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## **Abstract Book**

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# Oral Presentations

International Viral Hepatitis Elimination Meeting  
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## A cluster randomized controlled study of the secondary distribution of HCV self-tests in households in the general population to support micro-elimination in Karachi, Pakistan

Hasnain A<sup>1</sup>, Shilton S<sup>2</sup>, Shah W<sup>1</sup>, Markby J<sup>2</sup>, Sallahuddin S<sup>1</sup>, Hamid S<sup>1</sup>

<sup>1</sup>Department of Medicine, Aga Khan University Hospital, Karachi, Pakistan, <sup>2</sup>FIND, Geneva, Switzerland

**Background:** Pakistan has a nationwide HCV prevalence of 6% with majority of cases undiagnosed due to lack of comprehensive screening programmes. Self-testing has shown to increase testing uptake and acceptability in HIV due to its convenience and privacy advantages. This study aims to evaluate the acceptability and impact of a program enabling home delivery of HCV self-testing using the oral-based OraQuick® HCV rapid antibody test. It is nested within a community-based micro elimination project in an HCV endemic district of Karachi, Pakistan.

**Methods:** This cluster randomized control study targeted persons missed during house-to-house screening done as part of the micro-elimination study in two Union Councils in district Malir of Karachi. During house visits, individuals over 18 years of age not found at home were eligible for participation. Target sample size was 1000 participants each in the intervention and control group. In the intervention group, an HCV self-test was left with instructions for use explained to a senior household member. In the control group, a pamphlet was left with directions to visit the nearest clinic for HCV screening and individuals with a positive result underwent reflex testing at the clinic for confirmation of infection. Both groups were followed up within 4 weeks to determine if testing was completed and a brief survey was conducted. Results reporting (not testing) was incentivized and individuals with positive tests were linked for further management.

**Results:** 2185 participants have been recruited from 29th Nov 2021 to 11th April 2022 with 1184 in the intervention group and 1001 in the control group. Mean age was 34 years (range) in the intervention group and 35 years (range) in control group. The percentage of participants enrolled who are male in intervention and control group is 79% and 81% respectively. The proportion of participants who reported completing the HCV antibody test was 87% in the intervention group compared to 22% in the control group. 16% (168/1026) of the participants from the intervention group reported a positive result. 75% (125/168) of these participants completed RNA testing and 88% (30/34) of those with active viremia, initiated treatment. In the control group 7% (15/224) of the participants reported a positive result. 94% (14/15) of these participants completed RNA testing and 83% (10/14) of those started treatment. Over half (54%) of the participants who completed self-testing and 45% of those who completed the test in the control group had received no formal education. Nearly all (96%) participants who reported completing the test demonstrated willingness to perform HCV self-test in the future.

**Conclusions:** Results of this study demonstrate that HCV self-testing is acceptable in this setting and population with potential of self-testing to increase the uptake of testing compared to standard HCV testing services while ensuring confidentiality and convenience especially in hard-to-reach populations. Further evidence is needed to understand the differences in viremia rates between the two groups as well as a cost effectiveness analysis to inform program design.

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## Progress towards WHO HCV elimination incidence targets among people with HIV: findings from the International Collaboration on Hepatitis C Elimination in HIV Cohorts

Van Santen D<sup>1,2,3,4</sup>, Sacks-Davis R<sup>1,3</sup>, Doyle J<sup>1,5</sup>, Stoové M<sup>1,3</sup>, Stewart A<sup>1,3</sup>, Rauch A<sup>6</sup>, Mugglin C<sup>6</sup>, Klein M<sup>7</sup>, Young J<sup>7</sup>, Jarrin I<sup>8,9</sup>, Berenguer J<sup>9,10</sup>, Lazarus J<sup>11,18</sup>, Lacombe K<sup>12</sup>, Wittkop L<sup>13,14,15</sup>, Salmon D<sup>16</sup>, Matthews G<sup>17</sup>, Prins M<sup>2,4</sup>, van der Valk M<sup>4,19</sup>, Smit C<sup>4,19</sup>, Boyd A<sup>2,4,19</sup>, Hellard M<sup>1,5</sup>

<sup>1</sup>Burnet Institute, Melbourne, Australia, <sup>2</sup>Public Health Service of Amsterdam, Amsterdam, the Netherlands, <sup>3</sup>Monash University, Melbourne, Australia, <sup>4</sup>Amsterdam University Medical Centers, Amsterdam, the Netherlands, <sup>5</sup>The Alfred and Monash University, Melbourne, Australia, <sup>6</sup>University of Bern, Bern, Switzerland, <sup>7</sup>McGill University, Montreal, Canada, <sup>8</sup>Instituto de Salud Carlos III, Madrid, Spain, <sup>9</sup>Centro de Investigación Biomédica en Red de Enfermedades Infecciosas, Madrid, Spain, <sup>10</sup>Hospital General Universitario Gregorio Marañón, Madrid, Spain, <sup>11</sup>University of Barcelona, Barcelona, Spain, <sup>12</sup>Sorbonne Université, Paris, France, <sup>13</sup>Univ. Bordeaux, Bordeaux, France, <sup>14</sup>INRIA SISTM team, Talence, France, <sup>15</sup>CHU de Bordeaux, Service d'information médicale, INSERM, Institut Bergonié, Bordeaux, France, <sup>16</sup>Université Paris Descartes, Paris, France, <sup>17</sup>The Kirby Institute, Sydney, Australia, <sup>18</sup>Barcelona Institute for Global Health, Barcelona, Spain, <sup>19</sup>stichting HIV monitoring, Amsterdam, the Netherlands

**Background:** Prompted by the advent of direct-acting antivirals (DAA), the World Health Organization (WHO) set ambitious targets to eliminate hepatitis C virus (HCV) as a public health threat, including reducing HCV incidence by 30% in 2020 and 80% in 2030, compared to 2015. As HCV infection is more common among people with HIV (PHIV) than HIV-negative individuals, PHIV are considered a key population for elimination. We aimed to assess trends in primary (first) and reinfection incidence among PHIV, separately, and the relative contribution of primary and reinfection infections to the total number of new infections over time.

**Methods:** We used pooled individual-level data from six of 11 cohorts that had data to calculate primary HCV incidence from the International Collaboration on Hepatitis C Elimination in HIV Cohorts (InCHEHC), including data from Australia, France, the Netherlands, Switzerland and Spain. For

primary infection incidence, follow-up started from the first recorded negative HCV-antibody test date and ended at last negative antibody test or estimated infection date. For reinfection, follow-up started from the first negative HCV RNA test indicating treatment or spontaneous clearance until the last negative HCV RNA test or estimated reinfection date. Follow-up was restricted to 2010–2019. Poisson regression was used, while modelling calendar year with restricted cubic splines. To assess the relative contribution of infection type (i.e., primary and reinfection), we divided the total number of incident infections per infection type, including multiple reinfections per person, by the total number of incident infections per calendar year.

**Findings:** Overall, 45,942 participants at risk of primary infection were followed over 248,189 person-years (PY), with an overall primary infection incidence of 0.82 per 100 PY (95% confidence interval [CI]=0.78, 0.86) between 2010–2019. For reinfection, 8,222 participants were followed for 23,612 PY, with an overall incidence of reinfection of 3.8 per 100 PY (95%CI=3.5, 4.1). Both primary and reinfection incidence decreased over calendar years. When comparing 2015 to 2019: primary infection incidence decreased by 49%, from 0.81 per 100 PY (95%CI=0.76, 0.86) to 0.41 per 100 PY (95%CI=0.35, 0.47), and reinfection incidence decreased by 27%, from 4.3 per 100 PY (95%CI=3.8, 4.9) to 3.1 per 100 PY (95%CI=2.5,3.8), respectively. Most incident HCV infections could be attributed to primary infection in all calendar years. However, the proportion of incident HCV infections due to reinfection increased, from 18% in 2010 to 45% in 2019.

**Conclusions:** Countries in the InCHEHC collaboration are on track to meet the WHO's 80% incidence reduction target among PHIV, likely due to the availability and high uptake of DAAs. Our findings show that whilst incidence has declined, reinfection incidence has declined at a slower rate than primary infection incidence and its relative contribution to the current epidemic has grown since before DAAs were introduced. This highlights the importance of continued monitoring in people at risk of reinfection in our efforts to eliminate HCV as a public health threat.

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## Hepatitis C seroconversion among individuals with repeated testing in the country of Georgia, 2017-2021

**Baliashvili D<sup>1</sup>**, Shadaker S<sup>2</sup>, Furukawa N<sup>2</sup>, Tsereteli M<sup>3</sup>, Getia V<sup>3</sup>, Armstrong P<sup>2</sup>, Handanagic S<sup>2</sup>

<sup>1</sup>The Task Force For Global Health, Tbilisi, Georgia, <sup>2</sup>Division of Viral Hepatitis, National Center for HIV, Viral Hepatitis, STD and TB Prevention, CDC, Atlanta, USA, <sup>3</sup>National Center for Disease Control and Public Health of Georgia, Tbilisi, Georgia

**Background:** Georgia is one of the few countries currently on track to eliminate hepatitis C as a public health threat. As Georgia moves closer to achieving hepatitis C virus (HCV) elimination, demonstrating reductions in the ongoing transmission of hepatitis C becomes a priority. One way to monitor transmission is to assess seroconversion among persons repeatedly tested for HCV antibodies (anti-HCV), which can provide helpful information for assessing ongoing transmission trends and the effectiveness of preventive interventions. This analysis aimed to characterize the seroconversion cases among repeated testers in Georgia using the nationwide HCV screening registry data.

**Material and Methods:** We used data from the screening registry for 2017-2021 and identified a subset of adults (aged  $\geq 18$  years) with at least two anti-HCV tests  $\geq 14$  days apart and a negative result for the first available anti-HCV test. Seroconversion was defined as a negative anti-HCV test followed by a positive. We calculated the period prevalence of seroconversion overall and by age, sex, region, and screening setting. Prevalence ratios (PR) and 95% confidence intervals (CI) were calculated to make comparisons between groups.

**Results:** Out of 1,894,194 persons tested during 2017-2021, we identified 942,030 (49.7%) individuals with a negative anti-HCV test and subsequent antibody testing. Repeated testing was more common among females than males (52.6% vs. 46.0%) and among people aged 18-29 (52%), 30-39 (51.9%) and 70+ (52%). The largest proportion of repeated testers were tested in outpatient (56.4%, n=531,359) and inpatient settings (15.9%, n=149,576), followed by antenatal care, blood

banks, and other programs. The median time between the first and the last test was 654 days (IQR: 334-1012). In total, 13,022 (1.4%) individuals seroconverted. Seroconversion was more common among males than females (2.0% vs. 0.9%, PR=2.17, 95%CI: 2.08; 2.22) and increased with age, from 0.6% among people aged 18-29 years to 1.9% among people  $\geq 70$  years old. The seroconversion period prevalence slightly differed between those screened in the capital city of Tbilisi and other regions (1.5% vs. 1.3%, PR=1.16, 95%CI: 1.11; 1.20) and was higher in inpatient than outpatient settings (2.8% vs. 1.2%).

**Conclusions:** We found heterogeneity in seroconversion by different demographic groups and screening settings. Males were more likely to seroconvert, which could be attributed to injection drug use as a mode of HCV transmission that is more common among males. High seroconversion proportion among older age groups and inpatient settings suggests that health care-related transmission may also play an important role in the recent transmission of infection in Georgia. Our study suggests that tracking the ongoing transmission of HCV infection is feasible using programmatic data when a large-scale screening program and electronic systems are in place. Additional efforts to use programmatic data to calculate absolute incidence are underway, and will require triangulation of additional data sources.

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## Effectiveness of pangenotypic retreatment of chronic hepatitis C after prior failure of pangenotypic therapies

**Flisiak R<sup>1</sup>**, Jaroszewicz J, Zarębska-Michaluk D, Janocha-Litwin J, Parfieniuk-Kowerda A, Sitko M, Piekarska A, Białkowska J, Dybowska D

<sup>1</sup>Medical University of Białystok, Białystok, Poland

**Introduction:** Despite the overall excellent efficacy of pangenotypic direct-acting antiviral (DAA) options, there is still a small percentage of patients with hepatitis C virus (HCV) infection who do not respond to therapy.

**Objective:** This analysis was designed to evaluate the effectiveness of pangenotypic retreatment in pangenotypic failures.

**Patients and methods:** The study included patients treated with the pangenotypic regimen selected from the EpiTer-2 database, real-world project evaluating DAA-based treatment in Poland.

**Results:** Among 15,123 patients, 4,345 received one course of pangenotypic treatment (PAN-group) and 48 patients were retreated with pangenotypic regimens after pangenotypic failure (PAP-group). Patients from PAP-group were predominantly males (79% vs 53%,  $P<0.001$ ), had higher BMI ( $28,1\pm 4,0$  vs  $26,2\pm 4,6$ ,  $P<0.001$ ), were more often infected with genotype (GT) 3 (58% vs 27%,  $P<0.001$ ) and more frequently had liver cirrhosis (46% vs 21%,  $P<0.001$ ) when compared with the PAN-group. Importantly, no significant difference in treatment effectiveness was found between PAP and PAN-groups with sustained virologic response (SVR) rate of 89.6% vs 93.7% ( $P=0.39$ ) in intent-to-treat and 91.5% vs 97.6% ( $P=0.17$ ) in per protocol analysis. In this cohort double pangenotypic failures were four, all males, aged over 50, with liver cirrhosis and GT3 infection. The selection of a specific retherapy regimen did not affect SVR.

**Conclusions:** Our study documented the excellent effectiveness of pangenotypic regimens and demonstrated that most patients in whom these options were ineffective could be successfully retreated with next pangenotypic regimen. Dual

pangenotypic retherapy provide sufficient effectiveness exceeding 90%, but the best retreatment strategy is a triple pangenotypic regimen, especially in patients with unfavourable response factors such as GT3 infection, cirrhosis, and male sex.

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## Randomized controlled trial of home-based hepatitis C self-testing for key populations in Malaysia

**Abu Hassan M<sup>2</sup>**, Chan H<sup>2</sup>, Sem X<sup>1</sup>, Shilton S<sup>1</sup>, Chung H<sup>3</sup>, Karunanithy A<sup>4</sup>, Phiphatkhunarnon P<sup>5</sup>, Markby J<sup>1</sup>, Chan P<sup>6</sup>, Luhmann N<sup>7</sup>, Johnson C<sup>7</sup>, Nabeta P<sup>1</sup>, Nasir N<sup>8</sup>, Ongarello S<sup>1</sup>, Ivanova Reipold E<sup>1</sup>

<sup>1</sup>FIND, Geneva, Switzerland, <sup>2</sup>Clinical Research Centre, Hospital Sultanah Bahiyah, Alor Setar, Malaysia, <sup>3</sup>Drugs for Neglected Diseases initiative South-East Asia Regional Office, Kuala Lumpur, Malaysia, <sup>4</sup>Malaysian AIDS Council, Kuala Lumpur, Malaysia, <sup>5</sup>Love Foundation, Chiang Mai, Thailand, <sup>6</sup>World Health Organization Regional Office for Western Pacific, Manila, Philippines, <sup>7</sup>World Health Organization, Global HIV, Hepatitis and STI Programmes, Geneva, Switzerland, <sup>8</sup>Ministry of Health, Putrajaya, Malaysia

**Background:** Malaysia is an upper middle-income country and has been expanding and decentralizing HCV care to the primary healthcare level. HCV self-testing (HCVST), recommended by the World Health Organization, provides an additional way to increase access and uptake of HCV testing among key populations who are disproportionately affected by HCV. We integrated HCVST with an existing online HIV self-testing platform to assess the impact of home-based HCVST on the uptake of HCV testing among key populations nationwide.

