

**GIS “SLOW EPIDEMICS IN UKRAINE
(HIV/AIDS, TB, HEPATITIS)”. PROBLEMS AND
PERSPECTIVE OF RESEARCH PROJECT**

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Since 2004 year own investigations, related with comprehension of HIV/AIDS as mass spatio-temporal process are in progress.

Tuberculosis and Hepatitis epidemics are partly taken up in correspondence with HIV/AIDS epidemic. There are some clearly seen weak points in it. However, in the basis of this approach there is practical obstacles of making systematical research.

The work is not completed. In the report, we expound some results of research that have been made and also reveal perspectives of their continuation.

1. Do you need Ukrainian Epidemiology modern GIS Technology?!

It's extremely hard to translate it into English. The heart of the story is in tremendous and abysmal ignorance. Even on the contemporary level Ukrainian experts in Epidemiology of HIV/AIDS don't understand what GIS is. It's really hard to comment this situation. In one word – ignorance. There's no need to invent any other terms.

Конкретная история.

В начале августа 2007 года в Министерство охраны здоровья Украины была подана заявка на исследование.

«ПРОЕКТ СТВОРЕННЯ системи підтримки прийняття рішень (СППР) «Протидія епідемії ВІЛ/СНІД в Україні»

Організація – виконавець: Науково-дослідний інститут геодезії і картографії – Лабораторія геомоніторингу і прогнозування епідемічних процесів.

Керівник проекту: Ніколаєнко Д. В., доктор географічних наук, завідувач лабораторією геомоніторингу і прогнозування епідемічних процесів Науково-дослідного інституту геодезії і картографії».

18 сентября 2006 года был получен ответ за подписью заместителя министра Министерства охраны здоровья Украины В.П. Ивасюка. В ответе пишется:

для получения профессионального и непредвзятого вывода, касающегося необходимости проведения указанных работ, МОЗ отправило заявку на рецензию в Украинский, Крымский республиканский и Донецкий областной центры профилактики и борьбы со СПИДом. По результатам рассмотрения было определено, что самым важным фактором, вызывающим повышенную восприимчивость к ВИЧ, является недостаточность (либо слабость) системы социальных институтов и действий, которые связывают частную жизнь отдельной личности или семьи с общественной сферой, поэтому распространение ВИЧ-инфекции никоим образом не зависит от природных особенностей местности (географии) в отличие от, например, таких болезней, как гельминтозы: аскаридоз и трихоцефалёз, или малярия, жёлтая лихорадка и прочее».

Далее выражена принципиальная и негативная позиция в отношении геомониторинга эпидемических ситуаций по ВИЧ/СПИД в Украине.

Эпидемиологи Министерства охраны здоровья Украины, а также специалисты Украинского, Крымского и Донецкого центров профилактики и борьбы со СПИДом, которым посылались на рецензирование проект, высказали категорическое неприятие данного подхода к исследованию эпидемии в Украине.

С их точки зрения, подобная научная новинка в исследовании эпидемии ВИЧ/СПИД не нужна. Нет необходимости вести систематические и целенаправленные наблюдения за эпидемическими ситуациями, связанными с ВИЧ/СПИД на основании современных методов сбора, обработки и анализа данных, то есть на основании ГИС и СППР.

2. GIS & HIV/AIDS Diffusion

In interpretation of the HIV/AIDS diffusion it is important to allocate two basic levels very precisely - individual and mass. At an individual level much depends on standard of behavior of the person. At a mass level exact parameters of the epidemic depend not so much on concrete people, how many from socio-cultural standards of development of territory. They play a crucial role, in formation of the Standard of HIV/AIDS diffusion and set of characteristics, which is connected to it. The HIV/AIDS diffusion has exposed a high degree of sensitivity to the socio-cultural environment. There is a set of the data, which unequivocally indicted this sensitivity. They are recognizable at a mass level only. At an individual level they are not indicated.

Individual and mass levels are essentially differing. The idea of levels is important for understanding of the epidemic. Research of the HIV/AIDS diffusion, at a mass level, is an independent scientific task, which categorically is not reduced to the set of the scientific information received on an individual level. This set of the information can be useful in a small part of questions, which is necessary for research of mass process. Methodological standards, questions and answers, which are significant for an individual and mass level of scientific consideration of the epidemic are essentially different.

