

## Epidemiological Characteristics of HIV/AIDS Pandemic in Romania

Corina-Liana MANIU\*, Andrei ACHIMAȘ CADARIU

“Iuliu Hațieganu” University of Medicine and Pharmacy Cluj-Napoca, 13 Emil Isac, 400023 Cluj-Napoca, Cluj, Romania.

E-mail\*: dr\_corina\_63@yahoo.com

\* Author to whom correspondence should be addressed; Tel.: +4-0258-830558.

Received: 15 October 2010 / Accepted: 10 November 2010 / Published online: 15 December 2010

### Abstract

*Objectives:* A comparative research regarding the occurrence and evolution patterns of the HIV-AIDS epidemic between Romania and the major areas (Sub-Saharan Africa (SSA) and the USA, respectively) in order to establish the current trends of the diseases and the specific prognosis. *Material and Methods:* The research represents a systematic study over the entire period, of the HIV-AIDS pandemic from 1981-2008, based on specialty literature published in English or Romanian. In addition to theses, published articles, materials presented at conferences and congresses, reports and information from the main governmental and international organizations such as WHO, CDC, UNAIDS have been consulted. *Results:* Romania was the first country in Central and Eastern Europe to announce the diagnosis of an AIDS case in 1985. Since then, the prevalence per 100000 population of HIV infection cases, has demonstrated an ascending trend from 0.27 in 1992 to 19.67 in 2007. HIV-AIDS infection in children from Romania is unique worldwide. Therefore, from the cumulative total of 7606 AIDS pediatric cases between 1989-2007, 4885 have had a nosocomial transmission. The mother-to-child transmission is well controlled in Romania, similar to the USA. High-risk groups (injecting drug users or men having sex with men), represent a small percentage among the Romanian HIV-AIDS and SSA cases, compared to the USA. Romania, similar to the rest of Europe and USA, has not experienced in general population.

**Keywords:** HIV-AIDS; Sub-Saharan Africa (SSA); USA; Mother-to-child transmission (MTCT); Men having sex with men (MSM); Injecting drug users (IDU).

### Introduction

This research is intended to carry out a systematic study encompassing the entire period of HIV-AIDS pandemic, from its detection to our present days (1981-2008), having as basis the investigation of specialized literature, which was issued in English or Romanian, either in written editions or in electronic format.

#### *Objectives*

Presenting specific and comparative aspects of the impact induced by the HIV-AIDS infection in Romania, compared to acknowledged patterns: SSA (Sub Saharan Africa) and USA.

### Material and Method

This research makes use not only of published books and articles, materials that have been presented at Congresses and Conferences but also of reports, synthesis and notifications of the main international and governmental bodies like OMS, CDC, UNAIDS. The structure of synthesizing and processing the consulted materials is an original one, based on the pattern of emergence, developing and approaching the AIDS pandemic, and it intends to enclose Romania (obviously in an European context) in the

existing trends and to provide specific prognosis for our country.

*Geo political frame*

Sub Saharan Africa

Africa’s population is in a continuous motion. 40 percent of the world’s total displaced persons are of African origin. There is a strong association between mobility, migration and the risk of contacting AIDS.

SSA is the area of the continent delimited in the North by the southern part of the Saharan Desert, being the world’s poorest region over the last 25 years, with half of its 700 million people surviving with 0,65\$ a day or even less [2,3].

The growth of annual average GDP of the SSA countries has decreased from 7%, in the first half of the 60s, to an average of less than 4% in 2001 and of 2% in 2002 [4].

USA

USA’s population is the third in the world after India and China, reaching a total amount of 306533000 people, including, approximately, 11.2 million illegal immigrants [5,6]. USA displays intense population diversity, having 31 ancestral groups. The white people represent the most numerous racial group and the Afro-Americans stand for the best represented racial minority [7].

USA’s economy is on the highest position in the world, with IMF specifying that the estimate GNP for 2008 had a value of 14.3 trillion \$, constituting 23% of the gross world product [8].

The American health system outranks any other system in the world in terms of per capital expenditure and the percentage allotted from GNP [9,10].

Romania in the European context

The 52 European countries that participate in the active surveillance of HIV-AIDS coordinated by the European Monitoring Centre in Paris are grouped in three distinct geographical areas: the Western Europe, which includes 23 countries with a total population of 401 million people, Eastern Europe, which includes 15 countries belonging to the former Soviet Union with a total population of 287 million people and Central Europe, which includes 15 countries, among which Romania, with a total population of 193 million people.

At present, in the WHO European region there are over 2 million infected people.