**Materials and Methods:** This is a randomized controlled trial comparing HCVST sent via post (intervention arm, n = 500) with standard of care testing at a facility (control arm, n = 250). In the intervention arm, participants received either an oral fluid- or blood-based HCVST; in the control arm, participants were provided information about the nearest HCV testing center. All participants also received information about support resources and result reporting was done via online surveys.

**Results:** 750 individuals, with a median (IQR) age of 26 (23-31) years, were recruited, of whom 90.4% identified themselves as men who have sex with men. Most participants were male (96.7%), completed university (51.5%), and were employed (65.6%). Prior to this study, 58.0% of the participants were not tested for HCV; of these, the top reason why they did not get tested was they did not know how to get a test done (57.1%).

Additionally, acceptability of HCVST was high pre-enrolment into the study- 71.7% of the participants stated that they preferred to test for HCV by themselves at home; 97.0% were willing to test themselves at home if they had a test kit and instructions on how to do it. The above parameters were similar across all groups (blood- or oral fluid-based HCVST or control).

Importantly, 98.7% (152/154) of those who received an oral fluid-based HCVST, 98.1% (206/210) of those who received a blood-based HCVST and 51.4% (55/107) in the control arm reported completing HCV testing (p < 0.01). In the intervention arm, 96.9% (347/358) self-reported they were negative, 0.8% (3/358) were positive, 0.6% (2/358) did not want to disclose their results, and 1.7% (6/358) reported invalid tests; in the control arm, 87.3% (48/55) self-reported they were negative, 3.6% (2/55) did not want to disclose their results, 1.8% (1/55) do not know or have forgotten their result, and 7.3% (4/55) have not been told their results. 66.7% (2/3) of the participants, who self-reported positive HCV antibody results, have received confirmatory testing, indicating they did not have viremia and hence did not require treatment at this point.

**Conclusions:** Preliminary results show that HCVST via an online distribution model, compared with standard testing services, significantly increased the uptake of HCV testing among key populations in Malaysia. These findings also remind us that as many of those infected are still unaware of their status and that it is crucial to increase targeted testing so as to accelerate progress towards HCV elimination. Finally further studies can help understand how HCVST can also be distributed via community-based organizations or health facilities.

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## Results of a novel Hepatitis Delta Virus reflex diagnosis patient pathway in Valencia, Spain

Gómez Muñoz N<sup>2</sup>, García Deltoro M<sup>2</sup>, Ortega E<sup>1</sup>, Ocete M<sup>2</sup>, Gimeno C<sup>2</sup>, Diago M<sup>2</sup>, Martínez-Roma M<sup>1</sup>, Medina D<sup>3</sup>, Carrodeguas Iglesias A<sup>3</sup>,

<sup>1</sup>Fundación de Investigación HGUV, Valencia, Spain, <sup>2</sup>Hospital General Universitario de Valencia, Valencia, Spain, <sup>3</sup>Gilead Sciences, Madrid, España

**Background:** Individuals infected with Hepatitis B Virus (HBV) are at risk of Hepatitis Delta Virus (HDV) infection — the most severe form of hepatitis, estimated to affect 4.5-13% of HBsAg-positive carriers, resulting in accelerated progression to severe liver disease and hepatocellular carcinoma. In 2017 the European Association for the Study of the Liver (EASL) recommended testing HBV patients for HDV. Previous research in our center and elsewhere in Spain has found only 10-24% of HBsAg-positive patients to be routinely tested for HDV.

**Methods:** We adopted systematic, opportunistic HBV screening in patients aged 18 and older, without prior testing records, who required blood work for any purpose and could provide oral opt-out consent. We gradually implemented screening in 26 primary care centers, three addiction treatment units, select hospital departments and outpatient hospital clinics, and the penitentiary center starting from February 2019.

We implemented reflex or single-step testing for HDV starting from April 2022, wherein positive HBsAg tests trigger sequential HDV antibody (Ab) and HDV ribonucleic acid (RNA) tests on the same specimen, without physician or patient initiation.

**Results:** We performed 11,276 HbsAg from April to August 2022, with 276 (2.4%) HbsAg positive results. Of HBV-positive patients, 255 (92.4%) were subsequently tested for HDV Ab, with 19 (6.9%) HDV Ab positive results and 4 (21.1%) HDV RNA positive results. We successfully linked all HDV-positive patients to a first visit with a specialist post-diagnosis.

HDV patients found in our intervention had an average age of 50 (37-66), 75% male, 75% migrant

citizens (2 from Romania, 1 from Moldova), 50% coinfecting with HCV, 25% coinfecting with HIV, 50% with a history of alcohol abuse, 0% with a history of drug use. Median viral load was 455 (58-55,480) copies/mL at diagnosis.

**Conclusion:** To the best of our knowledge, this is almost the first published research on a novel HDV reflex diagnosis patient pathway in Spain.

Given our results, we posit that HBsAg-positive test results should automatically trigger HDV testing in the same specimen, as was done in the past with HCV Ab+ to HCV RNA.

Until HDV becomes a compulsorily notifiable disease, a paucity of epidemiological data will persist. Healthcare organizations must share similar data to educate the community on the burden of HDV and the need to test for the virus.



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## Documenting Hepatitis B Discrimination Globally and Its Impact

Freeland C<sup>1</sup>, Cohen C

<sup>1</sup>Hepatitis B Foundation, Philadelphia, United States

**Background:** 296 million individuals live with chronic hepatitis B worldwide; most have not been diagnosed and remain at risk of liver disease. People with hepatitis B often face discrimination that denies them employment or education opportunities, results in unfair treatment at work or in school, limits their ability to emigrate to certain countries, and in some cases prohibits them from serving in the military. Discrimination specific to hepatitis B has not been widely documented within the literature. This study aims to describe the experience of discrimination, document its impact, and shed light on its significant impact on those living with hepatitis B.

**Methods:** To document discrimination, a mixed method approach was employed using a self-report survey and key informant qualitative interviews. The survey was widely distributed through community networks and partnerships worldwide and asks individuals to share their experiences related to discrimination. For qualitative data, key informants were identified as community health leaders, public health scientists, doctors, and researchers, many of whom were also living with hepatitis B. Using a semi-structured guide, informants were asked to describe their experiences and any challenges for people living with hepatitis B including marginalization and its' consequences. A codebook was used to guide the organization of data for analysis, and all transcripts were double-coded.

**Results:** A total of 366 individuals completed the survey 31.75% individuals from the Philippines, 11.7% from Nigeria, 7.8% from India, 6.41% from Pakistan, 4.74% from the United States, 3.62% from Uganda, 2.51% from Ghana, and 2.23% from Bangladesh, Ethiopia, and Myanmar. Most respondents were between the ages of 30-39 (47.78%) and identified as male (61.34%) who personally experienced some form of discrimination (86.27%). Many of the reported

cases of discrimination from the survey related to deportation, denial of visas, jobs, and employment because of testing positive for hepatitis B. Many respondents reported that the discrimination occurred by an employer (43.24%), applying for a travel visa (22.06%), or health care setting (20.29%). Key informants echoed the findings from the survey and reported the substantial quality of life implications and often poorer health outcomes and economic implications resulting from hepatitis B discrimination.

**Conclusion:** Our data demonstrate that hepatitis B discrimination has a significant impact on the quality of life for those living with hepatitis B. Discrimination can occur at various points in life, from education to seeking employment, to restrictions on entry, travel, and stay in other countries. This study demonstrates the impact of discrimination and the need for future research that can lead to policy change and protections for people living with hepatitis B. With goals looking forward to viral hepatitis elimination by 2030, and with elimination, enhanced testing, protections should be in place to prevent discrimination and its negative impact on those living with hepatitis B.

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## Accelerating triple elimination of mother-to-child transmission of hepatitis B, HIV, and syphilis: Preliminary results from a demonstration project in Nghe An, Vietnam

**Vu Ngoc B**, Do K, Green K, Hoang K, Le H, Chu T, Tran A, Tran L, Ngo N, Tran L, Humeau Z

<sup>1</sup>PATH, Hanoi, Viet Nam

**Background:** Global commitments have been made to the elimination of mother-to-child transmission of HIV, syphilis, and hepatitis B ('triple EMTCT'), but implementation is still nascent in low- and middle-income countries. In Vietnam, there is a large gap between policy and implementation of triple EMTCT: a national action plan and guidelines are already in place, but only part of the action plan related to HIV and infant hepatitis B (HBV) immunization is implemented. In collaboration with the Nghe An Center for Disease Control, PATH and The Hepatitis Fund implemented a three-year initiative aiming to prove a scalable model of community-based, integrated, and coordinated testing and linkage to care for triple EMTCT in a north central coast province of Nghe An.

**Description:** We engaged twelve facilities, including eight commune health stations (CHS), two private facilities, and two district hospitals in Thai Hoa and Dien Chau districts to reach and screen pregnant women (PW) as early in their pregnancy as possible (first or second trimester) for the three diseases, using rapid diagnostic tests (HBsAg and dual HIV/syphilis). All facilities engaged in screening services, and district hospitals also served as treatment sites providing confirmatory testing, diagnosis, and treatment through an integrated and coordinated mechanism with related departments. Clients who had a reactive test result were referred or linked to a treatment site at district or provincial level up to women's choice for confirmatory testing and treatment initiation. Free hepatitis B-birth dose vaccination and free and fee-based hepatitis B immunoglobulin (HBIG) was provided to all newborns and eligible newborns, respectively.

Partner notification services were also given to the diagnosed.

**Lessons learned:** From July to September 2022, we reached 563 pregnant women, of which 557 (98.9%) were tested for HBsAg and dual HIV/syphilis. The vast majority (93%) were screened in first or second trimester (35% and 58%, respectively) compared to prior to the intervention when pregnant women were only evaluated in third trimester or at delivery time. The majority (83%) of PW were screened at a CHS or private facility (61% and 22%, respectively) compared to prior to the intervention when only district or provincial hospitals provided testing. Among those tested 6.5% were HBsAg positivity, of which 38.9% received an HBeAg or HBV DNA testing, and 42.9% were eligible for HBV prophylaxis, and 66.7% initiated HBV prophylaxis/treatment; none had a reactive HIV or syphilis test result.

Moving forward we continue to implement and evaluate the pilot model to inform policy advocacy. This advocacy will be used to secure resources for expansion, scale up and sustainability of the triple EMTCT program.

**Conclusions/Next steps:** The preliminary findings suggest that community-based, integrated and coordinated triple EMTCT model enables reaching and testing pregnant women early, and ensuring they and their newborns receive timely linkage to essential prevention and treatment services. Further work is needed to ensure free access to HBIG and screening, confirmatory testing and treatment of HBV and syphilis to accelerate triple elimination by 2030.

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## Status of Key Interventions and Essential Policies for HBV and HCV elimination in sub-Saharan Africa: A Summary of National Hepatitis Elimination Profiles from Six High-Burden Countries

**Hiebert L**, Scheibe A<sup>2</sup>, Sonderup M<sup>3</sup>, Spearman W<sup>3</sup>, Vilakazi-Nhlapo K<sup>4</sup>, Serumondo J<sup>5</sup>, Godwin Seake-Kwawu A<sup>6</sup>, Nartey Y<sup>1,7</sup>, Roberts L<sup>8</sup>, Senya K<sup>9</sup>, Laryea R<sup>10</sup>, Owusu-Ansah T<sup>10</sup>, Adjei C<sup>11</sup>, Desalegn H<sup>12</sup>, Aberra H<sup>12</sup>, Adugna W<sup>13</sup>, Erkie M<sup>14</sup>, Damian J<sup>16</sup>, Adesuwa O<sup>15</sup>, Ikpeazu A<sup>17</sup>, Njuguna H<sup>1</sup>, Gupta N<sup>1</sup>, Ward J<sup>1</sup>

<sup>1</sup>Coalition For Global Hepatitis Elimination, Task Force For Global Health, Decatur, United States, <sup>2</sup>University of Pretoria, Pretoria, South Africa, <sup>3</sup>University of Cape Town, Cape Town, South Africa, <sup>4</sup>National Department of Health, Pretoria, South Africa, <sup>5</sup>Rwanda Biomedical Centre, Kigali, Rwanda, <sup>6</sup>Ghana Health Service, Accra, Ghana, <sup>7</sup>University of Cape Coast, Cape Coast, Ghana, <sup>8</sup>Mayo Clinic, Rochester, United States, <sup>9</sup>World Health Organization Ghana Country Office, Accra, Ghana, <sup>10</sup>Hepatitis Foundation of Ghana, Accra, Ghana, <sup>11</sup>Hepatitis Alliance of Ghana, Accra, Ghana, <sup>12</sup>St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, <sup>13</sup>Ministry of Health, Addis Ababa, Ethiopia, <sup>14</sup>Addis Ababa University, Addis Ababa, Ethiopia, <sup>15</sup>Rise Against Hepatitis Global Initiative, Owerri, Nigeria, <sup>16</sup>Care for Social Welfare International, Lagos, Nigeria, <sup>17</sup>Federal Ministry of Health, Abuja, Nigeria

**Background and Aims:** To assess gaps and opportunities for hepatitis B (HBV) and C (HCV) programs and monitor progress towards elimination goals, the Coalition for Global Hepatitis Elimination (CGHE) developed National Hepatitis Elimination Profiles (N-HEPs). From the African region, profiles were developed for Ethiopia (ET), Ghana (GH), Nigeria (NG), Rwanda (RW), Senegal (SG), and South Africa (SA). Here we summarize the status of essential interventions and policies in seven key thematic areas for hepatitis elimination.

**Methods:** Country-specific data related to policies and service delivery coverage for national planning, strategic information systems, prevention of mother-to-child transmission (PMTCT), testing, treatment, harm reduction, and national budgeting were extracted from government reports, WHO/UNICEF databases, and peer-reviewed

publications, including systematic reviews and modeling studies. Officials from the Ministry of Health, clinical experts, and civil society representatives reviewed and contributed data.

**Results:** National planning: Five of the six countries set HBV and HCV elimination goals, aligned to WHO goals, and have current action plans (ET, NG, RW, SG, SA). Strategic information: RW has a fully implemented system for monitoring testing and treatment and has achieved interim 2020 targets for number of persons diagnosed and treated for HBV and HCV. NG is in the process of rolling out a monitoring system, and ET is piloting one.

