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Applied demography for local management
An overview of the Belgian experience

Michel POULAIN
FNRS - GéDAP
Groupe d'étude Démographie Appliquée
Université catholique de Louvain, LOUVAIN-LA-NEUVE, Belgium

Email : poulain@sped.ucl.ac.be
CYTISE website : http//cytiseweb.gedap.be/

ABSTRACT

Within the overall discipline of demography, applied demography exists nowadays on both sides of the Atlantic as a specific field of research. The principal aim of applied demography is planning and forecasting and all demographic methods are used for public management. This contribution presents special features and issues related to local demography based on the Belgian experience. The demographic management at local level is presented as a decision-making tool for supporting the development of public policies in order to ensure an optimal use of the local resources and a better equity between all citizens. By developing local demography researchers should keep in mind at every moment the sustainable development of the society at local level. Usually demographers put forward a long list of arguments for neglecting local demography. In fact the demographic data collection at local level has to be reinvented. The statistical problem of small populations has to be faced concretely. Explaining the high heterogeneity of demographic structures and behaviour at the neighbourhood level and its relation with housing and other socio-economic disparities is among the essential directions for research in local demography. The fundamental role of migration is also part of these priorities including the analysis of all related financial aspects and the associated "myth of growth" that deeply affects a lot of policy decisions taken at local level. All our concrete experiences prove the essential role of applied demographers for contributing to the sustainable development of the population from the local point of view.

KEY WORDS: ***Applied demography – Local demography – Sustainable development – Population policy – Small populations***

Introduction

In the line of the work initiated by HENRY (1960), **applied demography** has increasingly won the right to exist as a specific field of research within the overall discipline of demography. In 1978, the *Population Association of America* (PAA) created two working parties, one entitled *Business Demography* and a second, *State and Local demography* (POL 1997, 2003) ; in 1993 the *European Association for Population Studies* (EAPS) set up a working party called 'Demography for decision making : applied demography'. On both sides of the Atlantic, recent work bears witness to the existence of this sector of research in demography (SIEGEL 2002, DE BARTOLO 2003).

According to various authors (DE BARTOLO 1997, KITNER 1994, KITNER 1996, MURDOCH 1991, PLANE 1994, POTRYKOWSKA 1993, RIVES 1995, SIMPSON 1998, SWANSON 1996), the principal aim of applied demography is planning or forecasting, whether directly or indirectly demographic and relating to needs linked to the current situation and to the population structure and its future evolution. Problems are frequently encountered when forecasting at the local level, particularly with access to essential data as well as in the reliability of the results. A concern which is shared by demographers and geographers is that of optimal localisation, as a function of the needs and the characteristics of the population concerned. Finally, the comparison between relative behaviours, needs and consumption of different populations belongs wholly within the field of applied demography. The management of administrative personnel, the school population, the payment of pensions and benefits and other issues linked to the relationships between different generations are also subjects which fall within the competency of applied demographers.

Referring to SIEGEL (2002), applied demography is the area of demography which concerns the application of demographic methods and principles generally for the analysis and solution of problems faced by businesses, private organisations and public administrations of all kinds wherever they might prove useful, and more particularly to all issues relating to the membership and structures of the component populations, both in their current situation and in forecasts concerning them. Clearly, the field of applied demography excludes theoretical and historical approaches, except for descriptions of the current situation and explanatory analyses of behaviour. It is above all an area of research which fits into decision-making within the set of objectives pursued by the various actors involved.

Within the framework of this contribution, we will consider only the case of **applied demography at the local level**, in short **local demography**, examining its special features and the issues that it deals with, as well as the problems encountered within the framework of practical experience at the city level in Belgium[1].

[1] This contribution sets up a panorama built from research in applied demography at the communal level, which was begun in 1983 under the sponsorship of the Fondation Roi Baudouin as part of its « *Dialogue pour l'Avenir* » programme. This research was conducted by a team which in 1996 became the *Groupe d'étude de Démographie Appliquée* (GéDAP). Major contributions were made by Thierry EGGERICKX, researcher at FNRS, and Luc DAL, information technology specialist, as well as, more recently, by Jean-Pierre HERMIA and Jean-Paul SANDERSON.

From local demography to demographic management and policy support

In Europe, **local demography** is as yet a little-developed area because it calls for a different approach, as much on the methodological level (data gathering, methods of analysis) as on the conceptual level and in its conclusions. Working close to everyday reality, this is by nature an applied field that must answer as much to the needs of planners as to the advancement of knowledge. The demography of small population groups is certainly not new, but it is helpful to conceive of a new approach, which we will call **demographic management** and which employs demographic tools for local planning.

Demography analyses the evolution of populations which are most often aggregated according to a spatial criterion. It may involve the population of a country, of a region or of a city. What is more, in general terms, the behaviour of an individual belongs within the context of interaction or conjunction with those around him, in the sense of constructed relationships as much as local proximity. Further, the better to understand human behaviour, it is helpful to look at the complexity of the society within which the individual lives. The space occupied by the individual, the set of persons and places with whom he maintains links, is quite clearly affected by distance, the intensity of relationships decreasing in proportion to increasing distance. It is principally this observation which justifies the importance of comprehending demographic problems on a local scale. On the one hand, it is in a local context that individual relationships are formed and that we can best understand the roots of demographic phenomena. On the other, local demographic reality mirrors societal transformation and forms a particularly apt base from which to carry out policy actions which truly respond to the changing needs of the population.

