J. Preis, J. Kopp

HIV/AIDS EPIDEMICS AND HUMAN DEVELOPMENT AT THE BEGINNING OF THE 21ST CENTURY: CASE STUDIES OF UGANDA AND ESTONIA

The Department of Geography, the University of West Bohemia in Plzen (Plzen, Czech Republic)

This paper analyzes how the HIV pandemic has influenced levels of development throughout the world, quantitatively expressed by the Human Development Index (HDI). Regional examples in Uganda and Estonia are used to describe and explain the results of this investigation. The change in world HDI distribution from 2000 to 2005 was analyzed and the patterns found were compared to that of the HIV/AIDS epidemics between 2001 and 2005. The regional examples are the result of detailed monitoring during prevention and care work in the aforementioned countries through the Geography Department of the University of Western Bohemia in cooperation with NGOs ACET Czech Republic and ACET International.

HDI progression from 2000 to 2005 did not cause significant discrepancies in HDI levels between different countries, but it was confirmed that HIV/AIDS can hinder the human development measured by HDI. In Sub-Saharan Africa, the HIV/AIDS epidemic slightly decreases, but this is only partially projected into the growth of HDI (classic positive example is Uganda). The second most afflicted region by HIV/AIDS in terms of relative numbers is Central/Eastern Europe and central Asia. In this region both HIV prevalence and HDI grew between 2000 and 2005. The epidemic, however, is not yet a factor that would significantly hinder the HDI growth on national levels.

Key words: *HIV/AIDS, HDI, Uganda, Estonia, development.*

The goals of the paper. Despite ongoing difficulties, human development shows quite positive trends according to general databases. The HIV/AIDS epidemic is among the multiple factors that hinder human development and attempts to reduce poverty. It affects each region of the world with a different intensity and negatively influences the quality of life for local communities at different levels. In this paper we conduct an analysis regarding the impact of HIV/AIDS on the development of the world and focus on the two countries of Uganda and Estonia as examples and representatives of eastern Europe and Sub-Saharan Africa. Generally we suppose that HIV/AIDS epidemics has some negative impact on the quality of life in population. The question is, whether it is possible to prove it statistically by using national data of two case countries. We investigate how HIV/AIDS diffusion influences the characterstics of human development in the new millennium and question to what extent different regions of the world are really affected. We suggest that this correlation does not represent just a simple interdependence. The results of the quantitative analysis are then shortly explained in relation to regional examples. We are convinced that this is a very topical issue, which supports and contributes to many other development works such as UNAIDS annual reports and books including Barnett and Whiteside (2002) and Matic, Lazarus and Donoghoe (2006).

Within the last decade many articles concerning the HIV/AIDS epidemic from a spatial point of view were published, discussing and utilizing both qualitative and quantitative data. Loytonen (1991), who dealt with larger area units, studied the spatial diffusion of HIV/AIDS in the Nordic countries and later went on to observe the effects of HIV/AIDS spread on the population of Europe as a continent (Loytonen in Hall and White 1995). In the mapping field, Kalipeni and Zulu (2008) are modeling possible scenarios and trends of HIV/AIDS diffusion in sub-Saharan Africa using GIS (Geographical Information Systems). This article also discusses how useful GIS methods can be for future forecasting of the epidemics, particularly highlighting the fact that for some regions there are not continual sets of data that are regular and relevant, thus for these situations, spatial interpolation and extrapolation methods can be very useful.

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Muyinda et al. (1997) discusses AIDS-related stigma using a series of in-depth interviews, identifying the issues that hinder HIV+ people to live an ordinary yet fulfilled life. Gould (2006) points out: "(HIV/AIDS) is a phenomenon that affects and is affected by all sectors of economy and society, and therefore needs to be considered in these very broad and inclusive terms." Gould (2005) also points out that the early stage of the epidemic in Africa was connected with the urban world with primarily mobile, wealthy people, however the current stage of the phenomenon has shifted emphasis towards rural areas and poor people. Various statistics as well as case studies from Uganda confirm this.

