

THE EDUCATIONAL PATHWAYS OF YOUNG PEOPLE IN METROPOLITAN CITIES. A MULTIDIMENSIONAL ANALYSIS ACROSS URBAN CONTEXTS¹

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Abstract. An unequal territorial distribution of educational and scholastic supply limits accessibility to a complete educational and education system and the development of specific skills and abilities, exposing young people to a condition of educational and social fragility. In this study we develop an analysis of the educational and schooling pathways of young people aged 0-24 in the 14 Italian metropolitan cities and we verify whether there is a territorial differential, between more urbanised contexts and municipalities distant from the capital city, in the use of the educational and schooling system, in the supply structures and in the levels of education achieved.

1. Young people and educational fragility

In recent decades, profound demographic, socio-economic and cultural transformations have significantly impacted the living conditions and educational pathways of young people, contributing to the emergence of new forms of youth vulnerability. These changes are associated with an increasing exposure to the risk of educational poverty, understood as the deprivation of adequate opportunities for children and young people to learn, experiment and fully develop one's potential (Save the Children, 2014). Educational poverty is a multidimensional phenomenon, resulting from the family, economic and social context in which children and young people live, which is not limited to a lack of material resources but also includes a lack of educational, cultural and relational resources². This condition, now structural in many areas of the country, is closely linked to territorial segmentation and inequalities in access to educational pathways (Battilocchi, 2020).

Increasingly central to scientific and political debate, the issue of educational poverty has become even more relevant following the effects of the Covid-19 pandemic, which has worsened socio-economic conditions and negatively affected

¹ The paper has been jointly written by all the authors but § 1 and 2 can be attributed to D. Tronu, § 3 to V.F. Bellafiore, § 4 to L. Martina, § 5 to D. Cangialosi, § 6 all the authors. Elaborations have been realised by V.F. Bellafiore and L. Martina; maps by V.F. Bellafiore.

² This multidimensional approach goes beyond the anglo-saxon measure of educational poverty, which focuses on the failure to reach educational outcomes, both in terms of school attainment and achievement (Istat, 2024b).

young people's learning and cognitive development (Save the Children, 2021). The difficulty of the school system in guaranteeing truly equal conditions of access to education, personal growth and social participation for young people contributes to the consolidation of educational inequalities linked to the territorial context and the socio-economic background of the families of origin (Save the Children, 2024).

Educational poverty is therefore a particularly form of social exclusion, as it hinders young people's acquisition of essential skills for their personal, civic, and professional development, limiting their future opportunities for skilled employment in the labour market. This phenomenon is recognised as a determining factor in the reproduction of social and territorial inequalities, deeply connected to the segmentation of educational offer and processes of spatial segregation that penalise the most fragile contexts, generating a continuous circle linking low education, job insecurity and social marginalisation (Ballarino *et al.*, 2021).

In complex urban contexts educational and in particular in Italian metropolitan cities, inequalities take on diversified forms, reflecting the social, demographic and economic specificities of the territories. This variability is influenced by an unequal distribution of educational and school services, which is intertwined with structural factors - such as low birth rates, the socio-cultural composition of families and the parents' education- significantly influencing the access, participation and educational attainment and achievement of the new generations. The Italian metropolitan cities, although they represent poles of higher concentration of essential services, present deep internal imbalances in the territorial distribution of educational resources. The capital cities have a greater endowment of early childhood and upper secondary educational services, while the peripheral areas continue to suffer from a structural lag, with levels of educational coverage and per capita public expenditure significantly lower (Istat, 2024a). These imbalances contribute to the spread of educational fragility phenomena, such an increased number of early school leavers, repeaters and students completing school with inadequate skills (explicit and implicit dropout), leading to low educational attainment levels and difficulties for young people to enter the labour market. These inequalities in urban contexts are increasingly linked to factors of residential and functional segregation, as well as to the limited capacity of local policies to respond equitably to the demand for educational services. The territorial distribution reflects structural mechanisms of social selection and differentiated public investments, which generate cumulative effects on the educational and employment pathways of young people (Burgess and Sievertsen, 2020).

