and ongoing discussions about "medical deserts" in several OECD countries (Brînzac et al., 2023[10]). In the OECD's 2022 Risks that Matter survey, less than half of the respondents reported thinking they could have access to good-quality and affordable public services in a vast range of areas including education, employment and family support (OECD, 2023[11]). When asked about their main concerns for the near future, on average seven out of ten respondents identified accessing good-quality healthcare as a top concern.

However, little is known about geographic inequalities in people's access to essential services, particularly in a cross-country context, for lack of data. Earlier OECD work has focused on the challenges of service delivery in rural areas (OECD, 2010[12]; 2021[4]; 2022[13]), and strategies to improve accessibility of education and healthcare services (OECD/EC-JRC, 2021[3]; OECD, 2022[14]; 2022[15]). Related work is currently ongoing about the accessibility of essential services in settlements, i.e. cities, villages and towns. Previous OECD work has highlighted that low-income families have less access to healthcare services (OECD, 2019[16]) and benefit less from formal childcare services (OECD, 2011[17]; 2020[18]). At the national level, several OECD countries have increased efforts in recent years to measure accessibility of essential services. For instance, Chile recently produced indicators on the distance from residential blocks to childcare facilities, schools, primary-care units and parks in urban areas, as part of the National Urban Development Strategy.

The extent to which essential services are accessible to people in the different parts of a country depends on various factors, including: awareness, physical accessibility, capacity, affordability, and timeliness (waiting lists, punctuality/reliability) (Eurofound, 2020[19]). Personal-level barriers, such as low income or physical limitations, and institutional factors, such as the coordination among providers, and more broadly service integration, can affect service accessibility (OECD, 2015[20]).

This paper helps to address the evidence gap on geographic disparities in the access to essential services, focusing on one of the above-mentioned dimensions of service accessibility so far underexplored in

empirical cross-country research: *physical accessibility*. This is achieved by: (1) collecting data on the geographic locations of selected essential services across OECD countries and mapping them; (2) linking these location data with data on local population density and road networks; and (3) producing accessibility indicators for each service type at the level of small (TL3)[1] regions and comparing these indicators across regions as a way of quantifying geographic inequalities in service accessibility. The work focuses on three types of essential services: (i) Public Employment Services (PES); (ii) primary schools, and (iii) Early Childhood Education and Care (ECEC) centres. These services play an important role for people's labour market and social inclusion, notably by affecting labour supply in a context of tight labour markets in many OECD countries (Araki et al., 2023[21]). Moreover, in most countries, all three services fall under the responsibility or oversight of national authorities, such that official data are generally available.

The main contributions of this paper are the collection and analysis of comparable geolocation data for different essential services in a large number of OECD countries that can be used to document and quantify geographic inequalities in the accessibility of essential services. Indeed, the analysis presented builds on what has been a significant data collection effort using different sources and techniques, including: bilateral correspondence with national authorities; web scraping of information provided on national authorities' websites; and the use of data from previous or ongoing OECD projects. It currently covers location data for PES facilities in 32 countries, ECEC centres in 11 countries, and primary schools in 13 countries (for an overview, see Table 1). People's physical accessibility to these services is measured as their *travel times* to the nearest service facility from their area of residence, considering two possible transport modes: walking and driving.[2] Travel times are analysed in 5-minute intervals, between 0 and 60 minutes.

Given the complexity of collecting and analysing data on the locations of essential services across many OECD countries, this paper focuses entirely on describing and quantifying people's physical accessibility to services. It does not provide a comprehensive analysis of possible determinants of geographic variation in service accessibility. It also does not attempt to draw any links to other important dimensions of accessibility, notably service capacity, which will be needed to derive meaningful policy conclusions. Both would certainly be desirable, but collecting the required data at a granular level across countries would likely be even more challenging than for service locations. In that sense, the results presented in this paper should be interpreted as a contribution to a broader discussion of how to measure people's access to essential services within and across countries, to which a number of other projects at the OECD, at the Joint Research Centre of the European Commission, and elsewhere, are contributing.

This paper also avoids assessments on what is, or is not, an "acceptable" or "optimal" time for people to reach a certain service. Countries, and regions within countries, differ significantly in population density, transport infrastructure and settlement patterns. Travel times are just one among many relevant dimensions that policy makers need to consider when arranging for the provision of essential services. Other factors, such as the cost of service provision, the minimal or optimal capacity of service centres, and the quality of the service provided, are equally relevant, and in many cases policy makers face difficult trade-offs between these dimensions. In some low-population-density regions of Australia, Canada and the Nordic countries, for example, guaranteeing appropriate travel times for all citizens may not be feasible, let alone cost-efficient, and alternative strategies to ensure service provision, such as mobile and digital services, may be at times preferable.

The main results of the analysis are as follows:

- *Accessibility of essential services is high for large parts of the population, but some people are relatively underserved:* while in most countries the median person has low travel times to the

[1] The TL3 regions are defined according to the OECD's Territorial Grids. For EU countries, the TL3 classification is consistent with Eurostat's NUTS3 classification.

[2] The analysis does not consider public transport nor congestion effects. These two limitations are discussed in the next sections.

nearest service facility, people with the lowest accessibility can have travel times that are several times higher. For primary schools and ECEC centres, e.g. a person with the median travel time will generally walk less than 20 minutes to reach the nearest facility, while the 20% of people with lowest accessibility can take up to 60 minutes or more;

- *Lack of access to a motor vehicle can crucially undermine service accessibility for some people:* while driving to the nearest service facility is easy for most people in all regions, walking can often be very time consuming and in some cases unfeasible. For primary schools and ECEC centres, e.g., driving to the nearest facility will generally take less than 10 minutes for the 20% of people with highest travel times, while walking can take up to 60 minutes or more. For these people, not owning a motor vehicle may severely undermine accessibility in the absence of access to public transport;
- *Accessibility is higher in metropolitan than in non-metropolitan regions, but there can be significant disparities among regions of the same type:* in general, people in metropolitan regions or close to them have lower travel times, with differences between metropolitan and non-metropolitan regions reaching up to 40 minutes in some cases. But there can also be significant dispersion in travel times for regions with the same level of access to cities. For remote regions, e.g., walking times to the nearest primary school or ECEC centre can go from less than 10 minutes to more than 55 minutes;
- *Essential services are harder to reach in lower-income regions*: the share of people that can swiftly reach essential services decreases with regional income. The association remains significant even after controlling for other regional demographic and economic characteristics: a 10% higher regional GDP per capita is associated with a 2 percentage-point greater share of people who can reach a PES centre within 15 minutes by motor vehicle, and a 0.8 percentage-point greater share of people who can reach a primary school within 15 minutes by foot;
- *Service accessibility is systematically higher in areas where there are more potential users of a service, after considering other economic and demographic regional characteristics:* the share of people who can swiftly reach PES centres and primary schools is higher in regions with a larger share of unemployed people and of children, respectively. The association is particularly relevant for primary schools: a 1 percentage-point larger share of children living in a region is associated with a 3.5 percentage-point greater share of people who can reach this service in under 15 minutes by foot.

The remainder of this paper is organised as follows. Section 2. discusses the main contributions of this work in the context of the existing literature. Section 3. provides detailed information on the services covered in this paper, the data collection process, and the final data used in the analysis. Section 4. presents the methodology. Section 5. provides evidence on how accessible essential services are in OECD regions. Section 6. investigates how accessibility relates to key regional demographic and economic characteristics. Section 7. offers some concluding remarks.

2. Related literature

Accessibility of services is a broad concept that has been studied from various perspectives, but cross-country research on physical accessibility is scarce. Most cross-country studies in high-income countries have centred on non-spatial metrics, partly due to the lack of consistent geolocation data. These metrics include population-to-provider ratios (Simoens and Hurst, 2006[22]; OECD, 2021[4]); measures of service utilization (Devaux, 2013[23]; OECD, 2019[16]; van Doorslaer, 2006[24]), self-reported unmet needs (Ward and Ozdemir, 2012[25]; OECD, 2019[16]) and indicators on perceived barriers to access, particularly affordability (Cylus and Papanicolas, 2015[26]; Ünver, Bircan and Nicaise, 2018[27]; OECD, 2019[16]).

These studies predominantly focus on healthcare and childcare services and suggest varying levels of access – or perceived access – across OECD countries, within countries and between different population groups. At the national scale, high-income countries tend to report a smaller proportion of people with unmet medical needs and exhibit higher enrolment rates in childcare services than lower-income countries (Ward and Ozdemir, 2012[25]). Within countries, access can differ considerably between urban and rural areas. Yet, the nature of these differences varies by service. For instance, physician-to-population ratios are substantially higher in metropolitan than in non-metropolitan regions (OECD, 2021[28]). Similarly, rural residents signal more frequently distance and transport problems as barriers to access medical services, often twice as much as urban residents (OECD, 2019[16]). In contrast, Ünver, Bircan and Nicaise (2018[27]) find that urban residents perceive ECEC centres as less accessible than those living in rural areas, probably due to a tighter demand and higher costs in cities. Finally, a consistent finding across most studies is that low-income groups use healthcare and ECEC services less frequently and face greater financial barriers to access (Devaux, 2013[23]; Cylus and Papanicolas, 2015[26]; Ünver, Bircan and Nicaise, 2018[27]; OECD, 2019[16]). Yet, the data sources used in these studies do not allow for a granular geographic analysis: survey data are often not representative at the regional or even local level, and population-to-provider ratios are not consistently available across countries, particularly outside of healthcare services.

Recent studies aim to provide cross-country evidence on spatial accessibility of essential services, but their coverage of countries, types of regions, and services remains limited. For instance, Milbert et al. (2013[29]) compute travel times to the nearest primary and secondary school, hospitals, and transport infrastructure in five EU regions where geolocation data were available - Eastern Austria (Austria), Ruhrgebiet (Germany), Dél-Alföld (Hungary), Mazowsze (Poland), Navarre (Spain). The authors find that most people in these regions can access schools within a 10-minute drive, but that accessibility of hospitals, railway stations, and airports is more unequal across regions.

Two large-scale studies, more closely related to the work presented in this paper, go further in their efforts to broaden country and service coverage. First, the International Transport Forum (ITF) compiled spatial accessibility data for hospitals, schools, parks, eateries, shops, and recreational centres across urban and commuting areas in 25 European countries (ITF, 2019[30]). Using proprietary location data from *TomTom*, the study delineates, for each service, the share of the population that can access the nearest service within a certain time, whether by foot, car, or public transport. The results highlight substantial differences in accessibility. For instance, 30% of people in Eastern and Southern European commuting zones of major cities face more than a 30-minute drive to reach a hospital. However, the study does not cover non-metropolitan regions, where accessibility is arguably a more pressing policy concern. Second, the EU-funded project ESPON (2017[31]) identified 'inner peripheries' in EU countries, relying on open-source data from OpenStreetMap. The authors define 'inner peripheries' as areas economically disconnected from other territories and characterised by extended travel times by car to regional economic centres and essential public services, such as healthcare, schools, banks, and transportation infrastructure. The study profiled these areas in a few countries, noticing that these tend to be rural, have lower GDP per capita and older populations than other places.

A growing share of studies aim to capture a more nuanced picture of accessibility by focusing on a single country or region where complementary data is available, including capacity, income and employment. Those studies often rely on variations of the Two-Step Floating Catchment Area (2SFCA) method (Delamater, 2013[32]; Luo and Qi, 2009[33]; Radke and Mu, 2000[34]), which jointly accounts for the distance between users and facilities, the size of these facilities, and the density of users within a catchment area. Using this method, Pennerforster and Pennerforster (2020[35]) find that accessibility of ECEC centres in Vienna is highest in high socio-economic-status neighbourhoods. This confirms a similar earlier result for Australia (Cloney et al., 2016[36]). Similarly, Lee and Lubienski (2016[37]) show that school closures led to a greater decline in accessibility in neighbourhoods with a higher share of families below the poverty line. Meanwhile, in Spanish urban areas, Suárez, Mayor and Cueto (2020[38]) find that areas with higher accessibility of PES centres also show lower unemployment.

This paper contributes to the literature on accessibility of services in several ways. Firstly, it provides comparative insights across multiple OECD countries on the accessibility of primary schools, ECEC centres, and PES centres, covering both metropolitan and non-metropolitan regions. Notably, the accessibility of the latter two services has not yet been studied from a cross-country perspective, and most studies on accessibility have focused mostly on urban areas. Secondly, by looking into different segments of the distribution of travel times, the paper offers a more detailed analysis of the inequalities in service accessibility than previous papers, both across and within regions. Finally, the paper contributes to providing insights on the regional economic and demographic characteristics associated with accessibility of services for a large number of countries.

3. Service coverage and data

This section describes the services covered and the data used in the analysis. Subsection 3.1. provides a discussion of the choice of services, and their importance for labour market and social inclusion. Subsection 3.2. gives details on the data, including the main sources and the countries currently included in the sample for each service type.

3.1. *Service coverage*

The scope of essential services can be broad, including all services that are critical to preserving life, health, public safety and basic societal functioning. Principle 20 of the European Pillar of Social Rights, e.g., provides a non-exhaustive list, focusing on services that support basic human needs to live and function in society, such as water, sanitation, energy, transport, digital communications, and financial services (European Commission, 2018[8]). Besides these, there are several other types of essential services that are crucial for people's effective participation in society and in the labour market, such as education, childcare, healthcare, housing, employment services, among others.

This paper focuses on three types of essential services, which are all key for people's labour market and social inclusion. These are: (i) Public Employment Services (PES); (ii) primary schools, and (iii) Early Childhood Education and Care (ECEC) centres. These three services have in common their crucial role in determining people's labour supply decisions, which is of growing importance in a society marked by demographic changes, in which labour supply shortages are becoming more prevalent (Araki et al., 2023[21]).

PES play a central role in providing assistance to jobseekers and connecting them with employers and training opportunities (Lauringson and Lüske, 2021[39]). They help match labour market supply and demand by providing workers with information, job search assistance and placement opportunities, as well as assisting employers in hiring processes. In times where labour markets are increasingly tight in many regions, and where employers in certain sectors are struggling to find skilled workers, PES can provide targeted comprehensive support to activate jobseekers who are further from the labour market (OECD, 2021[40]), and promote the upskilling and reskilling of jobseekers to match changing labour demands.

Educational institutions, such as ECEC facilities and primary schools, also play a key role in determining labour supply. Indeed, access to flexible schooling and childcare solutions is often an important pre-requisite for being able to combine parenting responsibilities with work, particularly for parents with small children and single parents. The accessibility of primary schools and ECEC centres affects labour market

participation decisions both at the extensive margin (i.e. *whether or not* to work) and at the intensive margin (i.e. *how much* to work).[3]

These three services may also affect labour mobility. PES help reduce regional labour market imbalances by connecting jobseekers with jobs across different places in a country, and by providing support and possibly financial incentives to jobseekers who are ready to move to take up work elsewhere. Access to quality childcare and education is an important determinant for the location decision of families with small children, which many localities are keen to attract. By determining not only people's labour supply decisions, but also their residence choices, these services shape geographic inequalities more broadly.

For all three services, physical accessibility is an important determinant of people's accessibility. For ECEC centres and primary education, physical accessibility is essential for an effective service provision. Even in an increasingly digitalised world, these services can only be provided in person, and may require multiple daily travels by parents and their children. Longer commutes therefore quickly add up, with negative impacts on well-being and labour supply decisions. For PES, the importance of physical accessibility may be less obvious, given the growing digitalisation of service delivery (OECD, 2022[41]).[4] However, there are still limitations to the extent to which an in-person provision of these services can be replaced by a digital one. First, some jobseekers may lack digital skills or access to digital tools. While training in digital literacy may help, this is likely to be a lengthy and imperfect process, especially for vulnerable groups such as some individuals with disabilities and people in low-income households (European Commission, 2022[42]; OECD, 2022[41]). Second, the digital provision of PES can also pose challenges to PES staff, requiring changes in the culture of using digital tools and training (OECD, 2022[43]), which in several countries is still an ongoing process (European Commission, 2022[42]). Third, the degree of digitalisation of PES and the quality of PES IT infrastructure is still very heterogeneous across countries (OECD, 2022[41]). Finally, the strictness of monitoring and job-search procedures for jobseekers varies considerably across countries. In countries with complex requirements, enforcement may require in-person support (Immervoll and Knotz, 2018[44]).

The three services included in this paper also have in common that in many countries they fall under the responsibility or oversight of national ministries, as opposed to regional or even local authorities, which should in principle facilitate data collection. Nonetheless, in many cases, there does not exist a central repository with the addresses or geolocation data of service facilities that could be used for the purposes of this analysis, as the next subsection will illustrate.

3.2. *Data sources and country coverage*

There is currently no centralised repository of data on the geolocations of essential service facilities in OECD countries. Previous endeavours to collect comparable data are scarce. For EU countries, the Eurostat's Geographic Information System of the Commission (GISCO) database incorporates data on healthcare and education services.[5] Although these data provided a useful benchmark, tentative analysis

[3] The channels through which accessibility matters for parents' labour supply may differ. For ECEC, attendance is not compulsory in all countries, so accessibility will be key in driving enrolment. If childcare centres are less accessible, parents (and particularly mothers) may choose to stay home to take care of their children, staying out of the labour market for a longer time after their children are born. For primary schools, attendance is compulsory, so accessibility is not a determinant of enrolment and is likely to matter less for labour market decisions at the extensive margin. Nevertheless, it does matter for decisions at the intensive margin, since lower accessibility may increase parents' needs to adopt part-time work arrangements.

[4] Digital advancements have been most evident in the areas of labour market services (notably job search support and counselling) and training, with over 70% of OECD countries having had initiatives towards greater digital or remote delivery (OECD, 2020[56]; 2022[55]).