The HIV/AIDS diffusion is a process, certainly long-term. Even if magic medicine will be invented a process of diffusion continues for an uncertainly long time. The reason is that in a number of regions of the world has critical amount of the population infected, capable to support epidemical parameters for a long time. The HIV/AIDS diffusion is not a casual or random process, without the past and the future. It is a long-term synergetic process with its own standard of evolution which organically enters the evolution of various cultures (socio-cultural formations).

The HIV/AIDS epidemic is process closely connected with socio-cultural development of territories. The HIV/AIDS diffusion is imposed on numerous processes and systems, and can be correctly understood only in correlation with them. In this reason, specification of basic philosophical and social scientific positions of research of the HIV/AIDS diffusion is extremely important. Its medical aspects do not require similar specification, but research of mass process of diffusion, categorically requires specification of initial scientific positions. Probably, with ignoring this requirement, that correlation of a cultural and epidemical variety are not investigated for a long time. In result, of the HIV/AIDS diffusion is considered as the casual process proceeding in isotropic space. Idea very good, but unfortunately in complete contradiction with reality of the HIV/AIDS diffusion.

**System of Terminology
for Understanding
of the HIV/AIDS
diffusion**

The concepts & terminology connected to a macro system. Concepts & terminology of general Social Theory, selected of the observer of the HIV/AIDS process as foundation

The concepts & terminology connected to development of territories

Morphological units

Qualitative characteristics of HIV/AIDS epidemic

**HIV/AIDS
DIFFUSION AS
AN PROCESS**

Connections of the Morphological units and Streams

HIV/AIDS as an synergetic process

Homo Sapiens and HIV/AIDS

Some definitions

The Standard of HIV/AIDS diffusion – the spread of HIV/AIDS is very sensitive to the socio-cultural environment. Depending on the socio-cultural environment, various standards of diffusion are formed. The specific spatial, time, quantitative epidemiological parameters, the dominant reasons of distribution of HIV/AIDS are indicated. Some parameters can be similar or even identical, but in various standards of diffusion, the combination of parameters is most important. Specific combinations of the parameters create stable and unique standards of distribution of HIV/AIDS.

Stage of HIV/AIDS diffusion - for each standard of HIV/AIDS diffusion there is a unique version of genesis. Depending on the standard of diffusion, it is possible to determine various quantities of stages indicated for them. It is the characteristic typological. It repeats in the certain standard of HIV/AIDS diffusion, irrespective of its unique characteristics, connected with exact territories.

Epidemical point - settlement in which there are some people infected with HIV/AIDS. The quantity of infected people might vary. The most important attribute of an epidemical point is that it does not render active epidemical influence on neighboring or some other areas. Certainly, further spreading of the HIV/AIDS epidemic may take place inside of the epidemiological point, but it has no essential character.

Epidemical center – the settlement or functional center, which has critical weight of people infected with HIV/AIDS, sufficient for the maintenance of epidemiological parameters on a relatively high level. The quantity of infected people could vary. The most important specific is the active influence of such settlement or functional center on the further diffusion of HIV/AIDS. The typology of the epidemical centers is not developed. Nevertheless, it is possible to allocate two basic types: the epidemiological center as settlements and epidemical center as functional centers. They form their own and specific spatial epidemical networks.

Epidemical network - steady set of time-space relations between the epidemical center and epidemical dots, which is formed in a certain territory. The epidemical network might have both national and international character. It has no basic value. HIV/AIDS crosses frontiers without visible problems. For the formation of an epidemical network, frontiers of socio-cultural systems are very important.

Epidemical gradient - distinction of epidemical characteristics on certain territories. Within the framework of the same socio-cultural environment, the definition of gradients is important for the modeling and forecasting of the process of HIV/AIDS diffusion. The comparison of epidemiological parameters, without taking into account the variety of socio-cultural environments, is not effective.

Epidemical constants - fairly stable epidemiological parameters of HIV/AIDS diffusion, attribute for certain socio-cultural developed territories. Epidemical constants are dynamical, but their dynamism does not mean some uncertain and drastic changes. A certain order of parameters on the spread of HIV/AIDS for territory - it is rather stable. The reasons for the formation of those or other epidemical constants are not always understandable or explicable. However, empirically, they are determined quite clearly.

