Published in final edited form as:

Int J Environ Stud. 2008 ; 65(4): 501–513. doi:10.1080/00207230802291629.

Influence of social changes on the evolution of HIV infection in Romania

Simona Rută^{1,2} and Costin Cernescu¹

¹“St.S. Nicolau” Institute of Virology, University of Medicine and Pharmacy

²“Carol Davila” University of Medicine and Pharmacy

Abstract

The Romanian HIV epidemic started and evolved as a paediatric one, accounting for more than a quarter of the total European juvenile AIDS cases. In response to this major AIDS outbreak, emphasis was placed on the patient's treatment, by implementation of a free, universal access program of Highly Active AntiRetroviral Therapy. This approach has been highly successful, and has greatly increased the rate of survival in infected children. Nevertheless, these children are now teenagers or young adults, representing a large cohort of “long term survivors”- a unique population that represent a great challenge for the public health system and for their integration in the civil society. As the number of HIV infected adults is increasing, new high-risk behaviour groups, as well as vulnerable populations (young people, people living in poverty, Roma community) need to be reached in prevention programs. This article explores the impact of the socio-economic changes on the evolution of the HIV epidemic in Romania and speculates about the factors that might drive future increases in the incidence of HIV infections.

Keywords

paediatric AIDS; Romania; HIV transmission; heterosexual; nosocomial; materno-foetal

Background

At the end of 1989, immediately after the fall of the communist regime in Romania, the “St. S. Nicolau” Institute of Virology in Bucharest reported the first data on a major iatrogenic AIDS outbreak in children [1], with several thousands of cases. More than 98% of these cases were concentrated in abandoned children living in public institutions at the time of diagnosis, as a result of the disastrous pro-natalist policy of the communist regime that banned abortion and contraception and ignored sex education. Further studies done in collaboration with CDC Atlanta, Georgia, USA established that reusable unsterilized needles and syringes together with the indiscriminate use of unscreened blood micro-transfusions were the main risk factors in the nosocomial transmission. Only 4% of the paediatric cases were attributable to materno-foetal transmission [2,3]. A second wave of this unique nosocomial paediatric HIV epidemic was recognized during 1993-1995, when several hundreds of cases were diagnosed, this time in children living with their families and having both parents HIV negative (fig1). Again, multiple parenteral treatments were documented as a major risk factor for HIV transmission. Since then, Romania has accounted for the highest number of HIV/AIDS infections from the entire WHO European region, where the total number of paediatric AIDS cases was 12202 in 2006, as listed by the latest EUROHIV surveillance report, December 2007 [4].

The origin of the Romanian outbreak was suggested to be derived from a single or a limited source of infection. Further evidence for this interpretation comes from the uniform finding of a sole HIV subtype in the majority of cases. Early studies conducted by our team on institutionalized children [5] have reported the prevalence of a single particular HIV subtype — called F, a minor form, found only in Brazil and in Central Africa. But, further studies on the relative incidence of different HIV-1 subtypes over a 15 years period revealed a steady predominance of subtype F among both long term survivor children and newly infected adults, despite the fact that the spread of the epidemic had taken place in the presence of multiple circulating strains from Western Europe, from former Soviet Union, and possibly, from other continents [6]. This fact can have major implications for vaccine design, diagnostic/monitoring tests, and the emergence of antiretroviral resistance.

This article explores the factors that may continue to elevate the incidence and prevalence of the HIV/AIDS infections in Romania and have a significant correlation with the social and clinical implications for long term survivors among HIV infected children.

Impact of economic changes on AIDS epidemic in Romania

In 2006, Romania experienced a solid economic growth of above 7% and was among the best-reforming countries in the Central European region for the third consecutive year, largely overcoming the early challenges of transition. Nevertheless, there are still marked disparities compared to other EU countries. The Romanian per capita gross domestic product was 7800 USD in 2005 (table 1) and the total health expenditure per capita was 4% of GDP, which is substantially less than that of EU-25 countries [7].

