PREDICTORS OF ART INITIATION AND VIRAL SUPPRESSION IN A LARGE COHORT OF HIV PATIENTS IN UKRAINE

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Background

Rapid initiation of ART, treatment adherence support, proper management of virologic failure are important strategies for reaching the ambitious 90-90-90 goals in Ukraine and globally. Key national stakeholders and international donors have set ambitious fast track goals to increase the number of patients from 88,270 on 01/01/2018 to 140,000 by the end of 2018. This study was commenced to obtain reliable data on key treatment quality indicators, contributing factors and trends to inform program planning.

Methods

Data from medical charts of all patients who received care at HIV facilities in 2010-2016 in 18 out of 27 regions of Ukraine were entered into an electronic medical record system. After verification of data quality, depersonalized datasets linked by unique patient code were extracted at each facility and merged for analysis.

This analysis focused on the effect of clinical variables (HIV mode of transmission, clinical stage, CD4, VL, TB, HCV, injecting drug use [IDU]) on time from diagnosis to ART initiation and to viral suppression (<200cp/ml). The entire dataset, excluding children younger than 15 at diagnosis, was analyzed using Cox proportional hazard models.

Results

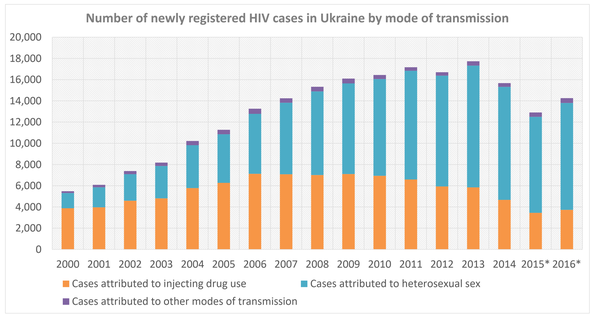
The cohort included 37,690 patients with HIV infection, approximately 30% of all patients receiving care in Ukraine in 2016. Average age at diagnosis 46.4% were females. Median time from diagnosis to ART was 26 months (95%CI: 25.0-26.9) and 14 months (95%CI: 13.7-14.3) from ART to viral suppression. Multiple significant predictors were identified for both outcomes (see Table). Notably, the time to ART initiation was increasing with male gender (aHR=.91), negative TB status (aHR=0.9), being at early clinical HIV stage (aHR=.53), IDU mode of transmission (aHR=.77). The chance of getting ART was increasing with lower CD4 (aHR=4.1 for CD4<200), reporting no recent IDU (aHR=1.11), having positive TB test (aHR=1.18), homosexual mode of transmission (aHR=1.18). Viral suppression was associated with younger age (aHR=.98), earlier clinical stage (aHR=1.08), having negative TB test (aHR=.86), IDU mode of transmission (aHR=0.93). Overall, coverage of key clinical assessments was not universal, and completion was associated with both outcomes.

Conclusions

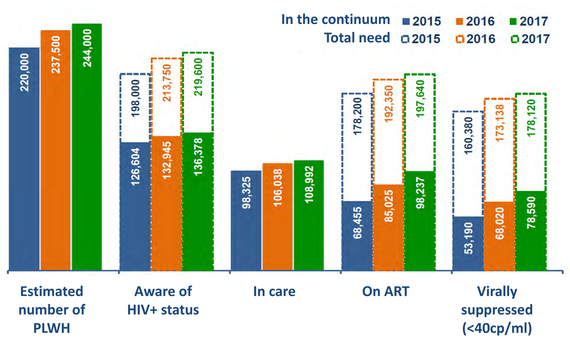
Quality of HIV care in Ukraine, characterized by coverage of key clinical tests, time to ART initiation and viral suppression indicators remains suboptimal. Patients with advanced disease had priority for ART, reflecting the delayed adoption of test-and-start strategy..

Background

- PWID-driven HIV epidemic in Ukraine shows signs of decline, most notable in highly affected regions
- Estimated 244,000 people live with HIV and 10,500 new HIV cases annually (Spectrum 2015)
- The Fast track plans are set to enroll 140,000 people on ART by the end of 2018, and 180,000 by the end of 2020



Official case registration data show that the number of newly registered cases is declining since 2012, and the number of cases attributed to IDU is declining since 2008.



The HIV treatment continuum is demonstrating significant gaps.