[5] For more information see https://ec.europa.eu/eurostat/web/gisco.

as part of the work on this project revealed limitations in the classification of services and their cross-country comparability. The European Tertiary Education Register (ETER) provides comparable geolocated data for tertiary education institutions, which however fall outside the scope of this project.

Therefore, one of the main contributions of this paper has been to systematically collect such data for the three services covered for a large number of OECD countries. In some cases, data on service locations were publicly available from official sources, notably the websites of public authorities. In many others, they had to be obtained through requests to national authorities. Table 1 summarises the country coverage for each service type, together with the definition considered in the data collection process for each service. Annex A. lists the sources for each service type/country in detail. The variety of sources and country coverage for each service type reflects the significant heterogeneity in data availability. The data collection took place between 2022 and 2023 and incorporates information on the geolocation of services at the time of collection. Data on the geolocation of services over time was not available for the vast majority of countries, such that measuring time trends in service accessibility falls beyond the scope of this paper.

Table 1. Country coverage and definitions

Service type	Countries covered	Definition considered in data collection
PES centres	32 countries: Austria, Bulgaria, Canada, Chile, Colombia, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and Switzerland.	Public body[6] whose main responsibility is to actively facilitate the integration of jobseekers into the labour market, and which implements employment services (placement and related services), potentially in addition to other active labour market policies (training, employment incentives, sheltered and supported employment and rehabilitation, direct job creation, start-up incentives).
ECEC centres	11 countries: Belgium, Estonia, Finland, France, Greece, Ireland, Italy, Netherlands, New Zealand, Norway, and Spain. Data for Estonia, France, Greece, Ireland, Italy, and Spain only cover pre-primary education.	Public or private entities who provide education and care for children between 0 and up to 5 or 6 years, depending on the country. The analysis only considers formal and regulated arrangements, i.e. entities that have a valid license and are registered with the authorities; family care arrangements are not considered. Includes day care centres, registered childminders, and pre-schools. Corresponds to ISCED level 0.
Primary schools	13 countries: Belgium, Czechia, Estonia, Finland, France, Greece, Ireland, Italy, Lithuania, Netherlands, Norway, Portugal, and Spain.	Public or private schools that provide primary education for children from 5 or 6 years to 10 or 11 years, depending on the country. Corresponds to ISCED level 1.

The main data sources for the three types of services covered are as follows:

- *PES:* data for several countries were available online in the form of postal addresses on national authorities' websites.[7] For some, this information was readily available for download. Where this was not the case, web scraping was used to retrieve the information.[8] For the remaining countries,

[6] In some countries, employment services may also be (partly) provided by private entities, such as a private company or NGO. These are referred to as Private employment service (PrES) and are not considered in this paper. A potential shortcoming is that a few countries outsource part of their employment services to private providers (Lauringson and Lüske, 2021[39]). In addition, all PES outsource some of their services and measures to support jobseekers, even if case management is done in PES offices.

[7] For all services where data were available only in the form of postal addresses these were converted into geographic coordinates, using the ArcGIS geocoding service of the Geocoder Python package.

[8] This was done using either the Web Scraper extension from Google Chrome or Python scripts using the Selenium Python package, while ensuring compliance with the websites' terms of service and the legal conditions for web

geolocation data were obtained through bilateral correspondence with national authorities, notably by including a question into a larger policy questionnaire.[9] The analysis considers only centres that provide face-to-face support to jobseekers, i.e., it excludes centres that only have an administrative role.

- *ECEC centres:* data were mainly collected through bilateral correspondence with national authorities exploiting synergies with the data collection for the OECD Teaching and Learning International Survey (TALIS). Location data were generally not available on the webpages of national authorities, one reason being that in many countries childcare is a local responsibility. Furthermore, some countries consider information on the addresses of ECEC centres to be sensitive and therefore subject to confidentiality restrictions.
- *Primary schools*: data were available online for some countries and could be downloaded or web scraped, as in the case of PES. For other countries, the information was provided directly by national authorities through bilateral contacts, either in the context of the TALIS as for ECEC, or as a follow-up of previous and ongoing OECD projects.

One important challenge when working with data on ECEC centres is that childcare is typically provided in two stages, which often fall under the responsibility of different institutions. The first stage, early childhood educational development (i.e. nurseries) corresponds to level 01 of the International Standard Classification of Education (ISCED). In most countries, this stage targets the youngest children, up to the age of 3 or 4 years, and is under the responsibility/supervision of ministries of social affairs or welfare or related organisms. The second stage, pre-primary education (i.e. kindergarten) corresponds to ISCED level 02. In most countries, this stage is available for children aged from 3-4 to 5-6 years and is under the responsibility/supervision of ministries of education. Another challenge is that there may be both public and private providers, and that care facilities may be formally recognised or informal (typically family) arrangements. The analysis covers both private and public providers, and only formal care facilities, i.e. those with a valid licence and registered with the authorities, such that family home arrangements are not considered. For Estonia, France, Greece, Ireland, Italy, and Spain, the data only cover pre-primary education, as no data for nurseries were available. To the extent that early childcare and kindergarten may be provided at separate facilities, one would expect the number of centres, and hence measured accessibility, to be lower in these countries relative to countries for whom both nurseries and kindergartens are included in the data.

Besides geolocation data, the project uses data on the resident population distribution, road networks and administrative regional borders. The population data were obtained from the Global Human Settlement Layer (GHS-POP R2023A; Schiavina et al. (2023[45])), which provides a global one-square-kilometre-resolution grid for countries' total resident population in 2020. The data refer to the total population, which is likely to be a relatively rough proxy of service demand. Having population data by age group would allow for a better approximation, but currently there are no publicly available sources of population data by age group for the countries studied. The road networks data are included in the Mapbox (2023*) Isochrone API*[10], while the administrative regional borders were obtained from the OECD's Territorial Grids for 2022.[11]

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scraping specified in the robots.txt files. Quality controls were conducted to identify duplicated observations and by cross-examining web scraped datasets with datasets received from national authorities, whenever both were available.

[9] "OECD questionnaire on digitalisation in Public Employment Services to support the provision of active labour market policies" launched in March 2023.

[10] For more information see https://docs.mapbox.com/api/navigation/isochrone/. Access to the Mapbox Navigation API (https://www.mapbox.com/navigation) granted through the Development Data Partnership (https://datapartnership.org/).

[11] The OECD's Territorial Grids can be found here: https://www.oecd.org/cfe/regionaldevelopment/territorial-grid.pdf.

4. Methodology

The indicators presented in this paper provide a harmonised measure of service accessibility across OECD small (TL3) administrative regions. All accessibility indicators have been computed within national borders, i.e., they do not consider international cross-border provision of services. Using the same measure of accessibility for all regions is important for ensuring a high degree of comparability of the results obtained for different regions and countries. However, institutional differences across countries, and even across regions within the same country, may limit comparability. For example, it may be difficult to compare driving times to PES in a country with high levels of digitalisation and a system that does not require a complex monitoring of jobseekers, with a country where PES digitalisation is low and jobseekers need to interact with PES often and in complex ways. Furthermore, as explained in the previous section, the type of ECEC services covered in the data differs across countries, which also hampers comparability.

The paper focuses on the physical dimension of accessibility. It does not account for other relevant aspects of accessibility such as information and awareness, capacity, affordability, and timeliness (waiting lists, punctuality/reliability) (Eurofound, 2020[19]). While an integrated analysis of several of these aspects would be highly desirable, data availability on those other dimensions is usually even lower, particularly at regional or local level. However, one possible avenue for future work could be to use information on service capacity (e.g. number of students in primary schools, number of places in ECEC centres) which is available for some countries.

Physical accessibility is measured as people's *travel times* to the nearest service facility from their area of residence, using two possible transport modes, *walking and driving*.[12] The measure uses 5-minute intervals between 0 and 60 minutes (i.e. 12 time thresholds), instead of a continuous time interval because of computational restrictions. The share of the regional population whose travel time is equal to or below a certain threshold gives a cumulative distribution over travel times intervals across people within a region. Given that travel times are computed in intervals, it is not possible to pinpoint the exact travel time for each point in the population distribution, but only to identify in which time interval each point of the distribution lies. To facilitate the interpretation of the results, the analysis often focuses on three parts of the population distribution: (i) the 20% of people with the highest travel times, and therefore the lowest accessibility (Bottom 20%); (ii) the median person; and (iii) the 20% of people with the lowest travel times and therefore the highest accessibility (Top 20%).

To make it easier to grasp the concept of a distribution of travel times, Figure 1 shows a snapshot of the dataset with the distribution of driving times to the nearest PES centre in Central Estonia. For example, a person in the Top 20%, representing the 20% of the population with lowest travel times, takes between 5 and 10 minutes to drive to the nearest PES centre. Meanwhile, a person in the Bottom 20%, representing the 20% of the population with highest travel times, takes between 30 and 35 minutes. The median person can reach the nearest PES centre within a 20-to-25-minute drive.

[12] This paper follows a methodological approach consistent with the one adopted in earlier/ongoing OECD work on territorial analysis.

Figure 1. Driving times to nearest PES centre in Central Estonia

	A	B	C	D	E
1	iso3	tl3_id	reg_name	time	sh_pop
2	EST	EE009	Central Estonia	5	16.5%
3	EST	EE009	Central Estonia	10	28.8%
4	EST	EE009	Central Estonia	15	34.0%
5	EST	EE009	Central Estonia	20	45.7%
6	EST	EE009	Central Estonia	25	58.0%
7	EST	EE009	Central Estonia	30	70.0%
8	EST	EE009	Central Estonia	35	84.6%
9	EST	EE009	Central Estonia	40	92.0%
10	EST	EE009	Central Estonia	45	96.7%
11	EST	EE009	Central Estonia	50	99.0%
12	EST	EE009	Central Estonia	55	99.6%
13	EST	EE009	Central Estonia	60	99.8%

Note: The information provided in each column is as follows: Column A shows the country id code; Column B the region id code; Column C the region name; Column D the 12 travel time thresholds presented in ascending order, from 5 minutes to 60 minutes; and Column E the share of the regional population that has access to a PES centre within a travel time that is either lower than or equal to each time threshold.
Source: OECD calculations based on location data obtained from national authorities. See Annex A for details.

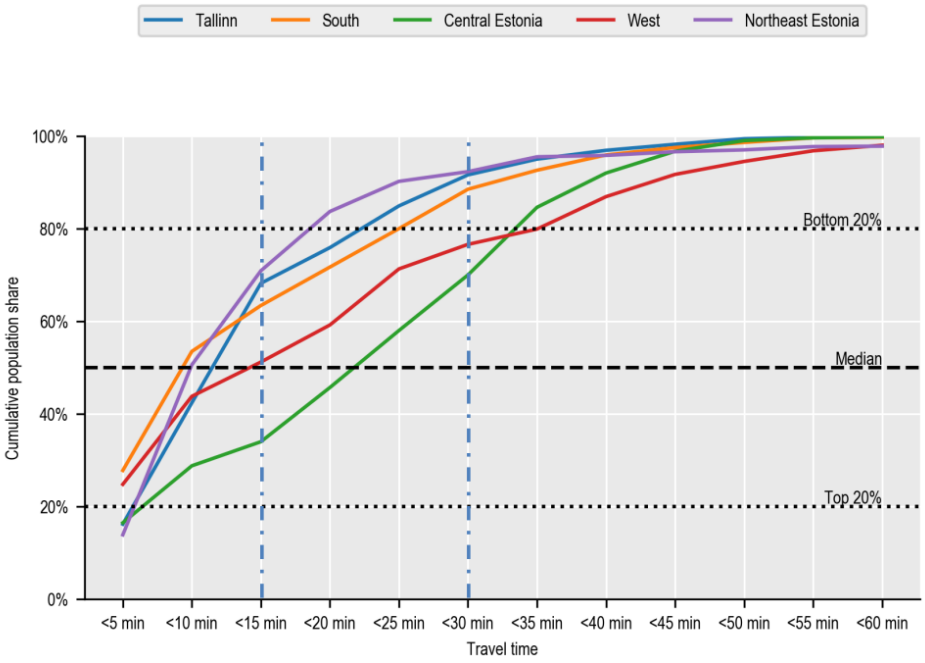
The results from these calculations can be represented in graphical format to depict cross-regional disparities in people's levels of accessibility. Figure 2 shows an illustration for all five regions of Estonia. Each of the curves in the figure gives the cumulative distribution of travel times for a specific region, i.e. the share of the regional population that can reach a specific service within a certain travel time. There are significant differences across regions in travel times at different points of the distribution. For people with the shortest travel times (Top 20%), cross-regional differences are modest. By contrast, there are large differences in accessibility for people with comparatively long travel times (Bottom 20%), with accessibility being significantly better in Northeast Estonia (travel time is between 15 and 20 minutes) than in the West (travel time is 35 minutes). The figure also allows identifying cross-regional differences in the share of population that can reach a service facility within a specific travel time. For example, the share of population with access within 15 minutes ranges from approximately 35% in Central Estonia to approximately 75% in Northeast Estonia. Overall, accessibility of PES centres by driving is highest in the comparatively densely populated Northeast Estonia, while it is lowest in the more sparsely populated West and Central Estonia.

The travel times computed in the analysis come with two main limitations, which could be addressed in future work. First, public transport is not considered as a possible travel mode, even though it is certainly a relevant travel mode for many essential-service users, notably those from disadvantaged groups such as people with low incomes or a disability. The main reason is that reliable data on public transport infrastructure and services – especially in rural areas – are not widely available. Second, the analysis does not consider congestion effects when calculating driving times, notably through road traffic. This is likely to result in an under-estimation of true driving times, especially in metropolitan regions, implying that the driving times presented in this paper likely correspond to lower bounds of people's actual driving times.

The choice of accessibility indicators presented in this paper reflects assumptions about people's likely usage patterns of each service. For PES, the paper only presents driving times. This is because visits to PES centres are likely to be sporadic, such that being able to walk to the nearest centre is probably not crucial for most of the population. However, this implies that jobseekers would need to have access to a motorised means of transportation or public transport, which may not always be the case. For primary schools and childcare facilities, both driving and walking times are presented. However, walking may be considered as the most relevant option to the extent that it may be a desirable policy goal to permit parents and their small children to be able to walk to these facilities on a daily basis.

Figure 2. Regional distributions of driving times to nearest PES centre, in Estonia

Cumulative percentage of the regional population with access to a PES centre within a specified travel time; small (TL3) regions in Estonia, 2023



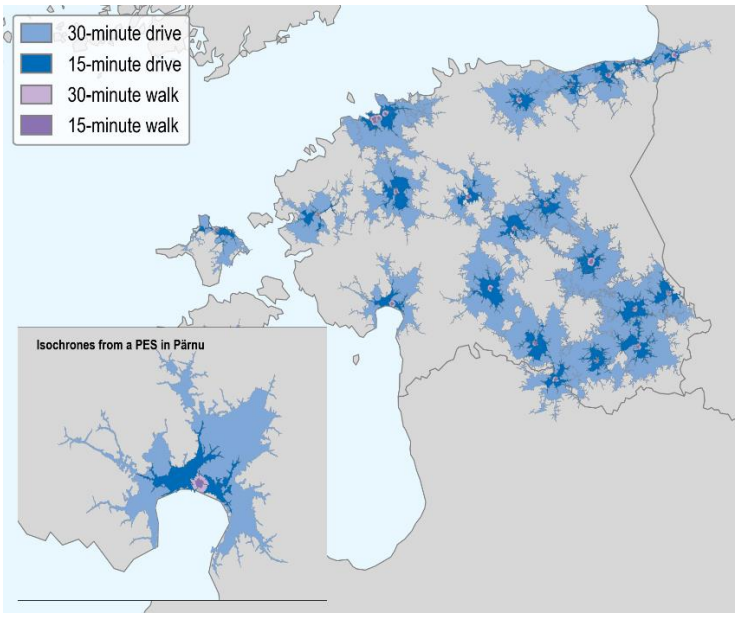
Note: The horizontal dashed lines indicate the travel times for Bottom 20%, median, and Top 20% of the regional population. The vertical dashed lines indicate the cumulative population shares with travel times below 15 and 30 minutes.
Source: OECD calculations based on location data obtained from national authorities. See Annex A for details.

Computing the accessibility indicators involves two main steps:

1. *Determining the isochrones*, i.e. the area that is reachable in a certain time from each service facility using a given transport mode (see Figure 3 for an example of the 15- and 30-minute driving and walking isochrones for PES in Estonia). In the analysis, isochrones are computed for each of the twelve time thresholds, for each of the two possible transport modes. This is done using the Mapbox (2023*) Isochrone API*, which provides isochrone polygons for a facility using its geographical coordinates as inputs for time ranges up to 60 minutes for three modes of transport: driving, cycling[13] and walking.
2. *Combining the isochrones with the population data and computing the accessibility indicators*. First, the isochrones for each type of service and each time threshold within a country are dissolved into a single polygon to obtain the area within reach of at least one facility and avoid overlaps. Isochrones are dissolved regardless of the regional borders, i.e. the area within reach of a service located in a given region is not limited to that region. These dissolved isochrones are then combined with the population grid and regional administrative borders to obtain the population in each region that can reach a certain service within a given travel time. The ratio of the population covered over the total regional population then gives the share of the regional population with access to a certain service within a certain travel time. Comparing travel times for the same population groups across regions allows assessing the regional inequalities in accessibility both within and between countries.

[13] The analysis presented in this paper does not consider cycling as a possible transport mode.

Figure 3. Isochrone polygons for PES centres in Estonia



Source: Authors' own calculations based on the Mapbox Isochrone API.

