Pirisi, G., Berkecz, B., Molnár, E. (2025): Reflections of urban shrinkage in the territorial structure of secondary education. CITY.HU Várostudományi Szemle. 5(2), 115–136.

Reflections of urban shrinkage in the territorial structure of secondary education

Gábor Pirisi[1] – Balázs Berkecz[2] – Ernő Molnár[3]

Abstract

A significant part of the Hungarian urban network is experiencing shrinkage – some settlements have been in continuous decline for more than a century – a trend consistent with developments across much of Central and Eastern Europe. Shrinkage, a complex phenomenon that challenges the millennia-old paradigm of urban growth, reshapes opportunities for local development. Population loss simultaneously reduces both the quantity and the quality of local human resources, undermines the sustainability of infrastructure and institutions and weakens community cohesion. Education, and particularly secondary education, given its high practical and symbolic significance, offers a particularly clear perspective from which to study this process.

While the overall decline of Hungary's urban population is well documented, it is less evident that the population of the cohort relevant to secondary education is declining at a much faster rate. Between 2011 and 2022 the rapid fall in student numbers was driven not only by demographic changes but also by certain educational policy shifts. In some small towns – especially those with fewer than 10,000 residents – this has jeopardized the viability of secondary institutions, leading to numerous school closures. Such losses threaten local employment and erode the intellectual fabric of these communities, posing a fundamental challenge to their long-term sustainability.

Keywords: shrinkage, urban network, secondary education, small towns

[1] University of Pécs, Institute of Geography and Earth Sciences, pirisi.gabor@pte.hu
[2] University of Pécs, Doctoral school of Earth Sciences, berkeczb@gamma.ttk.pte.hu
[3] University of Debrecen, Institute of Earth Sciences, Department of Social Geography and Regional Development, molnar.erno@science.unideb.hu

Absztrakt

A hazai városhálózat jelentős része, igazodva a szinte teljes Kelet- és Közép-Európát meghatározó folyamatokhoz, zsugorodik – bizonyos elemei akár száz éve folyamatosan. A zsugorodás komplex jelenség, amely a települések évezredes növekedési paradigmájával szemben újraszabja a fejlődési lehetőségeket. A népesség fogyása egyszerre csökkenti a helyben rendelkezésre álló emberi erőforrások mennyiségét és részben minőségét, teszi nehezen fenntarthatóvá a műszaki és humán infrastruktúra rendszereit és intézményeit, valamint erodálja a helyi közösségeket. Ezen halmazok egyik gyújtópontjában találjuk az oktatás problémáját, amelyből a városoknak reál- és szimbolikus síkon is nagyon fontos középfokát emeltük a kutatás fókuszában.

A hazai városhálózat zsugorodása közismert tény, de kevésbé nyilvánvaló, hogy a középiskolai oktatás szempontjából releváns korosztály létszáma ennél sokkal nagyobb ütemben csökken. A tanulók létszámának gyors apadását azonban nem csak ez, hanem néhány oktatáspolitikai változás is elősegíthette a vizsgált, 2011–2022 között időszakban. Mindazonáltal bármi is az oka, a városok egy részében, elsősorban a 10 ezer főnél nem népesebb kisvárosokban a zsugorodás számottevően veszélyezteti az intézmények fenntarthatóságát, mint azt számos megszűnt képzési hely is mutatja. Ez pedig, többek között a megszűnő munkahelyek és a szűkülő értelmiség révén alapvető kihívást jelent az érintett településeknek.

Kulcsszavak: zsugorodás, városhálózat, középfokú oktatás, kisvárosok

Introduction and objectives

When defining the concept of a city, analogies and metaphors drawn from living organisms readily emerge. It is almost intuitive to view cities as organisms that are born, grow, and over time decline, and eventually perish. Traditionally, however, urban decline and destruction of cities, were attributed to external forces or non-organic factors: epidemics, wars, and major social and economic collapses were seen as the primary causes, particularly during an era when the paradigm of growth – the expectation of continuous population and economic expansion – dominated society and scientific thought.

The growth paradigm has since been called into question. Natural population increase has slowed and, in many societies shifted into natural decrease, especially where falling fertility rates had not been offset by net in-migration. Meanwhile, the paradigm of sustainability challenges the conceptual and even moral foundations of growth itself.

Within a post-industrial context, growth can no longer be assumed as the default condition; decline and shrinkage are not mere dysfunctions but integral aspects of organic development, indeed characteristic features of post-industrial cities.

Hungary has become a key case for the study of demographic decline, urban shrinkage and depopulation[4]. Its population has been decreasing continuously since 1981, shaping all spatial and developmental processes. Shrinkage, of course, is as natural a phenomenon as growth: but it warrants investigation because it poses challenges to urban development, competitiveness, and the very management of cities that differ fundamentally in type and scale from those associated with expansion.

Population decline affects cities in complex ways (Martinez-Fernandez et al. 2012; Rieniets 2009). Two widely discussed consequences illustrate this: first, shrinking populations can erode economic potential and urban competitiveness; second, maintaining infrastructure designed for larger populations becomes progressively more difficult and costly.

Education lies at the intersection of these challenges. Urban shrinkage directly undermines established school systems as the pool of school-age children diminishes. This weakens financial sustainability, reduces the diversity of educational provision, and – like many other problems linked to shrinkage – can trigger a negative spiral in families' school choice decisions. The maintenance, operation, and, where necessary, reorganisation or closure of schools is therefore, a fundamentally local public matter, regardless of the prevailing system of educational governance. Beyond its practical implications, the issue carries strong symbolic weight, particularly in small towns where a single secondary school often represents a core urban function (Pirisi, Makkai 2014). For these reasons, this study focuses on secondary education within the broader context of shrinking cities. It asks to what extent elements of the Hungarian urban network were able to preserve their secondary-education roles between 2011 and 2022, and what factors explain the regional disparities that have emerged in this regard.

[4] There are a few other "shrinkage hot (or even cold) spots" – within Eastern Europe, the eastern German states, Ukraine, and parts of the Balkans are frequent research areas; outside Europe, Japan and large portions of the interior regions of the United States are often examined.

Theoretical foundations

The theoretical basis for the study of urban shrinkage as a phenomenon was established above all by the theory of the urbanisation cycle (Van den Berg et al. 1982). This theory incorporated the decline and contraction of cities as a natural part of urbanisation, occurring – or expected to occur – during the phases of relative and absolute deconcentration. Although the theory was subsequently refined and interpreted in various ways (Enyedi 2012), it made fundamental the idea that urbanisation does not necessarily entail uninterrupted growth.