The Human Development Index (HDI) - an alternative measure of development, that includes three components: longevity, education, and per capita income - shows a very slow annual increase, with a value of 0.805 [8]. This is below the average of 0.911 recorded in other OECD (Organisation for Economic Development and Cooperation) countries. Rapid economic growth increases the vulnerability to macroeconomic imbalances, and creates important challenges. These include economic disparities, poverty, rapidly aging and declining populations, persistent youth unemployment and a lack of scientific and technical innovation. A recent World Bank study of the changes in the levels and extent of poverty in Eastern European countries estimates that working adults and children form most of the poor in Romania [9]. Many of the families that have children living with HIV and a large part of the HIV infected adults live at the poverty line (about 83%, according to some studies [9]).

In response to the severity of the HIV/AIDS epidemic a National Multisectorial AIDS Commission (which includes ministries, NGOs, private sector representatives, international agencies and people living with HIV/AIDS) was established. This aims to increase the quality and the access to HIV/AIDS treatment and care and to reduce discrimination and stigma. The Domestic Public Expenditures spent by the Romanian government for AIDS increased from \$29.7 Million in 2003 to \$42.7 Million in 2005 [10], confirming that HIV/AIDS is recognized as a national strategic priority for the health system.

Romania is the only country in Central and Eastern Europe providing universal access to treatment and care for this disease. More than 70% of the total reported number of HIV patients, the great majority between 14-20 years old, is under active medical surveillance. They receive antiretroviral therapy (ARV) according to international standards [11]. For example, a comprehensive HIV/AIDS medical and psychosocial care and support as well as a community education program were developed in Constanta -one of the cities most affected by the paediatric AIDS epidemic- by the Baylor College of Medicine International Paediatric AIDS Initiative (BIPAI). This comprehensive program has led to the reduction in the death rate for HIV-infected children in Constanta from 15% to just 1% in 3 years [12]. A daily nutrition

allocation for all children living with HIV and nutrition compensation to all adults living with HIV/AIDS is granted by law, but access to education for children living with HIV, even though it has improved during recent years, is still limited by the opposition within the local communities, wherever education and social integration programs have not been implemented.

In these circumstances, it is of particular concern that there is lacking an adequate coordinated plan for the transition of HIV infected teenagers to appropriate assisted-living arrangements, especially in the case of those living in foster, group home, orphanage, or extended family placements, and for formerly institutionalized children who were returned to impoverished and often dysfunctional birth families without adequate monitoring and support for those families [13]. Programs directed towards the promotion of the rights of HIV/AIDS infected persons and reduction of stigma/discrimination are only just beginning and social interventions directed at vulnerable groups are modest. The international human rights system explicitly recognized HIV status as a prohibited ground of discrimination, but at the same time, several countries have recently introduced laws to criminalise HIV transmission by exposing another person to the virus. Widespread stigma and discrimination against people living with HIV, promoted by ignorance and fear, will be a major obstacle in the successful integration of the HIV infected teenagers and young adults in Romanian society.

Current state of HIV/AIDS epidemic in Romania

In June 2007 a cumulative total of 17,485 HIV/AIDS cases were reported. Of these, 10,260 of the infected individuals had developed AIDS, including 4,876 who died [11]. Data from this time demonstrated that 66.4% of the patients living with HIV/AIDS were children, and 77.87% of the total cumulative number of AIDS deaths was recorded in children. In the period 1989-1993 the majority of cases were recorded in infants and children less than 4 years old. After 2000 most of the paediatric cases were reported in the group 10 -14 years old (fig.2). An obvious explanation for these findings is that an overwhelming part of all these cases represent children parenterally infected during childhood, who are diagnosed very late during the evolution of the infection. Materno-foetal transmission of HIV was documented in only 4.8% of the total cumulative cases of HIV AIDS in children reported at mid 2007.

