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DISTRIBUTION OF SELECTED DISEASES OF THE CIRCULATORY SYSTEM IN THE UPPER NITRA REGION IN 1986-1990

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Problems of spatial distribution of given selected diseases in an area with a considerably affected human environment are solved. By means of geographical methodics a view of mortality intensity in the individual settlements in the Upper Nitra Region related to the amount of inhabitants is submitted. Owing to comparison indices of incidence (in the sense of mortality) are given for the territory of the Upper Nitra Region as a whole, for the district of Prievidza and for Slovakia. The contribution of this contribution lies in methodics more than in interpretation.

Key words: medical geography, ecology of diseases, distribution, circulatory system diseases, mortality, Upper Nitra, Slovakia

INTRODUCTION

Our speculation is a continuation to a previous contribution of ours (Krajčír 1993), in which we similarly made an attempt on the basis of mortality and from the position of geography (without a demographical standardization) to assess the spatial distribution of

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infectious and parasitary, neoplastic and metabolic diseases according to settlements (communes) in the Upper Nitra Region. Analogically as in the previous case we want to go out from the particular delineations, in which through a cartodiagrammatic manner we have represented the intensity of incidence (in the sense of mortality) of diseases of the circulatory system individually (a selection) and as a set, too. The intensity is represented in delineations in graduation according to the accompanying scale (at the right down) for the particular settlements (communes) and at the same time for major territorial wholes, i.e. for the Upper Nitra Region, the district Prievidza and for Slovakia (at the left). The number in positions of the individual settlements or those for the territorial units (at the left of the delineation) represent thus grades and as to the relative values belonging to them, they can be read from the scale mentioned. Only in such a case, when no death occurred in the commune or in the followed unit, the zero degree, of course, corresponds to the equal zero value.

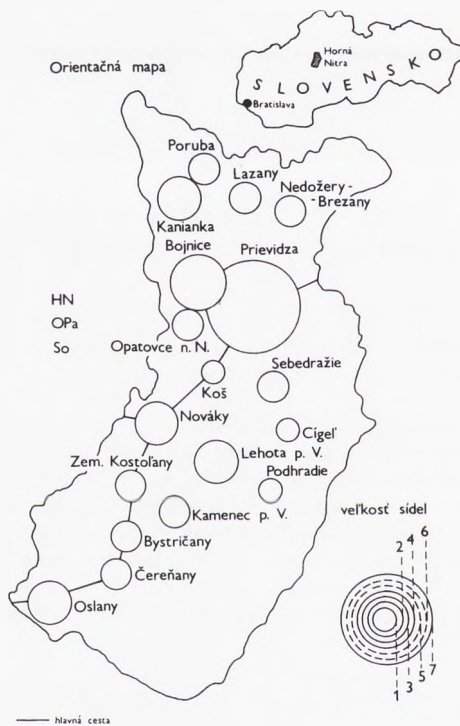


Fig. 1. Orientation chart of Slovakia with position of the Upper Nitra and orientation chart of the Upper Nitra with both names and size of settlements as well as with main road delineated. The size of settlements (communes) 1 - to 1000, 2 - to 2000, 3 - to 5000, 4 - to 10 000, 5 and 6 - not represented and 7 - above 50 000 inhabitants. Along the left side of cartodiagram: degree of incidence for the Upper Nitra - HN, for district Prievidza - OPa and for Slovakia - So.

Before we shall begin speculating on the individual records from the sphere of the circulatory system, it is suitable to put into mind that the record for all the causes from a previous contribution (Krajčír 1993, p. 55) has a large analogy in the figure on the

distribution of circulatory system diseases from this contribution (Fig. 2), which in the event is self-evident, when we realize what a share is covered by circulatory system diseases within the total mortality whether in Slovakia or also in the world at all.

