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Progress towards HCV micro-elimination in an urban HIV infected cohort

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Introduction

- Direct acting antivirals (DAA) lead to high rates of hepatitis C (HCV) cure
- The World Health Organization (WHO) has called for HCV elimination by 2030
- The WHO targets set to be achieved by 2030 (relative to 2015) are
  - 90% reduction in new infections
  - 65% reduction in hepatitis related mortality
- Key milestones to accomplish these goals include
  - Diagnosis of 90% of HCV infected individuals
  - HCV treatment in 80% of diagnosed individuals
- Similarly, the Joint United Nations Program on HIV and AIDS (UNAIDS) HIV 90-90-90 targets are that, by 2020,
  - 90% of people with HIV (PWH) will know their HIV status, 90% of these will receive antiretroviral therapy (ART) and 90% of these will be virally suppressed
- Micro-elimination refers to breaking down global goals into smaller and more easily achievable treatment and prevention goals using targeted methods for individual sub-populations
- PWH have been identified as a population in which HCV micro-elimination should be prioritized

Objective

- To examine progress through the HCV care continuum and ongoing barriers to HCV micro-elimination among PWH

Setting

- The Johns Hopkins HIV care model provides comprehensive HCV care within an HIV infrastructure using care teams consisting of a clinician, nurse, pharmacist and social worker to ensure continuity of care
- The co-located viral hepatitis clinic provides comprehensive care, including testing, evaluation, treatment, pharmacy prior authorization, and support for patient assistance program (PAP) applications for patients who have been denied insurance coverage for treatment
- In the state of Maryland, where the Johns Hopkins Hospital is located, the Department of Health has established criteria for HCV therapy paid for by Maryland Medicaid During the study period, payment for HCV therapy by Maryland Medicaid was restricted to patients with METAVIR stage F2 or greater liver disease

Methods

- **Design:** Cohort analysis of data from HCV infected PWH engaged in HIV care at Johns Hopkins Hospital
- **Participants:** Persons with HIV and active HCV infection who attended at least one HIV care visit in 2 or more consecutive years between January 1, 2013 and December 31, 2016.
- **Measurements:** Patients were followed through December 15, 2018 for HCV care referral, HCV treatment initiation, cure or death.
- **Analyses: T**he proportion of study population referred for HCV care, attending HCV care, prescribed HCV treatment, initiating HCV treatment, and achieving SVR were calculated over the study period
- Cox proportional hazard models were used to evaluate factors associated with treatment initiation

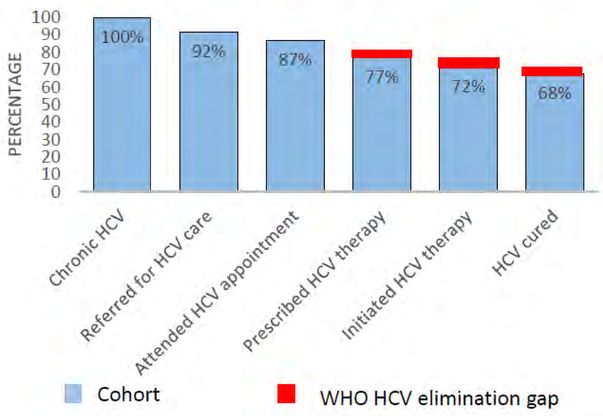
Results

Table 1:Characteristics of participants at first HIV care visit (2013-2016)

Characteristic	N	n (%) or median (IQR)
Age, years	593	54 (50-58)
Male sex	593	400 (67.5)
CD4 T cell count, cells/mm^3		
<200		80 (13.6)
200-350		118 (20.0)
>350		392 (66.4)
HIV RNA copies/ml	590	20 (20,87)
On antiretroviral therapy	593	553 (99.3)
On ARV and HIV RNA <400 copies/ml	590	460 (78.0)
HIV transmission risk factor	593	
Injection drug use		430 (72.5)
Men who have sex with men		65 (11.0)
Heterosexual		312 (52.6)
Recent hazardous alcohol use (AUDIT c)*	527	
No		456 (86.5)
Yes		71 (13.5)
Recent drug use (preceding 3 months)	527	
None (included marijuana)		420 (79.7)
Recent illicit drug use		107 (20.3)
Any prior psychiatric diagnosis	593	344 (58.0)
HCV Genotype	559	
1a		419 (75.0)
1b		118 (21.1)
Other		22 (4.0)
Fib 4 Score	585	
<1.45		152 (26.0)
1.45-3.24		291 (49.7)
≥ 3.25		142 (24.3)
Insurance	584	
Medicaid		297 (50.9)
Medicare		228 (39.0)
Other insurance		4 (0.7)
Proportion of scheduled HIV care visits missed in the preceding year	593	
0%		472 (79.6)
25-49%		11 (1.9)
≥ 50%		110 (18.6)

