Successful cascade of care and cure HCV in more than 2000 drugs users: how increase HCV treatment rate in drug users by nurse outreach care, since screening to treatment.

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Background: Although highest European screening rate in France, 33% of patients didn’t take care of hepatitis C because there were no diagnosed. Drug injection was main contamination route of hepatitis C virus (HCV) in France and western Europe since 1990. French guidelines were to treat all inmates and drug users, even fibrosis level. Access of HCV screening, care and treatment in drugs users, prisoners and homeless was low in France. They were considered as difficult to treat populations. All these patients need support especially psycho-educative interventions.

Method: Hepatitis Mobile Team (HMT) was created in July 2013 to increase screening care and treatment of hepatitis B and C patients. HMT was composed of 1 hepatologist, 3 nurses, 1 secretary, 2 social workers, 1 health care worker, for a cross-disciplinary approach.

Objective: Increase outreach screening care treatment access and cure of our target population. Patients and methods Target population was drugs users, prisoners, homeless, precarious people, migrants and psychiatric patients. We proposed part or all of our services to our medical and social partners. There were 15 services for 42 medical and social units in half million people area. There were 4 steps: for early detection and primary prevention 1. screening by Point of Care Testing PDBS (dried blood test) for HIV HBV HCV 2. Green thread: outside POCT/DBS and FIBROSCAN* in specific converted van. 3. Outreach open center 4. Drug users information and prevention 5. Free blood tests in primary care for patients without social insurance 6. Staff training. For linkage to care and fibrosis assessment: 7. Social screening and diagnosis (EPICES score) 8. Mobile liver stiffness Fibroscan* (indirect measurement of liver fibrosis) in site 9. Advanced on-site specialist consultation. For access to treatment: 10. Easy access to pre-treatment commission with hepatologists, nurses, pharmacist, social worker, GP, psychiatric and/or addictologist. 11. Low cost mobile phones for patients. For follow up during and after treatment 12. Individual psycho-educative intervention sessions 13. Collective educative workshops 14. Peer to peer educational program 15. Specific one day hospitalizations. All services were free for patients and for partners.

Results: from 2013 July to 2017 December, we did 4021 DBS for 3291 people (2053 HCV DBS) and 1165 Fibroscan*. HCV new positive rate was 19.8%. Our HCV active file was 504 patients included these 19.8% new patients screened by DBS; 96% realized HCV genotype, HCV viral load and FIBROSCAN. DAA treatment was proposed to 94%; 78% started treatment, 12% were lost follow up and 4% refused treatment. After treatment, there was 5 relapse and 3 reinfections by drug injection. Our cured rate was 76%. Sociological evaluation of our program showed that 4 program qualities for patients were free access, closeness [outside hospital], speed [of the results] and availability [of nurse and social workers].

Conclusions: Specific nurse follow-up of drugs users and other HCV high-risk patients including screening, early detection, diagnosis and treatment increase rate of treated and cured patients, with low rate of relapse and new infections.

Financial relationship with: GILEAD, AbbVie, MSD

Intergrating Hepatitis C Virus Screening and Linkage to Care of Baby Boomers at Community Hospital Emergency Department

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Background: Hepatitis C virus (HCV), is a major community health challenge, causing acute and chronic liver infection (WHO, 2017). Early screening and diagnosis are crucial in minimizing and eliminating this infection [CDC, 2015], especially since most people harboring this disease are asymptomatic and can unknowingly transmit the virus to others [WHO, 2017]. Holy Name Medical Center (HNMC) Teaneck, NJ, USA Emergency Department (ED) has taken a central role toward elimination by integrating HCV screening into the existing patient-care workflow by increasing routine screening and optimizing linkages to care to close the loop for these patients.
The baby boomer population (people born 1945-1965) represents three-quarters of all HCV cases nationwide, which is a significant segment of the local community population who utilize HNMC. Prior to February 2016, none of our baby boomer patients visiting the ED at HNMC were tested for HCV. In February 2016, HNMC collaborated with Gilead Sciences to offer free HCV screenings to baby boomer ED patients. Gilead’s Frontline of Communities in the United States (FOCUS) program was launched in 2010 to develop replicable model programs that embody best practices in screening for HCV and then linking the patients to healthcare. Gilead’s FOCUS program aims to make HCV screening a standard and thereby reduce the number of undiagnosed individuals.

Methods: In an effort to improve Linkage to Care (LTC), an interdisciplinary team worked to revise and refine the process for LTC thereby creating the HNMC LTC Protocol. The protocol clearly defines the process for linking patients to treatment using a multidisciplinary team approach. The interdisciplinary team included representatives from Hospital Administration, Data Science, Information Technology, Medicine, Nursing, Laboratory and Patient Access.

The LTC Protocol was initiated in May 2017. The protocol begins with sending a certified letter to the patient informing them of their results. A LTC RN Navigator then makes a follow-up phone call to HCV positive patients. She provides the patient with education regarding their diagnosis, arranging an appointment with a provider regardless of insurance coverage and assisting in transportation. For positive patients with unsuccessful follow-up contact, we set up EMR alerts to notify staff of in-house registrations. Additionally, if a patient is lost to follow-up, the Project Coordinator makes home visits with Emergency Medical Services (EMS) personnel.

Results: Since February 2016, HNMC has screened 14,000 patients for HCV of which 125 have been diagnosed with a positive RNA. After the implementation of the HNMC LTC Protocol, the LTC increased from 6% to 85%. Currently, 100 out of 125 Positive HCV patients have been appropriately linked to care.

Conclusion: As a very small number of people with chronic hepatitis infection are aware of their disease, simple and effective hepatitis screening strategies and tools still need to be developed and utilized in the general population, especially among the baby boomer generation (WHO, 2016). At HNMC, we continue to evaluate the efficacy in linkage to care and explore barriers in order to develop more successful strategies to ensure patients receive appropriate care.

No conflict of interest

03

Estimating the Impact and Costs of Scaling-Up Screening and Treatment for Hepatitis C Virus Elimination in Pakistan

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Background: Pakistan has the world’s second-largest hepatitis C virus (HCV) burden. With increasing access to highly effective direct-acting antiviral (DAA) HCV treatment, Pakistan can aim for the World Health Organization (WHO) HCV elimination targets. However, low levels of diagnosis and referral present challenges to treatment scale-up. We use modelling to project the impact and costs of screening and treatment interventions in Pakistan to reduce HCV incidence by 80% and HCV-related mortality by 65% by 2030 compared to 2015.

Material & Methods: We developed a dynamic HCV transmission model for Pakistan incorporating screening and treatment, and calibrated to national HCV seroprevalence data from 2007 (4.8%), surveys in people who inject drugs (PWID, 75-93%), and HCV prevalence trends between 1994-2014 from blood-donor data. Compared to a counterfactual of no treatment, we first determine the impact of maintaining status quo treatment levels (~150,000 annual treatments). We then estimated the impact and costs of scaling-up screening, referral, and DAA treatment interventions from 2018 for reaching HCV elimination, and explored which aspects of the cascade of care could have the greatest impact on HCV incidence, mortality, and costs. Costs were discounted at a standard rate of 3% per annum.
Results: Current levels of treatment are insufficient to reduce HCV burden in Pakistan by 2030. One-time screening of 90% of the general population in 2018 by 2030 with 80% referral to treatment results in 14 million individuals being tested and would improve treatment initiation to 335,000 treatments/year, with incidence decreasing by 24% and mortality increasing by 10%. Greater impact is achieved by prioritising screening to high HCV prevalence groups such as PWID and adults (>30+), and re-screening the general population every decade; PWID annually, which would result in 20 million persons being tested and 480,000 being treated annually, reducing incidence and mortality by 47% and 15%, respectively, by 2030. However, to decrease HCV incidence by 80% between 2018-2030 requires further scale-up of all aforementioned intervention aspects, including doubling the primary annual screening rate, increasing referral to 90%, implementing general population re-screening every 5 years, and re-connecting previously lost-to-follow-up infected persons back to care every 5 years for non-PWID; annually for PWID, with the mortality target reached by 2036. Preliminary cost estimates suggest that this screening and treatment scale-up strategy for HCV elimination in Pakistan is likely to cost USD$11 billion over 2018-2030, with two-thirds of costs coming from screening, or about USD$1,650 per cure. Alternatively, if prevention interventions halved general population and PWID transmission risk, then the same impact on incidence could be achieved with one-time prioritised screening with 80% referral, reducing the screening and treatment costs by USD$5 billion.

Conclusions: Substantial scale-up of screening, referral, and treatment interventions are needed to achieve WHO HCV elimination targets in Pakistan. This can be optimised if targeted strategies are undertaken to improve all aspects of the cascade of care, but overall costs will be considerable. Scaling up prevention interventions could substantially reduce screening and treatment costs.

No conflict of interest

04

Monitoring viral hepatitis elimination – generating reliable estimates of hepatitis C prevalence

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Background: Reliable data are needed in order to know where to strengthen the efforts towards viral hepatitis elimination and to monitor progress. Monitoring and comparing prevalence estimates between countries is challenging, due to the heterogeneous methodology in many prevalence surveys. To address this, the European Centre for Disease Prevention and Control (ECDC) contracted the Robert Koch-Institute to develop an evidence-based protocol for undertaking hepatitis C (HCV) prevalence surveys in the general population in the frame of the SPHERE-C project. A standardised protocol is needed to support EU/EEA Member States in their efforts to generate robust estimates of HCV prevalence.

Material and Methods: The evidence-based draft protocol covers three survey designs which all rely on probability-based sampling; a prospective nested survey design, a retrospective serum testing design and a stand-alone survey. In all three designs participants are asked to provide a blood sample which is tested for HCV (anti-HCV, and if reactive: PCR) and to answer questions on socio-demographics, HCV testing history, knowledge of status and risk factors. Piloting of the survey designs takes place under the SPHERE-C project, including process evaluation during the pilots. Quality assurance of all steps of the survey is defined and implemented through weekly evaluation, monitoring and data checking processes.

Results: A nested survey, with steps that resemble those of a retrospective testing design, is piloted being in Finland. Venous blood samples from the population-based national survey FinHealth 2017 (N=5917) are being tested.

A prospective nested survey is being piloted in Italy as part of a health examination survey with focus on non-communicable diseases in the context of salt consumption in particular (CUORE 2018-2019). A sample size of 890 people was calculated for the city of Catanzaro, and a random sample of the population aged 35-74 years, stratified by age and sex, were invited to take part. Participants are asked to give a venous blood sample for HCV-testing and respond to a questionnaire. Invitation
Georgia has made substantial progress toward eliminating hepatitis C. The national hepatitis C elimination program aims at achieving 90-95-95 targets by 2020: a) diagnose 90% of HCV-infected persons, b) treat 95% of those diagnosed, c) cure 95% of those treated. We aimed to assess progress toward elimination targets 3 years into the elimination program.

Materials and Methods: We estimated hepatitis C care cascade for adults [age ≥ 18 years] in Georgia. The estimated number of persons living with HCV infection was based on 2015 population-based national sero-prevalence survey, which showed that 5.6% of adult general population has chronic HCV infection (approximately 150,000 persons). Data on the number of persons screened for HCV was extracted from the national HCV screening database. Data on persons tested for chronic HCV infection through sustained virologic response (SVR) achievement were extracted from the national HCV treatment database. The data were extracted from April 28, 2015 to March 31, 2018.

Results: Since 2015, approximately 974,000 adults (35% of the adult general population of Georgia) have been screened for HCV infection. Overall 86,624 (8.9%) persons tested positive for HCV antibodies and of those 61,925 (71.5%) underwent HCV confirmatory testing with either HCV RNA or HCV core antigen. Chronic HCV infection was confirmed in 52,856 persons, representing 35.2% of the estimated 150,000 adults living with HCV.

A total of 45,334 persons initiated treatment, representing 35.3% of the estimated target population to be treated [128,250]. A total of 40,946 persons completed treatment. Of the 29,620 who were tested for cure of infection [i.e., SVR ≥ 12 weeks following treatment completion], 29,090 (98.2%) tested negative for HCV by PCR, indicative of a viral cure, representing 23.9% of the estimated target population to be cured (121,837). The SVR rate was slightly lower (97.3%) among persons with advanced fibrosis compared to those without advanced fibrosis (98.7%) [p < 0.001]. High cure rates were achieved among patients with all prevalent HCV genotypes in the country: 98.5% in genotype 1, 98.3% in genotype 2, and 97.7% in difficult to treat genotype 3.