Another possible approach is offered by the concept of uneven development (Smith 1984), in which urban growth and shrinkage represent two sides of the same coin. Whereas the cycle theory regards shrinkage as an intrinsic consequence of urbanisation, the uneven development approach sees it as an inherent feature of capitalism and of capitalist production of space. This is particularly evident where the contraction of a core city is accompanied by suburban expansion at the urban periphery – an interpretation that has also been present in Hungarian research on suburbanisation (Timár 2007; Timár, Váradi 2001).

It is important to recognise that urban shrinkage takes many forms, each with distinct consequences. Since the turn of the millennium, major research projects have examined the problem of (especially European) urban shrinkage in comparative perspective (Haase et al. 2014, 2016; Pallagst et al. 2014; Turok, Mykhnenko 2007; Wolff, Wiechmann 2018). Even so, there is no single, universally accepted definition of the "shrinking city" beyond the simple criterion of population decline.

Equally, the context and causes of shrinkage matter greatly. It is worth mentioning their diversity even without aiming for completeness, as urban contraction may be slow and gradual, but it can also be sudden and catastrophic: for instance, natural or human-induced disasters (Oswalt, Rieniets 2006), or even deliberate urban destruction (Coward 2008) complicate any understanding of the urbanisation trajectories of, for instance twentieth-century Poland, Bosnia and Herzegovina in the 1990s (Gekić et al. 2022), or post-2014 Ukraine after 2014.

More commonly, the drivers of shrinkage are less dramatic. In post-industrial societies, the most frequent cause is suburbanisation, which can produce significant population losses within administrative boundaries. This has affected Budapest in particular, in line with other post-socialist metropolises (Kovács, Tosics 2014). In reality this is a spatial redistribution of population deconcentration, rather than a decline in the competitiveness or attractiveness of the wider urban region, though it does raise concerns about falling tax revenues.

Another typical pattern links shrinkage to industrial structural change – or its absence – and to prolonged economic crisis. Detroit is an emblematic, though far from unique, example (Boros 2017; Bontje 2005; Cortese et al. 2013). Comparable trajectories can be observed in former industrial cities in Eastern Germany such as Leipzig, or in Czechia's Ostrava, and in declining and transforming port cities such as Liverpool, Genoa or Bilbao (Bernt et al. 2014). In such cases shrinkage can be traced to a loss of competitiveness and structural economic weaknesses, and research often focuses on the possibilities and methods of revitalisation (Ortiz-Moya 2015; Rhodes, Russo 2013), or alternatively, on managing decline (Bernt et al. 2014).

Hungary's urban network contains several examples where shrinkage can likewise be linked to industrial restructuring and, specifically, to the political-economic transition of 1989–1990 (Alföldi, Balázs 2018; Germuska 2024; Horváth, Csüllög 2012; Molnár 2015; Pirisi, Sókuti 2013), which was accompanied by a complex economic and social crisis. The collapse of the planned-economy model, and especially of formerly favoured heavy industrial sectors, produced high unemployment, emerging poverty and significant out-migration across many industrial regions.

Compared with international trends, however, research that connects shrinkage to revitalisation or structural-change strategies has been limited (Merza et al. 2024; Molnár, Egedy 2020). This may be because shrinkage is so widespread in the Hungarian urban network that even successful restructuring would not necessarily create the conditions for renewed population growth.

In the Hungarian context, therefore shrinkage is best understood not merely as population loss, but as population loss exceeding the national average (Trócsányi et al. 2018). It becomes a clear symptom of local crisis when natural decrease is accompanied by significant out-migration. While the near-universal contraction of small towns is not unique to Hungary (Pirisi, Trócsányi 2014), the centuries-long demographic decline of the market towns of the Great Plain has attracted particular scholarly attention (Jelinek, Virág 2020; Kovács 2010, 2017; Molnár 2016; Virág 2020).

Within Hungarian research of shrinkage – including a substantial body of village studies not discussed here – the issue of education rarely appears explicitly (Kovács 2012; Zolnay 2020), although empirical surveys have provided some evidence of links between demographic decline and the education system (Makkai et al. 2017). Naturally, the contraction of demographic base is only one, and perhaps not the most decisive component in the transformation of education system (Dézsi et al. 2014; Kozma 2002; Kozma, Forray 1999). Nonetheless, international experience makes the connection difficult to ignore (Nelle 2016; Yanagisawa 2018). Finally, shrinkage will persist for a long time. While rural communities are often marginalised and isolated by the process

(Alpek, Máté 2018), the demographic decline reported between the two most recent censuses (Horeczki et al. 2023) in small and medium-sized towns may also threaten the long-term viability of urban functions.

The present research is grounded on urban geography: it examines the educational role of towns rather than the operation of individual institutions. By linking shrinkage to secondary education, we aim to show that the education sector is directly exposed to urban demographic processes, and that powerful feedback mechanisms are at work. In the end, the contraction of the educational function jeopardises one of the fundamental roles of towns – especially small towns – reducing their capacity to maintain their central role in the settlement hierarchy.

Methodological issues

The study draws on data from the 2011 and 2022 censuses, a choice that proved practical from several reasons. Not only does it allow for comparisons between changes in education and those explored in settlement-geography studies based on the same reference points, but the period in question also broadly coincides with a political era in Hungary that brought major changes to the frameworks of social and regional development. This latter aspect must be taken carefully into account when interpreting the results. The most significant policy shifts during the period under review include:

(1) a strong centralisation of the entire educational system;
(2) a complete transformation of school maintenance system[5] and
(3) the adoption of Act CXC. of 2011, which lowered the upper age limit for compulsory schooling from 18 to 16 years.

The last measure, in particular, increased the rate of early school leaving in an already highly segregated system (Hermann 2019; Hermann, Kisfalusi 2023). The first of these changes had indirect implications for the present study, while the third had a direct impact, and a portion of the decline in student numbers between 2011 and 2022 can be attributed to it. Whatever, the social, economic, or educational policy objectives of this measure – and however suitable it may have been proved to be a tool to address

[5] In practice, this meant that whereas municipalities had previously played the dominant role in school maintenance – alongside a more limited presence of churches and non-profit organisations – after 2012 municipal responsibility was abolished. It was replaced by the state and other bodies within the central subsystem of public finance, while churches assumed a substantially larger role, and the involvement of civil organisations virtually disappeared.

certain educational problems (Pap 2015) – the fall in student numbers remains an undisputed fact, as does its effect on institutional funding.