PMTCT: NG and SG adopted universal HepB birth dose (BD), with coverage of 52% and 78%, in 2021 respectively. ET approved and is actively planning for BD introduction, GH and SA approved but have not implemented a universal BD policy, and RW adopted targeted BD for babies born to mothers living with HBV. Four countries (ET, NG, RW, SA) have policies for routine HBsAg screening of pregnant women with varying degrees of implementation, and ET, NG, RW, and SA have antenatal HCV screening recommendations with implementation challenges.

Screening: RW and NG recommend universal HBV and HCV screening; other countries have risk-based testing policies.

Treatment: ET, GH, NG, RW, and SA published HBV and HCV local treatment guidelines. NG and RW simplified HCV treatment algorithms by removing monthly monitoring and allowing non-specialists to prescribe. None have HCV fibrosis restrictions, and only NG has sobriety restrictions. ET, NG, and RW do not require genotyping for HCV treatment initiation. Only RW removed HBV and HCV treatment co-payments.

Harm reduction: Of three countries with data, the number of needle-syringes per person who injects drugs per year ranges from 0-9 (WHO 2020 target: 200). Opioid substitution therapy is not widely available anywhere.

National budget: ET, RW, and SG established national budgets for hepatitis programs, and SA and NG partially. In all countries, budgets remain insufficient.

**Conclusion:** Across sub-Saharan African countries examined, there remain opportunities for hepatitis elimination. Adoption and implementation of universal BD policies, expanded HBV and HCV testing recommendations, scaling up needle-syringe exchange programs, and reducing costs of HBV and HCV diagnostics and treatment should be prioritized to facilitate access and coverage of key interventions. N-HEPs summarize the nationally

validated status of hepatitis elimination for peer comparison and as a baseline for program monitoring.

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## Changes in hepatitis B and hepatitis C mortality rates in Central Asia from 2015 to 2019 and reduction in mortality needed to reach 2030 WHO viral hepatitis mortality elimination targets

Sanderlin Q<sup>1</sup>, Armstrong P<sup>1</sup>, Handanagic S<sup>1</sup>

<sup>1</sup>Centers for Disease Control and Prevention, Division of Viral Hepatitis, Atlanta, United States

**Background and Aims:** In 2022, the World Health Organization (WHO) released the Global Health Sector Strategy (GHSS) to eliminate hepatitis B virus (HBV) and hepatitis C virus (HCV) infections as public health threats by 2030. The WHO 2030 elimination targets for annual mortality are  $\leq 4/100,000$  for hepatitis B and  $\leq 2/100,000$  for hepatitis C. This study analyzes annual mortality rates for the nine countries constituting the Central Asia region (Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan, Turkmenistan, and Uzbekistan). Central Asia (CA) is part of a Global Burden of Disease (GBD) super region of Central Europe, Eastern Europe, and Central Asia. Compared to Central and Eastern Europe, Central Asia has maintained the highest HBV and HCV mortality rates from 2015 to 2019. This analysis investigates the change in annual mortality rates from 2015 to 2019 across these nine CA countries and the percent reduction in mortality rates needed to reach WHO 2030 elimination mortality targets.

**Methods:** We used publicly available GBD data for 2015 and 2019. The GBD is an international research program that assesses the impact of over 350 diseases, utilizing data from more than 3,600 collaborators and 140 countries. GBD classifies countries into regions based on epidemiological similarities and geographical proximity. GBD metrics and methods provide comprehensive data on hepatitis-related deaths and mortality estimates. We calculated the percent change in mortality rates from 2015 to 2019 for each CA country and the average change across all nine countries. We used 2019 mortality rates to

estimate the overall percent reduction needed to reach 2030 mortality targets for each country and across all nine countries of the CA region.

**Results:** In 2019, the annual mortality rate in the CA region was 8.1/100,000 for hepatitis B and 9.7/100,000 for hepatitis C; hepatitis B and hepatitis C caused 7,500 and 9,000 deaths across the CA region, respectively. Out of the nine CA countries, six had a reduction in HBV mortality rates from 2015 to 2019. Azerbaijan had the greatest reduction (-13.6 %) and Mongolia had the highest increase (+3.9%) in HBV mortality rate from 2015 to 2019. The reduction in HBV mortality rate needed to achieve the 2030 HBV mortality target for the entire CA region was 50.6%. Four countries showed a reduction in HCV mortality rates from 2015 to 2019. Kazakhstan had the greatest reduction (-7.9%) and Mongolia had the highest increase (+7.1%) in HCV mortality rate. The reduction in HCV mortality rate needed to achieve the 2030 HCV mortality target for the entire CA region is 58.8%.

**Conclusion:** Our analysis showed that from 2015 to 2019, among nine CA countries, HBV mortality rates reduced in six countries and HCV mortality rates reduced in only four. For the entire CA region, a 51% reduction in HBV mortality and a 59% reduction in HCV mortality rates are required to achieve 2030 WHO mortality targets. Tailored strategies and interventions to reduce mortality from hepatitis B and hepatitis C in the CA region are needed.

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## Combined COVID-19 vaccination and hepatitis C virus and HIV screening intervention for marginalised populations at a mobile testing unit in Madrid, Spain

Lazarus J<sup>3,4</sup>, Valencia J<sup>1,2</sup>, Ryan P<sup>1</sup>, Cuevas G<sup>1</sup>, Domingorena J<sup>2</sup>, Vicario Á<sup>2</sup>, Villota-Rivas M<sup>3</sup>

<sup>1</sup>Department of Internal Medicine, Hospital Universitario Infanta Leonor, Madrid, Spain, <sup>2</sup>Harm reduction Unit "SMASD", Madrid, Spain, <sup>3</sup>Barcelona Institute for Global Health (ISGlobal), Hospital Clínic, University of Barcelona, Barcelona, Spain, <sup>4</sup>Faculty of Medicine and Health Sciences, University of Barcelona, Barcelona, Spain

**Background:** The COVID-19 pandemic has hindered efforts to address blood-borne viruses like the hepatitis C virus (HCV) by reducing testing, particularly in marginalised groups, who have some of the highest rates of HCV and HIV and lowest rates of COVID-19 vaccination. This pilot study aimed to explore the acceptability of combining HCV point-of-care testing (PoCT) with COVID-19 vaccination in a mobile testing unit in Madrid, Spain.

**Material and Methods:** From 28 September to 26 October 2021, 101 individuals from marginalised populations (i.e., homeless people, those with substance use and/or mental disorders, sex workers, refugees, undocumented migrants) were offered COVID-19 vaccination along with HCV antibody (Ab) screening. If HCV Ab+, they were offered HCV-RNA PoCT. Everyone was screened for HIV, as per the standard of care. HCV-RNA+ and HIV+ patients not on antiretroviral therapy (ART) were offered linkage to care. Data were analysed descriptively.

**Results:** Of the 101 participants (mean age 35.9 [SD: 11.4]), 69.3% were male, 30.7% of Spanish origin, 59.4% had a precarious living situation or were homeless, 70.3% were unemployed, 59.4% had a substance use disorder, 28.7% had an incarceration history, 9.9% had mental health disorders, 4.0% had a previous sexually transmitted infection other than HCV or HIV and 10.9% had a previous HCV infection, of which 81.8% had been previously treated. Of all participants, 11.9% had a previous COVID-19

diagnosis, none had been vaccinated for COVID-19 and all received a COVID-19 vaccine, without any identified adverse events. All individuals were tested for HCV Ab and HIV and 15 (14.9%) and 9 (8.9%) were positive, respectively. Of those HCV Ab+, all were tested for HCV-RNA and 9 (60.0%) were positive, of which 55.6% reported that the most likely route of transmission was injecting drug use, 44.4% were probable reinfection cases and 33.3% were HIV co-infected. Of those HIV+, none were new diagnoses and 5 (55.6%) had abandoned ART. To date, 8 (88.9%) have started HCV treatment and 3 (60.0%) have restarted ART. The average duration between positive HIV diagnosis and ART re-initiation for the latter was 103 days (minimum: 25, maximum: 138). The average duration between positive HCV-RNA diagnosis and treatment initiation was 83 days (minimum: 22, maximum: 228) and of the MTU intervention 33 minutes (minimum: 25; maximum: 75).

**Conclusions:** The combined intervention had an acceptability rate of 100% and was considered safe, as no adverse events to HCV testing were reported. It also optimised the use of time, as participants were tested for HCV and HIV during the post-vaccination waiting period and it prevented the need for multiple visits. This approach can serve as a novel model of care to co-locate HCV and HIV screening and linkage to care as well as COVID-19 vaccination in marginalised communities.

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## Changes in the prevalence of hepatitis B and C viral infections among adults in Sindh province, Pakistan: findings from two sero-surveys in 2007 and 2019

Alamneh T<sup>1</sup>, Walker J<sup>1</sup>, Lim A<sup>1</sup>, Alam E<sup>2</sup>, Hamid S<sup>3</sup>, Choudhry N<sup>4</sup>, Ansari A<sup>5</sup>, Qureshi H<sup>6</sup>, Vickerman P<sup>1</sup>

<sup>1</sup>Population Health Sciences, Bristol Medical School, University of Bristol, Bristol, UK, Bristol, United Kingdom, <sup>2</sup>Pakistan Health Research Council Research Centre, Karachi, Pakistan, , , <sup>3</sup>Aga Khan University, Karachi, Pakistan, , , <sup>4</sup>Queen Mary University of London, London, UK, , , <sup>5</sup>University of Oxford, Oxford, UK, , , <sup>6</sup>Consultant Gastroenterologist, Doctor Plaza, Clifton Karachi, Pakistan, ,

**Background:** Viral hepatitis causes serious morbidity worldwide, most of which is due to hepatitis B virus (HBV) and hepatitis C virus (HCV) infections. The World Health Organization (WHO) has set targets to eliminate viral hepatitis as a public health problem by 2030. Pakistan harbours a large proportion of the global burden of viral hepatitis. Assessing the evolving epidemiological situation with relation to viral hepatitis is key for determining progress towards achieving the WHO elimination goals. We aimed to assess the change in prevalence of active HBV infection (HBV surface antigen (HBsAg)-positive) and ever exposure to hepatitis C virus (HCV antibody-positive) between 2007 and 2019 among adults in Sindh province, Pakistan, and identify associated risk factors.

**Material and Methods:** We utilised two household sero-surveys; a nationwide HBV and HCV sero-survey for Pakistan from 2007 and a sero-survey for Sindh from 2019, the second largest province in Pakistan. Both surveys used a two-stage stratified sampling design with all available individuals being included from each sampled household. We extracted data for Sindh province from the 2007 survey and pooled it with data from the 2019 survey, with both including data from all Sindh districts. We included adults from 18-100 years old in this analysis. Multilevel binary logistic regression, including clustering by district and household, was used to evaluate the change in HBsAg and HCV-Ab prevalence between surveys and to identify other

associations with prevalence. Variables with  $p$ -value $<0.2$  in bivariable analysis were candidates for multivariable analysis. Adjusted Odds Ratios (aOR) with 95% Confidence Interval (95%CI) were reported.

**Results:** A total of 5,029 and 3,684 adults from the 2007 and 2019 surveys, respectively, were included in this analysis. In the 2019 survey, 74.2% had medical injections in the last year, 5.8% reported family hepatitis history, 7.9% had ever had a blood transfusion, 13.6% were tattooed, and 28.2% were ever shaved by traditional barber. In 2007, 154 adults (3.1%; 95%CI:2.6-3.6) were HBsAg-positive and 52 (1.4%; 95%CI:1.1-1.9) in 2019. Regression analyses suggests that HBsAg prevalence decreased by 63% between the rounds (aOR=0.37, 95%CI:0.23-0.60), and was higher among males (aOR=1.81, 95%CI:1.24-2.64). Conversely, HCV-Ab prevalence among adults increased over the two surveys from 7.6% (95%CI:7.2-8.7) in 2007 to 10.8% (95%CI:9.8-11.8) in 2019, with district-level prevalence varying substantially from 5.2% to 25.9% in 2019. Regression analyses suggest that adult HCV-Ab prevalence increased by 113% between the rounds (aOR=2.13, 95%CI:1.68-2.71), and was higher among individuals reporting a history of blood transfusion (aOR=1.58, 95%CI:1.10-2.27), being tattooed (aOR=1.52, 95%CI:1.05-2.20), shaved by traditional barber (aOR=1.24, 95%CI:1.01, 1.52), medical injection in last year (aOR=2.01, 95%CI:1.54-2.61), family history of hepatitis (aOR=1.91, 95%CI:1.27-2.89), and being in birth cohorts 1950-1959 (aOR=2.94, 95%CI:2.20-3.94) compared to 1980-1989. HCV-Ab prevalence was 40% (aOR=0.60, 95%CI:0.45-0.80) and 49% (aOR=0.51, 95%CI:0.32-0.82) lower in adults with primary and secondary education compared to illiterate adults, respectively.

**Conclusions:** HCV may have increased dramatically over 2007-2019 in Sindh, while HBV prevalence has decreased. Although many behaviours are associated with HCV exposure, a history of medical injections may be the most important risk factor because of its high prevalence.

# Poster Presentations

International Viral Hepatitis Elimination Meeting  
IVHEM 2022

2 - 3 December 2022  
Amsterdam, the Netherlands



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## Hepatitis C care cascade before and during the direct-acting antiviral eras in New South Wales, Australia: a population-based linkage study

Yousafzai M<sup>1</sup>, Alavi M<sup>1</sup>, Valerio H<sup>1</sup>, Hajarizadeh B<sup>1</sup>, Grebely J<sup>1</sup>, Dore G<sup>1</sup>

<sup>1</sup>The Kirby Institute, UNSW, Sydney, Australia

**Background:** The hepatitis C virus (HCV) care cascade is important for identifying barriers in linkage to care and monitoring progress towards WHO HCV elimination goals. This study evaluated the HCV care cascade and factors associated with treatment uptake during pre-DAA (2011-2012 and 2013-2015) and DAA (2016-2018) eras in New South Wales (NSW), Australia.

**Material and Methods:** We conducted a cohort study of people with an HCV notification (1993 to 2017) followed through the end of 2018. HCV notifications were linked to administrative data sources, including HCV treatment (Pharmaceutical Benefits Scheme) and non-hospital services (Medicare Benefits Schedule). For each study period (2011-2012, 2013-2015, 2016-2018), those aged <18 years at the end of the period, who died within the first six months of the period or notification, and who had successful HCV treatment in the period before were excluded. Weights were applied to individual records to account for sex-specific spontaneous viral clearance to estimate the treatment-eligible population. The study population in each period was cumulative and brought forward from one period to the next, provided they fulfilled the inclusion criteria. Logistic regression analyses were performed to evaluate factors associated with treatment uptake.

