SETTLEMENT SIDE OF LIVING CONDITIONS AND QUALITY OF LIFE

MUNICIPAL ENVIRONMENT

Viktor Pál, Lajos Boros, András Trócsányi, Annamária Uzzoli, Gyula Nagy, Tamás Kovalcsik, Péter Szilassi, Tamás Gál, Ágnes Gulyás, Gábor Pirisi, Zsófia Ilcsikné Makra, Gábor Lados

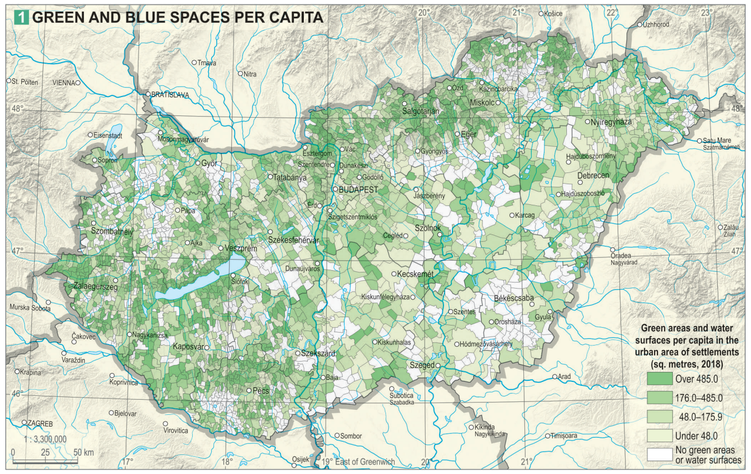
The aspects of quality of life presented in previous chapters are largely related to individuals. Thus, in most cases, people could – at least in theory – change those factors. Living conditions are, however, affected by several external factors that individuals cannot influence or can influence only indirectly. These include the state of the natural environment, exposure to environmental hazards, access to services and safety. Their spatiality reflects local and national political decisions, economic considerations, demographics, settlement structure and even global climate change. Such external factors both create opportunities and set limits for the inhabitants of individual settlements.

Natural elements of a municipal environment

The municipal environment is a complex system consisting of natural factors and influenced by social, economic and political factors, as well as the built environment. The natural factors provide a framework of conditions (e.g. land cover, water and air quality, microclimate, biodiversity) for individual and social life. These conditions determine well-being and health and are a source of hazards and risk factors. Moreover, they can, among many other factors, have a positive or negative effect on, for example, the development of the real estate market XII. 2. 1. 31. or satisfaction with the place of residence. Evidently, the natural environment also provides opportunities for recreation and leisure, and it can have an impact on health 1.

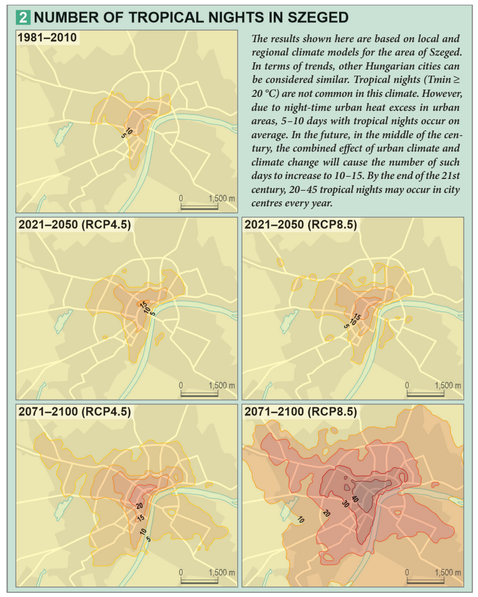
Built-up areas and land cover in a settlement affect many elements of the quality of life and fundamentally influence the well-being of the people living there XII. 1. 10. XII. 1. 11. XII. 1. 12.. The density of built-up areas and the presence of *green areas* (e.g. parks) and *water surfaces* (e.g. lakes and rivers) are particularly important factors, which can also play a significant role in mitigating the local effects of global climate change XII. 2. 2. 1.. Urban green spaces reduce the impact of extreme temperatures (heatwaves) through evaporation and energy conversion and help to lessen the likelihood of flash floods by retaining some of the fallen precipitation. Together with water surfaces (urban blue spaces), they cool the air and increase humidity via transpiration. Vegetation also reduces dust particles and noise pollution stemming from traffic and industry. In settlements, 'green' and 'blue' spaces provide opportunities for recreation and sports, thus contributing to people's health and well-being.

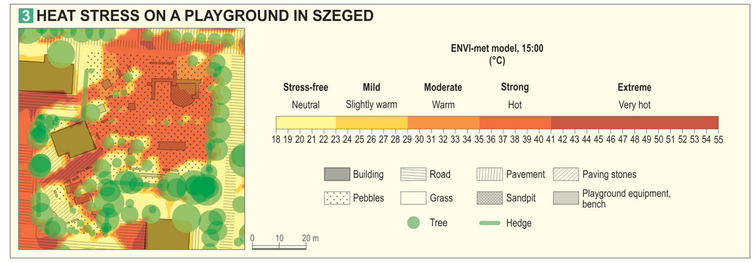
1 *Urban green spaces accommodate human comfort needs at Teleki Square in Budapest*

