

Executive Summary

This study of the socioeconomic impact of HIV/AIDS in Ukraine was prompted by the need to understand the potential impact of the country's rapidly growing HIV/AIDS epidemic. Ukraine was classified by the World Health Organization as a low HIV prevalence country in 1995, but only a decade later, Ukraine suffers the worst HIV/AIDS epidemic in Europe (DeBell and Carter 2005). Clearly, it is collective failure that prevents Ukraine from controlling the epidemic. Lack of understanding of the epidemic and its potentially devastating impact contribute to stigma, denial, and inadequate responses.

The World Bank and the Ministry of Health of Ukraine jointly conducted this study in collaboration with the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the International HIV/AIDS Alliance in Ukraine.

The study assesses the short- and medium-term (2004-14) socioeconomic impact of the HIV/AIDS epidemic and provides evidence for policy making. Using data available in January 2005, it evaluates the epidemic's impact on population growth, life expectancy, employment, and health care and social service costs in Ukraine and projects the potential benefits of disease prevention and treatment. Data from the Ukrainian AIDS Center and socioeconomic information from the government and other agencies were used to construct a baseline "no-AIDS" demographic projection of the Ukrainian population and three epidemic scenarios—optimistic, medium, and pessimistic.¹ These projections were used to apply several macroeconomic models to estimate the impact of the HIV/AIDS epidemic on various sub-populations, regions, and sectors.

Ukraine's HIV/AIDS Epidemic

Ukraine's rate of HIV infection is growing fast. HIV/AIDS is a relatively new phenomenon for Ukraine, with rapid spread of the virus only since 1994. Consequently, the overall prevalence rate is still relatively low, but the rate of infection increase is alarming: an average 33 percent increase per year since 1994. UNAIDS estimates that Ukraine had 360,000 infected adults as of the end of 2003 and an adult prevalence rate of 1.4 percent. (The exact number of infections is unknown due to the high degree of uncertainty associated with the size of the most-at-risk populations.) This study projects that nearly a half million people (477,000) were infected with HIV in 2004, a 32 percent increase over 2003. It also projects that, by 2014, the total number of HIV-positive people will range from 478,500 under the optimistic scenario to 820,400 under the pessimistic one. The adult prevalence rate will be between 1.9 and 3.5 percent, depending on projection assumptions.

The pattern of transmission is changing.

Until now, the HIV epidemic in Ukraine was concentrated in sub-populations, mainly injecting drug users

¹ Epidemic scenarios differ in their assumptions about the size and dynamics of the most-at-risk populations, yielding different estimates of adult prevalence rates. In our optimistic scenario, the adult HIV prevalence rate peaks at 2% in 2010, peaks at 2.48% in 2009-10 in the medium scenario, and rises continuously, reaching 3.5% in 2014 in the pessimistic scenario. Reduction in the vertical transmission rate (15.9% in 2003) is faster in the optimistic scenario (to 10% in 2004 and then to 5% in 2014) than in medium (gradual reduction to 5% by 2014) and pessimistic scenarios (gradual reduction to 10% in 2014). Availability of antiretroviral (ARV) therapy to those who need it increases from 1% in 2004, to 30% in 2010, and further to 50% in 2014 in the optimistic scenario; to 5% in 2005, further to 10% by 2010, and remaining at 10% until 2014 in the medium one; and to 5% in 2005 and remaining at 5% until 2014 in the pessimistic scenario. The study also constructed three cost scenarios for antiretroviral therapy (ART).

(IDUs), with the prevalence rate among pregnant women in urban areas still below 1 percent. Barnett et al. (2001) pointed out that the epidemic was shifting from high-risk groups to the general population through heterosexual transmission. Feshbach and Galvin (2005) reinforced this conclusion in their recent article. The epidemic's tendency to spill into the general population is reflected in official Ukrainian AIDS Center data indicating that the share of infections caused by intravenous drug use decreased from 83.6 percent in 1997 to 46.5 percent in 2004, while the percentage of heterosexually transmitted infections grew from 11.3 percent to 32.4 percent. This change in the transmission pattern calls for more aggressive measures to curb the epidemic's spread in the general population.

The young and women are hit hardest. The estimated HIV incidence rate for adults aged 15-49 in 2004 was 0.25 percent, with the highest incidence rate of 0.69 percent in the 20-24 age group. Two-thirds of all new HIV infections are among young people aged 20-34, and 39 percent of the newly infected are women, according to the 2004 medium scenario. Young women are more vulnerable than young men: the incidence rate for women 20-24 is 0.88 percent and 0.5 percent for men of the same age. By 2014, it is estimated that the 20-34 age group will account for three-quarters of all new HIV infections, half of which will be among women.