Generally, the majority of the geography or sociology oriented articles deal with sub-Saharan Africa. Only a few monitor another very possible epicentre of the epidemic: the post-soviet world. Moran (2005) is among the most profound, spanning large areas of Russia and calculating the correlation between socio-economic patterns and HIV/AIDS diffusion.

Methodology. The Human Development Index has been chosen as a parameter of human development in particular countries. It is calculated by a relatively simple methodology in the reports about human development (UNDP 2006, UNDP 2007b). HDI calculation equally works with three indicators: life expactancy at birth, knowledge (adult literacy rate and gross enrolment ratio) and GDP per capita (PPP US$). These three indicators are then transfered to three indexes (life expectancy, education and GDP). We chose HDI because unlike the other indicators in accessible world databases (Esty et al. 2005, SOPAC 2005), time scales are available for a large number of countries. Furthermore, compared to indicators used by Esty et al. 2005 and UNDP 2006, it directly captures human development and has a simple "inner" structure. It is noted, however, that using this indicator also has weaknesses; calculating quality of life using only the three aforementioned parameters can result in significant generalizations. We decided to search for changes between 2000 and 2005 from the database accessible in the Human Development Report 2007/2008 (UNDP 2007a) and in some cases we also worked with data between 2000 and 2004 (UNDP 2006).

Firstly we made an analysis of the change in HDI distribution across the world according to the changes in development of HDI. The change is a base for evaluation – whether the development of the society measured by HDI has been equal. Then we compared the HIV/AIDS epidemic indicator (prevalence in % for ages 15-49) for 2005 and HDI in 2005 (UNDP 2007a). Using multiple linear regression, relations between HDI parameters and the HIV/AIDS index were tested. This index was defined accordingly with methodology for calculating standardized HDI indicators (UNDP 2007b). Index HIV = 1-(actual value-minimum value)/(maximum value-minimum value), where actual value = log (HIV prevalence [% ages 15-49]), minimum value = -1,31, maximum value = 1,53.

The development changes were observed in relation to the HIV/AIDS increase, and HDI change as a dependence on the HIV/AIDS figure (prevalence in % for ages 15-49) for 2005 and the change of HDI at particular states between 2000 and 2004, and then as a dependence of the change in the HIV/AIDS indicator between 2001 and 2005 (UNDP 2003, 2006) in the link with the change in HDI (2000-2004). These development changes related to the HIV/AIDS epidemics and HDI were searched as interdependence between the change of HIV/AIDS figure in 2001-2005 and HDI indicator change between 2000 and 2005 (UNDP 2007a).

The links and possible development trends that were found are explained in the following regional examples. These were based on personal field research amongst people afflicted by HIV/AIDS who were connected to the organization ACET (AIDS Care Education Training) Czech Republic in Uganda and the region of Central and Eastern Europe (especially Estonia and Russia).

Human Development at the beginning of the 21st century. HDI did not increase at the same rate within the chosen time frame. Countries with the middle value of HDI grew the most quickly (fig.1). India's population dominates the lower twenty-five percent of the world's HDI compared to the range of 50-60 percent dominated by China. The evaluation considers the index for particular states, for results are skewed when they concern countries as one unit, particularly in those such as China or India (UNDP 2006, UNDP 2007b).