Based on this framework, the study investigates, also using multivariate techniques, how the composition of youth demand and the uneven distribution of educational offer in Italian metropolitan cities contribute to the definition of different territorial patterns of educational and occupational vulnerability. In particular, infra-

urban dynamics are analysed, highlighting the disparities within metropolitan cities and comparing the metropolitan territories of the North and the South, with the aim of bringing out the interactions between structural, social and spatial factors that influence young people's access to and success in education. The aim is to provide evidence to guide targeted policies that reduce territorial inequalities in young people's educational pathways and promote equity in access to education and the labour market, in line with the 2030 Agenda goals³.

2. Data and Methods

This paper presents a descriptive and multivariate analysis of the main socio-demographic characteristics and the educational pathways of young people in Italian urban contexts. This analysis is integrated with several indicators concerning the availability of educational services and school facilities, with the aim of identifying recurring patterns and territorial configurations that highlight the main critical issues related to educational inequalities. The reference area consists of the 14 metropolitan cities⁴, comprising 1,268 municipalities, and their respective territorial subdivisions, defined in accordance with criteria of geographical contiguity starting from the capital municipality, surrounding it are the municipalities belonging to the first and second belts municipalities, as well as the other municipalities within the metropolitan city (Istat, 2020). The descriptive analysis is based on a selection of indicators, referring to the period 2021-2022 and representing the main dimensions of both educational demand and supply, identified according to the availability and accuracy of data at the municipal level⁵.

The study focuses on the population aged 0–24, starting from early childhood – a crucial stage for reducing social and cognitive development gaps and extending to adolescents and young people, through the analysis of school participation and outcomes, using also several proxy indicators as repeater rates, educational attainment levels and young people not in education and not employed⁶ (Istat, 2024 a). Based on the assumption that an unequal geographical distribution of educational and school facilities can limit learning opportunities and hinder the development of specific skills and competences, cluster analysis is used to verify the existence of

³ Goal 4 of the 2030 Agenda aims to ensure quality education and equal opportunities, to reduce educational disparities and to strengthen inclusive education systems.

⁴ Italian metropolitan cities are territorial entities that have replaced provinces in 10 urban areas of ordinary statute regions, to which are added four metropolitan cities of special statute regions.

⁵ Only the mobility indicator refers to 2019, as it was the last year available at the time of drafting the contribution.

⁶ Indicators on students leaving school with inadequate skills (low performers), collected by Invalsi, were not used in the analysis, as it was not possible to calculate data for all territorial subdivisions of the metropolitan cities.

disparities between metropolitan areas with high availability of such facilities and those where access is limited and student mobility to municipalities other than where they live is high. In metropolitan cities, conditions of more educational fragility tend to be concentrated in cities in the South of Italy compared to those in the North and, within urban areas, in municipalities that are geographically further away from the main centres providing essential services, which are generally concentrated in the capital cities (Istat, 2024a). Cluster analysis therefore offers an additional multidimensional interpretation that is useful for a more granular understanding of the relationship between human capital development and school and territorial context, supporting the definition of targeted interventions aimed at ensuring higher levels of education quality, increased school participation and social inclusion of young people in the most critical metropolitan areas.

The indicators come from many Istat and Sistan sources and were calculated by aggregating the data available at the municipal level for the 56 suburban areas of the 14 metropolitan cities, comprising 1,268 municipalities and defined on the basis of municipal geography as of January 1, 2024 (Table 1). Data relating to the supply of early childhood education services (authorised places and expenditure by Municipalities), as well as those on the socio-demographic characteristics of young people (incidence and dynamic of the population aged 0-24, educational attainment levels, population not in education and not employed⁷ and people daily commuting for study purposes within their municipalities of residence), come from Istat sources. Data regarding school resources, full-time enrolled and repeaters in the upper secondary schools are provided by the Ministry of Education and Merit (MIM).

Table 1 - Indicators by total of metropolitan cities.