DISEASES OF THE CIRCULATORY SYSTEM

As it is evident from the previous paragraph and from the cartodiagram (Fig. 2) in diseases of the circulatory system as a whole we work with 5 degrees of adequately lower values (to be understood lower ones related to the distribution of all the causes). With regard to the generally well-known high frequency of the occurrence of these diseases and with regard to the fact that they are diseases of the circulatory system in total, it does not surprise anyhow that in the framework of settlement diagram of the Upper Nitra Region all the settlements, one and all, display an odd positive value of mortality.

Degree 1 appears for more significant territorial units, above all for the district town Prievidza, but also for the district unit proper (Prievidza), and also for less significant settlements Kanianka and Kamenec pod Vtáčnikom. We know about Kanianka that it has got lately a settlement with relatively extensive housing construction for young families, which take refuge in this place also from the surrounding communes, in particular from those ought to have been reduced substantially due to economic and at the same time due to environmental reasons. All the more it holds good about the growth of Prievidza alone. And thus it is not surprising at all that both these settlements, although very different by size, display just the lowest degree of mortality.

Degree 2 - as opposed to the previous one - displays linkages between the settlements Čereňany, Bystričany and Zemianske Kostoľany, but also between Cigel' and Sebedražie, since in both cases there is a series of settlements being situated in a mutually immediate linear neighbourhood. Over and above also the average of monitored Upper Nitra as a whole falls here - and this is less favourable than the average for the entire district Prievidza. And that's something already.

A kind of a not sufficiently unambiguous interconnection may be seen also in a series of settlements displaying intensity of the 3rd degree. It is a line connecting Poruba - Bojnice - Opatovce nad Nitrou - Nováky - Lehota pod Vtáčnikom. The relatively more significant size of the settlements Bojnice, Nováky and Lehota pod Vtáčnikom need not be emphasized in this case, since it scarcely may be meaningful. This degree is at the same time average also for the entire territory of Slovakia. Perhaps just due to this fact also here in the Upper Nitra Region this degree affects settlements "scattered", as a matter of fact, along a line, which as if an axis intercrossing with its own way the territory studied (and "representing" it at the same time) and perhaps also due to this reason this degree is bound to 3 different settlement sizes. In other words: through both these features the Upper Nitra corresponds to the whole-Slovakian average.

Degree 4 is marked for the fact that it appears in fringe positions of the territory in question, namely in the north, here even in a spatial linkage between neighbouring settlements Lazany and Nedožery-Brezany, and in the south in the case of Oslany.

Degree 5 speaks for Koš and Podhradie, which means that it speaks through maximum mortality for 2 from among 3 smallest settlements in the Upper Nitra (the 3rd of them, namely Cigel', recods the 2nd degree only).

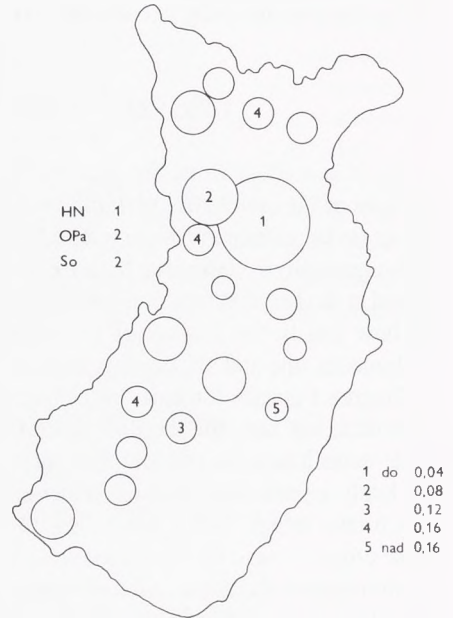
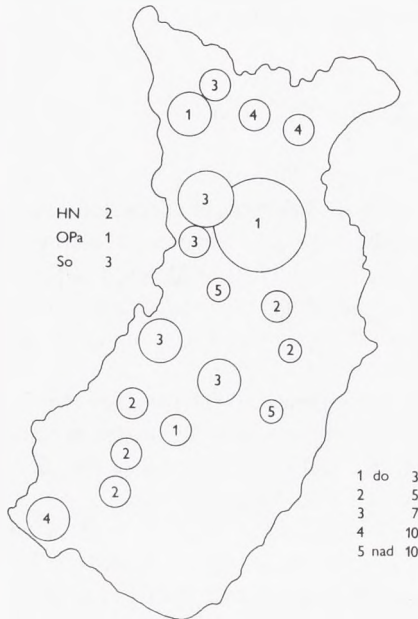


Fig. 2. Diseases of the circulatory system (in total).

