

## **Summary of results of the economic analysis of effectiveness of investments in HIV prevention services among key population groups**

Economic instability in the country and limited availability of resources for HIV/AIDS programs in the subsequent years may threaten the HIV prevention services for key population groups (KPGs). This is especially important given the fact that since 2017, the funding from the Global Fund to Fight AIDS, Tuberculosis and Malaria for Ukraine will cease and the country will have to undertake responsibility for the funding of such programs.

The economic burden of HIV is annually increasing. Also, in view of the need to ensure access to antiretroviral treatment for all people living with HIV. The latest national AIDS spending assessment of expenditures for HIV/AIDS response showed that treatment-related activities account for 47% of all expenditures for HIV epidemic response (according to the 2012 study). However, the available HIV cost estimates often do not provide a possibility to undertake a comprehensive assessment of the economic burden, because the service costs are often not accounted or not available.

CBA analysis is widely applied in different economic sectors and is considered one of the most popular and convenient methods to inform decision-makers on allocation of resources. This analysis allows assessing the benefits, accounting for necessary resources and making appropriate managerial decisions. The advantage of CBA is the possibility to compare costs and benefits in different or related sectors, such as social and medical. The results of CBA analysis are usually presented by benefit-to-cost ratio. If the benefits exceed the costs, the estimated program is considered cost-effective.

Within the framework of the political sustainability project (Political Sustainability), with financial support from the International HIV/AIDS Alliance (UK), the various HIV epidemic scenarios were modeled (counterfactual analysis) using AIDS Epidemic Model (AEM) for scenarios of support or absence of HIV prevention programs among KPGs and the feasibility of investments in prevention programs using cost-benefit analysis for prevention programs implementation is assessed using cost-benefit analysis (CBA).

### **Goal and objectives**

This document is intended to present the summary of the results of HIV prevention investment programs feasibility assessment and to serve as an additional data source for decision-making on these programs planning and ensuring their funding.

This main objectives of the analysis are the following:

- 1) to conduct a brief overview of literature on the economic return on investment in HIV prevention services for KPGs;
- 2) to conduct the analysis of HIV prevention costs against the potential losses caused by the absence of such programs (in a form of analysis of costs associated with provision of medical and social services for PLHIV);
- 3) to analyze and present the economic implications of HIV prevention programs implementation and the consequences of HIV prevention absence among KPGs, during the years 2018-2030;
- 4) to compare costs against benefits and make conclusions on feasibility of funding prevention programs.

**The level of the analysis:** national and regional. Regional level analysis covers Lviv, Odesa and Kherson oblasts. The modeling of HIV epidemic and costs covered the period of 2015-2030. The modeling of cost modeling was conducted on the service provider level.

This study is expected to inform the partners:

- At the national level: for development and implementation of the Strategy of ensuring HIV prevention services sustainability for KPGs (in pursuance of the National HIV/AIDS Program for 2014—2018).
- At the regional level: for advocacy of taking and implementation of political decisions to ensure gradual takeover of HIV prevention programs from donor to budget funding (after the expiration of the donor funding).