Dimension	Indicator	Code	Source	Year	Median	Min.	Max.
Socio-demographic characteristics	Change in population 0-24 (1992-2022) (%)	VAR_0-24	Istat	2022	-22,5	-55,6	65,3
	Population 0-24 (% of total)	POP_0-24	Istat	2022	21,9	17,1	28,0
	Population 20-24 with at least upper secondary education level (%)	EDU_20-24	Istat	2022	86,5	71,1	90,5
	Mobility within the municipality for study purposes (%)	MOB	Istat	2019	63,2	45,0	99,4
	Population 15-24 not in education and not employed (%)	NOT_ST_EMPL	Istat	2022	15,9	9,7	26,8
	Employment rate 15-24 years	EMPL_15-24	Istat	2022	18,9	12,1	27,7
School context	Authorised places of early childhood education services (per 100 aged 0-2)	AP_0-2	Istat	2022/2023	27,0	8,0	55,4
	Municipal per capita expenditure on early childhood (values in euro per child aged 0-2)	EXP_0-2	Istat	2022	644	0	4638
	Upper secondary schools (% of total schools)	UPP_SEC_SC	MIM	2021/2022	11,4	0,0	22,6
	Enrolled by school full time in pre-primary school (% of total enrolled)	ENR_FT_PRE	MIM	2021/2022	83,0	16,3	99,8
	Enrolled by school full time in primary school (% of total enrolled)	ENR_FT_PRI	MIM	2021/2022	38,6	1,1	92,8
	Repeaters in upper secondary schools (per 100 enrolled in total)	REP	MIM	2021/2022	6,7	0,2	23,7

⁷The last indicator differs from NEET (Neither in Employment nor in Education and Training) as it uses Istat Census data on professional and non-professional condition and includes 15–24-year-olds actively seeking work or in non-professional status other than studying or receiving pensions from previous work or capital income.

3. Main indicators on educational pathways of young people

This section analyses some of the indicators used in the cluster analysis, to identify the main territorial disparities across the dimensions of the framework.

Young people are the key component for the development of a cohesive, inclusive and sustainable society. In metropolitan cities, people aged 0-24 on 31 December 2022 are 4.8 million (36.8% of total Italian youth) and represent 22.7% of total population. They have decreased significantly over the last 30 years (-19.7%). Southern metropolitan cities have a higher incidence of youth particularly in Naples, Catania and Palermo, but also the sharpest declines up to -44.4% in the metropolitan city of Cagliari (Figure 1). Only Bologna shows an increase in the youth segment (+23%). In the capital cities, the contraction of young people (-27.2%) is greater than in the municipalities of the first two urban belts.

Figure 1 – Population aged 0-24 and change in population in the metropolitan cities (%).

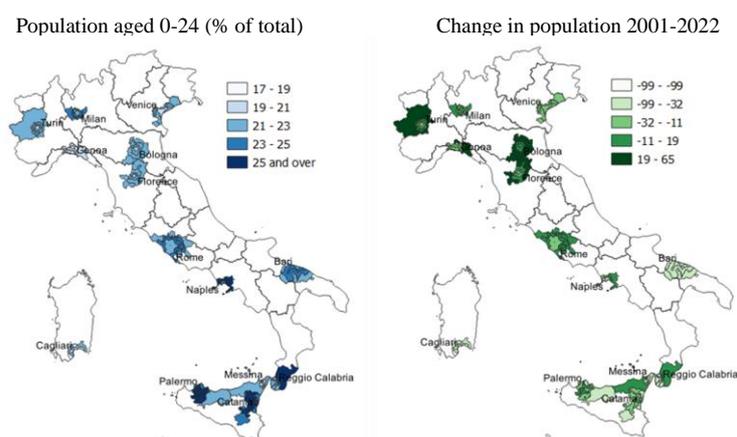


Figure notes: Elaboration on Istat data

The offer of educational and school services is crucial to promote accessibility and participation in the education system and to ensure equal opportunities. Authorized places by Municipalities in public and private early childhood services, in the educational year 2022/2023, are 30.7 places per 100 children under 3 years old and show significant disparities between metropolitan cities in the North-Centre and those in the South (Table 2). The MCs North-Centre exceeds the target of 33.0%, with the exception of Venice and maximum values in Bologna (49.4%) and Florence (45.8%). The most critical values are in the South especially in Naples and Catania, below 13%. Place coverage is highest in the capital cities (38.3%) and lowest in the second belts (22.6%). Full-time school attendance is prevalent in pre-primary (76% of total enrolled) and reaches almost half of total enrolled in primary schools, but with relevant territorial differences. This option is widespread in the metropolitan

cities of the Centre-North, especially in Bologna (pre-primary 97.1%) and Milan (primary 87.8%). The southern metropolitan territories are more disadvantaged in offering this service, mainly in primary school, with Palermo in last place (primary school 5.9%).