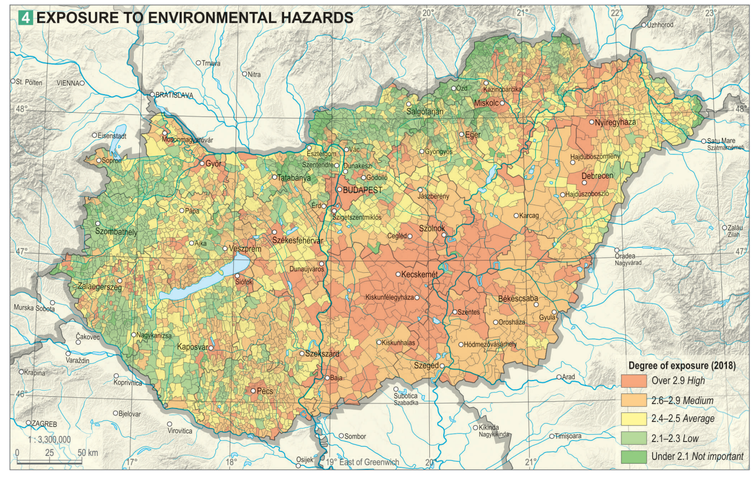


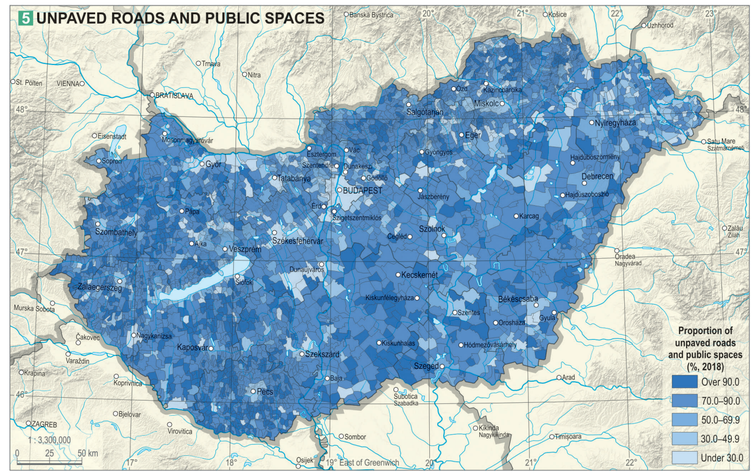
Based on the extent of urban green and blue spaces per capita, the most favourable situation can be found in upland settlements bordered by forests and in the country's recreational areas (e.g. around Lake Balaton) due to their abundance in extensive parks. In cities too, there are usually many parks and other green spaces XII. 2. 2. 1..

Climate and weather affect the health and well-being of the population and due to the climate change, the current impacts will also change significantly. While the expected change in temperature is known on a regional scale in Hungary, on a local scale the picture is more mosaic-like, especially in urban areas. In view of the spatially dissected cityscape, urban air cools much more slowly at night than the air in the surroundings, resulting in urban heat islands. At night, cities are warmer by 1-3 °C on average, but the difference can be as high as 8-9 °C. Due to the heat island effect, the average annual temperature in the inner parts of Hungarian cities and towns is approximately 1 °C higher than on the outskirts. This discrepancy is similar in magnitude to the warming of the last hundred years on a national scale. The *tropical night index* XII. 2. 2. 2. gives the average annual number of nights with a minimum temperature above 20 °C. Such conditions coincide with heat warnings, when even healthy people find it difficult to rest at night. For those struggling with illness the heat stress can even be fatal. Data from Szeged show that the period of heat stress is currently the longest in the city centre, but the problem will soon affect the outskirts, too. By the end of the century, the centre of Szeged may well experience more than 40 such days each year XII. 2. 2. 2.. (The calculations using the results of regional climate models were founded on the MUKLIMO urban climate model.) On a micro-scale (e.g. on the streets or in a public space), the perceived temperature is influenced by factors other than the air temperature, including solar and heat radiation, humidity and wind, all of which are significantly modified by the urban land cover (e.g. densely built-up areas) 2. The most favourable environment for the human body is the one that requires the least adaptation from the heat balance (the so-called neutral thermal comfort range). Creating such an urban environment is a challenge for urban planners. *Human comfort* research has developed modelling methods that can be used to quantify the extent of the heat stress. In this way the comfort conditions can be mapped and the effects of urban development predicted. The research in Szeged identified critical areas where the public is exposed to *heat stress*. Based on the findings of such research, more favourable conditions can be created through the introduction of green surfaces and by planting trees. Such actions can mitigate the effects of global climate change at local level XII. 2. 2. 3..









2 *A renewed public square: King Béla Square in Szekszárd (Tolna County)*

become intolerable when human life is directly threatened. All this reproduces or increases inequalities arising from social status and vulnerability. The number of environmental risks and hazards in settlements is constantly growing, while the perception of risk in society is also changing. The exposure of the population to the various *environmental hazards* depends on, among other things, the geographical location of the place of residence, its position in the settlement hierarchy, income level and lobbying ability. Natural hazards that degrade the quality of life are often associated with geological features or climate change. Instances of the former are earthquakes and landslides, while examples of the latter include increasing frequency of intermittent water shortages (at times of drought), excess water (inundations, waterlogging, flash floods), and extreme weather events (hail and windstorms). These events can lead to physical damage in the settlement (e.g. damage to buildings) or damage to human health (e.g. infections and injuries). Occasionally, large amounts of pollen and spores in the air, as well as airborne dust from transport and heating and other air pollutants, impair the air quality in settlements. Pollution from the disposal of hazardous waste or from agricultural and industrial activities can be reduced or eliminated through appropriate regulation and remediation using up-to-date technologies. Based on the complex exposure index (calculated using data on floods, excess water, damage events, hazardous waste disposal, drinking water quality, air quality, drought and heatwave days over the last decade), the Alföld (drought, floods, excess water) and the metropolitan areas (air pollution and heat stress) are more exposed to natural hazards, as they are cumulatively affected by the factors mentioned above XII. 2. 4..