Countries with the highest and the lowest levels of HDI grew the most slowly. The example of the most developed countries could be explained by natural limits of the continuous growth indicators (adult literacy rate, life expectancy), and is why it is recommended to use more utilized indicators (Human poverty index for OECD countries; HPI-2 according to UNDP (2007a)). For the least developed countries, is necessary to look at the factors which limit human
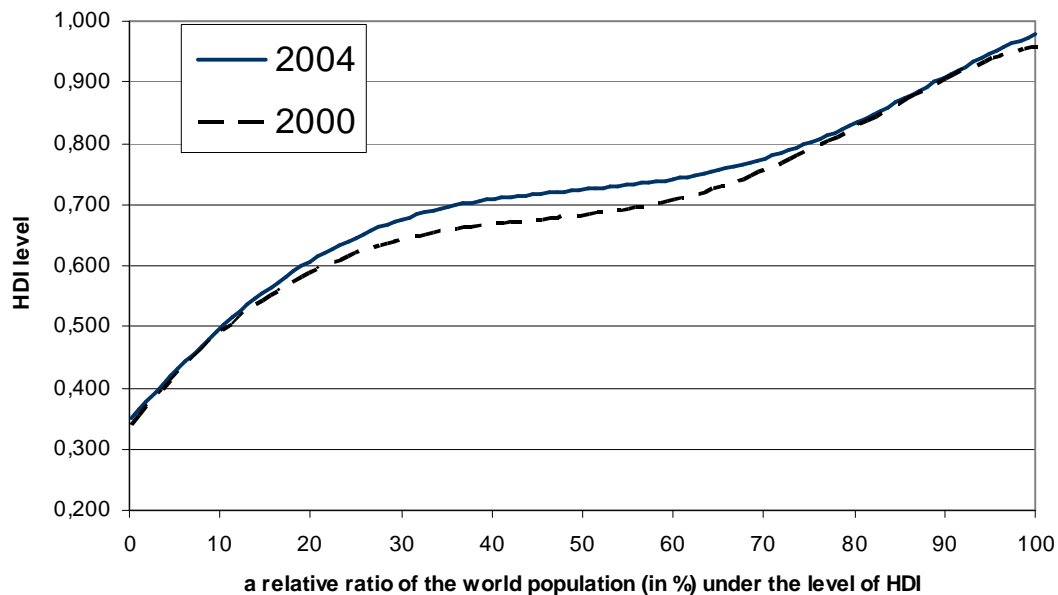
Fig. 1. The changes of the HDI distribution for the world population between 2000-2004 expressed by the polynomic function. Source: own elaboration, data by UNDP (2006).

development, especially in terms of economic situations (debts, insufficient economic structure), political instability and poor health conditions, which lowers the efficiency of the economy as well as life expectancy at birth. The UN report for World Water Day shows how the influence of economic factors can be serious: the main cause of water shortage in Sub-Saharan countries and parts of India is not climatic drought but lack of finances to provide it (UN Water 2007).

The HDI development between 2000 and 2004 did not lead to a significant reduction of huge discrepancies between the states occupying both ends of the HDI scale. Despite slight improvement of conditions in some of the poorest countries (according to HDI), the relative poverty (inbalance of the degree of human development) was not eliminated. The differentiated median for the HDI figure of countries with the highest and lowest HDI was extended from 0,513 HDI units in 2000 to 0,519 HDI units in 2004. This comparison is influenced by a significant increase of the population in the poorest countries. However, some negative factors, such as the epidemic of HIV/AIDS, hinder this population growth.

The link of HIV/AIDS epidemic and human development in period 2000-2005. From observing the development of HIV in particular regions of the world between 2001 and 2007, it was found that the only relative decrease in adult HIV/AIDS

prevalence is in Sub-Saharan Africa (fig. 2). This trend has been obvious since 2000 (UNDP 2007). However, the significant increase took place in the Pacific Ocean region, in Eastern Europe and Central Asia, the latter of which was influenced by spreading from the East. The aggregated indicators provided by UNDP are distorted, because the Baltic countries are included in the Central Europe region.

Almost all the least developed countries, whose HDI decreased between 2000 and 2005, are located in Sub-Saharan Africa. This region is also the most afflicted by HIV/AIDS. Logically we can expect that HIV/AIDS diffusion affects the quality of life of local people, measured by HDI (especially the direct relation to life expectancy at birth). This mutual dependence has been proved by the multiple linear regression between HIV and HDI indexes, shown respectively by their partial indicators (table 1).

