SERVICES OF GENERAL INTERESTS INDICATORS: METHODOLOGICAL ASPECTS AND FINDINGS[1]

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Abstract: Services of general interest is a concept used extensively within the EU policy making but lacking a precise definition in scientific terms. Based on the operational definition proposed by Bjørnsen et al. (2012) this paper focuses on translating this definition into meaningful indicators, using the NACE classification. Data restrictions and services not covered by NACE classes make it necessary to find representative indicators in addition to an overarching and consistent indicator concept. Indicator meaning, regional deviations, and statistical implausibility are further constraints on the appropriateness of SGI indicators. The paper concludes with proposals for further research and data requests.
Keywords: services of general interest, NACE classification, indicator, methodology.

INTRODUCTION

Services of general interest (SGI) have widely come to be regarded as covering the arrangements, tasks and functions assumed to be of essential importance to citizen welfare, quality of life and participation, as well as to the general functioning of societies at a level of development and quality corresponding to Community visions and goals (the European model of society). Their assumed importance poses an obligation on public authorities to ensure their provision according to certain standards in respect of quality, availability, accessibility and affordability – in defence of "general interest" (the implementation of fundamental citizen rights and, in EU terms, the achievement of economic, social and territorial cohesion).

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In the literature and official documents on SGI in the EU context the term 'services' is seldom if ever contested or even discussed. However, the national and EU regulatory SGI frameworks generally address specific industries or sectors (the supply side, the service providers, etc.). 'Sectors' seems to be the most frequently used term alongside 'services' while terms like industries, areas, arrangements, undertakings, institutions, enterprises, missions, objectives and functions are also frequently employed. In principle, most services are potentially essential/of general interest since history shows that ongoing socio-economic and technological change imposes new requirements and needs to be fulfilled as prerequisites for individual quality of life, as well as for a well-functioning and sustainable economy. Changes in the way wealth is produced, in the division of labour, in the product life cycle, and not least in the environmental imperative of 'serving' the products from long before birth until well after death, including the sustainable management of raw materials, energy consumption, product utilisation and waste, continuously place new types of services at the centre of the system of wealth production. Many services have become indispensable - in terms of the production of the goods and services necessary - to fulfil basic needs and secure environmental sustainability (Giarini 2009).

The territorial evidence to support the implementation, monitoring and evaluation of territorial policy measures, in respect of SGI, remains insufficient. Therefore, in 2010, ESPON launched the project "Indicators and perspectives for services of general interest in territorial cohesion and development" (SeGI). The purpose of the project is to deliver an overview of the current territorial situation of services of general interest in Europe, in particular focusing on:

- Existing definitions and classifications of services of general interest, and how they can be applied from the point of view of territorial cohesion and development.
- Indicators and how they can be used to measure the level of services of general interest.
- Mapping the current situation of services of general interest throughout Europe, for instance studying the distribution of services and what kinds of specialisation areas can be detected.
- Studying territorial development potentials and constraints in different areas in Europe, focusing on current trends, as well as different territorial development paths and the relationship between territorial governance and services of general interest.

In this paper we describe the process and outcome of, and constrains in defining SGI indicators to meet the need for information on SGI supply, quality and accessibility in Europe. While Costa et al. (2013 in this volume) assess "typical" SGI indicators used in the literature, the approach of this paper is to use the operational definition of "services of general interest" to translate them into a system of indicators (chapter 2). The constrains of this approach are mainly the unsatisfying availability of current data as well as imperfect matching of statistics with data needs (chapter 3). The majority of computable indicators, due to data availability, are indicators regarding the provision of certain services in regions. Chapter 4 analyses if service availability in regions is sufficient to measure service implementation and regional disparities. Chapter 5 draws some conclusions regarding the need for data if the presented system of indicators is implemented for monitoring the provision of SGI in Europe.

A deliberate choice of indicators presented in this paper is the base for typology and indices elaborated by Humer and Palma (2013 in this volume). SGI standards, for example accessibility, are analysed by Stępniak and Rosik (2013 in this volume) on a much lower territorial level than all other indicators presented here. The results of their analysis are used for the correlation of SGI availability and SGI accessibility in chapter 4.

2. SGI INDICATOR DEFINITIONS AND CONCEPTS

Indicators are quantitative (and sometimes also qualitative) measures which seek to make the status and the development of societal concerns visible. As such, they provide a very important tool for monitoring, forecasting and steering the societal processes. Indicators can, however, only be meaningful if certain criteria for their construction are respected; focusing in particular on their conformity with theory, their relevance and their expressiveness. Furthermore, it is helpful if indicators are comprehensible. Finally, the availability of indicators is of huge practical importance, and indeed this remains the biggest limiting factor in respect of indicator calculation in this project.

Two practical ways to create indicators are available: i) the inductive approach where the indicators that best fit the theoretical assumptions are chosen based on a broad review of existing indicators and literature. The literature review by Costa et al. (2013 in this volume), however, questions the efficiency of this approach in measuring the provision of SGI overall: a lopsided representation of different types of services, on one hand, and the existence of numerous indicators not representing the provision of services, on the other, does not fit satisfyingly into the theoretical frame. ii) The deductive approach begins from theoretical assumptions and hypotheses and translates them into representative indicators. In cases of very complex systems and broad topics, such as services of general interest (SGI) with aspects of different scales, the deductive method is given preference. The starting point to define SGI indicators here is the theoretical operational of SGI by (Bjørnsen et al. 2012). First, the operational definition outlines the entities or units of the services concerned. Following the literature on services the term 'services' can mean products, activities, facilities, industries, utilities or organisations (Foss 2011). Bjørnsen et al. (2012), therefore, suggest to use the NACE Rev 2 classification (Statistical classification of economic activities in the European Community, 2008) as a reference frame based on a wide tentative and 'additive' perception of the actual European landscape of policies and practices related to SGI and related concepts. The NACE Rev 2 classification covers all activities related to any kind of production or sale of goods or services. Furthermore, the NACE classification is mandatory in the EU and, therefore, delivers the necessary framework for a comparable statistical analysis. Within this pragmatic operational NACE Rev, 2 classes are included in the universe of potential SGI if they may be roughly judged to satisfy the following broad criteria - based on literature/document surveys and the common judgment of the project group:

1. Are represented among the typical services of the 'welfare state' in various EU27+4 countries;
2. Are representing other services subject to political/legal public intervention in a 'SGI-context' in various EU27+4 countries;
3. Are included in sectors already classed as SGEI (under sector legislation) in the EU;
4. Are representing areas/sectors exemplified as (potential) SGI in EU documents on SGI.

The NACE Rev. 2, adopted by the European Council in 2006, is a revision of NACE Rev. 1, established by Council Regulation 3037/90 in 1990, and by NACE Rev 1.1 in 2002. Statistics on economic activities under NACE Rev. 1 has to conform to this classification; Rev. 2 is mandatory in the European Union (Eurostat 2008).

The structural business statistics produced by Eurostat are based on Council Regulation 58/97 of December 1996 (European Commission 1997) and oblige all Member States to deliver statistics according to NACE Rev. 1, confirming at the same time the definitions of units in accordance with Council Regulation 696/93 (European Commission 1993). In terms of NACE classes, regulation 58/97

encompasses only sections C to K and M to O of the Rev.1 classification, and it defines precisely for which sections the divisions have to be differentiated by the statistics.

Statistical basis for these indicators is the 'Regional structural business statistics' provided by Eurostat (2013). And basic unit of these statistics are "local units" as "an enterprise or part thereof (e. g. a workshop, factory, warehouse, office, mine or depot) situated in a geographically identified place. At or from this place economic activity is carried out for which - save for certain exceptions - one or more persons work (persons employed, even if only part-time) for one and the same enterprise" (European Commission 1993 p. 0010).

Besides defining entities or units via a deliberate choice of NACE sections, divisions and groups, the operational definition touches the four main standards of SGI which are: availability, accessibility, affordability and quality. The measures relating to each standard differ: availability relates to the counting of units; accessibility specifies relative distance in length or time; affordability is indicated by a monetary measure; and quality remains difficult to translate into quantitative measures. No indicator can express all of these aspects at the same time. Therefore, the ideal matrix of indicators is built on the use of NACE classification and on the four standards for each class.

Table 1. Ideal matrix of SGI indicators

SGI unit NACE Rev 2 classes	Standards/dimensions of SGI			
	availability	accessibility	affordability	quality
D 35.11				
D 35.12				
….				

Availability: Does the service, as defined by the NACE classification, exist in the region? Does such a facility exist and if so, how many such facilities exist? Is a certain amount (e.g. length, personnel) of this service available in a given region?

The availability indicators express only the presence or absence of certain services in the region (number of local units), and to some extent also the number of providers (persons employed). They do not, however, show whether the level of service provision is sufficient. The sufficient or basic reference minimum level of services is a political and societal one and might be answered differently in the various Member States. As such, only the variance of supply or availability of services will be addressed.

Furthermore, availability alone does not show whether services in given regions are locally concentrated or dispersed. Concentration or dispersion can only be measured inter-regionally which requires the same local or geo-coded data as in the case of accessibility analysis (see also chapter 4).

Accessibility: Are the services in the region, in accordance with the NACE classification, easily accessible by the citizens/beneficiaries? How far do the citizens/beneficiaries have to walk or drive to reach a given service facility? How much time do they have to spend to get to these facilities?

The literature on accessibility generally highlights the notion of physical access by viewing it in terms of overcoming a distance seen as a physical barrier. However, access in this sense can also be denied or restricted by high costs, the lack of facilities, or the existence solely of facilities

of an inferior or unacceptable quality. Penchansky and Thomas (1981) define accessibility by the so-called *five A's of access* which are: affordability, availability, accessibility, accommodation and acceptability.

Within the five A's, 'accessibility' refers to physical distance; 'availability' means the existence of a certain number of service facilities satisfying the needs of citizens; 'affordability' terms the charge for a service as either acceptable or unacceptable for the client or citizen; 'accommodation' is another aspect of access, namely the organisation of a service, e.g. hours of operation; and 'acceptability' describes how comfortable the client is with the provider (Milbert et al 2013).

With the exception of accommodation and acceptability, the other A's are part of the four standards/dimensions of SGI. In other words, these standards are contingent upon each other. The availability of a service is a prerequisite for its accessibility, while accessibility in a broader sense means also affordability. With regards to physical distances, accessibility can influence affordability by inflicting travel costs while affordability influences acceptability, and so on.

In this paper 'accessibility' will be used in this narrow sense of physical distance. This is consistent with the consensus in the extensive literature on quantitative accessibility analysis. Most measures used refer to potential accessibility by measuring distances in length (km), time (driving distance) or share of population living within a certain distance. Driving distances by car is the most often used 'mode of transportation' in the literature (Milbert et al. 2013, Stępniak and Rosik 2013 in this volume).

Affordability: Should certain services be provided for a charge or should they be provided for free? Should they be paid for or charged to the state indirectly through general taxation or directly by the customers themselves at the point of access? How expensive are the services? Is the price or charge for a service fair for all potential citizens/beneficiaries or are some excluded on price grounds alone? Do the prices or charges for services vary a lot between regions or are they more or less equal within states? What are the differences between states and regions?