Municipal infrastructure

Alongside the housing stock, community infrastructure – facilities, utilities and the transport network – constitutes a part of municipal infrastructure. Included in the above are the municipal energy supply (e.g. electricity, gas, district heating, sanitary hot water), the municipal water and sanitation system (e.g. piped drinking water and sewage disposal), waste management, and the paved road network in the settlement. A significant part of community infrastructure is closely related to the housing stock, as the systems and networks are connected to people's homes. As the infrastructure becomes more developed, so it provides a higher standard of living to local people. In this way, the population retention capacity of a settlement grows. In recent decades, much infrastructure has improved significantly, often thanks to European Union regulations and support.

The *paved road network* is not only a prerequisite

© Geographical Institute, CSFK, www.nemzetiatlasz.hu, Budapest, 2021

XII. 2. 2.

3 *Road improvements in villages in the Southern Alföld*

for transport but also reduces dust pollution (thereby improving the air quality of settlements). The proportion of paved roads in the inner area of settlements has increased significantly in recent decades 3 and currently exceeds even 90% in 67 towns and villages. Although regional disparities have decreased, there are still many unpaved roads (the proportion is higher than 70% in 2,180 settlements). The spatial distribution of settlements in the unfavourable category is only partially related to economic development. Further, areas with tiny villages do not form a homogeneous group, since in some places (i.e. where adequate resources were obtained) their internal road network is highly developed XII. 2. 2. 5..

Changes in *energy supply* (e.g. the expansion of the natural gas supply network) provide opportunities for more comfortable living in rural areas. Still, this would also require improved income conditions for disadvantaged social groups.

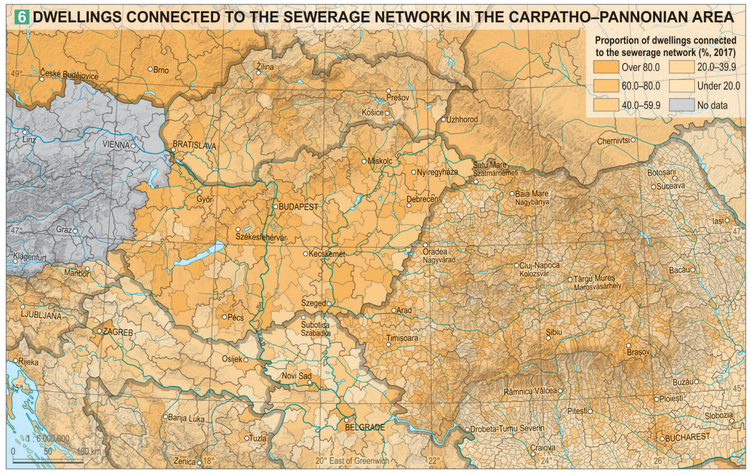
Public drinking water systems in Hungary have improved significantly since the country's accession to the European Union in 2004. More than 94% of dwellings are now connected to the network, which compares favourably internationally. Even so, supplying clean drinking water to people living in tanyas remains a challenge 9. This is a particularly serious problem in the Southern Alföld, where the arsenic content of water from artesian wells should be reduced.

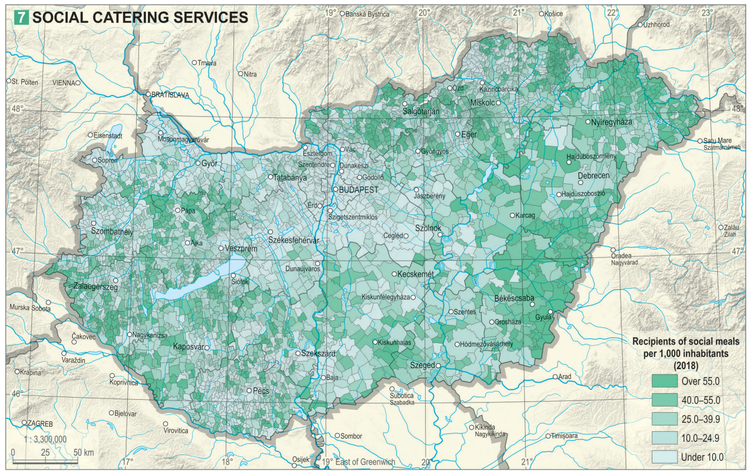
Under EU rules, it is imperative to improve wastewater treatment, to increase the number and proportion of *dwellings connected to the sewerage network*, and to close the utility gap (i.e. where dwellings are connected to the public water supply but not to the sewerage network). Conditions in Hungary in this field are more favourable than those in the neighbourhood, especially in comparison with the fragmented rural areas of the neighbouring Southern Slav regions XII. 2. 2. 6.. As far as wastewater treatment is concerned, the advantages of major cities and heavily urbanised areas are striking throughout the Carpathian Basin.