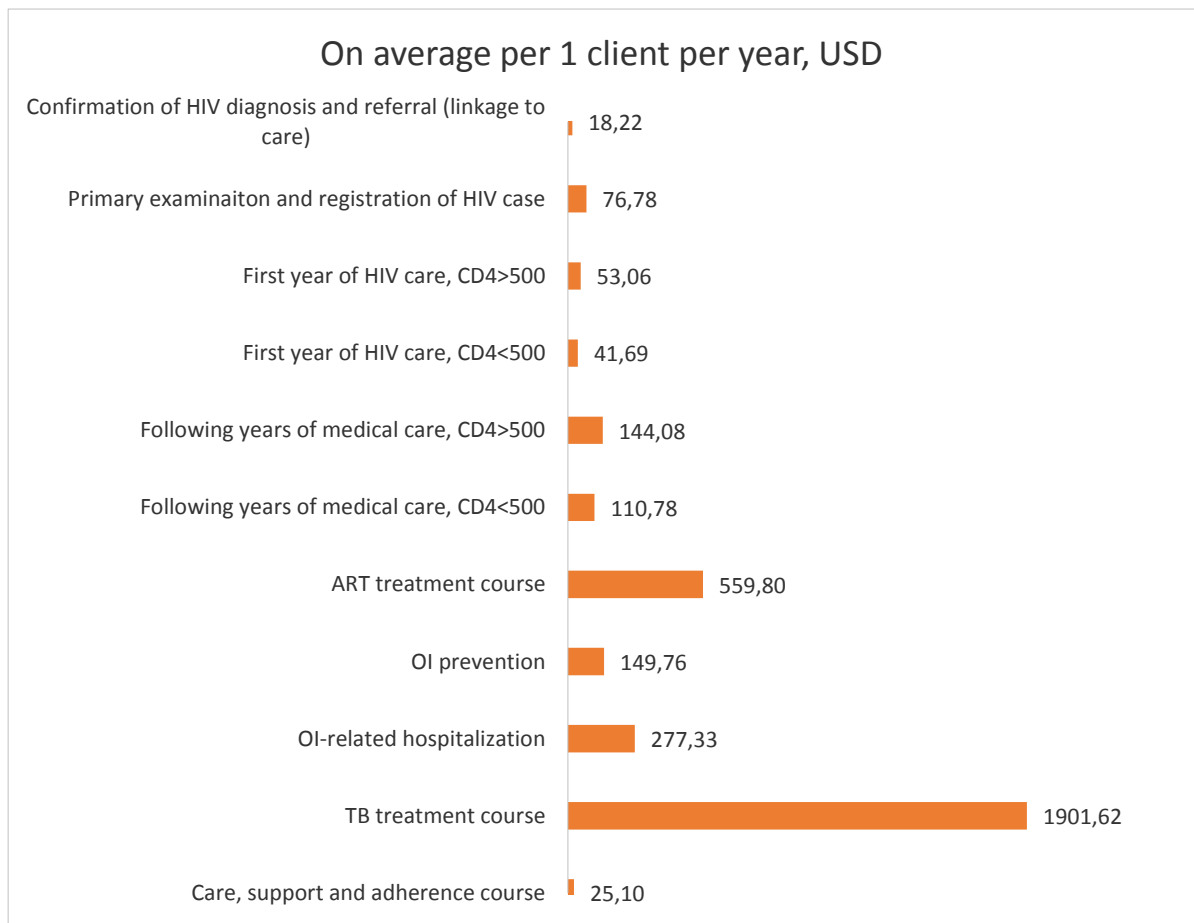
### Cost assessment

To calculate the prevention services costs in the CBA analysis we used standard cost assessments of HIV prevention programs for KPGs (with breakdown by PWID, SWs and MSM groups), as foreseen within the GF grant implementation.

| HIV risk group   | Cost of services provision per client per year | Cost of consumables | Total cost of services per client per year |
|--|--|---------------------|--|
| HIV prevention programs for people who inject drugs (PWID) | \$19,35  | \$12,37             | \$31,72                                    |
| HIV prevention programs for sex workers (SWs)              | \$25,26  | \$14,23             | \$39,49                                    |
| HIV prevention programs for men having sex with men        | \$14,48  | \$9,80              | \$24,28                                    |

With the purpose of cost modeling of services provision for PLHIV, the elements of medical and social servicing were grouped in separate blocks. These blocks are corresponding to the key stages of social and medical support to the PLHIV and include the following:

- 1) Confirmation of HIV diagnosis;
- 2) Primary examination and registration for medical surveillance;
- 3) First year of surveillance, for patients with different CD4 count
  - a) CD4 < 500 cells;
  - b) CD4 > 500 cells, including, as necessary:
    - a. ARV-therapy;
    - b. Prevention and treatment of opportunistic infections;
    - c. Care and support to patients, ART adherence and support for patients with HIV/TB.
- 4) Subsequent years of surveillance and medical assistance to patients with CD4 count
  - a) CD4 < 500 cells;
  - b) CD4 > 500 cells, including, if necessary:
    - a. ARV-therapy;
    - b. Prevention and treatment of opportunistic infections;
    - c. Care and support to patients, ART adherence and support for patients with HIV/TB.