Conclusions: Georgia has made substantial progress towards eliminating hepatitis C. During the first three years of the elimination program, over a third of the estimated people living with HCV were diagnosed, most have initiated treatment, and high cure rates are being achieved. A significant number of persons who screened themselves for HCV were diagnosed and treated.
positive for HCV have not obtained confirmatory testing, highlighting the need to improve diagnosis and linkage to care, which will be critical for achieving the elimination goals.

No conflict of interest

06

Use of facility-based provider initiated testing and counselling approach to ascertain viral hepatitis C status amongst high-burden populations in Nigeria

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Background: Viral hepatitis ranks amongst the leading causes of mortality globally. In Nigeria, an estimated 24 million persons chronically infected with HBV and/or HCV could proceed to develop advanced liver diseases, and pose a risk of disease transmission if untreated. Despite the high burden of the disease and opportunities available for treatment, approximately 95% of people infected with HCV are unaware of their status. To improve case identification, Provider Initiated Testing and Counselling (PITC) used in the HIV program and approved/recognized by the WHO was employed across two facilities in Nasarawa State, Nigeria to drive HCV case detection. Using this approach, patients visiting the facility outpatient clinics were offered screening for HCV to ascertain their status. This analysis aimed to highlight the impact of PITC at these pilot facilities in Nasarawa as a model to improve case identification in high burden environments as Nigeria works towards viral hepatitis elimination.

Methods: This analysis utilized retrospective data from facilities to determine access to and volume of HCV screenings successfully conducted using Rapid Test Kits (RTKs). Two facilities, Dalhatu Araf Specialist Hospital (DASH) and General Hospital (GH) Akwanga in Nasarawa were selected as initial pilot sites to demonstrate impact with two different health facility tiers. While healthcare worker trainings were conducted for physicians on HCV management during this timeframe, all other relevant facility-level factors including human resource capacity, laboratory and clinic workflow remained the same. Six months of retrospective data on adult HCV screening through outpatient departments (OPD) were compared pre- and post-PITC intervention and screening volumes and seropositivity were assessed. Pre-PITC data was collected from January to July 2017 for DASH and July to December, 2017 for GH Akwanga. Post-PITC data was collected from October 2017 to March 2018 for DASH and March to August 2018 for GH Akwanga

Results: Six months retrospective data were compared across two facilities pre- and post-PITC intervention (2017 – 2018). At DASH, 1650 individuals [mean:275/month] were screened pre-PITC with 14% HCV seropositive while post-PITC, 2155 individuals [mean:359/month] were screened with 15% HCV seropositive. In GH Akwanga 392 persons [mean:65/month] were screened pre-PITC with 17% seropositive while post-PITC, 790 persons [mean:132/month] were screened with 16% seropositive.

Conclusions: Implementation of PITC led to a 31% and 103% increase in patients referred for HCV screening services from the OPD clinics at DASH and GH Akwanga respectively. Sero-positivity remained relatively stable across timeframe, implying a net increase in the volume of positive patients identified and referred for confirmatory testing. Outcomes of the study shows that the PITC model may be critical to expanding access to early diagnosis to enable persons ascertain HCV status in high burden environments.

For more details concerning the PITC analysis, please contact: Owens Wiwa owiwa@clintonhealthaccess.org

No conflict of interest

07

Disproportions in the HCV incidence between Centers Addictions and Harm Reduction Units

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Abstracts

**Background:** Harm reduction strategies have been shown to decrease the incidence of HIV infection in people who inject drugs (PWID), but the results have been inconsistent when it comes to prevention of HCV infection. We aimed to examine the rate of HCV seroconversion among drug users followed at two mobile harm reduction unit (MHRU) and two Addiction Centers (AC) to evaluate HCV incidence density and associated factors to HCV seroconversion in DAA times.

**Methods:** A cohort of drug users have been followed at two Harm Reduction Unit (HRU) and two Addiction Centers (AC) in Madrid (Spain) between 2013 and 2017. The HRUs are mobile services and the AC are localized in Madrid downtown. Individuals who were HCV-negative at baseline and who had at least one re-test for HCV infection were eligible for the analysis of HCV incidence density. Kaplan-Meier methods were employed to estimate the incidence density. We calculated the hazard ratio (HR) of HCV seroconversion using Cox proportional hazard regression.

**Results:** 2560 drug users had at least an HCV test. At baseline, 890 were HCV negative and had at least one follow-up HCV test. 466 were attended in two HRU and 424 were attended in two AC. After 5 years of follow-up, 40 seroconverted for HCV (31 at HRUs and 9 at AC). HCV prevalence was 52% and 33% in URDs and AC, respectively. At December 2017, 39.4% and 43% had received DAA treatment in HRU and AC, respectively; without statistical differences. Overall incidence density of HCV seroconversion was 3.95 cases (IC 95%: (3.57 - 4.33) per 100 PY; 7.87 (IC95% 6.47 - 9.27) cases per 100 PY in subjects who were attended in HRUs and 1.45 cases (1.07; 1.84) per 100 PY in subjects who were attended in AC. In the multivariable analysis the age and time of injected drug use remained independently associated with time to HCV seroconversion [AHR]= 0.94 (0.89 - 0.98); p= 0.004 and 1.04 [IC 95% 1.0 - 1.08]; p= 0.042, respectively.

**Conclusions:** Despite efforts in HCV prevention in harm reduction units, a high incidence of HCV was found among active drug users attended in HRUs in comparation to drug users who attended at AC. Half of PWID have not been treated yet. New strategies will be implemented for younger PWID and drug users with longer intravenous drug use to avoid new HCV infections.

No conflict of interest

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**08**

**Integrated testing and integrated diagnostic platforms of Hepatitis B and C with HIV and TB in Rwanda**

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**Background:** In 2015, HBV and HCV resulted to respectively 887,000 and 399,000 deaths mostly from complications (cirrhosis and hepatocellular carcinoma), adding significantly to the global disease burden.

The national prevalence of HBV and HCV infection in Rwanda is not well documented, and the mortality related to these infections is poorly characterized. Current estimates compiled from a variety of different studies provided an HBV surface antigen (HBsAg) prevalence ranging between 1.9% and 7%, while HCV studies have suggested an anti-HCV seropositivity varying between 0.8% and 5.7%.

Access to screening, care, and treatment, in Rwanda, has been limited due to multiple reasons, including the high costs, the complexity of therapy, and limited access to diagnostics services. The national guidelines lay out the service package that should be available at each health facility level. These levels include referral, provincial, district hospitals and, health centers. All these facilities should be offering different HBV/HCV services integrated within existing HIV services countrywide and discussions are in progress for integration of HBV/HCV services in TB services especially performing HCV VL by GenExpert platform.

**Material and Methods:** For EIA testing, the first stage of the screening is the blood collection, labelling and blood decantation. This activity is being done by lab technicians and nurses from different 500 HFs in DH catchment zone and sent to 15 sites having ELISA platform through sample transportation vehicles.

Results obtained, patients with HCV Ab positives are invited for samples collection for HCV VL and then resend for HCV VL in the 9 sites performing viral load for confirmation through also sample transportation vehicles and tested there they are tested and results are sent back to health facilities.
Data obtained were analysed using SPSS 21. Bivariate and multivariate analysis were done to find factors associated with HCV and HBV.

Results: We have Existing 15 ELISA test sites and 9 VL test sites with Roche platform across the nation and these are distributed according to Provinces with additional platform

Discussions with TB division to upgrade 47 GeneXpert platforms distributed in different health facilities (one health center, district hospitals, 4 provincial and 8 referral hospitals and for HCV testing.

In recent screenings performed in Rwanda, 117,258 HIV-positive individuals were screened for the presence of HBsAg and anti-HCV. The prevalence of HBsAg and anti-HCV were 4.3% and 4.6% respectively. 182 (0.2%) HIV-positive individuals were co-infected with both HBsAg and anti-HCV. The prevalence was higher in males; HBsAg, 5.4% vs. 3.7%; and anti-HCV, 5.0% vs. 4.4 %. Moreover, it increases with age, 17.8% in people aged ≥65 years; and varied geographically.

Conclusion: Integration of Hepatitis testing in existing HIV and Hepatitis testing have been a success to the program of viral hepatitis in Rwanda, this made Rwanda an example in prevention and management of viral hepatitis in the region. However a lot need to be done in matter of testing and management of viral hepatitis by availing viral hepatitis services in all health facilities.

No conflict of interest

HCV, HBV and HIV infection and linkage to care in migrants: The Immigrant Take Care Advocacy (I.Ta.C.A.) experience in Palermo

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Background: The massive and persistent boost of migration from the Mediterranean coasts highlighted critical issues in the health care management chronic infectious diseases such HIV, hepatitis B and C in migrant population. Considering the prevalence of these infections in African countries associated with additional risk factors, connected to the ways those people travel and the time they spent in Libyan camps, before they resettled in Italy, migrants are a particularly vulnerable population. Thus it is necessary to perform a screening test for HIV, HBV and HCV, in order to start an eventual linkage to care.

Methods: Upon arrival the patients have been included in a not formal network, that connects the local healthcare institutions and the reception centres on the territory. Migrants, were screened for HIV, HBV and HCV 4 to 6 weeks after arrival. When the hospital took charge of every single patient, there was always an intercultural mediator. For those subjects with one or more diagnoses of infectious diseases, after a proper transcultural counselling intervention, a program of diagnosis and care was offered, according to the national guidelines.

Results: During the triennium 2015-2017, 2,639 migrants were observed, 28% women and 72% men with a medium age of 24 years. The 74% of migrants came from seven countries: Gambia, Nigeria, Senegal, Ivory Coast, Ghana and Mali. HIV infection was diagnosed in 57 cases. All the patients followed the diagnostic procedures according to the national guidelines for diagnosis and treatment of HIV. Antiretroviral therapy was offered to all the patients, after a proper transcultural counselling intervention. The HIV Care Cascade observed in this population highlighted: 77% of patients retained in care, patients on HAART. 68%; HIV-RNA < 20 UI/ml: 60%. HBV infection was diagnosed in 257 cases. All the patients followed the diagnostic procedures according to the national guidelines. The therapy was offered according to the latest EASL guidelines, after proper transcultural counselling interventions. We highlight that chronic HBV infection without hepatic disease was observed in 185 patients. Coinfection HBV/HIV was found in 51 patients (20.2%). The 79 % of HBV infected patients were retained in care of 79%, 50 started the treatment, and 47 had an HBV-DNA < 20 UI/ml. 24 cases of HCV infection were diagnosed. 10 were treated in our hospital according to the national guidelines, all of them completed the therapy and had a sustained virological response at the 12th week follow-up visit. 4 patients
moved to other European countries and four were lost to follow-up, HIV coinfection was found in one patient.

**Conclusions:** In the last three years, the migration phenomenon took on our territory a not negligible number of people with chronic viral infections that in the vast majority of the cases needed a pharmacological treatment. Thus, we consider essential the elaboration of working schemes that can make easier the use of the healthcare system for this population, with the objective to guarantee the right to health to every single migrant and to stop the spread of HBV, HCV and HIV.

*No conflict of interest*

**10**

**Significance of HCV drug resistance testing for Georgian hepatitis C elimination program**

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**Background:** Combination of LDV/SOF with or without ribavirin has been proved to be effective regimens for Georgian hepatitis C elimination program. As of April 2018, more than 25 000 patients received LDV/SOF containing regimen yielding SVR rates of 98.5%, 98.8% and 98.0% among HCV genotype 1, genotype 2 and genotype 3. Although overall high rates of SVR, total number of HCV patients experiencing virologic failure can be still significant. One of the major explanations for virologic failure is emergence of RASs among HCV genotype 1 and 3, however effect of RASs for treatment failure among HCV genotype 2 is still debatable.

**Methods:** We report occurrence of NS5A RASs among HCV patients experiencing virologic failure at Infectious diseases, AIDS and Clinical Immunology Research Center. HCVpatients received either 12 or 24 weeks of LDV/SOF with or without ribavirin and relapsed after treatment completion. NS5A region sequencing on post treatment specimen was performed using home based semi nested sequencing assay with the following primers: HCV-NS5a_6082_F1: ARTGATGCAACGCCGTCTAGCTT (6082-6106), HCV-NS5a_6652_R: CCCGWBAYTARTGGAARTCA (6652-6633) and HCV-NS5a_6120_F2: AACCAGYTCCCATACACTA (6120-6142). HCV NS5A sequences were analyzed by Geno2pheno [HCV] tool available at http://hcv.geno2pheno.org/index.php.