Developing tools to support demographic management on a local scale

Demographic management on a local scale should permit us to take better account of demographic reality when carrying out policy initiatives which affect a population and the territory occupied by it. It should follow up these policies and evaluate them *in fine* relative to the desired objectives. Among the extra-demographic goals to which demographic management ought to contribute as a decision-making tool for local government, the following three seem to be the most essential:

- To seek **optimisation** in the use of the local resources which are shared by a population
- To seek **equity** when establishing the rights and obligations of all citizens
- To ensure **transparency** in the making of policy decisions in order to guarantee **democracy** within local government or management

In general, we can identify six successive steps in the implementation of such an action:

1. collect data, which are most likely to be statistical, but which could also be qualitative, and which permit a description of the situation and a clear overview of the problem
2. attempt to understand the relationships between the different variables involved and, in particular, the spatio-temporal and socio-economic variations that are observed

3. forecast the future evolution of the situation relative to the problem under analysis, either by estimating future trends or by means of scenarios based on the various policy options
4. detect and identify problem areas, whether these be spatial (a city, a given district or neighbourhood) or temporal (at a given instant, either present or future)
5. suggest a policy action and an implementation strategy
6. measure its effectiveness while guarding against undesirable side-effects

Hence demographic management represents a set of tools for decision-making for the use of local authorities and planners. In practical terms, we can identify several areas of application, such as:

- The creation or extension of certain infrastructures, particularly those intended for education, culture, sport, even cemeteries, and optimal siting of these relative to the populations concerned
- Local planning or landscaping and its impact on future demographic evolution and well-being of the population concerned
- Within the environmental framework, the consumption of water, treatment of waste water and sewage, roads and highways, waste disposal
- Demand for housing and adequate housing provision for future population levels and household numbers
- Planning of social services and all matters relating to the employement, health and safety of the whole population of the city, particularly in terms of the different neighbourhoods, social groups and age groups
- The allocation of taxation and other dues from the population as well as the distribution of public subsidies and other forms of assistance

Quite often, the different figures or indices which can be calculated produce evidence of major differentials between different neighbourhoods, between age groups and between the various social groups: this leads to the more general problem of **equity**, particularly between different generations, which is the basis of sustainable development. Informing policy-makers about the major role of changing numbers of births and possible impacts of baby-booms or important migration flows and in this purpose alerting public opinion about possible medium or long term negative impacts of current situations, laws or regulations as well as new ones to be introduced is also part of the tasks to be fulfilled by demographers working at local level.

Local demography and sustainable development

Let us recall, if it be necessary, that the main objective of sustainable development in society is to guarantee the well-being of a population which lives harmoniously and equitably within a given area, and to do this without compromising in any way the inheritance of future generations, who should be able in their turn to benefit from a similar or better quality of life within the same space.

In order to guarantee the well-being of current and future generations, it is convenient to highlight situations and developing processes which skirt around this main objective and to

look for ways of remedying these situations or modifying the processes. At all times, the following question should be borne in mind: what would be the impact of the current situation or the consequence of a given change on the potential well-being of future populations? This forecasting exercise is essential if we wish to ensure the sustainable character of development by evaluating the extent to which decisions taken today could create unsustainability in the future for the generations and populations which will occupy the same territory.

The primary objectives of sustainable development are therefore the following:

- The well-being of each individual
- This will be sought in harmony with the well-being of others. This harmony is defined in a given area and within a given population, the extent of both territory and population varying according to the issues dealt with. It is not limited to inter-personal relations between individuals, but extends to public action and all associative and community life.
- When pursuing the two previous objectives, care should be taken to respect and ensure the well-being of future generations or, at least, not to compromise their legitimate wish for well-being; this to be done for the same territory and for time horizons which vary according to the issues dealt with

What are the constituent elements of well-being? Or, as a corollary, what situations are capable of creating "ill-being"? We are probably best served by turning to the fundamental rights of man as set out by the United Nations in the "Declaration of the Rights of Man", and which relate to education, housing, security, employment, freedom of speech and opinion, food, water and air quality, health, freedom of movement, space, property… There are numerous corollaries in terms of social exclusion, poverty, isolation, insecurity, inequality, the search for complementarity capable of overturning certain value-systems…
At this stage, there is no question of a discipline which would be foremost and omnipresent in judging the appropriateness of a process of sustainable development for a given society on its own territory.

The great deal of scientific support for the study of the evolutionary processes and mechanisms necessarily leads to interdisciplinary. However, the difficulty linked to this interdisciplinarity is obvious, and includes the difficulty of communication with political actors, who are the only ones capable of carrying out of sustainable development policies.
In this context, the demographer cannot be ignored. He can suggest a set of strictly demographic indicators which are associated with harmonious societal development (annexe 1). In addition, he possesses the quantitative keys to describing the size of the population, its structures and its rates of increase and decrease. He can describe, not just in numerical terms, all the populations and groups of actors within the logic of of sustainable development. The demographic perspective permits the estimation of the evolution of these populations and all that links in with this, in order to evaluate certain essential components of the lifestyle that we will bequeath to future generations.