The life expectancy index embodies the most significant statistical figure for the HIV index. GDP is statistically less significant and the education index is insignificant (partial indicators were tested by T-statistic). Economic development and the level of education in the society do not necessarily lead to a decrease in HIV/AIDS prevalence. Among economically developed countries there are some with rising prevalence. Local economic development can be followed by the growth of HIV/AIDS prevalence, such as in Uganda or Estonia (tab. 2).
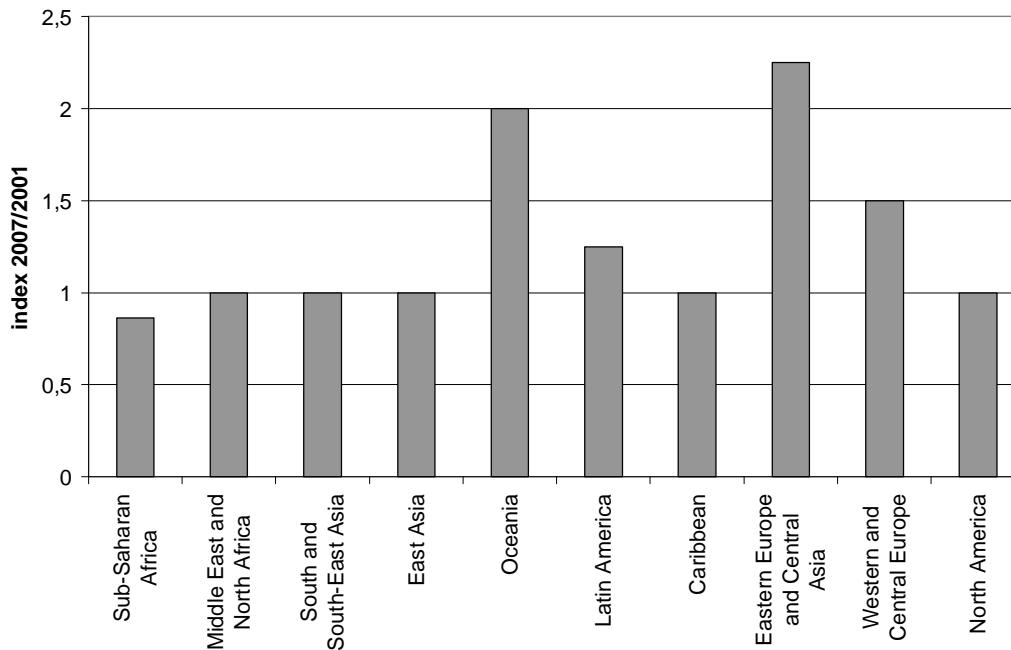
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Fig. 2. Index of changes of HIV/AIDS prevalence of various regions of the world between 2001-2007.
Source: own elaboration, data by UNAIDS (2007).

Table 1

Multiple linear regression between HIV index (dependent variable) and HDI indexes (independent variables)

HDI indexes	GDP	Education	Life	Absolute figure
regression coefficients	-0,53761	-0,04413	1,522463	-0,01066
standard errors	0,130974	0,118902	0,124949	0,058196
determination coefficient	0,600661			

Source: own elaboration, data UNDP (2007a)

Table 2

Specific issues of the case countries

	HDI (2000)	HDI (2005)	Life expectancy index (2005)	Education index (2005)	GDP index (2005)	HIV prevalence (% aged 15-49) (2001)	HIV prevalence (% aged 15-49) (2005)
Estonia	0,829	0,860	0,77	0,968	0,842	0,5	1,3 [0,6-4,3]
Uganda	0,480	0,505	0,412	0,655	0,447	7,9	6,7 [5,7-7,6]

Source: own elaboration, data by UNDP (2007a), UNAIDS (2007)