For the statistical analysis, regions are grouped following the OECD access-to-cities typology (see Box 1 for further details). This implies that TL3 regions with more than half of their population living in the same metropolitan area (i.e. a FUA of at least 250 000 people) - as defined in Dijkstra, Poelman and Veneri (2019[46]) - have been aggregated into a single region for better comparability. For instance, the metropolitan area of Brussels is composed of seven TL3 regions (Brussels Region, Aalst, Halle-Vilvoorde, Leuven, Nivelles, Ath and Soignies).

Box 1. Classification of small (TL3) regions by level of access to cities

The OECD Access to Cities typology for small (TL3) regions helps to assess differences in socio-economic trends in regions, both within and across countries. It accounts for the presence of cities, or Functional Urban Areas (FUAs), and the extent to which the latter are accessible by the population living in each region. The typology classifies small (TL3) regions into metropolitan and non-metropolitan regions according to the following criteria:

Metropolitan region, if more than half of its population lives in a midsize/large FUA. Metropolitan regions are further classified into:

- *Metropolitan large*, if more than half of its population lives in a (large) FUA of at least 1.5 million inhabitants; and
- *Metropolitan midsize*, if more than half of its population lives in a (midsize) FUA of at least 250 000 to 1.5 million inhabitants.

Non-metropolitan region, if less than half of its population live in a midsize/large FUA. These regions are further classified according to their level of access to FUAs of different sizes:

- *Near a midsize/large FUA* if more than half of its population lives within a 60-minute drive from a midsize/large FUA (i.e. with more than 250 000 inhabitants) or if the TL3 region contains more than 80% of the area of a midsize/large FUA;

- *Near a small FUA* if the region does not have access to a midsize/large FUA and at least half of its population has access to a small FUA (i.e. between 50 000 and 250 000 inhabitants) within a 60-minute drive, or contains 80% of the area of a small FUA; and
- *Remote*, otherwise.

This paper only distinguishes between metropolitan regions and the three types of non-metropolitan regions, not considering the distinction between large and midsize metropolitan regions.

Sources: (OECD, 2020[47]) and (Fadic et al., 2019[48]).

5. How accessible are essential services in OECD regions?

This section presents evidence on how accessible essential services are in OECD regions.[14] It starts by showing that accessibility is generally high for a large part of the population (Subsection 5.1.), but that there exist important inequalities between population groups, with people with the lowest levels of accessibility often having very long travel times (Subsection 5.2.). The analysis then moves to a comparison of walking and driving times, showing that for some people not owning a motor vehicle may severely undermine or even impede accessibility (Subsection 5.3.). Finally, it assesses disparities between metropolitan and non-metropolitan regions, concluding that accessibility is in general higher in the former, but that even among regions with the same level of access to cities there are non-negligible differences in accessibility (Subsection 5.4.).

5.1. *For all services, accessibility is high for a large part of the population*

In most regions in European countries, PES centres are easily accessible by motor vehicle for the median person (Figure 4). Driving times are generally below 20 minutes, which is reasonably short given that most people would probably not need to visit PES very frequently. The main exceptions are regions that are remote (e.g. Lozère, a *Département* in the south of France or La Gomera, one of Spain's Canary islands) or that are non-metropolitan regions close to a small FUA (e.g. Avila, a province northwest of Madrid in Spain, or the Western Region in Iceland), where median driving times are higher than 30 minutes. In Colombia and Mexico, accessibility tends to be lower than in other countries, with some regions having median driving times above 50 minutes. For a person in the Top 20%, driving times are less than 10 minutes in the vast majority of regions (not shown here for ease of presentation).

For primary schools and ECEC centres, accessibility by motor vehicle is also high, with driving times being below 10 minutes in virtually all regions (not shown for ease of presentation). Furthermore, accessing these services by foot is in general also feasible for the median person, as walking times to both the nearest primary school and ECEC centre are below 20 minutes in most regions (Figure 5). As previously mentioned, walking is likely to be the most relevant mode of transportation for these services, for most people, given how frequently parents and children need to travel there. There are however some notable exceptions such as Douro in the north of Portugal for primary schools and Lugo in the north of Spain for ECEC centres. A deeper dive into the results of ECEC centres further shows that there can be non-negligible differences between accessibility for kindergartens and nurseries, as illustrated in Box 2 for Belgium.

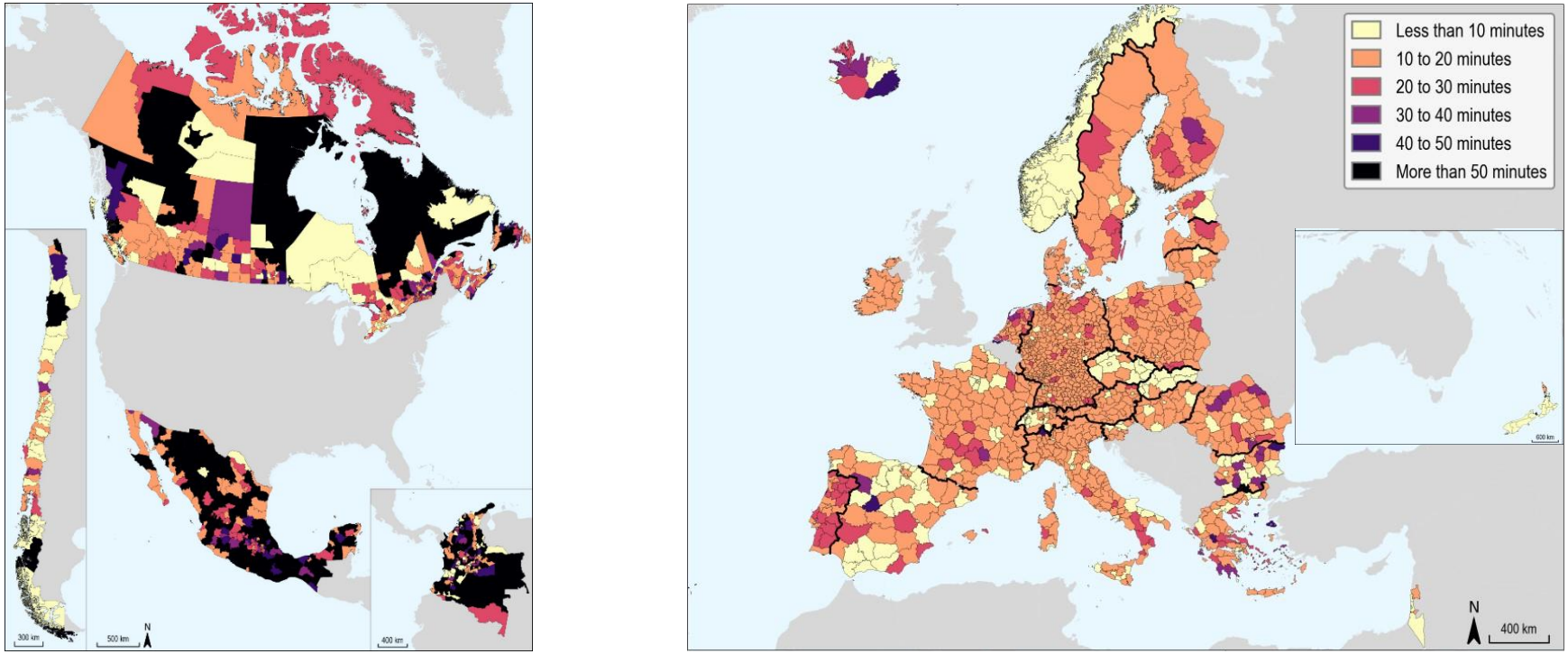
[14] As discussed in previous sections, all the results presented in this paper refer to physical accessibility. For simplicity, only the term accessibility is used.

Figure 4. PES centres are within a short driving time for the median person, in most regions

Driving times to nearest PES centre, for the population median

A. Americas

B. Europe, Israel and New Zealand

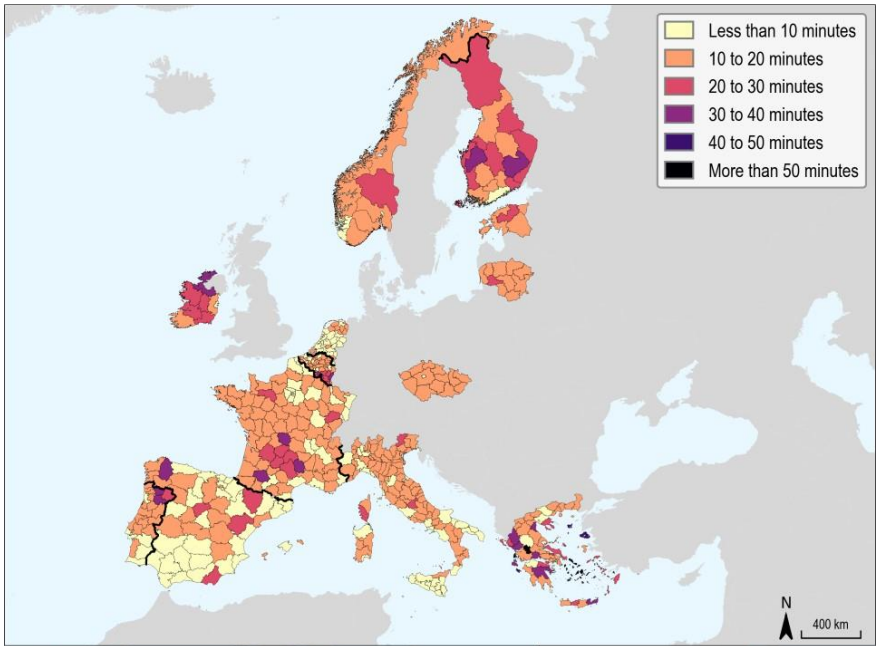


Note: The island regions Åland (Finland), Gotland (Sweden), Eivissa y Formentera (Spain) and Mayotte (France) are not included in the analysis. Other insular regions are included in the analysis but not shown here to simplify the visual representation. The regions Trento, Bolzano and Aosta Valley (Italy), are not included in the analysis.
Source: OECD calculations based on location data obtained from national authorities. See Annex A for details.

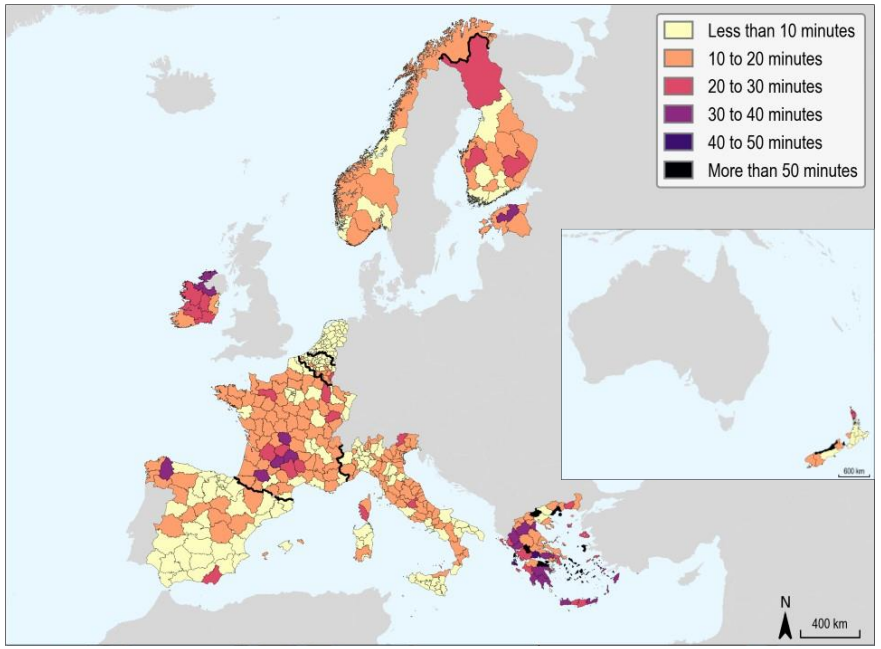
Figure 5. Primary schools and ECEC centres can be reached by foot by the median person, in most regions

Walking times to nearest primary school and ECEC centre, for the population median

A. Primary schools



B.ECEC centres



Note for primary schools: The island regions Azores and Madeira (Portugal) are not included in the analysis. For Spain, all island regions are included in the analysis, but not shown in the graphs, to simplify the visualisations. The regions Trento, Bolzano and Aosta Valley (Italy) are not included in the analysis.
Note for ECEC centres: For Estonia, France, Greece, Ireland, Italy, and Spain only pre-primary education is covered. The island regions Jan Mayen and Svalbard (Norway) and the regions Trento, Bolzano and Aosta Valley (Italy) are not included in the analysis.
Source: OECD calculations based on location data obtained from national authorities. See Annex A for details.

Box 2. A spotlight on the accessibility of nurseries and kindergartens in Belgium

In several countries, there are important institutional differences between the provision of early childhood educational development (i.e. nurseries) and pre-primary education (i.e. kindergarten). The data available do not allow for a systematic cross-country analysis of the differences in accessibility for these two types of ECEC, as only in very few countries the two types can be distinguished. One exception is Belgium, for which separate data for nurseries and kindergartens are available.

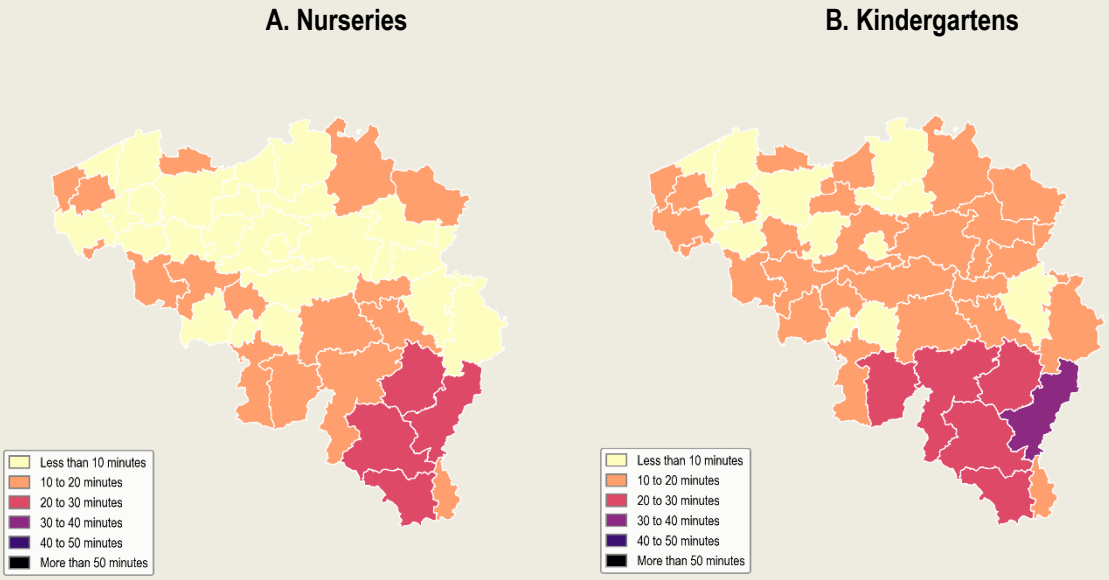
In Flanders, the ECEC system is split into two, with different ministerial authorities being responsible for children up to 3 years (under the Flemish Ministry for Welfare, Public Health, Family and Poverty Reduction, and managed by the government agency Upbringing - *Opgroeien*) and between 2.5 and 6 years (under the Flemish Ministry of Education and Training). This split encourages the division between "care" and "education" in ECEC centres. A similar split exists in Wallonia, with care for children up to 3 years being the responsibility of the Birth and Childhood Office (*Office de la Naissance et de l'Enfance* – ONE), and pre-primary education for children between 2.5 and 6 years being the responsibility of the Ministry of Education.

Besides these institutional differences, there can exist important distinctions in how services are provided. In Wallonia, childcare at the kindergarten level is generally provided in centre-based settings, while childcare at the nursery level can be provided both in centre-based settings or through a system of regulated home-based provision by childminders. The standard of care requires one childminder for a maximum of four full-time-equivalent children, with the presence of five children permissible in specific circumstances. Centre-based childcare settings account for 77% of childcare capacity, while home-based care accounts for the remainder (ONE, 2021[49]). Although childminders account for only one quarter of total service capacity, they constitute two thirds of nursery institutions in Wallonia, and therefore play an important role for geographic accessibility.

Walking times to these two types of facilities for the median person in Belgium show non-negligible differences, with accessibility of nurseries being higher than that of kindergartens in many regions (Figure 6). For instance, in a few regions in Flanders and in northern Wallonia, the nearest nursery is within less than a ten-minute walk for the median person, while for kindergartens this is the case only in the Brussels Capital region. Furthermore, for all regions in Flanders and in the North of Wallonia, walking times to the nearest nursery are below 20 minutes, while for kindergartens they can go up to 30 minutes. Accessibility is in general lower in regions in the south of Wallonia, both for nurseries and kindergartens, but it is particularly low for kindergartens in some regions. The higher accessibility of nurseries likely reflects the very large number of childminders in Belgium. Although these facilities ensure greater proximity, their capacity is in many cases very limited, and therefore their actual ability to cater to local demand may be lower. A complete assessment of the accessibility of nurseries would require a joint analysis of these two dimensions of accessibility, spatial accessibility and capacity.

Figure 6. Walking times to nurseries are lower than to kindergartens for the median person in Belgium

Walking times to nearest nursery and kindergarten, for the population median, in Belgium



Note: Location data for the German-speaking region of Belgium was not available, and therefore this region is not included in the analysis. This may bias downwards the results for the neighbouring French-speaking regions, as some people in these regions are likely to travel to the adjacent German-speaking region to access childcare services.
Source: OECD calculations based on location data obtained from national authorities. See Annex A for details.