If more than one provider offers a certain service in a region, the price of or charge for such a service may vary across the region. Additionally, the prices of services on a private market may vary over time. In the case of some services, local authorities can, within certain limits, set the pricing structure. The actual rate that the charge is set at, however, does not necessarily express the affordability of a given service. Nevertheless, regional and national disparities in prices of and charges for certain services often highlight i) the differences in the costs of supply; and ii) the discovery of pre-existing differences in terms of cultural and political/moral values.

To sum up, it is clear that there exist significant gaps in the availability of regional data on prices and charges for services. Some countries calculate a consumer price index (cost of living index), many public transport companies publish their charges on the internet, and some research has been done on the cost of living and regional price differences. Nevertheless, a comparable data set for nearly all ESPON countries, even at the NUTS 0 level, is simply not available or easy to create. The Eurostat statistics 'Mean consumption expenditure per household with expenditure greater than zero by detailed COICOP level' on the NUTS 0 level cover, theoretically, nearly all SGI services defined by the NACE classification but in practice the vast amount of unavailable data restricts the number of indicators to only a few examples.

The collected indicators are prices or price levels and expenditures per capita. They do not measure 'affordability'. Even if prices are related to income the information they contain in relation to acceptability is weak. Prices only give indirect information on costs by screening national differences in Europe.

Quality: 'Quality' is a subjective/individual value of a service related to many different aspects like accommodation, security, predictability, appearance and acceptability. Accessibility can also be a function of quality.

In the case of SGI, quality standards are influenced by different historical experiences and they adhere to different citizen expectation levels across the EU Member States. Furthermore, statements regarding quality cannot be evaluated easily. Does one need to make use of a certain service or not? Is the quality of a certain service evaluated based on experience of usage or merely based on what other people say about it?

There has hitherto been little research on service 'quality'. Such research is either based on one-dimensional self-reported measures or the measures remain vague in the attempt to cover all functions of the multidimensional construct of quality (Parasuraman et al. 1985). Nevertheless, comparable information on the quality of services across Europe is clearly missing. As such, the quality standard in respect of services is not extensively discussed here.

3. AVAILABLE SGI INDICATORS AT THE REGIONAL LEVEL

There are a number of problems in generating the theoretically deduced SGI indicators, including, i) the significant lack of data in general, and ii) the availability of regional statistics that may be related to services but which do not enumerate exactly what is needed to build the required indicators. Therefore, most of the requested indicators have to be simplified into what are, in effect, suboptimal formulations, given the available regional (and national) statistics.

The indicators of SGI **availability** are calculated by the number of local units (number of persons employed) per 100,000 inhabitants (1,000 km²).The main data source for the number of local units and the number of persons employed is the 'Regional structural business statistics' provided by Eurostat (2011/12).

Differing from the general concept to base SGI indicators on the NACE *classes*, the SeGI project had to refer mainly to the NACE *divisions* on the NUTS 2 level as the lowest regional level with available data. E.g. instead of distinguishing between the NACE classes (section E) 38.11 'Collection of non-hazardous waste', 38.12 'Collection of hazardous waste', 38.21 'Treatment and disposal of non-hazardous waste' and 38.22 'Treatment and disposal of hazardous waste' the division 38 'Collection, treatment and disposal of waste' in total was the object of examination.

Two sections of NACE designated services are not, however, included in the regional structural business statistics used here: education (section P) and health (section Q). For both sections, some alternative indicators had to be found. Both sections will, nevertheless, be illuminated in greater depth below. Furthermore, social housing indicators are not covered by NACE at all. As such, the search for indicator concerning this service will also be described separately.

The indicators of SGI **accessibility** are outcomes of a *distance-to-nearest-provider* analysis, based on the shortest travel time delivered by calculations conducted using the GIS software (see Stępniak and Rosik 2013 in this volume). The designated methodology relies on data accuracy in respect of all layers used: network, population and the location of service providers. In addition to the huge computable capacities necessary, and the required capacities to scrutinise the completeness and accuracy of the data, the availability of comparable geo-coded data in Europe is, nevertheless, also problematic. As with the ESPON project TRACC (Spiekermann et al. 2011), this project also had to limit the accessibility indicators and the analysis of the accessibility of services to the case study regions.

Indicators of SGI **affordability** are only presented by means of a few selected indicators on prices/price levels and on investments. All these indicators are not, however, available for the regional level, but only for the national level. The chosen indicators, moreover, do not highlight the affordability *per se* of the services in question, but only the national difference in prices and investments. This particular aspect, however, requires further in-depth analysis and research before we can construct more appropriate indicators. Unfortunately, this was simply not feasible within the tight confines of this project. The same can be said about the **quality** aspects. The rate of use and outcomes are weak indicators to represent the multidimensional construct of 'quality'. More research is thus necessary in this scope before appropriate indicators can be constructed. Again, this was simply not feasible within the confines of this project.

It is mainly the availability of services that is represented at the NUTS 2 level. Data gaps in relation to the available Eurostat statistics were filled by data culled from the websites of various national statistical offices. Where necessary, and if possible, statistics from a higher geographical level were disaggregated to the NUTS 2 level. Despite all these efforts, some minor data gaps remain for most indicators.

SGI INDICATORS FOR SECTION P - EDUCATION

Data for NACE section P – local units and persons employed – are not available from Eurostat, neither on the NUTS 2 nor the NUTS 0 level. The NACE classifications of section P.85 (numbers in parenthesis indicate the classes) do, nevertheless, perfectly address the different levels of education: pre-primary education (10), primary education (20), general secondary education (31), technical and vocational secondary education (32), post-secondary non-tertiary education (41), tertiary education (42), sports and recreation education (51), cultural education (52), driving school activities (53) and other education n. e. c. (59).