Most of the cases have been reported in 1990 (43 of a total of 1123). Then there was registered a continuous decline (16 out of 373 newly diagnosed cases in children in 2000 and 3 out of 15 newly diagnosed cases in children in 2006), in contrast to the reported increase in the number of adult cases (fig 3). This fact can also reflect a deficiency in the early case detection. In 1998, legal provisions were introduced for mandatory HIV counselling and free testing in order to diagnose this infection among pregnant women. As a consequence, the number of HIV tests performed for pregnant women more than tripled from 25.000 in 2000 to 78 020 in 2006 [11]. This permitted the identification of an increased number of HIV positive mothers from 0.07% in 2002 to 0.1% in 2006.

The real estimate may be much greater, since the number of pregnant women tested for HIV still represents barely a third of the number of births, mainly because more than 20% of the pregnant women never go to the doctor before they give birth and 40% of the pregnant women have a medical visit only after the first quarter of their pregnancy. This leads to a delayed identification of the mothers infected with HIV, at birth or even after, when the child starts to have suggestive symptoms. There is in consequence a diminished impact of the PMTCT (Prevention of Mother to Child Transmission) program which is available free of charge, in the 9 monitoring AIDS regional Centres. Because a delayed diagnosis of HIV infection implies an increased risk of transmission, it is worth thinking about the possibility of applying the recent revised recommendations from the United States Centres' for Disease Control (CDC) [14]. These are aimed at increasing the number of health care facilities in which screening for HIV is routine (hospital emergency departments, urgent care clinics, and primary care settings),

and also to allow screening to be done by rapid diagnostic tests. This will promote an earlier detection of HIV infection, decrease the time needed to perform risk assessments and pre-test HIV counselling as well as the stigma associated with requesting or consenting to an HIV test [15].

Undoubtedly, the total number of HIV infected persons within Romania is much higher, since new cases of children infected in the 1987-1991 period, are still being diagnosed (fig 4). These are now being reported as adult cases, in accordance with the CDC criteria. This explains why, out of the total adult cases, 40.5% are registered in the age group of 15-19 years and over a third of the newly diagnosed cases of HIV/AIDS infections (125/391 in 2006 and 44/141 at mid 2007) continue to be in the same 15-19 years age group. In 2006, the incidence of HIV/AIDS in this group was 7.24 at 100 000 population compared to a mean of 1.64 at 100 000 population in the other age-groups.

What has changed in the way the HIV infection is spreading in Romania and what are the factors that will influence the future of the epidemic?—Nosocomial transmission was responsible for the huge number of paediatric HIV cases registered in Romania until 1995. In June 2007, out of the cumulative total number of cases reported in children less than 14 years old, an estimated 64.4% were acquired nosocomially, while another 21.8% were acquired by transfusions with unscreened blood (fig 5). The national transfusion system is now considered safe. Testing of all donated units is mandatory for hepatitis B and C, HIV, HTLV I/II and syphilis. But, according to a recent WHO report on the status of blood services in South-Eastern Europe [16], the number of donations in Romania is 1.7 per 100 inhabitants per year as compared to 3.6 per 100 inhabitants in many other European countries and to a mean of 2.1 per 100 inhabitants in all South-Eastern European states. Of particular concern relating to transmission risk is the high number of remunerated donors (79%) and replacement donors —such as family and directed donations-(10%), the last ones accounting for many of the first time donors.

Data from the National Institute for Blood Transfusion indicate that between 1990-2003, out of a total number of 6, 695, 000 blood units that have been tested for HIV infection, 367 have been positive, indicating a HIV prevalence of 5.48 at 100.000 donors population; higher than the one reported in the general adult population (fig 6). In 2006, 19 out of 327, 050 tested donors were found positive for HIV infection (14 out of 83 210 first time donations, 3 out of 201 379 regular donors and 2 out of 4 461 occasional donors). Promotion and recruitment of voluntary non-remunerated blood donors, from low-risk populations is a priority for the national transfusion program.