Methods

Data collection

- The data were extracted from an electronic medical record system (STMA) routinely used by clinical facilities for clinical data management and reporting
- The system was used as an interim solution before the national Medical Information System was implemented
- Medical charts of all patients receiving care in 2010-2016 were entered by clinical staff
- 10% of charts were re-entered to verify data quality
- The depersonalized datasets (lined by unique identifier) were extracted and submitted for analysis

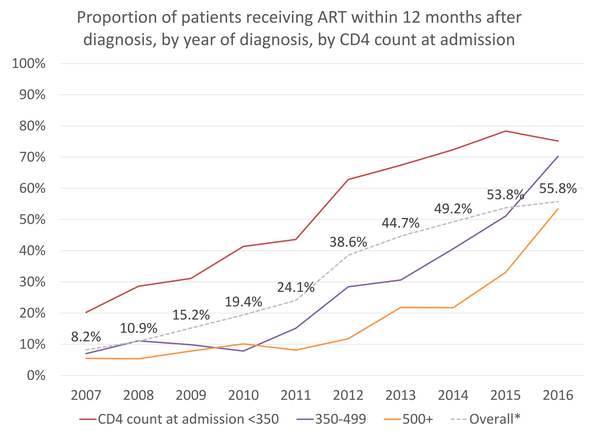
Dataset

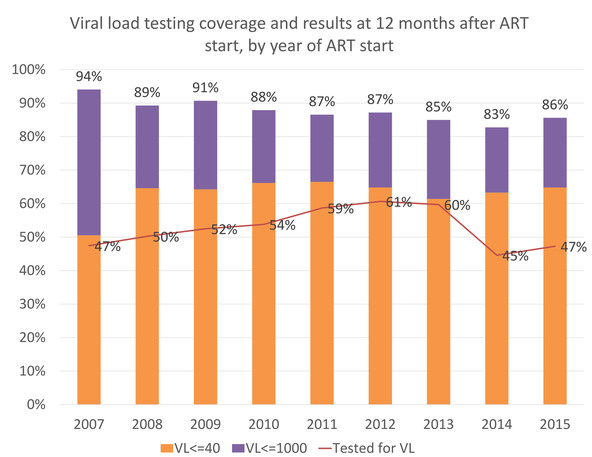
- The combined dataset included data 18 out of 25 regions of Ukraine that have 62,9%70f all Ukrainian population and 58,6%1 of patients enrolled in HIV care in Ukraine in 2015
- The cohort for this analysis included 37,690 patients, approximately 30% of all patients receiving care in 2016.
- The data included
  - dates of HIV diagnosis, registration in care, ART initiation and discontinuation, death,
  - prescription of ART regimens
  - Dates and results of tests for CD4, VL, HCV and HBV
  - Date and cause of death

Analysis

- Survival methods were used to analyze time to events (ART initiation, viral suppression)
- Kaplan-Meier method for univariate analysis
- Cox regression for multivariable analysis to identify predictors of main outcomes
- The STMA database and export files were developed in MS Access; the final dataset with de-identified personal data was analyzed using SPSS version 21 for Windows