The annual increase of newly reported HIV cases has stabilized to about 10% annually, between the years 1990 and 1997 [11]. This trend from Western Europe has changed since 1999 by an increase in new cases, reflecting an increase of both “domestic and imported” infections. The developing and wide implementation of HAART in Western Europe had represented a regression point of the epidemic.

Yet, despite its great proportions, the Eastern HIV epidemic is strenuous among the marginalized groups. Over the last years, Europe has received foreign tourists three times more than any other region [11]. The present patterns of migration in Europe comprise migrant arrivals from areas with a high HIV-AIDS endemicity, particularly from Sub-Saharan Africa and, in a lesser extent, from Latin America, the Caribbean and South-Eastern Asia.

*Comparative Tables*

Table 1 - 3 present the life expectancy at birth, economical indicators as well as health expenditure for SSA, North America and Europe.

**Table 1.** Life expectancy at birth

	1960-69	1970-79	1980-89	1990-99	2000-2004	2008	Estimated 2005-2010
General	52.5	58.1	61.4	63.7	65.4	69.00	67
SSA	42.4	46.3	49.0	47.6	45.9	40.65	45.06
Europe	69.9	71.10	72.0	72.6	73.7	78.70	72.05
N. America	70.1	71.6	74.3	75.5	77.6	78.06	72.08

**Table 3.** Health expenditure (public and private budget) \$/capita

Year	RO	USA	SSA
2007	433	6096	364.2

**Table 2.** Economic indicators

	RO	USA	SSA
GNI \$/capita	6150	46040	3745
GNP mil\$ 2007	165980	13811200	73264
Percentage of population below poverty level	-	-	51.45
Percentage of population living on less than 1\$ a day (1990-2005)	-	-	41.26

**Results and Discussion**

*The particularities of the epidemic*

Romania was the first country from the central and Eastern Europe to announce the European Monitoring Centre from Paris on a case of AIDS diagnosis, which appeared in 1985. Until early 1990 only a few dozen cases of HIV/AIDS in adults were reported to the Ministry of Health and World Health Organization. The occurrence of HIV/AIDS infection in children was first signaled in 1989, having been notified since 1990.

The situation of HIV/AIDS infection from Romania is permanently judged in the light of UNAIDS estimations that refer to the prevalence of HIV infected persons or AIDS patients in the general population. The statistical analysis of AIDS cases can be made starting with the first year of reporting, respectively 1985, but the analysis of HIV seropositivity cases can be made only from 1992 since the anti-HIV testing became possible. From that moment on the prevalence to 100000 inhabitants, of the HIV infection cases, had an ascending trend from 0.27 in 1997 to 19.67 in 2007.

The situation of HIV/AIDS infection of the Romanian children experiences a unique position in the world. Thus, from the cumulative total of 7606 cases of pediatric AIDS, throughout the period 1989-2007, 4885 cases experienced a nosocomial transmission.[12]. In 1987 the percentage of children infected with HIV in the total number of live births was 0.21. The AIDS occurrence in children reached its peak in 1990, with an amount of 18%, and over the years 1992 and 1998 it remained stable, with two apparent peaks in 1995 and 1997, respectively between 9 and 13%.

Subsequently, beginning from 2001, a significant decrease in the number of HIV pediatric cases (0 to 14 years old at diagnosis date) is observed, the emerging cases being represented by the maternal-fetal transmission.

Analyzing the number of AIDS cases in adults (age > 14 years) over the period 1985-2007, one can observe that most of them undergo a heterosexual transmission.

The number of AIDS cases recorded in the age group 15-19 years exceeded twice the number of cases reported in the same age group in the previous year. The young people belonging to this age group were born between 1986 and 1990.

General data from the end of 2007 show a total of 10851 AIDS cases out of which 7606 cases are in children. Total of HIV cases-4234 out of which 2131-pediatric HIV cases [13].

The analysis taking into consideration the age of new HIV/AIDS infection cases, which were recorded in 2007, highlights a majority in the group age 15-19 years, followed by 35-39 years, and almost equal to the latter, the group age 25-29 years.

In 2007, there were 7591 patients under surveillance in Romania (7351 adults and 240 children) and 6500 patients in HAART therapy out of which 6304 adults and 196 children. The fact that it is the highest number of HIV persons under medical care in the Central and Eastern Europe is worth mentioning.