Eurostat currently provides statistics on students/children in accordance with the International Standard Classification of Education (ISCED97, UNESCO 1997): students by age and participation rates of students by ISCED97, population by highest level of education attained, population participating in life-long learning, teacher-pupil ratios and average class sizes for selected ISCED97 groups, and annual expenditures for education by ISCED97. ISCED97 classes match NACE classifications 85.10 to 85.42, however, with some differentiation (e.g. 85.31 general secondary education is differentiated by ISCED into lower secondary and upper secondary education).

The number of students/pupils and participation rates do not necessarily, however, reflect the availability of educational services in the region. For most countries/regions one can assume that students up to ISCED level "upper secondary schools" or NACE 85.31 attend schools in their home regions. In regions or countries with a culture of boarding schools this very assumption is misleading. Furthermore, this assumption is valid to a certain degree on a higher regional level (NUTS 2 and higher). On a lower regional level or at the municipal level, however, this assumption fails. E.g. already on the NUTS 3 level in some German regions pupils have to cross regional boarders to attend upper secondary schools.

As a kind of proxy for the availability of education services the number of teachers can be assessed. Eurostat provides this number only on the NUTS 0 level, only for ISCED 1 (primary schools) to ISCED 3 (upper secondary schools), and only as a ratio of teachers to pupils. To overcome the problem of boarding schools, commuting pupils and crossing of regional boarders the ratio of teachers should better be referred to the population of referring age groups.

Education is, however, very important among SGI. Therefore, the project group calculated the enrolment indicators which do not fit directly into the general indicator scheme and which are

suboptimal in measuring availability. Furthermore, these indicators are problematic because of different school systems in the countries involved, the differences in commencement and conclusion of compulsory schooling, and significant differences in the change in educational levels, especially from primary to secondary education.

These indicators are presumed to show the capacities of schools to address the needs of the residential population/children. One has to keep in mind, however, that the chosen indicators are sub-optimal to indicate the availability of educational services, namely the number of schools/educational facilities and the number of employed persons (primarily teachers).

SGI INDICATORS FOR SECTION Q – HEALTH AND SOCIAL CARE

Data for NACE section Q – local units and persons employed – are not available from Eurostat, neither on the NUTS 2 nor on the NUTS 0 level. Following the NACE classifications (numbers in parenthesis indicate the section and classes) would, however, allow for the differentiation of health and care services: hospital activities (86.10), general medical practice activities (86.21), specialist medical practice activities (86.22), dental practice activities (86.23) and other human health activities (86.29), residential nursing care activities (87.10), residential care activities for mental retardation, mental health and substance abuse (87.20), residential care activities for the elderly and disabled (87.30) and other residential care activities (87.90), social work activities without accommodation for the elderly and disabled (88.10), child day-care activities (88,91) and other social work activities without accommodation n.e.c. (88.99).

Presently, Eurostat and other international organisations provide the following statistics on health and social care to measure their availability: staff (doctors and physicians, nurses and midwifes, dentists, physiotherapists), hospital beds (available beds, curative beds, psychological care beds) and children in day care by age groups and groups of weekly care.

Therefore, with the present statistics, NACE class 86.10 hospital activities will be represented by the number of hospital beds per 100,000 inhabitants, NACE class 86.21 and 86.21 by the number of doctors and physicians, physiotherapists and nurses and midwifes per 100,000 inhabitants, NACE class 86.23 by dentists per 100,000 inhabitants, and 88.91 by the number of children in day care as a percentage of residential children in referring age groups. All other NACE classes in respect of section Q are not yet represented, however, due to missing data.

With the statistics currently available the differentiation between hospital activities and other medical practice activities is not clear. The number of doctors and physicians as well as of nurses and midwifes is not differentiated between hospital staff and staff in medical practices. The number of dentists per 100,000 inhabitants is highly correlated to the number of doctors and physicians (correlation coefficient 0.713).

The present indicators on child care show the same weaknesses as those for students in different educational levels: a substandard attendance may be caused by substandard availability of the service or by different preferences in sending children into day care or not. Only if the number of children in day care can be set equal to the available number of places in child care can these indicators measure the availability of care services for children. Additionally, the statistics on day care for children are only available for the NUTS 0 level. This is not, however, sufficient to show the often large differences within countries like Germany - between East and West-Germany - as well as between urban and rural regions.

SGI INDICATORS ON SOCIAL HOUSING

Social housing is the most problematic field of SGI in terms of generating indicators:

- No common definition of 'social housing' exists.
- No common understanding or practice, in respect of social housing, exists across all countries.
- Present statistics refer to housing but not specifically to 'social' housing.
- This field is not covered by the NACE classification system.

Social housing programmes in European states refer either to real estate and the building of houses/flats for indigent persons/households, or involve direct payments to indigent persons/households, or a combination of both. The mix of programmes, their design and whether such programmes exist at all varies significantly between countries. As such, a common statistic to enumerate the extent of social housing simply does not exist. The only statistics providing data directly related to social housing by Eurostat is the "Expenditures of social protection and social exclusion for housing". All other national and international statistics, such as housing by year of building, housing by ownership, housing of certain standards or people reporting on the suboptimal standard of their housing cannot be directly interpreted in the meaning of social programmes even if some of the information may indicate a need to renew the social housing stock and to further invest in social housing.

The social housing sector is facing a period of rapid change. One important factor here is the rise in owner-occupation. In this light social housing can no longer simply refer to rental housing or transfers to households."What is social housing? Is it just building houses at an affordable price, or must it also encompass social services, security issues, spatial planning, resident participation?[...] Should social housing be targeted only at low-income households, as the Commission suggested?" (Boccadoro 2008, p. 267). Social housing thus requires a more in-depth definition before meaningful and appropriate indicators can be built. This should be the object of another research project in the future.