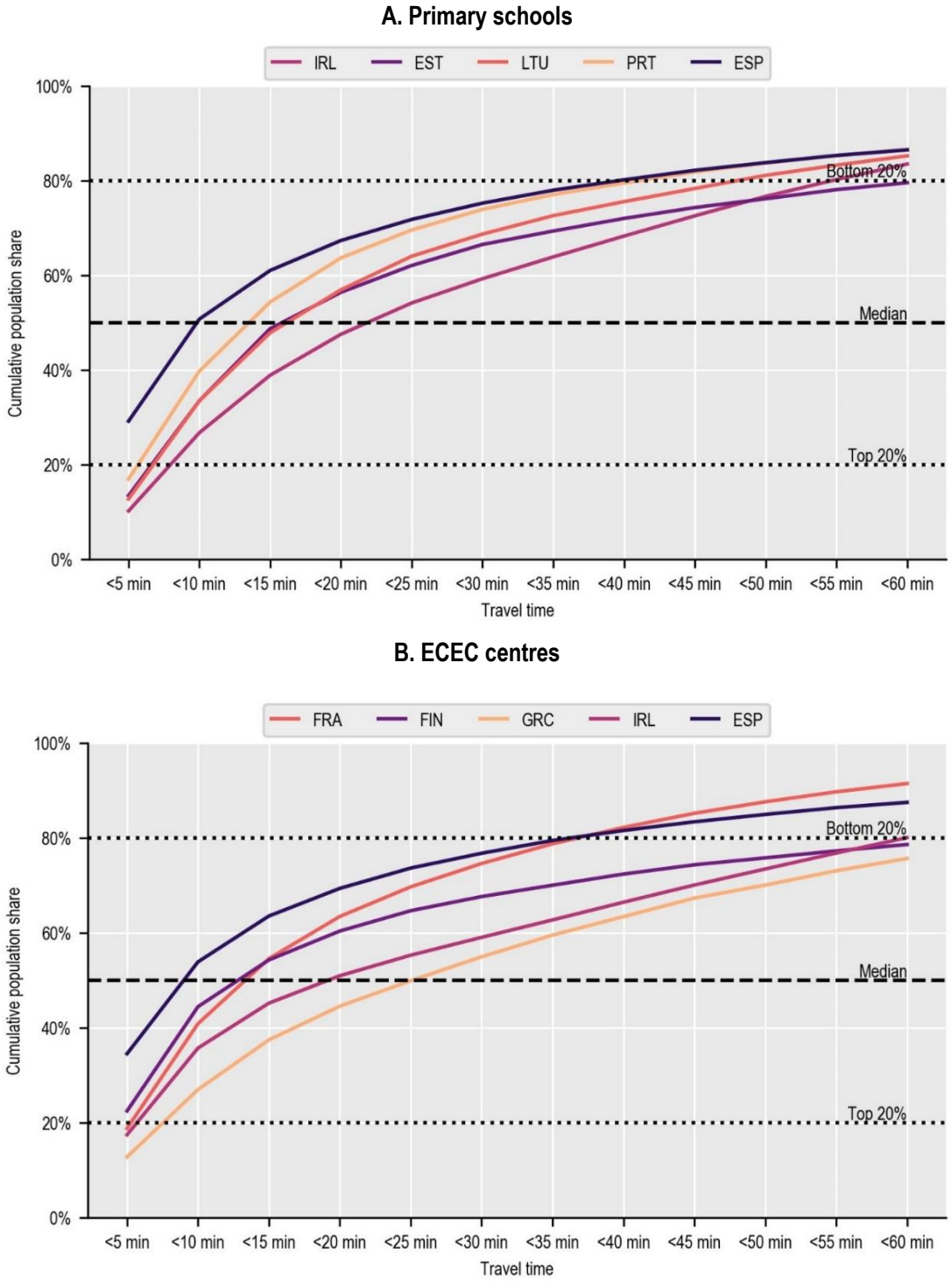
5.2. *For some people, travel times to reach essential services can be quite long*

While in most countries accessibility is high for a large fraction of the population, people with lowest accessibility may find reaching the nearest service largely unpractical or even unfeasible. Figure 7 provides an illustration of the distribution of walking times to the nearest primary school and ECEC centre, at the country level, in a selection of countries. In all countries, the 30% of the population with lowest access have walking times to the nearest primary school and ECEC centre higher than 20 minutes. In some countries, e.g. Ireland, accessibility can be low even for a larger share of the population, with walking times being higher than 20 minutes for 50% of the population. For a person in the Bottom 20%[15], walking times can go up to 60 minutes in several countries. Although there is no exact time threshold above which walking to the nearest service may be considered unpractical, it is likely that people with walking times above 20 minutes will find it difficult to access their children's school or ECEC centre by foot, given that this journey will often need to be made daily. These results suggest that countries struggle to make services equally accessible for all population groups, with a non-negligible share of people being relatively underserved.

[15] As explained in Section 4. , people in the Bottom 20% are the 20% of people with the highest travel times in the travel time distribution.

Figure 7. Walking to the nearest primary school and ECEC centre can be unfeasible for many people, in most countries

Walking times to nearest primary school and ECEC centre, for a selection of countries, country average

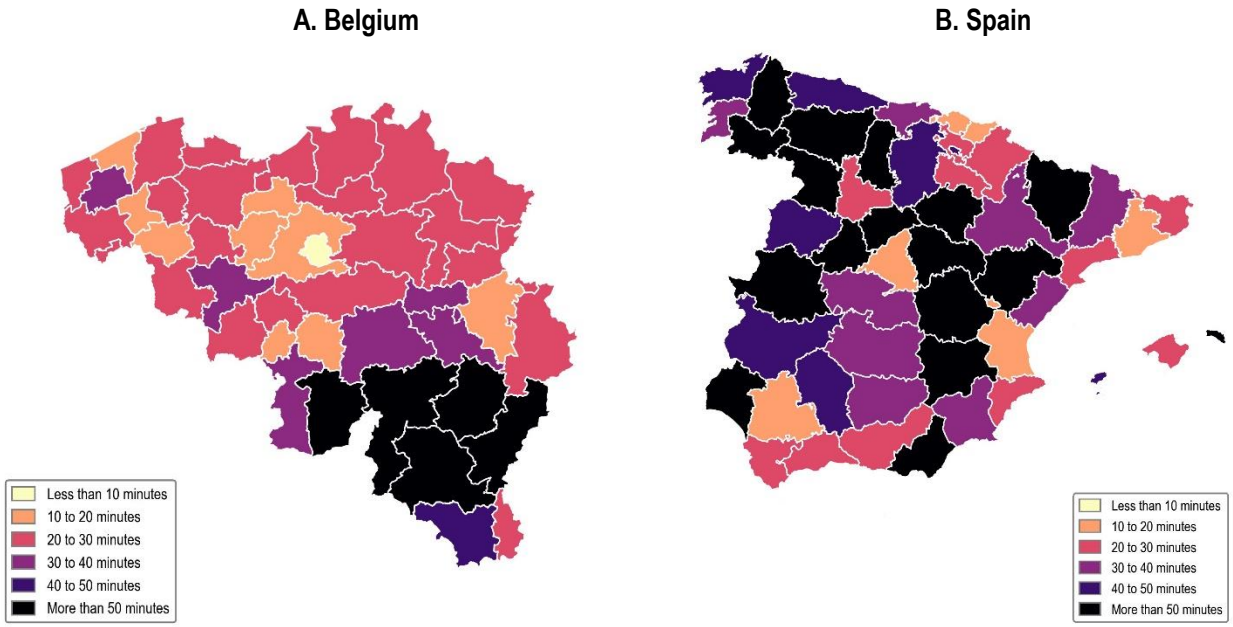


Note for primary schools: The island regions Azores and Madeira (Portugal) are not included in the analysis.
Note for ECEC centres: For France, Greece, Ireland, and Spain only pre-primary education is covered.
Source: OECD calculations based on location data obtained from national authorities. See Annex A for details.

However, there can be large cross-regional disparities in accessibility among groups that are less well served in several countries. While on average the Bottom 20% in a given country can be significantly underserved relative to the rest of the population, this may not be the case in all regions, with some being able to ensure a high level of accessibility even for those at the higher end of the travel time distribution Figure 8 illustrates this for primary schools, in Belgium and Spain, focusing on walking times. In Belgium, while in the Brussels Capital region someone in the Bottom 20% can reach the nearest primary school within a 10-minute walk, it can take more than 50 minutes for someone in that same population group in the Bastogne or Neufchâteau regions in the south of the country. In Spain, walking times to the nearest primary school for someone in the Bottom 20% can go from 10 to 20 minutes in Madrid and Catalonia, to more than 50 minutes in Huelva and Huesca.

Figure 8. Regions can differ significantly in the accessibility they provide to those that are less well served

Walking times to nearest primary school, for the Bottom 20%, in Belgium and Spain



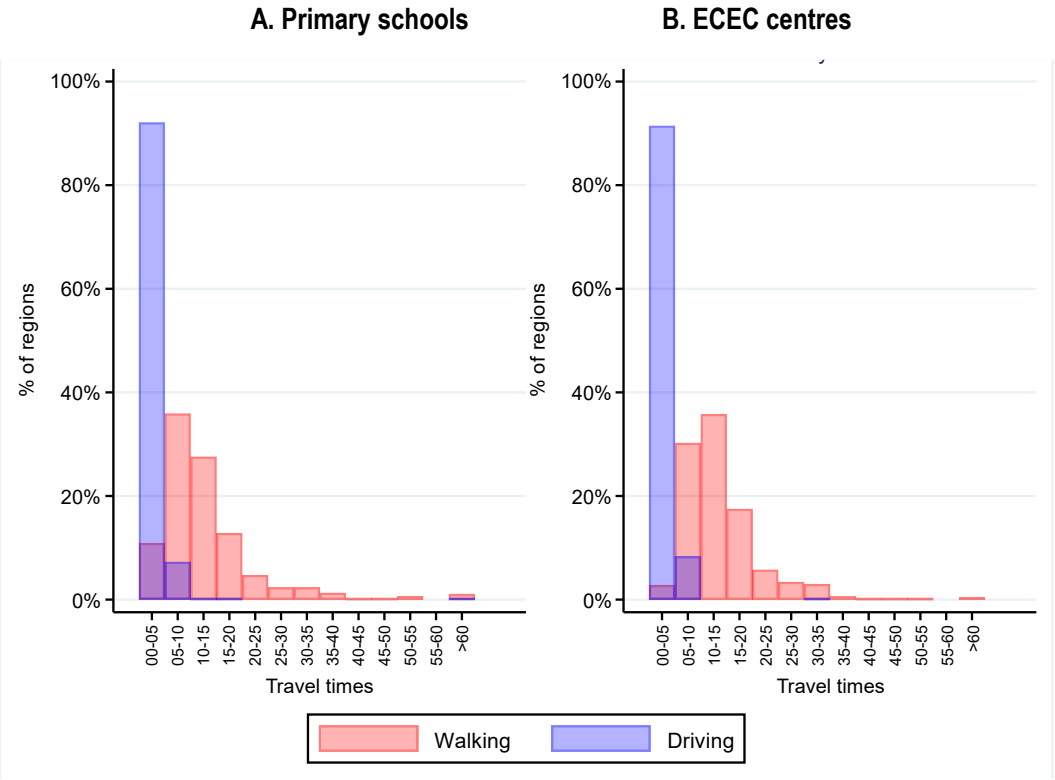
Note: For Spain, only pre-primary education is covered.
Source: OECD calculations based on location data obtained from national authorities. See Annex A for details.

5.3. *Having access to a motor vehicle may crucially impact inequalities in accessibility*

Having access to a motor vehicle may be an important determinant of inequalities in accessibility. For the median person, driving times to the nearest primary school are below 5 minutes in most regions considered in this paper, while walking times can go up to 25 minutes in several regions and even higher in a few (Figure 9). For ECEC centres, the same pattern holds, but a higher share of regions exhibits shorter travel times, which suggests that accessibility is somewhat better than for primary schools. While driving to these services is easy in all regions, walking can often be very time consuming. As previously mentioned, accounting for the possibility of taking public transport is likely to be key and may show that viable alternatives to using a motor vehicle are available in several regions. Furthermore, particularly for primary schools, school buses may also be a crucial mode of transportation in some countries.

Figure 9. Driving times to the nearest primary school and ECEC centre are short in all regions, while walking may be unfeasible in some regions

Driving and walking times to nearest primary school and ECEC centre, for the median person, in all regions across all countries

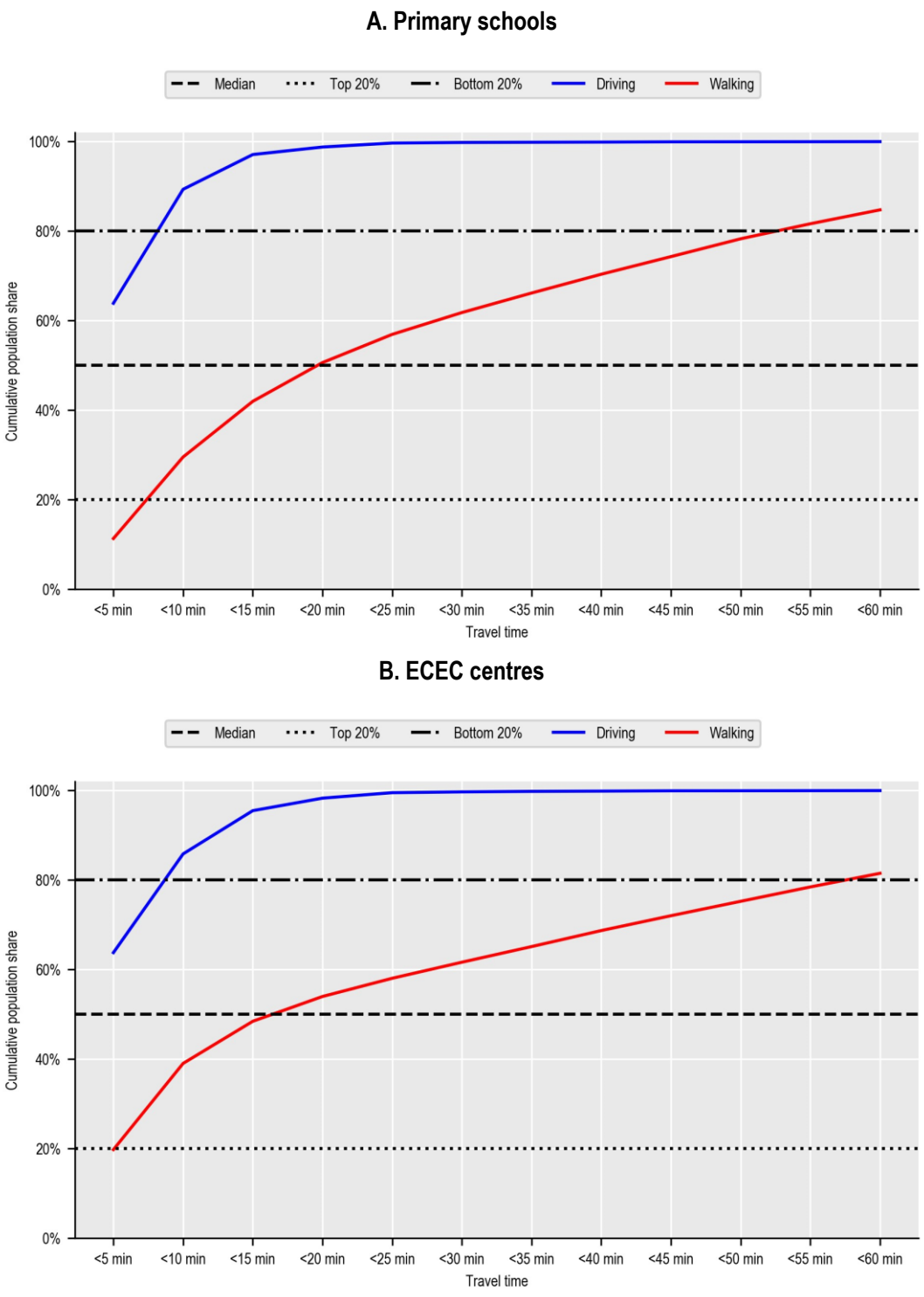


Note for primary schools: The island regions Azores and Madeira (Portugal) and the regions Trento, Bolzano and Aosta Valley (Italy) are not included in the analysis.
Note for ECEC centres: For Estonia, France, Greece, Ireland, Italy, and Spain only pre-primary education is covered. The island regions Jan Mayen and Svalbard (Norway) and the regions Trento, Bolzano and Aosta Valley (Italy) are not included in the analysis.
Source: OECD calculations based on location data obtained from national authorities. See Annex A for details.

A comparison of the full distribution of driving and walking times shows that in general the difference in accessibility using these two transport modes is more pronounced for population groups that are less well served. While not owning a motor vehicle is generally not a problem for the median person, it may seriously undermine accessibility for those with lowest access. Figure 10 provides an illustration for primary schools and ECEC centres, in Ireland. For the median person, driving times to both primary schools and ECEC centres are below 5 minutes, while walking times are between 15 and 20 minutes. For someone in the Bottom 20%, driving times are below 10 minutes, while walking times are close to 55 minutes. While for the median person accessing the nearest primary school or ECEC centre is feasible both by motor vehicle and by foot, for someone in the Bottom 20% access by foot is likely unfeasible.