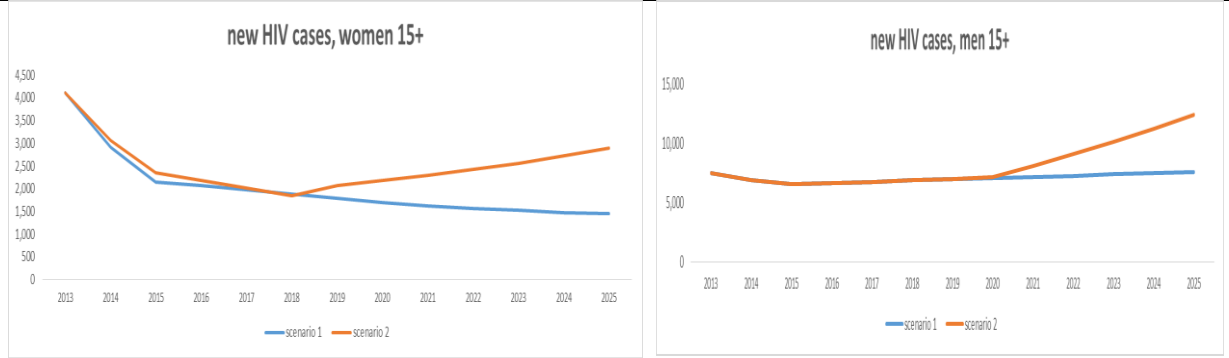
### **HIV epidemic modeling under different scenarios**

HIV epidemic modeling under different scenarios at the national level is based on historical socio-demographic indicators and epidemic development indicators: the number of newly registered HIV cases, the number of patients on ART, HIV prevalence among the risk groups and indicators of risky behaviors, etc. The following assumptions were used for modeling different scenarios.

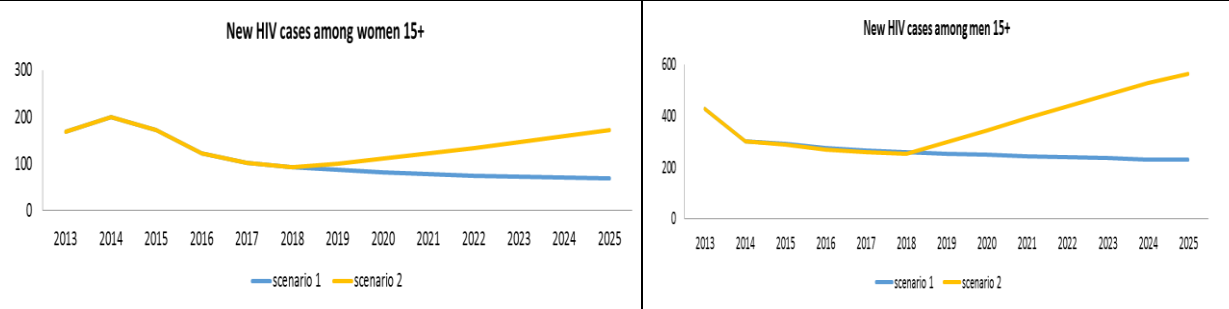
**Scenario 1: the availability of prevention programs for key population groups** and their efficiency allows ensuring the appropriate levels of safe behavior among KPGs at the level of 2013 indicators.

**Scenario 2: the prevention programs are implemented only within the available grant funding (2015-2016), and starting in 2018 prevention services are not provided**, as a result safe behavior indicators start deteriorating to the level of early and mid-2000s.