Table 2 – Education services, enrolled by school time and repeaters*. Year 2021/2022 (%).

Metropolitan Cities	Authorised places of early childhood education services			Full time pre-primary school				Full time primary school				Repeaters in the upper secondary schools for 100 enrolled in total				
	Capital cities	First belt	Second belt	Total MC	Capital cities	First belt	Second belt	Total MC	Capital cities	First belt	Second belt	Total MC	Capital cities	First belt	Second belt	Total MC
Turin	43.9	38.1	31.8	36.3	81.1	96.0	90.0	88.1	77.7	87.1	71.1	72.5	7.4	6.7	6.9	6.7
Milan	48.0	44.5	37.6	42.4	87.2	85.9	82.3	86.2	82.4	82.8	88.3	87.8	6.4	6.8	6.9	6.8
Venice	39.3	27.0	28.5	30.1	93.8	96.8	99.8	95.7	71.5	88.4	82.5	87.4	7.3	6.4	6.8	6.8
Genoa	40.7	25.6	30.8	38.4	97.2	98.3	95.4	96.2	61.7	38.6	24.0	82.9	8.3	3.1	2.0	8.2
Bologna	51.8	53.3	50.1	49.4	97.3	96.5	99.5	97.1	61.7	70.0	75.5	81.9	6.7	6.6	5.9	7.2
Florence	55.4	42.2	38.8	45.8	91.4	93.3	98.6	93.5	81.0	84.1	88.3	71.4	7.2	7.8	8.8	8.1
Rome	51.2	30.6	21.3	43.0	81.7	84.2	88.8	75.2	75.0	88.8	89.0	88.2	4.8	5.1	7.9	5.2
Naples	15.8	13.4	8.5	12.3	80.0	89.9	70.8	77.6	32.2	13.3	11.3	19.4	7.9	6.0	6.0	6.7
Bari	26.4	16.9	17.9	21.1	45.2	61.2	84.3	75.6	17.8	16.6	13.0	15.7	4.5	6.7	4.4	4.6
Reggio Calabria	20.5	11.2	8.9	15.9	58.4	78.1	54.4	68.9	7.8	8.9	33.9	13.0	4.7	15.1	8.9	8.0
Palermo	12.8	15.3	14.0	13.4	16.9	16.3	22.7	22.2	4.8	1.1	1.4	5.9	8.6	5.7	8.5	8.1
Messina	10.3	24.9	23.3	19.4	44.9	48.9	77.1	67.2	14.1	8.1	39.5	18.6	6.0	-	0.2	5.6
Catania	8.0	8.8	12.8	11.4	25.5	18.8	32.4	30.3	11.0	6.2	8.4	9.0	7.3	3.8	6.4	6.9
Cagliari	42.1	42.1	31.0	40.5	99.4	93.8	98.0	96.5	45.0	26.0	17.9	32.4	10.3	12.9	23.7	11.5
Totale MC	38.3	29.1	22.6	30.7	74.8	73.3	74.5	76.0	87.5	60.7	40.1	49.5	8.7	6.5	6.9	6.8

Table notes: Elaboration on Istat and MIM data. *Authorized places are referring to educational year 2022/2023.

A measure of school outcomes is given by the share of repeaters, which is 6.6% per 100 enrolled in secondary schools. The worst performance is recorded in the MC of Cagliari (11.5%), followed by Genoa (8.2%), Palermo and Florence (8.1%). The best result is recorded in the MC of Bari (4.6 repeaters per 100 enrolled). At infra-territorial level, the incidence of repeaters is slightly higher in the second belts, among which Cagliari stands out (23.7%). There is also a gender difference with a worst result for boys (8.2%) than for girls (4.9%), in all territories.