**Results:** Among 115,667 people with an HCV notification, 87,063 fulfilled the eligibility criteria. During 2011-2012, 2013-2015, and 2016-2018, cumulative HCV notifications were 71,667, 77,969, and 80,017; 52,016, 56,793, and 57,467 were eligible for treatment and 0.6%, 5%, and 38% initiated HCV treatment, respectively. Birth cohort <1945 (vs. ≥1965), females, Aboriginal ethnicity, and HCV/HBV co-infection were associated with

lower HCV treatment. Birth cohort 1945-1964 (vs. ≥1965), regional/rural area of residence, and HCV/HIV co-infection were associated with higher treatment uptake. Incarceration and drug dependence were associated with lower treatment uptake during the pre-DAA era and associated with higher treatment uptake during the DAA era.

**Conclusion:** In Australia, marginalized populations including those incarcerated, and those with drug dependence have been transformed from populations with lower treatment uptake during the pre-DAA era to higher treatment uptake during the DAA era. However, treatment uptake remained consistently lower among females and Aboriginal people. Culturally appropriate interventions and policies to reduce vulnerabilities, including flexible models of care and point-of-care testing and treatment, are recommended to enhance the HCV care cascade during the DAA era.

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## Effectiveness of ReLink initiatives to re-engage diagnosed-but-untreated HCV-positive patients with DAA treatment

Kreter B, Scherbakovskiy S<sup>1</sup>, Buti M<sup>2</sup>, Branch A<sup>3</sup>, Mendizabal M<sup>4</sup>, Drenth J<sup>5</sup>, de Ledinghen V<sup>6</sup>

<sup>1</sup>Gilead, Foster City, United States, <sup>2</sup>Hospital Universitario Valle Hebrón, Barcelona, Spain, <sup>3</sup>Icahn School of Medicine at Mount Sinai, New York, United States, <sup>4</sup>Hospital Universitario Austral, Buenos Aires, Argentina, <sup>5</sup>Radboud University Medical Centre, Nijmegen, The Netherlands, <sup>6</sup>Centre Expert Hépatites Virales, Aquitaine, France

**Background:** Hepatitis C virus (HCV) infection is a major cause of chronic liver disease that can progress to cirrhosis and hepatocellular carcinoma. The WHO has identified HCV infection as a public health threat and set a global target for HCV elimination by 2030. Simple pangenotypic direct-acting antiviral regimens allow most patients to be cured with minimal pretreatment and on-treatment monitoring. To achieve the WHO goal, patients—including previously diagnosed HCV-positive patients who have been lost to follow-up—need to be linked to care. Studies report up to 60% of patients who test positive for HCV antibody are

lost to follow-up and not treated. This loss has been further exacerbated by the COVID-19 pandemic, during which there was a reduction in treatment urgency, such that many patients put off receiving care. Here, we explore the effectiveness of care re-engagement programs for patients with HCV.

**Methods:** We assessed ReLink programs (sponsored by Gilead Sciences, Inc.), designed to identify and engage HCV-positive patients with medical care and HCV treatment. We evaluated these programs by analyzing the number of patients, steps in the care cascade where patients were lost to follow-up, and the efficacy of the engagement program (determined by number relinked and treated).

**Results:** Six programs assessed 44,964 patient records, identifying 11,163 patients lost to follow-up and eligible for contact. Several common points in the care cascade were identified where patients were most frequently lost to follow-up, often after diagnosis but before start of treatment. The main reason for loss to follow-up was the inability to contact patients. Overall, 3812 patients were linked with care, and 701 were treated (Table). Several key points were identified for improving patient engagement with care, including the use of electronic databases to identify patients lost to follow-up, securing reliable contact information for patients, and partnership with medical societies.

**Conclusion:** Active case-finding, patient navigation, and care coordination in these programs led to increased engagement and treatment rates. Engaging HCV-positive patients with care is urgent, as many may already have developed more advanced liver disease. Adopting and adapting effective strategies from these programs may be a feasible way to improve patient outcomes and increase treatment numbers, thus contributing to meeting the WHO goal of HCV elimination.

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## Identifying risk factors for HCV transmission in the country of Georgia: A case-control study

Kanchelashvili G<sup>1,5</sup>, Butsashvili M<sup>1,5</sup>, Galdavadze K<sup>2</sup>, Tsereteli M<sup>2</sup>, Shadaker S<sup>4</sup>, Handanagic S<sup>4</sup>, Baliashvili D<sup>3</sup>, Kamkamidze G<sup>1</sup>, Armstrong P<sup>4</sup>

<sup>1</sup>Health Research Union, Tbilisi, Georgia, <sup>2</sup>National Center for Disease Control and Public Health, Tbilisi, Georgia, <sup>3</sup>The Task Force for Global Health, Tbilisi, Georgia, <sup>4</sup>Division of Viral Hepatitis, Centers for Disease Control and Prevention, Atlanta, United States, <sup>5</sup>The University of Georgia, Tbilisi, Georgia

**Background:** Hepatitis C virus (HCV) infection is one of the leading causes of chronic liver disease. The most prominent risk factors associated with HCV exposure in the country of Georgia are injection drug use (IDU) and blood transfusion. In 2015, Georgia launched the world's first national HCV elimination program. A 2021 serosurvey demonstrated a decrease in prevalence from 5.4% to 1.8% in chronic HCV infection among the adult population since 2015. The HCV elimination program treated over 76,000 patients with a 98.9% cure rate during that time. The HCV elimination program includes improvements in infection control practices in health care and beauty settings, and harm reduction services for people who inject drugs, among others. Understanding the primary sources of ongoing HCV transmission is crucial to focus prevention efforts and target interventions for different population groups. This study aimed to evaluate current risk factors for HCV transmission in the country of Georgia.

**Material and methods:** A case-control study was conducted among adults aged  $\geq 18$  years. Cases (patients who seroconverted with screening dates at least 12 days apart) and controls (persons with  $\geq 2$  negative anti-HCV test results dated 90 to 364 days apart) were randomly selected from the national HCV screening database. Both cases and controls provided consent and were then asked to participate in a telephone interview inquiring about socio-demographic, clinical, and behavioral information, and about risk factors for HCV infection during the last 2-6 months. Descriptive statistics, odds ratios (OR), and 95% confidence intervals (95%CI) were calculated.

**Results:** A total of 206 cases and 229 controls participated in the survey; response rates were 68.9% (n=206/299) and 52.5% (n=229/436), respectively. Compared to control subjects, case-subjects were more likely to be male (57.8% vs. 35.8%; OR=2.45, 95%CI:1.66-3.60) and over age 40 years (69.4% vs. 52.4%; OR=2.06, 95%CI:1.39-3.06). More case-subjects performed invasive medical procedures as part of their occupation (e.g., assisting surgeries, administering intravenous/intramuscular injections, or invasive dental procedures) compared to control subjects (9.2% n=19/206 vs 4.4% n=10/229, OR=2.22, 95%CI:1.01-4.90). Receipt of a blood transfusion was reported by 6.3% (n=13/206) of case-subjects and 1.3% (n=3/229) of control subjects (OR=5.07, 95%CI:1.42-18.07), and 9.2% (n=19/206) of case-subjects and 0.4% (n=1/229) of control subjects reported injection drug use (IDU) (OR=23.17, 95%CI:3.07-174.66). Case-subjects were more likely to have a history of surgery or an invasive medical procedure, such as dental surgery, endoscopy, gynecological, or other (45.6% [n=94/206] vs. 26.2% [n=60/229]; OR=2.36, 95%CI:1.58-3.53). Case-subjects were also more likely to have spent  $\geq 24$  hours in the hospital compared to control subjects (28.6% [n=59/206] vs. 11.8% [n=27/229]; OR=3.00, 95%CI:1.81-4.96), and 3.4% (n=7/206) of case-subjects were incarcerated or detained compared to none among control subjects.

**Conclusion:** Our findings suggest primary risk factors for HCV transmission currently in Georgia are IDU, hospitalization, blood transfusion, and incarceration. These identified risk factors of HCV transmission provide opportunities to target known transmission sources and further improve HCV infection prevention in the country of Georgia.

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Abstract number 16 has been withdrawn.

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Abstract number 17 has been withdrawn.

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### Estimating chronic hepatitis B virus prevalence in European countries: an updated systematic review

**Bivegete S**<sup>1</sup>, Trickey A<sup>1</sup>, Thornton Z<sup>1</sup>, Scanlan B<sup>1</sup>, McNaughton A<sup>1</sup>, Lim A<sup>1</sup>, Nerlander L<sup>2</sup>, Fraser H<sup>1</sup>, Walker J<sup>1</sup>, Hickman M<sup>1</sup>, Vickerman P<sup>1</sup>, Johnson H<sup>2</sup>, Duffell E<sup>2</sup>, Brooks-Pollock E<sup>1</sup>, Christensen H<sup>1</sup>

<sup>1</sup>University Of Bristol, Bristol, United Kingdom, <sup>2</sup>European Centre for Disease Prevention and Control, Stockholm, Sweden

**Background:** Hepatitis B virus (HBV) is a leading public health problem globally. In Europe, the burden of HBV disproportionately affects at-risk groups, including men who have sex with men (MSM), migrants and prisoners. Understanding the current burden of infection is increasingly important as countries work towards the 2030 elimination targets.

**Objectives:** We aimed to update the latest estimates of chronic HBV (CHB) prevalence for the EU/EEA and UK in key sentinel and at-risk population groups using a systematic review.

**Methods:** We undertook a systematic review to update estimates of chronic HBV (CHB) prevalence for the EU/EEA and UK in key sentinel and at-risk population groups. Databases were searched for original research articles in English published between 1/1/2018 to 24/2/2021. Titles and abstracts were screened to identify articles containing relevant information on CHB prevalence in Europe as measured by HBsAg status, with full text screening undertaken to confirm inclusion. Sentinel groups included first-time blood donors (FTB), general population (GP) and pregnant women; at-risk groups included MSM, migrants and prisoners. The updated estimates were incorporated into an existing HBV prevalence database (spanning 2005-2017) developed by the European Centre for Disease Control using the same inclusion/exclusion criteria. External grey literature data were obtained from country experts.

**Results:** A total of 5678 articles were title and abstract screened, of which 307 were full-text screened. A total of 41 published studies were included in the review, consisting of studies in GP

(n=12), migrants (n=17), pregnant women (n=5), MSM (n=3) and prisoners (n=4). Additional estimates from grey literature were also included (n=108), comprising of GP (n=10), migrants (n=7), pregnant women (n=16), MSM (n=6), prisoners (n=8) and FTB (n=61).

Weighted CHB prevalence estimates from the existing and updated database indicated a low HBV prevalence ( $\leq 2\%$ ) among sentinel populations in all regions with exceptions in Romania, Bulgaria, Italy and Greece (reported prevalences 3.4-7.6%). Prevalence among prisoners varied considerably across all regions (range 2.1-25.2%) and 46% countries lacked data. Studies among migrants recorded some of the highest HBV prevalences and estimates in this sub-population were typically higher in Southern European regions (range 5.0-12.2%). Reported HBV prevalence among MSM was low ( $\leq 2\%$ ), except in Belgium, Croatia, and Estonia (range 2.3-3.4%). Studies on MSM and migrants were absent in Eastern Europe.

**Conclusion:** This review builds on previous estimates in the EU/EEA and UK, providing an additional 149 prevalence estimates across the region (updated total; n=581). HBV prevalence was higher in Southern and south-Eastern Europe compared to other regions. Estimates indicate that the majority of the CHB burden in Europe continues to be in high-risk groups, particularly prisoners and migrants. Developing tailored interventions targeting high-risk populations incorporating up-scaled testing and care linkage, will be crucial in order to meet the 2030 elimination targets in Europe.

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## Integration of Hepatitis-C care among People Living with HIV in Anti-Retroviral Therapy centres in Punjab, India

Grover G<sup>2</sup>, Sond A<sup>1</sup>, Tandon R<sup>3</sup>, Govil P<sup>3</sup>

<sup>1</sup>William J. Clinton Foundation, Chandigarh, India, <sup>2</sup>Department of Health and Family Welfare, Punjab, Chandigarh, India, <sup>3</sup>William J. Clinton Foundation, Delhi, India

**Background:** The state of Punjab, India has been providing free access to Hepatitis-C (HCV) screening and treatment to its population since 2016. To

expand HCV services to people living with HIV (PLHIVs), Punjab started providing HCV screening and linkage to treatment at 13 Anti-retroviral therapy (ART) centres in October 2018. During the COVID-19 pandemic in 2020, capacity building of medical officers of ART centres was done on HCV treatment and these ART centres were designated as HCV treatment centres, further integrating HCV care for PLHIVs. This abstract documents the results of Punjab's expansion of delivery of HCV care to PLHIVs at ART centres.

**Material and Methods:** Data from Punjab's Monitoring and Evaluation (M&E) System was used, with approval from Punjab's Department of Health and Family Welfare. Descriptive analysis was conducted to analyse the demographic characteristics and HCV cascade of care of the PLHIV availing HCV services at these ART centres. Further, a comparison of the cascade of care was done for age and sex.

**Results:** Between October 2018 and August 2022, Punjab screened 45,067 PLHIV (65.56% male, 34.21% female, 0.23% transgender). Out of those screened, 23.48% (10,581) tested HCV seropositive. 79.19% (8,379) of whom were tested for viral load, with 81.00% (6,787) testing positive for the virus. Out of those testing positive, 73.82% (5,010) were initiated on treatment, and 63.29% (3,171) of them have completed treatment. Out of those completing treatment, 93.95% (2,979) were eligible for Sustained Virologic Response (SVR12). Of those eligible for SVR12, 67.07% (1,998) were tested. 83.88% (1,676) were found as cured for HCV.

Males, when compared to females, were found to have higher HCV seropositivity, (32.68% of 29,546 males vs 5.93% of 15,418 females), higher viral load positivity (82.01% of 7,576 males vs 71.91% of 794 females), higher dropouts from detected viral load positive to treatment initiation (27.46% of 6,213 males vs 12.43% of 571 females), and lower SVR12 cure rate (81.84% of 1,740 males vs 97.66% of 256 females).

When analysed by age, HCV seropositivity was found highest among persons aged 19-40 years (29.67% of 30,243) as compared to persons <12 years (1.29% of 308), 12-18 years (19.34% of 884), 41-60 years (10.4% of 12,204) and >60 years (10.61% of 1,385), while cure rate was found highest in older age groups, >60 years (97.44% of 39) as compared to 12-18 years (53.33% of 15), 19-40 years (81.33% of 1,569) and 41-60 years (94.64% of 373). No person <12 years of age was found

eligible for an SVR test and 43 people had an incorrect age reported in the M&E system.

**Conclusion:** Punjab has successfully integrated HCV testing and treatment within the ART centre framework for PLHIVs, a high-risk population for which access to testing and treating would have otherwise remained a challenge. However, reasons for higher HCV seropositivity and higher viral load positivity in males need to be analysed further.