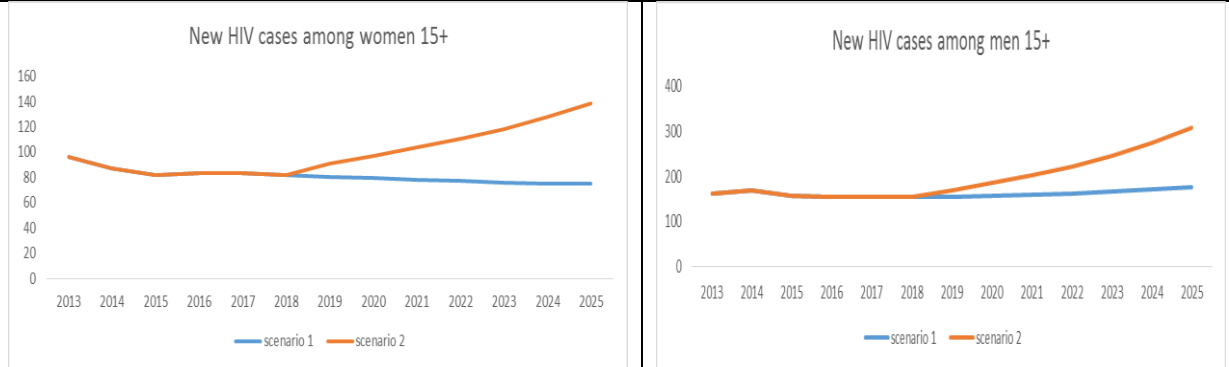
### HIV epidemic development scenarios: national model



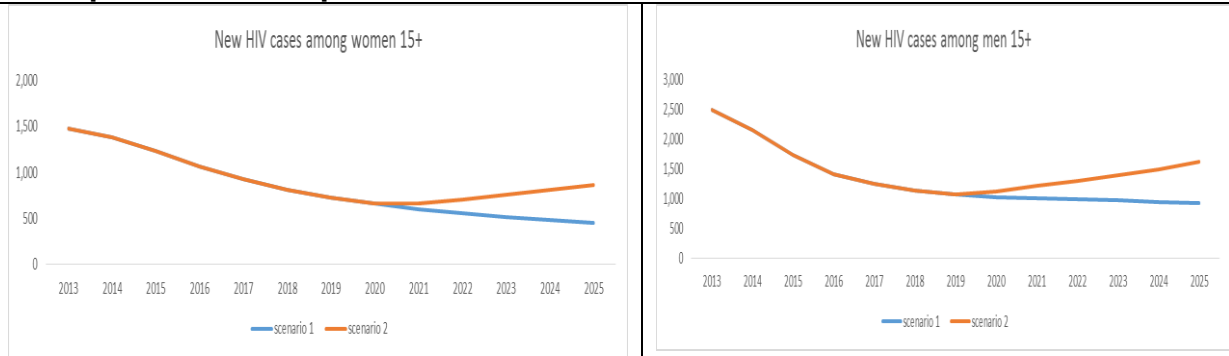
### HIV epidemic development scenarios: Kherson oblast



### HIV epidemic development scenarios: Lviv oblast



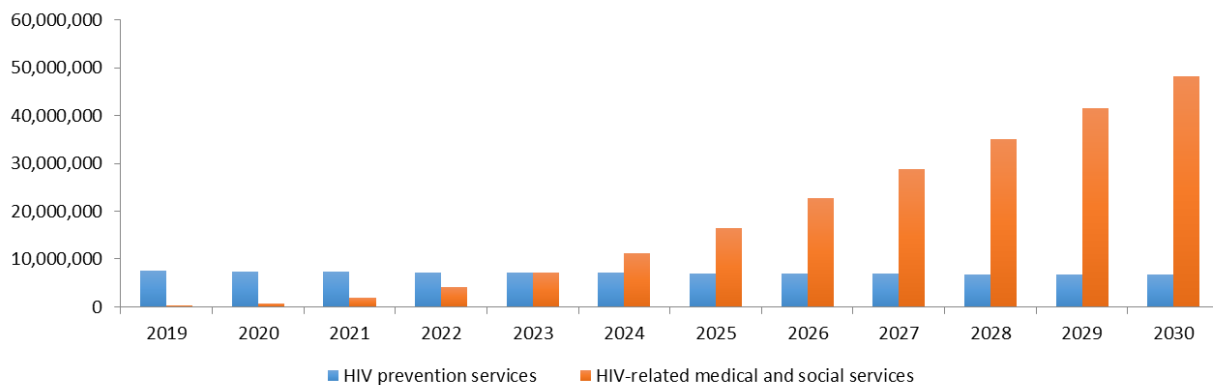
### HIV epidemic development scenarios: Odesa oblast



### Cost and benefit modeling for different HIV epidemic scenarios

Costs and benefits (in terms of resource saving) of HIV prevention programs for key population groups were compared nationwide and for specific regions against the results of different scenarios: prevention programs continuation or termination. The result of such comparison was the benefit-to-cost ratio obtained by comparing the expected benefit against expected costs. If the ratio is equal or higher than one, the proposed program is considered feasible in terms of investment.