The educational qualification is essential to enter the labour market. In 2022, 85.4% of 20-24 year olds in metropolitan cities had at least upper secondary education, with the highest values in the MCs of the Centre-North, particularly Rome, Venice and Bologna (Figure 2).

Within the metropolitan territories, the capital cities have lower levels of education than the urban belts, except for Rome and Cagliari. There is also a gender difference showing a higher level of education for girls (88.2%) than for boys (82.8%). The lack of appropriate skills and a high level of education contributes to increasing the number of dissatisfied young people who, by not studying and not working, dissipate their human potential that should instead be put to the benefit of society as a whole. Young people neither studying nor working make up 16.3% of people aged 15–24 in the metropolitan cities, with the highest rates in Palermo, Catania (both 24.2%) and Naples (23%). The metropolitan city of Florence stands out as having the lowest value (10.3%). Considerable differences are found within the metropolitan areas, with worst values in the second belts (17.6%). The phenomenon does not show marked gender differences, 16.6% for females and 16.1% for males.

Figure 2 – Population aged 20-24 with at least upper secondary education and not in education and not employed (%). Year 2022

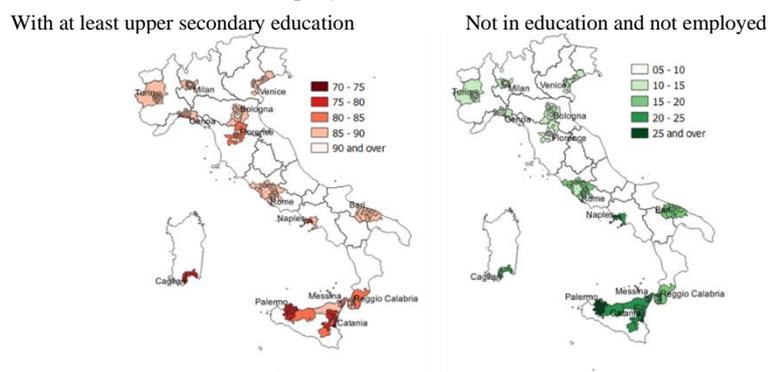


Figure notes: Elaboration on Istat data

4. Cluster analysis

Cluster analysis is applied to the set of twelve indicators and for the 55 territorial levels⁸ of the MCs to identify homogeneous groups of territories. A preliminary correlation analysis shows that the most highly correlated indicators are NOT_ST_EMPL and EMPL_15-24 (-0.88), EXP_0-2 and AP_0-2 (0.84); however, we decided to retain all indicators because they capture distinct theoretically relevant dimensions. Before running cluster analysis, the indicators were scaled using the standardization method (z-score). For cluster analysis, the k-means algorithm (MacQueen, 1967) is used. It is a non-hierarchical clustering tool and its objective is to subdivide a set of units into k clusters based on their similarity, minimizing the total intra-cluster variance and maximizing the inter-cluster variance. The optimal number of clusters into which the data should be divided is not known a priori, which is why the clustering analysis is performed for different values of k, ranging from 2 to 8. To evaluate the clustering method and the choice of the number of groups in this work, the Elbow and the Silhouette (Rousseeuw, 1987) methods are used. The Elbow method is a graph in which the optimum number of clusters is determined by the point forming an “elbow”, indicating that higher numbers of clusters do not significantly reduce the within-group sum of squares. Silhouette method is based on the calculation of intra and inter-cluster distances and is implemented by calculating the silhouette value⁹ for each data point and averaging the result over the entire data

⁸ Only one territory (other municipalities in the metropolitan city of Cagliari) is excluded as it consisted of only one municipality, which led to distorting results in the cluster analysis.