A further methodological challenge arose when comparing student numbers because of the reorganisation of the education system. In the TEIR database, regional statistics provided by the Hungarian Central Statistical Office (HCSO) present student figures per settlement in different breakdowns for the two census years, which prevents direct comparisons by school type. To ensure consistency, we therefore aggregated the total number of full-time students above primary but below tertiary education levels, including all forms of vocational training. This figure was then compared this with the number of residents aged 15–18. This approach, however entails certain limitations. Some secondary school students fall outside the 15–18 age range; for example, those who began school at the age of seven may not graduate with a matura until the age of 20, (especially if enrolled in a five-year secondary programme). Moreover, although the most common educational pathway in Hungary remains the four-year secondary school following eight-years of primary education, there are also six- and eight-year grammar schools, that admit students at the age of 10–12. Their numbers are not negligible: they account for roughly 13–14% of annual secondary-school applicants, with about 10% ultimately admitted (according to Education Office reports on secondary-school admissions). An additional difficulty lies in the mismatch between population and enrolment data. Age-group figures are recorded by place of residence, whereas student numbers are registered at the location of the school Age-group figures are recorded by place of residence, whereas student numbers are registered at the location of the school. In some settlements, therefore, the number of enrolled students can be two or two and a half times higher than the local population of the corresponding age group. Nevertheless, these discrepancies are relatively stable over time: the share of six- and eight-year schools in the system remains roughly constant, and annual cohort sizes do not fluctuate significantly. For these reasons, the method was considered appropriate for tracking changes between 2011 and 2022.

The scope of the analysis covered all current Hungarian towns (348 in total). These settlements practically encompass the entire secondary-education system: in 2022, for instance, 99.4% of full-time grammar-school students were enrolled in a town, and only eight non-urban settlements offered grammar school education. Among these, some are rapidly urbanising villages with strong suburban characteristics (e.g. Solymár, Kápolnásnyék); others are disadvantaged rural communities in peripheral regions, that provide schooling for marginalised social groups, including Roma children (e.g. Alsószentmárton, Biri, Magyarhertelend); a few host special (private) education programmes, where the rural setting is integral to their philosophy (e.g. Nemesvámos, Mezőörs);

and one – the "Hungarian Football Capital" of Felcsút – offers grammar-school education as part of the Ferenc Puskás Football Academy.

For the spatial analysis, towns and cities were classified to illustrate both regional and hierarchical differences. The primary framework was the urban hierarchy published in the Hungarian National Atlas (Z. Kovács et al. 2021), which was subdivided into further categories in some cases. Following Hungarian geographical tradition, towns were distinguished in Eastern and Western Hungary using River Danube as a dividing line, reflecting differences in settlement networks[6] and in the socio-economic dynamics of these broader regions. Agglomeration towns of the Budapest metropolitan region and those surrounding "the provincial cities" were differentiated given the varying scale and character of suburbanization. Data analysis employed descriptive statistical techniques and visualisation through QGIS geospatial software (version 3.34).

Results

Changes in the (secondary) school-age population

Between the 2011 and 2022 censuses, Hungary's population declined by about 330,000 people – accounting roughly for 3.3% of the total. Somewhat unexpectedly, the population of the towns included in our study (measured as the permanent population) fell by 4% to 6.77 million over the same period.

Although public discourse often frames this phenomenon as a specific Hungarian problem – frequently accompanied by dramatic headlines and narratives of national decline – urban shrinkage is in fact a general characteristic of Central and Eastern Europe. Drawing on data compiled from various sources[7], it becomes apparent that while about 73% of Hungarian towns, nearly 90% of Serbian and Bulgarian towns, and about 80% of Polish towns lost population between 2011 and 2022, even 50-60% of Czech,

[6] The two main macro-regions of Hungary – the Great Hungarian Plain with Northern Hungary (the "East") and the Transdanubian Region (the "West") – have historically followed different development trajectories, which are reflected in the character of their settlement network. The West is marked by a dense pattern of small (often tiny) villages interspersed with a few small towns functioning as local centres, whereas urbanisation on the Great Plain has been shaped by relatively large agrarian towns, a near absence of a village system, and consequently with a more limited hierarchy of central places.

[7] Population data were drawn from the census publications of the respective national statistical offices, and, where data quality permitted, from the summary tables provided by *citypopulation.de*.

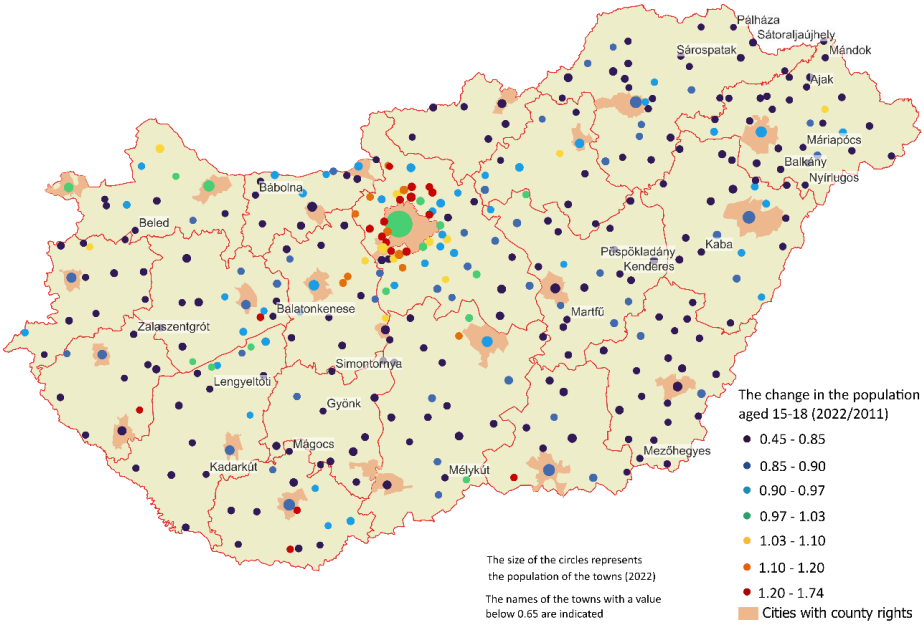
Slovak, and Slovenian towns experienced shrinkage. Owing to differences in administrative systems and statistical methods, these figures are not perfectly comparable, yet they clearly demonstrate that shrinkage is a typical – indeed European – feature of the settlement network, rather than a uniquely Hungarian one.