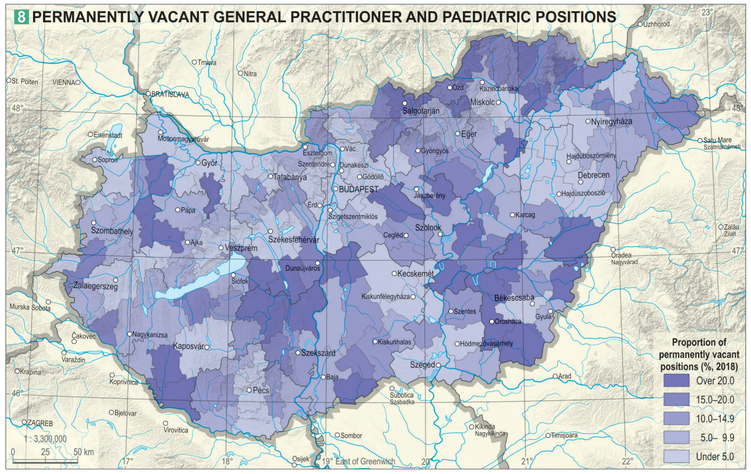
Supply and accessibility to services

The role of effective and accessible services is underscored by several studies on the quality of life: shopping options and the availability of a physician contribute to people's subjective well-being. Such factors can influence people's choice of where to live. Examples are the presence or absence of health services and the proximity to educational institutions and retail outlets. All this will have an impact on everyday life and career opportunities.

Social care is partly a state task and partly a municipal task. Further, non-governmental organisations and churches are also involved in related tasks (e.g. social catering services, day care for the elderly and disabled, homestead and village caretaker services, family and child welfare services, and street social work). Of these, social catering services operate in most places in Hungary. Indeed, the provision of such services is particularly characteristic of peripheral areas and small settlements. Catering is a mandatory task of local governments and is mainly used by the elderly XII. 2. 2. 7..