Figure 10. In Ireland, as in all countries, disparities between driving and walking times are higher for the less well served

Driving and walking times to nearest primary school and ECEC centre, in Ireland



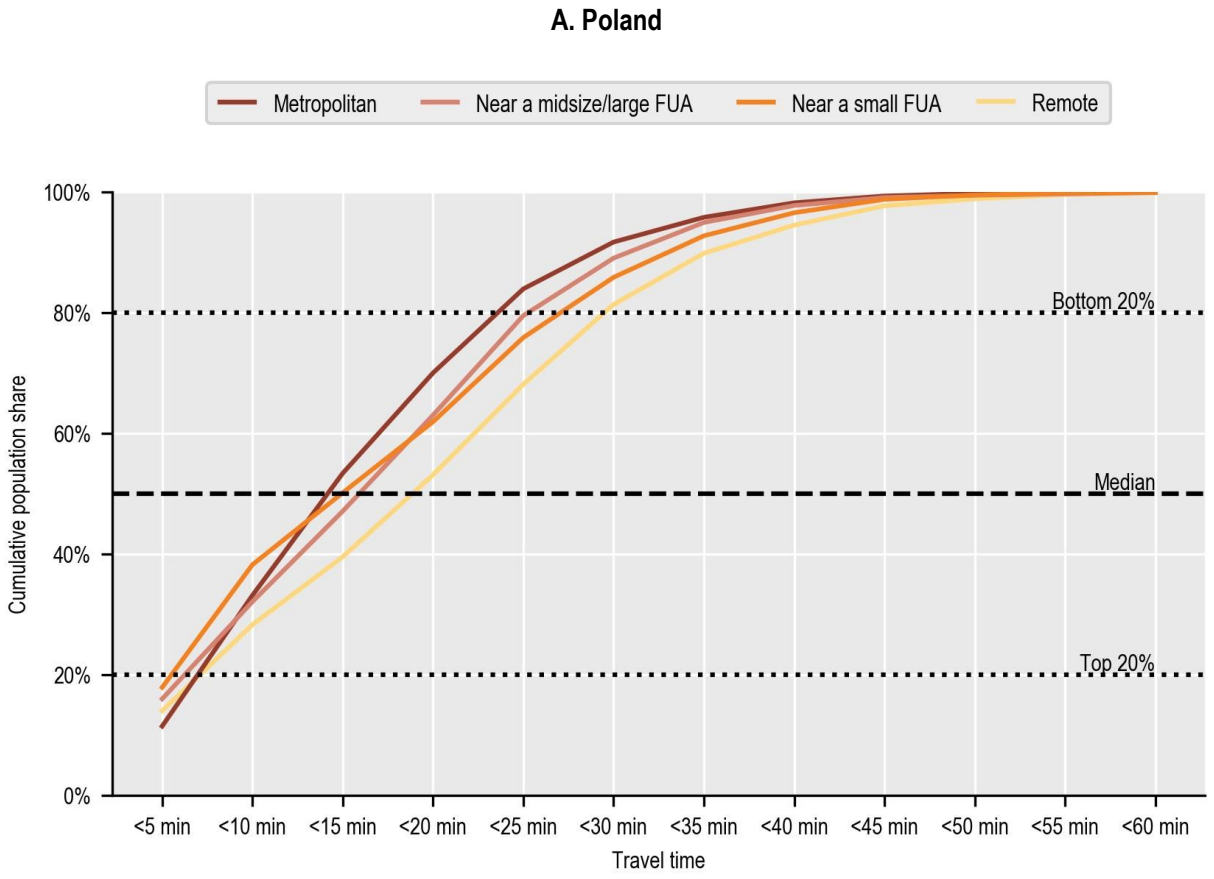
Source: OECD calculations based on location data obtained from national authorities. See Annex A for details.
Note: The people in each population group of the two distributions need not coincide. For example, the group of people with median driving time is not necessarily the same group of people with median walking time.

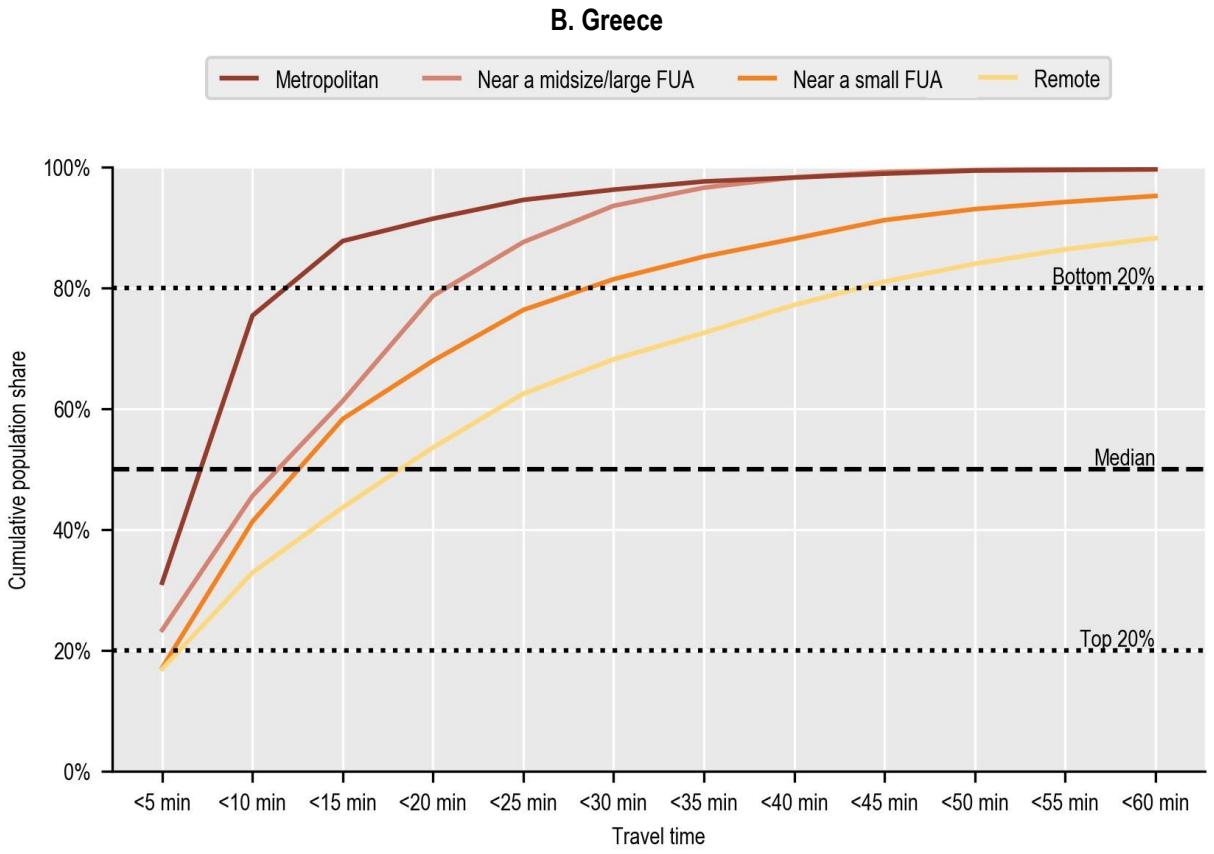
5.4. *Accessibility is higher in metropolitan than in non-metropolitan regions, but there can be large differences among regions with a similar level of access to cities*

A more systematic analysis of service accessibility by level of access to cities unveils significant differences between residents in metropolitan and non-metropolitan regions. For almost all countries included in the analysis, a greater degree of access to cities is associated with shorter travel times. However, the range of disparities between metropolitan and non-metropolitan regions varies considerably across countries. Figure 11 illustrates this by comparing the distribution of driving times to the nearest PES centre for the four types of regions defined in Box 1 for two particular countries, Poland (Panel A.) and Greece (Panel B.). In Poland, these distributions are relatively close, while in Greece they are much more spread apart, especially for the people with lowest accessibility. For example, while in Poland travel times for the Bottom 20% range between 20-25 minutes in metropolitan regions to 25-30 minutes in remote regions, in Greece they range between 10-15 minutes and 40-45 minutes. The lower accessibility in non-metropolitan regions may reflect a combination of several factors including lower number of centres per capita, lower population density, and/or less developed transport infrastructure. The same pattern holds for accessibility by foot for primary schools and ECEC centres. However, differences in accessibility by motor vehicle to these services between metropolitan and non-metropolitan regions are much less marked, since driving times are in general low.

Figure 11. Driving times to PES centres decrease with the degree of access to cities, but the extent differs significantly across countries

Driving times to nearest PES centre, by level of access to cities, in Poland and Greece



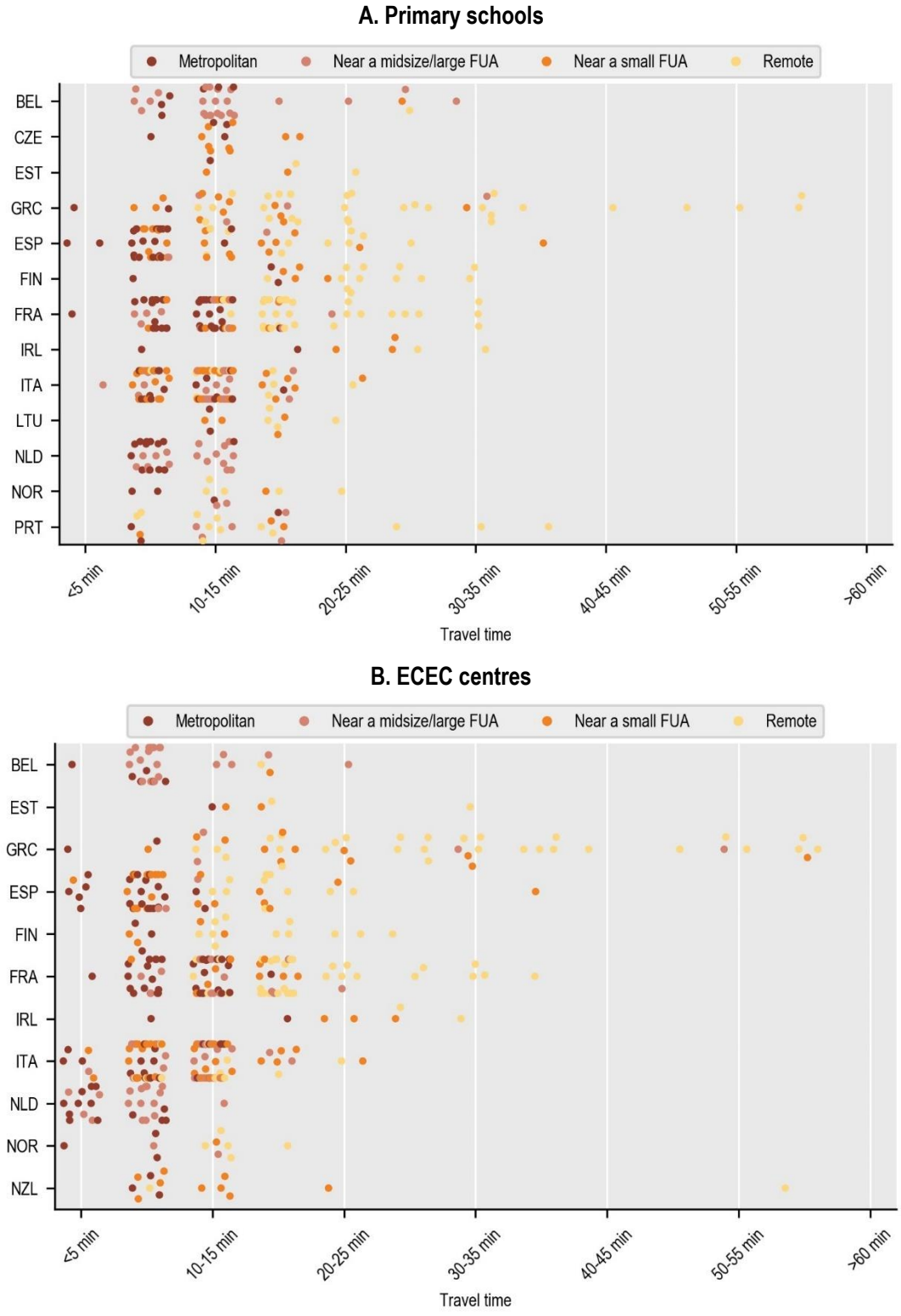


Source: OECD calculations based on location data obtained from national authorities. See Annex A for details.

The spread of travel times also differs substantially among regions of the same type. In all countries, the dispersion of walking times to primary schools and ECEC, for the median person, is small for metropolitan regions with most of these regions having walking times close to 15 minutes (Figure 12). By contrast, the dispersion in walking times in regions with lower access to cities can be quite high, in particular for regions near a small FUA or remote regions where walking times can go from less than 10 minutes to more than 55 minutes. However, patterns vary across countries: in some, such as Lithuania and Netherlands, median walking times are quite similar for most regions irrespective of their type; in others, such as France and Greece, there is a higher dispersion of travel times across regions.

Figure 12. Dispersion in walking times to primary schools and ECEC centres for the median person is generally low among metropolitan regions, but can be high among non-metropolitan regions

Walking times to nearest primary school and ECEC centre, for the population median, by level of access to cities



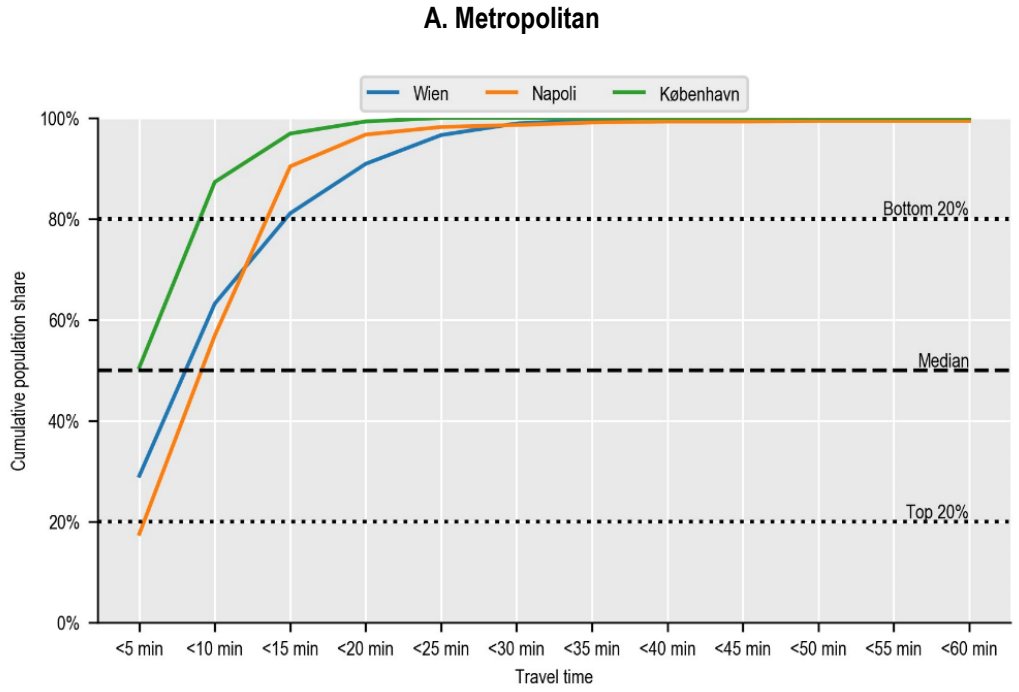
Note for primary schools: The island regions Azores and Madeira (Portugal) and the regions Trento, Bolzano and Aosta Valley (Italy) are not included in the analysis.
Note for ECEC centres: For Estonia, France, Greece, Ireland, Italy, and Spain only pre-primary education is covered. The island regions Jan Mayen and Svalbard (Norway) and the regions Trento, Bolzano and Aosta Valley (Italy) are not included in the analysis.
Source: OECD calculations based on location data obtained from national authorities. See Annex A for details.

While differences between metropolitan and non-metropolitan regions go a long way in explaining geographic disparities in accessibility, other factors clearly matter, which translates into disparities among regions with the same level of access to cities. Figure 13 illustrates this for two sets of regions with the same level of access to cities and similar total population and population density. It shows the distributions of travel times to the nearest PES centre for selected metropolitan regions in three different European countries (Panel A.), and five selected remote regions in France (Panel B.). The metropolitan regions – Copenhagen (Denmark), Naples (Italy) and Vienna (Austria) – all have 2 to 3 million inhabitants, and a population density between 2 400 and 3 300 inhabitants per square kilometre. The remote regions, which are located in different parts of mainland France, all have between 140 000 and 180 000 inhabitants, and a population density between 25 and 29 inhabitants per square meter.

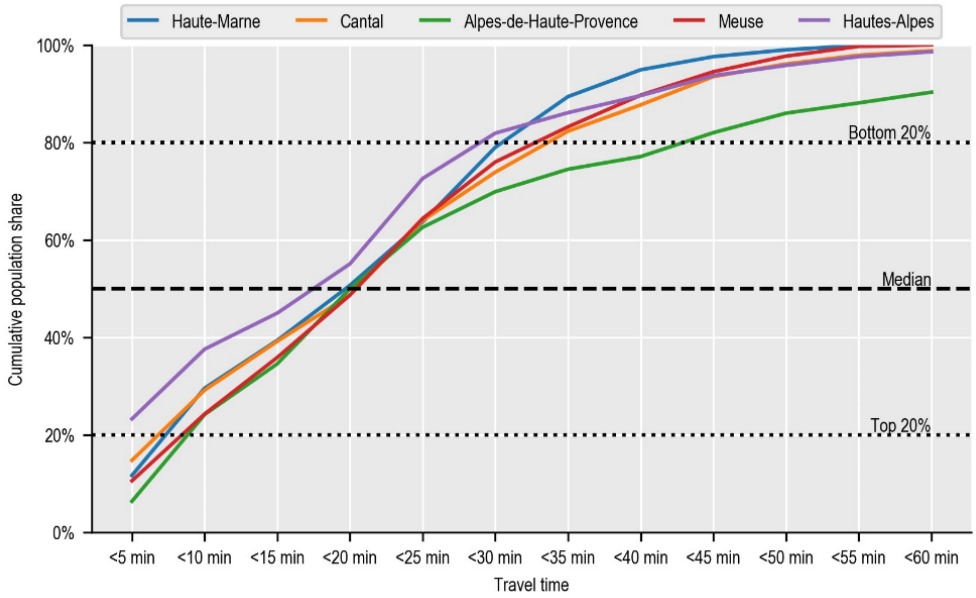
The results show that differences in driving times to PES centres may be driven not only by a metropolitan/non-metropolitan divide but also by institutional and structural factors differentiating regions of the same type. Interestingly, disparities in metropolitan regions are more concentrated at shorter travel times (below 25 minutes), while for non-metropolitan regions disparities persist for longer travel times.