Population dynamics are, of course, influenced by more than declining birth rates: rising life expectancy and migration balances also play an important role. The change in the secondary school-age population (15–18 years) shows that the ageing of the population only partly offsets the loss caused by fewer births. The decline in this age group is therefore is much steeper – over 10%. In 2011, there were 296,000 residents aged 15–18 in the towns studied; by 2022, this number had fallen to just 267,000.

While overall population change and the change in the 15–18 age group are strongly correlated, some noteworthy differences emerge. Whereas 82 towns recorded population growth, only 48 experienced an increase in their secondary school-age population. Of these, at least a 3% rise was seen in 40 towns, and a 10% rise in only 28. By contrast, 199 towns recorded a decline of at least 15%, and 23 lost one-third or more of this age group. The town with the greatest overall population loss was Tiszaújváros (−17%), a dynamic industrial centre – perhaps a surprising outcome if the small Balatonkenese boundary change is excluded. Yet the steepest fall in the secondary school-age population occurred in Pálháza, in the northeastern Zemplén region, where more than half (!) of 15–18-year-olds disappeared within a decade despite a very modest overall population loss of 5.2%. At the other extreme, Halásztelek (overall population +32%) and Biatorbágy (15–18 year olds +74%) both in the Budapest agglomeration, represent the highest growth, foreshadowing the broader spatial patterns discussed below *(Figure 1)*.

Figure 1.

Change in the population aged 15–18



Source: Authors' own compilation based on HCSO data

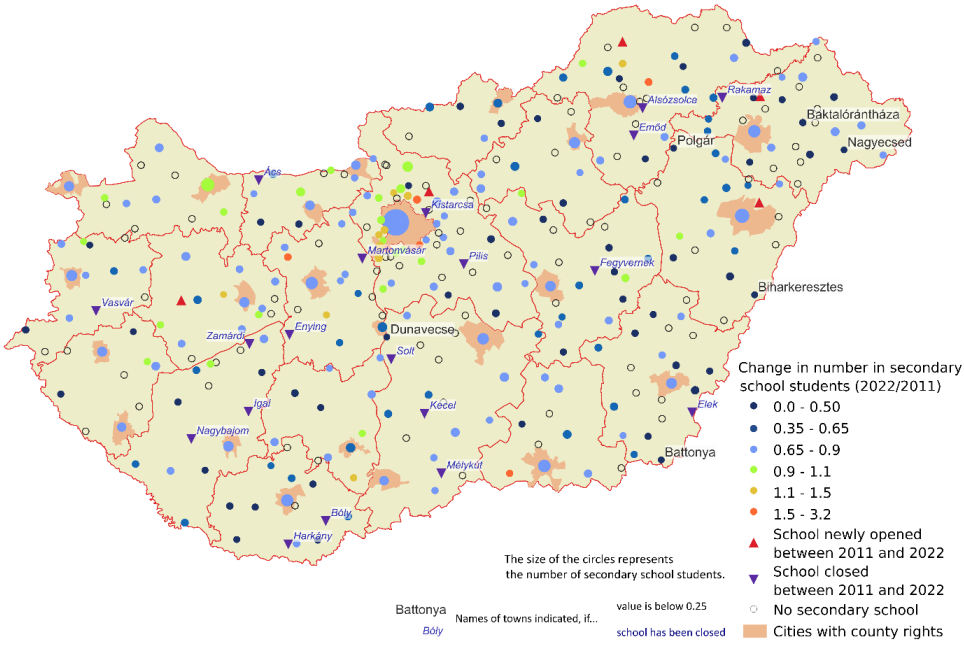
Stable or rising populations are found almost exclusively in agglomeration areas – besides the capital, examples include Mórahalom near Szeged and Kozármisleny near Pécs – and around Lake Balaton. The relative stability of the dynamic north-western cities of Sopron and Győr is also noteworthy, signalling large-scale regional transformations. There are eight towns where the number of 15–18-year-olds grew despite an overall population decline (Budapest, Mosonmagyaróvár, Sopron and several other very small towns). Conversely, 80 towns recorded overall population growth but a shrinking 15–18 cohort. As the map illustrates, shrinkage is heavily concentrated in the peripheral regions: South Transdanubia, north-eastern Hungary, and almost the entire Tiszántúl region (the easternmost region of Hungary).

Change in student numbers

The decline in secondary school student numbers during the study period significantly exceeds both the overall population loss and the fall in the relevant age group. By 2022 the total number of secondary-school students had fallen to 76.5% of the 2011 figure – a substantial difference. Part of this drop is likely statistical, reflecting redistribution among school types, but it also represents a genuine contraction: the shrinking age cohort and lower enrolment rates are acting simultaneously.

Figure 2.

Change in the number of secondary school students (2022/2011)



Source: Authors' own compilation based on HCSO data

When examining the map showing the changes in student numbers *(Figure 2)*, the first thing to emphasise is that there are a relatively large number of towns – 19 in total – where secondary education was present in 2011 but no longer existed by 2022. It is clear that geography alone does not explain their distribution (although peripherality is a dominant feature); rather the modest size of the settlement is decisive with only two

exceptions: these towns have fewer than 10,000 inhabitants. In contrast, new secondary schools were opened in only five towns (Devecser, Hajdúsámson, Nagyhalász, Szendrő, Veresegyház). It is noteworthy that this list includes Veresegyház – one of the country's fastest-growing agglomeration towns with exceptionally high average incomes – alongside four small towns characterised by distinctly low income levels.

Regional differences are also evident in *Figure 2*. The decline in student numbers is significantly smaller in the Budapest metropolitan area and in the northern part of Transdanubia. These differences reflect not only variations within the settlement hierarchy but also the broader East-West divide in the Hungarian urban network *(Table 1)*.

Table 1.

Number of students in full-time secondary education (2022, as a percentage of 2011)

Hierarchy	*BP*	*Rural centres*		*Agglomeration towns*		*Total*
		West	East	Buda-pest	Other	
Capital city	88					88
Regional centres		82	81			82
County centres		75	77			76
Medium towns with complete functions		69	64	97	43	70
Medium towns with incomplete functions		64	68	112		70
Small towns with complete functions		71	58	96	47	64
Small towns with incomplete functions		58	68	88	68	67
Village towns		72	55	100	76	67
Titular towns		60	54	97	106	75
Total	*88*	*73*	*70*	*98*	*67*	*76*

Source: Authors' own compilation based on data retrieved from the TEIR-System

Overall, a marked decrease in the number of full-time secondary students in Hungarian cities and towns can be observed: in 2022 the figure stood at just over 75% of the 2011 level. Within the urban network, however, the dynamics vary considerably. The capital (88%) and the regional centres (82%) are the most stable, while county centres as a group, are close to the national average. By contrast, medium-sized and small towns, together with village towns and titular towns, experienced a far more substantial

decline. Among rural centres, the differentiating pattern appears to be hierarchical: the lower the position in the urban hierarchy, the shaper the decline in student numbers. Regional contrasts emerge only in the lower categories of the hierarchy: in general, towns in the West display higher values, presumably due to stronger urban attraction zones and the more favourable position of the region in the national migration flows *(Table 1)*.