SUMMARY TABLE OF AVAILABLE SGI INDICATORS ON REGIONAL LEVEL

The following additional (non-EU) countries were included in the data collection process: Albania, Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Montenegro, Serbia and Turkey. On the NUTS 2 level, 96 SGI indicators could be calculated while on the NUTS 0 level - 134 plus 4 indicators on social housing. Unfortunately, the number of persons employed as a capacity measure is simply an insufficient measure on the NUTS 2 and NUTS 0 levels for many SGI. Additional indicators on NUTS 0 level were calculated and collected from official statistics, mainly from Eurostat, to complete the picture in these NACE sections where regional structural business statistics of Eurostat are weak. Nevertheless, total sections (e. g. G – retail) could not be included due to tremendous data gaps.

The summarizing indicator table – key SGI indicators (see Table 2) – contains only those indicators for which

- the data availability is acceptable (at least 70% of all regions are covered); and
- the regional correlation to other indicators of the same section is low.

With the data available it is difficult to construct and compute complex indicators. The advantage of complex indicators is that they summarise complex constructs into few or even one measurement. The successful condensing of this information is, however, dependent on the pre-existence of qualitatively good individual indicators which function as the base material. The quality of complex indicators is, however, highly dependent on the method of composition. The prerequisite that indicators have to be 'theory conforming' is also significant for comprehensive

indicators (Nardo et al. 2005). Furthermore, complex/composite SGI indicators should have a use and comprehensibility beyond the SeGI project.

Table 2. Key SGI indicators

NACE	indicator	unit	regional level	
D.35	Primary energy production 2009	TOE per 100,000 inhabitants	NUTS 0	
D.35	Share of renewable energy of primary energy production 2009	in % of energy production	NUTS 0	
D.35	Electricity prices 2009	Euro per kWh	NUTS 0	
D.35	Electricity, gas, steam and air conditioning supply 2009	number of units per 100,000 inhabitants	NUTS 0	NUTS 2
D.35	Electricity, gas, steam and air conditioning supply 2009	persons employed per 100,000 inhabitants	NUTS 0	NUTS 2
E.36	Water collection, treatment and supply 2009	number of units per 100,000 inhabitants	NUTS 0	NUTS 2
E.37	Sewage, treatment and supply 2009	number of units per 100,000 inhabitants	NUTS 0	NUTS 2
E.38	Waste collection, treatment and disposal 2009	number of units per 100,000 inhabitants	NUTS 0	NUTS 2
H.51	Air transport 2009	number of units per 100,000 inhabitants	NUTS 0	NUTS 2
H.50	Water transport 2009	number of units per 100,000 inhabitants	NUTS 0	NUTS 2
H.49	Land transport 2009	number of units per 100,000 inhabitants	NUTS 0	NUTS 2
H.49	Freight transport by road 2010	tonne-km per inhabitant	NUTS 0	
H.49	Freight transport by rail 2010	tonne-km per inhabitant	NUTS 0	
H.49	Motorways, length 2009	km per 1.000 sqkm	NUTS 0	NUTS 2
H.49	Roads, other than motorways, length 2009	km per 1.000 sqkm	NUTS 0	NUTS 2
H.49	Railways, tracks in total, length 2009	km per 1.000 sqkm	NUTS 0	
H.49	Busses, motor coaches and trolley busses 2009	number per 100,000 inhabitants	NUTS 0	NUTS 2
H.53	Postal and courier activities 2009	number of units per 100,000 inhabitants	NUTS 0	NUTS 2
H.53	Price for a standard domestic letter 2010	Euro	NUTS 0	
J.60	Programming and broadcasting 2009	number of units per 100,000 inhabitants	NUTS 0	NUTS 2
J.61	Telecommunication activities 2009	number of units per 100,000 inhabitants	NUTS 0	NUTS 2
J.61	Costs for local calls (10 minutes) 2008	Euro	NUTS 0	
J.61	Households with access to broadband 2010	percentage of households	NUTS 0	NUTS 2
M.70	Puplic relations and consultancy activities 2009	persons employed per 100,000 inhabitants	NUTS 0	NUTS 2
M.75	Vetrinary activities 2009	number of units per 100,000 households and farms	NUTS 0	NUTS 2
M.75	Vetrinary activities 2009	persons employed in m˛ per 100,000 households and farms	NUTS 0	NUTS 2