Fig. 3. Chronic rheumatic heart diseases.

Fig. 2-8. Along the right side of cartodiagram: numerical scale of incidence (average annual number of deaths per 1000 inhabitants).

CHRONIC RHEUMATIC HEART DISEASES

The map diagram of the distribution of this group of diseases (Fig. 3) is interesting due to the fact that both the entire area of the Upper Nitra (with degree 1) and the district town Prievidza alone (with degree 1) and in addition most of the followed settlements of the Upper Nitra (with O degree) display balance more favourable than superordinate (and thus also more extensive) territorial units of the district Prievidza and Slovakia (both with degree 2). This fact as if suggesting that the correlation component from the sphere of geographical environment should be looked for more elsewhere than in the polluted environment of the Upper Nitra. On the other hand, in turn, settlements with degree 3 (Kamenec pod Vtáčnikom), 4 (Zemianske Kostol'any, Opatovce nad Nitrou a Lazany) and 5 (Podhradie) figure here. They are, it is true, small settlements, therefore their weight cannot be large enough, nevertheless we cannot avoid a note, namely that they are marked for two peculiarities as to the spatial reception (in a way like we can see them in the cartographical record). Firstly, the mentioned settlements form more or less continuous chains (Opatovce nad Nitrou - in an interconnection perhaps also Bojnice - Lazany as one chain and Zemianske Kostol'any - Kamenec pod Vtáčnikom - Podhradie as another one). Secondly, the mentioned settlements figure with their marked intensity in a contrasty way just to those with zero value (those with zero degree) in the surroundings (and they are most).

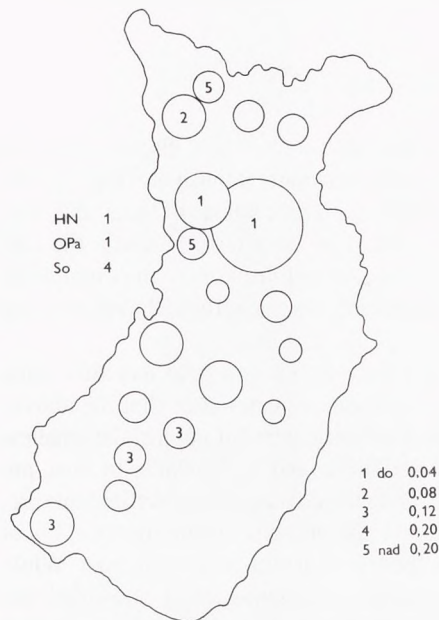


Fig. 4. Hypertension disease.

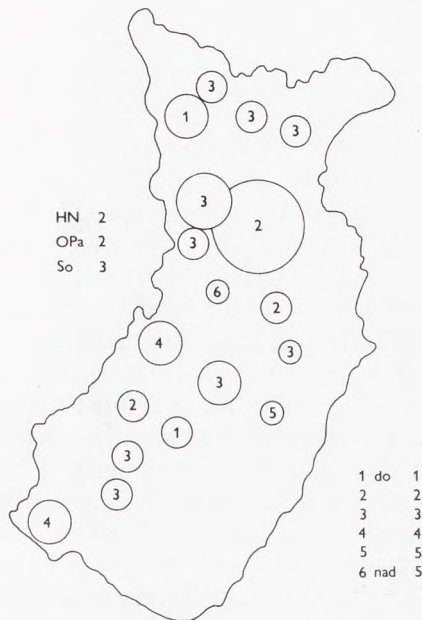


Fig. 5. Ischaemic heart disease.