Nevertheless, towns in the Budapest agglomeration exhibit the highest values across all hierarchical categories, presumably due to their dynamic migration and population growth, which alters the general hierarchy-driven pattern. Several towns around the capital even recorded an increase in student numbers: among the more significant secondary education centres, Fót (191%), Halásztelek (179%), Érd (133%), Budaörs (131%), Dunakeszi (114%), Százhalombatta (113%), Törökbálint (113%), Budakeszi (109%), and Pilisvörösvár (102%) should be highlighted. Beyond the capital region only Bodajk (313%), Mórahalom (160%), and Szikszó (140%) registered substantial increases, despite their relatively modest earlier importance; all three are urban suburban towns of other regional centres. Since most agglomeration towns fall into the categories of village towns and titular towns, this distortion effect is most pronounced at the lowest levels of the hierarchy. As a result, small towns with complete urban functions but located lower in the urban hierarchy and shaped primarily by rural-centre dynamics rather than suburbanisation, occupy the weakest position in the national context. In this group, the number of students in full-time secondary education has fallen to less than two thirds of the 2011 level *(Table 1)*.

A comparison of Tables 2 and 3 illustrates the outcomes of these differentiated dynamics. The capital and the regional centres have increased their shares of full-time secondary school students, while county centres have largely maintained their previous proportions. Together, these 20 cities (out of Hungary's 348 towns) accounted for 58.6% of students in 2011 and 63.0% in 2022, confirming the trend toward concentration. With some exceptions, medium and small towns are the clear losers of this restructuring process: their collective share has declined from 34% to 28%. Despite the above-average growth of agglomeration towns – especially around Budapest – the share of village towns and titular towns in full-time secondary education has remained marginal and continues to decrease, apart from those within the agglomeration zone of Budapest. East–West differences meanwhile are clearly visible only at the lower levels of the hierarchy.

Table 2.

Distribution of students in full-time secondary education by urban hierarchy (2011, %)

Hierarchy	*BP*	*Rural centres*		*Agglomeration towns*		*Total*
		West	East	Buda-pest	Other	
Capital city	21.4					21.4
Regional centres		5.6	10.3			15.9
County centres		11.2	10.1			21.3
Medium towns with complete functions		4.8	3.6	1.6	0.6	10.6
Medium towns with incomplete functions		2.0	7.2	0.8		10.0
Small towns with complete functions		3.7	6.6	0.7	0.2	11.2
Small towns with in-complete functions		0.6	1.1	0.2	0.3	2.1
Village towns		0.6	2.4	0.7	0.4	4.1
Titular towns		0.7	1.2	1.1	0.4	3.3
Total	*21.4*	*29.3*	*42.5*	*4.9*	*1.9*	*100.0*

Source: Authors' own compilation based on data retrieved from the TEIR-System

Table 3.

Distribution of students in full-time secondary education by urban hierarchy (2022, %)

Hierarchy	*BP*	*Rural centres*		*Agglomeration towns*		*Total*
		West	East	Buda-pest	Other	
Capital city	24.8					24.8
Regional centres		6.0	10.9			17.0
County centres		11.0	10.2			21.2
Medium towns with complete functions		4.4	3.0	1.9	0.3	9.7
Medium towns with incomplete functions		1.7	6.4	1.1		9.2
Small towns with complete functions		3.5	5.0	0.8	0.1	9.5
Small towns with incomplete functions		0.4	1.0	0.2	0.3	1.8
Village towns		0.6	1.7	0.9	0.4	3.6
Titular towns		0.6	0.8	1.4	0.5	3.3
Total	*24.8*	*28.2*	*46.2*	*6.3*	*1.6*	*100.0*

Source: Authors' own compilation based on data retrieved from the TEIR-System

Last but not least, the number of students in full-time secondary education per 1,000 inhabitants indicates the strength of the secondary-educational role of the different urban settlement groups. While the capital and medium towns with incomplete functions remain close to each other and to the overall urban average, cities at higher hierarchical levels (regional and county centres, and medium towns with complete functions) show higher values, whereas towns at lower levels (small, village and titular towns) display lower averages. Except for Budapest, the influence of the hierarchy – and the distinction between the urban settlements with central functions and the agglomeration towns as a whole between settlements with central functions and the agglomeration towns as a whole – is evident *(Table 4)*.

Table 4.

Number of students in full-time secondary education per 1,000 inhabitants (2022)

Hierarchy	*BP*	*Rural centres*		*Agglomeration towns*		*Total*
		West	East	Buda-pest	Other	
Capital city	61					61
Regional centres		87	85			86
County centres		82	90			86
Medium towns with complete functions		71	67	107	42	73
Medium towns with incomplete functions		51	75	33		60
Small towns with complete functions		45	45	30	27	42
Small towns with incomplete functions		27	46	29	32	36
Village towns		22	27	34	24	28
Titular towns		15	7	14	11	11
Total	*61*	*64*	*61*	*30*	*19*	*56*