**Results:** Of 49 relapsed patients tested, 22 (44.9%) had HCV genotype 1, 2 (4.0%) HCV genotype 2, 2 (4.0%) HCV RF1_2k/1b, and 23 (46.9%) HCV genotype 3 patients respectively. Regimens included LDV/SOF 12 weeks N=15, LDV/SOF/RBV 12 weeks N=21, LDV/SOF/RBV 24 weeks N=13. Of 49 patients failed, 28 (57.1%) had at least one major substitution. Among HCV 22 genotype 1 patients, 21(95.5 %) had RASs at positions 31, 58, 92 and 93. The most prevalent combination (57.1%) was 31M and 93H followed by 93M alone (23.8%) and remaining patients had RASs at either positions 31, 58, 92 or 93 of NS5A. As of 23 HCV genotype 3 patients, only RASs detected were at position 30 among 5 (21.7%) patients. In addition, no RASs were detected among HCV genotype 2 , however both HCV RF1_2k/1b patients had RASs at either 31 or 92, 93 positions as expected for HCV genotype 1.

**Conclusion:** Our data suggests that detection of NS5A RASs among HCV genotype 1 and to a lesser extent among genotype 3 infection could guide treatment response or re-treatment interventions among patients within Georgian national hepatitis C elimination program. Thus, we recommend NS5A resistance testing for HCV genotype 1 and 3 patients failing on LDV/SOF within national hepatitis C elimination program.

*No conflict of interest*

**11**

**Micro-elimination as a strategy for addressing viral hepatitis C in Europe: are high-risk groups being left behind?**

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Background: In 2016, the World Health Assembly ratified the first-ever Global Health Sector Strategy on viral hepatitis, setting a global goal to eliminate viral hepatitis as a public health threat by the year 2030. For hepatitis C, elimination is defined as 80% reduction in incidence and a 65% reduction in mortality by 2030. Now, two years later, national health systems must set country-specific goals if they hope to achieve elimination, and seriously examine what it would take to eliminate HCV in their respective countries. To date, only six countries in the European Union/European Economic Area are on track to meet the 2030 targets. Micro-elimination has been posited as an effective way to eliminate hepatitis C. In a micro-elimination approach, national elimination goals are broken down into smaller goals focusing on individual population segments at high risk for infection such as those currently on dialysis, co-infected with HIV or incarcerated individuals. The Hep-CORE 2018 study set out to determine patient perspectives of the populations at highest risk in their countries and which population segments would benefit most from a micro-elimination approach.

Methods: The Hep-CORE micro-elimination instrument was disseminated in July 2018 as an online survey to collect data on the response to hepatitis C in at-risk populations. The survey was sent to member patient groups of the European Liver Patients’ Association (ELPA) in 28 European and 2 Mediterranean Basin countries. The survey included seven questions on overall national policy, existing actions addressing or seeking to eliminate viral hepatitis C in target populations, and questions on which populations are or should be targeted for testing and treatment. Responses were analysed descriptively as our effective sample size was one respondent patient group per country.

Results: Patient groups from 25 countries responded for a response rate of 83%. Fourteen patient groups (56%) reported that their country has a national strategy and/or action plan to address viral hepatitis. Patient groups reported that populations that are most targeted by existing programmes in their respective countries are blood donors (80%), people living with HIV (72%), and haemodialysis patients (68%). Patient groups reported that the most difficult populations to identify and treat were people who inject drugs (PWID) and are actively injecting (68%), homeless people (52%), prisoners (24%), and former PWID not engaged in harm reduction programmes (24%). Patient groups ranked active PWID (36%), prisoners (32%), and migrants from high prevalence countries (28%) as the most important populations to identify and treat.

Conclusion: Population groups at highest risk of hepatitis C virus infection were reported to still be largely unaddressed by many European countries in spite of their commitments to effectively pursue viral hepatitis elimination. Specific engagement and tailored responses for such populations must be scaled-up across Europe in order to meet the adopted elimination targets.

Financial relationships with: AbbVie, Gilead Sciences, MSD

Characteristics of patients with missing sustained virologic response (SVR) data, elimination program in Georgia

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Background: The HCV Elimination Program in Georgia, starting in 2015, set the ambitious goal of curing 95% of patients treated, defined as achieving sustained virologic response (SVR). Unfortunately, loss to follow-up may lead to biased interpretation of results if the missing tests to ascertain SVR status belong to a group of patients whose response to treatment influences the observed outcomes.

Materials & Methods: Objective of this study was to compare characteristics of HCV patients having SVR test at 12-24 weeks after completion of antiviral treatment to patients lost to follow up and not having SVR test. Data were extracted from elimination program database of clinic NeoLab, one of the major implementers of HCV elimination program. Socio-demographic, behavioral and clinical data of all patients treated with direct acting antiviral (DAA) treatment are entered in this database. Characteristics of patients who had SVR test at 12-24 weeks after treatment were compared to those who did not show up for SVR visit.

Results: Overall, 2296 DAA treated patients reached the point of 24 weeks after completion of treatment and were eligible for the analysis (patients who died or stopped the
High Efficacy and Safety of the combination HCV Regimen Elbasvir and Grazoprevir for 8 Weeks in Treatment-Naïve, non-severe fibrosis HCV GT1b-Infected Patients: Final results of the STREAGER study.

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Background: Genotype 1b is the most common HCV genotype globally, accounting for the largest proportion of infections in Europe, Latin America, Russia, Turkey, and East Asia. Reducing treatment duration can improve adherence and reduce drug exposure. Accordingly, we evaluated the efficacy of 8 weeks fixed dose single tablet combination of an NS5A inhibitor elbasvir 50 mg per day (EBR) and protease inhibitor grazoprevir 100mg per day (GZR) in treatment-naïve patients, with non-severe fibrosis (F0-F2).

Method: Analysis included 112 treatment-naïve (TN), with non-severe fibrosis (Fibroscan® lower than 9.5 kPa and Fibrotest® lower than 0.59), HCV GT1b-monoinfected patients were enrolled in STREAGER trial, a study which included 117 patients. Historic labs were used for enrollment. Subsequent genotyping by sequencing during the course of the study identified 5 patients with non-1b genotype (2 GT1a, 1 GT1h, 1 GT1e and 1 GT1i). Thus, we will include in the final analysis 112 GT1b patients. The primary end point was the proportion of patients with HCV RNA below the lower limit of quantification (LLLOQ) 12 weeks after treatment [SVR12].

Results: Mean age was 54 ± 13 years, 31 per cent were male, viral load higher than 800.000 IU per ml: 70 of 112 (62.5 per cent); ALT higher than the upper limit of normal: 51 of 112 (46 per cent). Using Fibrotest® [FT], 69 had a F0-F1 fibrosis score (FT lower than 0.32); by Fibroscan® [FS] 100 had F0-1 fibrosis score (FS lower than 7.1 kPa), FIB-4 lower than 1.45 and APRI less than 1 was found in 74 of 112 (66 per cent) and 107 of 112 (95.5 per cent) patients respectively. By the end of treatment (EOT), 94.6 per cent (106 of 112) of patients had HCV RNA indetectable. No adverse event grade III or IV related to treatment was observed. Relapse occurred in 3 patients. Viral loads before treatment of these 3 patients were as follows: 14, 16.4, 8.3 millions IU per mL. RAS (resistance associated substitutions) at relapse were respectively: Y93H; L31M, Y93H, D16V, Q30L. Then, mITT (modified intention-to-treat) SVR12 for patients with genotype 1b (after exclusion of the 5 patients with genotype non 1b) was 109 of 112 (97.3 per cent). SVR24 results will be available at the IVHE meeting.

Conclusion: High SVR12 (109 of 112, 97.3 per cent) was achieved in a TN non severe fibrosis GT1b-infected patients treated for 8 weeks by the combination of elbasvir and grazoprevir.

Financial relationships with: Abbvie, Gilead Sciences
Factors associated with high healthcare resource utilization among HIV/HCV co-infected patients in Ukraine

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Background: HIV/HCV co-infection has placed an increasing burden on the health care delivery system. Accurate estimates of resource utilization attributable to HIV/HCV co-infection are needed to inform resource allocation. This study aimed to define factors of high health care utilization indices among HIV/HCV co-infected vs HIV mono-infected patients in Ukraine.

Methods: Participants with known HIV and HIV/HCV positive status were randomly selected from the list of in-patient services for people living with HIV in Sumy region (Sumy, Ukraine) between 2014 and 2017. The data from medical documentation including the number of nights spent in the hospital (NSH) and the number of visits for in-patient medical assistance (VMA) per current year were analyzed. The relative risk (RR) of high resource utilization indices in patients with HIV/HCV co-infection and HIV mono-infection was observed. We also estimated adjusted index of relative risk (aRR) stratified by gender, age, current CD4 cells count, injecting drug use and experience of ART. High resource utilization indices were defined as ≥10 NSH and ≥2 VMA per current year.

Results: One hundred and sixty-seven persons were enrolled in the study: 111 HIV/HCV co-infected (64 % males, age (30±6.0) years), 56 HIV mono-infected (50 % males, age (31±7.3) years). The 2 study populations were well matched except for the route of HIV transmission: people who inject drugs reached 81 % in HIV/HCV co-infected vs 32 % for HIV mono-infected (p<0.001). The median CD4 cells count did not differ between groups (HIV/HCV co-infected – (323±27.65), HIV mono-infected – (251±24.65) cells/µL). There was no significant difference in receiving ART in both study populations.

The relative risk of ≥10 hospital nights for patients with co-infection was 1.6 (95% CI, 1.1-2.5, p=0.043). For co-infected subjects the relative risk of ≥2 visits for in-patient medical assistance consisted 3.2 (95% CI, 1.4-7.1, p=0.004).

In adjusted analyses in HIV/HCV co-infected vs HIV mono-infected persons, CD4 count <200 cells/µL, experience of ART and age over 40 were significantly associated with high indices of NSH (aRR=1.4, 95% CI, 1.1-1.8, p=0.038; aRR=1.2, 95% CI, 1.1-1.7, p=0.046; aRR=1.39, 95% CI, 1.2-2.4, p=0.04, respectively). Adjusted index of relative risk for high VMA rate was significant in strata of co-infected persons on ART and with CD4 count <200 cells/µL (aRR=1.8, 95% CI, 1.1-2.5, p=0.03; aRR=1.2, 95% CI, 1.1-1.9, p=0.04, respectively). Gender and a history of injection drug use were not associated with high indices of NSH/VMA in co-infected vs mono-infected group.

Conclusions: HIV/HCV co-infection in Ukraine remains associated with higher resource utilization health care indices, especially at lower CD4 counts and in patients who receive ART. These policy makers could use for planning of adequate budgets for medical care for this category of population in a context of limited resources and decentralized distribution of financial revenues.

No conflict of interest

Rationale and approaches for the treatment of young women with human immunodeficiency virus and hepatitis C virus coinfection

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Background: In Russian Federation continues to increase the incidence of human immunodeficiency virus (HIV) and hepatitis C virus (HCV) infection among young women by sexual transmission. Therefore, women of childbearing age should be given preference in deciding of initiation antiviral therapy because of the risks of mother-to-child transmission of HIV and HCV during pregnancy and childbirth. Becomes relevant, to identify the psychosocial and clinical factors that could influence antiretroviral therapy (ART), initiation of HCV therapy and adherence to long-term observation and treatment.
**ABSTRACTS**

**Materials and Methods:** Performed a comprehensive survey of 100 young women with coinfection HIV/HCV, observed in the Leningrad regional AIDS Centre. Social and psychological characteristics, clinical status, results of instrumental and laboratory measurements (CD4 lymphocytes count, HIV and HCV RNA, biochemical blood analysis) were evaluated. The purpose and response to ART and treatment of HCV with the use of direct-acting antivirals (DAAs), interferon schemes were analyzed.