⁹ Silhouette = $(AverageOut - AverageIn) / \max(AverageOut, AverageIn)$, where AverageOut is the minimum average distance between the data point and data within other clusters and AverageIn is the average distance between the data point and other data within the same cluster.

set. The average of the silhouette can vary between -1 and 1: a value close to 1 means that the cluster is well formed, a value close to 0 indicates that the position is unclear and a value close to -1 that the dataset is poorly subdivided. The Elbow method (Figure 3) shows that the optimal number of clusters can be observed at $k=5$, although not very pronounced. Table 3 shows Silhouette and RSQ values, calculated as the number of clusters varies from 4 to 8. The clusters with fewer clusters (2 and 3) are excluded, which are not very explanatory for the purposes of our analysis. The 5-group cluster has the highest silhouette value (0.2682) with a variance explained by the model (RSQ) equal to 0.6263, while the 4 and 6-group clusters show the next best values for the silhouette (0.2550 for both). Therefore, the two combined methods lead us to choose the optimal number for $k=5$.

Figure 3 – Elbow method. WSD by number of clusters.

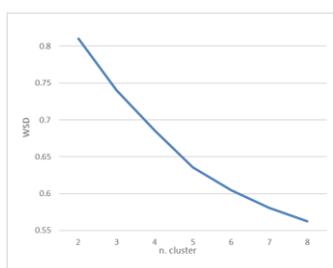


Table 3 – Cluster analysis statistics by number of clusters.

N. cluster	Silhouette	RSQ
4	0.2550	0.5566
5	0.2624	0.6263
6	0.2550	0.6684
7	0.2448	0.7002
8	0.2294	0.7242

Table and figure notes: WSD=Within cluster standard deviation pooled over clusters and all the variables; RSQ=R square pooled over all the variables

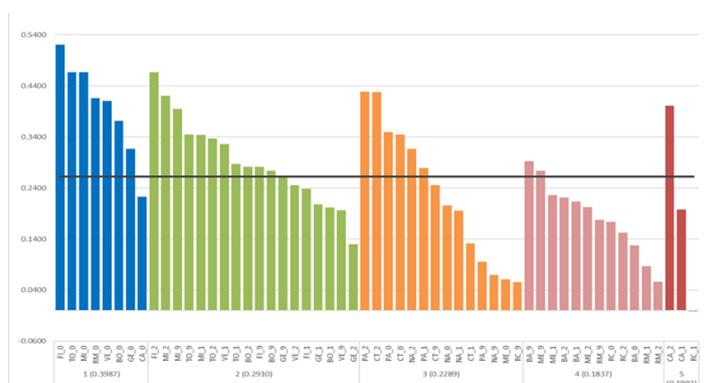
Silhouette average values (Figure 4) in each group for the five-group cluster highlight that in this classification the groups are strong with fairly high values, even though there is a small cluster with only three territories (RC_1, CA 2, CA 1).

The highest value is presented by first group (0.3987), which comprises the eight MCs capital cities of the Centre-North and Cagliari capital city, while the lowest value is presented by the fourth group (0.1837), composed of Southern territories; the only negative value is given by RC_1 in the 5-group of the only three territories.

5. Cluster analysis: results and territorial gaps

The results of the cluster analysis confirm the existence of a North-South gradient in the educational offer of the territory, which however does not necessarily condition the levels of education achieved also thanks to the good degree of mobility outside the municipality of residence. Instead, there are territorial disadvantages in the level of education and labour market participation. The demographic weight of the youth component is more in favour of the South which has a younger structure and is also confirmed in the formation of the groups.

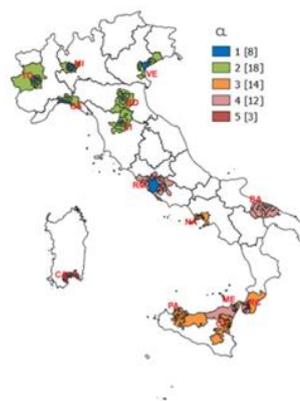
Figure 4 – Silhouette values by group and territories for the five-group cluster.



The profiles of the five groups (Figure 5) obtained by cluster analysis are shown in Table 5, which presents the average values of the indicators in the groups.

Table 5 – Cluster centres and value Italy by indicators. **Figure 5** - Metropolitan cities by clusters.