Local demography belongs within a system of practical utility that is entirely humane, which does not bow before the political power establishment nor before economic liberalism, whose imperatives increasingly modify the principles and mechanisms of local management by distancing it from its primary sources. Demography and the demographer must devote

themselves to introducing constructive elements into the incessant re-examination of the choices to be made for tomorrow's society.

Demographic management helps to highlight the diverse nature of the needs within a city or a **neighbourhood** as well as to identify the issues facing a city and its needs relative to those of others. At the local level, demography supplies tools which help to identify the target groups, anticipate the changes in process and their consequences, detect situations which are incompatible with of sustainable development, follow up and evaluate the effects of measures. It is a question of clarifying and refining the definition of the sub-populations and their internal variability, the better to respond to specific needs and to adapt strategies to future developments. The identification of target groups no longer depends on a single criterion – nationality, occupation, economic situation – but on a combination of several criteria, which takes into account the biographical dimension (eg. nationality at birth and when the census was taken, place of residence at various times) and which highlights the most significant differences or inequalities in age, sex, civil status, education level… In brief, it is a question of improved identification of the foreigners, the elderly, the non-standard families, the unemployed… who live in a given place.

Demographic analysis allows us to place the needs of each sub-group of residents within the context of trends which mark the evolution of the population structure, its composition by age and sex, the composition of households, the types of migrants and the phenomena which underlie these trends (fertility, mortality, migration flows). We can then study the existence of overageing population, immigrant ghettos, inequalities between old and new neighbourhoods, the challenges faced by poor or single-person households, non-traditional modes of family life… On a wider scale, positioning the city relative to its peers relates to the necessity of equitable sharing of supplies and of subsidies or other due subventions at the regional, national and even international level.

Demographers dislike local populations

Starting from the principle that local demography is what demographers analyse at the local level, we are forced to recognise that local demography is the poor relation of demography. In fact, a quick examination of the table of contents of demographic journals or programmes from and contributions to population conferences confirms without doubt that demographers show little interest in the study of local populations. Fortunately, this situation is being reversed as the Chaire Quételet conference was devoted in 1988 to the theme "*Population et gestion communale*" while the 10th French national demographic colloquium in Bordeaux on the interactions between demography and regional development gave an important place to local demography. In December 1998, the *Istituto di Ricerche sulla Populazione* (IRP) in Rome held a scientific meeting devoted exclusively to local demography. Following the 11th French national demography conference held in Strasbourg and also devoted to local population, a workshop was organised by AIDELF in Sion on the theme of demographic indicators aiding the tracking of the sustainable development of towns and local populations. Finally, an EAPS congress session at The Hague in September 1999 was devoted to the demography of regions and towns. So, even if the local demography still shows some failings, the trends are reversing and the future belongs to it

in so far as we are now establishing in a rigorous way its principles of analysis and its specific methods.

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What arguments do demographers put forward for neglecting local demography?

The arguments are many and diverse, and are largely the same in the USA as in Europe (SIEGEL 2002 and POL 2003). The following list is by no means exhaustive:

1. First, data does not exist or are not accessible. Further, if the data are available they are not generally thought to be sufficiently reliable.
2. The populations concerned are too small and demand specific statistical precautions related to 'small populations'.
3. More generally, the analysis of populations on a local scale necessarily removes the statistical comfort provided by large numbers.
4. Furthermore, one is further away from the anonymity that characterises demographic study on a large scale. In local demography it is common to come face to face with the population concerned in flesh and blood rather than with anonymous individuals, and even less with statistical units or, quite simply, numbers. The inevitable confrontation with the local population can be a source of inconvenience when it is a question of describing specific behaviour or taking risks in terms of points of outlook.
5. In the demographic analysis of local populations the most important demographic phenomenon becomes spatial mobility and it is acknowledged that the demographer would often prefer to consider migration as a disruptive phenomenon so as to work in the 'pure state'. What is more, population forecasts at the local level are full of pitfalls since migration becomes the principal developmental mechanism, with an impact that can be considerable. Moreover, many behavioural variables and socio-economic factors must be taken in to account in order to predict the future of migratory movements on the local level.
6. Furthermore, when working at the local level, the demographer cannot ignore spatial variation, which forces him to anticipate the field of geodemography.
7. Having said this, the demographic study of local populations urgently implies a multidisciplinary approach and the confrontation with scientists from other disciplines. Multidisciplinarity and the confrontation with scientists from other disciplines are undoubtedly enriching, but they are also a burden in terms of the time it is necessary to devote to them.
8. Finally, it has to be said that local demography has rarely been the subject of studies, articles or conference papers which present the work of its researchers. To sum up, it is not an esteemed area of demographic science.