NACE	indicator	unit	regional level	
N.78	Employment agencies 2009	number of units per 100,000 inhabitants	NUTS 0	NUTS 2
P.85.1	School enrolment pre-primary 2009	students in pre-primary education per 100 population aged 0 to official school entrance age	NUTS 0	NUTS 2
P.85.3	School enrolment upper secondary 2009	students in upper secondary education per 100 population of relevant age	NUTS 0	NUTS 2
P.85.4	School enrolment tertiary 2009	students in tertiary education per 100 population of relevant age	NUTS 0	NUTS 2
P.85.2	Student-teacher-ratio in primary schools 2009	number of students per teacher	NUTS 0	
P.85.3	Student-teacher-ratio in upper secondary schools 2009	number of students per teacher	NUTS 0	
P.85.2	Average size of school class - primary schools 2009	average number of pupils per class	NUTS 0	
P.85.3	Average size of school class - lower secondary schools 2009	average number of pupils per class	NUTS 0	
P	Price index for education 2011	EU 27 = 100	NUTS 0	
P	Expenditures total for education 2011	in PPS (EU27) per capita	NUTS 0	
Q.86.1	Available hospital beds 2008	per 100,000 inhabitants	NUTS 0	NUTS 2
Q.87.1	Psychiatric care hospital beds 2008	per 100,000 inhabitants	NUTS 0	NUTS 2
Q86.21-22	Physician and doctors 2008	per 100,000 inhabitants	NUTS 0	NUTS 2
Q.86	Professional nurses and midwives 2008	per 100,000 inhabitants	NUTS 0	NUTS 2
Q.86	Private health care expenditures 2010	Euro per capita	NUTS 0	
Q.88.91	Children less than 3 years in kindergartens/child care for 29 hours and less per week 2009	in % of children of age group	NUTS 0	
Q.88.91	Children less than 3 years in kindergartens/child care for 30 hours and more per week 2009	in % of children of age group	NUTS 0	
Q.88.91	Children 3 years and more in kindergartens/child care for 29 hours and less per week 2009	in % of children of age group	NUTS 0	
Q.88.91	Children 3 years and more in kindergartens/child care for 30 hours and more per week 2009	in % of children of age group	NUTS 0	
R.90	Theatres, operas, art-halls 2006/07	number of units per 100,000 inhabitants	NUTS 0	NUTS 2
R.93	Sport stadiums 2009	number of units per 100,000 inhabitants	NUTS 0	NUTS 2
R.93	Sport stadiums 2009	capacity per 100,000 inhabitants	NUTS 0	NUTS 2
social housing	Expenditures of social protection for housing and social exclusion	Euro per capita	NUTS 0	
	Cost overburden for housing 2010	persons per 100 persons at permanent risk of poverty	NUTS 0	

The key SGI indicators depict an indeterminate collection of different units of SGI. Some service sectors are not represented at all (retail), some are represented in a deficient way (social housing, elderly care), and some with sub-optimal indicators, and often in an inconsistent manner (education, health, culture and recreation). Furthermore, any attempt to normalise the indicators is doomed to

failure, given the pre-existing data gaps. The project group, therefore, recommends that the tempta-tion to create artificial complex indicators and add them to the ESPON database is not followed; the risk of creating overly simplistic and ultimately misleading information is too high. Further evidence is provided in relation to the SGI typology work (Humer and Palma 2013 in this volume).

4. SGI AVAILABILITY – HOW WELL ARE THE INDICATORS DEFINED?

IS SGI AVAILABILITY SUFFICIENT TO DESCRIBE REGIONAL DISPARITIES?

As we have seen above, the four standards of SGI – availability, accessibility, affordability and quality – cannot be treated in isolation as there are numerous interdependencies and interactions at work here. Affordability is an aspect of accessibility as well as of quality, availability is a precondition for accessibility, while accessibility is an aspect of quality, etc. Furthermore, if we calculate accessibility, we predominantly measure travel time in a specific manner, basically by neglecting the non-physical barriers. Affordability and quality are even more difficult to calculate as the basic statistics relating to these areas are, generally, missing.

If only availability is quantifiable in relation to European regions, are these measures sufficient to describe regional disparities in respect of SGI? If only absolute numbers of local units of certain services in NUTS 2 regions are available, nothing can be said about the concentration of these units. How important is the centrality or non-centrality of these units for accessibility?

There is some evidence to suggest that land use and the location of service facilities coincide and that this is likely to continue as transportation hubs are developed (Bailly 2009, Polzin 1999). Nevertheless, White (1979) argues that accessibility alone is not a sufficient criterion for the location of facilities; facility linkage or facility agglomeration are more important factors to be taken into consideration. The significant effect of multi-purpose trips on use and accessibility is described by Erwing (1994). Furthermore, the influence of new technologies on usage and on accessibility of facilities and services is often highlighted. Couelis (2000) argues that new technologies could provide an important alternative to physical traffic if accessibility was to be assessed in a more sustainable way.

Using the currently available indicators and referring to the statistics gathered in the context of the SeGI project, only a preliminary test of the interaction of availability in terms of the number of units/facilities and of their accessibilities can be undertaken at this time. The accessibility analysis in the five case study areas, however, has shown a high level of correlation between the availability of and accessibility to certain services. The interaction between the availability of and the accessibility to motorways is perhaps the clearest correlation here. Basically, and unsurprisingly, the accessibility of motorway hubs increases with the density of the motorway-network. The effect is even greater on the value of the maximum travel time to the nearest motorway hub. There is also a strong relation between the availability of hospital beds and the accessibility of hospitals. Again, the relation is stronger in for the maximum travel time and weaker for the average travel time in the region (see Fig. 1).

Accessibility to railway stations shows a similar level of dependence in relation to the railway net as that described above in relation to motorways. For airports and for tertiary education not only is the availability of this service in the region important, but also its availability in other regions as well as the range of activities (national/international flights; technical and/or social sciences) provided in these regions. In the case of school/education indicators, moreover, one has to remember that the focus on enrolment measures is only able to provide suboptimal indicators for the availability of these services in the region (see chapter 2.2).
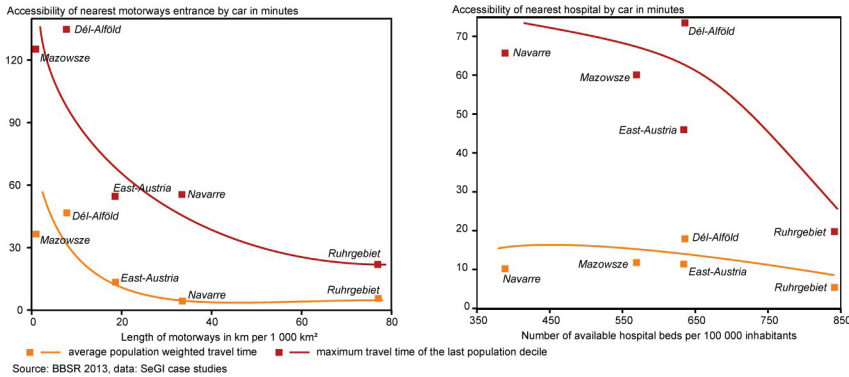
Figure 1. Dependence between accessibility and availability of certain services

Given the function of the accessibility of motorways in relation to their availability (effectively tracking the density of the motorway-net) a similar function or dependences can be assumed for the accessibility to, or the density/availability of, other net-infrastructures, such as ICT-nets, fresh water pipes and canals, electricity mains, and various kinds of transport nets.