	Cluster centres					Overall	Italy
	CL1	CL2	CL3	CL4	CL5		
VAR_0-24	-22.4	3.0	-26.9	-24.5	-39.5	-16.6	-23.2
POP_0-24	20.1	21.6	25.2	22.3	20.9	22.4	22.3
EDU_20-24	85.2	87.8	80.8	87.6	81.3	85.3	86.0
MOB	94.0	58.2	72.8	67.0	53.7	68.8	70.7
NOT_ST_E	12.5	11.2	23.5	18.0	19.7	16.5	14.7
EMPL_15-2	20.8	25.1	14.2	17.2	15.5	19.5	21.5
AP_0-2	46.5	36.0	12.5	22.2	28.1	28.1	30.0
EXP_0-2	2973.6	1288.9	338.7	574.0	435.0	1088.9	1,116.0
UPP_SEC	17.4	8.2	14.2	10.5	6.1	11.4	12.8
ENR_FT_PI	91.0	93.9	45.8	67.3	89.3	75.2	83.0
ENR_FT_PI	69.5	63.0	11.7	28.4	17.6	40.9	39.2
REP	7.3	6.7	6.8	4.9	17.3	7.0	6.6



The first cluster (CL1) includes the eight capital cities of the MCs of the Centre-North and Cagliari, which present advantageous situations in the offer of services and results. They register excellent performances in the supply of educational services (authorised places for early childhood cover 46.5% of children under 3 years old) and of school facilities, including the use of full time in both pre-primary and primary schools (91.0% and 69.5% of enrolled respectively). Per capita expenditure on early childhood education services (2,974 euro) is the highest compared to the other groups. Levels of education and participation of young people in the labour market are also high, with high mobility within the municipality for study purposes and thus strong self-containment. However, the incidence of young people aged 0-24 is the lowest (20.1%). Nearly 1.4 million young people aged 0-24 (28.8%) reside

in this group, concentrated in the eight capital cities (Table 6). The second cluster (CL2) includes all the urban belts of the six metropolitan cities of the North (18 territories) with advantages in education and employment pathways despite the low supply of upper secondary schools. Levels of education and participation of young people in the labour market are highest (87.8% and 25.1% respectively), but are accompanied by the low incidence of upper secondary schools (8.2%) and commuting within the municipality for study purposes, thus with low self-containment. They achieve good performance in the offer of educational services, with high full-time attendance in pre-primary (93.9%) and primary schools (63.0%). In demographic terms, this cluster is the only one in which there are been an increase in the number of young people over the last thirty years (+3.0%). In this group of 18 urban belts made up of 646 municipalities, 1.2 million young people aged 0-24 live (24.2%), so they are more dispersed across the territory than CL1.

Table 6 – Clusters characteristics.

Cluster	Territories	N. territories		Population 0-24		N. Municipalities	
		a.v.	%	a.v.	%	a.v.	%
CL1 The capital cities of the Centre-North and Cagliari have an advantage in offering services and outcomes	Total (% on Total groups)	8	14.5	1,400,023	28.8	8	0.6
	Capital cities (%on Total CL1)	8	100.0	1,400,023	100.0	8	100.0
	1st Belt (%on Total CL1)						
	2nd Belt (%on Total CL1)						
	Other Mun. MC (%on Total CL1)						
CL2 The urban belts of the Northern MC's have an advantage in education and employment, despite the lower supply of secondary schools	Total (% on Total of groups)	18	32.7	1,175,246	24.2	646	51.0
	Capital cities (%on Total CL2)						
	1st Belt (%on Total CL2)	6	33.3	377,965	32.2	79	12.2
	2nd Belt (%on Total CL2)	6	33.3	285,249	24.3	97	15.0
	Other Mun. MC (%on Total CL2)	6	33.3	512,032	43.6	470	72.8
CL3 The main urban centres in the South with their belts with major issues in offering services and outcomes	Total (% on Total of groups)	14	25.5	1,469,571	30.3	310	24.5
	Capital cities (%on Total CL3)	4	28.6	504,984	34.4	4	1.3
	1st Belt (%on Total CL3)	3	21.4	232,914	15.8	32	10.3
	2nd Belt (%on Total CL3)	3	21.4	276,028	18.8	54	17.4
	Other Mun. MC (%on Total CL3)	4	28.6	455,645	31.0	220	71.0
CL4 Other metropolitan areas in the South, urban belts of Rome with high criticalities in the educational supply and school services	Total (% on Total of groups)	12	21.8	747,038	15.4	276	21.8
	Capital cities (36 on Total CL4)	2	16.7	106,202	14.2	2	0.7
	1st Belt (%on Total CL4)	3	25.0	242,687	32.5	46	16.7
	2nd Belt (%on Total CL4)	4	33.3	165,943	22.2	55	19.9
	Other Mun. MC (%on Total CL4)	3	25.0	232,206	31.1	173	62.7
CL5 Cagliari belts and first belt of Reggio Calabria with worst issues in school services and educational and labour outcomes	Total (% on Total of groups)	3	5.5	61,043	1.3	27	2.1
	Capital cities (%on Total CL3)						
	1st Belt (%on Total CL3)	2	66.7	49,067	80.4	20	74.1
	2nd Belt (%on Total CL3)	1	33.3	11,976	19.6	7	25.9
	Other Mun. MC (%on Total CL3)						
Total		55	100.0	4,852,921	100.0	1,267	100.0