With so many reasons to discourage demographers working on the analysis of local populations one can understand why there are so few of them and why if some demographers of the so-called 'second rank' are sometimes obliged to commit themselves to local demography, in the absence of other research allowing them to earn a living, they do not cry it from the rooftops. Clearly it is not by such behaviour that the demography of local populations will develop with the best conditions for collaboration, for its principles and for its own methods and will become a subject in itself within demography. In such a context both present and future demographers cannot sharpen the weapons so as to express

themselves on the ever more numerous multidisciplinary questions linked to the sustainable development of the society of the future.

Reinventing demographic data collection

The detailed analysis of demographic structures in both urban and rural present-day populations and the analysis of the individual and collective behaviour responsible for the demographic development and for the future of the populations demand recourse to objective data describing current reality and its dynamic. It is with this in mind that it is necessary to collect the best data and to calculate the indicators likely to suggest a well thought-out plan for the evolution and development of these populations. Gathering data and constructing demographic indicators are indissoluble tasks, since the data are collected in order to construct the indicators while the indicators themselves operate on the available data.

With the help of numerous administrative sources, censuses and surveys, demographic data gathering is able to supply the basis for these different demographic indicators. Henceforth, innovation is the key, but rather than a comprehensive gathering of data it is more useful to focus on gathering the information which is most useful for casting light on the questions asked. This is untilled soil and the way forward is wide open, always bearing in mind that private life must be respected.

What are the data sources for the demographic analysis of local populations? With the help of information technology more and more basic demographic data, as well as data at local level, are being collected. Three main sources permit the demographic analysis of local populations: census, population registers and other sources including both specific surveys and other administrative sources.

The population census

There is scarcely any need to present the census, which is undoubtedly the most important source for local demography. Its potential lies in the diversity of variables gathered, in both demographic and socio-economic fields, as well as in everything that concerns details of housing. Furthermore, the possibility of aggregating these data at the local level of areas and districts (neighbourhoods and cities) constitutes a basic advantage for spatial and geodemographic comparison.

Without going in to what is common knowledge it is nevertheless important to remember that these possibilities are reduced by the four following factors:

- The quality of the census in terms of its exhaustive enumeration of the population, of the importance of non-responses and of the trustworthiness of replies given by those surveyed.
- The availability of data on individuals or aggregated at the appropriate level for the successful analysis of local populations. On this point, we are convinced that the obstacles which are encountered under the pretext of the respect for privacy should be lifted within the framework of projects whose primary aim is the optimisation of public

management at the level of the local population.

- The static character of the data, which suggest a snapshot of the local population on a given date, a snapshot which can later be compared to that produced by the next census
- The time lapse before the census data are made available, which can often be too long, and which renders the data increasingly less able to describe a fast-changing situation.

Hence data issuing from population censuses are necessary for the study of local populations, but they are far from being sufficient. They do not detract from the necessity of searching elsewhere, in various administrative records or specific surveys in order to complement and explain the census results. What is more, many countries have stopped carrying out censuses; there is clearly a wish to abandon the census and replace it by optimal usage of an integrated set of administrative records.

The population register

Here, again, it is not necessary to describe in detail the population register which allows one to follow the dynamics of the population of a city, or even of a *neighbourhood*. In so far as one can consult the register in an optimal fashion, this is a tool without peer for the study of demographic variables (POULAIN 2003). As opposed to the census which provides a static snapshot of the population at a given moment, the register is a dynamic source which, within its computerised and centralised format, holds a record of the whole set of demographic facts marking the life of a person, which can be called up at any time. In other words, local administrations could, in theory, know at any given time the state of and the most recent changes to their populations, with, in the case of Belgium in particular, a very satisfactory level of accuracy. We are dealing here with a database of primary importance for local demography, especially if we understand that it allows us to define any spatial unit of analysis within a city and to consider variable periods of observation.

In a country where population registers and integrated systems of registration of civil status and change of residence are available, we can in principle set up a dynamic picture of the population at any given time, with knowledge of most of the demographic structures. It is clear that the use of these data will first of all encounter two major obstacles: their **accessibility** and **respect for anonymity**. There is wide variability in the attitudes of various countries to these issues. Nevertheless, administrations do access and utilise the data, in the interests of local management, and can be assisted by demographers in doing this. Besides, demographers see respect for data anonymity as ethically vital. But when the data are supplied and used by statistical or scientific research organisations, or especially by the public administrations themselves, the interest of the citizen is clear and the problem of confidentiality does not present itself. Furthermore, as in the case of the census, it is important to be careful about the reliability of data extracted from the population register. Systematic biases may exist due particularly to differences between the official situation of the population as reflected by the register and the actual state of the same population. Finally, it is worth noting that, since population registers in many countries[2] are held only at a local level, the fine demographic analysis that they allow for cannot be conducted at the

[2] We note that population registers exist in most of the 25 member states of the European Union, with the exception of Cyprus, France, Greece, Ireland, Malta, Portugal, and the United Kingdom. Population registers also exist in Iceland, Norway, Switzerland, Bulgaria and Romania. Of those countries that hold registers, only Italy and Germany lack a centralised register of population.

national level, due to the non-centralisation of the registers.