Figure 13. Driving times to the nearest PES centre differ for similar regions with the same level of access to cities

Driving times to nearest PES centre, for selected similar metropolitan and remote regions



B. Remote



Note: Similar regions were defined as regions with comparable levels of total population and population density. Regions in Panel A. all have between 2 and 3 million inhabitants, and a population density between 2 400 and 3 300 inhabitants per square kilometre. Regions in Panel B. all have between 140 000 and 180 000 inhabitants, and a population density between 25 and 29 inhabitants per square kilometre.
Source: OECD calculations based on location data obtained from national authorities. See Annex A for details.

6. What demographic and economic characteristics are associated with higher service accessibility?

Previous sections have provided evidence on systematic inequalities in service accessibility across regions but have offered only a glimpse on what regional characteristics may explain these inequalities. This section expands the analysis to examine the relationship between service accessibility and a selection of regions' economic and demographic characteristics. Subsections 6.1. and 6.2. offer a descriptive analysis of the associations between service accessibility and some of these characteristics. Subsection 6.3. uses econometric analysis to assess the relative significance of different regional characteristics in explaining inequalities in accessibility once all characteristics are considered in conjunction.

For conceptual and methodological reasons, this section makes a slight adjustment in the outcome variable used in the analysis. Instead of *travel time categories*, it uses the *share of people in a region who can reach a service within 15 minutes* by motor vehicle (PES) or by foot (primary schools and ECEC centres)[16]. This offers some advantages for carrying out econometric analysis. First, as a continuous variable, this variable is well suited for an ordinary least squares regression model and facilitates the interpretation of regression coefficients. Second, it provides greater variation across regions than travel time categories. This is so because, irrespective of the population group chosen (e.g., median, bottom 20%), most regions tend to exhibit travel times within a narrow range of categories. Third, and related to the previous point, this variable does not require focusing on one population group alone for the analysis. The selection of the time thresholds – 15 minutes by motor vehicle (PES) and foot (primary schools and ECEC centres) – is

[16] Both variables are derived from the same travel time distribution (see Figure 1). Instead of using the travel times for a group of the population (e.g., the median person), this section takes the share of the population that can reach a service within a given travel time threshold.

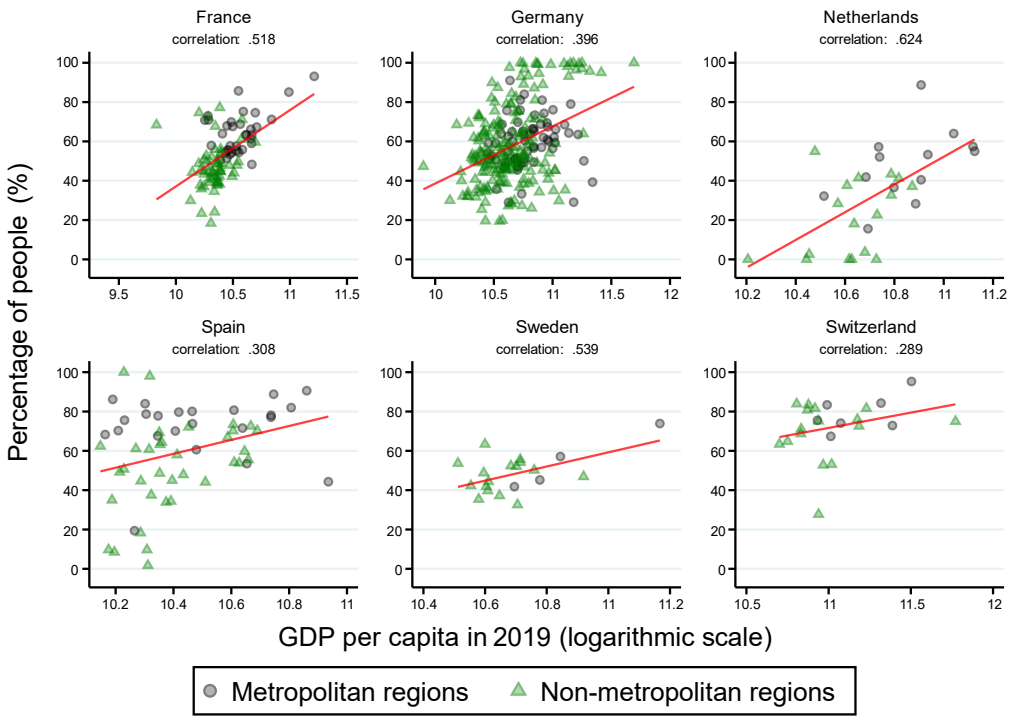
justified on grounds of both policy relevance and data structure: it maximises the variation across regions. In fact, as the time threshold increases, a very large share of people can reach these the services in most regions, particularly for PES.

6.1. Services are systematically less accessible in lower-income regions

In most countries, the share of people who can swiftly reach essential services is much lower in lower-income regions that in more affluent ones. The differences between higher- and lower-income regions are substantial across most countries. For example, whereas almost all people living in the highest-income regions of France and Germany can reach a PES centre within a 15-minute drive, less than 50% of people can do so in most lower-income regions in these countries (Figure 14). Similar disparities are apparent for primary schools and ECEC centres (Annex B, Figure A B.1). This highlights that making services accessible for all is particularly challenging in poorer regions.

Figure 14. PES centres are systematically less accessible in lower-income regions

Association between the share of the population that can reach a PES centre within 15 minutes by motor vehicle and GDP per capita in 2019, in selected countries



Note: The figure shows 6 out of the 26 countries for which data on accessibility of PES and regional income at the TL3 level are available, but the pattern shown for these countries generalises to the others. The island regions Gotland (Sweden), Eivissa y Formentera (Spain) and Mayotte (France) are not included in the analysis. GDP per capita is measured in 2019 to avoid potential distortions because of the COVID-19 crisis.
Sources: Accessibility data derived from OECD calculations based on location data obtained from national authorities. See Annex A for details. GDP per capita expressed in 2015 international $ is retrieved from the OECD Regional Statistics database: https://www.oecd.org/regional/regional-statistics/.

The relationship between service accessibility and regional income partly reflects differences between metropolitan and non-metropolitan regions, but not only. Metropolitan regions generally have a higher GDP per capita than non-metropolitan ones (OECD, 2023[50]), and also service accessibility is typically higher

in the former (Figure 11). This is the result of a combination of factors including higher population density, better transport infrastructure, and economies of scale, which facilitate a more efficient service provision. Yet, the income accessibility gap between metropolitan and non-metropolitan regions is not merely a by-product of these advantages. Even a*mong* metropolitan regions, most countries show very high accessibility in a handful of high-income metropolitan regions. Meanwhile, many lower-income metropolitan regions exhibit accessibility levels similar to those of non-metropolitan regions (Figure 14 and Annex B, Figure A B.1). Indeed, the econometric analysis in Subsection 6.3. suggests that even when accounting for the degree of access to cities, the share of residents who can swiftly reach essential services is generally larger in higher-income regions.

Unlike for GDP levels, current service accessibility is not systematically associated with GDP growth over the last 15 years in a bivariate analysis, i.e. without accounting for other characteristics. In most countries, regions whose GDP per capita has grown more slowly over the last 15 years do not currently exhibit a lower share of people being able to reach services in under 15 minutes (Annex B, Figure A B.2). While an association can be observed in some countries, the direction of this association is not uniform across countries. For example, whereas in France regions in economic decline exhibit lower accessibility of PES, the opposite is true in Germany.

6.2. The potential number of users alone is not systematically associated with better services accessibility

Accessibility of essential services could also be driven by local demand. Intuitively, one would expect governments to promote service accessibility in areas where the concentration of potential users is higher. However, a simple correlation analysis, which does not account for any other regional characteristics, does not find a systematic relationship between accessibility levels and demand indicators for all countries and services.

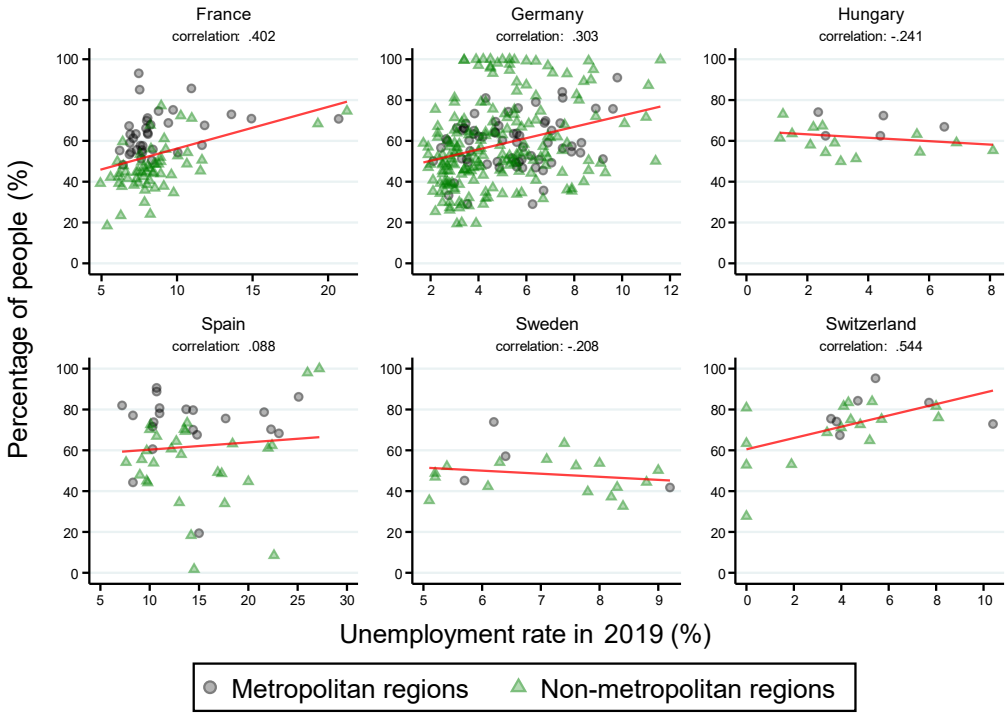
For PES centres, the association between regional unemployment[17] and service accessibility is not consistent across countries (Figure 15). As discussed in Subsection 3.1. , PES play an important role in supporting employers and jobseekers. Yet, in half of the countries for which data are available, the share of people who can access a PES centre by motor vehicle within 15 minutes does not vary significantly across regions with different unemployment levels; in some countries, it is even larger in places with lower unemployment. This may reflect that that the geographic placement of PES centres in many countries likely results from governance structures and other institutional constraints, rather than being a direct response to local unemployment.

However, two elements call for a more nuanced interpretation. First, a simple bivariate correlation analysis does not permit controlling for other factors that may be associated with both service accessibility and unemployment levels, such as population density, regional income levels and demographic composition. The econometric analysis presented in Subsection 6.3. demonstrates that those factors matter, and that after considering these characteristics, the share of people who can reach a PES in under 15 minutes does indeed increase with the regional level of unemployment. Second, the accessibility indicators presented in this paper reflect physical accessibility for the overall population, not the specific service users, i.e., the unemployed people. This might weaken the relationship between accessibility and unemployment.

[17] The unemployment rate of aggregated metropolitan regions is computed as the population-weighted average across the TL3 regions belonging to that region.

Figure 15. PES accessibility does not vary systematically with regional unemployment levels

Association between the share of the population that can reach a PES centre within 15 minutes by motor vehicle and the unemployment rate in 2019, in selected countries

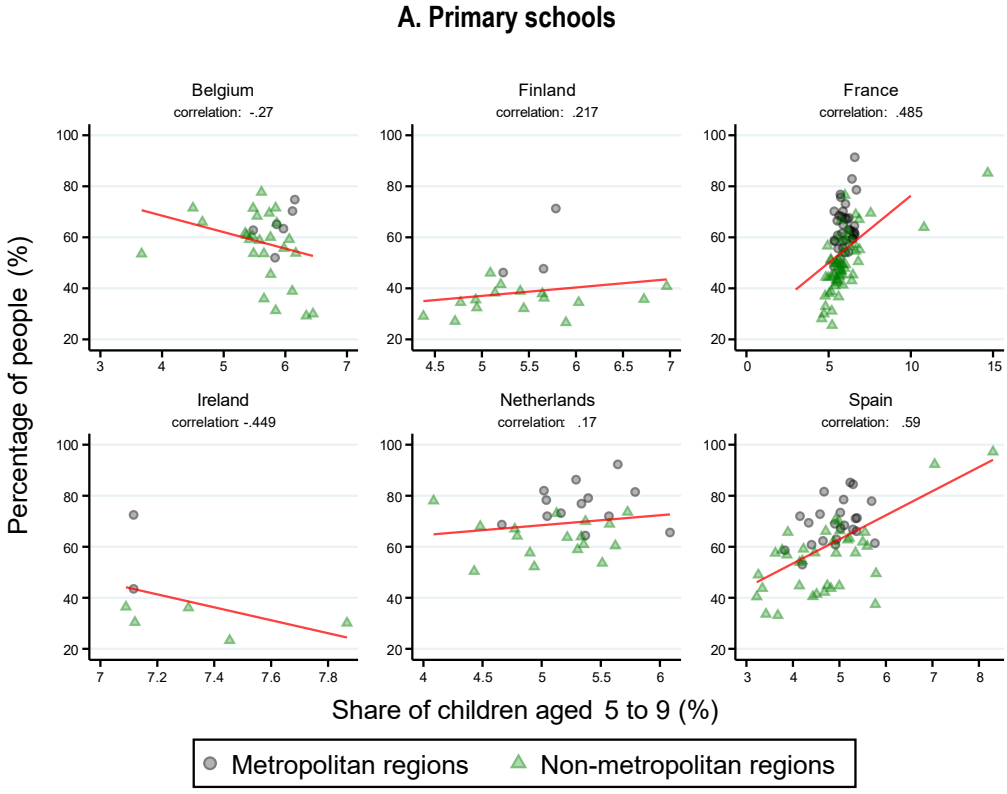


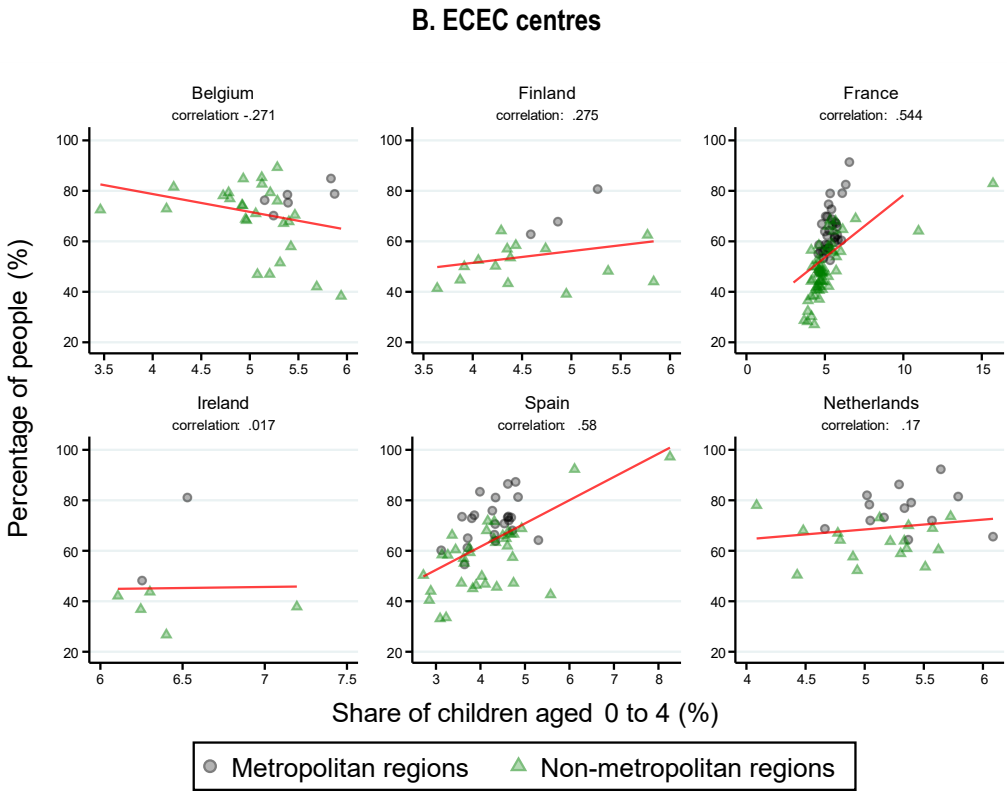
Note: The figure shows 6 out of the 19 countries for which data on accessibility of PES and unemployment at the TL3 level are available. The lack of a consistent pattern shown for these countries is also observable for other countries. The island regions Gotland (Sweden), Eivissa y Formentera (Spain) and Mayotte (France) are not included in the analysis. The unemployment rate is measured in 2019 to avoid potential distortions because of the COVID-19 crisis.
Sources: Accessibility data is derived from OECD calculations based on location data obtained from national authorities. See Annex A for details. Unemployment data is retrieved from the OECD Regional Statistics database: https://www.oecd.org/regional/regional-statistics/.