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## It's Your Right – a peer-designed and -led hepatitis C testing and treatment campaign

Walsh L<sup>1</sup>, Adamson E<sup>1</sup>, Leyden E<sup>2</sup>, Dicka J<sup>3</sup>, Endemann S<sup>4</sup>, Holly C<sup>5</sup>, Pepolim L<sup>6</sup>, Townsend T<sup>7</sup>, Combo T<sup>1</sup>, Pedrana A<sup>1</sup>, Hellard M<sup>1</sup>

<sup>1</sup>Burnet Institute, Melbourne, Australia, <sup>2</sup>Queensland Injectors Health Network, Brisbane, Australia, <sup>3</sup>Harm Reduction Victoria, Melbourne, Australia, <sup>4</sup>Northern Territory AIDS and Hepatitis Council, Darwin, Australia, <sup>5</sup>Hepatitis SA, Adelaide, Australia, <sup>6</sup>NSW Users and AIDS Association, Surry Hills, Australia, <sup>7</sup>Anglicare Tasmania, Hobart, Australia

**Background:** An estimated 117,800 people in Australia live with hepatitis C. Despite the widespread availability of direct acting antiviral therapy in Australia, many barriers remain to hepatitis C testing and treatment, especially for people who inject drugs. Without addressing these barriers, people who inject drugs will miss out on curative treatments, and Australia will not meet World Health Organisation 2030 hepatitis C elimination targets.

**Materials and Methods:** It's Your Right was the first Australia-wide hepatitis C testing and treatment campaign to be co-designed and delivered by peer workers with lived and living experience of injecting drug use. To design It's Your Right, the Burnet Institute partnered with the Australian Injecting and Illicit Drug Users League and co-chaired a national reference group. To overcome COVID-related restrictions, It's Your Right was developed through an innovative on-line co-design process. The campaign was evaluated using a mixed methods approach, which involved the analysis of

organisational service delivery data, surveys of people who inject drugs (n=120), and interviews (n=20) and focus groups (n=9) with the people who designed and implemented the campaign.

**Results:** It's Your Right was implemented across Australia by nine peer-led services between April and December 2022. The campaign combined positive rights-based slogans and engaging street advertising, with peer outreach and engagement strategies tailored to the needs of local communities. Localised engagement strategies included peer-referrals to trusted services, cash incentives, point-of-care testing, and events. During the campaign peer workers had over 1500 conversations about hepatitis C with clients, and more than 700 people were tested for hepatitis C at implementing services.

**Conclusions:** The It's Your Right campaign provided an opportunity for services to trial new models of care and connect with new organisations in their local area. Challenges included the implementation of new services (e.g. point-of-care testing) on top of usual workloads and supporting clients with hepatitis C to overcome barriers to treatment.

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## Significant Gaps in Hepatitis B Vaccination in Adults in Viet Nam: Important Targets Toward Hepatitis B Elimination by 2030

Kim T<sup>1</sup>, Pham T<sup>3,4</sup>, Le D<sup>1</sup>, Dao D<sup>4</sup>, Phan L<sup>4</sup>, Le A<sup>4</sup>, Trang A<sup>4</sup>, Tang H<sup>1</sup>, Liu J<sup>2,5,7</sup>, Dao D<sup>4,6,7</sup>

<sup>1</sup>Pham Ngoc Thach University of Medicine, Ho Chi Minh City, Viet Nam, <sup>2</sup>International Health Program, College of Medicine, National Yang Ming Chiao Tung University, Taipei, Taiwan, <sup>3</sup>University of Illinois at Chicago, Chicago, USA, <sup>4</sup>Vietnam Viral Hepatitis Alliance, Reston, USA, <sup>5</sup>Institute of Public Health, National Yang Ming Chiao Tung University, Taipei, Taiwan, <sup>6</sup>Center of Excellence for Liver Disease in Viet Nam, Johns Hopkins University School of Medicine, Baltimore, USA, <sup>7</sup>These authors contributed equally to this work, ,

**Background and aims:** Gaps in adult hepatitis B vaccination were undefined in Viet Nam, a lower middle-income country. To address these gaps, this study defined hepatitis B vaccine coverage in adults

and its associations in Ho Chi Minh City (HCMC), Viet Nam. This study also proposed interventional strategies, with the priority of identifying gaps to ultimately facilitate hepatitis B elimination by 2030 and beyond.

**Methods:** During 2019-2020, a multi-stage cluster serosurvey with probability proportional to size technique was conducted to representatively invite 17,600 adults (18 years old or older) throughout HCMC for hepatitis B screening (HBsAg, anti-HBs, and anti-HBc). Serologic results defined two dependent variables: vaccine-induced immunity (i.e., isolated anti-HBs) and susceptibility (i.e., hepatitis B naive). Associations of dependent variables with surveyed demographics, socioeconomic statuses, and behaviours and medical history at-risk for hepatitis B in the general population were evaluated using weighted Poisson regression. Additionally, sensitivity analyses were done in the non-infected population (i.e., including only those who were both negative for HBsAg and anti-HBc) to exclude the influence of people who were infected (i.e., those who were positive for either HBsAg or anti-HBc) on the estimates. Data analyses were conducted using R 4.0.5.

**Results:** 15,395 (87.5% of 17,600) adults presented to the screening events, representing 90.4% of the HCMC population. After data verification and checking, 14,675 (95.3% of those active) were included in the final data analysis. This study has revealed four key findings. Firstly, the prevalence was 18.5% (95%CI, 17.3-20.0%) for hepatitis-B-vaccine-induced immunity, while that for susceptibility to hepatitis B was 37.7% (95%CI, 35.6-39.8%). Secondly, even though analyses in the general population revealed a falling trend in vaccine-induced immunity prevalence from younger to older age groups ( $p$  for trend  $<0.001$ ), sensitivity analyses in the non-infected population showed that the younger age groups, especially those aged 30 to 50 years, had the lowest prevalence ( $p$  for trend  $<0.003$ ). Thirdly, social disparities in hepatitis B vaccination existed across different ethnicities, areas of residence, educational levels, house ownership, and health insurance statuses. Ethnic minorities had a significantly lower prevalence of vaccine-induced immunity than the Kinh in the general population (aPR = 0.23; 95%CI, 0.06-0.88%). Compared with those without formal education, people who attended high school and higher education were associated with increased vaccine-induced immunity in the general population (aPR = 1.85; 95%CI, 1.48-2.31% and aPR = 2.47; 95%CI, 2.01-3.04%). In addition, rural districts had a significantly

lower prevalence (aPR = 0.74; 95%CI 0.59-0.92%) than urban districts. Fourthly, there was no significant association between vaccine-induced immunity or susceptibility and at-risk behaviours and medical histories.

**Conclusions:** This study depicts a significant unmet need for hepatitis B vaccination in the general adult population in HCMC, Viet Nam. Indeed, the lack of vaccination was unevenly distributed regarding age groups, geographical areas, and socioeconomic statuses, which reveals profound social disparities. Therefore, to achieve hepatitis B elimination goals, besides the current recommendations for infant and risk-based strategies, hepatitis B vaccination should be recommended for the broader population.

## 22

### The Potential of Viral Hepatitis Elimination Programs for Pandemic Preparedness and Response: A Scoping Review of Case Studies

Ali N<sup>1</sup>, Gupta N<sup>1</sup>, Ward J

<sup>1</sup>Task Force for Global Health - Coalition for Global Hepatitis Elimination, Atlanta, United States

**Background:** The COVID pandemic required massive scale-up of investments in health systems across the globe. In low- and middle-income countries, particularly, there was a critical need to leverage existing infrastructure of vertical disease programs to respond to the pandemic effectively and efficiently. Viral hepatitis elimination programs, which require widespread investments in preventive, diagnostic, therapeutic and surveillance capacities may provide key opportunities.

**Methodology:** We conducted a scoping review to explore 1) how investments in viral hepatitis elimination contributed to pandemic response, 2) how investments for COVID-19 response can contribute to hepatitis elimination and 3) future role of hepatitis elimination programs in pandemic preparedness and response.

We conducted a non-linear, iterative scoping review of literature in PubMed, Medline and EMBASE from January 1, 2020, through August 30, 2020, published in English. We used search terms “COVID pandemic and hepatitis elimination”, “service delivery”, “testing”, “data reforms”, “hepatitis B vaccination”, “community resources”, “leveraging resources”, “innovative solutions”. (These terms are not exhaustive).

The shortlisted studies were categorized into 5 areas; data modernization, telemedicine, vaccination, access, and community led interventions and, service integration.

**Results:** Overall, 897 articles were identified by our search. Of these, 46 (5.2%) were shortlisted for full text review. Finally, 9 articles were included by thematic categories; data modernization (1, 11%), telemedicine (2, 22%), service integration (2, 22%), Vaccination (2, 22%), access and community led interventions (2, 22%). Of these nine articles, eight described programs from individual countries and one synthesized survey data from 20 countries.

Findings from OECD health working papers described the improvements in data collection and reporting systems with implementation of new data technology and regulatory reforms to improve data availability, accessibility, and privacy. The use of telemedicine for hepatitis C care was augmented and found effective during the pandemic in studies from Mexico and Romania as compared to in-person care. To make up for the loss of screening volumes, two studies from the US suggest that the co-testing for HIV, HCV and COVID-19 in emergency departments could link positive patients to care. A small study from UAE reported no additional risks to young adults receiving COVID-19 and Hepatitis B vaccine, and a study from China showed the willingness of guardians to co-administer COVID-19 vaccine with other antigens in children. Articles from Nigeria and Burkina Faso showed that community-based organizations delivered multi-month supply of hepatitis medications to patient homes.

**Conclusion:** The literature contained several examples of innovative solutions to maintain or leverage hepatitis services during the COVID-19 pandemic; however, such reports were extremely limited. Focused efforts will be required to codify and replicate such experiences for future knowledge and practice sharing and to leverage investments in hepatitis elimination programs for future pandemics.

**Next Steps:** The Coalition for Global Hepatitis Elimination, along with a diverse group of global stakeholders will explore these case studies and

identify other unpublished experiences to develop a formal set of recommendations for global and national policy makers regarding the potential of viral hepatitis elimination programs for pandemic preparedness and response.

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### Prevalence of Hepatitis B and C viral infections among Transgenders (TGs) and Men who have sex with Men (MSM) in Lahore (Punjab) and Larkana (Sindh) Cities of Pakistan

**Mahmood H<sup>1</sup>**, Saeed Q<sup>2</sup>, Qureshi H<sup>3</sup>

<sup>1</sup>Integral Global, USA, Islamabad, Pakistan, <sup>2</sup>Islamabad Healthcare Regulatory Authority, Islamabad, Pakistan, <sup>3</sup>Ministry of Health, Islamabad, Pakistan

**Background:** Pakistan has one of the world’s largest burdens of viral hepatitis. A National Hepatitis Seroprevalence survey done in 2008 showed 2.5% prevalence of Hepatitis B (HBsAg) and 5% prevalence of Hepatitis C (anti-HCV) in Pakistan; affecting approximately 12 million people all over the country.

In Pakistan, Transgenders (TGs) and Men who Have Sex with Men (MSM) are highly socially vulnerable and experience enormous stigma in the society. Their sexual behaviors, social, cultural and economic factors make them vulnerable to infectious diseases like Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV). There is a rising HIV epidemic among sexual networks particularly TGs and MSM, and a generalized epidemic of hepatitis B & C in the country. This has led to an exaggerated transmission of these diseases in these groups. There was not enough scientific evidence available to guide policy makers to devise effective HBV and HCV prevention and control strategies for these marginalized populations. Therefore, this study was planned to estimate the disease burden among TGs and MSM and to establish linkages to free hepatitis treatment services.

**Objectives:** •To estimate the prevalence of Hepatitis B (HBsAg) and Hepatitis C (anti-HCV)

infections among TGs and MSM in Lahore and Larkana cities of Pakistan

- To establish linkages to free healthcare for HBV and HCV positive patients
- To see the treatment response by following up HBV and HCV positive patients

**Methodology:** This was a cross-sectional study for a period of two years (2020-2022) in two major cities of Lahore (Punjab) and Larkana (Sindh). The study was implemented in collaboration with Pakistan's National Ministry of Health, National AIDS Control Program, Provincial Hepatitis Control Programmes of Punjab and Sindh and Private Sector Diagnostics. A "One Stop Shop" model for the elimination of hepatitis C infection was introduced in the study where the local Community Based Organizations (CBOs) were strengthened as One Stop Shops where free hepatitis C screening, testing and treatment was done on the same day. Same day testing and treatment were done in the CBOs to ensure maximum treatment compliance and minimum loss to follow up.

**Results:** A total of 2241 MSM and TGs were screened for anti-HCV and HBsAg in Lahore and Larkana, 201 (8.96%) tested positive for anti-HCV and 69 (3.1%) were HBsAg positive. Since Hepatitis B management needs specialized expertise, therefore, the HBsAg positive patients were referred to the provincial hepatitis control programmes for further testing, treatment, follow up and care. The 201 (8.96%) anti-HCV positive cases were referred to CBOs to get tested and treated under One Stop Shop model. Of those, 159 (79.1%) got tested for HCV RNA and 99 (62.3%) had detected RNA. Eighty seven individuals (87.9%) had initiated treatment and all of them had completed treatment. To date, 77 (88.5%) patients are eligible to test for Sustained Virologic Response (SVR), out of which 67 (87%) patients were tested for SVR; 57 (85%) were HCV RNA negative.

**Conclusion:** An integrated multisectoral approach can be a good model for HCV elimination in key populations.

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## Exploring the feasibility of HCV-specific Self-testing, Brief Intervention and Referral to Treatment as a model for effective linkage to care of Persons who Live with Hepatitis C and Inject Drugs in Kyrgyzstan

NIKITIN D<sup>1</sup>, Bessonov S<sup>2</sup>, Shilton S<sup>3</sup>, Ivanova Reipold E<sup>3</sup>, Martínez-Pérez G<sup>3</sup>, Bekbolotov A<sup>4</sup>, Suranbaeva G<sup>5</sup>, Bessonova A<sup>6</sup>

<sup>1</sup>Global Research Institute (GLORI) Foundation, Bishkek, Kyrgyzstan, <sup>2</sup>Kyrgyz Harm Reduction Network Association, Bishkek, Kyrgyzstan, <sup>3</sup>FIND, global alliance for diagnostics, Geneva, Switzerland, <sup>4</sup>Republican AIDS Center, Bishkek, Kyrgyzstan, <sup>5</sup>Scientific and Production Center for Preventive Medicine under Ministry of Health, Bishkek, Kyrgyzstan, <sup>6</sup>Women's Network of Key Communities, Bishkek, Kyrgyzstan

**Background:** In Kyrgyzstan, hepatitis C virus (HCV) prevalence is around 3% for the general public, and 17-60.4% among persons who inject drugs (PWID). The Harm Reduction Network and GLORI Foundation partnered with FIND to conduct a Rapid Qualitative Assessment of Values and Preferences of HCV Self-testing among PWID in Kyrgyzstan. This partnership then expanded to a study on the feasibility of implementing HCV self-testing among PWID. Participants in this study used HCV self-testing in a supervised environment and were linked to HCV care through peer navigators using the HCV-specific Screening, Brief Intervention and Referral to Treatment (HCV SBIRT).