**National model:** When comparing the costs associated with the provision of HIV prevention services, to costs associated with additional new HIV cases, the expenditures will become equal since 2023 and further on medical and social services will cost more than preventive services.



As investments and further expenditures have economic nature, the net present value (NPV) is used to bring the cost of investments (expenditures) and benefits to the same value. The 3% annual discount rate was applied.

| Indicator                                   | 2018-2030   |
|---|-------------|
| Actual costs of prevention programs, USD    | 92,553,623  |
| Actual benefits of prevention programs, USD | 218,050,485 |
| NPV of costs, USD                           | 76,033,718  |
| NPV of benefits, USD                        | 165,138,222 |
| Benefit-to-cost ratio                       | <b>2.17</b> |

Accordingly, for the national level the benefit-to-cost ratio of providing prevention services to KPGs is 2.17, which is more than twice higher the feasibility threshold for economic effectiveness.

**Kherson oblast model:** The comparison of the costs associated with the provision of HIV prevention services with losses associated with additional new HIV cases indicates that starting in 2021 the health and social services expenditures in the oblast will significantly exceed the costs of HIV prevention services.

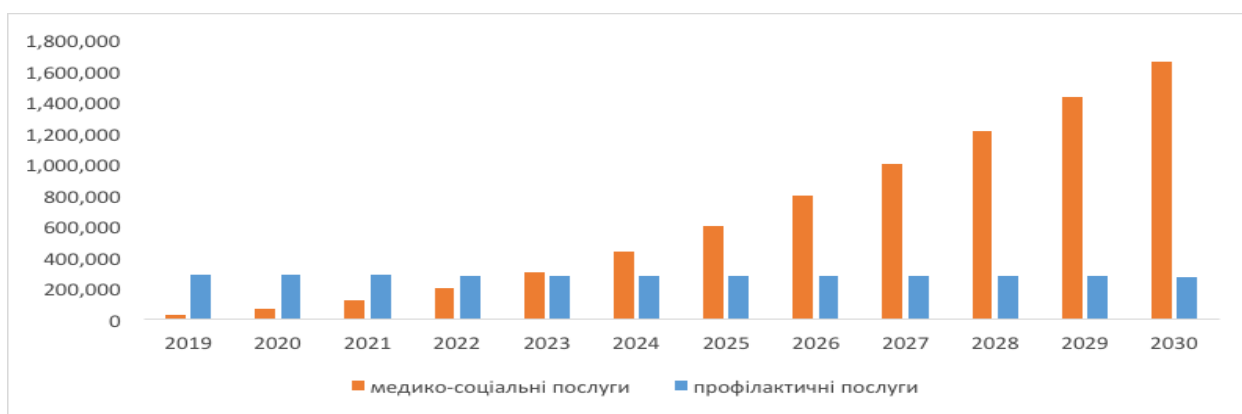


The compared costs and benefits for the oblast are calculated, as the benefit-to-cost ratio for prevention programs in Kherson oblast is defined.

| Indicator                                   | 2018-2030   |
|---|-------------|
| Actual costs of prevention programs, USD    | 2,119,807   |
| Actual benefits of prevention programs, USD | 10,956,129  |
| NPV of costs, USD                           | 1,746,673   |
| NPV of benefits, USD                        | 8,425,491   |
| Benefit-to-cost ratio                       | <b>4.82</b> |

After adjustment of actual costs to the NPV, the benefit-to-cost ratio was calculated for HIV prevention programs among KPGs in Kherson oblast. According to the results of CBA analysis, this ratio was 4.82, which almost five times exceeds the feasibility threshold.

**Lviv oblast model:** Comparison of the costs associated with the provision of HIV prevention services with losses associated with additional new HIV cases indicates that since 2023 the health and social services expenditures in the oblast will significantly exceed the costs of HIV prevention services.