Similarly, in relation to the function of accessibility in respect of hospitals and the availability of hospital services, one can assume that the accessibility of services is simple a function of their availability. This function is even clearer for the maximum travel time to the closest facility than for the average travel time.

There is some theoretical and empirical evidence available which suggests that the availability of services is an important, and in some ways rather efficient, measure for the supply of services. The presence or availability as such is a prerequisite for all other aspects of these services. At least in terms of physical accessibility the influence of availability seems evident. Economies of scale will also have an effect on prices/running costs, thus also affecting the cost side of affordability. Moreover, some aspects of quality are dependent on availability: waiting time for a service and productivity increase with its availability, and this has implications for quality, etc. These hypotheses would, however, benefit significantly from empirical proof that can be obtained in future research.

At best, the indicators of SGI availability mentioned above can be used to describe both the regional distribution and the reasons for the differences experienced across Europe, at least in an approximate way. Even if good indicators for accessibility, affordability and quality remain elusive, the availability indicators can, nevertheless, account for much of the service supply in the region. How to overcome the remaining data gaps to obtain a qualitatively good set of service availability indicators will be discussed in chapter 5.

HOW RELIABLE ARE THE NACE STATISTICS IN THE MEASUREMENT OF SGI AVAILABILITY?

Despite the fact that the metadata of regional structural business statistics of Eurostat describe "local units", one should not ignore a possibility that in some cases Member States deliver data not on local units but on enterprises: e.g. in France the numbers show that a discrete distribution of postal and courier services is remarkable, specifically, the number of local units per inhabitant in the country as a whole is low against a tenfold higher number of local units per inhabitant in the capital region. Nevertheless, the state owned enterprise *La Poste* runs a postal office in every city and nearly every larger rural

community. No additional information on this dichotomous distribution, however, is available. Eurostat simply does not, in this case, indicate any deviations from the local unit principle (metadata).

The example of postal services shows us other constraints in using the NACE classifications: in some countries the regional deviation shows an urban-rural gradient. In Norway the number of local units *per capita* is higher in the capital and other urban regions and lower in rural regions, especially in thinly populated areas. Here the retail sector has taken over some of the postal service functions, so that the service, albeit reduced, is maintained. To some extent this general trend can also be seen in Germany, where the gradient is not so distinct from urban to rural regions. However, in 2005, some thirteen years after the liberalisation of the postal market, the *Deutsche Post* had reduced the number of offices by 40% (Brandt 2007 p.23). Similarly in rural regions retail outlets, such as supermarkets and convenience stores, have taken over some of the functions of the original postal services.

In many countries, however, the market liberalisation was more formal than actual with the regulated letter market in particular being effectively reserved for the former state companies which often retained 90% or more of this market (Brandt 2007). Saving and running local post offices is very differently organised in different states. The markets for parcel and express services are, however, more competitive. As the competitors in this segment serve mainly the business clients, the higher number of local units in urban regions in many countries (e.g. Austria, Belgium, Norway, Spain and UK) seems reasonable.

Besides the French case and the fact that in some countries/regions various private sector retail outlets have assumed responsibility for some postal services which are not counted in this statistic, the number of local units per inhabitant represents well the level of availability and the differences in the national organisation of postal and courier services.

Another problem of the NACE statistics is the encountering of privately distributed services in the sectors that formerly were distinctly under public obligation, as illustrated by the example of broadcasting: in the broadcasting segment these are pay-TV and commercial channels.

Broadcasting provides an important service for disseminating information from local to international news as well as for cultural, social and democratic education (European Parliament 1996; Harrison and Woods 2001). It is for this reason that audiovisual broadcasting gains legitimacy as a public service and attracts state funding. Another argument for public funding is the guarantee of broad access and the inclusion of all population groups. Nevertheless, the Treaty of Amsterdam emphasises the importance of public service broadcasting but leaves the determination of its scope to the Member States (Harrison and Woods 2001). Public broadcasting takes up only some 25% on average of all the EU-based broadcasting activities (Bardoel and d'Haenens 2008). The share of commercial broadcasting and pay-TV is increasing, reducing the accessibility for all social population groups. Thus "the dilemma of programme quality versus popular reach has become bigger than ever before" (Bardoel and d'Haenens 2008, p. 351).

Some countries offer a greater range of local and regional radio and TV broadcasting activities (Croatia, Greece, Portugal, Spain, also to some extent Scandinavia and some East-European countries). In other countries this service is more concentrated in terms of large units (Germany, France) and/or additionally concentrated regionally (France: region Île de France). The average size of broadcast stations in Germany is bigger than in other European countries, and it also varies the most. The regional concentration in Germany is due to federal responsibility for broadcasting, resulting in bigger stations in each federal state and a few small stations in some regions. On the other hand, one also finds countries like Spain and Italy with, on average, a larger number of smaller broadcasting stations in every region.

Even though de-concentration of broadcasting can be seen to coincide with the higher transmission of, and reference to, regionally specific information, culture and news, this issue, nevertheless, needs some clarification. In some cases a clustering of broadcasting industries may already have taken place, as in the region/city of Cologne (Germany) or in Brussels (Belgium).