**Materials and Methods:** The project lifecycle included the formative and implementation stages. The assessment of values and preferences of HCV self-testing was conducted in 2020 and informed the follow-up implementation stage activities. The 2020 assessment aimed to determine acceptability of and preferences for HCV self-testing among PWID through face-to-face individual and group semi-structured interviews and participatory action-research. The follow-up feasibility study measured concordance between untrained PWID HCV self-testers using a supported model and confirmatory testing. The community-based HCV



SBIRT framework utilized at implementation stage, gave us opportunity to screen and assess the severity of substance disorders and hepatitis status, identify the appropriate level of treatment, establish smooth and safe referral mechanisms, and link the HCV-positive study participants to specialty care. Brief intervention focused on increasing insight and awareness regarding substance use and HCV care, built on peer feedback and advice and included motivation toward behavioral change.

**Results:** Participants in Stage One (n=47) and Stage Two (n=100) appreciated the community leading role in promoting HCV self-testing and acknowledged the innovative approach that would give PWID flexibility, safety and advanced comfort. Of 39 participants in Stage Two who tested HCV Ab+, the HCV viremia was confirmed by DNA quantitative test in 27 participants, of whom all 27 were linked to treatment, completed it and attained sustained virologic response (SVR) that was confirmed by negative DNA qualitative test in all 27 participants. Of 39 participants who tested HCV Ab+ and got access link to the anonymous Client Satisfaction survey, 30 completed the post-lab survey and 23 completed the 1-month follow-up survey. 97% of them appeared satisfied and extremely satisfied by the study. They felt comfortable and extremely comfortable with the staff member at Harm Reduction Network at the Self-Testing Phase, the laboratory personnel at the Confirmatory Testing Phase and the medical staff at the Follow-Up Treatment Phase. Number of participants who rated their quality of health “in the past 4 weeks” after the treatment started as “good”, significantly increased.

**Conclusions:** Communities leading role is a key factor for creating a favorable context for designing and successful implementation of projects focusing on PWID and key populations’ health and well-being. Use of HCV SBIRT framework enhanced overall quality of linkage to care and treatment outcomes. When adjusted to the needs of key populations, HCV SBIRT proves to be a feasible and comprehensive approach that can be performed in a variety of settings, including the resource-limited ones.

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## Hepatitis Elimination in Nasarawa State, Nigeria : Progress till date

Adamu I<sup>1</sup>, Ahmed Y<sup>1</sup>, Angbazo J<sup>1</sup>, Sikiti B<sup>1</sup>, Bako I<sup>1</sup>, Bello R<sup>1</sup>, Agwuocha C<sup>2</sup>, Adisa O<sup>2</sup>, Akanmu M<sup>2</sup>, Nwobi O<sup>2</sup>, Kama J<sup>2</sup>

<sup>1</sup>Nasarawa State Ministry of Health, Lafia, Nigeria, <sup>2</sup>Clinton Health Access Initiative, FCT, Nigeria

**Background:** Africa continues to lag behind in the global response with an estimated 10M individuals living with HCV and just 5% diagnosed as of 2019 contrary to the 2016 Global Health Sector Strategy’s goal of eliminating viral hepatitis as a public health threat by 2030. With CHAI’s support, a policy framework establishing HCV “test and treat” programs across the country in line with the global guidance was domesticated in Nasarawa State estimated to have an HCV seroprevalence of 13.2%, higher than the national average of 1.1%. To address the high burden, the Nasarawa State Government committed to a 5-year HCV Elimination Plan, aimed at screening 2.4M people and placing an estimated 141K chronically infected persons on treatment. The purpose of this abstract is to evaluate the program’s current state of implementation in Nasarawa State

**Approach/Methods:** Prioritizing micro-elimination in a defined high-risk population – People Living with HIV (PLHIV), the program strategically rolled out in 2020 in an initial 2 ART sites due to the COVID-19 pandemic, with subsequent expansion to 11 additional sites across all 3 geographical regions in the State. HCV services were integrated into HIV services, to drive HCV screening, viral load testing, and treatment initiations. Enrolled PLHIVs were linked to HCV screenings across all 13 sites. In tracking screenings and eliminating repeats, screenings conducted were recorded in facility laboratory registers and uploaded into a central google dashboard. 6 months screening data from June – December 2020 were analyzed to determine areas of high seropositivity which informed the distribution of HCV viral load tests and treatments due to limited Government resources. Taking into cognizance scientific and ethical considerations regarding seropositive rates, number of ART patients, and geopolitical location, 6 healthcare

facilities were prioritized to link waitlisted seropositive patients to viral load and treatment.

**Results:** Currently, a total of 13,206 PLHIVs have accessed screenings of which 70% (9,244) are female. Largest proportion of PLHIVs screened (37%) were within the ages of 31-40yrs while lowest proportion of screenings (2%) occurred amongst the ages 61-70yrs. Average seropositivity rates – 16% (Range : 11% - 23%), HCV seropositivity rates was highest (28%) in the age group 61-70yrs and lowest (7.37%) in age group 0-10 yrs. Out of 2,113 PLHIVs that screened positive , 29% (610) anti-HCV positive individuals were linked to viral load testing with average vireamic rates of 57% realized. Out of 348 chronic HCV PLHIVs, 96% (334) individuals with chronic HCV were initiated on treatment, with an estimated 73% (244) PLHIVs completed treatment. HCV micro-elimination has been achieved in 2 facilities in accordance with WHO program targets that stipulate the diagnosis of  $\geq 90\%$  of enrolled PLHIVs and  $\geq 80\%$  placed on treatment.

**Conclusion:** Nasarawa State remains steadfast in its resolve to advance its viral hepatitis elimination efforts and hopes to achieve micro-elimination in additional 4 facilities in 2022 in furtherance to its overarching quest for viral hepatitis elimination in the State by 2025 potentially catalyzing a nationwide elimination response in the country.

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## Progress towards HCV elimination in the country of Georgia: Insights from modelling and national survey

**Walker J**<sup>1</sup>, Tskhomelidze I<sup>2</sup>, Shadaker S<sup>3</sup>, Tsereteli M<sup>4</sup>, Handanagic S<sup>3</sup>, Armstrong P<sup>3</sup>, Gamkrelidze A<sup>4</sup>, Vickerman P<sup>1</sup>

<sup>1</sup>University Of Bristol, Bristol, United Kingdom, <sup>2</sup>Task Force for Global Health, Tbilisi, Georgia, <sup>3</sup>Division of Viral Hepatitis, Centers for Disease Control and Prevention, Atlanta, USA, <sup>4</sup>National Center for Disease Control and Public Health of Georgia, Tbilisi, Georgia

**Background:** A national serosurvey in 2015 found the country of Georgia had high hepatitis C virus (HCV) prevalence, with 5.4% of adults (~150,000 people) chronically infected. In April 2015, Georgia

launched a national program to eliminate HCV infection (reduce prevalence by 90%). We developed an HCV transmission model to capture current and historical dynamics of HCV infection in Georgia, and project long-term impact of the elimination program. A follow-up serosurvey in 2021 provided data which was used to validate the model and update impact projections.

**Material and Methods:** The original model was calibrated to the 2015 serosurvey and surveys among people who inject drugs (PWID), accounting for age, sex, PWID status, and liver disease state. We compare model projected prevalence overall and by age group, sex, and among ever injected drugs to 2021 serosurvey prevalence, and filter the original 532 parameter sets to match the serosurvey results. We used logistic regression to assess which input parameters or model characteristics affect fit. We used program data on 77,168 persons treated May 2015–February 2022 to estimate current incidence of HCV infection, cases and deaths averted. We project the impact of reductions in treatment rates that occurred in during the COVID-19 epidemic.

**Results:** The original modelled adult hepatitis C prevalence for 2021 (2.7%, 1.9-3.5%) was higher than the observed serosurvey prevalence (1.8%, 1.3-2.4%); across all groups uncertainty bounds overlap. Only 14% of 532 model runs fit within the 95% confidence interval of all hepatitis C prevalence estimates; 32% fit overall, 28% fit in females, 43% fit in males, 85% fit in ever-injected drugs. Runs that fit the 2021 serosurvey data tend to have lower total population and lower general population hepatitis C incidence, suggesting the model overestimated the initial burden of infection. After filtering, modelled hepatitis C adult prevalence is slightly higher than the observed prevalence (2.1%, 1.6-2.4%). Hepatitis C incidence in March 2022 is estimated to be 0.05 (95% credible interval (CrI) 0.03-0.11) per 100 person-years in general population, and 1.14 (0.08-6.4) per 100 person-years in PWID, a 60% decrease since 2015. As of March 2022, 9,186 (5,396–16,720) infections and 842 (489-1324) deaths have been averted, with benefit accumulating to 26,154 (15,850–47,627) infections and 3,971 (2,516-5,536) deaths averted if tracked to 2030. Treatment numbers went from 996/month in 2019 to 406/month March 2020–March 2022 during the COVID-19 pandemic, resulting in 14,127 fewer treatments, 471 (242-817) fewer infections averted by March 2022. At 406 treatments/month, elimination can be reached in 2031.

**Conclusions:** HCV prevalence reduction due to treatment and prevention interventions was greater than originally projected, but treatment numbers must still increase in order to reach HCV elimination by 2030.

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## PREVALENCE, KNOWLEDGE, ATTITUDE, PRACTICES AND DETERMINANTS OF HEPATITIS B VIRUS TRANSMISSION AND PREVENTION AMONG PERSONS WHO INJECT DRUGS IN LAGOS STATE, NIGERIA

Ganiyu J<sup>1</sup>, Onajole A

<sup>1</sup>National Aids, Viral Hepatitis And Stis Control Programme, Federal Ministry Of Health, Abuja, Nigeria, Abuja, Nigeria,  
<sup>2</sup>SEHAM Foundation, Lagos, Nigeria

**Introduction:** Hepatitis B virus infection still remains a major global public health problem. Of the estimated 376,000 high-risk drug users in Nigeria in 2018, 21% were injection drug users. Despite the higher risk of hepatitis B virus among this group, the poor investment and absence of targeted national prevention, treatment and care interventions can be attributable to lack of evidence or data in the country. This study is aimed to determine the prevalence, knowledge, attitude, practices and factors associated with hepatitis B virus transmission and prevention among injection drug users in Lagos State, Nigeria.

**Methods:** A cross-sectional study that utilized respondent-driven sampling to identify 274 respondents between October 2020 and January 2021. A pre-tested interviewer-administered questionnaire was used to collect data on socio-demographic characteristics, knowledge, attitude and practices with transmission and prevention of hepatitis B virus. A screening test for Hepatitis B Virus surface antigen and Focus Group Discussion (FGD) were also conducted. Multivariable analysis was done to assess factors associated with Hepatitis B Virus transmission and prevention as well as status of completion of three doses of Hepatitis B Virus immunization.

**Results:** The Hepatitis B Virus prevalence was 9.9%, and there was general poor knowledge and negative attitude towards Hepatitis B Virus transmission and prevention. A month before the study, 95.6% injected drugs, 35% shared needles and syringes with three persons, 55% sometimes injected drug with new sterile needle and syringe and 66.4% did not consistently use condom when having sex. In multivariable logistic regression analysis, the predictors of Hepatitis B Virus infection were being single, older age at first injection of drugs and not using condom in last intercourse with person other than spouse/partner. The vaccination coverage of 89.4%, 69.5% and 63.4% were reported for first, second and third doses of Hepatitis B Virus vaccine among respondents, respectively. However, there was no factor associated with uptake of HBV vaccine.

**Conclusion:** There was high prevalence of Hepatitis B Virus with increased risk of unsafe injection and sexual practices among respondents. Therefore, there is an urgent need for catalytic funding, domestic financing and support for government at all levels to implement the national strategic plan and policies on viral hepatitis for prevention, treatment and care for persons who inject drugs including advocacy for free Hepatitis B Virus vaccination for adults in the routine immunization schedule.

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## Barriers to timely administration of hepatitis B birth dose vaccine to neonates of mothers with hepatitis B in a sub-Saharan African Context

Ampong Adjei C, Suglo D, Yanful Ahenkorah A, E. MacDonald S, Richter S

<sup>1</sup>University of Ghana, Ghana, Accra, Ghana

**Background:** The global health sector strategy on viral hepatitis aims to reduce new hepatitis B infections by 90% by 2030. Yet, hepatitis B birth dose (HepB-BD) vaccination, which is effective in preventing mother-to-child transmission of

hepatitis B, remains low in sub-Saharan Africa. Given the essential role that midwives play in infants' birth dose immunisation, we explore their perspectives on the reasons for delays and non-administration of HepB-BD to eligible neonates in Ghana.

**Methods:** We conducted interviews with 18 midwives, stratified by region (Greater Accra and Northern regions). Participants were selected purposively. The data were transcribed, coded, and analysed following the Braun and Clarke (2006) data analysis procedure.

**Findings:** The participants conveyed a broad range of barriers to HepB-BD vaccination in Ghana. These include the mother's denial of hepatitis B seropositivity; the mother's ignorance of the impact of hepatitis B on their newborn; partners' non-involvement in post-test counselling; and the high cost of hepatitis B immunoglobulin and hepatitis B monovalent vaccine. Other reasons included vaccine unavailability and midwives' oversight and documentation lapses.

**Conclusion:** We recommend educating expectant mothers on the importance and effectiveness of HepB-BD vaccination during Antenatal care (ANC) visits, as well as educating midwives on HepB-BD vaccination procedures. In addition, ensuring sufficient supplies and administering hepatitis B vaccines in the delivery ward should be done to guarantee that babies receive the vaccines on time. Importantly, Ghana needs policies that require HepB-BD vaccination as part of the Expanded Programme on Immunisation (EPI) to ensure the investments and funding it needs.

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## Combined COVID-19 vaccination and hepatitis C virus screening intervention for marginalised populations at a centre for addiction services in Barcelona, Spain

Lazarus J<sup>7,8</sup>, Grau-López L<sup>1,2,3,4</sup>, Buti M<sup>5,6</sup>, Palma-Álvarez R<sup>1,2,3,4</sup>, Ramos-Quiroga J<sup>1,2,3,4</sup>, Villota-Rivas M<sup>7</sup>

<sup>1</sup>Department of Psychiatry, Addiction and Dual Diagnosis Section, Hospital Universitari Vall d'Hebron, Barcelona, Spain, <sup>2</sup>Psychiatry Group, Mental Health and Addiction, Vall d'Hebron Research Institute (VHIR), Barcelona, Spain, <sup>3</sup>Biomedical Network Research Centre on Mental Health (CIBERSAM), Madrid, Spain, <sup>4</sup>Department of Psychiatry and Forensic Medicine, Autonomous University of Barcelona, Barcelona, Spain, <sup>5</sup>Department of Internal Medicine, Hospital Universitari Vall d'Hebron, Barcelona, Spain, <sup>6</sup>CIBERhd, Instituto de Salud Carlos III, Madrid, Spain, <sup>7</sup>Barcelona Institute for Global Health (ISGlobal), Hospital Clinic, University of Barcelona, Barcelona, Spain, <sup>8</sup>Faculty of Medicine and Health Sciences, University of Barcelona, Barcelona, Barcelona, Spain

**Background:** The COVID-19 pandemic has hindered efforts to address blood-borne viruses like the hepatitis C virus (HCV) by reducing testing, particularly in marginalised groups such as people with substance use disorders (SUDs), who have some of the highest rates of HCV and lowest rates of COVID-19 vaccination. This pilot study aimed to explore the acceptability of combining HCV testing with COVID-19 vaccination in a centre for addiction services in Barcelona, Spain.