Reduction of the tainted-blood related transmission was assisted by a decrease in the number of unnecessary transfusions, mandatory screening for HIV for all blood donations, and the general availability of disposable needles and syringes. On the other hand, there is mounting evidence that the universal precautions are not fully respected throughout all the medical care facilities. In outpatient clinics, it has been suggested that sterile equipment might have become contaminated with blood before use [17]. In addition, shortage of equipment for infection-control (including puncture-proof containers for used sharps, disinfecting solutions, and single-use gloves) is sometimes reported [18]. All these deficits pose a serious risk of acquiring a variety of blood borne pathogens, especially in dental practices in small cities or rural areas.

Recently, Romania was described as “The European home of hepatitis” with 6-8% of the total population infected with HBV and 8-12% with HCV [19]. In our studies, a substantial percentage (78.3%) of the HIV-infected long term survivors amongst Romanian adolescents have evidence of HBV co-infection with a high prevalence of HBV replicative markers (43.5% for HBsAg; 11.2%; for HBeAg); in addition, 5.6% of chronic HBsAg carriers were co infected

with HDV; while HCV infection of HIV patients was infrequent (0.8%) [20]. The HIV transmission efficiency through unsafe medical injections in Romanian orphanages was estimated at 2% to 7%; the transmission efficiency for HBV is probably about 10-fold greater [21]. In addition the time spent by HBsAg positive children in orphanages is positively correlated with the prevalence of HBV infection [22]. HIV infected patients' manifest decreased responses to the HBV vaccine and a waning over time of their protective antibody titre [23]. As the incidence of HBV replicative markers is almost double in patients with immunological AIDS, we can also assume that these patients may act as "super shedders" and maintain a high rate of HBV infection in the community.

Sexual transmission

Since 1995, the HIV/AIDS incidence rate among adults has increased constantly, mainly related to heterosexual transmission. This mode of transmission accounts for 60.57% of the total adult cases registered at mid 2007 (fig. 7). Of note are the absence of nosocomial transmission in adults, the relatively low incidence of transmission through unscreened blood and, the high percentage of the so called "unknown" transmission (25.46%), which suggests an inadequate way of assessing the relative significance of different modes of acquiring the infection [24]. [May the unknown transmission be in fact related to parenteral transmission or is it more likely that it reflects the patients' unwillingness or difficulty in acknowledging socially stigmatizing behaviours?]. According to a study of the National Institute for Public Health, funded by the Global Fund against HIV, TB and malaria [25] in the general population, the median age of the first sexual contact has constantly decreased in the last decade from 20.5 years in 1996 to 18 years for girls and to 16 years for boys in 2004.

Will sexual transmission be responsible for the start of a new wave of HIV infections in Romania with all the long term survivors reaching adult age and with the natural tendency of HIV spreading in adults?

In the general population, one out of five young sexual active adults disclosed having more than one sexual partner in the last 3 months, and only 58.9% of the men and 52.9% of the women declared using a condom at first sexual contact, or during current sexual activity. The promotion of condom use within the family practitioners network and family planning clinics network remains limited. There are very few selling points in rural areas. Even in seroconcordant HIV infected couples counselling about the need of safe sex practices is of outmost importance, since acquisition of recombinant HIV strains through unprotected sex is possible in chronic HIV infection, as underlined by recent reports of super infection with drug-resistant viral variants [26].

In Romania, as in many other Eastern European countries, a significant increase in street prostitution was seen during the last decade, often associated with traffic of human beings. As prostitution continues to be illegal in Romania, there are no official estimations of the number of commercial sex workers and consequently the data regarding HIV infection in this particular risk group are limited and unreliable (5 out of 96 tested persons were positive in 2003; 2 out 146 in 2004, and none out of only 47 tested in 2006). Increased travel, the movement of rural populations to large cities, urban poverty and a weakening of family structure all promoted sexual practices that facilitate promiscuity, prostitution and increased transmission not only of HIV, but also of other sexually transmitted infections. These have reached epidemic levels in Romania (fig 8).