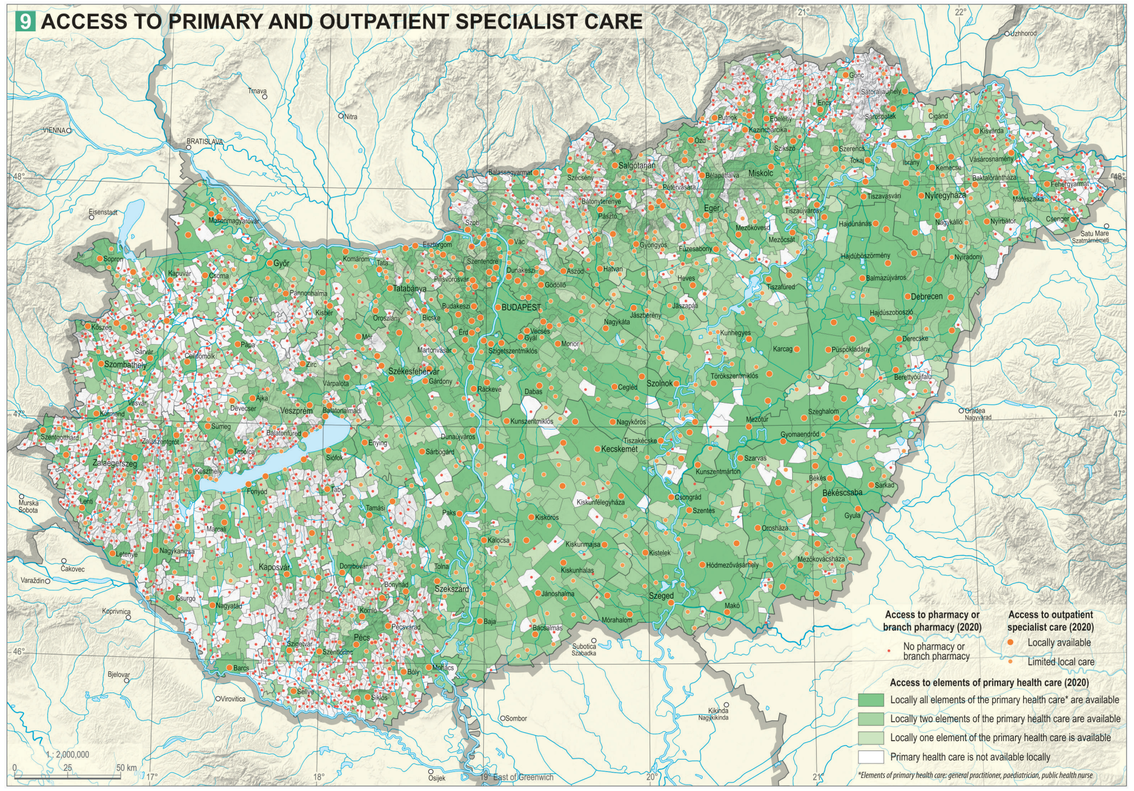


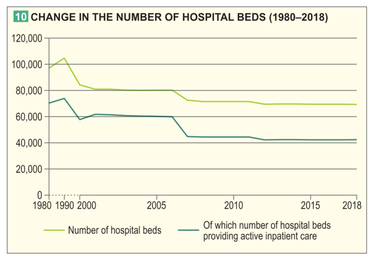


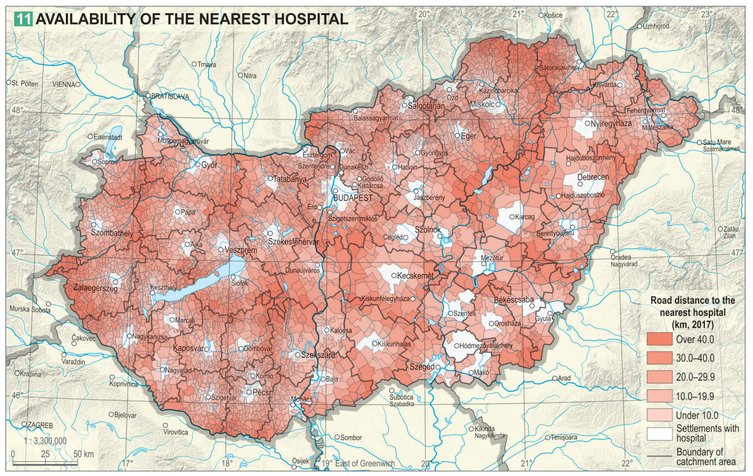


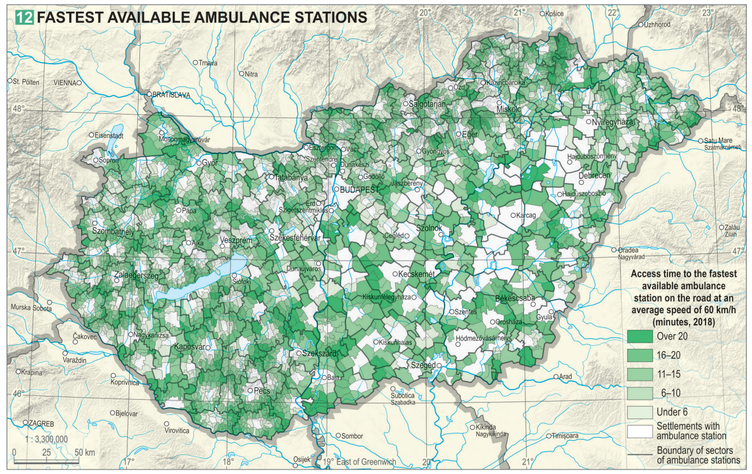
Access to health care will depend on a patient's afflictions, their willingness to seek care, the availability of appropriate health services nearby, and how quickly they can be made available. The 'gatekeeper' role of primary health care aims to relieve the burdens on specialist care (i.e. patients should only be transferred to a higher level within the apparatus if the necessary treatment can only be provided there). In many settlements, the *GP (general practitioner) position is vacant*. The problem is addressed by local governments through substitution XII. 2. 2. 8.. This, however, leads to a reduction in consultation hours and difficulties in terms of access. Smaller settlements in particular are often served by substitute (visiting) general practitioners and public health nurses. Further, it is likely that the general practitioner will also perform the tasks of paediatricians and that there will be *no local pharmacy* XII. 2. 2. 9.. In remote and inaccessible places (e.g. border regions, inner peripheries, outskirts and tanyas) there is a lack of primary care, and it is difficult for local people to access the district health centre in the nearest town, where at least some specialist care is available. People in such areas are usually in poorer health and are more often hospitalised XII. 1. 15., so there is a greater need for health services closer to home and better access.

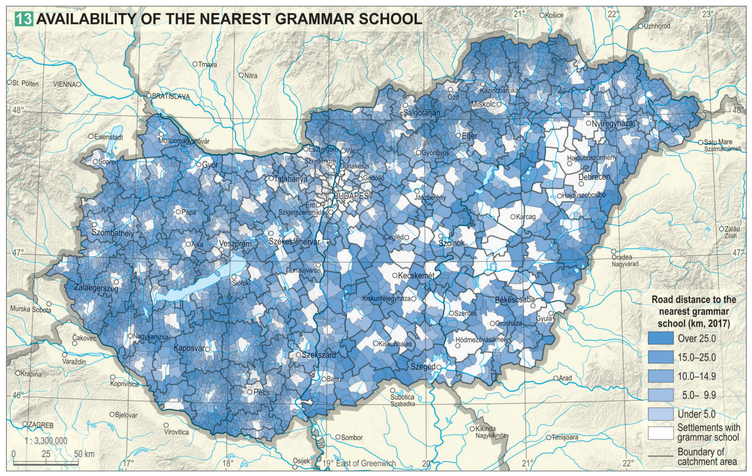
Prior to the collapse of communism, Hungarian health care relied heavily on inpatient care. Consequently, there were many hospital beds and wards; patients often stayed in hospital for longer periods than elsewhere in Europe. Because the maintenance of hospital-based health care is costly, the number of beds and institutions was steadily reduced during the transformation of the health care system, which began in the 1990s and resumed in 2007 and 2012 XII. 2. 2. 10.. Despite the above, the number of beds is still high, although there are not enough 'chronic beds' with long-term patients. Nevertheless, the demand for long-term care is constantly growing, owing partly to the ageing population and partly to their health status. The location and availability of inpatient facilities thus depend both on the structure inherited from the past and on the principle of progressivity applied in health care. This means that the simpler and more frequent cases are treated in primary care or outpatient specialist care near a patient's place of residence, while the more complex and rarer cases are addressed in regionally centralised hospitals. Concerning the latter, the most common interventions are carried out in spatially dispersed hospitals, while the most complex ones require treatment in spatially concentrated institutions (county hospitals, regional care centres and national institutes). It is important for people in their daily lives that hospitals with therapies for the most common diseases are relatively close to where they live XII. 2. 2. 11.. Increasing

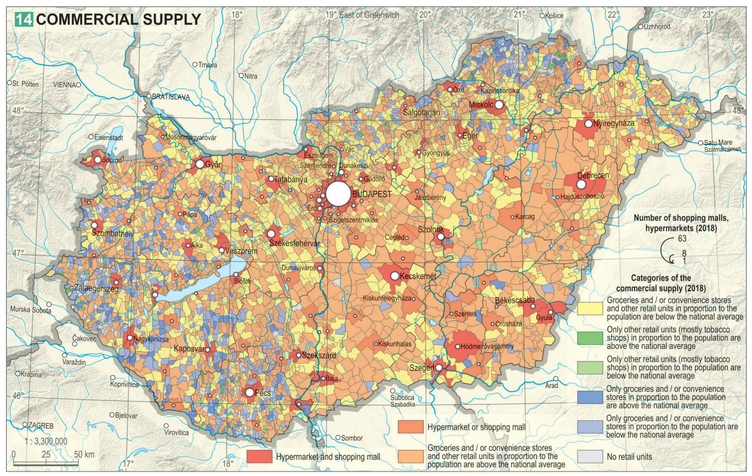












one-day care capacity is important for the efficiency and effectiveness of care and for spatial equality.