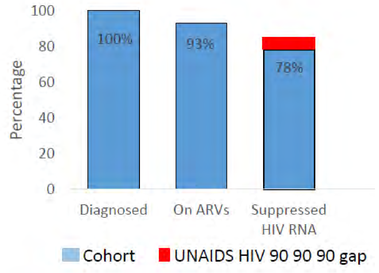
*Recent hazardous alcohol use: Score of 4 or above for men and 3 or above for women on AUDIT C done within 3 months preceding HCV treatment initiation or most recent HIV care visit

Figure 1 : HCV care continuum with WHO elimination gaps



*HCV cured group includes 397 (66.9%) with sustained virologic response and 9 (1.5%) with an undetectable HCV RNA after end of treatment but <10 weeks after end of HCV treatment

Figure 2: HIV Care Continuum with HIV 90 90 90 gap



- 30 deaths occurred among 593 individuals prior to HCV treatment initiation (5.2%; mortality rate: 18.6 per 1000 person-years)
  - 10 (33.3%) liver related
  - 13 (43.3%) non-liver related deaths
  - 7 (23.3%) unknown cause of death

Table 2: Factors associated with HCV treatment initiation

Characteristic	Crude Hazard Ratio (95% CI)	Adjusted Hazard Ratio (95% CI)
Sex		
Male vs Female	1.38 (1.12-1.69)	1.17 (0.95, 1.45)
Race		
African American vs Other	1.12 (0.81, 1.56)	0.96 (0.68,1.37)
Fibrosis Stage ¥		
Stage F0-F1	1.0	1.0
Stage F2 or greater	**1.50 (1.19,1.89)**	**1.48 (1.17,1.88)**
Missing	0.77 (0.60, 0.98)	0.77 (0.60, 0.99)
Insurance		
Medicaid vs Medicare	**0.64 (0.52,0.79)**	**0.75 (0.61,0.92)**
Time-varying covariates		
Age (years)		
≥50 vs <50	**1.41 (1.12, 1.77)**	1.09 (0.85, 1.39)
On ARV and HIV RNA <400		
No vs Yes	**0.24 (0.15 , 0.40)**	**0.29 (0.18, 0.49)**
Recent drug use		
Illicit drug use vs None	**0.71 (0.54, 0.92)**	0.83 (0.63, 1.09)
Missing vs None	0.75 (0.52, 1.09)	0.95 (0.64, 1.42)
Proportion of missed HIV visits €		
1-24% vs 0%	**0.63 (0.48 , 0.84)**	**0.72 (0.54, 0.97)**
25-49% vs 0%	**0.51 (0.38, 0.68)**	**0.66 (0.49, 0.89)**
≥ 50% vs 0%	**0.28 (0.18, 0.42)**	**0.39 (0.25, 0.60)**

Significant factors highlighted in Bold font

¥ Fibrosis stage of F0-F1 defined based on non-invasive testing score cutoffs of a fasting liver stiffness measurement of ≤7.9 KPA or FibroTest of <0.48 and F2 or greater defined as fasting liver stiffness measurement of >7.9 KPA or FibroTest of ≥0.48. Data available on 368 of 593 patients.
€ Proportion of missed HIV visits of total scheduled HIV visits starting 1 year prior to first HIV visit

Summary

- HCV treatment outcomes have improved significantly in the oral DAA compared to interferon era
- There remain enormous challenges to elimination of HCV and HIV as public health threats
- The convergence of suboptimal HIV care engagement and untreated HCV infections underscore the importance of developing integrated strategies for HIV and HCV elimination

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