The incidence rate for syphilis increased dramatically from 32.2 in 1996 to 56.88 in 2002, and even in 2006 a rate of 26.15 per 100 000 population was reported [27], compared to below 2 per 100 000 population in Western Europe. Over 57% of the cases are registered among young people, and under reporting is common because of perceived stigma, STI care-seeking delays,

and self-medication. Even so, voluntary testing for HIV in a limited number of persons with STI revealed an increase from 0.28% in 2004 to 1.15% at mid 2007. Even more alarming are the data from the Romanian Association Against AIDS documenting that between 2001 and 2004, 5.6% of the children and young people living in the streets in Bucharest were treated for syphilis and a high number of sex workers were injecting heroin and donating blood on a regular basis [28].

The discriminatory legislation towards men who have sex with men (MSM) was only recently eliminated, but, according to the reports of NGO ACCEPT (the first Romanian nongovernmental organization that defends and promotes the rights of lesbians, gays, bisexuals and, transgender persons) discrimination persists at the level of attitudes and mentalities. Therefore, seroprevalence studies of HIV and STI in this population are scarce. Only 32 HIV tests were performed among MSM in 2006, out of which two were positive. The large majority of the MSM have knowledge about HIV and consider that the use of condoms is one way to prevent HIV and STI transmission, but do not report a consistent use of condoms.

Intravenous drug use

There are no official data concerning the number of intravenous drug users (IDUs) in Romania, but estimations indicate an important increase of the number of people injecting heroine in Bucharest, especially young people aged 15 to 24 years, but also users aged 10 and 16 years old, reaching an estimated incidence of 24 000 (1% of the total Bucharest population). According to a 2006 report of the National Anti Drug Agency a well-structured drug selling market exists in Romania in large urban settlements, heroine being the most readily available drug. Incrimination of the illegal possessor of drugs for his own consumption greatly contributes to the difficulties in acknowledging this risk-behaviour, and even in the treatment enrolment rate [29]. Prevalence of hepatitis B and C resulting from testing activities is of tens of percentage points and at the same time the large majority of users reported unprotected sexual activity.

Despite these alarming facts, in Romania, during the 1992- 2006 period, only 17 cases of HIV infection related to injecting drug use were reported in the data from the National Commission against AIDS, compared to a total of 31 521 cases in the EU and a total of 260 854 cases in the entire WHO European Region [30]. Current global estimates for Eastern Europe reveal dramatic changes in the countries which border Romania's North East (e.g. Moldavia, Ukraine and Russia), with a logarithmic growth in the HIV infection rate. In the Russian Federation IDUs comprise 85% of the cumulative number of registered HIV cases, while in Ukraine the number of cases have increased by 150% during the two-year period December 2001 to December 2003 [31].

According to the data provided by the National Penitentiary Administration in 2005, of the 37,600 prison inmates, 2,402 (6.38%) self-declared as drug users, 62.23% were aged between 20 and 24 years and 93.8% were men. At the end of 2004, 16 cases of AIDS were registered in prisons, while in 2006 from 715 tests performed among convicts, only 1 was positive. Sexual transmission of HIV and other STI can yet become a problem, since one third of the inmates report multiple sexual contacts, with less than 1% declaring a consistent use of condoms, and 67% declaring that they never use one. Intravenous drug use, common use of razors, tattooing and self-mutilation are additional factors that can contribute to HIV and hepatitis spreading [32].

Failure in reaching the IDUs population for seroprevalence studies can have disastrous consequences, not only because they are likely to become an important link in the transmission chain for HIV, hepatitis and STI, but also through possible changes in the molecular epidemiology of the epidemics. Such cases have been reported for the former Soviet Union

epidemic, where different HIV subtypes were initially reported. These have now been replaced by a subtype A variant of monophyletic origin, introduced in 1995, during the successive outbreaks among IDUs (southern Ukraine, Russia, Latvia and Belarus), with a more recent secondary spread via heterosexual transmission [33].