**Results:** The age of the patients was 36±6 years. Most women had a long history of coinfection (9,1±5,5 years). The main social problems of women were related to work (34.2%) and family circumstances (26.3%). According to the assessment of mental status, 72% had a psychiatric diagnosis, 60% of women had a history of psychoactive substances use. The CD4 lymphocytes count was 494±29 cells/µl. 78% of patients received ART and 84.6% had high adherence to treatment. The main cases of HIV-associated diseases were candidiasis (62%), tuberculosis of various localizations (15%), viral (7%) and bacterial (3%) lesions. In 45 patients HCV RNA was detected in the blood, in a quarter (n=39) according to elastometry was identified severe liver fibrosis (METAVIR F3-4). Normal bilirubin levels were in 85%, alanine aminotransferase and aspartate aminotransferase were increased in 41% of cases. The somatic condition of women with HIV / HCV coinfection was, in almost all cases, satisfactory. Comorbid infectious and noncommunicable diseases were diagnosed in 59% of women. The majority suffered from diseases of the digestive (32.2%), urogenital (20.3%) and respiratory systems (18.6%). Nervous system diseases were diagnosed in 70%. According to the results of the ultrasound examination: 67.7% had diffuse parenchymal liver changes, 36% - diffuse changes in the pancreas structure, 24% had hepatomegaly, 13.3% - splenomegaly. Antiviral treatment of HCV was performed in 1/4 of women. Pegylated interferon in combination with ribavirin received 62.5% and in 86.6% sustained virological response was achieved. 5 patients received regimens based on DAAs with favorable results.

**Conclusion:** Identified social and psychological problems, clinical features in young women with HIV / HCV coinfection can adversely affect the treatment of both HCV and HIV infection. It is necessary to provide additional support and assistance in solving the difficulties for these women before prescribing therapy in order to increase adherence. The treatment regimen for HCV should be selected individually, depending on the presence of comorbid diseases when a woman is ready for therapy and prolonged observation. Considering the results of treatment, DAAs with no side effects and high efficiency is a priority for women with HIV / HCV coinfection.

**No conflict of interest**

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**Long term safety and efficacy of Tenofovir disoproxil fumarate (TDF) in nucleos(t)ide (NA) analog-experienced chronic hepatitis B patients.**

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**Background:** One of the major challenge in the treatment of Chronic Hepatitis B (CHB) is to maintain long-term viral suppression without promoting the selection of drug-resistant mutations and drug related toxicity. Tenofovir disoproxil fumarate (TDF) has demonstrated high antiviral efficacy in treatment-naive patients with chronic HBV infection but experience in nucleoside/nucleotide analogue (NA)-experienced patients is limited. This study assessed the efficacy and safety of TDF up to 10 years of NA-experienced CHB patients.

**Method:** We retrospectively analysed this prospectively maintained data of 132 TDF treated patients from 2006 to 2010 at tertiary care centre. For each patient, medical records were reviewed to obtain demographic information, baseline CHB characteristics, and co-morbidities. Multivariate logistic regression analyses were carried out to identify the unique association between predictor variables—including age, sex, diabetes, hypertension, pre-existing renal insufficiency, history of renal transplant, duration of therapy—and increase in Serum creatinine (Scr) or decrease in eGFR. For all analyses, a P value of <0.05 was considered to be statistically significant.

**Results:** Patients demographics included 121 males and 11 females with mean age of 54 years. Out of 132 patients 100 had chronic hepatitis and 32 had cirrhosis. At time of starting treatment mean HBV DNA, alanine aminotransferase (ALT) levels were 5.18 Log 10 IU/ml, 128 mU/ml respectively. After mean duration of 6.3 years of TDF therapy 125(94.6%), 123(93%), 67(94.3%) patients achieved a virological response, ALT normalization and HBe antigen

**No conflict of interest**
7 patients were lost to follow up. 3 patients developed HBs antigen clearance and out of them 2 developed HBs antigen seroconversion. 4 patients developed HCC, out of them 3 were expired. 17 (12.8%) patients developed renal dysfunction defined by eGFR <50mL/min by Cockcroft-Gault formula. By multivariate analysis, the only significant factors associated with an increase in SCr were a past or present history of diabetes (P=0.003) and pre-existing renal insufficiency (P=0.001).

**Conclusion:** TDF is effective and safe for NA-experienced CHB patients and should be used cautiously in patients with co-morbidities like diabetes, due to risk of renal dysfunction.

No conflict of interest

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**What are the navigation needs of newly diagnosed patients affected by viral hepatitis in Dobrogea, Romania?**

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**Background:** In Dobrogea region, Romania, HCV prevalence is of 3.2% and HBV prevalence is of 4.4%. In this context, Baylor foundation has initiated a health system navigation program for newly diagnosed persons affected by viral hepatitis. We set to evaluate support needs, to guide the interventions aimed at helping patients access treatment and care.

**Material & Methods:** A survey was designed on the following topics: knowledge regarding treatment and care entry points (where to go, what are the blood tests and treatment selection criteria), knowledge about treatment and long-term disease monitoring, practical knowledge about contacting key persons in the care process. Descriptive statistics of responses were analyzed using SPSS.

**Results:** 153 patients completed the survey, age 53.74 (SD 14.39, range 24-81), 63.2% female, 76.9% from urban area, 46% with hepatitis C. All patients were enrolled at Baylor foundation for services during April - July 2018. 70% can correctly identify at least one specialist responsible for hepatitis care in Romania, but the rest incorrectly identify GPs and homeopathy physicians. Regarding diagnosis of hepatitis: 79% know about viral load and 75% of specific antigens; only 44% know about fibrosis levels and the same percent consider that transaminases are good indicators of progress of hepatic disease. Only 26% could indicate a credible source of information about treatment and eligibility, with 23% stating that they do not know from where to get information. 56% rely on GPs to access care, although these professionals are not directly involved in the navigation process. Only 55% of respondents know what the expected effect of the treatment is, the rest not knowing or holding various incorrect information. There is general uncertainty about the medical recommendations to follow regarding the long-term care of hepatitis after treatment, with acknowledgement of importance of a healthy life-style [56%]. Respondents reported high rates of knowledge of contact data of various key persons in the system of care, such as specialists, GPs and so on (range 74.5%-89.5%) and good knowledge of services that they can access free of care within Baylor foundation.

**Conclusions:** To improve the delivery of navigation support program, it is important to assess the knowledge base of patients. GPs are invested by patients as support sources, but their role may be limited in the context of hepatitis care in Romania and this can lead to delays in accessing treatment. Wider dissemination regarding rapid entry points into care is needed. Our survey indicated that patients need health literate information about hepatitis related blood tests and about treatment eligibility criteria. Currently, patients cannot indicate reliable patient-centric sources of information. Navigation support should include a practical dimension regarding long term self-management, even after successful treatment. Most patients surveyed were actively involved in the care process. Services should build on this positive aspect and provide easy to access, reliable and health literate information, that can empower patients to manage their health issues.

No conflict of interest

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**The effectiveness of viral hepatitis C treatment with direct-acting drugs in HCV/HIV co-infected patients**

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Background: Chronic viral hepatitis C is a topical issue of modern infectology. Anti-HCV were found in a significant part of the population of Ukraine: from 2% in blood donors to 80–85% in people living with HIV and TB, which makes it possible to consider the diseases as indicator of social and medical disadvantage of society. The risk of liver cirrhosis for 20 years is from 20 to 30% and depends on various factors, including the presence of metabolic syndrome, alcohol abuse, co-infection with hepatitis B and HIV. Modern antiviral treatment with the use of direct-acting drugs to achieve a sustained virological response, which is equivalent to a healing in majority of patients.

Materials and Methods: We performed the evaluation of the effectiveness of antiviral treatment of HCV infection using direct-acting drugs in 57 patients co-infected with HIV during 2016-2018 (70% male, age (40.3±0.7) years). 41 patients (72%) noted injecting drug use, 13 (22.8%) had pulmonary TB. HCV genotype 1 was observed in 28 patients (49.2%), 2 - in 4 (7.1%), 3 - in 25 (43.9%). Liver cirrhosis (Child-Pugh Class A) was established in 5 patients (8.8%). 95% of patients (54 persons) received ART: TDF/FTC/EFV (25 people, 46.3%), ABC/3TC/EFV (6 people, 11.1%), ABC/3TC/LPV/r (5 people, 9.3%), AZT/3TC/EFV (5 people, 9.3%), other schemes - 13 patients (24%). HIV RNA was undetectable in all patients who receive ART. The median number of CD4+ cells was (620±44.8) cells/μL.

Treatment of HCV was performed according to the following schemes: SOF+DCV 12 W (3 persons, 5.3%), SOF+RBV 12 W (2 persons, genotype 2, 3.5%), SOF+LED 12 W (26 people, 45.7%) and SOF+LED+RBV 12 W (26 people, 45.7%).

Evaluation of antiviral therapy was performed by examining the patient’s blood for the presence of viral RNA at least 12 weeks after treatment (SVR12).

Results: SVR12 was achieved in 55 patients (96.5%). One of the non-respondents with genotype 2 received suboptimal treatment (SOF+RBV 12 W). The second non-respondent was a patient with genotype 3a who received treatment under the scheme SOF+LED+RBV 12 W. Conducting treatment was not accompanied by severe side effects and did not require dose adjustments or changes in course duration.

Conclusions: Modern antiviral regimens for HCV treatment are highly effective, even in the presence of HIV infection, and can cure patients in more than in 95% of cases. Drugs are well tolerated and combined with antiretrovirals.

No conflict of interest

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Molecular Surveillance of Transmission Networks for Hepatitis C Elimination in MSM (MS-TRACE): A pilot-study in Amsterdam

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Background: Acute HCV infections, especially reinfections, occur at high rates among men who have sex with men (MSM), despite a high uptake of direct-acting antivirals (DAAs). It has become apparent that a treatment-as-prevention approach alone is not sufficient to curb the HCV epidemic in this population. Clearly, more sophisticated methods are necessary to identify the sources and timing of new HCV infections among MSM.

The rapid evolution of HCV implies that infections with similar genetic sequences are likely to be related by recent transmission events. Hence real-time monitoring of clusters of closely related sequences can be informative for the design of public health interventions.

Here, we describe a micro-elimination approach aiming to monitor, control, and eventually eliminate the ongoing transmission of HCV among MSM and prevent further spread to the community at large. We present MS-TRACE (Molecular Surveillance of TRAnsmission networks for hepatitis C Elimination in MSM), as well as a pilot study of the Amsterdam MSM population.

Methods: MS-TRACE is a (near) real-time monitoring tool based on the Nextstrain platform (Nextstrain.org) which has been adjusted to fit the HCV epidemic. First positive samples were obtained between 1994 and 2018 from both HIV-positive (n=171) and HIV-negative (n=22) men in Amsterdam. Sanger sequencing of the hypervariable region HVR1 and flanking regions was performed, resulting in 525 base pair segments. Alignment, analysis, and annotation was performed using the Nextstrain pipeline: sequences were aligned using mafft, maximum-likelihood trees were inferred using RaxML, molecular-clock phylogenies were inferred using treetime. Sequences were annotated with epidemiological parameters and were visualised using auspice. Clustering of the sequences was performed using PhyCLIP.
Results: In Amsterdam, genotype 1a (63%) and genotype 4d (20%) are the major circulating variants. Of all genotype 1a infections, 24% were reinfections (n=35), whereas 17% of all genotype 4d were reinfections (n=8). We did not observe specific clustering based on chronic vs acute infections. The majority of sequences were part of a cluster and cluster introduction dates ranged from 1994 to 2004. The majority of clusters were ‘active’ clusters (i.e. at least one new infection in the past 5 years), but some inactive clusters were also observed.

Conclusion: The MS-TRACE surveillance tool can identify key targets for rapid interventions, awareness campaigns, and testing strategies. This can include strategies to prevent further spread to HIV-negative MSM and to control and eventually eliminate HCV from the MSM population. Here we presented the case study of the HCV infected Amsterdam MSM population, but clearly, the HCV epidemic among MSM is an international epidemic and is not constrained by country borders. We therefore aim to expand MS-TRACE to include international sequences, initially focusing on European countries. Furthermore, for the prospective part of this study we are collecting more epidemiological parameters in collaboration with the Public Health Service Amsterdam to obtain a more detailed picture of the epidemic among MSM. Parameters such as PrEP usage and travel history can enrich the tool greatly and could guide the municipal health services to design targeted interventions.

No conflict of interest

20 Working towards eliminating HCV among men who have sex with men in Amsterdam using an innovative multilevel approach: The NoMoreC project

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Background: In the Netherlands current transmission of hepatitis C virus (HCV) occurs primarily among HIV-positive men who have sex with men (MSM) as HCV incidence dropped to nearly zero among people who inject drugs. Early testing and treatment in combination with up-scaling of preventive measures may curb the HCV epidemic among this population. Within the MC Free (Amsterdam MSM Hepatitis C Free) consortium we developed the “NoMoreC” project aiming to reduce HCV incidence among MSM in Amsterdam.