HYPERTENSION DISEASE

Also in this case the cartographical figure on the distribution of disease (Fig 4) is interesting by the fact that the entire area of the Upper Nitra (with degree 1), but also the entire district Prievidza (with degree 1) display substantially lower intensity of mortality than average for the entire territory of Slovakia (with degree 4). And in addition (like in the previous case), most settlements of the Upper Nitra display value 0. We can state again balance between two largest (and at the same time neighbouring) settlements on one hand and superordinate units on the other. Concretely there is degree 1 figuring for both the settlement units Prievidza and Bojnice, and the units Upper Nitra and Prievidza district. In this connection striking and markedly high is the value for the territory of Slovakia. From this fact it results logically at least that there are areas in Slovakia, in which the distribution of this disease reaches considerably higher values than here in the Upper Nitra. In this sense says also the fact that along a few settlements with a record there are most settlements here (like in the previous case) without a record (thus with zero value of intensity). Owing to that reason also this disease in many views is similar in its spatial distribution (like it may be observed on the cartographical record in question) to those in Fig. 3 and the comments to chains and contrasts related to zero-value localities hold good also here repeatedly, nevertheless a certain shift as to space and values can be observed. As to the peri-urban chain of Prievidza records of degree 5 at Poruba and Opatovce nad Nitrou could be significant (both the settlements represent at the same time limits of the chain). As to the

other chain (in the south of the Upper Nitra) the same degrees of intensity (3) figure, in turn, in all the three settlements (Oslany - Bystričany - Kamenec pod Vtáčnikom).

ISCHAEMIC HEART DISEASE

In contrast to both the previous cartographical records we reach to a disease, which is within the studied area Upper Nitra represented substantially more intensively (Fig. 5). The matter, however, is not a substantially higher intensity (compare values of the scale), but, of course, also spatial distribution, when each settlement (commune) records the odd intensity (this being not of any sort as to all the other selected diseases of the circulatory system). And at all, the distribution of intensity in the cartographical figure brings to mind distribution of diseases of the circulatory system (Fig. 2).

If we notice the whole-Slovakian average (3rd degree), we can state that this value appears here more frequently (up to 9 times). In addition, we can notice that the above-average value of degree 4 appears in two industrialized settlements of not just the smallest size (Oslany, Nováky), and degrees 5 and 6 at Podhradie and Koš, which, in turn, are settlements with the lowest number of population. Both these categories of settlements are, it is true, due to their size different in their statement and thus also in significance, but at the same time both speak in the same direction, although each with its own manner. While in the case of Oslany, Nováky and Koš it is evidently a consequence of one-sided and immoderate activities of man, in the case of Podhradie it is perhaps just a relative remoteness from the "civilization" and care activities in the Upper Nitra. Related to the whole-Slovakian value of intensity the assessment of the town Prievidza, or also smaller settlements as Sebedražie, or Zemianske Kostol'any is remarkable, it is true, but statement from the side of Kanianka, or Kamenec pod Vtáčnikom may be interesting, because it is minimal (degree 1). As to Kanianka, however, we know it as a settlement that is young, so that it is to answer, as a matter of fact, only the question of low intensity at Kamenec (of course, along hypothetical speculations related to maximalist sphere (Oslany, Nováky, Podhradie and Koš). Taking all together, remarkable is also the fact that both the whole of the Upper Nitra and the space of the district unit Prievidza record a "better" degree of intensity (degree 2) related to the whole-Slovakian average (degree 3).

ACUTE INFARCTION OF THE MYOCARDIUM

Similarly, like the disease in the previous cartographical diagram, also this disease (Fig. 6) is marked for covering all the settlement units (communities) with non-zero values (thus no degree 0 appears), although in contrast to the previous illustration in Fig. 5 the disease reaches in rough only a half-intensity. The Upper Nitra alone as a whole displays, and it is interesting, the value of degree 2, which is, it is true, by one degree more than the district unit does, but nothing more than the average for the entire Slovakia. Settlements with such a degree represent in the Upper Nitra in number exactly a half of the total amount (9 out of 18). They are settlements of the 2nd, 3rd and 4th size degrees (number of inhabitants), and thus nothing extraordinary is in it. Nevertheless 3 settlements record the lowest degree 1 (Prievidza, Kanianka and Kamenec pod Vtáčnikom). The low mortality