HIV/AIDS is unevenly distributed across the country. Among the worst-affected regions are those in the southeast oblasts of Donetsk, Dnipropetrovsk, Odesa, and Mykolaiv. Accounting for only a quarter of the total population of Ukraine, these regions will bear an estimated 36-43 percent of accumulated HIV cases by 2014 and 31-38 percent of annual AIDS-related deaths. Donetsk Oblast will account for 13-19 percent of Ukraine's HIV infections, followed by Odesa Oblast at 10-14 percent. The epidemic in these oblasts is unfolding against a backdrop of natural population decline, which is faster than the national average. By 2014, AIDS-related death rates in these two oblasts will exceed the national average by a factor of 1.5-2.1.

Socioeconomic Impact of HIV/AIDS

The epidemic's impact on demographics and health status could be devastating. The largest demographic impact of the HIV/AIDS epidemic in Ukraine is through its effect on population morbidity and mortality rates. The majority of all HIV infections are among those in the most active reproductive age (20-34). The disease certainly affects their capacity for childbearing, and Ukraine has persistently declining birth rates. Over 1991-2003, the Ukrainian population declined by almost 4 million, an average of 300,000 per year. Given the shrinking size of the young adult groups and the persistent demographic decline, even modest increases in adult prevalence rates could result in a strong long-term demographic impact.

The study estimates that the number of new AIDS cases reached 13,700 in 2004, and annual AIDS deaths were approaching 10,000 even in the optimistic scenario. By 2014, AIDS-related deaths will account for almost a third of all male deaths in the 15-49 age group and 60 percent of female deaths in that age group. In 2014, AIDS is projected to reduce male life expectancy by 2-4 years: from 65.6 in the hypothetical "no-AIDS" scenario to 63.4 (optimistic) and 61.6 (pessimistic) scenario. Similarly, a female born in 2014 will be expected to live three years less (to age 72.9) in the optimistic scenario and almost five years less (to age 71.0) in the pessimistic one, instead of an expected 75.8 years in the "no-AIDS" scenario. A potentially catastrophic increase in HIV/AIDS morbidity and mortality is expected in the medium term if prevention measures fail. Also, several complicating factors exacerbate the situation: the demographic decline, the high prevalence of tuberculosis (TB) and sexually transmitted infections (STIs), and a generally weak health system.

HIV/AIDS has become one of the major obstacles to economic growth in Ukraine. AIDS affects all agents in an economy: households, businesses, and the government, and its effects impact many of the economy's aspects: greater mortality and morbidity; reduced labor supply, labor efficiency, and labor productivity; loss of investment

in human capital and diminished returns to such investment; increased health care spending and the loss of tax revenues; and decreases in public and private savings and investment, among others. Reduced fertility among women infected with HIV amplifies the demographic decline and is responsible for longer-term effects. Based on various plausible AIDS scenarios during 2004-14, the study found an expected 1-2 percent reduction in the labor force due to the epidemic. In addition, since the younger groups are most affected, the labor force losses will be felt for a long time. Furthermore, HIV/AIDS in Ukraine has a pronounced gender differential: the sharpest decline in labor force participation is for females in the 15-19 age group. This decline is in addition to the labor force reduction due to the underlying demographic trend, estimated to be a 10.4 percent fall by 2014 from the 2004 rate. In the worst-affected oblasts, the contribution of HIV/AIDS to labor force shrinkage is more pronounced: an additional estimated 2.7 to 3.6 percent for Donetsk and 2.2 to 4.2 percent for Odesa Oblasts.

The phenomenon of children being orphaned to HIV/AIDS is already taking a toll on both society and *households* in Ukraine. According to the medium scenario, Ukraine will have 42,000 dual orphans due to AIDS-related deaths of both parents by 2014. The number of children who have lost at least one parent to AIDS is projected to reach 105,000-169,000 by 2014, depending on the scenario. Those children are at risk of impeded access to quality education, health care, and even basic needs, which in turn puts them at higher risk for unemployment, diseases, and poverty. Without adequate social assistance from the government and society at large for these children, a vicious cycle results.

Medical expenses associated with treating HIV/AIDS and opportunistic infections can become catastrophic at the household level, driving poor households below the poverty line. This is particularly true in countries such as Ukraine, with weak social and private insurance systems. This study makes explicit assumptions about availability and price of antiretroviral therapy (ART) to devise cost scenarios for drugs and hospitalization. Depending on the cost scenario selected, total annual AIDS care expenditure is

estimated to be 41 million-629 million hryvnia (UAH) by 2014. (This wide range is due to the high degree of uncertainty about the future costs for both antiretroviral [ARV] and non-ARV medical treatment.)