Methods: NoMoreC includes online and face-to-face interventions aimed to increase HCV awareness and promote risk reduction behavior and willingness to test. The project web-app at www.NoMoreC.nl offers information, videos and personalized advice on risk reduction and testing options, including a C-test service. C-test is a low-cost internet-guided home-based testing service for HCV-RNA using dried-blood-spots (home-collection testing involving a certified laboratory). This service allows MSM to test confidentially using a highly sensitive test for the detection of acute HCV infection. Test results are communicated via the project’s website and online counseling starts immediately.

To help men reduce their risk for HCV (re)infection, owners of sex venues and organizers of sex parties are given advice on how to create an enabling environment for risk reduction. We developed a ‘NoMoreC toolbox’ containing items that can be used to reduce risk of infection. E-learning modules are developed to increase awareness and skills among healthcare professionals.

Results: NoMoreC is developed through active involvement of the MSM community, commercial stakeholders and healthcare professionals and was launched in February 2018. We use a promotion strategy that is created and coordinated by men of the MSM community at risk for HCV, including outreach activities and discount vouchers for dissemination via social/sexual networks. Thus far, 30 C-tests have been ordered online. Toolboxes are currently being distributed at the STI clinic and HIV treating centers in Amsterdam and 23 boxes have been ordered online. We aim to distribute 1000 tests and 450 toolboxes and we evaluate the use and effectiveness of all aspects of the interventions.
Conclusions: We expect that our multilevel approach including closely linked online and face-to-face interventions will increase the uptake of testing and engagement in preventive behaviours among MSM. When successful, this approach can be expanded to other cities that face a similar epidemic among HIV-positive MSM.

No conflict of interest

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HCV Treatment in people who use drugs actively within of a low-threshold and harm reduction setting

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Background: To eliminate HCV viremia en people who use drugs (PWUD) actively could be contribute to eliminate networks of transmission (reinfections or infections in new injectors). Our aim was to provide treatment and cure in a vulnerable, marginalised and difficult-to-reach population that consume drugs chronicaly.

Methods: A new model of HCV care for PWUD actively was implemented. Coordinated effort between Hospital Infanta Leonor (Madrid) and an NGO-operated mobile harm reduction unit (Servicio Móvil de Atención Sanitaria a Drogodependientes [SMASD]) based in Cañada Real (Madrid). The model included the HCV treatment to PWUD at the last year.

Steps: 1) Identifies, engages and tests patients (SMASD), 2) Patient navigators (nurse and social educator) accompanies HCV+ patient to the Fast Track Clinic (from the SMASD to the Hospital). Patient navigation services include: appointment scheduling, appointment reminders, accompanying patients to Fast Track Clinic (FibroScan® and confirmatory HCV RNA testing), collection of DAA therapy from hospital pharmacy. All tests are completed in <1 hour and results are received in 3–4 days, 3) Joint treatment decision between physicians at the hospital and in the harm reduction unit, 4) Patient navigators collect DAA therapy from the hospital pharmacy and deliver it to Cañada Real (Infanta Leonor pharmacy). 5) Treatment follow-up as a directly observed treatment (DOT), on site follow-up clinical appointments and blood test, therapeutic surveillance (adverse effects, adherence and interactions) and reinfection counselling was done in SMASD). Therefore, only one appointment at the Hospital was required.

Statistical: SVR12 rates for all patients who started treatment were reported on an intention to treat (ITT) basis and we included a modified intention to treat (mITT) analysis excluding non virological failures. Reinfections accounted as failures in the ITT. REDCapTM was used for data management.

Results: 165 PWUS were included and received HCV treatment. 95% used drugs at the last 3 months and 56% used drugs at the time of HCV treatment initiation. Mean age was 44 years (9.8SD), 79% were males, 76% were Spanish born and 23% had an active psychiatric illness, 73% received opioid substitution therapy, 26% were co-infected with HIV, all of whom were on ART and had been undetectable for a median period of 14 months. The overall SVR12 rate was 74% (ITT, reinfection=failure) and 92% (mITT). Two patients stopped therapy (side effects and follow-up lost). Two patients had a virological failure before SVR12. Five patients were re-infected and four of them retreated. The response to treatment was not different according to the baseline HIV status or the use of drugs or not at the time of HCV treatment initiation.

Conclusions: High rates of SVR12 were observed. Low-threshold and non-judgemental nature is essential for the success of HCV treatment in PWUD. Models of HCV care and elimination must be adapted to the circumstances and the needs of the target population. Low-threshold access and a flexible model are essential for PWUDs who are socially and mentally more unstable. Adequate treatment is only possible if the HCV treatment are carried out in the right setting where patients feel comfortable and not stigmatised or discriminated against.

No conflict of interest
Demonstrating the feasibility of Hepatitis C treatment in Cameroon

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Background: Untreated Hepatitis C can lead to chronic liver disease and death. In Cameroon, 190,000 persons of the 24 million inhabitants are estimated to be chronically infected. The efficacy of Directly Acting Antivirals (DAA) to cure hepatitis C weeks is clearly demonstrated. Despite substantial price reductions, DAA remains inaccessible for a large proportion of Cameroonian. The centralized organization of care, and insufficient diagnostic capacity for the screening, confirmation and treatment monitoring further complicate the control of hepatitis C in the country. We set up to enroll a cohort of 150 patients to demonstrate the feasibility of treating Hepatitis C with DAA, using a simplified treatment and diagnostic algorithms geared achieving high cure rates, while reducing the overall treatment costs.

Methods: HCV infected patients were identified through 6 clinics of Yaoundé hosting a gastroenterology outpatient care. Standardized treatment was based on branded Sofosbuvir/Ledipasvir or Sofobuvir/Ribavirine (negotiated at ~ 450 USD/treatment), depending on the viral genotype and stage of liver disease. Patients contributed 25% of the treatment cost. The diagnostic algorithm included HCV genotyping, two HCV viral loads (at enrolment and to confirm viral suppression at 12 weeks post-treatment), a determination of disease stage through the fibrotest, and other hematology and biochemistry investigations (~320 USD/patient). All laboratory tests were paid by the study and executed in a reference laboratory setting. Patient data were digitally collected on site.

Results: Between September 2017 and June 2018, 131 HCV patients were pre-enrolled. Among the 111 eligible patients starting treatment, 70% were female, 92% were older than 45, 50% were unemployed and 75% were living within a 20km radius from the clinic. Considering the liver disease stages, 35.5% had no or mild fibrosis, while 64.5% presented with severe fibrosis. Co-morbidities associated with older age (15% with diabetes and 40% with high blood pressure) were frequent. The most frequently identified HVC genotype was genotype 4 (54%), followed by 1 (35%) and (11%). Three patients with deteriorated clinical condition at study entry, died after treatment initiation. There were no losses to follow up. Out of the 38 patients completing treatment, 35 had a suppressed viral load 12 weeks after the end of the treatment, translating into a cure rate of 95%.

Conclusion: Delivering high quality DAA treatment in ‘real life’ clinical settings of Cameroon is feasible. The structures and flow of work put in place can be used to expand DAA treatment with a simplified diagnostic and consultation algorithm to a larger cohort of patients recruited from other entry points (such as the blood banks or the HIV clinics) and from different regions of Cameroon. Financial mechanisms, performance supporting the increased accessibility of DAA and diagnostics testing within a national treatment program are needed. Pay for Performance approach and partial patient contribution will be used for the next phase of this program.

No conflict of interest

Efficacy and Safety of Sofosbuvir/Velpatasvir for the Treatment of Patients with Chronic Hepatitis C Genotype 1-6 Infection: Integrated Analysis of Eight Phase 3 Clinical Trials

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Background: The World Health Organization (WHO) estimates that 71 million people are chronically infected with the hepatitis C virus (HCV) worldwide, and has a goal to eliminate this disease as a public health threat by 2030. The once-daily single tablet regimen (STR) sofosbuvir/velpatasvir (SOF/VEL) is a PI-free, pan-genotypic, pan-fibrotic, single duration regimen for the treatment of HCV offering a simplified option to address this elimination goal. This 12 week regimen can be used irrespective of viral genotype, viral load, fibrosis status or HIV co-infection status. This integrated analysis of phase 3 clinical trials evaluates the safety and efficacy of SOF/VEL for 12 weeks in patients with HCV across all genotypes (GT) and fibrosis stages, including patients with compensated cirrhosis and HIV/HCV coinfected participants.

Methods: Analysis of safety and efficacy data for HCV GT 1-6 treated with SOF/VEL for 12 weeks without ribavirin from eight phase 3 clinical studies (ASTRAL-1, -2, -3, -5, POLARIS-2, -3, GS-342-1522; and GS-342-1521). Results are reported on an intention-to-treat analysis.

Results: Overall, 1938 patients with HCV GT1-6 were included. The mean age was 52 years, 61% were male, mean BMI was 26.6 kg/m2, and 5% were HIV/HCV coinfected. Genotype distribution was: 38% GT1, 16% GT2, 32% GT3, 14% GT4-6. Advanced fibrosis (F3 or F4) was present in 822 (42%) patients, including 496 (26%) with compensated cirrhosis. The study also included 494 (25%) treatment experienced patients. Overall, 98% of the patients achieved sustained virologic response (SVR), with ≥95% across all genotypes including patients with compensated cirrhosis and 95% in HIV/HCV coinfected patients. SOF/VEL was well-tolerated, with adverse events (AEs) reported in >5% of patients including headache (24%), fatigue (19%), and nausea (10%). Grade 4 laboratory abnormalities were identified in <1% of the patients.

Conclusion: SOF/VEL STR for 12 weeks is a simple, highly effective, and well-tolerated treatment for HCV GT1-6 patients. These data support current AASLD/IDSA, EASL, and WHO recommendations for HCV treatment using SOF/VEL in GT1-6 patients.

Financial relationships with: Gilead Sciences

Gilead Sciences’ Commitment to Global Elimination of Hepatitis C Virus

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Background: Gilead Sciences has helped transform the landscape of hepatitis C virus (HCV) through innovative medicines, partnerships, and pioneering access programs. Gilead continues to support the efforts of governments and partner with professional and community-based organizations, healthcare providers (HCPs), and payers to accelerate progress toward the WHO’s goal of global HCV elimination by 2030.

Materials & Methods: Across the company, multiple departments support programs to increase HCV screening, access, and linkage to care (LTC).

Results: The FOCUS program, which recently expanded to Europe, enables partners, including health systems, governments, and harm reduction organizations, to develop and share best practices in HCV screening and LTC. Through Q2 2018, 248 FOCUS partners have conducted 2.2 million HCV antibody screening tests in 92 cities/counties in the United States.

Through investigator-sponsored research (ISR) and external collaborations, Gilead supports global HCV elimination projects in high-risk populations and geographies. By year-end 2018, the ISR program will have supported over 120 HCV screening and LTC studies in HCV monoinfected and HIV/HCV co-infected patients. The company is also involved in several pilot nationwide elimination programs, including in Iceland, Mongolia, India, and The Republic of Georgia. Gilead is also supporting several key initiatives in Australia related to its nationwide elimination program.

Corporate Grants supports the efforts of community-based organizations and public health entities to educate their constituents about HCV. Gilead’s Access team works with regional partners to introduce cost-adjusted branded HCV drug in low- and middle-income countries, and patent pool/license agreements with multiple generic drug
manufacturers to produce low-cost generic versions of HCV medicines for developing countries.

The Independent Medical Education Department supports programs that expand the knowledge of HCPs to manage HCV. In 2017 and 2018, these programs will have educated 73,000 HCPs on HCV elimination-related topics.

Conclusions: Gilead will continue to support global strategies toward HCV elimination through partnerships with governments, professional societies, community-based organizations, and HCPs.

Financial relationships with: Gilead Sciences

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Comparing the transmission prevention benefits of hepatitis C treatment strategies at the global, regional, and country levels: a modelling study

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Background: To meet the World Health Organization’s 2030 hepatitis C virus (HCV) elimination targets, countries must efficiently allocate their resources to prevent and treat HCV infections. Policy makers need data on who to target for treatment to reduce morbidity and prevent new infections. We estimated the prevention gains of four treatment strategies across country, regional, and global-levels in terms of infections averted (IA) per treatment undertaken.