Equal *access to* emergency and *ambulance services* can be a matter of life and death. Although in most cases a delay is not decisive, in certain cases (e.g. accident, stroke, heart attack) lives depend on rapid intervention. In the European Union, an ambulance is expected to arrive at the scene of an intervention within 15 minutes of the call-out. The Hungarian population has access to 254 ambulance stations, but in view of the geographical conditions and despite recent developments (the replacement of vehicles, the opening of 22 new ambulance stations and spatial rationalisation), this is still unresolved for 739 settlements with roughly three-quarters of a million people. In this respect, the road network and topography are the most important elements. Still, changing settlement density does not facilitate equal access either. The most disadvantaged villages may be located more than 30 km away, and even the poorly accessible tanyas in the extensive outskirts of major towns may be located up to 20 km from an ambulance station. In major cities and towns, the street network and traffic levels hinder rescue. In spatial terms, the ambulance service exhibits clear differences between the centres and edges of districts. Such differences cannot be reduced without a substantial transformation of the spatial system of ground, air and mobile stations XII. 2. 2. 12..

Access to *education*, including the *availability of grammar schools*, is a prerequisite of entrance to higher education, a key issue in the supply of highly qualified intellectuals. The principle of economies of scale means that grammar schools can only operate in the more populated settlements. In the market town areas of the Alföld, the catchment area often covers only one settlement, the seat of the school. Distances requiring significant commuting (over 25 km) can be found in the northeastern and the western parts of Hungary XII. 2. 2. 13.. This reflects the problems of urbanisation: due to the shortcomings in small towns, poorly supplied areas arose along the national and county borders (e.g. in Ormánság, Őrség, Cserehát and Sárrét). In the eastern part of Hungary, internal peripheries developed in the vicinity of county borders, from where it is difficult to reach grammar schools. These difficulties are reflected in the further education statistics and the occupational structure. The most typical examples are found in the southern margins of Győr-Moson-Sopron County, along the Tisza, along the border of Hajdú-Bihar and Heves counties, and in Outer Somogy. At county level, Nógrád can be highlighted, where the location of (small) towns is peripheral, and there is no easily accessible grammar school in the southern and western part of the county.

Consumption is influenced not only by income conditions VI. 7. 14., but also by the availability of retail outlets and *commercial supply*. After 1990, as commercial developments become profit-oriented, the spatial location and accessibility of commercial units have been determined by business considerations. Thus, the number of retail outlets and the supply of goods grew and became more accessible at the higher levels of the settlement hierarchy, in urban areas and in district centres. On the other hand, centrally located shopping malls can be accessed mostly by car transport, which indirectly leads to the exclusion of several disadvantaged VI. 7. 7. VI. 7. 8. social groups (e.g. the elderly and those on lower incomes). Commercially important areas have arisen (e.g. the Budapest agglomeration, the vicinity of Lake Balaton, regional centres, centres of county relevance, some border areas), but their favourable situation can be explained by different reasons (e.g. economic suburbanisation, open borders) XII. 2. 2. 14.. At the same time, the number of retail outlets has declined and shops have become more difficult to access (or indeed inaccessible) in some rural, peripheral areas VI. 7. 20.. Shops have been closed in response to low effective demand or high operation costs. Mobile general stores are a special solution. In general, the retail supply is particularly poor in areas with tiny villages 4 (e.g. Nógrád, Borsod, Cserehát, Tokaj Mts., Bereg, Ormánság and Zala Hills): people living in such areas suffer from a lack of both quantity and quality in supply. Although the retail supply of towns in the Alföld is more favourable, people living on the outskirts must cover similar distances for shopping as the inhabitants of areas with tiny villages.

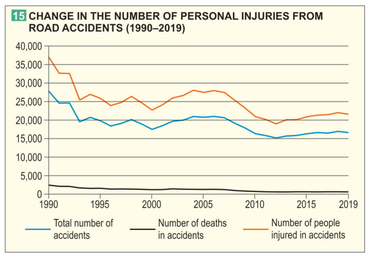
Security

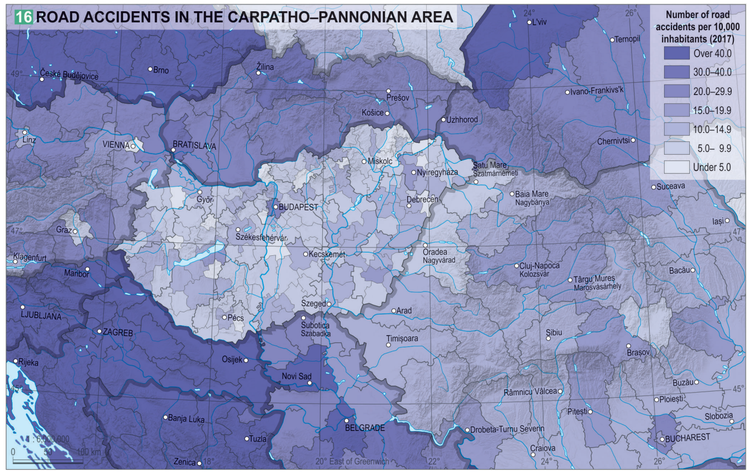
Security is a basic human need and therefore plays a prominent role in both subjective and objective quality of life. Public security and traffic safety are of particular importance. In general, the quality of life is better in settlements with low crime rates and few accidents.