All these facts highlight the importance of continuing efforts to raise awareness of risk behaviours and prevention modes in both long term survivors, HIV infected teenagers and other vulnerable populations like MSM, prisoners, and the Roma community.

Conclusions

The presence of a large cohort of long term survivors - teenagers who acquired an HIV infection parenterally more than 15 years ago, together with the constant increase in the number of HIV infected adults can fuel a new wave in the AIDS epidemic in Romania. Following the success of HAART in reducing the morbidity and mortality associated with HIV/AIDS infection, work must concentrate on prevention. There is a need for prevalence studies to be done on co-infection of HIV with viral hepatitis, STI and TB in vulnerable populations (prisoners, poor people, injecting drug users). Studies on risk behaviours are not a part of the national surveillance program, and the public system has a limited capacity of ensuring access to HIV counselling. Even if several non-governmental organizations attempt to face these issues, the interventions remain limited in time and space, There is a need for a strengthened national response which can meet the HIV/AIDS challenge in all sectors.

References

1. Patrascu IV, Constantinescu SN, Dublanchet A. HIV-1 infection in Romanian children. *Lancet* 1990;335(8690):672. [PubMed: 1969055]
2. Hersh BS, Popovici F, Apetrei RC, Zolotusca L, Beldescu N, Calomfirescu A, Jezek Z, Oxtoby MJ, Gromyko A, Heymann DL. Acquired immunodeficiency syndrome in Romania. *Lancet* 1991;338(8768):645–9. [PubMed: 1679471]
3. Hersh BS, Popovici F, Jezek Z, Satten GA, Apetrei RC, Beldescu N, George JR, Shapiro CN, Gayle HD, Heymann DL. Risk factors for HIV infection among abandoned Romanian children. *AIDS* 1993;7:1617–24. [PubMed: 8286071]
4. EuroHIV. HIV/AIDS Surveillance in Europe. End-year report 2006. Saint-Maurice French Institute for Public Health Surveillance 2007;75:40.Table 18
5. Cernescu C, Tardei G, Necula A, Ruta SM, Pau CP. The serologic significance of F viral genotype for Human Immunodeficiency Virus type 1 epidemic. *Journal of Infectious Diseases* 1994;170:1043–4. [PubMed: 7930705]
6. Chitu V, Diaconu CC, Veliceasa D, Ruta SM, Grancea C, Târdei G, Cernescu C. Dynamics of the HIV-1 variability in adults from Bucharest, 1992-1998. *Romanian Journal of Virology* 1999;50:43–51. [PubMed: 11601379]
7. Statistical Pocketbook. Key figures on Europe. 2006 [accessed on November 15, 2007]. <http://www.epp.eurostat.ec.europa>
8. United Nations Development Programme (UNDP). Human Development Report. 2007 [accessed on November 22, 2007]. http://hdrstats.undp.org/countries/country_fact_sheets/cty_fs_ROM.html
9. Alam, A.; Murthi, M.; Yemtsov, R.; Murrugarra, E.; Dudwick, N.; Hamilton, E.; Tiongson, E. Eastern Europe and the former Soviet Union. The International Bank for Reconstruction and Development/ The World Bank; Washington DC: 2005. Growth, poverty, and inequality.
10. Government of Romania. National strategy for surveillance, control and prevention of HIV/AIDS cases 2004-2007. [accessed October 16, 2007]. published online at <http://www.unicef.org/romania>
11. National AIDS Committee, Department for AIDS monitoring, Matei Bals National Institute for Infectious Diseases, Bucharest. Statistic data on HIV/AIDS infection in Romania, June 2007. 2007 [accessed October 17, 2007]. published online at <http://www.cnlas.ro/hiv/statistica.htm>