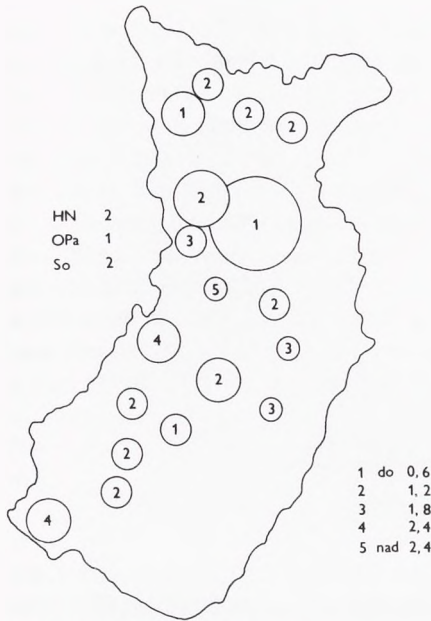


Fig. 6. Acute infarction of the myocardium.

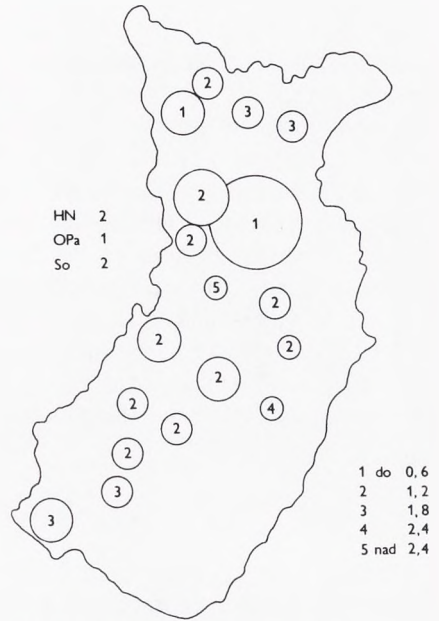


Fig. 7. Vascular diseases of the brain.

at Kanianka is not surprising, but degree 1 at Kamenec pod Vtáčnikom would be able to be indicative for us in this context. In general, also in this case we meet with an analogical lay-out of intensity degrees like in diseases of the circulatory system in total (Fig. 2), or in ischaemic disease of the heart (Fig. 5). After all, it is also logical, since the disease is relatively frequent and in this way along the ischaemic heart disease still more frequent it unambiguously represents a significant share of total volume of diseases of the circulatory system (ischaemic diseases of the heart still with a more significant extent). Again, striking is degree 4 at Oslany and Nováky, or degree 5 at Koš.

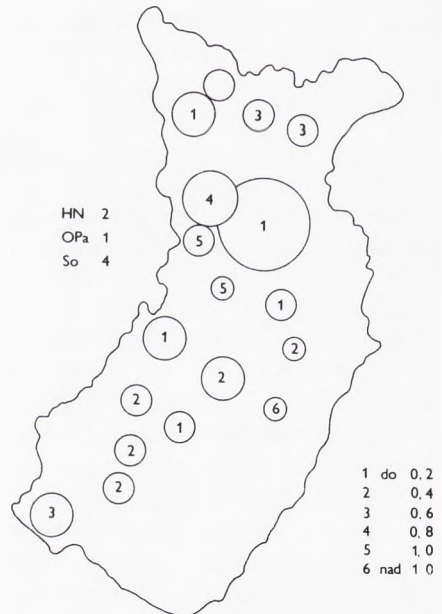


Fig. 8. Atherosclerosis.