**Table 4.** Distribution of AIDS cases among adults by modes of transmission in Romania (1985-2007)

Mode of transmission	Sex		Total
	Men	Women	
Homosexual/Bisexual	98	0	98
IDU	8	3	11
Hemophiliacs *	19	8	27
Transfusions *	132	175	307
Heterosexual	1091	905	1996
Not mentioned	423	383	806
Total	1771	1474	3245

\* Patients who have received blood or plasma in the late 80s and early 90s

**Comparative data with acknowledged patterns (SSA, USA)**

It was considered highly interesting for such a study to compare general epidemiological data and data which regard population groups that have certain specific features. (Women, MSM-men having sex with men, MTCT-mother to child transmission, IDU-injecting drug use)

In the acceptance of this study for the SSA, data referring to five Southern-African countries: (Botswana, Southern Africa, Swaziland, Zimbabwe and Zambia) have been analyzed (Table 5 and 6).

**Table 5.** People living with HIV and HIV prevalence in age groups 15-49 years

Year	Romania		USA		SSA	
	HIV persons	Prevalence 15-49 years	HIV persons	Prevalence 15-49 years	HIV persons	Prevalence 15-49 years
1990			720000		1266900	5.90
1991	2800		780000	0.5	1706100	7.74
1992	5000		820000	0.6	2394000	9.74
1993	6700	0.1	850000	0.6	2771000	11.80
1994	8600	0.1	880000	0.6	3428000	13.96
1995	10000	0.1	890000	0.6	4118000	16.14
1996	11000	0.1	910000	0.6	4902000	18.20
1997	12000	0.1	930000	0.6	5790000	19.96
1998	13000	0.1	940000	0.6	6440000	21.22
1999	14000	0.1	960000	0.6	7100000	21.84
2000	15000	0.1	990000	0.6	7400000	22.18
2001	15000	0.1	1mil	0.6	7980000	22.32
2002	15000	0.1	1 mil	0.6	8210000	21.98
2003	15000	0.1	1.1 mil	0.6	8430000	21.66
2004	15000	0.1	1.1 mil	0.6	8460000	21.58
2005	15000	0.1	1.1 mil	0.6	8570000	20.70
2006	15000	0.1	1.1 mil	0.6	8580000	20.18
2007	15000	0.1	1.2 mil	0.6	8590000	19.00

*The situation of women in the frame of HIV/AIDS epidemic*

Globally, there were 30.8 million HIV infected people in 2007 (Table 7). Half of them were women [14]. Biologically speaking, women stand a chance two times higher than men to become infected through heterosexual contact. Moreover, women cannot always negotiate using a condom and are sometimes subjected to nonconsensual intercourse.

**Table 6.** New infections among adults and children, AIDS fatalities, AIDS fatalities among children, HIV prevalence among young people (15-24 years) during 2005

	New infections adults	New infections children	AIDS fatalities	Children with HIV	HIV/AIDS fatalities in children	Prevalence for 15-24 years	
						Women	Men
Global	4.9 mil	700000	3.1 mil	2.3 mil	570000	0.2	0.2
SSA	3.2 mil	630000	2.4 mil	2.1 mil	520000	0.3	0.7
Northern America	43000	500	18000	9000	100	0.6	0.4
Romania	490	16	212	465	91	13.92	4.28

**Table 7.** Women (15+) with HIV/AIDS in 2007 (estimated)

RO	SUA	ASS	GLOBAL
7000	230000	4710000	15500000

*SSA*

In 1985 there was equality in the number of male and female HIV infections. In 2007 there were 12 million infected women compared to 3.8 million infected men;  $\frac{3}{4}$  of the total of infected women were living in the SSA [15].

USA

In 2001, 101398 infected women were living in the USA and in 2005 there were 126964; 72% of them experienced a heterosexual transmission and 26% belonged to the IDU category; if in 1985 only 8% of the newly recorded cases were women, this percentage increased in 2006 to 27% [16].

The women belonging to ethnic minorities, who are immigrants or refugees, are mostly affected. From the total of AIDS cases in women, 80% are of Afro-American and Hispanic origin, even if they represent only a quarter from the total of female population [17].

Romania

During the interval of 1985 and 2008, from the total of AIDS cases. 6323 are men and 4741 are women [13]. Regarding the distribution of AIDS cases among women in age and diagnosis groups, for the interval 2002-2007. One can observe a large proportion of the age group 15-19 years old, these being people born during 1987-1990.

**Table 8.** Occurrence of HIV/AIDS cases in Romanian women cumulative by mode of transmission

	AIDS cases (1985-2007)	HIV cases (1992-2007)
IDU	3	3
Hemophiliacs	8	1
Transfusion receivers	175	86
Heterosexual	905	838
Undetermined	383	160
<b>Total</b>	<b>1474</b>	<b>1088</b>

**MTCT(mother-to-child-transmission)**

USA

In the USA, in the lack of antiretroviral therapy 25% of HIV seropositive pregnant women transmit the virus to the conception product, this being translated into a number of approximately 1750 newborn infected children annually. In 2005 the number of persons living with HIV, who had a perinatal transmission, was of 6051 to a cumulative number of 8464 and a number of 4800 cumulative fatalities. From this number approximately 66% were of Afro American origin and 20% of Hispanic origin.