Material and Methods: To simulate country-level HCV epidemics a dynamic, deterministic HCV transmission model was used, incorporating age demographics, population growth, and HCV progression. Country-specific data from systematic reviews and UN datasets were used to calibrate the model to each country’s HCV epidemic. In each country we evaluated the impact of treating 50 infected individuals in 2018 in four scenarios: either selected randomly [treat-all], targeted among people who inject drugs (PWID), targeted among people aged ≥35, or targeted among those with cirrhosis. We estimated the number of infections from 2018-2038 with and without these additional 50 treatments, weighting country estimates by HCV burden for regional and global averages. Linear regression was used to identify associations between the number of IA per treatment and demographic factors.

Results: Eighty-eight countries amassing 85% of the global population were included. Globally, the model estimated 0.35 (90% credibility interval [CrI]: 0.19, 0.56) IA over 20-years for every randomly allocated treatment. Similar IA are achieved from treating those aged ≥35 (0.29, 90% CrI: 0.15, 0.48), and from treating individuals with cirrhosis (0.27, 90% CrI: 0.14, 0.45). Globally, treating PWID was most effective, with 1.23 (90% CrI: 0.77, 1.84) IA per treatment. This was reversed in countries with high chronic HCV prevalence among PWID. The IA per randomly allocated treatment was positively associated with a country’s population growth-rate, and negatively associated with higher HCV prevalence among PWID.

Conclusions: Prevention benefits can be achieved from a treat-all strategy. The greatest benefits are achieved in countries with high population growth. The greatest benefits in IA, globally, are achieved from targeting PWID. However, HCV elimination programs must also target treatment among the general population, especially in settings where PWID only make up a small percentage of those infected.

No conflict of interest

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Risk factors of HCV infection from Hepatitis screening campaign in 13 districts in Rwanda

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Background: In commitment of Government of Rwanda to expanding the capacity to screen, diagnose and treat patients with chronic hepatitis C (HCV) infection, several campaigns of screening were conducted countrywide in 2017 and 2018. These campaigns served to increase both public awareness of Viral Hepatitis (VH) and enrich existing data on the epidemiology of chronic HCV infection in Rwanda. An understanding of the HCV epidemic through prevalence estimates and risk factors will help shape the country public health approach towards the identification of high risk population and effective case finding.

Methods: The primary objective of this study is to use data collected from the screening campaign in 2018 to describe the risk factors associated with the HCV infection among the voluntarily participating members of the general population. The study consists of a descriptive cross-sectional and analytical study. The data collection consisted of data collected through lab request form (LRF) on site from individuals participating voluntarily to the screening campaign. During the campaign the targeted population were individuals aged >45 years from 7 districts of Southern province and >25 years old form 6 districts of Eastern and Northern provinces. Healthcare workers trained in VH screening, diagnosis and patient counseling performed sample collection and testing. Sample collection took one week in South and two weeks for Eastern and Northern Province. SPSS 20 was used for statistical analysis. Bivariate and multivariate logistic regressions were used to assess factors associated with HCVAb in screened people.

Results: A total of 157,677 individuals were screened in 13 districts during the campaign. Number of individuals who screened positive for HCV Ab in different populations was 12,830(8.1%). The Factors statistically associated to HCV were the age, the marital status and co-morbidities (cancer or HIV). Age group: Individuals were categorized two groups; 55-64 years old with OR=1.698 with 95%CI= (1.366-2.112)and 65 years old and above with OR=3.473 with 95%CI= (2.792-4.321)Marital status: Widowed or married people was considered with OR=1.068 with 95%CI= (1.006-1.134), Co-morbidities: Individuals suffering from cancer with an OR=1.575, 95%CI= (1.094-2.268) and HIV positives as HIV status with OR=1.446 with 95%CI= (1.263-1.655).

Conclusions: This is the results from one of series of campaigns of viral hepatitis screening in different groups of general population which should contribute to strategically identify high risk group population, effective case finding and guide the country’s interventions towards elimination. Marital status, having cancer and HIV positive status were shown to be risk factors for hepatitis C. Estimates for the prevalence of HCV in screened people was 8.1% with a high prevalence in 65 years and over group of 18.4%.

No conflict of interest

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Prevalence and risk factors of Hepatitis B Virus infection among people screened during Hepatitis screening campaign in 13 districts in Rwanda.

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Background: The Rwandan government has shown continued commitment to expanding its capacity to screen, diagnose and treat patients with chronic hepatitis B (HBV) infection. However, both public awareness of viral hepatitis (VH) infections and existing data on the epidemiology of chronic HBV infection in Rwanda is limited. This study examined the prevalence of HBV and its associated factors in Rwanda to inform program implementation.

Methods: A nationwide HBV screening campaign was organized from 29 March to 22 June 2018 included general population targeted individuals aged >25 years old form 13 districts which were shown to be among districts with high prevalence of Hepatitis B Virus infections in the last VH screening campaigns. Sensitization was done through multimedia announcements, community health workers and local church leaders. Healthcare workers trained supported in VH screening, diagnosis and patient counseling performed, interview for collecting information on socio-demographic, clinical and behavior characteristics sample collection and testing. Sample collection was done for one week in South and two weeks for Eastern and Northern Province. Murex enzyme-linked immunosorbent assays (ELISA) for HBsAg (version 3.0) was used to test samples. SPSS 20 was used for statistical analysis Bivariate and multivariate logistic regressions were used to assess factors associated with HBSAg in screened people.
**Results:** A total of 157,677 individuals were screened in 13 districts during the campaign. Number of individuals who screened positive for HBs Ag in different populations were 7207(4.6%). The high prevalence of HBV was found in 35-44 years old group (5.1%) with p-value=0.082. Factors statistically significantly associated to HBV were being male OR=1.20 95%CI (1.14-1.27), being in Ubudehe category 4 OR=2.13, 95%CI (1.06-4.25) compared to category 1, ever had Tuberculosis(TBC) with OR=3.42 95%CI ( 2.27-5.17), ever been transfused OR=1.14, 95%CI=( 1.07-1.21) and history of viral hepatitis in the family with OR=1.22, 95%CI( 1.04-1.43).

**Conclusions:** These data provide the first national estimate of hepatitis B prevalence and its associated factors in Rwanda. These findings have also helped identify people with the highest risk of Hepatitis B acquisition. These should be the priority of future hepatitis B prevention and treatment efforts in Rwanda.

*No conflict of interest*

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**Viral hepatitis and harm reduction: Strengthening the continuum of care**

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**Background:** For nearly 25 years, the Hepatitis Education Project (HEP) has been a national leader in viral hepatitis. Despite extensive experience with hepatitis testing and case management, HEP’s prevention activities were previously limited to community education. To strengthen prevention services, HEP opened a syringe services program, with the goal of improving access to the HCV continuum of care for people who inject drugs.

**Methods:** In July 2017, HEP established a syringe services program [SSP] in Seattle, WA. Through the program, HEP provides prevention, through the provision of sterile injection equipment; diagnosis, through HCV antibody and confirmatory testing; and linkage to HCV care and treatment, through case management support. HEP also provides free hepatitis B testing and hepatitis A and B vaccinations.

**Results:**

- 51% of SSP clients who received rapid antibody screening were positive for HCV antibodies.
- 78% of antibody-positive clients received confirmatory testing; of those, 79% were diagnosed with chronic HCV.
- 25% of diagnosed clients were linked to care with a medical provider.
- 33% of clients linked to care were cured of hepatitis C.

To improve the quality and accessibility of services, HEP employed multiple strategies, including partnering with peer outreach worker and providing mobile SSP services to residents of homeless encampments throughout South Seattle. Through these changes, the program grew from 15 client encounters in July 2017 to 268 encounters in January 2018. The number of syringes distributed increased from 1,280 syringes in July 2017 to 15,775 syringes in January 2018.

To better support SSP clients, approximately 70% of whom are currently homeless, HEP expanded the medical case management program to include comprehensive case management services. These services, including food, transportation, and housing resources, establish a holistic support system to increase client self-efficacy and improve health outcomes throughout the continuum of care.

**Conclusions:** Data from the first year of the SSP support co-locating harm reduction and hepatitis services. The high burden of HCV and high uptake of HCV confirmatory testing among SSP participants demonstrate the importance and feasibility of providing onsite HCV screening and confirmatory testing at SSPs. Despite successfully integrating hepatitis prevention and screening services, HEP’s current program lacks a critical step in the care continuum: HCV treatment. Without accessible, low-barrier HCV treatment programs, PWID will continue to lack access to these lifesaving medications. As such, HEP is exploring various methods and partnerships to fulfill our goal of providing HCV treatment directly to clients through HEP’s SSP.

*No conflict of interest*
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Impact of pre-test HIV and viral hepatitis counselling on building objective and subjective knowledge in Constanta, Romania

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Background: Baylor Black Sea foundation unfolds a voluntary HIV and viral hepatitis counselling and testing program for the general population. All clients receive a standardized pre-test content, along a personalized evaluation of risk factors. Our objective was to evaluate the impact of the pre-test counselling on increasing knowledge from two different perspectives: from an objective standpoint (assessed by a scored knowledge questionnaire) and from a subjective standpoint (assessed through a visual scale regarding person’s perception on his/her knowledge increase).

Materials & Methods: Cross-sectional data collected through convenience sampling for persons tested by Baylor foundation in Constanta and Tulcea centers, during June - August 2018. Clients received an objective knowledge set of items regarding HIV and viral hepatitis transmission before the meeting with the counselor; then, the pre-test counselling unfolded, with the aim of assessing and correcting information about transmission, as well as preparation for the testing procedure and consent collection. After the blood sample collection and before the post-test counselling, beneficiaries received the objective knowledge questionnaire, plus the assessment regarding the subjective knowledge. Scores on questionnaires ranged from 0 to 100; other sociodemographic data was collected. SPSS was used for data analysis.

Results: 182 persons were enrolled, age range 17-77 (47.7±15.3), 64.3% females, 71% from Constanta, 94.5% with health insurance, 70.3% not tested before for any of the infections, 8.2% vaccinated for HBV; 61% were self-referrals and the rest were referred by health care professionals. Among the risks, 65.4% mentioned risks associated with medical equipment, 8.2% sexual behavior, 2.7% cosmetic equipment and the rest other risks. Prevalence rates were of 0.5% for HIV, 4.9% for HBV and 1.9% for HCV. Mean knowledge results were as follows: 56.4 for pre-test objective knowledge, 75.03 for post-test objective knowledge and 70.05 for subjective knowledge. There was a significant increase of objective knowledge (t=-10.401, df 104, p<.01) and the increase was higher than the mean subjective increase (t= 2.383, df 174, p=.018). In terms of subjective knowledge 77.5% considered their increase with more than 60% for HIV and 85.2% for hepatitis even if the objective increase was significantly lower (mean increase of 18.62 points). Participants perceived they learnt more about hepatitis than about HIV (t= -4.99, df 181, p<.001).

Conclusions: Pre-test counselling contributes to increasing knowledge about transmission of viruses, both on a subjective and an objective level. Knowledge, in general, is a recognized factor that determines enacting prevention behaviors; by building improved knowledge, pre-test sessions help influence this determinant. We recommend the maintenance of this educational component in public health programs, such as the voluntary counselling and testing programs, that address public health priorities.

No conflict of interest

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Creating evidence basis to monitor progress of viral hepatitis elimination goals in Germany

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Introduction: Reliable data are needed in order to know where to strengthen the efforts towards viral hepatitis elimination and to monitor progress. There is currently no overview of the scientific evidence regarding the epidemiological situation of viral hepatitis B (HBV) and C (HCV) in the general population and vulnerable groups in Germany. We performed a systematic literature review to understand the existing evidence, baseline epidemiological situation, identify knowledge gaps, and measure progress of viral hepatitis elimination in Germany.

Methods: A systematic literature review was undertaken according to PRISMA statement guidelines and the Cochrane Collaboration to identify eligible references describing burden of disease (prevalence, incidence, transmission routes, distribution of genotypes, co-infections with viral hepatitis viruses or HIV, quality of life
and outcome of infection) and management (vaccination, diagnosis, therapy and liver transplantation). We searched the online databases Embase, PubMed, Europe PMC, Scopus and Base Bielefeld and CC Med. The search was limited to references published between January 2005 and March 2017. This abstract describes data on HBV and HCV prevalence and incidence and HBV vaccination coverage.

Results: Overall, 99 publications with a total of 303 outcomes were identified. Of those, 39 and 32 described HBV and HCV prevalence, respectively. One outcome described HBV-infection and four outcomes described HCV incidence. For vaccination coverage 44 outcomes were identified.