12. Kline MW. Perspectives on the Paediatric HIV/AIDS Pandemic: Catalyzing Access of Children to Care and Treatment. *Paediatrics* 2006;117:1388–1393.
13. Human Rights Watch Report. Life Doesn't Wait": Romania's Failure to Protect and Support Children and Youth Living with HIV. 2006.
14. Branson BM, Handsfield HH, Lampe MA, Janssen RS, Taylor AW, Lyss SB, Clark JE. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *Morbidity and Mortality Weekly Reports (MMWR) Recommendations and Reports* 2006;55(RR14): 1–17.
15. Fenton KA. Changing Epidemiology of HIV/AIDS in the United States: Implications for Enhancing and Promoting HIV Testing Strategies. *Clinical Infectious Diseases* 2007;45:S213–20. [PubMed: 18190289]
16. WHO. Blood services in South-Eastern Europe. Current status and challenges. 2007 [accessed November 01, 2007]. at <http://www.euro.who.int>
17. Romanian Coalition to Prevent Nosocomial Infections. Injection practices among nurses - Valcea, Romania. *Morbidity and Mortality Weekly Reports* 2001;50:59–61.
18. Dentinger C, Pasat L, Popa M, Hutin YJ, Mast EE. Injection practices in Romania: progress and challenges. *Infection Control and Hospital Epidemiology* 2004;25:30–35. [PubMed: 14756216]
19. Safe injection global network. Romania - A European home of hepatitis". 2007 [accessed 01.03.2007]. <http://uqconnect.net/signfiles/Archives/SIGN-POST00387.txt>
20. Ruta SM, Matusa RF, Sultana C, Manolescu L, Kozinetz CA, Kline MW, Cernescu C. High Prevalence of Hepatitis B Virus Markers in Romanian Adolescents with HIV. *Medscape General Medicine* 2005;7:68–72. [PubMed: 16369373]
21. Gisselquist DP. Estimating HIV-1 transmission efficiency through unsafe medical injections. *The International Journal of STD & AIDS* 2002;13:152–159.
22. Ruta SM, Diaconu CC, Grancea C, Cernescu C. A survey of hepatitis B virus infection in children from Romanian orphanages. *Proceedings of the Romanian Academy Series B* 1999;1:67–71.
23. Nedelcu I, Craciun D, Tardei G, Ruta SM, Grancea C, Cernescu C. Assessment of anti hepatitis B vaccination efficacy in high risk children. *Romanian Journal of Virology* 1998;49:43–52. [PubMed: 10892425]
24. Ruta SM, Matusa RF, Sultana C, Manolescu L, Cernescu C. Some limits in estimating the burden of HIV-related morbidity in Romania. *Proceedings of the Romanian Academy Series B* 2003;5:73–8.
25. National Institute for Public Health. National Survey on Reproductive Health. 2004 [accessed on November 20, 2007]. Bucharest document available in Romanian at <ftp://ftp.unfpa.ro/unfpa/SSRR2004.pdf>
26. Blick G, Kagan RM, Coakley E, Petropoulos C, Maroldo L, Greiger-Zanlungo P, Gretz S, Garton T. The probable source of both the primary multidrug-resistant (MDR) HIV-1 strain found in a patient with rapid progression to AIDS and a second recombinant MDR strain found in a chronically HIV-1-infected patient. *Journal of Infectious Diseases* 2007;195:250–9.
27. Laukamm-Josten, U.; Klavs, I.; Renton, A.; Fenton, K. Sexually transmitted infections in Europe: no impact on HIV — yet. In: Matic, S.; Lazarus, JV.; Donoghoe, MC., editors. *HIV/AIDS in Europe: Moving from Death Sentence to Chronic Disease Management*. WHO Regional Office for Europe; Copenhagen: 2006. p. 171-188.
28. Romanian Association Against AIDS (Asociatia Romana Anti SIDA). Commercial Sex Work, a Public Health and Social Perspective Romania. 2005 [accessed November 15, 2007]. available at http://www.ceehrn.org/EasyCEE/sys/files/2007_UniversalAccess_Romania.pdf
29. National anti drug agency. Evaluation report on the 2005- 2008 Action Plan for the implementation of the National Antidrug Strategy 2005- 2012. 2006 [accessed October 12, 2007]. available online at www.ana.gov.ro
30. EuroHIV. HIV/AIDS Surveillance in Europe. Mid-year report 2006. Saint-Maurice: French Institute for Public Health Surveillance 2007;74
31. Joint United Nations Programme on HIV/AIDS (UNAIDS). Report on the Global HIV/AIDS epidemic Geneva. 2006.
32. Ruta SM, Abagiu A, Cernescu C. Acute viral hepatitis in correctional facilities. *Journal of Clinical Virology* 2001;22:173.