Other sources of data

Besides the census and the population register, there is a whole set of data sources suitable for the analysis of local populations, as long as attention is paid to the reliability and exhaustiveness of the corresponding data-collection process and provided that it can be considered representative of the population under study as a whole. Registers of civil status, electoral registers, army records, school attendance records… are all registers or files that are capable of being used for the analysis of local populations. It is clear that an in-depth knowledge of the mechanisms governing local administrations and the potential data sources, allied with the critical spirit indispensable to a demographer, will in most cases result in the usage of data to produce excellent demographic analysis at a local scale. We cannot over-emphasise the need for turning to specific surveys which might have been carried out at the local level and which could cast light in one way or another on local populations, their attitudes, opinions and expectations.

Methods for the analysis of small populations

Applied demographic analysis in the study of local populations is synonymous with the problem of small samples. Even when exhaustive observation of the population and its demographic events has been carried out, there remains very often a large residual stochastic variability. The smaller the population or the rarer the phenomenon of interest, the greater will be the temporal instability or the spatial disparity of the calculated parameters, which can no longer be translated into real variations in structures or behaviour.

It is therefore imperative, in the case of small populations, to attach a confidence interval to every measure of demographic behaviour and all counts of the events to which they give rise. The width of this allows the testing of the significance of the values calculated from the observations.

However, demographers cannot limit themselves to the conclusion that the value taken by a demographic indicator is statistically significant, without trying to shed further light on the situation. The only possible standpoint is to identify the threshold beyond which behaviour or a demographic structure could be considered marginal or abnormal and to alert the political authorities if this threshold has been crossed. All marginal observations should be subjected to analysis to explain their causes and the resulting consequences, in order that local officials may be alerted and action taken to reduce inequalities, the causes of a situation which is, a priori, abnormal.

Within the framework of the study of local populations, we are constantly confronted with the statistical problem of small populations (ARS 2003). When dealing with small numbers, the principal question which arises is the following: *do the differences observed between the values calculated for demographic indicators, for a given small population on the one hand, and for a much larger reference population at the regional or national level on the other hand, reveal distinctly*

different behaviour within the small group relative to the larger reference group? Or do these differences arise out of a stochastic process linked to the small size of populations subject to risk and to low rates of occurrence of the indicators studied, the whole translating into a limited number of events and individuals observed?

In the usual case of the exhaustive observation of a population and the demographic events within it, there can be no a priori stochastic variation, whatever the size of the population. In practical terms, this means, for example, that for a given population of any size, the number of individuals within an age group on a given date or the number of births or deaths during a given period are not subject to chance. However, it must be admitted that, the smaller a population, the rarer the phenomenon or characteristic of interest is likely to be and the greater the risk that the corresponding demographic parameters suffer from temporal instability or spatial disparity. At the communal level and even more so at the intra-communal level, the small number problem arises only out of the need to account for aggregation bias that could perturb the stability of measures of population movement and of demographic behaviour. In fact, demographic data are, in principle, personal information although the majority of research is carried out at the communal level, working with aggregated data. There are three main ways in which personal data can be aggregated: these are space, time, and individual personal characteristics, such as sex, age-group or generation, socio-professional category, nationality… Hence, any error within the aggregated data would be due solely to the choices made during data collection, in terms of the choice of spatial decomposition, the chosen period of observation, the choice of age-groups or other personal criteria. The simple fact of considering the whole population of a city or of a neighbourhood constitutes a choice made in terms of spatial aggregation, counting demographic events occurring between 1 January and 31 December of each year constitutes a choice made in terms of temporal aggregation, while grouping a population within five-year age bands represents aggregation in terms of this variable. These often arbitrary aggregates are nevertheless indispensable since, if we were to consider the data individually, we would find no more than a single individual with the required characteristics in a given place, or no more than a single occurrence of an event in a given place at a given time. Unfortunately, the arbitrary character of some aggregates[3] could introduce a certain amount of error into data which are initially free of this risk.

Hence, in what way can this proportion of 30% of people aged 60 or over within a population of 100 or 400 inhabitants - which, let us recall, corresponds to the reality in the field - be considered an extreme or marginal result compared to a national average of 20%? Which threshold will require the intervention of a demographer to raise the alarm? It is the probability of finding in a random sample of the same size a value greater than or equal to that considered that will permit us to measure the degree of marginality. For equal population sizes, it is easy to see that the further the rates calculated for the population under study diverge from the reference values, the more extreme the situation. Given equal rates within two populations of different size, the greater marginality will correspond with that observed within the larger population. If the rates and sizes are different, it is the probability using the binomial law as explained by ARS (2003) which allows us to compare

[3] It is not possible to talk about random aggregation in the case of a division of the space into communes, which would be equivalent to the existence of spatially distinct centres of population.

the degree of marginality of the populations concerned. The smaller the probability, the greater the level of marginality.