Results: Time to ART and viral suppression



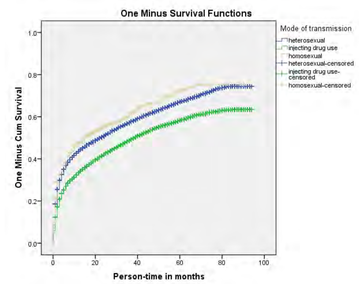


Results: Predictors of ART initiation and viral suppression

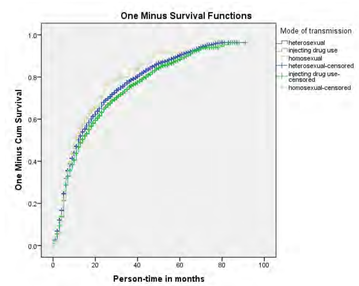
		% started ART within stratum	HR (95% CI)	aHR (95% CI)	% virally supressed	HR (95% CI)	aHR (95% CI)
Age			0.995(0.994-0.997)	0.988(0.987-0.990)		0.98(0.98-0.99)	0.98(0.98-0.99)
Sex	females	59.3%	ref		59.5%		
	males	54.0%	0.90(0.87-0.92)	0.91(0.89-0.94)	54.4%	0.89(0.86-0.91)	1.01(0.98-1.05)
CD4	Untested	34.2%	ref		14.9%		
	<200	82.6%	3.62(3.48-3.76)	4.07(3.86-4.29)	51.8%	6.88(6.20-7.64)	1.57(1.40-1.75)
	200-349	77.1%	2.76(2.64-2.87)	3.37(3.20-3.56)	61.8%	7.58(6.83-8.42)	1.37(1.22-1.53)
	350-499	52.2%	1.51(1.44-1.59)	1.90(1.78-2.02)	66.4%	7.82(7.03-8.69)	1.21(1.08-1.36)
	500+	31.4%	0.82(0.77-0.87)	1.03(0.96-1.11)	68.0%	7.29(6.56-8.11)	1.04(0.92-1.16)
VL<200	Untested	51.0%	ref				
	No	67.4%	1.32(1.28-1.36)	1.01(0.97-1.04)			
	Yes	50.3%	0.80(0.74-0.86)	0.75(0.70-0.82)			
Clinical stage	unverified	58.7%	ref		37.9%		
	stage I-II	42.5%	0.55(0.53-0.57)	0.53(0.51-0.56)	61.3%	2.60(2.45-2.75)	1.08(1.00-1.16)
	stage III-IV	67.5%	1.15(1.11-1.19)	0.81(0.77-0.86)	58.6%	2.19(2.08-2.32)	0.88(0.82-0.95)
IDU status	unverified	53.8%	ref		57.1%		
	no current idu	63.5%	1.18(1.15-1.22)	1.11(1.07-1.15)	56.7%	1.10(1.07-1.14)	1.20(1.16-1.24)
	current idu	54.1%	0.92(0.84-1.00)	0.96(0.87-1.05)	54.1%	1.03(0.96-1.11)	1.22(1.13-1.33)
	on OAT	64.7%	0.98(0.81-1.20)	0.91(0.74-1.12)	60.3%	1.07(0.93-1.23)	1.24(1.07-1.43)
HCV status	Untested	51.5%	ref		55.0%		
	Yes	65.6%	1.28(1.23-1.33)	1.08(1.04-1.13)	60.0%	1.15(1.11-1.19)	1.03(1.00-1.08)
	No	65.9%	1.35(1.30-1.39)	1.14(1.10-1.18)	57.3%	1.20(1.16-1.24)	1.07(1.03-1.12)
TB status	Untested	50.8%	ref		61.2%		
	No	61.1%	1.17(1.13-1.21)	0.90(0.87-0.94)	55.4%	0.90(0.88-0.93)	0.86(0.84-0.89)
	Yes	74.2%	1.76(1.69-1.82)	1.18(1.13-1.23)	49.3%	0.91(0.87-0.95)	1.04(0.99-1.09)
Mode of transmission	heterosexual	58.3%			60.2%		
	injecting drug use	50.3%	0.76(0.74-0.79)	0.77(0.74-0.80)	59.0%	0.91(0.88-0.94)	0.93(0.89-0.96)
	homosexual	61.6%	1.12(0.98-1.28)	1.18(1.03-1.36)	58.1%	1.06(0.91-1.24)	1.06(0.91-1.24)
	other	50.2%	0.94(0.82-1.06)	0.93(0.82-1.06)	54.9%	0.85(0.74-0.98)	1.03(0.89-1.18)

Results: Time to ART and viral suppression by mode of transmission

Time from diagnosis to ART initiation, by mode of transmission



Time from ART initiation to viral suppression, by mode of transmission



Conclusions

- Enrollment to ART has accelerated significantly in the past decade
- However, the enrollment rate (55.8% within 12 months of diagnosis) remains suboptimal
- Patients with advanced disease had priority for ART, reflecting the delayed adoption of test-and-start strategy
- The rate of viral suppression remains stable at about 86% reaching the level of <=1000 cp/ml within 12 months of ART initiation
- Coverage by essential clinical tests (TB, HCV, HBV) and assessment of drug use remains suboptimal
- Mode of transmission is a strong predictor of ART initiation, with more limited effect on viral suppression
- Current IDU is delaying ART initiation, but does not influence viral suppression
- Data from electronic medical records provide a unique opportunity for on-demand review of key quality indicators as well as in-depth study of trends and contributing factors for program planning.

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The authors declare no conflict of interest

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