33. Balode D, Ferdats A, Dievberna I, Viksna L, Rozentale B, Kolupajeva T, Konicheva V, Leitner T. Rapid epidemic spread of HIV type 1 subtype A1 among intravenous drug users in Latvia and slower spread of subtype B among other risk groups. *AIDS Research and Human Retroviruses* 2004;20:245–249. [PubMed: 15018713]

AIDS cases by diagnostic year

Fig 1. Evolution of the HIV epidemic in Romania

Two important waves account for the great majority of paediatric cases: the first one in 1989-1990 and the second in 1994-1998. A small but steady increase in the number of adult cases can be seen especially after 1993.

Fig 2. Cumulative total of paediatric AIDS cases after the diagnostic year

While in the period 1989-1993 the great majority of cases were recorded in infants and children less than 4 years old, between 1993-1999 most of the cases were diagnosed in older children, aged 5-9 years. After 2000 most of the paediatric cases are recorded in the group 10-14 years old. This shows that an overwhelming part of all these cases represents children nosocomially infected during 1987-1990, who are diagnosed very late during the evolution of the infection.

Fig.3. AIDS cases in women after diagnostic year and age at diagnosis and the burden of vertical transmission

The majority of adult cases are registered in the group of 15-19 years old that will soon become sexually active and can represent the start of a new wave of the epidemic in Romania. The magnitude of vertical transmission between 1989-1996 is in flagrant contradiction with the small number of adult cases reported during this period. For the vertical transmission, the reported mother's main risk factor is heterosexual infection, but a great number of cases are registered in children born from mothers with "unknown" mode of transmission.

Fig 4. Age-distribution of newly diagnosed HIV/AIDS cases

Cumulative total is plotted on the right axis and newly diagnosed cases (until mid 2007) on the left one. The majority of new AIDS cases continue to be concentrated in the group of 15-19 years old, with HIV infection acquired most probably before 1990, while the cumulative total peaks for HIV diagnostic in the group 10-12 years old and for AIDS in 5-9 year old - which is either not consistent with materno-foetal transmission or reveals a considerable delay in the diagnosis.

Fig 5. HIV transmission in children

The main mode of transmission is nosocomial, but the similar distribution of the “unknown” cases throughout the years suggests that these are also acquired by parenteral way.

Fig 6. Safety of the transfused blood

Each year between 300000- 560000 blood donations are tested for HIV infection, with 12-35 units found positive for HIV.

Fig 7. HIV transmission in adults

The main mode of transmission is heterosexual, but the “unknown” way of transmission is again present, as in the case of the children.

Fig 8.
Incidence rate of sexually transmitted infections (STI) in Romania 1996-2006

Table 1

Romania 2005-2006 — socioeconomic indicators

Socioeconomic indicators	Romania	EU-25	Percent of EU-25
GDP per capita 2000	5750	20100	28.6
GDP per capita 2005	7800	23400	33.3
Inflation rate	9.1 (6.2 in 2006)	2.2	413.6
Population growth	(-)0.9	0.4	
Life expectancy male	67.7	75.1	90.3
Life expectancy female	75.1	81.2	92.5
Crude birth rate ‰	10	10.5	95.2
Total fertility rate ‰	1.3	1.5	86.7
Infant mortality ‰	16.8	4.5	373.3
Marriages ‰	4.8	6.6	72.7
Divorces ‰	1.6	2.1	76.1
Education expenditure	4.1	4.98	82.3
Health expenditure	4	7.6	52.6
Physicians per 100000	195	>300	65