Source: Authors' own compilation based on data retrieved from the TEIR-System

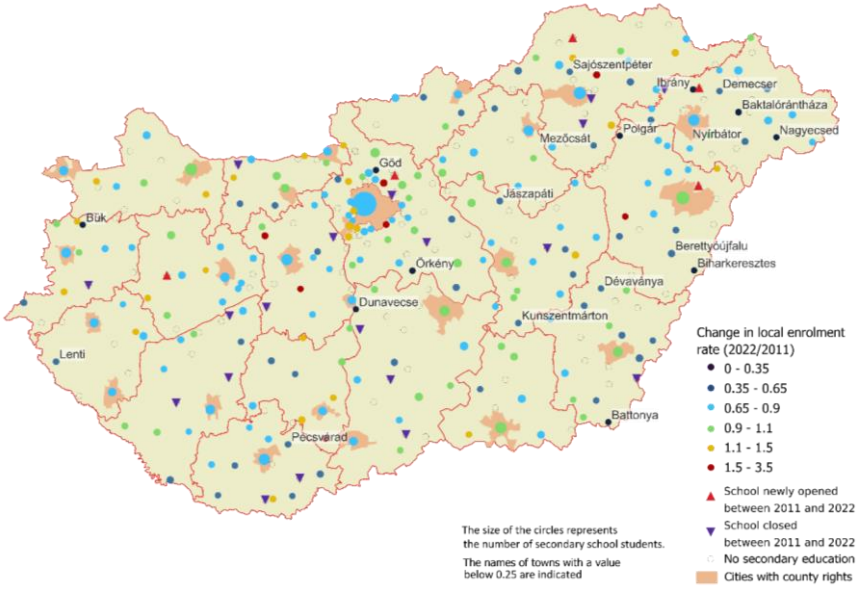
Several cities and towns display a distinctly strong secondary-education profile. Among county centres, Eger (141 students per 1,000 inhabitants) stands out, while Vác (145) – despite its location in the Budapest metropolitan area – leads the group of medium towns with complete functions. Kisvárda (147) is notable among the medium towns with incomplete functions. Smaller towns show even more pronounced figures: Fehér-gyarmat (124) among small towns with complete functions, Tokaj (252) among small towns with incomplete functions, Aszód (206) among village towns and Bodajk (143) in the group of titular towns. These exceptional values can be attributed to strong local educational traditions, or youth-oriented specialist institutions, and/or relatively large catchment areas.

Further correlations

Although the number of school-age residents and the number of enrolled students are closely related, this alone does not explain the observed shrinkage *(Figure 3)*.

Figure 3.

Change in enrolment rates (secondary students / 15–18 year old population) (2022/2011)



Source: Authors' own compilation based on HCSO data

Change in enrolment rates reveals additional underlying factors. On the map, a value of around 1.0 indicates that the student population changed in proportion to the 15–18 year old cohort. This pattern is most evident in the large and medium-sized cities of Eastern Hungary (e.g. Debrecen, Szolnok, Kecskemét, Szeged), several towns in Northern Transdanubia (e.g. Győr, Tata, Pápa, Kőszeg), and in the Budapest agglomeration. By contrast, large and medium-sized towns in Transdanubia show a relatively greater contraction of the education sector, which can often be linked to their hinterlands: even where the central settlement itself has not lost significant population, its surrounding areas frequently have.

The sharpest declines are found in small towns of only a few thousand inhabitants, where enrolment rates have in some cases fallen by half – examples include Jászapáti, Kunszentmárton, Battonya, Nagyecsed and Polgár. Although there are exceptions in this group (e.g. Bük, Pécsvárad, Göd) and some cases can be explained by specific local factors – for instance, Nagyhalász, which benefited from the opening of a new school near Ibrány – the overall pattern strongly suggests that the partial exclusion of low-income groups from secondary education is a key contributing factor.

This interpretation is supported by supplementary analyses. To account for catchment area effects districts (rather than towns) were grouped into quintiles according to personal income tax per taxpayer. Between 2011 and 2022, the change in enrolment rate changed in each quintile, we get values of averaged 87%, 84%, 81%, 75% and 71% across these quintiles, demonstrating a marked gap between the two highest-income and the two lowest-income categories. A further perspective shows that declines in the enrolment rates are much smaller in districts with large-cities than in those led by small towns as their administrative centres. Within the latter group, districts containing several towns ("rival" small-town districts) fare better than those dominated by a single small town.

Conclusions

A shrinking city—shrinking education?

The link between demographic decline and the contraction of education is unavoidably evident. As the population of cities and towns falls, so too does the number of young people eligible for schooling. Our analysis highlights that demographic processes affect education far more intensively than might be assumed: the decline in the secondary-school-age population is already nearly twice the rate of overall population loss.

This fact alone raises serious concerns about the sustainability of secondary educational institutions. Moreover, while the post-transition period of Hungarian educational policy was characterised by the expansion of secondary – and especially, grammar-school – education (M. Császár 2004), these processes seem to have stalled or partly reversed after 2010. The drop in student numbers stems not only from demographic factors but also from policy changes: the lowering of compulsory-schooling age, the – moderately successful – preference for vocational training over grammar schools, and the discouragement of longer programmes – such as eight- and six-year grammar schools, "zero-year" language preparatory classes – have all contributed to this process. Regional comparisons with settlement hierarchy and income data further suggest that a typical driver of the decline is the exclusion of disadvantaged 17–18-year-olds. Whether judged from a moral or social perspective, this represents a significant net loss here, making the sustainable operation of existing institutions increasingly difficult.

Shrinkage is also uneven, triggering strong spatial concentration. Budapest and the regional centres have increased their share of secondary education, and the Budapest agglomeration – where the most positive local changes are observed – has raised its combined proportion of national enrolment from 25% to 31%.

By contrast, small towns are the principal losers, regardless whether they are “Transdanubian type” towns with extensive catchment areas or “market town type” – typical of the Eastern part of the country. In settlements of 5,000-20,000 residents, student numbers have dropped by at least one-third and enrolment rates by roughly 23%. Excluding agglomeration settlements, the 2022 student count in small towns with complete and incomplete functions, is barely 60 % of the 2011 figure.

The erosion of secondary education at the lower levels of the urban hierarchy is stark. The 19 settlements that lost their secondary school altogether had an average population of 5,900 in 2022. Among towns with fewer than 5,000 residents, the proportion offering secondary education fell from 44% to 38%; in those with 5,000-10,000 residents, the figure dropped from 65% to 58%. The process shows no signs of stopping: in 2022, 16 towns had fewer than 100 secondary-school students, and in 12 of these, the decline since 2011 exceeded 50%. If we set a threshold of 200[8] students as the minimum for a sustainable secondary school, 49 towns, fall below this line, with 26 of experiencing particularly steep shrinkage. These institutions may be at risk of closure within only a few years.

[8] This is not an official threshold; it simply represents the size of two parallel classes of roughly 25 students each, which remains relatively small for a secondary school.

A shrinking education system—a shrinking city?

The cases of Bonyhád, Csurgó, Pápa, Sárospatak, Mezőtúr – towns with long-standing educational traditions (often Protestant in origin) – illustrate the scale of change. On average, these towns lost around 10% of their total population and 27% of their secondary-school-age cohort, alongside a 28% decline in student numbers. While this roughly mirrors demographic trends and might seem relatively favourable, it still represents the disappearance of 200-300 from each settlement – and in Pápa's case, more than 1,000. Collectively, these towns have lost more than 200 full-time teachers, around 26% of the 2011 staff.