At the *business level*, the negative impact of HIV/AIDS usually includes greater direct expenditures for medical treatment, larger contributions to sickness/disability/death benefits, and the loss of investment in recruiting and training employees.

For the *health sector*, health budgets take a direct blow from the increased demand for hospital and outpatient services, with bed occupancy by HIV/AIDS patients stretching available resources. Furthermore, the medical workforce itself is likely to be decimated by the epidemic, causing a clash between growing demand for professional care and a shrinking pool of medical professionals.

In the *public sector*, HIV/AIDS impacts both revenue and expenditures. The loss of productive time for income-generating activities lowers the tax base, shifting more of the tax burden to the healthy remainder, who may in turn respond by reducing their labor supply. Like the medical sector, the public and business sectors are also likely to lose their employees to the epidemic. Direct budget revenue losses through the fall in employment due to HIV/AIDS, forgone income taxes, and unpaid pension and social security (temporary disability and unemployment) levies are estimated to reach 263-418 million UAH (in optimistic-pessimistic scenarios). At the same time, the projected additional budget expenditure in 2014 will add 109-200 million UAH for permanent disability pensions due to HIV/AIDS, 20-35 million UAH in pensions from the Social Protection Fund, 7-12 million in temporary HIV disability payments, and 3-8 million in AIDS orphan pensions. The total HIV/AIDS-related, government-funded additional benefits are estimated to be 139-255 million UAH per year by 2014.

Other negative effects include an increase in the country risk premium and possible effects on trade (both in goods and services) and balance of payments.

A comparison of the non-AIDS scenario with optimistic and pessimistic outcomes shows that Ukraine could experience a 1-6 percent reduction in the level of output (gross domestic product, or GDP, in constant prices), a 2-8 percent reduction in total welfare, and a 1-9 percent reduction in investment.

Sectoral analysis suggests that labor-intensive sectors whose labor inputs suffer from the epidemic will be among the worst affected. In the sectoral analysis based on the computable general equilibrium (CGE) model, sectors such as those producing non-energy materials and processing metallurgy and metal were found to be the most affected, with output falling by up to a third in the worst-case scenario. Given the relative share of these sectors in the country's trade structure, the pessimistic scenario's fall of 40 percent in exports of these sectors translates into a 5.5 percent fall in GDP, an 8 percent fall in total welfare, and a 9 percent fall in investment.

The availability of ART provides hope for extending life expectancy and healthy years to infected people with treatment access. The study estimates that the cost of ART ranges from 353 million UAH under the optimistic case (with 50 percent of AIDS patients in need treated) and 52 million UAH under the pessimistic one (with only 5 percent of patients getting treatment). However, without adequate treatment, such as in the pessimistic case, the cost for caring for AIDS patients is more than 80 percent higher than that cost under the optimistic ART case. The analysis confirms that providing ART is a cost-effective measure under a range of scenarios with respect to the cost of treatment. In the low-cost scenario, as little as 419 UAH per person per year on average is required to prevent a new HIV infection. Even in the high-cost scenario, it costs an average of 762 UAH per person per year to prevent one new infection, net of avoided hospitalization costs.

Policy Implications

In line with other international studies, the results from this study demonstrate that the HIV/AIDS epi-

dem has serious consequences for Ukraine's society and jeopardizes future development. In the medium term, the study shows a significant impact on economic growth, investment and social welfare, life expectancy, and population growth. If current trends continue without effective control of the epidemic, the longer-term impact could be much more devastating. The cost of inaction or ineffective action would be prohibitive.

The epidemic's distribution as shown in this study calls for attention to and effective targeting of youth, females, and the worst-infected oblasts. Prevention and treatment programs must reach these target groups, and messages and services must fit their needs.

The current transmission pattern signals a need for a prevention strategy focused on harm-reduction programs as well as sex education for youth. Even though the mode of transmission is evolving towards heterosexuals, IDUs still constitute the majority of those infected; special effort must be made to reach them.

Donetsk, Dnipropetrovsk, Odesa, and Mykolaiv Oblasts are among the worst-affected regions. Given the important role they play in Ukraine's economy, these regions should be treated with priority in implementing HIV prevention, education, and treatment measures.

Due to data limitations, this study could only model the impact of ARV treatment as one of the possible interventions. The study demonstrates that providing ARV treatment can be cost-effective and that scaled up treatment is the key to avoiding escalating health costs. ARV treatment needs to be complemented with preventive education to curb the epidemic's spread.

The epidemic is still at the early stage in Ukraine, which means that timely, effective interventions, including the availability of ARV treatment, could halt and reverse the epidemic and reduce its impact on socioeconomic development.