The number of *road accidents* is influenced by several factors: driving habits, the number and technical condition of vehicles, the specifics of the road network and traffic volumes, and the development and use of the public transport network. These factors are also related to economic processes, a fact that is clearly reflected in the accident statistics. A correlation can be discerned between the number of accidents and periods of economic upswing and recession: increasing car use during an upswing leads to an increase in the number of accidents. At the same time, in line with the European trend, the number of fatal accidents in Hungary has decreased in recent years, reflecting improved vehicle safety and road safety XII. 2. 2. 15.. Compared to the surrounding countries, the number of accidents per 10 thousand inhabitants is lower in Hungary. The highest values can be found in Budapest and in other major cities and their surroundings XII. 2. 2. 16.. For many years, the main cause of accidents has been speeding, which played a role in about a third of the cases. Drunk driving accounted for 8.3% of accidents, with the greatest proportions seen in Bács-Kiskun and Szabolcs-Szatmár-Bereg counties.

Although most accidents in Hungary occur within settlements, there is an increased risk of accidents also on the country's motorways and main roads which handle large international transit traffic. Moreover, such accidents are often the more serious ones. However, European experience has shown that the expansion of the motorway network ultimately reduces the number of accidents. As far as accidents within settlements are concerned, vehicle collisions with pedestrians at pedestrian crossings are a major concern, especially in Budapest.

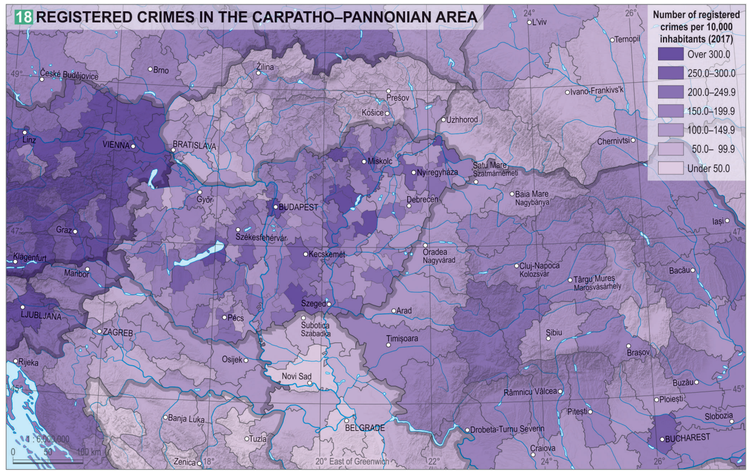
International comparisons of *crime* are only possible to a limited extent, as criminal law varies from country to country, so the same offence may be classified differently. An analysis of the spatiality of crime is made difficult by the fact that not all crimes appear in official statistics (i.e. the proportion of undetected crimes is high because, for instance, victims do not report crimes due to fear or loss of trust). Crime statistics (e. g. on robbery and murder) in the countries of the EU improved in the 2010s. The data have developed favourably also in Hungary since 2013: both the number of registered crimes and that of criminals have decreased. This may be due to a number of reasons: a possible increase in the number of hidden offences, an improving economic situation, and legislation that deters potential criminals by making the work of the investigative authorities more effective. There has been a significant reduction in the number of thefts, which make up the largest share of total crimes and are often committed in Central Hungary (Budapest and Pest County) XII. 2. 2. 17.. The number of crimes remains high in the major cities and towns, in tourist destinations, and in peripheral underdeveloped areas XII. 2. 2. 18.. Each of the three subgroups experiences a different typical set of crimes. In tourist areas, the proportion of offences involving property or public order is high, whereas fraud or economic crimes are more frequent in the major cities and towns. In the underdeveloped areas the proportion of offences against lower value personal property is high. Most crimes, however, are committed not in underdeveloped areas or in poorer settlements but where the chances of material gain are higher. It can also be stated that the more serious crimes tend to occur in the more populous settlements.





17 REGIONAL DISTRIBUTION OF THE FREQUENCY OF CERTAIN CRIME TYPES (2018)

Region	Number of crimes per 10,000 inhabitants: Assault	Homicide	Violence against a public official	Fraud	Theft	Vandalism	Embezzlement	Breach of the peace	Crimes related to drugs	Driving under the influence of alcohol or in a delirious state
Central Hungary	8.34	0.09	0.27	17.31	54.63	4.90	2.39	8.15	5.55	25.36
Central Transdanubia	10.53	0.09	0.19	15.42	61.31	6.54	5.23	8.36	6.02	19.07
Western Transdanubia	10.28	0.06	0.21	12.09	50.06	3.02	1.36	8.92	4.66	12.77
Southern Transdanubia	8.81	0.12	0.30	16.34	80.09	5.49	1.82	13.75	4.83	13.80
North Hungary	7.45	0.06	0.24	16.96	36.96	5.18	1.40	6.44	8.45	20.00
Northern Alföld	8.97	0.09	0.38	27.17	81.82	9.20	2.99	11.33	15.00	16.34
Southern Alföld	6.90	0.09	0.35	19.71	51.09	4.82	3.47	6.86	7.66	13.92
Hungary	***8.83***	***0.09***	***0.30***	***19.50***	***63.63***	***6.19***	***2.61***	***9.60***	***8.82***	***17.06***