This is really an important element of the problem. The shrinkage of education can also be understood as a decreasing ability of settlements to reproduce their human resources: fewer students mean fewer qualifications, a reduced labour market supply, and lower competitiveness. The departure of teachers – key members of the local intelligentsia and central to cultural life and civic engagement – brings a qualitative shift. The resulting scarcity of graduate-level jobs, puts out-migration into a self-reinforcing cycle.

Until recently, small towns primarily faced an indirect effect of higher education expansion: the pursuit of university degree drew many young people away who, a generation ago, would have ended their education with a small-town matura. They "find their way home" to small towns in a minority of cases only (Makkai et al. 2017). It is especially troubling when this educational mass migration begins already at secondary level. Measures such as the county and country pass systems, though not physically shortening distances, have made regional and national centres more financially accessible. Small-town schools struggle to compete with the variety and prestige of larger cities' offerings.

Even in historically strong school towns mentioned at the beginning of this chapter, the accumulated cultural capital and the very positive reputation have only slowed, but not halted, the decline. Other small towns with less explicit educational profile show much steeper losses: Szigetvár has lost 51% of its total students, Túrkeve 53%, and Sátoraljaújhely 54%, with a combined 55% drop in full-time secondary-school teachers. Qualitative change is also highly significant: the number of students graduating with a matura has fallen by two-thirds in Sátoraljaújhely and Túrkeve and by one-third in Szigetvár, clearly reflecting the shrinking share of academically oriented schools.

If the current trends persist – and no demographic turnaround is in sight – one of the strongest symbols of small-town urban life – the grammar school – may follow the fate of the sugar factory, the civic casino, the barracks, or even the railway station: surviving as a historically significant but functionally hollowed-out element of urbanisation.

Acknowledgement

The research of Gábor Pirisi and Ernő Molnár was supported by the National Research, Development and Innovation Office under project NKFI-1 SNN 148581 „(Hidden) Industrial Champions: Origins, Features and Futures of Industrial Small Towns. A comparative study of Hungary and Slovenia".

References

Alföldi, G., Balázs, B. (2018): The Future of a Shrinking Hungarian City, Salgótarján. *Corvinus Regional Studies*, 2., 37–45.

Alpek, B. L., Máté, É. (2018): „Nagyon el vagyunk ám itt zárva" – izolálódó települések a Baranyai-Hegyháton. *Településföldrajzi Tanulmányok*, 1., 70–91.

Bernt, M., Haase, A., Großmann, K., Cocks, M., Couch, C., Cortese, C., Krzysztofik, R. (2014): How does(n't) Urban Shrinkage get onto the Agenda? Experiences from Leipzig, Liverpool, Genoa and Bytom. *International Journal of Urban and Regional Research*, 5., https://doi.org/10.1111/1468-2427.12101

Bontje, M. (2005): Facing the challenge of shrinking cities in East Germany: The case of Leipzig. *GeoJournal*, 1., 13–21.

Boros, L. (2017): Detroit válsága - okok és következmények. *Földrajzi Közlemények*, 4., 356–369.

Cortese, C., Haase, A., Grossmann, K., Ticha, I. (2013): Governing Social Cohesion in Shrinking Cities: The Cases of Ostrava, Genoa and Leipzig. *European Planning Studies*, 10., https://doi.org/10.1080/09654313.2013.817540

Coward, M. (ed.) (2008): *Urbicide: The politics of urban destruction*. Routledge.

Dézsi, G., Kozma, G., Teperics, K. (2014): Spatial distribution and development of educational institutions in different historical periods: a Hungarian case study. *Human Geographies-Journal of Studies and Research in Human Geography*, 2., www.humangeographies.org.ro

Enyedi G. (2012): *Városi világ*. Akadémiai Kiadó. https://doi.org/10.1556/9789630597982

Gekić, H., Bidžan-Gekić, A., Drešković, N., Mirić, R., Reményi, P. (2022): *Urban and Rural Geography of Bosnia and Herzegovina*. 241–263. https://doi.org/10.1007/978-3-030-98523-3_12

Germuska P. (2024): A szocialista várostól a szocialista típusú új városig. Egy városcsoport tipológiái és posztszocialista átalakulása az utóbbi másfél-két évtized szakirodalmának tükrében. *CITY.HU Várostudományi Szemle*, 2., 37–60.

Haase, A., Bernt, M., Großmann, K., Mykhnenko, V., Rink, D. (2016): Varieties of shrinkage in European cities. *European Urban and Regional Studies*, 1., 86–102. https://doi.org/10.1177/0969776413481985

Haase, A., Rink, D., Grossmann, K., Bernt, M., Mykhnenko, V. (2014): Conceptualizing urban shrinkage. *Environment and Planning A*. 7., https://doi.org/10.1068/a46269

Hermann Z. (2019): A tankötelezettségi korhatár csökkentésének hatása a lemorzsolódásra. *Munkaerőpiaci Tükör, 2018.* Közgazdaság-és Regionális Tudományi Kutatóközpont. 69–78.

Hermann, Z., Kisfalusi, D. (2023): School segregation, student achievement, and educational attainment in Hungary. *International Journal of Comparative Sociology*. https://doi.org/10.1177/00207152231198434

Horeczki, R., Molnár, E., Pirisi, G. (2023): Population dynamics of the Hungarian small towns in the light of censuses. *Deturope – The Central European Journal of Regional Development and Tourism*, 2., 66–84.

Horváth, G., Csüllög, G. (2012): The Rise and Fall of a Mining and Industrial Region. In P. Wirth, B. M. Černič, W. Fischer (Eds.), *Post-mining regions in Central Europe. Problems, Potentials, Possibilities*. Oekom.

Jelinek, C., Virág, T. (2020): Zsugorodó városok és társadalmi egyenlőt-lenségek magyarországon. *Szociologiai Szemle*, 2., 4–26. https://doi.org/10.51624/szocszemle.2020.2.1

Kovács, K. (2012): Rescuing a small village school in the context of rural change in Hungary. *Journal of Rural Studies*, 2., 108–117. https://doi.org/10.1016/J.JRURSTUD.2012.01.020

Kovács, T. (2010): The Phenomenon of Socio-economic Shrinking in the Example of the Nagykunság Region. *Periodica Oeconomica*, 37–47.

Kovács, T. (2017): Kisújszállás, 'the Cultural Capital of Great Cumania' – Shrinkage, Resilience and Culture-Based Urban Development in East Hungary. *Deturope,* 3., 122–140.