The prevalence of HBsAg in the adult general population was 0.3%, in children 0.2%, in pregnant women 0.5-1.6%, and 0.2-3.4% in different clinical populations. The prevalence was 2.3-3.6% in migrants, 1.7-4.5% in HIV positive males /men having sex with men (MSM), and 0.3-2.5% in people who inject drugs (PWID). HBV incidence in HIV-positive MSM was 2.51 cases per 100 person-years.

The anti-HCV prevalence in the adult general population was 0.2-0.3% and 0.9-3.5% in clinical populations. It ranged from 0.4-2.3% in migrants, 8.2-10.1% in HIV positive males/MSM, and 63.0-68.8% in PWID. For prisoners one study was identified with an anti-HCV prevalence of 14.3%. HCV incidence in the adult general population was 0.02% per year. Self-reported incidence was 0.4% per year in HIV negative or not tested MSM and 4.3% per year in HIV positive MSM. Measured incidence in a cohort of HIV positive MSM was 1.54 per 100 person-years, and the reinfection rate ranged from 4.8-8.2 per 100 person-years.

The reported hepatitis B vaccination coverage ranged between 65.6% [serological] and 91.0% [vaccination cards] in children, 63.6-94.0% in health care staff, 47.5-59.5% in MSM, 15.0-52.0% in PWID.

Conclusion: A reliable evidence basis was found for HBV and HCV prevalence in the general population in Germany, which is very low. Burden of disease is high among vulnerable groups. In these populations testing and linkage to care and a close observation of the epidemic are recommended. No evidence was identified for recipients of blood transfusion, sex workers or persons with tattoos/piercings, and only weak evidence for prisoners. Only one study provides reliable data on PWID. Incidence/reinfection data is scarce in Germany and completely missing for PWID. HBV vaccination coverage is insufficient and must be improved.

No conflict of interest

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Immunization status of cohort of children vaccinated against hepatitis B virus in Ekiti state over ten years after incorporation into National Program on Immunization.

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Hepatitis B vaccine has been introduced in Nigeria for over a decade now, yet, data on sero-conversion status of the immunized cohort in the population are scarce. Such data are important for objective evaluation of the impact and effectiveness of the HBV vaccination program. This study therefore aims at determining the sero-conversion status and the prevalence of HBV infection among the immunized cohort of children in Ekiti state, Nigeria. The cross-sectional study was conducted across all the three senatorial districts of Ekiti state, between October and December, 2017. A total of 441 children consisting of 246 males and 195 females (Male to female ratio= 1.3:1) between 5 to 10 years were recruited into the study. All subjects have had 3 full doses of hepatitis B vaccination before the age of 1 year. Ethical clearance was obtained from Ethics and Research Committee of Ekiti State University Teaching Hospital Ado Ekiti. Approval and permission were also given by the Ekiti State Ministry of Health and Ekiti State Primary Healthcare Development Authority. Multistage sampling technique was used. After caregiver’s consent and assent from the children, 2 to 5mls of blood samples were collected from each subject and tested for the various hepatitis B viral markers (HBeAg, HBeAb, HBcAb and anti-HBsAg, HBsAg) using Hepatitis B combo kit manufactured by Acumen. All subjects were negative for HBsAg, HBeAg, HBeAB and HBcAb. However, only 47 (10.7%) had detectable anti-HBsAg. Among anti-HBsAg positive Our findings showed zero prevalence of hepatitis B but minimal seroconversion rate among vaccinated children in Ekiti state, Nigeria. We conclude that majority
of this children may be at risk of HBV at a later age. To avert a setback in the goal of Hepatitis B viral eradication by year 2030, we therefore recommend a booster dose of hepatitis B vaccine at the school age of 6 years to all children. However, since very low level antibody titres may not be detectable by quantitative detection methods as used in this study, further work using quantitative detection is required to overcome such major limitation

No conflict of interest

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Trend in Prevalence of Hepatitis C Virus Infection among β-thalassemia Major Patients: 10 Years of Experience in Iran

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Background: Hepatitis C virus (HCV) is the leading cause of transfusion transmitted infections (TTIs) among patients with β-thalassemia major. A high prevalence of HCV was reported among these patients. The aim of this study is seeking the trend of the prevalence of HCV infection among the patients with b-thalassemia major in Guilan province, Northern Iran over a 10-year period.

Methods: A retrospective study was conducted on 1113 patients with β-thalassemia major in the Guilan province, northern Iran from 2002 to 2012, using multiple data sources. A blood sample was taken from each patient, and a questionnaire regarding demographic data and risk factors was completed for them. Enzyme-linked immunosorbent assay and recombinant immunoblot assay for HCV were performed in all cases. A stepwise forward logistic regression analysis was done.

Results: The prevalence of hepatitis C infection among β-thalassemia major patients was 13.6%. The risk of hepatitis C among β-thalassemia major patients was greater before screening program for HCV (odds ratio = 9.6, 95% confidence interval: 2.3–40.5). In addition, the prevalence of anti-HCV seropositivity was decreased dramatically among patients who have received transfusions after implementation of blood donor screening for HCV. There were no positive HCV cases in the patients younger than 10 years.

Conclusions: The risk of TTIs including HCV can be reduced by implementing screening program for healthy blood.

No conflict of interest

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Viral hepatitis co-infection among the people living with HIV

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Background: Hepatitis C (HCV) and hepatitis B (HBV) are common co-infections of HIV. World Health Organization estimates, that HCV affects 2-15% and chronic HBV affects 5-20% of people living with HIV (PLHIV). PLHIV co-infected with viral hepatitis have a more rapid fibrosis progression than HCV and HBV mono-infected patients. We aimed to understand the situation concerning co-infections among PLHIV in Armenia and develop recommendations to prevent their further spread and progression.

Methods: The International Review Board of the American University of Armenia approved the study protocol. We interviewed 180 beneficiaries of the “Positive People Armenian Network” NGO using quantitative cross-sectional survey design with structured self-administered questionnaire. We used convenience-sampling approach. Descriptive statistics was run using SPSS 16 software.

Results: The mean age of participants was 40.6 (SD, Standard Deviation, 8.3). Males comprised 61.1% of the sample. The most prevalent co-infection was HCV (52.8%). About 14% of the respondents reported having only HCV, one percent of the study participants mentioned having only HBV. About 2% of the respondents reported having both HCV and HBC co-infections.
Conclusions: The study results showed that the prevalence of co-infections among PLHIV is high. There is need to do educational programs aiming to increase the knowledge on prevention of co-infections. Programs aiming early detection and treatment of HCV and HBV among PLHIV should be widely implemented in Armenia.

No conflict of interest

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Determination of Sero prevalence of Hepatitis B Virus infection and associated risk factors among medical waste handlers in Kenyatta National Hospital, Nairobi, Kenya

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Background: Infectious and hazardous wastes generated in healthcare facilities, if not properly disposed, pose enormous risk to patients, staff, waste handlers, and the community. Medical waste contains a wide range of potentially harmful microorganisms among which Hepatitis B virus are the most significant pathogens. In developing countries, management of medical wastes has not received sufficient attention and the priority it deserves due to limited resources. Hazardous and non-hazardous wastes are non-segregated thus creating a great health risk to medical waste handlers. This study is aimed to determine the sero prevalence of Hepatitis B Virus infection and risk profile among medical waste handlers in Kenyatta National Hospital.

Material & Methods: A cross sectional study was conducted among medical waste handlers at the Kenyatta National Hospital. A structured predesigned and tested questionnaire was used to capture socio demographic data and factors associated with Hepatitis B Virus infection. Serum samples were obtained from each participant and analyzed for Hepatitis B surface Antigen using the enzyme linked immune absorbent assay. Data analysis was done using SPSS version 22.0. Prevalence was calculated as a proportion of participants who were sero reactive to Hepatitis B Surface Antigen. Risk profile was compared between the infected and the non-infected group using Fishers exact test and significance interpreted at 5%.

Results: A total of 185 medical waste handlers were recruited. The mean age was 41.5 years [SD 10.3 years] and 53% were females. About a third [31.9%] had college level of education, 83.8% were aware of HBV, 3.8% had ever taken HBV test and only 27% had been vaccinated. The median duration of exposure to medical waste was 15 years (IQR 7.5-20 years). Prevalence of HBV infection was 2.7% [5 medical waste handlers]. There was no significant difference between the infected and uninfected participants in relation to risk profile [p >0.05]. However, it was noted that all the infected participants had never received a training on medical waste handling and infection control, none had been vaccinated, had reported needle pricks and medical waste splashes on to their mucous membranes. PEP accessibility was at 8.1% and 28.1% incidences were reported in the occurrence register.

Conclusion: The prevalence in medical waste handlers indicated intermediate endemicity population. Efforts to eliminate HBV in this population need to focus on increasing awareness, screening, offering universal vaccination and ensure all handlers are trained on infection control.

No conflict of interest

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Knowledge of Hepatitis B infection, its Routes of transmission and vaccination uptake among Hospital workers in south west Nigeria: Implication for Prevention, screening and linkage to treatment facility

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Background: Knowledge of Hepatitis B infection, its Routes of transmission and vaccination uptake among Hospital workers in south west Nigeria: Implication for Prevention, screening and linkage to treatment facility

The burden of hepatitis B is receiving attention by many International organizations. United Nation hopes to combat hepatitis by year 2020 as stated in goal 3.3 of Sustainable Development goals. Combating and or eliminating hepatitis B involves treatment of current infection while preventing new ones. Health worker are crucial to all these and their level of knowledge of the virus determines to a certain degree how effective they perform these roles.
The aim of this study was to determine the knowledge of hepatitis B virus, its routes of transmission and vaccination uptake among hospital workers in south west Nigeria.

**Methods:** A cross sectional study involving 2 teaching hospitals, 1 Federal medical centre, 10 general hospitals, 2 mission hospitals and 6 private hospital across 3 states in south west Nigeria. A self-administered questionnaire was used to obtain information from different cadres of hospital workers. The questionnaire had information on bio data, length of work in the hospital, awareness of hepatitis B virus, its mode of transmission, specimen for screening, when to refer asymptomatic patients for evaluation and possible treatment, modalities for treatment, awareness of vaccine against the virus, vaccination status of respondents and their spouses. Knowledge score was calculated for each respondent. Association were tested for with students' T test and ANOVA.

**Results:** Total of 1,018 health workers comprising 383 (37.6%) Nurses, 220 (21.6%) hospital Maids, 90 (8.8%) Pharmacists, 80 (7.9%) Laboratory Scientists, 63 (6.2%) Health information Officers, 56 (5.5%) Laboratory Technologists, 46 (4.5%) medical officers, 39 (3.8%) Pharmacist Technicians, 46 (4.5%) medical officers, 39 (3.8%) Pharmacist Technicians, and 41(4%) other hospital staff participated in the study. Almost all the respondents (988,97%) knew about hepatitis B, while 980 respondents (95%) knew blood is the right specimen for screening for hepatitis B infection. Only 557 (60%) and 449 (44.1%) knew hepatitis B could be transmitted through needle prick and from mother to child respectively. Six Hundred and Twenty-One (69%) though multivitamins and silymarin are the main stay of hepatitis B treatment while 742(73%) would refer an asymptomatic patient with hepatitis B for further evaluation and possible treatment. Mean knowledge score was 12.53 ± 3.83 and was significantly related to cadre of the health workers (p=0.00) and the level of the hospital where they work (p=0.01). Eight Hundred and forty-one respondents (82.6%) knew their HBV status while, only 688 (66.8%) respondents reported having being vaccinated.

**Conclusion:** While majority of the hospital workers in south west Nigeria are aware of the hepatitis B infection and the right specimen for screening for it, many are still not aware that of needle prick and vertical routes of transmission. Moreover, some of them are still not aware of their HBV status while many are not vaccinated. We advocate a continuous education of health workers about hepatitis B and its routes of transmission and the need to link all positive patients to treatment facility irrespective of symptoms.

No conflict of interest

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**ABSTRACTS**

**37**

**Ten Years Trend of HBV and HIV in patients with beta thalassemia in Guilan, North of Iran, 2002-2012.**

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**Introduction:** Transfusion Transmitted Infection (TTI) continue to be a problem in many parts of world and multitransfused patients of beta thalassemia major are at a particularly increased risk of TTI. This study was conducted to assess ten years trend of prevalence Hepatitis B virus (HBV) and Human Immunodeficiency virus (HIV) among thalassemia patients in Guilan province.