Interregional HDI and HIV index comparison proves the differences between particular parameters (fig.3). Sub-Saharan Africa has a particularly significant discrepancy between GDP index and a low value for that of HIV. If the relation between HIV/AIDS and HDI development are examined more thoroughly, we discover some figures that vary from the hypothesis of a simple indirect functionality between the change in HIV prevalence (2001-2005) and HDI (2000-2005) (fig.4). Several categories of countries can be differentiated according to the level of development in the region of Sub-Saharan Africa. In most, there is a slight decrease in HIV/AIDS affliction, but despite this, only a few experienced a growth in HDI as well (e.g. Ethiopia, Burundi, Rwanda, Botswana). In other countries HDI continued to decrease (Zimbabwe, Kenya, Lesotho). Specific development in Uganda is described in the next part of this paper.
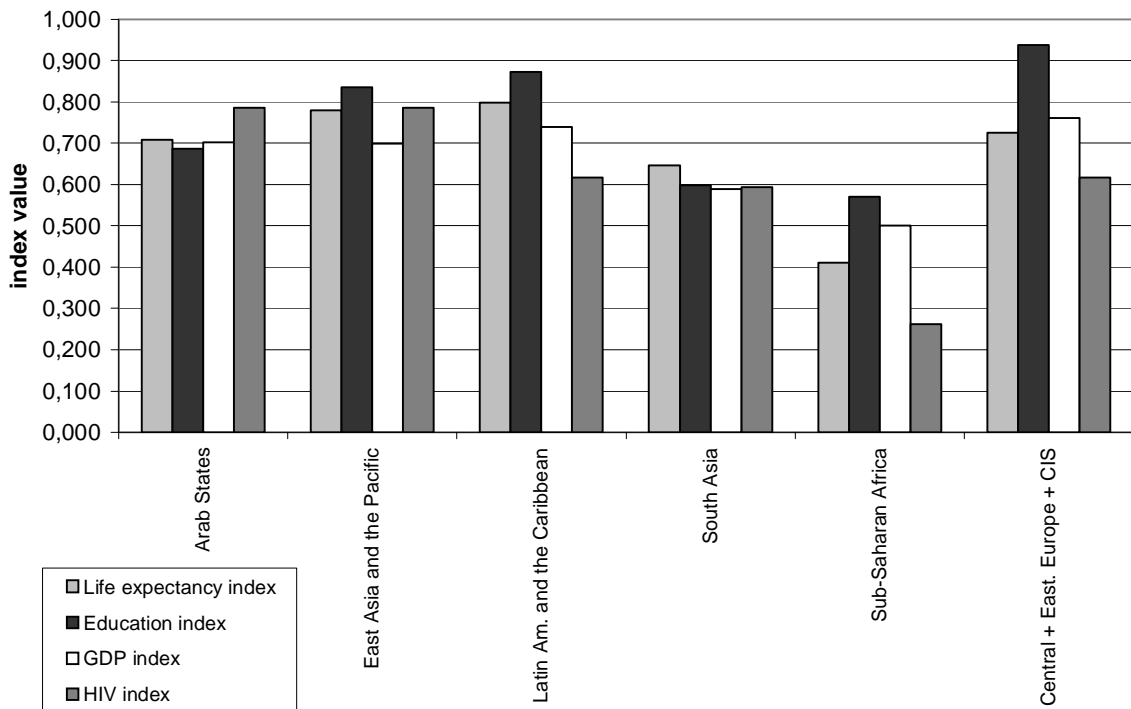
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Fig. 3: Index HDI and HIV comparisons in chosen regions of the world (2005).
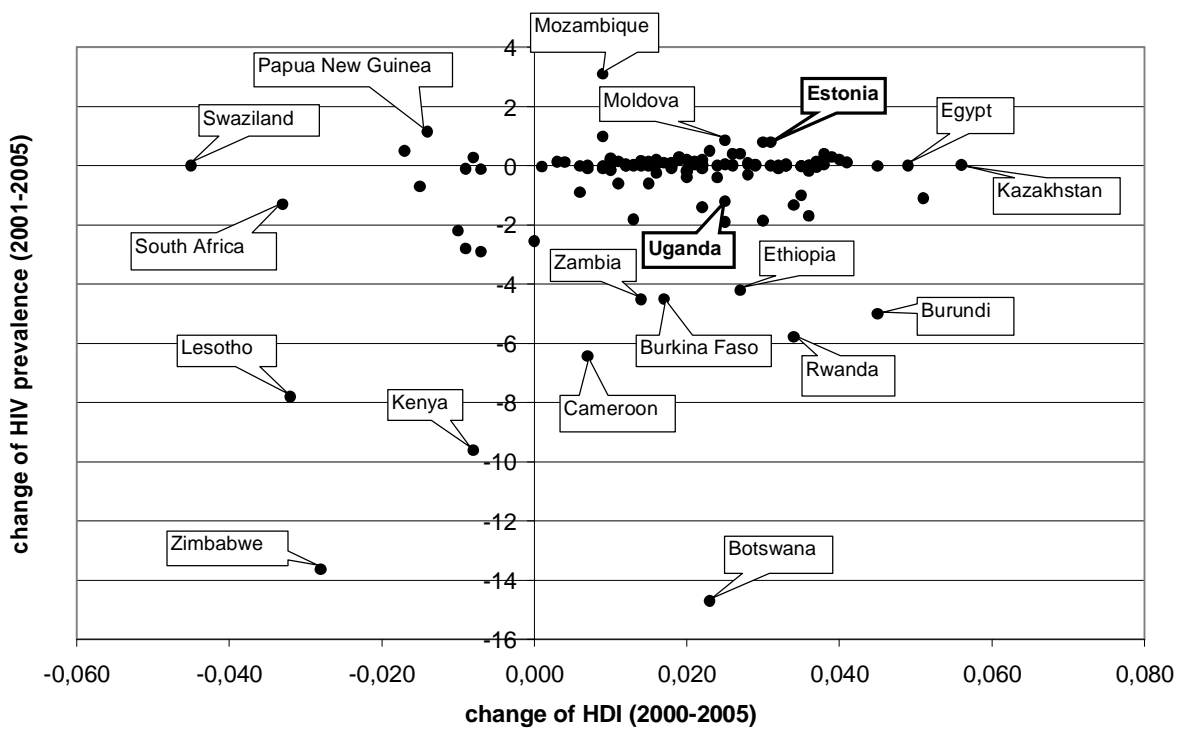Source: own elaboration, data by UNDP (2007a)