Unlike for PES, the accessibility of primary schools and ECEC centres relates to local demand, though with some exceptions. In most countries, the share of people that can access primary schools and ECEC centres by foot within 15 minutes increases with the share of children in the regional population. This pattern is stronger in non-metropolitan regions, where levels of accessibility vary more strongly. In metropolitan regions, most people can access these services in a short amount of time, regardless of the share of children in the region. Yet, not all countries display this association between accessibility and the share of children: in Belgium, Greece and Ireland, for example, the population share that can access a school in less than 15 minutes by foot is even *lower* in regions with a higher proportion of children (Figure 16). These countries also exhibit no systematic association between accessibility of ECEC centres and the share of children living in a region. Still, when interpreting these results, it is important to keep in mind i) that the accessibility indicators used in the analysis do not consider the capacity of schools and ECEC centres, and ii) that they are derived from total population data, while families are likely concentrated in specific areas within regions. For these reasons, the results cannot be directly interpreted as indicating a lack of responsiveness of service provision to local needs. Further analysis could consider using population data by age ranges to measure the accessibility of schools and ECEC centres specifically for this demographic group.

Figure 16. Primary schools and ECEC centres are generally more accessible in regions with a greater share of children, but not in all countries

Association between the share of the population that can reach a primary school or an ECEC centre within 15 minutes by foot and the share of children in a region, in selected countries





Note: The figure shows 6 out of the 13 (primary schools) or 11 (ECEC centres) for which data on accessibility of PES and the share of children at the TL3 level are available. For ECEC, France, Ireland, and Spain include only pre-primary education centres. The age ranges are defined according to the categories available in the data.
Sources: Accessibility data derived from OECD calculations based on location data obtained from national authorities. See Annex A for details. Demographic data is retrieved from the OECD Regional Statistics database: https://www.oecd.org/regional/regional-statistics/.

6.3. Service accessibility significantly relates to regional income, access to cities and demand indicators, even after controlling for other regional characteristics

A limitation of the bivariate analysis presented in the previous subsections is that it cannot account for potential confounding factors, i.e., characteristics that are related both to accessibility and the explanatory variable. The econometric analysis in this subsection attempts to address this concern. For example, as Subsections 5.4. and 6.2. highlight, travel times to essential services are systematically longer in non-metropolitan and lower-income regions. At the same time, these characteristics often overlap, as non-metropolitan regions have systematically lower incomes. The econometric analysis allows to assess which regional characteristics are most closely associated with service accessibility and provides some information on the magnitude of these associations.

The analysis in this subsection focuses on two of the three services, PES centres and primary schools, for which the number of observations is sufficient for a regression analysis. The most complete specification is based on a restricted sample of countries – 16 for PES and 13 for primary schools – for which data on the necessary covariates are available at regional level.

It relies on the following simple OLS linear regression model:

$$Y_{rc} = \alpha + \beta_1 Demand_{rc} + \beta_2 Income_{rc} + \beta_3 Demographics_{rc} + \beta_4 Metropolitan_{rc} + \varphi_c + \varepsilon_{rc} \quad (1)$$

where Y_{rc} captures the share of the population in region *r*, country *c*, that can access a PES centre within 15 minutes by motor vehicle or a primary school within 15 minutes by foot. $Demand_{rc}$ captures the

unemployment rate (in the regressions for PES) or the population share of children aged 5 to 9 (in the regressions for primary schools) in each region. $Income_{rc}$ measures both the level and growth in regional GDP per capita, while $Demographics_{rc}$ captures both the level and growth in the regional population, as well as population density. $Metropolitan_{rc}$ is a categorical variable with five outcomes capturing the degree of access to cities, as defined in Box 1. φ_c are country fixed effects, included to account for cross-country differences in income, institutional arrangements, and national policies on service provision. In the estimation, regions are weighted by the inverse of the number of regions in a given country. This ensures that all countries are given equal weight in the estimation, such that the results are not driven by countries with a large number of regions. Standard errors are not clustered given the limited number of countries included in the analysis. Most findings remain consistent when clustering, though with somewhat reduced statistical significance.

The analysis does not claim to provide a *causal* explanation for variations in service accessibility. It does not consider other regional characteristics that may be associated with the variables under study and with the accessibility metric, such as the quality of transport infrastructure (i.e., omitted variable bias). In addition, service accessibility might also have an impact on population and economic trends (i.e., reverse causality). Still, it provides a first exploratory exercise on the correlates of accessibility of services at the regional level.

The econometric analysis suggests that most results from the earlier simple bivariate analysis are robust to the inclusion of control variables, but yields some additional insights (see Table 2):

- *Services are systematically more accessible in higher-income regions even after controlling for other regional characteristics*, including access to cities. The magnitudes are not negligible, particularly for PES centres. For instance, a 10% higher GDP per capita is associated with a 2 percentage-point greater share of people who can reach a PES centre within 15 minutes by motor vehicle. Meanwhile, a similar increase in GDP per capita is associated with a 0.8 percentage-point greater share of people who can reach a primary school within 15 minutes by foot.
- *Metropolitan regions exhibit higher accessibility of services than non-metropolitan ones, even after accounting for demographic and economic characteristics*. The share of people who can access a PES centre (by motor vehicle) and a primary school (by foot) in under 15 minutes is almost 10 percentage points higher for PES and 15 percentage points higher for primary schools in large metropolitan regions than in remote non-metropolitan ones, over and above any direct association with population density. The gap is significantly wider if population density is not included in the regressions.
- *Service accessibility is systematically higher in areas where there are more potential service users*, *after accounting for other characteristics.* The share of people who can swiftly reach PES centres and primary schools is higher in regions with a higher share of unemployed people and of children, respectively. This finding contrasts with the descriptive results in Subsection 6.2. , which found that the association between service accessibility and potential demand did not apply to all countries. The association is particularly relevant for primary schools: a 1 percentage-point higher share of children living in a region is associated with a 3.5 percentage-point higher share of people who can reach this service in under 15 minutes.

  Yet, this point cannot be directly interpreted as proof of governments' ability to adjust service provision to needs, as the relationship may be a two-way street. Indeed, policy makers may respond to high unemployment in specific regions by strengthening local employment support, possibly also improving service accessibility. At the same time, the local presence of PES centres may contribute to a better matching of jobseekers to vacancies, thereby lowering unemployment. Similarly, families may move to regions where schools are more accessible, hence raising the share of children in those regions.

Table 2. Correlations between the share of people who can reach the nearest service facility within 15 minutes and regional characteristics

	% of people within 15 minutes by motor vehicle to nearest PES				% of people within 15 minutes by foot to nearest primary school			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Unemployment rate in 2019 (%)	0.233			0.807***				
	(0.307)			(0.253)				
Children aged 5 to 9 in 2022 (%)					4.806***			3.503***
					(1.102)			(0.997)
GDP p.c. in 2019 (Ln)		23.389***		20.531***		22.737***		8.068***
		(2.920)		(4.029)		(3.683)		(2.748)
Annual GDP p.c. growth 2005-2019 (%)		-2.951***		-4.028***		-2.354***		-1.268**
		(0.866)		(0.987)		(0.803)		(0.592)
Total population in 2022 (Ln)			8.744***	0.480			9.079***	1.584*
			(0.755)	(1.331)			(0.900)	(0.881)
Annual population growth 2015-2022 (%)			2.325	-7.631***			1.386	-7.128***
			(1.467)	(2.021)			(1.534)	(1.196)
Population density in 2022 (Ln)				6.615***				5. 844***
				(1.157)				(0.745)
2. Metropolitan – Medium				-2.797				-7.311*
				(3.153)				(4.105)
3. Non-metropolitan – Medium				-4.510				-11.756***
				(3.838)				(4.403)
4. Non-metropolitan – Small				-3.867				-10.217**
				(4.017)				(4.540)
5. Non-metropolitan – Remote				-9.723**				-15.283***
				(4.557)				(4.891)
Country FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	692	922	1612	661	451	448	449	448
Number of countries	18	25	32	16	13	13	13	13
Adjusted R-squared	0.383	0.455	0.546	0.617	0.376	0.480	0.597	0.727

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Note: For PES centres, the island regions Gotland (Sweden), Eivissa y Formentera (Spain) and Mayotte (France) are not included in the analysis. For primary schools, the island regions Madeira and Azores (Portugal) and the regions Trento, Bolzano and Aosta Valley (Italy), are not included. GDP per capita and unemployment data is measured in 2019 to avoid potential distortions because of the COVID-19 crisis, as data for 2022 is not available for these variables. The reference category for access to cities is Metropolitan – Large.

Sources: Accessibility data derived from OECD calculations based on location data obtained from national authorities. See Annex A for details. Data on regional characteristics retrieved from the OECD Regional Statistics database: https://www.oecd.org/regional/regional-statistics/.

- *Regions that have expanded over the last 15 years show lower service accessibility, once controlling for current income and population levels.* The share of people that can reach the nearest PES centre and primary school in under 15 minutes is *lower* in places with *higher* GDP per capita growth, but only after accounting for income levels. Similarly, the share of people that can reach the nearest primary school is also *lower* in places with *higher* population growth, after accounting for population levels. This implies that changes in service provision do not necessarily mirror the pace of demographic or economic changes.

  One possible interpretation of these results is that regions which are expanding economically and demographically may take time in catching up with the provision of essential services. In other words, the deployment of services like PES centres and primary schools lags the pace of population and economic growth. At the same time, the results suggest that in regions experiencing population or economic contractions, the existing service facilities may not be immediately adapted to economic and demographic changes.

7. Concluding remarks

This paper presents results on the accessibility of essential services at the level of small (TL3) regions in OECD countries, focusing on three types of services: PES, ECEC centres, and primary schools. These findings are the result of significant efforts in data collection, which are still ongoing. Gathering geolocation data for a large number of countries and developing a harmonised framework allowing for cross-country comparisons are the main contributions of this paper. The results presented here are a first attempt at unveiling interesting and informative patterns about differences in accessibility of essential services across regions and across countries. In particular, the paper describes and quantifies disparities in services accessibility both across regions, and between population groups within regions, and provides evidence on how these patterns relate to regions' economic and demographic characteristics.

The limitations of the presented analysis, as discussed in main text of the paper, clearly define a future data collection and research agenda. First, the analysis focuses only on *one* dimension of accessibility, physical accessibility, which is likely to be an important component of accessibility for all three service types considered. Other dimensions, such as capacity, affordability, and quality of service are clearly also key for a complete assessment of accessibility, but considering these dimensions has so far been beyond the scope of this work. Second, physical accessibility is measured as people's travel times to the nearest service facility only by walking and driving. In reality, public transport is likely to also be an essential – or indeed the only available – means of travelling to the nearest service facility. However, reliable data on public transport infrastructure and services are not yet available from open-source tools for a large number of countries. Third, the analysis does not consider congestion effects, notably through road traffic. This is likely to result in an under-estimation of true driving times, especially for cities, implying that the driving times presented in this paper are lower bounds of people's actual driving times.

Some of these limitations will be addressed in future stages of this project. The Joint Research Centre of the EC (DG JRC) has developed a significant body of work that would allow modelling public transport and congestion effects at least for a small selection of countries (Duma et al., forthcoming[51]; Giordano, Ibáñez and Aycart, forthcoming[52]; European Commission, DG JRC, forthcoming[53]), and there are plans to integrate the work from these two projects. Beyond these methodological advances, three additional avenues for further work appear particularly

worthwhile. First, broadening the scope of the essential services covered. Looking at healthcare services would be particularly relevant, though there are important conceptual challenges given the large number of different types of services that could be covered. Second, increasing the country coverage, especially for ECEC centres, for which the current sample is still relatively small and does not allow for a cross-country analysis of the differences between nurseries and kindergartens. Third, bringing together the results on regional inequalities in accessibility of essential services with other data available at the regional level, such as on household incomes (Königs et al., forthcoming[54]), for a more comprehensive picture of geographic inequalities in economic well-being and living standards.

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Annex A. Overview of data sources

Table A.1. Data sources for PES

Country	Source	National authority	Link to website
AUT - Austria	OECD questionnaire*, file provided	Arbeitsmarktservice Österreich (AMS)	https://www.ams.at/organisation/adressen-und-telefonnummern
BGR - Bulgaria	OECD questionnaire*, web scraped from website	Ministry of Labor and Social Policy: Employment Agency	https://www.az.government.bg/bg/stats/view/2/305/
CAN - Canada	OECD questionnaire*, web scraped from website	Government of Canada	https://www.servicecanada.gc.ca/tbsc-fsco/sc-hme.jsp
CHE - Switzerland	OECD questionnaire*, file provided	SECO (State Secretariat for Economic Affairs)	No website available
CHL - Chile	OECD questionnaire*, web scraped from website	Bolsa Nacional de Empleo	https://www.bne.cl/listado-omil
COL - Colombia	OECD questionnaire*, downloaded from website	Unidad del Servicio de Empleo	Puntos Atención | Servicio Publico de Empleo (serviciodeempleo.gov.co)
CZE - Czechia	Shared by national authority	Úřad práce ČR	https://www.uradprace.cz/web/en/employment-agencies
DEU - Germany	Shared by national authority	Bundesagentur für Arbeit	https://web.arbeitsagentur.de/portal/metasuche/suche/dienststellen
DNK - Denmark	Shared by national authority	Arbejdsmarkedsstyrelsen	https://www.star.dk/en/#
ESP - Spain	Web scraped from website	Servicio Publico de Empleo Estatal	https://www.sepe.es/HomeSepe/que-es-el-sepe/que-es-el-sepe-conocenos/Red-de-oficinas.html
EST - Estonia	OECD questionnaire*, file provided	Töötukassa	https://www.tootukassa.ee/et/kontaktid/esindused
FIN - Finland	OECD questionnaire*, web scraped from website	Työ- ja elinkeinotoimisto	https://toimistot.te-palvelut.fi/
FRA - France	Web scraped from website	Pôle emploi	https://www.pole-emploi.fr/annuaire/
GRC - Greece	Web scraped from website	Δ.ΥΠ.Α.	https://www.dypa.gov.gr/poy-aniko
HUN - Hungary	OECD questionnaire*, web scraped from website	Nemzeti Foglalkoztatasi Szolgalat	Területileg illetékes foglalkoztatási osztály (munka.hu)
IRL - Ireland	Web scraped from website	Intreo	http://www.gov.ie/en/service/40cf48-find-your-local-intreo-office/
ISL - Iceland	OECD questionnaire*, file provided	Vinnumala Stofnun	https://www.vinnumalastofnun.is/en/about-us/service-centers
ISR - Israel	OECD questionnaire*, file provided	Israeli Employment Service	No website available
ITA - Italy	OECD questionnaire*, file provided	Agenzia Nazionale Politiche Attive Lavoro	https://www.anpal.gov.it/cerca-sportello
LTU - Lithuania	OECD questionnaire*, file provided	Užimtumo tarnyba	https://uzt.lt/kontaktai/bendrosios-konsultacijos/32
LUX - Luxembourg	OECD questionnaire*, file provided	Agence pour le développement de l'emploi (ADEM)	https://adem.public.lu/fr/marche-emploi-Luxembourg/acteurs/adem/agences-plans-acces.html
LVA - Latvia	Downloaded from website	Nodarbinātības valsts	https://www.nva.gov.lv/en/licensed-

		aģentūra	private-employment-agencies
MEX - Mexico	OECD questionnaire*, web scraped from website	Servicio Nacional De Empleo - Portal de Empleo	https://www.empleo.gob.mx/necesitas-ayuda
NLD - Netherlands	OECD questionnaire*, web scraped from website	UWV	https://www.uwv.nl/particulieren/klantenservice/contact/uwv-kantoren.aspx
NZL - New Zealand	OECD questionnaire*, file provided	Ministry of Business, Innovation and Employment	No website available
NOR - Norway	OECD questionnaire*, web scraped from website	The Norwegian Labour and Welfare Administration (NAV)	https://www.nav.no/sok?f=0&uf=1
POL - Poland	OECD questionnaire*, file provided	Publiczne Służby Zatrudnienia (PSZ)	https://psz.praca.gov.pl/wybor-urzedu
PRT - Portugal	OECD questionnaire*, file provided	Instituto do Emprego e Formaçao Professional (IEFP)	https://www.iefp.pt/redecentros
ROU - Romania	OECD questionnaire*, file provided	National Agency for Employment	No website available
SVN - Slovenia	OECD questionnaire*, file provided	Zavoda RS za zaposlovanje	https://www.ess.gov.si/en/jobseekers/contacts-and-office-hours#/
SVK - Slovakia	OECD questionnaire*, file provided	Ústredie práce, sociálnych vecí a rodiny (ÚPSVAR)	No website available
SWE - Sweden	Shared by national authority	Arbetsförmedlingen	https://arbetsformedlingen.se/kontakt/vara-kontor?

* “OECD questionnaire on digitalisation in Public Employment Services to support the provision of active labour market policies”, distributed in March 2023.