**Material and Methods:** From 20 January to 30 June 2022, 86 individuals with SUDs were offered COVID-19 vaccination along with HCV antibody (Ab) screening. If HCV Ab+, they were screened for HCV-RNA. If HCV-RNA+, patients would be offered linkage to care. Data were analysed descriptively.

**Results:** Of the 86 participants (mean age 47 [SD: 10.1]), 76.7% were male, 84.9% of Spanish origin, 18.6% had precarious living situation or were homeless, 32.6% were unemployed, 26.7% had an incarceration history, 20.9% had mental health disorders, 11.6% had a previous sexually transmitted infection other than HCV or HIV, 14.0% were HIV+ and 32.6% had a previous HCV infection,

of which 96.4% had been previously treated. Of all participants, 15.1% had a previous COVID-19 diagnosis and 93.0% had been previously vaccinated for COVID-19, of which 90.0% had received the full first round schedule but none had received a COVID-19 vaccine booster. Everyone received a COVID-19 vaccine, without any identified adverse events. Of everyone, 54 (62.8%) were tested for HCV Ab, of which 17 (31.5%) were positive, of which all were tested for HCV-RNA and none were positive. The study intervention took, on average, 23 minutes (minimum: 20; maximum: 25).

**Conclusions:** The combined intervention had an acceptability rate of 62.8% and was considered safe, as no adverse events to HCV testing were reported. It also optimised the use of time, as participants were tested for HCV during the post-vaccination waiting period and it prevented the need for multiple visits. This novel model of care demonstrated the effectiveness of co-locating HCV screening with COVID-19 vaccination for marginalised communities.

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## Hepatitis C Free Balears: a micro-elimination program focused on people who use drugs in the Balearic Islands, Spain

**Herranz A**<sup>1</sup>, García M<sup>2</sup>, Murillas J<sup>2</sup>, Bonet L<sup>3</sup>, Martorell F<sup>4</sup>, Cantarero R<sup>4</sup>, Trelles M<sup>5</sup>, Canet R<sup>6</sup>, Fernández P<sup>6</sup>, R Rubí A<sup>7</sup>, Martín L<sup>7</sup>, Vilaplana L<sup>8</sup>, Sansó A<sup>9</sup>, Gelabert J<sup>10</sup>, Escudero M<sup>11</sup>, Buti M<sup>12,13</sup>, Vilella À<sup>11</sup>, Lazarus J<sup>1,14</sup>

<sup>1</sup>Barcelona Institute for Global Health (ISGlobal), Hospital Clínic, University of Barcelona, Barcelona, Spain, <sup>2</sup>Department of Internal Medicine and Infectious Diseases, Hospital Universitari Son Espases, Mallorca, Spain, <sup>3</sup>Department of Gastroenterology, Hospital Universitari Son Espases, Mallorca, Spain, <sup>4</sup>Department of Internal Medicine and Infectious Diseases, Hospital Comarcal d'Inca, Mallorca, Spain, <sup>5</sup>Department of Gastroenterology, Hospital Comarcal d'Inca, Mallorca, Spain, <sup>6</sup>Department of Internal Medicine and Infectious Diseases, Hospital Can Misses, Ibiza, Spain, <sup>7</sup>Department of Gastroenterology, Hospital Can Misses, Ibiza, Spain, <sup>8</sup>Department of Internal Medicine and Infectious Diseases, Hospital Comarcal de Manacor, Mallorca, Spain, <sup>9</sup>Department of Gastroenterology, Hospital Comarcal de Manacor, Mallorca, Spain, <sup>10</sup>Department of Gastroenterology, Hospital Mateu Orfila, Menorca, Spain, <sup>11</sup>Department of Gastroenterology, Hospital Universitari Son Llàtzer, Mallorca, Spain, <sup>12</sup>Department of Internal Medicine, Hospital Universitario Vall d'Hebron, Barcelona, Spain, <sup>13</sup>CIBERhd, Instituto de Salud Carlos III, Madrid, Spain, <sup>14</sup>Faculty of Medicine and Health Sciences, University of Barcelona, Barcelona, Spain

**Background:** There are an estimated 1,400 individuals living with untreated hepatitis C virus (HCV) in the Balearic Islands, Spain, of which, the majority are people who inject drugs (PWUD), a group that often have difficulties accessing healthcare. This study developed a simplified new model of care to micro-eliminate HCV in this population.

**Material and Methods:** A new HCV care model for PWUD has been implemented since April 2021 in 21 centres on the Balearic Islands: 12 addiction service centres, three non-governmental organizations (NGOs), a mobile methadone unit, the Mallorca prison, and four social inclusion centres. The intervention protocol consists of four phases: 1) recruitment and testing on-site via a point-of-care anti-HCV antibody (Ab) test (Oraquick®, OraSure Technologies Inc.) and a dried blood spot (DBS) test to confirm viremia (HCV-RNA); 2) linkage to care; 3)

treatment prescription via telemedicine; and 4) monitoring on-site of sustained virological response (SVR) 4 and 12 weeks after treatment completion and testing for reinfection a year after diagnosis. Descriptive statistics were used and a p-value of <0.05 was considered statistically significant.

**Results:** Of the 1,050 recruited patients, 33% (351) were anti-HCV+ and 129 (36.7%) were HCV-RNA+. Of those with active HCV infection, 91% (117) reported having had a previous HCV diagnosis and 22% (29) had previous HCV treatment.

Amongst those HCV-RNA+, the mean age was 46.9 years (SD:8.7), 74% (95) were male, predominantly Spanish-born (86%, 111), and 54% (70) reported active drug and alcohol use. There was HIV co-infection in 17% (22/129) of these participants, and 86% (19/22) of these were linked to specialty care. Of those HCV-RNA+, 111 (86%) have started treatment, 92 (71%) have completed treatment, and 5 (4%) abandoned it. The other 18 (14%) are pending treatment initiation, 50% of whom are HIV co-infected. Treatment was provided to 93% of those mono-infected, and 68% of those co-infected. The mean number of days between the HCV-RNA+ diagnosis and treatment prescription was shorter among the mono-infected (16, SD:31.9) compared to those co-infected (43, SD:41.3) ( $p<0.01$ ). The mean number of days between the HCV-RNA+ diagnosis and treatment initiation was 21 (SD:31.6) in the mono-infected, and 42 (SD:63.3) in the co-infected ( $p=0.24$ ).

SVR4 and SVR12 monitoring tests were performed in 69 (75%) and 58 (63%) patients who completed treatment, with undetectable HCV-RNA results in 96% (66) and 95% (55) of them, respectively. Testing for reinfection was performed in 12% (32/278) of the patients screened a year ago and detected two reinfections. Of the total participants, eight (0.8%) were lost to follow-up.

**Conclusions:** The Hepatitis C Free Balears model of care facilitates HCV elimination among PWUD in the Balearic Islands by decentralising testing and teleprescribing treatment. In addition, the new model allows co-infected patients lost in the system to be relinked to healthcare including HIV treatment. Although the rate of SVR12 reached by the PWUD population is high, repeating diagnostic tests should be part of routine care in addiction services centres to detect new infections and reinfections, especially if there is active drug use.

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## Shared Primary-Specialty Care Models for the Management of Chronic Hepatitis B in China: Highly Effective and Cost-effective

**Seto W**<sup>1</sup>, Zhang L, Liu H, Zou Z, Su S, Ong J, Ji F, Cui F, Ning Q, Li R, Shen M, Fairley C, Wong W

<sup>1</sup>The University Of Hong Kong, Hong Kong, Hong Kong

**Background:** The latest WHO Global health strategies for HIV, hepatitis and STI recommend decentralising routine hepatitis testing and care to primary care. China accounts for one-third of the world's hepatitis B virus (HBV) infections, and has recently scaled up its national primary care system, capable of providing comprehensive care to individuals living with chronic hepatitis B (CHB). We evaluated the impact and cost-effectiveness of shared primary-specialty CHB care models in China.

**Method:** We constructed a decision-tree Markov model to simulate hepatitis B virus (HBV) disease progression in a cohort of 100,000 CHB individuals aged  $\geq 18$  years over their lifetime (aged 80), presented according to the Consolidated Health Economic Evaluation Reporting Standards. CHB individuals were determined by clinicians on whether they were eligible for HBV treatment according to the Chinese Guidelines for the Prevention and Treatment of Chronic Hepatitis B (2019). We evaluated the population impacts and cost-effectiveness in three scenarios: (1) status quo; (2) shared-care model with HBV testing and routine CHB follow-ups in primary care and antiviral treatment initiation in specialty care; and (3) shared-care model with HBV testing, treatment initiation and routine CHB follow-up in primary care and treatment for predetermined conditions in specialty care. Specialist referral criteria for predetermined conditions (including cirrhosis, undergoing immunosuppressive therapy, concomitant liver disease, pregnancy etc.) followed the Chinese Chronic Hepatitis B Primary Care Guidelines (2020). We evaluated from a healthcare provider's perspective with 3% discounting rate and a cost-effectiveness threshold of 3 times China's GDP. Sensitivity analysis accounted for the

multidisciplinary collaboration, cost of training and upgrading of medical infrastructure.

**Results:** With the status quo, we projected that 27.97% (89,636 person-years) of the 100,000 CHB individuals would progress to HBV-related complications, and would result in spending US\$569.03 million over the cohort's lifetime. Compared with status quo, all shared-care models were cost-effective or cost-saving. Scenario 2 would result in a net gain of 3,015-110,096 quality-adjusted life years (QALYs) and prevent 276-8,378 HBV-related deaths. It would result in a net monetary benefit of US\$110.21 million over the cohort's lifetime, saving US\$0.97-126.27 million, with a benefit-cost ratio of 0.04-5.70. Scenario 3 would result in a net gain of 14,012-117,185 QALYs and prevent 1,273-8,874 HBV-related deaths. It would result US\$564.45 million over the cohort's lifetime and save US\$47.75-193.32 million, with a benefit-cost ratio of 0.71-2.09. Sensitivity analysis based on a broad range of designated parameters showed all incremental cost-effective ratios consistently <3 times per-capita GDP. Improving HBV antiviral treatment initiation from 11% to 80% among eligible CHB individuals would substantially improve the cost-effectiveness of shared-care models, with each dollar relocated to primary care gaining US\$2.09 in return, resulting in a net monetary benefit of US\$4.51 billion over the cohort's lifetime.

**Conclusion:** Shared-care models with HBV testing and treatment in primary care, together with referrals of predetermined conditions to specialty care are highly effective and cost-effective in China. Implementing shared-care models may significantly improve the quality of life and reduce liver-related deaths amongst individuals living with HBV, and have important implications for HBV-related health policies and service provision.

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## Time to hepatitis C RNA testing and treatment in the era of direct-acting antiviral therapy among people with hepatitis C in NSW, Australia

Yousafzai M<sup>1</sup>, Alavi M<sup>1</sup>, Valerio H<sup>1</sup>, Hajarizadeh B<sup>1</sup>, Grebely J<sup>1</sup>, Dore G<sup>1</sup>

<sup>1</sup>The Kirby Institute, UNSW, Sydney, Australia

**Background:** Unrestricted access to direct-acting antiviral (DAA) therapy raised optimism for achieving WHO's HCV elimination goals in Australia. This study aimed to identify the factors associated with timely (within four weeks) HCV RNA testing and timely (within six months) DAA initiation following HCV notification in the DAA era (2016-2018) in NSW, Australia.

**Material and Methods:** We conducted a population-based retrospective cohort study in NSW. Notifications of positive HCV serology were linked to administrative data sources, including HCV testing and treatment. Weights were applied to individual records to account for sex-specific spontaneous viral clearance to develop an estimated population with chronic HCV infection. Logistic regression analyses were performed to identify the factors associated with timely HCV testing and treatment.

**Results:** Among 5582 people with an HCV notification during 2016-2017, 3867 (69%) were tested for HCV RNA, including 2770 (50%) who received timely testing. Among an estimated 3925 people with chronic HCV infection, 2372 (60%) initiated DAA therapy, including 1370 (35%) who received timely treatment. In adjusted analysis, factors associated with timely HCV RNA testing included age ( $\geq 30$  years), female sex, non-Aboriginal ethnicity, country of birth Australia, and no history of drug dependence. Factors associated with timely treatment were age ( $\geq 30$  years), male sex, non-Aboriginal ethnicity, country of birth Australia, no history of drug dependence, and HCV/HIV co-infection.

**Conclusion:** In the DAA era, 50% of people with an HCV notification did not receive timely HCV RNA

testing. Most people with HCV infection received therapy; however, DAA initiation was delayed among many. Innovative strategies to enhance timely diagnosis and treatment uptake, including point-of-care technologies and simplified models of care, are required to optimize HCV elimination efforts.

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## Evaluation of a two-day training program on Viral Hepatitis among in-service nurses: A quasi-experimental study

**Rastogi A<sup>1</sup>**, Bansal A<sup>1</sup>, Jindal A<sup>1</sup>, Sharma T<sup>1</sup>

<sup>1</sup>*Institute of Liver And Biliary Sciences, New Delhi, India*

**Introduction:** Lack of knowledge about viral hepatitis may put healthcare personnel at a higher risk of infection, which could raise the likelihood of the virus spreading to their families and the general public. Therefore, nurses, in particular, need to receive proper and current training to prevent and manage viral hepatitis. A carefully thought-out training programme was organized by Project PRAKASH (PRogrammed Approach to Knowledge and Sensitization on Hepatitis) to educate in-service nurses about viral hepatitis prevention and management.

**Aim:** To assess the effectiveness and impact of the two-day training program on viral hepatitis among in-service nurses through a pre-post assessment survey.

**Materials and Methods:** A quasi-experimental, non-randomized, controlled study with pre-and post-test assessments was conducted among in-service nurses from November 2021 to July 2022. The intervention consisted of a two-day virtual training program titled 'Hepatitis Induction Program Phase-II' designed to enhance the knowledge related to viral hepatitis. A 33-item questionnaire divided into four domains: i) General, ii) Transmission & Clinical Manifestation, iii) Diagnosis & Management, and iv) Infection Prevention & Control was used to assess the knowledge related to viral hepatitis. The post-

knowledge assessment was attempted among all the nurses completing 80% of the training program after seven days of the training. Paired t-test was used to assess the effect of training on knowledge using STATA-14.