Fig. 4. A relation between HDI (2000-2005) and the prevalence change of HIV (2001-2005) in the particular countries.
Source: own elaboration, data by UNDP (2006).

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The HIV/AIDS epidemic, in general, is slightly decreasing in Sub-Saharan Africa (0,30 % decrease in a total indicator between 2001 and 2005), however it only partially influences a very moderate growth of HDI. Different trends are possible to observe in other regions afflicted by HIV/AIDS (South Asia, Carribean region or Eastern Europe). There are few countries in Eastern Europe (Lithuania, Latvia, Ukraine, Moldova, Russia) where in the observed time period the prevalence of HIV/AIDS significantly grew alongside HDI. The spread of HIV in these countries is increasing, but so far it has not proved to be a determining factor in hindering the development of society (measured by HDI). Negative impacts of the disease are predominantly balanced by economic growth. The level of affliction, where the negative health situation hinders the economy, has not yet been overcome.

Regional examples of HIV/AIDS epidemic's impact on human development

Uganda

Twenty years of civil war combined with an HIV/AIDS epidemic caused the Ugandan economy to collapse. Uganda at the beginning of its independence was a country with the potential to be a prosperous and successful "pearl" of Africa. However the opposite was true. In the 1990s, HIV/AIDS prevalence was about 18 per cent of the total population (UNAIDS 2005), with some communities and rural areas experiencing rates between as much as 30 and 50 per cent. When the epidemic reached its peak in Uganda, one of the biggest problems was stigmatization of those who were HIV + or PWA (People With AIDS). Muyinda et al. (1997) describes how the stigma of "having AIDS" deeply impacted the family structures, behavior and ordinary life in rural communities.

Many small communities and societies completely collapsed due to the loss of adults dying from AIDS and now there are villages which consist only of AIDS orphans and a few adults who managed to survive. In many families, the oldest members and the family heads are twelve-year-old boys, without proper education, who must look after their younger brothers and sisters. HIV/AIDS did not only ruin the Ugandan economy, but its social structures too. Children are therefore at danger; without anybody to support their basic needs, orphans are forced to provide for themselves. Many drop out of school because they have no money to pay for school fees, supplies or uniforms, and often resort to commercial sex in order to raise finances, which puts them at high risk of HIV infection and severe psychological damage. Only sustainable relief projects can now help these rural communities to develop, although it is vital that monetary aid is not the only solution. Dixon (2002) advocates that tools to fight against HIV must include investment, business, international trade and development programmes to help both families and individual people (for example, micro-banking). Local NGOs together with Christian churches and governmental support must run projects that initiate a self-developing process. One such scheme, coordinated by the authors of this article, enabled AIDS orphans to continue their studies at elementary school (Nukalabya School, Kampala), with the goal of financing something that would have a continuous and sustainable impact (Preis, 2005). School uniform, school utilities and mosquito nets were bought, and all money was invested into the local cash flow. Pupils could finish their school year (2005-2006) as they possessed all the things they required to study, were well dressed, and the use of mosquito nets reduced the transmission of malaria. This saved money on anti-malarial drugs and enabled them to attend lessons regularly.