Questions relating to the cultural benefits of pay-TV and commercial TV channels, which are all viewed as increasingly important revenue generators, should be discussed in a broader societal and political context. The statistics, however, show very distinctly the current regional availability of, and the differences between, broadcasting services. The statistics, therefore, meet the demand for the information required.

A comparable problem is faced by employment agencies. Employment agencies cover a huge range of different employment related activities: advertising vacancies, procuring training for e.g. unemployed with low skills and the long-term unemployed, temporary employment and contract work, payment of unemployment benefits as well as registration and statistical reporting. Temporary and contract work in particular is often handled by private agencies while other services predominantly remain the responsibility of public authorities/agencies. The structural business statistics do not explicitly distinguish between public and private agencies or between services with a governmental mandate and those that are private-sector and for-profit based. Employment agencies, nevertheless, play an important role in procuring work for the unemployed or job-seekers. Whether temporary and contract work fulfils its role as a "stirrup iron" into the regular labour market or actually undermines the rules governing regular labour market, political regulations are required. The structural business statistics on employment agencies show the current levels of availability of such services and their regional deviation in Europe.

The submission of statistics by Member States is thus far in conformity with the regulations on structural business statistics which remain a fruitful and reliable source for building the SGI availability indicators used to map the European regional distribution of, and differences between, social services of general interest, and, to some extent, also services of general economic interest. The latter are, however, more reliable as regards effectiveness and quality of the net-infrastructure than regarding the presence and availability of local units.

The vast transformation and change of services is an economic and societal fact. Supply of services, on one hand, and changes of services, on the other, can seldom be illustrated by a single figure but need time comparisons. Therefore, the above problems of crooked picture given by the NACE statistics originate only partly in the statistics themselves. Nevertheless, the indicator system described here improves the situation regarding indicators on SGI supply as well as their regional distribution and differences. To enhance this indicator concept, the NACE statistics need to be improved, as summarized in the following chapter.

5. MAIN CONCLUSIONS

The main research aim of this paper was to try to translate a new pragmatic operational definition of "services of general interest" by Bjørnsen et al. (2012) into meaningful indicators to be used for future common statistical monitoring. This operational definition suggests the NACE Rev. 2 be used as a suitable framework for defining the range of services to be counted as being 'of general interest'. The Eurostat's structural business statistics enables us to build indicators for NACE divisions and classes. The quality of statistics as well as advantages and disadvantages of this approach are exemplary for

a number of distinct services, as outlined in chapter 4. In what follows the pros and cons of using the NACE are summarised:

- The NACE classification covers all activities related to any kind of production or sale of goods or services, thus allowing us to produce a complete picture of SGI.
- The NACE classification is mandatory in the European Statistical System, so no new statistics would have to be established to meet the need for data necessary to develop an adequate system of SGI indicators.
- The presence of SGI (number of units) and the capacity of SGI (persons employed) can be described within the NACE classification for all services. These two measurements, in relation to population, provide a sufficient picture of the availability and distribution of most SGI in Europe.
- Additional statistics in respect of the NACE classification are part of the data collection of Eurostat for some sections. The turnover of retail outlets is the main issue to be noted here. In the context of SGI, however, the "turnover" of the NACE classes could also be of interest in estimating the importance of a given service for the regional economy. The statistics on turnover would qualitatively increase the value of the indicator system in terms of estimating the contribution of a given service to regional economy.
- It is primarily indicators based on the NACE statistics that frame the availability of SGI. But, as we note in chapter 3.1, the notion of availability also determines the aspects of accessibility, affordability and quality. As these aspects are more difficult to determine and/or have a higher resource demand, it should be a priority to improve the availability indicators.
- Council Regulation 58/97 on the structural business statistic refers only to the NACE sections C to K and M to O. Sections P (education) and Q (health) in particular are not covered by the structural business statistic. As outlined in chapters 2.2 and 2.3, the NACE divisions of these sections would actually fit very well into the concept while respecting the necessary differentiation of the various services within these sections. Here, Regulation 58/97 should thus be widened to cover also these sections.
- In addition, further thought should be given to whether Regulation 58/97 should also be extended to cover section R – arts, libraries and sports. Data collection currently refers to branch-specific catalogues of art galleries, museums and sports halls, which often cover only the larger event hall venues or museums. The NACE statistics would also count smaller local units. The business statistics would not, however, cover the clubs and associations offering art or sport recreation on free of charge basis which is very often the case.
- On the NUTS 2 level a large amount of data is missing for confidentiality reasons. Section G on the retail trade in particular exhibits significant data gaps.
- Data gaps increase further when we turn our attention to persons employed and turnover.
- Presently, on the regional level (NUTS 2) only data for the years 2008-2010 is available at EUROSTAT due to the revision of the NACE classification. Therefore, time comparison and development indicators are not computable.

In addition to the recommendations on the improvement of the structural business statistics, further commitments should also be made to:

- Establishing the NACE statistics at the NUTS 3 level. (This is desirable but seems likely to face insurmountable difficulties at present).
- Collection of, at least, the following variables for each NACE class: number of local units, number of persons employed, turnover.

- If for some years to come the developments in respect of SGI are not measurable using the NACE data, an additional attempt should be made to collect data for at least the year 2000 (approximations based on NACE Rev.1 or Rev. 1.1).
- Furthermore, the metadata in Eurostat should provide better information on the quality and origin of the original data, including the statistical unit employed.

Empirically based statements, e.g. on the impact of market liberalisation, are not yet possible without the above-mentioned time comparison. This issue raises one of the main political questions associated with this general issue, namely, what impact has market liberalisation had on the availability of SGI?

Editors' note:

Unless otherwise stated, the sources of tables and figures are the author(s), on the basis of their own research.

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