The testing rate of the pregnant women ranged between 25-69% in 2006. The therapeutic TARV management during pregnancy along with applying cesarean section and medication to the newborn leads to a perinatal transmission rate of 2% or even less. If the ARV medication starts only in the perinatal phase the rate would be of 10%. MTCT represents 91% of the total pediatric AIDS [18].

SSA

The SSA has not only the highest HIV prevalence in the world but also the highest rate of perinatal transmission- of up to 30%. The breast feeding rate is high in this area. Breast feeding increases the risk of transmission with 14 % ( excess risks). For women who get infected while breast feeding the risk increases with 20% [19].

In Africa MTCT is accentuated by the lack of medicine, services and information. The lack of testing facilities in many areas is also noticed. Preventive medication was given to only 31% of the HIV infected women from the Eastern and Southern Africa and to 7% from the Western and Central Africa.

Romania

In 2007 in Romania, 45% percent of the pregnant women were tested for HIV. 97% of the seropositive HIV pregnant women have received TARV. 4500 doctors and 2300 nurses are experts in MTCT.

**Table 9.** HIV/AIDS occurrence in children (<14 years), vertical transmission, Romania. Cumulative total, compared with the total cases in children

Mode of transmission	AIDS(1898-2007)			HIV(1992-2007)		
	male	female	total	male	female	Total
Maternal-fetal IDU mother	0	1	1			
Maternal-fetal-Heterosexual mother	137	85	222	49	45	94
Maternal fetal-undetermined	89	43	132	37	35	42
<b>Total</b>	<b>4436</b>	<b>3170</b>	<b>7606</b>	<b>1114</b>	<b>1017</b>	<b>2131</b>

**IDU-injection drug users**

USA

**Table 10.** IDU AIDS cases living in late 2006

	Total of living AIDS people	%		No. of living people	%	Cumulative number	%
Men	59077	17	Black	31339	22	163070	21
			Hispanic	14472	23		
			White	12328	9		
Women	33470	26	Black	19136		67693	35
			Hispanic	5528			
			White	8262			

*Africa*

The drug use is increasing in Africa especially in the coastal countries: Nigeria, Tanzania, Kenya, and Southern Africa. 19. 4% of the IDUs from Southern Africa are HIV seropositive [20]. The prevention programmes for these populations are quite rare. Only Southern Africa has programmes that target the IDUs [21].

*Romania***Table 11.** IDU AIDS cases - Romania - cumulative 1985-2007

	IDU	Total
Men	8	1771
Women	3	1474
<b>Total</b>	<b>11</b>	<b>3245</b>

**MSM***Africa***Table 12.** Prevalence of HIV infection among MSM in three African countries

Zambia	33 %
Kenya	43 %
Senegal	22 %

*SUA*

## MSM:

- 2/3 from the diagnosed infections in adult men
- 26% from the hospitalizations in the sexually transmitted disease clinics out of which 46% of Afro American origin. 21% of Hispanic origin and 17% white people.

A higher transmission among the black MSM is due to the high rate of practicing unsafe sex in the first years of the epidemic, to the high prevalence of sexually transmitted diseases among the black HIV seropositive MSM, to a poorer adherence to therapy [22].

*Romania*

- MSM AIDS cases –cumulative 1985-2007- 98 out of a total of 3245
- MSM AIDS cases- cumulative 1992-2007- 64 out of a total of 2103 [13]

**Conclusions**

1. Similarly with the USA and the rest of Europe. Romania did not show a decline of life expectancy at birth, as it had happened in the SSA.

2. The income indicators (GNI/capita and GDP), respectively health expenditures (2007) in Romania are closer to those of the SSA than to those of the USA.
3. The majority of AIDS cases in adults in Romania knew a heterosexual transmission.
4. In the sexually active age group (15-49 years) the prevalence is much lower in USA and Romania, compared to the SSA.
5. The analysis of the year 2005 reveals for Romania a high prevalence in the age group 15-24, these people being born during 1987 and 1990 and experiencing a nosocomial transmission.
6. In Romania the number of HIV infected females is almost equal to the number of male infections while USA and SSA are facing an increase in the percent of new HIV infection cases among women.
7. The mother to child transmission knows an efficient management in Romania similar to the USA management and in contradistinction to the SSA management.
8. The risk groups-IDU and MSM represent a low percentage in the HIV/AIDS casuistic from Romania and SSA when compared to the USA.