VASCULAR DISEASES OF THE BRAIN

As we can see on Fig. 7 degree 1 represents Prievidza both on level of the town and the district. In addition, this degree appears still in the position of Kanianka. Degree 2 is unobtrusive, since it occurs on the whole 10 times (on the level of settlements) and in addition it represents intensity for both the Upper Nitra and the entire Slovakia. In this connection the district Prievidza is relatively "better", when it records degree 1, and this occurs in the settlement pattern of the Upper Nitra (as stated above) only in 2 places (out of these in one case the significant Prievidza as the town figures). Degree 3 reports itself from the marginal positions of the Upper Nitra. In the north they are Lazany and Nedožery-Brezany, in the south Oslany and Čereňany. At last the last 2 degrees characterize Podhradie (degree 4) and Koš (degree 5), both the settlements belonging to the smallest and each of them having its relevant characteristic, as we assume, in the age composition, when both at Koš owing to the inevitable and involuntary removal and at Podhradie owing to the remoteness above all older population persist.

ATHEROSCLEROSIS

Similarly as in the hypertension disease, also here (although not to such an extent) we can observe (Fig. 8) that a whole series of settlements does not record the whole-Slovakian average. And in this way also in this case the Upper Nitra and in particular the superordinate unit of the district Prievidza figures as "much better" than Slovakia. In this connection a few of settlements (communes) have got intensity equal or also higher to/than Slovakia. Owing to this reason they are above all Bojnice with an intensity of degree 4 and further Opatovce nad Nitrou and Koš with degree 5 and at last the remotest Podhradie with degree 6.

CONCLUSION

Here we would like still give some general and also concrete notes. Different may be approaches in assessment of a territory, in this case in assessment of the territory of the Upper Nitra, from the viewpoint of although only geographical distribution of health. And of course, only hardly any of them may be then sufficiently complex. Usually we are able to follow within a delimited territory only a section of problems, or to follow a problem from a certain point of view. In connection with this contribution may, for instance, be quoted a work by V. Hašanová (1988), which displays, in relation to our contribution, a certain interconnection (overlap) in the category of mortality of diseases of the circulatory system, and this also in spite of the fact that there is a demographical approach in the work mentioned. A spatial overlap may be observed more in a work by Š. Očovský (in the press), in which the author in assessing the health state of population of the district Prievidza (and also neighbouring districts for comparison) leans on a complex index and this is obtained by him from data on the general mortality, infant mortality, average length of life and the so called lost life potential.

Not this contribution of ours represents thus such one, from which we should be able to expectate a comprehensive assessment of the territory of the Upper Nitra, although even only from the viewpoint of medical geography aimed at the distribution of diseases of the circulatory system, and although even only on the basis of mortality. If we do not take a factological contribution in solving such series of problems into consideration, a certain contribution of this paper lies a little bit in the methodological indicating a spectrum of interpretation endeavours at least on the basis of those factors that are apparent from the situation introduced into the diagram. The level of interpretation thus, of course, depends above all on the volume of basic information, but also on the extent of territory studied. It is impossible in such a small territory like the Upper Nitra within such a discipline like the geography of health to find a sufficiently extensive space for following some striking and regionalistically formed differences, at least not such ones, in which their statement value may be adequately demonstrable, solid and in this way acceptable.

As to conclusions from the above mentioned research problems, the results on the basis of mortality in the form as obtained in the followed selective constellation, are relatively favourable for the Upper Nitra. Maybe, less favourable statements would be found, if we worked on the basis of morbidity instead of mortality, or if another group of diseases were in question. Maybe, another approach is more relevant in this direction, considering the impaired human environment. And considering just diseases of the circulatory system, it is possible also that the distribution of them has got a certain specific environmental disposition to a more striking manifestation just here in the Upper Nitra, nevertheless it gets lost in a tangle of other, positive or favourable realities. Owing to this possibility the territory of the Upper Nitra as a whole is neutralized at the same time to such a degree that as a whole it does not show off in negative sense within the profile studied.

In solving the problems we went out from data obtained at the Statistical Office of the Slovak Republic (ŠÚ SR) in Bratislava, and which in an initial form were processed and arranged by the Enterprise for Computing Technology (PVT), Division Nitra. For willingness and general aid many thanks belong to both respective workers of PVT in Nitra and those of ŠÚ SR in Bratislava (namely to M. Žirko, B.S., and further to Ing. M. Tirpák, Ing. F. Antonič and especially to Ing. J. Lobotková). At the same time we would like to express our thanks to the Grant Agency for Science (Grant Project 308) for its partial support in solving also this part of the project, and of course, last but not least also to respective workers of the Institute of Geography, the Slovak Academy of Sciences.