Similarly, another relatively small amount of money was invested into a rural community in the province Iganga, near the town of Jinja. Goats and corn were bought and children were trained in how to breed goats, crop the corn, feed themselves and make some business from harvest surpluses. Children now have a basic start to overcome their poverty which had been caused by HIV/AIDS. Further examples include a small rural community in the Kakiri area (east of Kampala), where a woman was given 20 USD to start her business (buying vegetables at big markets and selling it at her small village). She now has her own stall, where she sells tomatoes, peppers and aubergin, and earns 1 USD netto per day, although recently she found she was not able to feed her family (Preis, 2008).

These modest examples show that even in communities previously destroyed by HIV/AIDS and poverty, good stimuli can catalyze sustainable development of the local area, which can gradually expand to a sustainable development of the whole nation.

Estonia

The connection between HIV and poverty is also clearly displayed in the small but progressive country of Estonia. Experts attribute this to several factors: the young age of commercial sex workers (CSWs) and intravenous drug users (IDUs) and their low level of condom use. According to UNAIDS estimation, Estonia's HIV prevalence is 1,3 per cent (AFEW 2007), which is quite high considering its European situation and is above the European average. One of the most risky and vulnerable groups are Estonian-Russians,

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concentrated especially in north and east Estonia, next to the Russian border. Due to the history of conflict between these two nations, Estonian-Russians continue to suffer from association with this heritage.

From the factors that contribute to a macro risk environment written by Goodwin et al. (2003), the following are the most relevant in the case of Estonia: the growth of both prostitution and temporary sexual partnerships as a means of economic survival, community values stressing greater sexual freedom (Rhodes et al. 1999 in Goodwin 2003), and the widespread sense of hopelessness promoting risk taking behaviour (Kalichmann et al. 2000 in Goodwin 2003). Estonian-Russians are often involved in commercial sex due to it being one of the only ways in which to earn sufficient money to live. Most of them do not have Estonian citizenship as this involves passing an exam on Estonian constitution and history in the Estonian language; a difficult task in absence of the means by which to study. Many Russians thus live in Estonia without citizenship and are unable to be employed in jobs with good salaries. They are a poor community and for many of the women, the only opportunity to earn money is to become CSW. Many of their clients are from Finland, as Estonian-Russian

CSWs are comparatively cheaper and more accessible. The issue does not seem to be so dangerous for the first sight, because the Estonian economy, before financial crisis one of the fastest growing in Europe, easily eliminates current impacts of HIV/AIDS. The infection has now only a regional character, but unless the fighting tools and concrete steps are taken, the prevalence can later grow and have national or even international impact, which could change the quality of life and human development in this part of our world. Current financial crises and economical problems which Estonia now face can even fuel the epidemics on the local level.