**Methods and Materials:** In this cross-sectional study, beta-thalassemia major patients’ records from 2002 to 2012 were evaluated in Guilan. Sources of data were health centers of province and territories, blood transfusion organization, general hospitals and private clinics. Demographic and results of serologic tests such as HIV-Ab HBs-Ag were entered in check list and finally data analyzed with SPSS Ver 18.

**Results:** Of the 1113 thalassemia patients only 5 (0.4%) patients were HBs positive. None of them was positive for HIV Ab. Three HBs positive patients were co-infected by HCV. None of hepatitis C infected patients was under ten years. None of them was positive for HIV Ab.

**Conclusion:** These findings show that the strategies for prevention of Transfusion Transmitted Infection and safety of blood products in this respect have indeed been successful.

No conflict of interest
ABSTRACTS

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Knowledge, attitude and practices of doctors and Midwives of district health centers of Bamako toward the screening of Hepatitis B.

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Background: The viral hepatitis B is an important public health concern all over the world. In Mali the prevalence of Ag HBs is close to 15% in the general population. Hepatitis B screening is a key point for its prevention and control, principally in the prevention of mother to child transmission.

Material & Methods: In February and March 2014, we conducted prospective study to describe knowledges, attitudes and practices of medical doctors and mid wives toward hepatitis B screening in six district health centers of Bamako the capital town of Mali, West Africa.

Results: We found the theorical knowledge in terms of population targets for hepatitis B screening to be good in 69.6% of the staff these centers but the is a lack in the practice of this screening (54.9% of the staff never asked for HBs Antigen screening in any patient). There is lack of informations on hepatitis B screening in the National documents of Politics, Norms and Procedures have been pointed out by the staff. Almost all the respondents (96.1%) had never benefit of updated training on hepatitis B screening. The knowledge on hepatitis B screening targets was better in staff with professional experience of 15 years and over. The hepatitis B vaccine coverage of the staff remains low (67.2%). The health workers perceives these insufficiency on hepatitis B screening and proposes some corrective ideas.

Conclusion: Knowledges, attitudes and practices of health care worker in district health centers in Bamako toward hepatitis B screening needs to be improved. Continious training and guidelines are mandatory.

No conflict of interest

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Catch-up Vaccination with integrated KAP study of Hepatitis B amongst Medical Students in a High Risk Setting of a newly established Medical Institution

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Background: India is in the intermediate HBV endemcity zone (HBsAg prevalence among the general population ranges from 2 to 8%) with 50 million cases which makes it the second largest global pool of chronic HBV infections. Among healthcare workers seroprevalence is two to four times higher than that of the general population.

Objectives:

1. To know the knowledge, attitude and practices (KAP) of medical students regarding Hepatitis-B
2. To know the vaccination status of the medical students against Hepatitis-B
3. To Immunize the unimmunized and partially immunized medical students

Materials & Methods: This is a cross-sectional study that was conducted from March to April, 2018. A notice regarding the vaccination program was circulated amongst all the students of the medical college (only first and second year students are there) through proper channels of the Department of Community Medicine. Students were invited to the department on specified dates for awareness and immunization against Hepatitis B. Their KAP was assessed with the help of a self administered questionnaire.

Results: With a response rate of 81.3%, a total of 161 students participated in the study out of 198. The students were between the ages of 17 to 25. Majority of the students were males (112, 70%) as compared to females (49, 30%). Out of the 161 study subjects, only 13(8%) students had received a completed course of Hepatitis B vaccination in the past, 30 (18.6%) students had history of inability to complete the 3 doses of Hepatitis B vaccination and rest were never immunized against Hepatitis-B. The results depict the poor knowledge of students towards the disease. The knowledge about the risk of acquiring the disease at the hospital or high risk setting was present in less than half of the students. Only 50.3% were aware that it can be transmitted through percutaneous injury, 39.8% knew about the transmission through mucuous membrane and 44.1% knew that it can be transmitted if breeched skin comes in contact with infectious material. The attitude of students was positive as 155 (96.3%) opined that everyone should get Hepatitis B vaccination and 145 (90.1%) thought that the vaccine is certainly helpful. Only
6 (3.7%) students said that they are either not at risk or do not need the vaccine. The average knowledge score was 10.63 out of 16 and average healthy practice score was 2.94 out of 4. On applying Pearson correlation test, it was found that there was a positive correlation of knowledge and practices of the students (p=0.012), implying that better knowledge of the disease has a positive effect on the practices exercised by an individual.

**Conclusion:** Newly enrolled students and other individuals attached to a high risk setting such as a medical institution should be screened for immunization status during initial medical examination as the number of unimmunized persons especially against Hepatitis B is high. They also need to be sensitized towards this prevalent disease and its prevention.

**Keywords:** Hepatitis-B, KAP, medical students, high risk, Hepatitis screening

*No conflict of interest*

### 41

**Hepatitis C Point-of-Care Testing and Clinic Automated Testing in a Broad Community-based Program in Alabama**

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**Background:** The efficacy of direct acting antiviral (DAA) therapies presents a real possibility for a mission of Hepatitis C (HCV) elimination in Alabama. The arduous ground work to detect and bring the affected population into care is critical. This work can be empirically informed by best screening modalities for an elimination strategy in Alabama. Two modalities are considered. Point-of-care (POC) testing for hepatitis C virus (HCV) provides same-visit results, facilitating disease detection and linkage to care at the clinic level. Automated in-clinic electronic medical record (EMR) triggered screening provides a more systemic solution to reaching and linking the affected patient to care. We assessed screening yield, RNA completion and linkage to care (LTC) rates for both modalities in a broad community-based program in Alabama.

**Material & Methods:** We utilize evaluation data over a two year funding period. In our first year, the modality utilized was primarily POC testing. In the second year, the data utilized is from automated EMR triggered screening with accompanying reflex confirmatory quantitative viral load performed for sero-positives. We utilize cumulative grant year data to measure testing yields and LTC rates. Both testing modalities involved a state-wide partnership. The POC testing modality was implemented with 17 testing sites while the in-clinic EMR triggered screening are being implemented by 15 sites with at least seven more waiting to be operational.

**Results:** Community sites utilizing POC kits tested 3930 subjects from November 2016 to October 2017. 419 out of 3930 or 11% were sero-positive, and 71% or 299/419 had a confirmatory RNA test performed. Of those who completed their confirmatory viral load test, 241 or 80% were confirmed with viremia. EMR triggered screening reported 2423 subjects tested from May to August 2018 and 339 out of 2423 (14%) were sero-positive. RNA completion is automatically triggered by the lab for all sero-positive patients, and 66% (223/337) were viremic. Between POC test and EMR testing model, sero-positives diagnosed at drug treatment centers represented 22% and 35% of the overall se-positive population respectively. RNA completion rates were 67% for POC vs 100% for the EMR model.

**Conclusions:** In this community-based setting in Alabama, both POC and EMR testing models showed high screening yield and rates of confirmatory RNA testing. For optimal diagnostic scale up, POC testing and in-clinic automated EMR screening model are efficacious, complementary strategies for HCV elimination.

*No conflict of interest*

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**Rethinking “Hard to Reach”: The Need for Community-Based Screening in Viral Hepatitis Elimination**

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**Background:** In the United States, most new hepatitis C (HCV) infections result from injection drug use, yet people who inject drugs (PWID) face major barriers to hepatitis C testing and treatment. PWID are often considered “hard to reach” due to low healthcare utilization. However, in the era of highly effective HCV treatments, strategies to engage this population are critical to eliminating viral hepatitis. Community-based screening programs are one tool for increasing HCV diagnoses among PWID.
ABSTRACTS

Methods: The Hepatitis Education Project (HEP) is a nonprofit organization in Seattle, USA, that provides low-barrier hepatitis services for marginalized communities. HEP’s programs include Correctional Health, Medical Case Management, Prevention and Outreach, and Policy. Through these programs, HEP provides viral hepatitis education, screening, testing, and vaccination for underserved communities disproportionately impacted by viral hepatitis. These populations include people who inject drugs; people experiencing homelessness; people with low incomes; incarcerated or formerly incarcerated individuals; and immigrants and refugees. Staff provide services at health fairs, syringe exchanges, methadone clinics, shelters, hygiene centers, homeless encampments, and other community-based organizations.

Results: In 2017, HEP screened 1,426 individuals for HCV. Of those,
- 18% screened positive for HCV antibodies
- 40% had never been screened
- 31% reported a history of injection drug use
- 23% reported homelessness or unstable housing
- 20% reported a history of incarceration

Conclusions: Community-based screening programs can successfully engage “hard to reach” populations that are often excluded from traditional healthcare systems. To eliminate viral hepatitis, greater investment in community-based screening programs is needed to improve HCV diagnosis, especially among PWID. Other strategies, including improvements in testing technology, can increase the effectiveness of community-based screening programs and reduce the morbidity and mortality associated with viral hepatitis.

No conflict of interest

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Standardization of Quadruplex TaqMan Real-Time PCR Assay for Simultaneous Detection of Hepatitis B, C, D and E Viruses

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Background: The earliest diagnosis of viral hepatitis infection is important for its timely treatment and a check on its progression to serious liver diseases. Although various assays are available for detection of hepatitis B virus (HBV), hepatitis C virus (HCV) and hepatitis E virus (HEV) individually, however, these assays have several limitations. The present study was aimed to standardize a Quadruplex TaqMan real-time PCR assay for simultaneous detection of HBV, HCV, HDV, and HEV associated nucleic acids in a single run.

Materials & Methods: This assay was developed using primers and probes after multiple sequence alignment for all viruses. The real-time PCR was standardized from singleplex to quadruplex detection of HBV, HCV, HDV, and HEV in serum using different variables including temperature, primer concentrations, and probe concentrations. Standard curves were generated with the help of 10-fold serial dilution of standard over a range 10⁷ – 10¹ copies/μl (copies/microliter) for each virus. Further, it was used for copy number quantification for all these viruses.

Results: This assay was found to be a sensitive, specific and reproducible system for detection of HBV, HCV, HDV, and HEV simultaneously. The detection limit for different viral genome were found to be 1.7 x 10¹ copies/μl for HBV, 5.3 x 10¹ copies/μl for HCV, 1.7 x 10² copies/μl for HDV and 2.01 x 10¹ copies/μl for HEV in this assay.

Conclusion: Present assay offers a potential for its use as a highly reliable, cost-effective and useful alternative molecular tool for a common use in diagnostic laboratories for detection of viral hepatitis cases.

No conflict of interest

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Message From the Front Line for Eliminating HCV in PWID

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Background: In efforts to eliminate HCV, ability to reach first time testers, people not connected to clinical services, and members of key populations is critically important. Findings from our EU HCV Community Testing survey has shown more than half of the countries surveyed require medical personnel to provide testing, creating barriers for PWID to access testing and for NGOs to hire medical workers to provide testing on-site. We would like to highlight the experiences of PWID accessing community testing, HCV treatment and services
Material & Methods: We propose to have a discussion with invited harm reduction program workers and drug users to share experiences regarding barriers to community testing, treatment access, distribution of prevention equipment, and preventing re-infection. Having PWID share experiences accessing testing, treatment and prevention equipment is critical information needed to eliminate HCV in key populations.

Results: Despite the fact HCV treatment has cured thousands of people worldwide, today we still see significant policy barriers to community testing, prevention services, and most the affected accessing treatment. This session will offer valuable information from a patient’s perspective, and low threshold organisations perspective on challenges to overcome barriers and address specific prevention needs. To effectively eliminate HCV these issues need to be.

Conclusions: Our recent testing survey and capacity building work in Europe has shown, while many countries have focused on access to HCV treatment, no attention is being made to ensure community testing can be scaled up, and injectors are not being re-infected. The proposed session will identify needs for preventing re-infection, including information for advocacy and policy reform to increase community testing and improve access to treatment. If HCV elimination is our goal, then the target groups most affected needs to be involved in policy making and service delivery recommendations.

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<td>HCV, HBV and HIV infection and linkage to care in migrants: The Immigrant Take Care Advocacy (I.Ta.C.A.) experience in Palermo</td>
<td>9</td>
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<td>Disproportions in the HCV incidence between Centers Addictions and Harm Reduction Units</td>
<td>7</td>
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<td>HCV treatment in people who use drugs actively within of a low-threshold and harm reduction setting</td>
<td>21</td>
<td>39</td>
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