From the decision-making viewpoint, it helps to try to emphasize the idea that the smaller the population, the more likely it is that marginality exists. If there is high spatial correlation between the data considered, spatial aggregation would help us pursue this objective by combining neighbouring populations which could be supposed to face the same problem. In doing this, if we succeed in increasing the size of the population concerned while keeping the level of divergence from the reference population more or less intact, the level of marginality will increase and by identifying the area of intervention in specific fashion, we are better able to look for an explanation and for action that could remedy the situation. It is just as possible to combine population groups with similar characteristics and which could be expected to face common problems. So we could combine adjacent age groups or both sexes, if we can do so without losing any explanatory potential. In this way, we would also increase the size of the population concerned. Finally, in temporal terms, we can also check for temporal auto-correlation, by testing whether an observation at time *t+1* is correlated with an observation at time *t*. This is generally true in the analysis of population structures since these possess certain inertia. Conversely, if we are counting the number of events in a given period, it is appropriate to check if there is a temporal correlation between successive observations, in which case a temporal re-grouping will be necessary in order to better highlight the marginal character of the situation. If this aggregation preserves or increases the degree of marginality, the problem is no longer incidental and its explanation should lie within the time period. If, conversely, the temporal correlation is small, the problem is incidental or accidental without however being random. In carrying out analyses of correlation in time and in space, and by re-aggregating as necessary the better to highlight marginal results, we are resolutely involved in an attempt to explain; we can re-order priorities within the problem-set so as to draw immediate attention to the most obvious marginalities, those which require the most immediate decision-making.

Spatial structure: local demographic disparities

The division of space must take account of the optimal threshold for re-grouping, which must be a compromise between the universes of particularism and of generalisation. It is convenient, on the one hand, to draw out common traits which stand out from the individual differences, so as to render the mass of information intelligible as well as operational, and on the other hand to take into consideration the extreme cases, those fringe observations which are overshadowed by the mean values. The analysis should not limit itself to the framework of the cities. The optimal division must be based on the daily experience of individuals and attempt to gather within the same spatial unit all those who share a common life space and who are, as a result, faced with the same spatial environment and to the same problems linked to the layout of their territory: we will refer to this as the **neighbourhood** (POULAIN 1999b).

The process of definition of a neighbourhood within a urban or rural must be the result of an approach which is essentially scientific, based on a set of criteria between which a

compromise must be found. These neighbourhoods are not only a division which aims at a geo-statistical presentation, but also an indispensable key for the development of policy action at the intra-communal level. In addition, their spatial definition, as well as their designation, must be subject to a consensus of opinion among the local elected officials, the local administration, and the population. The spatial definition of neighbourhoods calls upon a wide range of criteria as demonstrated by the list presented below which served to define the 47 neighbourhoods of the city of Namur, 17 for Huy and 55 for Charleroi (POULAIN 1999a, EGGERICKX 2000 and VILLE DE CHARLEROI 2001).

CRITERIA FOR THE DEFINITION OF NEIGHBOURHOODS

1. The neighbourhoods taken together form a **partition of the territory** of the city in such a way that each household and each citizen belong to one and only one neighbourhood .

2. In so far as this constraint is compatible with the other criteria, a neighbourhood shall be equivalent to the **sum of one or more statistical sectors** which are spatially contiguous.

3. The **area** covered by a neighbourhood should be **all in one block**.

4. A neighbourhood should contain **a sufficient number of citizens** (1.000) without, however exceeding a **maximum threshold** (10.000). Nevertheless, certain neighbourhoods corresponding to well-defined population centre could be of smaller size. In such a case, a re-grouping of neighbourhoods will allow the calculation of certain demographic indicators.

5. Neighbourhoods should be **roughly similar in area**, while at the same time being larger in rural zones and smaller in areas of high population density.

6. The **shape of a neighbourhood** should resemble a disk as far as possible, in order to limit the distances within it.

7. The definition of a neighbourhood should attempt to **highlight population centres** in which citizens live together in harmony as a result of their spatial proximity.

8. The borders between neighbourhoods should take account of **existing limits** to the extent to which this can be justified, forming a separation between distinct mindsets or lifestyles.

9. The borders should follow the courses of **rivers and streams, railway lines and major roads**.

10.**Old historical borders** should not necessarily be used to demarcate neighbourhoods.

11. Changes in relief, landscape or habitat should also be taken into account in defining the extent of neighbourhoods.

12. Except where this is justified by differences in housing or habitat, **both sides of a street** should fall within the same neighbourhood.

13.Where a street must be divided between two neighbourhoods, the demarcation should be made at a point where there is **a natural break in the buildings**.

It is clear that few of these criteria are strictly quantitative or administrative in nature. Side by side with objective criteria are others which are frankly subjective, such as the feeling of

belonging to a neighbourhood, a parameter which is difficult to quantify because one can only measure it as a result of a survey but which is very useful for good management of a population. The spatial definition of neighbourhoods constitutes in reality a long-drawn out process which involves many agents and very varied criteria. This was tested in practice on the two great Belgian urban agglomerations of Charleroi and Namur. The dissection of the agglomeration must be done by means of a ceaseless dialogue with political representatives as well as knowledgeable local people and committees within the existing neighbourhoods. The final result is far from being unique, but the essence of it rests in the fact that it brings together a wide consensus across all those concerned and, more hypothetically, within the population. It is only on this condition that the concept of the neighbourhood gains its meaning in the sense of a framework for the life shared in common by a set of people living in the same place. It is of primordial importance to keep in mind that it is at the level of the neighbourhood that the majority of contemporary political problems are experienced and that the society of tomorrow is being constructed.