Conclusion. Based on data and available statistics it is obvious, that HDI between years 2000 and 2005 grew both in Uganda and Estonia. The increase is similar: 3,7 % in Estonia and 5,2 % in Uganda, respectively. Estonian HDI was definitely fueled by dynamic economic growth, while Ugandan HDI was positively influenced by relatively improving health care and growing social stability and education rate. These conclusions result from situation analysis in particular case countries and correspond with development of national level's index figures (Fig. 5).
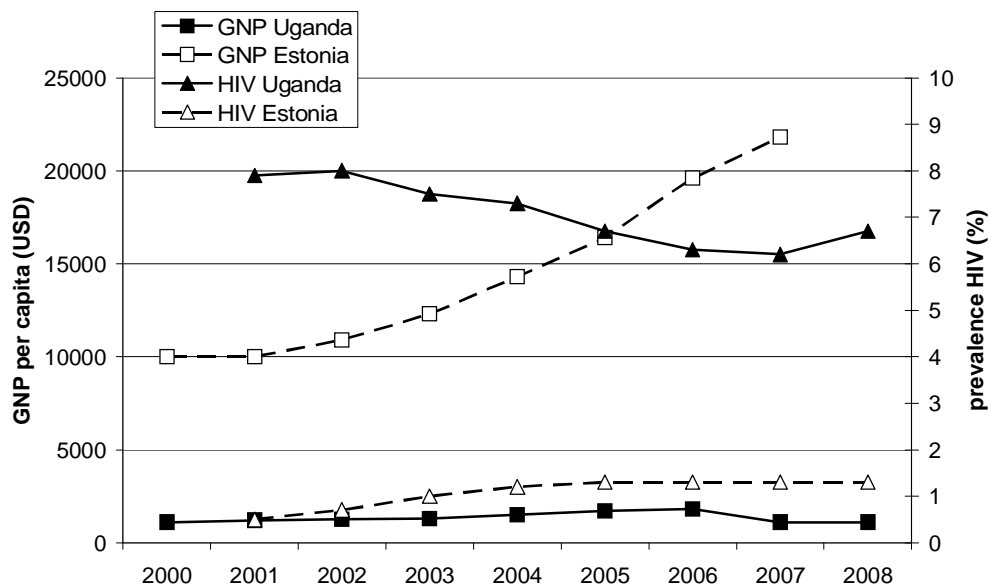

Fig. 5. Development of national index figures: GNP per capita and HIV prevalence in Uganda and Estonia 2000-2008. Source: UNAIDS/WHO (2009a, 2009b), UNAIDS (2006, 2007), CIA WorldFact Book.

Sub-Saharan Africa's fight against HIV/AIDS and its link with local economic and social situations is a helpful example for the region of Central and Eastern Europe, which has proven to be relatively one of the most afflicted region of HIV/AIDS in the world.

Conclusions in this paper show that current statistics describe and monitor the situation of nations as a whole, yet within these countries several communities or regions may exist which are impacted by the epidemic much more seriously, causing the quality of

life for the people living there to be far under the national average. The critical question is this: at what point will the link discussed in this paper be recognized? When the HIV/AIDS epidemic has spread even further, influencing more national statistics? This subject needs to be incorporated into future research, with a focus on data gathering from particular regions as opposed to whole nations. The latter approach produces vastly generalized results that omit regional, social and ethnic differences. It is obvious that the fast-spreading diffusion of HIV/AIDS in the post-communist world is a challenge for ministries, NGOs and other organizations, all of whom must work to spread prevention programmes especially among the younger generations in schools, with governments and municipalities releasing the finances for it.

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ЕПІДЕМІЯ ВІЛ-ІНФЕКЦІЇ/СНІДУ І ЛЮДСЬКИЙ РОЗВИТОК НА ПОЧАТКУ 21-ГО СТОЛІТТЯ: ДОСЛІДЖЕННЯ НА ПРИКЛАДІ УГАНДИ ТА ЕСТОНІЇ

Дж. Прейс, Дж. Копп

РЕЗЮМЕ. Проаналізовано вплив пандемії ВІЛ-інфекції на рівень розвитку у світі, який оцінюється за допомогою людського індексу розвитку (ЛІР). Щоб описати і пояснити результати цього дослідження, використовуються регіональні приклади Уганди й Естонії у період з 2000 до 2005 рр. Аналізовані показники були надані кафедрою географії університету Західної Богемії та окремими неурядовими організаціями Чеської Республіки.

Підтверджено, що ВІЛ-інфекція/СНІД перешкоджає людському розвитку. Незначний спад поширення ВІЛ-інфекції/СНІДу у деяких африканських регіонах (Уганда) супроводжується закономірним зростанням ЛІР. У країнах центральної і східної Європи та центральної Азії протягом аналізованого періоду поширеність ВІЛ-інфекції зростала, однак характеризувалася й тенденцією до збільшення й ЛІР. На підставі цього автори доходять висновку про те, що епідемія ВІЛ-інфекції/СНІДу не здатна суттєво перешкоджати зростанню ЛІР на національних рівнях.

Ключові слова: ВІЛ-інфекція/СНІД, людський індекс розвитку, Уганда, Естонія, розвиток.