Kovács, Z., Beluszky, P., Tóth, G., Egedy, T. (2021): Városok. In: K. Kocsis (Ed.): *Magyarország Nemzeti Atlasza – Társadalom*, CSFKI Földrajztudományi Intézet. 116–127.

Kovács, Z., Tosics, I. (2014): Urban Sprawl on the Danube: The Impacts of Suburbanization in Budapest. In: K. Stanilov & L. Sýkora (Eds.), *Wiley Blackwell,* 33–64. Wiley Blackwell. https://doi.org/10.1002/9781118295861

Kozma, T. (2002): Transformation of education systems: The case of hungary. *European Education*, 4., 10–33. https://doi.org/10.2753/EUE1056-4934340410

Kozma, T., Forray, R. K. (1999): Az oktatáspolitika regionális hatásai. *Magyar Pedagógia*, 2., 123–139.

M. Császár, Z. (2004): *Magyarország oktatásföldrajza*. Pro Pannonia Kiadó.

Makkai, B., Máté, E., Pirisi, G., Trócsányi, A. (2017): Where Have All the Youngsters Gone? The Background and Consequences of Young Adults' Outmigration from Hungarian Small Towns. *European Countryside*, 4., 789–807. https://doi.org/10.1515/euco-2017-0044

Martinez-Fernandez, C., Audirac, I., Fol, S., Cunningham-Sabot, E. (2012): Shrinking Cities: Urban Challenges of Globalization. *International Journal of Urban and Regional Research*, 2., 213–225. https://doi.org/10.1111/j.1468-2427.2011.01092.x

Merza, P., Pirisi, G., Maráz, H., Pap, N. (2024): Komló - a Mecsek kapuja? A kisvárosi arculatváltás nehézségei egy egykori bányaváros példáján. *Földrajzi Közlemények*, 4., 376–391. https://doi.org/10.32643/fk.148.4.6

Molnár E. (2015): Martfű: egy cipőgyártó kisváros múltja és perspektívái. *Földrajzi Közlemények,* 2., 132–146.

Molnár E. (2016): Gazdasági alapok és népességmegtartó képesség a 21. századi Mezőtúron. In: Forray K., Kozma T., Molnár E. (szerk.): *Mezőváros új szerepben*. HERA – HTSART – ÚMK, Budapest. 97–111.

Molnár, N., Egedy, T. (2020): Turizmusfejlesztéssel a hátrányos helyzetű területek felzárkóztatásáért – Salgótarján és a Karancs-Medves-vidék turisztikai potenciálja. *Földrajzi Közlemények*, 1., 43–64. https://doi.org/10.32643/fk.144.1.4

Nelle, A. B. (2016): Tackling human capital loss in shrinking cities: urban development and secondary school improvement in Eastern Germany. *European Planning Studies*, 5., 865–883. https://doi.org/10.1080/09654313.2015.1109611

Ortiz-Moya, F. (2015): Coping with shrinkage: Rebranding post-industrial Manchester. *Sustainable Cities and Society*, *15*, 33–41. https://doi.org/10.1016/J.SCS.2014.11.004

Oswalt, P., Rieniets, T. (2006): *Atlas of shrinking cities*. Hatje Cantz.

Pallagst, K. M., Wiechmann, T., Martinez-Fernandez, C. (2014): Shrinking Cities – International Perspecitves and Policy Implications. *Routledge Advances in Geography*. Routledge.

Pap, M. (2015): A tankötelezettségi korhatár csökkentésének negatív hatásai. *Acta Medicina et Sociologica*, 6., 57–86.

Pirisi, G., Makkai, B. (2014): Kulturális gazdaság és társadalmi tőke a zsugorodó kisvárosokban. *Köztes-Európa*, 1., 191–200.

Pirisi, G., Sókuti, Z. (2013): Egy zsugorodó ipari kisváros: a gazdasági szerkezetváltás településszerkezeti hatásai Ajkán. *Területfejlesztés és Innováció*, 2., 19–31.

Pirisi, G., Trócsányi, A. (2014): Shrinking Small Towns in Hungary: The Factors Behind the Urban Decline in "Small Scale". *Acta Geographica Universitatis Comenianae*, 2., 131–147.

Rhodes, J., Russo, J. (2013): Shrinking smart? Urban redevelopment and shrinkage in Youngstown, Ohio. *Urban Geography*, 3., 305–326. https://doi.org/10.1080/02723638.2013.778672

Rieniets, T. (2009): Shrinking cities: Causes and effects of urban population losses in the twentieth century. *Nature and Culture*, 3., 231–254. https://doi.org/10.3167/nc.2009.040302

Smith, N. (1984): Uneven Development: Nature, Capital, and the Production of Space. In *Uneven Development*. University of Georgia Press.

Timár, J. (2007): Different Scales of Uneven Development – in a (No Longer) Post-socialist Hungary. *Treballs de La Societat Catalana de Geografia*, *64*, 103–128.

Timár, J., Váradi, M. M. (2001): The uneven development of suburbanization during transition in Hungary. *European Urban and Regional Studies*, 4., 349–360.

Trócsányi, A., Pirisi, G., Máté, É. (2018): An interpretation attempt of Hungarian small towns' shrinking in a post-socialist transformation context. *Chasopys Socialno-Ekonomichnoyi Heohrafiyi/Journal Of Human Geography*, 1., 5–20.

Turok, I., Mykhnenko, V. (2007): The trajectories of European cities, 1960–2005. *Cities*, 3., 165–182.

Van den Berg, L., Drewett, R., Klaasen, L. H., Rossi, A., Vijverberg, C. H. T. (1982): *Urban Europe: A study of growth and decline*. Pregamon PRess.

Virág, T. (2020): Demográfiai polarizáció, térbeli és társadalmi marginalizáció két zsugorodó középvárosban. *Szociológiai Szemle*, 2., 27–49.

Wolff, M., Wiechmann, T. (2018): Urban growth and decline: Europe's shrinking cities in a comparative perspective 1990–2010. *European Urban and Regional Studies*, 2., 122–139. https://doi.org/10.1177/0969776417694680

Yanagisawa, R. (2018): Building Active Mindset among the Local Youth for Rural Sustainability-New Role of Local Schools in Aging and Shrinking Society. In K. J. Kennedy J. C.-K. Lee (Eds.), *Routledge International Handbook of Schools and Schooling in Asia.* Routledge. 722–729.

Zolnay, J. (2020): Térvakság oktatási stratégiák a városi zsugorodás és a ta-nulói létszám csökkenésének időszakában. *Szociológiai Szemle*, 2., 96–114. https://doi.org/10.51624/szocszemle.2020.2.5