Table notes: population is referred to 31 December 2022.

The third cluster (CL3) brings together the main urban centres of the South with their belts (14 territories), that present the most critical problems in the supply of services and outcomes. They present the highest presence of young people aged 0-24 (25.2%), even if significantly decreasing over the thirty-year period, accompanied by the lowest values of the supply and expenditure for educational services and of the use of full-time education in pre-primary (45.8%) and primary schools (11.7%).

The values of the level of education and participation in the labour market are also lower. The supply of upper secondary schools is appreciable compared to the other groups (14.2%), with a good degree of self-containment (72.8% mobility within the municipality for study purposes). There are 1.47 million young people aged 0-24 in this group (30.3%).

The fourth cluster (CL4) includes the other metropolitan territories and urban belts of Rome (12 territories) with high criticalities in the supply of educational and school services but with a good level of education. The supply and expenditure for educational services are very low, but they are accompanied by a good supply of full time in pre-primary schools (67.3%). The incidence of upper secondary schools in relation to the total is low (10.5%), which is associated with low self-containment due to considerable mobility outside the municipality for study purposes. Levels of education are high (87.6%), but levels of participation in the labour market and education are low. In this group, there are 747,000 young people 0-24 (15.4%).

Finally, the fifth cluster consists of Cagliari belts and first belt of Reggio Calabria (3 territories) with the most critical issues. It is characterised by the greatest decrease in the population aged 0-24 (-39.5%), the lowest supply of upper secondary schools (6.1%) and the highest incidence of repeaters in upper secondary schools (6.1%). Expenditure on educational services is low, but there is excellent utilisation of full-time in pre-primary schools (89.3%). These areas have low levels of education and labour market participation, with 61,000 young people 0-24 live there (1.3%).

6. Conclusions

The multidimensional analysis of the educational offer and of the educational pathways of young people in the 14 Italian metropolitan cities is carried out on a new subdivision of the selected territorial domain, which allows to capture intra-metropolitan disparities more effectively. Around the metropolitan capitals, first- and second-level urban belts are identified, which, being progressively more distant from the large urban centers, have fewer services and are considered to potentially affect the educational vulnerability of young people. The results of the analysis confirm profound territorial inequalities that influence access, participation and educational outcomes, both within and across metropolitan cities. The MCs of Centre-North generally show better provision of educational services and higher school performance, whereas many Southern areas, especially the peripheral territories, suffer from insufficient provision and greater educational vulnerabilities. Student mobility towards capital cities with better educational provision partially mitigates these imbalances but does not eliminate initial disparities stemming from family, social and territorial background. These findings highlight the need of investment in educational services, school quality and to reduce early school leaving in these fragile areas. For the definition of policy actions, continuous monitoring based on

granular and timely data and a multidimensional approach is required, in order to promptly identify the areas of greatest vulnerability and to implement targeted and differentiated interventions capable of strengthening the educational offer in disadvantaged areas, thereby promoting inclusion and educational equity.

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