Translated by A. K r a j č í r

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ROZŠÍRENIE VYBRANÝCH OCHORENÍ OBEHOVEJ SÚSTAVY NA HORNEJ NITRE V ROKOCH 1986-1990

V príspevku sa rieši problém súvislosti medzi výskytom vybraných ochorení obehovej sústavy a narušeným životným prostredím na Hornej Nitre. Výskyt (incidenciu), či priestorové rozšírenie sledujeme v študovanej oblasti predovšetkým podľa sídel vo vzťahu k počtu obyvateľov a na báze mortality. Pri sledovaní rozšírenia javu uplatňujeme predovšetkým geografický prístup a zameriavame sa skôr na metodiku ako na interpretáciu. Naša predstava o predmetných väzbách by bola úplnejšia, keby sme namiesto mortality pracovali s morbiditou, alebo keby sme napr. spracúvali takúto problematiku v rámci väčšieho územného celku. Preto na porovnanie incidencie v jednotlivých sídlach Hornej Nitry predkladáme zároveň pri každom čiastkovom kartodiagrame ukazovatele za Hornú Nitru ako celok, za okres Prievidza a za Slovensko.

V úsilí naznačiť vlastný (geografický) metodologický prístup sledujeme pri jednotlivých kartodiagramech kategóriu priestoru v takých partikulárnych aspektoch, ako je napr. celkové priestorové obsadenie polôh sídel (obcí), t.j. zastúpenie incidencie v rámci Hornej Nitry, rozloženie intenzity incidencie, poloha sledovaného javu v kontexte s okolím. Popri väzbách, ktoré môžeme sledovať ako dôsledok ekonomiky, industrializácie a využívania zeme, vidíme aspoň náznaky interpretácie napr. vo veľkosti sídla, v jeho polohe vo vzťahu k väčším sídlami, k dopravným trasám a v dôsledku toho aj napr. k sústredenejšej zdravotnickej starostlivosti, alebo k narušenejšiemu životnému prostrediu, resp. väčšej odľahlosti (čo sa zasa môže odzrkadľovať tak pozitívne, ako aj negatívne).

Uvedomujeme si, že pri spracúvaní a riešení uvedenej problematiky sme v určitom zmysle narážali na operatívne obmedzenia, ako napr. malý rozsah študovaného územia, malý časový záber sledovaného javu, vyhranenosť na poli geografie, prepojenie iba na kategóriu mortality (bez morbidity). V celkovej koncepcii riešenia problému sme sa preto mohli obmedziť skôr na metodologický prístup a interpretačné snahy uplatňovať iba náznakom.

Obr. 1. Orientačná mapka Slovenska s polohou Hornej Nitry a orientačná mapka Hornej Nitry s názvami a veľkosťou sídel ako aj so zákresom hlavnej cesty.

Veľkosť sídel (obcí): 1 - do 1000, 2 - do 2000, 3 - do 5000, 4 - do 10 000, 5-6 - nezastúpené a 7 - nad 50 000 obyvateľov. Po ľavej strane kartodiagramu: stupeň incidencie za Hornú Nitru - HN, za okres Prievidza (na území ktorého sa nachádza oblasť Hornej Nitry) - OPa a za Slovensko - So. Obr. 2.-8. Po pravej strane kartodiagramu je číselná stupnica incidencie (priemerný ročný počet zomretých na 1000 obyvateľov).

Obr. 2. Choroby obehovej sústavy (spolu).

Obr. 3. Chronické reumatické choroby srdca.

Obr. 4. Hypertenzná choroba.

Obr. 5. Ischemická choroba srdca.

Obr. 6. Akútny infarkt myokardu.

Obr. 7. Cievne choroby mozgu.

Obr. 8. Ateroskleróza.