© Geographical Institute, CSFK, www.nemzetiatlasz.hu, Budapest, 2021

XII. 2. 2.

National Atlas of Hungary (MNA)
www.nationalatlas.hu

Editorial board
Károly Kocsis (President)
István Klinghammer (Honorary president), Zsombor Nemerkényi (Secretary),
Gábor Gercsák, Áron Kincses, Zoltán Kovács, Géza Tóth, László Zentai

Cartographic Advisory Committee
László Zentai (President)
Zsombor Bartos-Elekes, Zsolt Bottlik, László Buga,
István Elek, Mátyás Gede, Gábor Gercsák, János Györffy,
Mátyás Márton, László Orosz, Zsolt Győző Török

MNA Society

Volume editors
Károly Kocsis (Editor-in-chief), Zoltán Kovács, Zsombor Nemerkényi, Gábor Gercsák, Áron Kincses, Géza Tóth

Chapter editors
Péter Bajmócy, Lajos Bálint, Pál Beluszky, Lajos Boros, †Bálint Csatári, Zoltán Dövényi,
Károly Kocsis, Zoltán Kovács, Péter Őri, Viktor Pál, Laura Szabó, Judit Székely, Patrik Tátrai

Revised by
Ferenc Probáld, Gábor Gercsák

English translation by
Richard William McIntosh

English translation revised by
Andrew Gane, Gábor Gercsák, Ferenc Probáld

Cover design
Geographical Institute, RCAES, Ildikó Kuti – Civertan Bt.

Design and typography
Ildikó Kuti – Civertan Bt.

Printing
Pannónia Nyomda Kft. (Budapest)

Publisher: László Kiss (Director general)
Eötvös Loránd Research Network (ELKH), Research Centre for Astronomy and Earth Sciences (CSFK), www.csfk.org

The publication is supported by:
Government of Hungary
Ministry for Innovation and Technology (ITM)
Eötvös Loránd Research Network (ELKH)
Hungarian Academy of Sciences (MTA)

Closing date of editing: 1st May 2021

ISBN 978-963-9545-58-8ö
ISBN 978-963-9545-64-9

NATIONAL ATLAS OF HUNGARY SOCIETY

Authors
Péter Bajmócy
Lajos Bálint
Pál Beluszky
Lajos Boros
Gabriella Branyiczkiné Géczy
†Bálint Csatári
Zoltán Dövényi
Tamás Egedy
Szabolcs Fabula
Tamás Faragó
Jenő Zsolt Farkas
Dóra Gábriel
Tamás Gál
Ágnes Gulyás
Ferenc Gyuris
Zsófia Ilcsikné Makra
Ferenc Jankó
Áron Kincses
Károly Kocsis
Zoltán Kovács
Tamás Kovalcsik
László Kulcsár
Gábor Lados
Zsuzsanna Makay
Judit Monostori
Lívia Murinkó
Gábor Nagy
Gyula Nagy
Csilla Obádovics
Péter Őri
Viktor Pál
János Pénzes
Gábor Pirisi
Laura Szabó
Judit Székely
Péter Szilassi
Patrik Tátrai
Géza Tóth
Pál Péter Tóth
András Trócsányi
Annamária Uzzoli
András Wéber

Authors of maps and figures
Norbert Agárdi
Erika Bácskainé Pristyák
Péter Bajmócy
Lajos Bálint
Dániel Balizs
András Balogh
Olga Baranyai
Zsombor Bartos-Elekes
Pál Beluszky
József Benedek
Zoltán Bertus
†András Bognár
Lajos Boros
Zsolt Bottlik
Gabriella Branyiczkiné Géczi
László Braun
Tamás Csapó
†Bálint Csatári
István Csernicskó
Gábor Demeter
Gyula Dézsi
Zoltán Dövényi
Tamás Egedy
Tibor Elekes
György Farkas
Jenő Zsolt Farkas
Sándor Frisnyák
Tamás Gál
Ágnes Gulyás
Róbert Győri
Ferenc Gyuris
Iulia Hărănguș
Viktor Hegedűs
István Horváth
Zsófia Ilcsikné Makra
Ferenc Jankó
Erzsébet Jász
Laura Kardos
Áron Kincses
Tamás Kiss
Károly Kocsis
Sándor Kókai
Zoltán Kovács
Balázs Kovalcsik
Tamás Kovalcsik
†András Kubinyi
József Kücsán
Gábor Lados
István Máté Lengyel
József Lennert
Zsuzsanna Makay
Kvetoslava Matlovičová
Zsolt Máté
Ciprian Moldovan
József Molnár
Csilla Mucsiné Égerházi
Lívia Murinkó
Gábor Nagy
Gyula Nagy
Ádám Németh
Péter Őri
Viktor Pál
Gábor Pálóczi
István Zoltán Pásztor
János Pénzes
János Pintér
Péter Róbert
Tamás T. Sikos
Balázs Szabó
Laura Szabó
Katalin Szende
Judit Székely
Péter Szilassi
Sándor Szűcs
Patrik Tátrai
†Gusztáv Thirring
Tibor Tiner
Gábor Tolnai
Géza Tóth
Pál Péter Tóth
András Trócsányi
Annamária Uzzoli
†Árpád E. Varga
Gábor László Vasárus
András Wéber
Jernej Zupančič

Chief cartographers
Fanni Koczó
Anikó Kovács
Gáspár Mezei
Zsombor Nemerkényi

Contributors to cartography
Norbert Agárdi
Lajos Bálint
Zsombor Bartos-Elekes
Zsolt Bottlik
Gábor Demeter
Renáta Szabó

Technical staff
Margit Laczkó
Árpád Magyar

© Geographical Institute, CSFK, www.nemzetiatlasz.hu, Budapest, 2021