Essential directions for research in local demography

First of all, it is important to be clear about the research area covered by the analysis of local populations. We can consider that local demography covers all research and investigations which impinge either directly or indirectly on the variable "population". In the strictest sense of demography, this means that all types of research carried out by demographers at a wider level will, when applied to local populations, form part of research in local demography. But, in addition, we can include within local demography, all those studies which are not necessarily concerned with the problem of demography, but to which demographers contribute with the help of **their own tools**. Among these, we can identify the four following tools, which seem to us to be the most important:

1. complementarities between transversal analyses (at a given time) and longitudinal analysis (of a cohort), a complementarities which is particularly highlighted by a Lexis diagram.
2. the important role of age and sex within the framework of the age pyramid and all factors relating to its evolution.
3. the concept of a population subject to risk and the various methods of standardisation which allow for comparison between behaviours and situations within populations which possess different structures.
4. population forecasts, whether these concern the whole population of specific sub-groups

All the other research methods and tools do not seem to us to be specific to the demographer, especially the statistical methods and methods of spatial analysis that we must share with many other scientists, whether they be geographers, sociologists, economists, urban planners…

In a more general sense, if it is appropriate to consider demography at the local level, it is first of all because demographic problems discovered at the national and international level, ageing and immigration to name but the two most important, can only stem from trends and situations which are mostly encountered at the micro-regional or local level. Aging and

immigration cannot exist so clearly on a national scale without obvious signs being manifested within a large number of local communities. Now, it is within these local communities, neighbourhoods of towns, villages or hamlets that demographic behaviour is formed on a daily basis. It is within these human groups that births and deaths are experienced as the months go by, and the structure of households and families develops and changes. Further, it is here that demographic tensions come into being, linked to the socio-economic differences, the cultural differences, and the ideological differences which characterise society. As a result, it is within neighbourhoods, villages and cities that demographic norms are set and experienced. But it is also in these places that marginal situations are revealed, situations which are too often ignored behind the averages calculated at the national level. By marginal situations, we mean diversity of behaviour: a diversity which, beyond those risks inherent to marginality, can prove itself to display considerable richness such as a wide range of socio-professional associations, socio-cultural sensibilities or, simply, modes of thinking or living.

At this point, we must consider **the knowledge of the demographic structures at neighbourhood level** within local communities. The examination of the variation of demographic structures within the cities themselves quite often displays the existence of quite varied structures. It is not unusual to discover that the proportions of the elderly, young people or people living alone can double or triple from one neighbourhood or village to another. It can also happen that certain spatially contiguous population centres display structures and behaviour that are demographically quite opposed. Hence, for the majority of cities, we are forced to note that the demographic picture is not homogenous at the communal level; independently of the errors or variations arising out of small numbers, it is heterogeneity that we notice first of all (EGGERICKX 1996). As a result, communal management needs must act in full knowledge of these disparities.

If, as a whole, one city presents different demographic characteristics from the majority of the others, it helps, on the one hand, to take up the challenge of these differences, and on the other, to try to smooth them out, particularly by means of migration. But this applies to marginal cases, involving very few cities, whereas the variability of demographic situations is seen within all cities to a greater or lesser degree. Demographically speaking, knowledge of a city allows us to highlight these marginal situations at the city level. Even if, as we have already pointed out, some of these situations are enriched by their intrinsic diversity, we notice also a greater propensity for the manifestation of tensions between the groups concerned and the appearance of demo-socio-economic problems. Relatively too many of the elderly, of single-person households, of young people… could give rise to problem situations which must be resolved. The situations are diverse as are the remedies.

But, beyond this, the great specificity of demography seen through the filter of local communities is the **fundamental role of migration**, which redistributes populations and modifies the demographic and socio-economic structures of local populations. International migration can be considered as one type of these migrations, one which clearly has a very profound impact on certain urban cities. It is this incessant movement of households which punctuates the lifecycle of individuals and makes up its path of migration. All these moves, when viewed on a national scale, constitute no more than a background noise of internal population redistribution. Within a local grouping, on the other hand, the changes of

residence ceaselessly redraw the demographic picture, the composition of households and families, and as a result, they transform the mind-sets and the features peculiar to individual places.

For a given city, the birth and death rates are generally of the order of a percentage point, which in actual numbers translates into a gain or loss of a few thousand. On the other hand, entries to and exits from a city are generally of the order of 5 to 10 per cent and the migratory balance could result in a net increase or decrease of a few percentage points of the population each year. An 'average' city could therefore expect to see turnover in a fifth of it population every five years. This helps us to understand why spatial mobility is the most important demographic component in the life of a local community and hence forms the subject of policy and of action, within the framework of local management.

The migratory balance has a non-negligible impact on the evolution of the **total population** of a city. As a result, one can rightly ask the question of how the size of the population of a city affects, either directly or indirectly, the management of communal affairs. We can go so far as to ask if it is in the common interest to try to increase or decrease the population of the city.