Table A.2. Data sources for ECEC

Country	Source	Link to website
BEL - Belgium	For Flanders: Opgroeien (Grandir) for nurseries and Onderwijs for kindergartens; For Wallonia and Brussels : ONE (Office de la naissance et de l'enfance) for nurseries and Enseignement.be, Annuaire des écoles d'enseignement fondamental ordinaire, for kindergartens	https://data-onderwijs.vlaanderen.be/onderwijsaanbod/bao/lijst?hs=111+121 http://www.enseignement.be/index.php?page=25932&act=search&check=&unite=111&geo_type=0&geo_prov=&geo_cp=&geo_loca=&geo_mots=&reseau=111%2C126%2C123%2C122%2C121%2C131%2C132
ESP – Spain*	Ministerio de Educacion y Formacion Profesional	https://www.educacion.gob.es/centros/home.do
EST – Estonia*	Haridus - ja teadusministeerium	https://www.ehis.ee/
FIN - Finland	Oeptus – Ja Kulttuuriministeriö (OKM)	n/a
FRA – France*	Annuaire de l'éducation	https://data.education.gouv.fr/explore/dataset/fr-en-annuaire-education/table/?disjunctive.nom_etablissement&disjunctive.type_etablissement&disjunctive.appartenance_education_prioritaire&disjunctive.type_contrat_prive&disjunctive.libelle_departement&disjunctive.libelle_academie&disjunctive.libelle_region&disjunctive.code_type_contrat_prive&disjunctive.pial&disjunctive.code_academie&disjunctive.ministere_tutelle
GRC – Greece*	Υπουργείο Πολιτισμού, Παιδείας και Θρησκευμάτων	https://geodata.gov.gr/el/dataset/skholeia
IRL – Ireland*	The Department of Children, Equality, Disability, Integration and Youth (DCEDIY)	n/a
ITA – Italy*	Ministerio dell'Istruzione e del Merito	PUBLIC: https://dati.istruzione.it/opendata/opendata/catalogo/elements1/leaf/?area=Scuole&datasetId=DS0400SCUANAGRAFESTAT PRIVATE: https://dati.istruzione.it/opendata/opendata/catalogo/elements1/leaf/?area=Scuole&datasetId=DS0410SCUANAGRAFEPAR
NLD - Netherlands	Ministrie van Onderwijs, Cultuur en Wetenschap	https://data.overheid.nl/dataset/gegevens-kinderopvanglocaties-lrk#panel-description
NOR - Norway	Utdanningsdirektoratet	https://barnehagefakta.no/sok ; https://www.udir.no/om-udir/data/barnehagefakta-baf/
NZL - New Zealand	Educational Measurement and Assessment	https://www.educationcounts.govt.nz/directories/early-childhood-services

* Data for Estonia, France, Greece, Ireland, Italy, and Spain only cover pre-primary education.

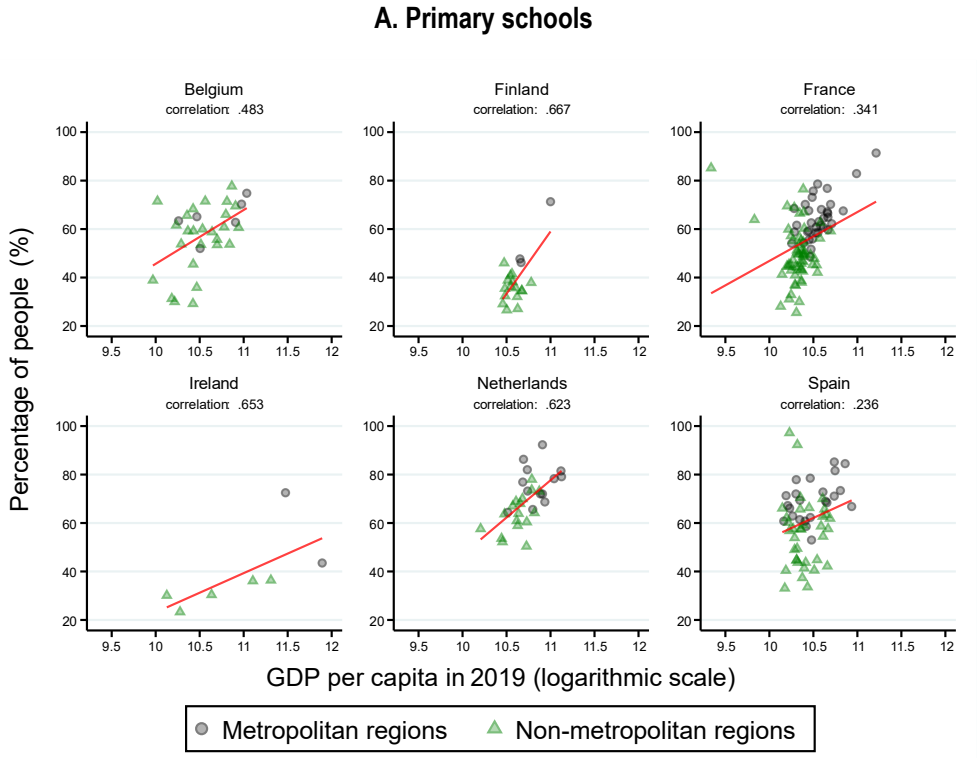
Table A.3. Data sources for primary schools

Country	Source	Link to website
BEL - Belgium	For Flanders: Vlaams Ministerie van Onderwijs en Vorming For Wallonia and Brussels : Enseignement.be, Annuaire des écoles d'enseignement fondamental ordinaire	https://data-onderwijs.vlaanderen.be/onderwijsaanbod/bao/lijst?hs=111+121 http://www.enseignement.be/index.php?page=25932&act=search&check=&unite=111&geo_type=0&geo_prov=&geo_cp=&geo_loca=&geo_mots=&reseau=111%2C126%2C123%2C122%2C121%2C131%2C132
CZE - Czechia	Ministerstvo školství, mládeže a tělovýchovy	https://data.gov.cz/dataset?iri=https%3A%2F%2Fdata.gov.cz%2Fzdroj%2Fdatov%C3%A9-sady%2F00022985%2F63989c80e16fc31c77e23ab529c76b52
ESP - Spain	Ministerio de Educacion y Formacion Profesional	https://www.educacion.gob.es/centros/
EST - Estonia	Haridus - ja teadusministeerium	https://www.ehis.ee/
FIN - Finland	Tilastokeskuksen	https://www.paikkatietohakemisto.fi/geonetwork/srv/eng/catalog.search#/metadata/6a8b4061-7a48-4667-bbdb-13952726c79f https://tilastokeskus.fi/tup/oppilaitosrekisteri/index_en.html
FRA - France	Annuaire de l'éducation	https://data.education.gouv.fr/explore/dataset/fr-en-annuaire-education/table/?disjunctive.nom_etablissement&disjunctive.type_etablissement&disjunctive.appartenance_education_prioritaire&disjunctive.type_contrat_prive&disjunctive.libelle_departement&disjunctive.libelle_academie&disjunctive.libelle_region&disjunctive.code_type_contrat_prive&disjunctive.pial&disjunctive.code_academie&disjunctive.ministere_tutelle
GRC - Greece	Υπουργείο Πολιτισμού, Παιδείας και Θρησκευμάτων	https://geodata.gov.gr/el/dataset/skholeia
IRL - Ireland	SchoolDays.ie	http://www.schooldays.ie/articles/primary-Schools-in-Ireland-by-County
ITA – Italy	Ministerio dell'Istruzione e del Merito	PUBLIC: https://dati.istruzione.it/opendata/opendata/catalogo/elements1/leaf/?area=Scuole&datasetId=DS0400SCUANAGRAFESTAT PRIVATE: https://dati.istruzione.it/opendata/opendata/catalogo/elements1/leaf/?area=Scuole&datasetId=DS0410SCUANAGRAFEPAR
LTU - Lithuania	Geoportal Lithuania	https://www.geoportal.lt/geoportal/en/web/en/search#queryText=educational%20establishments
NLD - Netherlands	Ministrie van Onderwijs, Cultuur en Wetenschap	Gegevens kinderopvanglocaties LRK | Data overheid
NOR - Norway	Utdanningsdirektoratet	https://data-nsr.udir.no/swagger/index.html
PRT - Portugal	Instituto Nacional de Estatistica	n/a

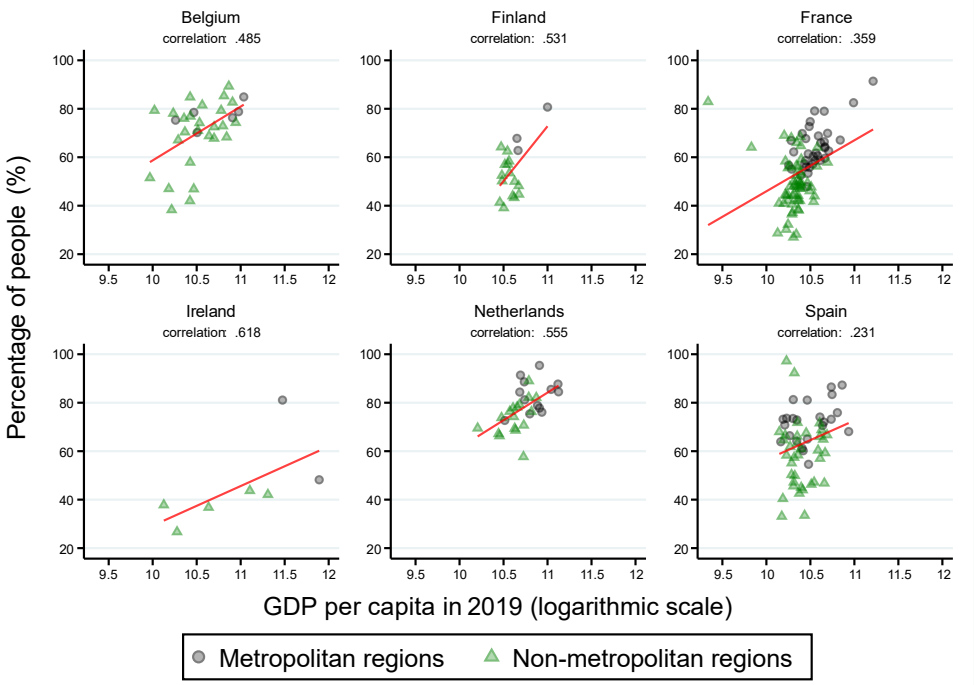
Annex B. Additional figures

Figure A B.1. Primary schools and ECEC centres are systematically less accessible in lower-income regions

Association between the share of the population that can reach a primary school and an ECEC centre within 15 minutes by foot and GDP per capita in 2019, in selected countries



B. ECEC centres

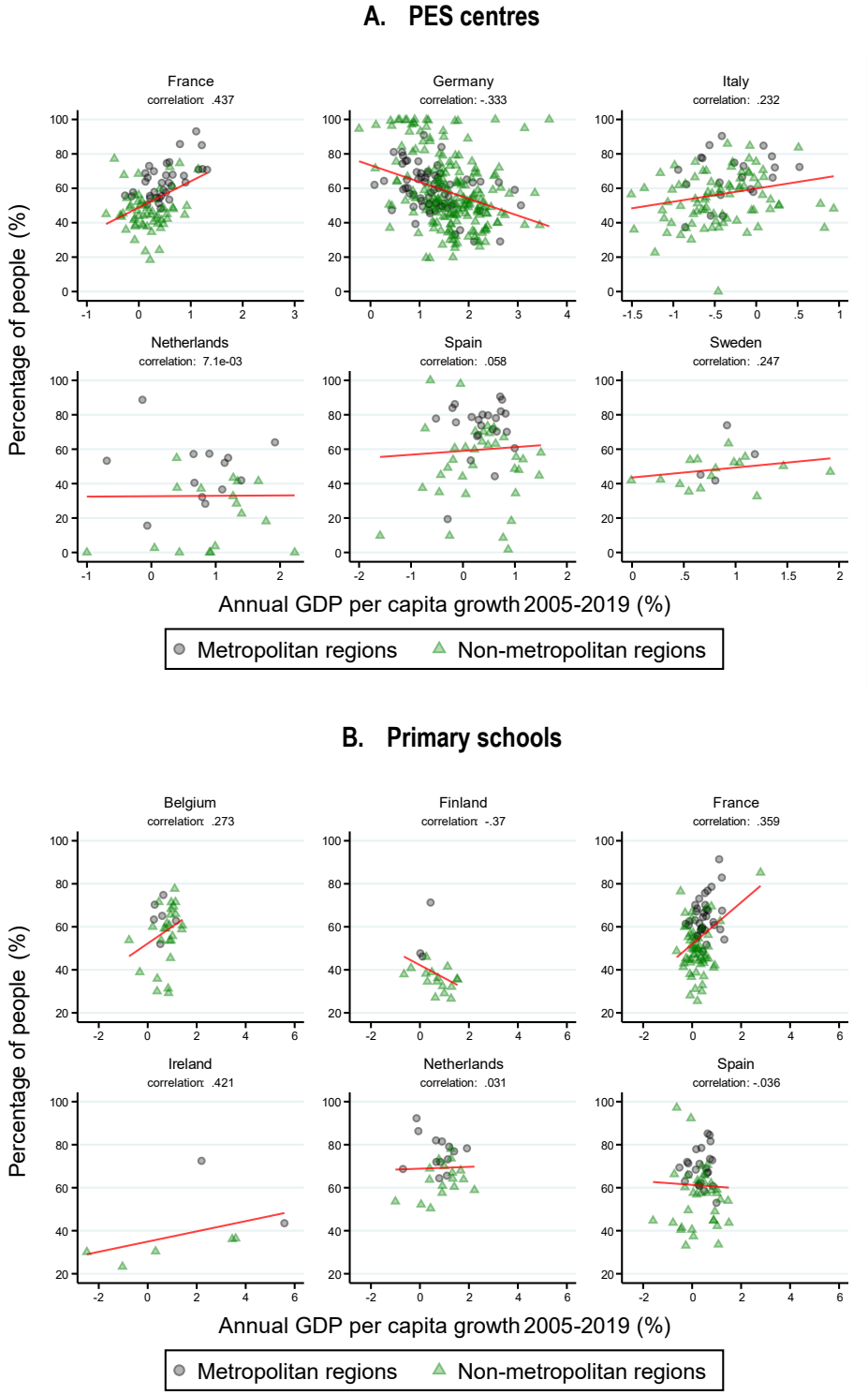


Note: The figure shows 6 out of the 13 (primary schools) or 11 (ECEC centres) for which data on accessibility of PES and regional income at the TL3 level are available, but the pattern shown for these countries generalises to the others. For ECEC, France, Ireland, and Spain include only pre-primary education centres. GDP per capita is measured in 2019 to avoid potential distortions because of the COVID-19 crisis.

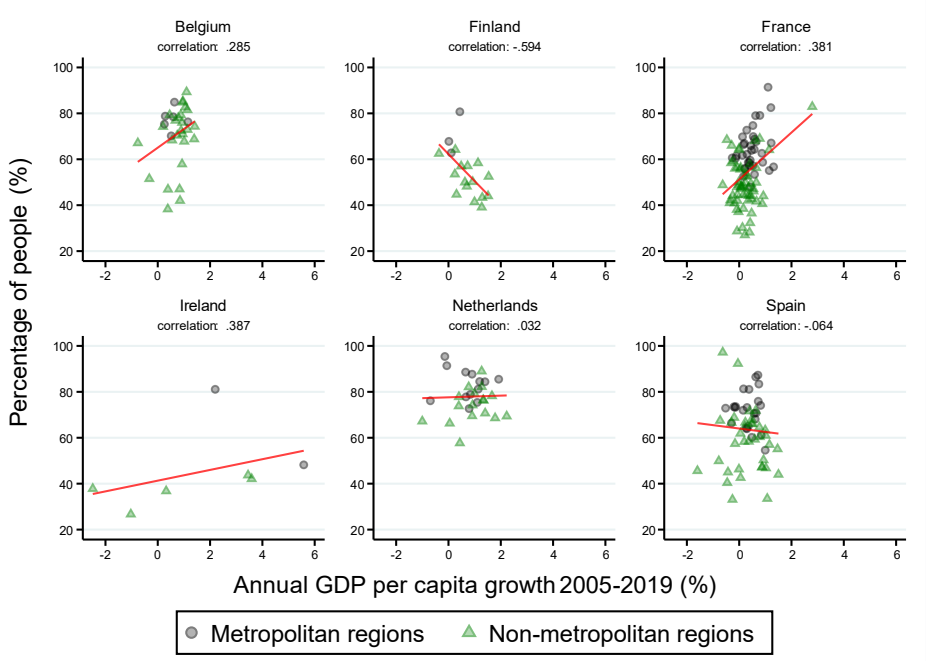
Sources: Accessibility data derived from OECD calculations based on location data obtained from national authorities. See Annex A for details. GDP per capita expressed in 2015 international $ is retrieved from the OECD Regional Statistics database: https://www.oecd.org/regional/regional-statistics/.

Figure A B.2. Service accessibility is not systematically associated with economic growth

Association between the share of the population that can reach a PES centre within 15 minutes by motor vehicle and GDP per capita growth, in selected countries



C. ECEC centres



Note: The figure shows 6 out of the 25 countries (PES) or 13 (primary schools) or 11 (ECEC centres) for which data on accessibility of PES and regional income growth at the TL3 level are available, but the lack of a consistent is also present across the remaining countries. For PES, the island regions Gotland (Sweden), Eivissa y Formentera (Spain) and Mayotte (France) are not included in the analysis. For ECEC, France, Ireland, and Spain include only pre-primary education centres. Growth in GDP per capita is measured up to 2019 to avoid potential distortions because of the COVID-19 crisis.
Sources: Accessibility data derived from OECD calculations based on location data obtained from national authorities. See Annex A for details. GDP per capita expressed in 2015 international $ retrieved from the OECD Regional Statistics database: https://www.oecd.org/regional/regional-statistics/.