### **Conflict of Interest**

The authors declare that they have no conflict of interest.

### **References**

1. US Committee for Refugees. World refugee survey 2002. [online] 2002 [cited 2009 September]. Available from: URL: <http://www.refugees.org>
2. First get the basics right. In: A Survey of sub-Saharan Africa. The Economist. p. 3. 2004.
3. World Bank. World development indicators. Washington DC. [online] 2004 [cited 2009 September]. Available from: URL: <http://www.worldbank.org>
4. World Bank, African development indicators, Washington DC, and UNECA. Economic report on Africa. Addis Abeba. [online] 2003 [cited 2009 September]. Available from: URL: <http://www.worldbank.org>
5. U.S. POPClock Projection- U.S. Census Bureau - figure updated automatically. [online] [cited 2009 September]. Available from: URL: <http://www.census.gov>
6. Adams JQ, Strother-Adams P. Dealing with Diversity. Chicago: Kendall/Hunt., 2001.
7. U.S. Census Bureau. "Ancestry 2000". [online] 2004 [cited 2009 September]. Available from: URL: <http://www.census.gov/prod/2004pubs/c2kbr-35.pdf>
8. International Monetary Fund, "United States". [online] [cited 2009 September] Available from: URL: <http://www.imf.org/external/pubs/ft/weo/2009/01/weodata/weorept.aspx?sy=2006&ey=2009&scsm=1&ssd=1&sort=country&ds=.&br=1&c=111&s=NGDPD%2CNGDPDPC%2CPPPGDP%2CPPPPC%2CLP&grp=0&a=&pr.x=60&pr.y=9>
9. OECD Health Data 2000: A Comparative Analysis of 29 Countries [CD-ROM] (OECD: Paris. 2000).
10. The U.S. Healthcare System: The Best in the World or Just the Most Expensive?. University of Maine. [online] 2001 [cited 2009 September]. Available from: URL: <http://dll.umaine.edu/ble/U.S.%20HCweb.pdf>
11. Matic S. Twenty-five years of HIV-AIDS in Europe. In „HIV-AIDS in Europe-Moving from death sentence to chronic disease management”. Publications WHO Regional Office for Europe 2006.
12. CNLAS- The Evolution of the HIV/AIDS Phenomenon in Romania between 1985-2007. Institutul de Boli Infecțioase Matei Balș. București. [online] 2008 [citer 2009 September]. Available from: URL: [www.cnlas.ro](http://www.cnlas.ro).
13. CNLAS - Romania la 31 decembrie 2008. [online] 2008 [cited 2009 September]. Available from: URL: [www.cnlas.ro](http://www.cnlas.ro).
14. UNAIDS/WHO., UNAIDS Report 2008. [online] [cited 2009 September]. Available from: URL:<http://www.unaids.org/en/KnowledgeCentre/HIVData/GlobalReport/2008/default.asp>
15. Padian NS, Shiboski SC, Jewell NP. Female-to-male transmission of human immunodeficiency virus. JAMA 1991;266:1664-1667

16. Noble R. United States HIV & AIDS statistic summary. [online] 2007 [cited 2010 September]. Available from: URL: [http/ avert.org](http://avert.org)
17. Espinoza L, Hall HI, Hardnett F, Selik RM, Ling Q, Lee LM. Characteristics of persons with heterosexually acquired HIV infection. United States 1999-2004. *American Journal of Public Health* 2007;97:144-149.
18. CDC- HIV/AIDS Fact Sheets : Mother-to-Child HIV Transmission and Prevention- oct 2007.
19. Nielsen KA. Preventing Perinatal HIV Transmission in the Developing World. One Step at Time. [online] [cited 2010 September]. Available from: URL: [www.needscape.com](http://www.needscape.com)
20. PEPFAR: HIV Prevention for injection drug users in Africa a growing issue. [online] [cited 2009 September]. Available from: URL: [www.aidsmap.com](http://www.aidsmap.com).
21. Carney T, And Parry. Harm Reduction in Southern Africa: Strategies used to address drug-related HIV (and Hepatitis C). [online] CDH. iul.2008 [cited 2009 September].
22. Ellis KH. HIV more prevalent among black MSM despite fewer risk behaviors. *Infectious Disease News*. [online] 2008 [cited 2009 September]. Available from: URL: [www.infectiousdiseaseneews.com](http://www.infectiousdiseaseneews.com)