Territorial risk (territory of risk) - the most vulnerable territory, from the point of view of the spread of HIV/AIDS. The relative parameters of the prevalence of HIV/AIDS on vulnerable territories are higher. The risk of being infected in such territories is much higher than in the others. For the definition of territories of risk, it is very important to determine areas for comparison and the analysis of HIV/AIDS diffusion correctly. The comparison of global and local parameters, without taking into account prominent features of HIV/AIDS diffusion is completely senseless. This is very important for understanding the HIV/AIDS epidemic and the realization of Space Precision Prophylactics.

More details about methodology in report *O. BOYKO. USAGE INCLUDING OBSERVATION METHODOLOGY FOR EXPLANATION OF HIV/AIDS EPIDEMIC. 2009 SUMMER IN ODESSA.*

3. Preliminary version of GIS

Preliminary version of GIS, oriented towards correct description of slow epidemic processes, can be represented the following way:

1. GIS program.

2. Cartographic basis of processing information on epidemic processes.

3. Theoretical and methodological foundations of GIS

Expert points of view on HIV/AIDS and/or Tuberculosis:

- Theoretical basis.
- Methodological basis.
- Comprehension of empirical data in some particular expert methods.

4. Space division of epidemic process / Space Precision of epidemical process

Within the framework of this block the following questions should be obligatorily taken up:

Criteria of dividing (space precision identification) epidemic process into spatio-temporal units. There can be several criteria and all of them can be significant. Taxonomic units, identified on the basis of some particular research approaches. Depending on initial expert point of view, the system of taxonomic units can be more or less advanced.

Calibration of the empirical base on epidemic processes according to specifics of taxonomic unit.

5. Heterogeneity of mass spatio-temporal epidemic process and its description according to specific criteria.

HIV/AIDS, Tuberculosis and Hepatitis epidemics is a number of multifarious processes. They reveal itself in different ways and these reveals have regular character. To realize logic of reveal and development of epidemic process heterogeneity, some basis should be established. For example, socio-cultural.

6. Epidemical situations on HIV/AIDS and Tuberculosis. Typological analysis and description.

Complexity of slow epidemic process description is that the process is being «shredded» on some indexes. Taking into account incorrectness of epidemiological statistics and disdainful attitude to empiric data in epidemiology of HIV/AIDS, it all ends with total incomprehension of what's going on. Situational spatio-temporal method of processes description is quite productive.

7. «Human» geography of described district.

This block «brings GIS to land». It affords to describe not only statistical data in borders of administratively territorial clusters, but also gives us an idea of real Human Epidemic Geography of the most dangerous places. There will be «strange» thematic maps. For example, map of empty glass bottles and waste-paper acceptance points, or anything else, what can be used for earning cash.

8. Block of start-off data on HIV/AIDS and Tuberculosis epidemics.

9. Diagnoses of death of HIV/AIDS, Tuberculosis and other diseases, connected with them.

10. Population sickness rate structure for maximum possible period of its description.

11. Statistical processing of data.

12. Epidemic chains and features of their evolution.

Introduction of this knowledge may help to understand the epidemical situation and advantageously emphasize creating GIS compare to approaches that has been done in epidemiology of HIV/AIDS previously.

Epidemic chains typology.

Description of epidemic chains evolution.

Examples of epidemic chains in general and in region particularly.

13. Morphology of epidemic process in general and in described region particularly.

Diffusion of HIV/AIDS as a mass process.

Diffusion of Tuberculosis as a mass process.

Diffusion of Hepatitis as a mass process.

Types of epidemic diffusion.

SC-nosis.

14. Natural-geographical characteristics of epidemic process.

15. Frequently asking questions, asked to GIS and support of finding the answers.

16. Monitoring of epidemic process.

Many blocks of this GIS are connected with empiric process observation, but its worth to detach special block, connected with monitoring. For example, its worth to detach:

- Monitoring of epidemics in general.
- Monitoring on prescribed territories.
- Monitoring on prescribed groups.
- Monitoring on set of diseases, registered on prescribed territories.
- Monitoring on set of diseases, registered in prescribed groups.

There are authors' working-ups in every of these directions.

More details and some maps in report:

*Y. N. FARION. MAPPING OF TUBERCULOSES EPIDEMIC IN
ODESSKAYA OBLAST*

More details and some maps in

Nikolaenko D., Boyko O. Epidemical Chains transmission of
HIV/AIDS/Tuberculoses. 2009 Seasons in
Odessa // Environmental Epidemiology. 2009, № 3. C. 275 –
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<http://www.hiv-aids-epidemic.com.ua/indexenviro-2009-3.htm>

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Thanks for your attention!

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