First of all, and in more or less general fashion, the **number of peoples' representatives** responsible for communal management is a function of the population. Further, the wages of representatives are also linked to the same population figure. There is no doubt that, in a good number of cases, communal representatives and the principal local government officials would gain **financial advantages** if the population of the city were to **increase**. It is hard to deny that this should not be taken into consideration when we tackle the myth of growth and the interest a city has in seeing its population grow. In the field of **local finance**, when we try to decipher the links between local taxation and the increase of the size of the population, we could be tempted to conclude that every new arrival into the city represents a net gain to the communal coffers. This gain could also be greater if it resulted in new house-building or if the individual or rather, the household concerned, disposed of ample means. These two elements are the undeniable advantages that are usually put forward by local political representatives, in order to try to attract new-comers into the city. But in order to measure the **financial advantage** that a city could expect to draw from the new arrival, we must also look at the debit side. Very little expenditure is proportional to the number of people in the population. To confirm this, we can look at the effect of this figure on the expenditure level by comparing the same city at two moments separated by an increase or a decrease of the population. This approach is clearly awkward because the variation in the population numbers in a city is slight, except over long periods of time. In this latter case, we could risk running into different socio-economic situations and as result finding it difficult to compare them. We could also analyse the expenditure distribution across all cities, while taking account of their relative sizes. But the transposition of results so obtained to changes in the spending pattern of a single city as a result of a change in the size of the population remains a fraught exercise.

When drawing up **a financial balance sheet for an "average" new resident**, we can nonetheless suppose that the anticipated additional income is on average balanced by the additional expenditure. Hence the additional inhabitant produces a balanced financial result,

unless if the new arrivals, when responding to similar stimuli, do not overall fit the description of “average” individual.

This leads us to consider the myth of growth. Demographic growth at any price has been the objective pursued at state level, in various circumstances. But this objective has also percolated into communal management: "**Si la population croît, tout va !** " i.e. “If the population increases, all is well”. This is a cry which is often heard from local politicians. Thus, no communal worthy would stop at drawing a positive conclusion when reporting such growth. The public is generally of the same opinion, and is encouraged in this by the press’s positive headlines - which can, however, become disquieting in the event of a population downturn.

But if there is indeed growth, this cannot be thought of solely as the net result of births and deaths, without the added effect of migratory movements. It is these last which we have seen to be responsible for growth, whether directly or indirectly, by modifying the age-structure of the population and rendering it more able to produce a positive net result (mainly by increasing the number of young adults). Population growth is therefore quite often due to net positive migration and is a sign that the city is attracting more than it loses. The availability of jobs, the ease of communication, the quality of the environment are most often used to explain this attraction or rejection. It is also clear that the attractiveness of a place or the preference for a city is not the same for all ages, but fortunately, also differs for individuals within the same age group depending on their personal aspirations.

Nevertheless, it remains true that greater migration flows can be seen towards certain areas in response to their well-defined attractions. In certain cases, the city powers are well able to enhance these attractions and thereby meet their wish of increasing the city population and hence the sum of their revenues. Above all, it is necessary to minimise migratory movements which unbalance the age structure of the local population. One-way migrations are bad, migratory exchanges are good, in order to bring in dynamism and the renewal which characterises the contact between different and rich local cultural heritages. A certain amount of mobility is desirable, but it must be constrained by the need to maintain in each place, within each community, an age-pyramid in equilibrium, or at least to try and avoid a net total of zero within any age group. This is probably much easier to say than to put into practice, given the diversity of human aspirations and behaviour.

Because, in fact, with a population figure that is stable at the national level, all growth observed in the so-called ‘preferred’ cities will translate as a matter of course into a reduction in the other cities. Suppose that each city selfishly tried to increase its own population, at the expense of the others. A healthy and dynamic city management would gain additional benefits for the city in this context. If the population of the city increases disproportionately, this would disturb its internal management, which would then make it run the risk of losing its attraction, particularly for those who live in it. Finally, we should not fail to point out that, as a result of unbalanced migration flows between cities, we would often be forced to build housing and new infrastructure in rural areas while, on the other hand, in towns and industrial areas, housing is often abandoned and the sporting, cultural and educational amenities become under-used. With, in the final reckoning, an enormous waste of state, city and the people’s resources, but also a waste of space, that space which

since the beginning of the 19th century, we have continued to develop as we reclaim it from nature.

An interactive database as a concrete tool for policy support in local demography

In the framework of our researches in local demography and all the collaborative work undertaken with cities in Belgium during the two last decades, GéDAP has developed an interactive database named CYTISE that is now available on the internet at the following address: **http//cytiseweb.gedap.be/**

This database allows any potential user, normal citizen or policy-maker, to download and compare directly a large amount of data collected from the Belgian Statistical Office at the level of the 262 communes of Wallonia, the French-speaking region of Belgium. Elaborated by Luc DAL this tool is easy to use without any training, it provide direct comparative tables for any of the 262 communes, considered two by two. Appropriate figures are proposed as well as time series and thematic maps for more that 200 indicators grouped in six themes that are population, migration, household, housing, socio-economic characteristics and environment. CYTISE has shown to be a very useful tool and the intention exists to incorporate in the near future a population projection module that would be suitable for local populations. The same type of interactive database is now under construction for the city of Namur with the consideration of its 47 neighbourhoods and this is done in close cooperation with the local policy makers and may be considered as a **keyboard for a strategic development of the city**.

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