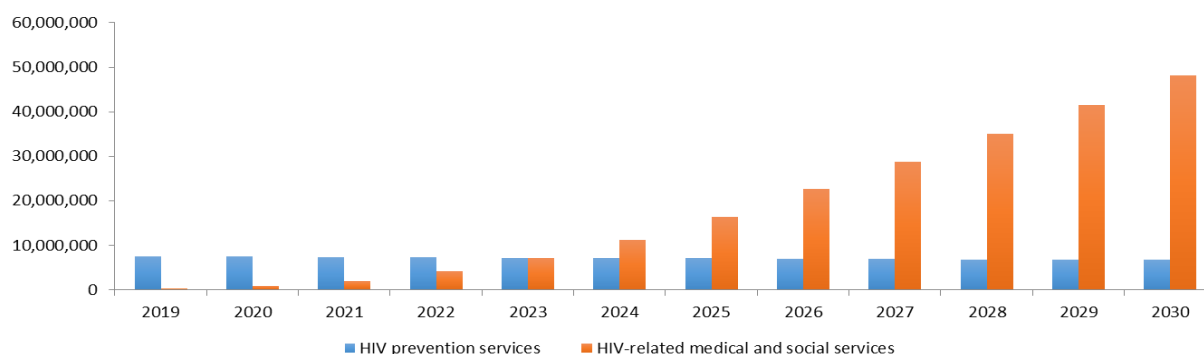
The costs and benefits for the oblast are compared, and benefit-to-cost ratio for prevention programs in Lviv oblast is calculated.

| Indicator                                   | 2018-2030   |
|---|-------------|
| Actual costs of prevention programs, USD    | 3,634,342   |
| Actual benefits of prevention programs, USD | 7,847,312   |
| NPV of costs, USD                           | 2,978,901   |
| NPV of benefits, USD                        | 5,981,199   |
| Benefit-to-cost ratio                       | <b>2.01</b> |

After adjustment of actual costs and benefits to NPV, the benefit-to-cost ratio was calculated for HIV prevention services among KPGs in Lviv oblast. According to CBA analysis, this ratio is 2.01, which exceeds the programs feasibility threshold more than twice.

**Odesa oblast model:** Comparison of the costs associated with the provision of HIV prevention services with losses associated with additional new HIV cases indicates that

since 2023 they almost equal HIV-related medical and social expenditures in the oblast, and in subsequent years they will significantly exceed the costs of HIV prevention services.



The actual costs and benefits for the oblast are calculated, as well as benefit-to-cost ratio for prevention programs in Odesa oblast.

| Indicator  | 2018-2030   |
|--|-------------|
| <b>Actual costs of prevention programs, USD</b>    | 9,908,810   |
| <b>Actual benefits of prevention programs, USD</b> | 23,763,494  |
| <b>NPV of costs, USD</b>                           | 8,119,278   |
| <b>NPV of benefits, USD</b>                        | 18,003,207  |
| <b>Benefit-to-cost ratio</b>                       | <b>2.22</b> |

Accordingly, after bringing the actual value to NPV, the benefit-to-cost ratio of prevention programs is calculated for Odesa oblast. This ratio is 2.22, which more than two times exceed the threshold for feasibility of investing in prevention programs.

**Conclusions:** Based on the results of the CBA analysis, it can be concluded that the implementation of HIV prevention programs among key population groups at the national level is cost-beneficial, because the benefits of implementation of the programs exceed the costs. The ratio of benefits to costs in modeling for the period until 2030 is 2.17, and is higher than the threshold for determining programs feasible in terms of investments.

These results show that each dollar invested in existing prevention programs by 2030 can save \$2.17 for the funding agencies. These is achievable due to the outcomes of prevention programs that lead to prevention of HIV infections, which in turn results in savings related to no need to provide services for averted HIV cases.

The results of the analysis should serve as an additional argument for decision-making on prevention programs support in the regions and nationwide, as well as seeking their funding from state and local budgets.

It should be also noted that prevention programs implemented by the sub-recipients of ICF "International HIV/AIDS Alliance in Ukraine" also cover prevention of hepatitis B and C, and STIs. The averted costs of treatment and other components of medical servicing related to these infections are not included in the analysis, thus, prevention programs implementation benefits might turn out even higher.