**Results:** A total of 1576 nurses were trained through six two-day trainings across India. The mean pre-test knowledge score was 16.8 out of 33, while the post-test knowledge score was 23.4 out of 33. The mean difference between the pre and post-test was statistically significant ( $p < .001$ ).

**Conclusions:** Short training programs similar to the current program helped the in-service nurses to enhance their knowledge of viral hepatitis.

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## Community Based Mobile Hepatitis C Testing and Treatment Expands Outreach to Urban and Rural Communities in New Jersey to Eliminate Hepatitis C

**DeStefano C<sup>1</sup>**, Slim J, Finkel D, Leyden K, Levaggi E, Torres J, Scarinci E, Vera S, Pastor A, Iyahan P

<sup>1</sup>*NJCRI, Newark, United States*

**Background:** NJCRI is a non-profit org. in Newark, NJ that provides medical care and support services for highly vulnerable, hard to reach clients. During the COVID pandemic, we modified our Hepatitis C Program by providing a hybrid mobile outreach and testing program along with telemedicine. This model engage, treat and provide support services to those individuals with a history of substance use and also delivered highly efficacious, cost effective medical care to urban and rural communities.

**Methods:** NJCRI assessed the impact of COVID on HCV clinical care, testing, prevention and treatment and used community engagement and outreach partnering dealing with a history of substance use to provide mobile Hep C Testing, prevention, care & treatment across the state. Our Mobile Team travels to all the sites during non-traditional hours to capture all populations from 5am to 11pm and



provides comprehensive, self-contained Hepatitis C assessment and coordination of care. The team completes the EMR registration, testing, education and makes the appointments with the provider via telemedicine for the following week. Medication orders are sent and prior authorizations are done via EMR, which delivers the medications directly to the individual's location.

**Results:** In 3/2020, we had 4 community partners for this initiative and the partners came to NJCRI prior to the lockdowns. This posed barriers to care for many patients, such as lack of transport, poor adherence to the appointments, excessive paperwork and absence of lab work at appointment time with the provider. Excellent pilot outcomes led us to expand services from the original 4 partner sites to 12 sites by 3/2022. From 1/2020- 6/2021, 340 were screened, 106 positives were treated. After full implementation of our mobile program, from 7/2021- 3/2022, we tested and outreached to 507 people, 254 tested positive, 199 were treated, 55 are pending due to preauthorization's, incarceration and labs. A Nurse Disease Interventionist will be focusing on SVR testing/results, to be presented at the meeting.

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**Conclusion:** Novel community engagement and clinical practices during the COVID pandemic to provide mobile, telehealth HCV services and field based testing successfully delivered high quality care to underserved communities in urban and rural settings.

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## Hepatitis C virus infection micro-elimination approach to illicit substances users under follow-up in a drug addiction treatment unit in Integrated Response Center (IRC) from Setubal Peninsula, Portugal: preliminary results

**Lima Vieira C<sup>2</sup>**, Rodrigues D<sup>3</sup>, Campante F<sup>1,3</sup>, Gaspar A<sup>4</sup>, Sequeira R<sup>1,5</sup>, Gois A<sup>1,5</sup>, Virgolino A<sup>1,6</sup>, Antunes F<sup>1,6</sup>

<sup>1</sup>Instituto De Saúde Ambiental, Faculdade De Medicina Da Universidade De Lisboa, Lisboa, Portugal, <sup>2</sup>Gastroenterology Unit, Centro Hospitalar Barreiro Montijo, Barreiro, Portugal, Barreiro, Portugal, <sup>3</sup>Internal Medicine Department, Centro Hospitalar Barreiro Montijo, Barreiro, Portugal, Barreiro, Portugal, <sup>4</sup>Pharmaceutical Department, Centro Hospitalar Barreiro Montijo, Barreiro, Portugal, , Portugal, <sup>5</sup>CRI Peninsula Setúbal, Setúbal, Portugal, , Portugal, <sup>6</sup>Laboratório Associado TERRA, Faculdade de Medicina da Universidade de Lisboa, Lisboa, Portugal, , Portugal

**Background:** Pursuing a hepatitis C virus (HCV) elimination strategy by 2030, barriers must be reduced from diagnosis till treatment, tailoring approaches depending on patients' setting. In Portugal, HCV prevalence in people who inject drugs (PWIDs) is approximately 70%. Addiction treatment units (ATUs) are an opportunity for a micro-elimination approach, assessing and treating HCV-infected patients who use drugs (PWUD). Considering this, we aimed at decentralizing from the hospital to the ATU both outpatient assessment and treatment to improve linkage to care, adherence, and outcomes, evaluating the efficacy of direct acting anti-viral (DAA) treatment in this setting.

**Material and Methods:** Prospective study in PWUD (> 18years old) under care in ATUs in Barreiro (Setubal Peninsula IRC), delivering specialized hepatology care and HCV treatment at the ATU, aiming to assess the effectiveness of an HCV micro-elimination program and the efficacy of DAA. PWUD were recruited, screened for anti-HCV antibodies and, if positive, evaluated with RNA, genotyping (GT), AST, ALT, platelets, and liver stiffness (assessed with non-invasive APRI/FIB4

scores). Enrolment started in May 2021 and is still on going.

**Results:** Out of 244 patients enrolled: 58.7% (143) were anti-HCV+, of these 31.5% (45) RNA+, 53.1% (76) RNA and 15.4% (22) are awaiting assessment. Considering RNA+ patients: 79.5% were male, mean age of 50.4±6 years with GT1 predominance (GT1-27; GT3-8; GT4-9). Two patients were previous non-responders to glecaprevir/pibentavir. Median fibrosis score Fib4 1.44 (0.23-5.9) and APRI 0.9 (0.1-4), 63% with APRI>0.5 and FIB4>1.5. These patients had abdominal ultrasound previously performed and two had features of liver cirrhosis. No previous liver decompensations were reported. Forty-one patients started treatment with no related adverse event reported. One patient was admitted to the hospital with pneumonia non-DAA related still achieving sustained virologic response (SVR). Currently, EOT analysis of 34 patients is available: 28 (82.4%) patients RNA- and 6 (17.6%) patients RNA+. SVR12 analysis is available for 28 patients: 21 (75%) cured (all previously EOT-). Of those not achieving SVR12, one was a reinfection (HIV coinfection, keeping risk behaviours after EOT) and the other six (GT1-5; GT3-1; GT4-1) were RNA+ at EOT, suggesting non-adherence to treatment (three did not complete therapeutic scheme). Of these six patients, three had Fib4>1.5 and repeated US with no hepatocellular carcinoma; the GT3 patient had no significant fibrosis (Fib4-1.3; APRI-0.4).

**Discussion/conclusion:** Almost 60% of our PWUDs are HCV-positive. The decentralizing strategy has posed several constraints to the study, mainly limited human resources, during the COVID-19 pandemic, and frequent failures on scheduled appointments on the part of PWUD. Therefore, after limited enrolment after one year we had to empower the ATU's nurse staff with rapid anti-HCV and RNA testing. Reinfection was a minor reality in this population. We conclude that improving HCV care in ATUs implies an integrated (hospital and ATUs) strategy centered on empowering these units that are the most capable to tailor the approach to assess, treat and monitor these HCV patients.

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## Prevalence and Evaluation of Hepatitis B Viral Replication in Pregnant Women With and Without HIV Coinfection in Mali

Fofana D<sup>1</sup>

<sup>1</sup>University, Bamako, Mali

**Introduction:** Pregnant women with a high Hepatitis B Virus (HBV) DNA viral load (VL) can still transmit HBV to the fetus or newborn, despite receiving hepatitis B immunoglobulin (HBIG) and vaccination of the newborn at birth. Although HBV infection is common in sub-Saharan Africa, data on maternal virological outcomes are limited.

**Methods:** In this longitudinal study, we assessed the sero-prevalence of hepatitis B surface antigen (HBsAg) from pregnant women's samples obtained during antenatal visits between January and May 2022 at a public health clinic in Bamako, Mali. HBsAg positive samples were then tested for HBV VL, with a high VL defined as >2000 IU/mL.

**Results:** Of the 998 pregnant women included, 84 (8.4%) had a positive HBsAg. Of these 84, median age was 27 yrs (interquartile range [IQR], 23-32); most were married (98%) and homemakers (73%); and 18% were primiparous, however, only 10% knew their HBV serological status before the current pregnancy. Alanine aminotransferase (ALT) level was < 35 IU/L in 92% of cases and 26 (34.6%) had a VL > 2000 IU/mL, including 5.3% with a VL > 200 000 IU/mL. Three (3.5%) were HIV co-infected of which two had a detectable HIV VL >40 and one had HBV DNA at 1500 IU/mL. There was no statistically significant relationship between age, parity, and VL ( $\chi^2$  test, respectively,  $p=0.67$ ;  $p=0.76$ ).

At present, 32/84 women have delivered at term and 31/32 received the first vaccine dose within 24 hours of delivery. However, HBV immunoglobulin must be purchased by the patient and only 23/32 received immunoglobulin.

**Conclusion:** This study characterizes HBV infection among pregnant women in Mali. HBsAg

seropositivity is high and a third of women had HBV VL >2000 where antiviral treatment would be indicated to prevent mother to child transmission of HBV. These data confirm the need for hepatitis B vaccination and treatment programs for women of child bearing age in sub-Saharan countries like Mali, as well as, routine HBs Ag screening of pregnant women.

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## Awareness and Attitude about Hepatitis B and C viral Infection among Healthcare Workers in Sokoto, Nigeria

Hali B<sup>1</sup>, Magaji B A<sup>1</sup>, Yakubu A<sup>1</sup>

<sup>1</sup>Usmanu Danfodiyo University, Sokoto, Sokoto, Nigeria

**Background:** Hepatitis B and C viruses' infections are the most important causes of viral hepatitis and life-threatening liver diseases which are liver cirrhosis and primary liver carcinoma globally. The World Health Assembly set a milestone of eliminating these infections by the year 2030. Perception and attitude of healthcare professionals towards these viruses are key to ensuring their elimination as these viruses are highly infectious and hospital associated infections.

**Methodology:** The study was cross-sectional carried out from October 2015 to March 2016 in secondary healthcare facilities in Sokoto metropolis. The study participants were 171 Healthcare professionals of different cadres: Nurses, Nurses Interns, Midwives, Midwife Interns, Doctors, Medical laboratory Scientists, Medical laboratory Interns, Science laboratory Technicians, and Science laboratory Technician Interns. Self-administered Questionnaire technique was adopted in obtaining information about the understanding and attitude of the study participants towards hepatitis B and C virus infection. SPSS Version 20 was used for the data analysis. Results were expressed as frequencies and percentages.

**Results:** The study comprises of 87 (50.9 %) and 84 (49.1 %) males and females respectively, and their age was  $28 \pm 7$  (Mean  $\pm$  SD). 150 (87.7 %) and 147 (86.0 %) were aware of hepatitis B and C virus

infection respectively, and the awareness was comparable among sex: (P= 0.750; 0.431 respectively). 161 (94.2 %) study participants were not aware of their hepatitis B and C virus infection status. 163 (95.3 %) study subjects believed that it is always necessary to use hand gloves during an invasive procedure in patient with hepatitis B and/or C virus infection.

24 (14.0 %), 28 (16.4 %) and 22 (12.9 %) of the study participants do not either believed or know that they are at risk of acquiring hepatitis B and C virus infection due to their profession, and that patient can contract hepatitis B and/or C virus while in the hospital respectively.

158 (92.4 %), 157 (91.8 %), 152 (88.9 %), and 140 (81.9 %) of the healthcare professionals were aware that hepatitis B and C virus infection could be transmitted via blood and blood products, needle prick injury, exchanged of used needles and syringes, and prenatal respectively. 152 (88.9 %), 137 (80.1 %), and 136 (79.5 %) of study participants were aware that hepatitis B and C virus infection could be prevented by safe handling of blood/blood products and sharp objects, and testing of donated blood for hepatitis B and C virus infection respectively.

**Conclusion:** Substantial percentage of study participants demonstrated negative manner towards hepatitis B and C virus infection and were not aware that hepatitis B and C virus infection could be transmitted or prevented via their professional practices. There is need for continue education of healthcare professionals especially of secondary healthcare facilities on hepatitis B and C virus infection so as to close the gabs on the perception and attitude about hepatitis B and C virus infection.

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## Implementing a Protocol to Improve HCV Screening in the Emergency Department

Abdulsalam N<sup>1</sup>

<sup>1</sup>Mount Sinai Hospital/rutgers University, nj, United States

**Purpose of the Project:** Screening for hepatitis C virus (HCV) is the first step in preventing HCV transmission and treating the disease. Despite multiple access points to health care, the emergency department (ED) is a crucial arena for delivering urgent care services and often serves as the front door to the hospital. As such, ED nurses are in a prime position to screen for HCV infection in adults. The aim of this project is to improve the HCV screening rate among patients 18 years and older in the Emergency department.

**Methodology:** The purpose of this project was to improve HCV screening rates over baseline among patients seen in the ED. This project aimed to increase HCV screening by 10%. The project used retrospective and prospective chart reviews to assess the intervention's effects. The DNP student selected 200 random charts from the ED's electronic medical record (EMRs) during the two months immediately preceding and following the intervention. Eligible charts of patients included those for patients 18 years of age and older of any gender. Charts of patients who had a pre-existing HCV diagnosis were excluded. Each review evaluated the number and percentage of charts with a documentation of HCV screening and the rates of acceptance/refusal of screening.

**Results:** The DNP student reviewed a total of 200 patient charts (n=200) (i.e., 200 records each pre- and post-implementation). The chi-square test of association between pre- and post-implementation was statistically significant (chi-square1df = 183.65,  $p < 0.0001$ ). This confirms that HCV test offerings increased significantly following the project's educational intervention.

**Implication for Practice:** HCV infections are on the rise. It is imperative to implement new approaches to improve screening rates because the more patients are screened, the more patients are diagnosed and treated. Without implementing a

process flow to address this gap related to HCV testing, EDs may continue to miss opportunities to identify undiagnosed HCV infection and facilitate linkage to treatment. The most common facilitator of HCV screening was structured educational initiatives among nurses. This project described an effort to implement evidence-based practices by creating and integrating HCV screening into the ED workflow, starting at, and implementing a PDSA framework cycle to improve HCV screening rates.

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## Evaluation of HCV transmission through endoscopy procedures

Merabishvili T<sup>1</sup>, Baliashvili D<sup>2</sup>, Tskhomelidze I<sup>2</sup>, Tsereteli M<sup>1</sup>, Karichashvili L<sup>1</sup>, Gamkrelidze A<sup>1</sup>, Armstrong P<sup>3</sup>, Butsashvili M<sup>4</sup>

<sup>1</sup>National Center for Disease Control and Public Health, Tbilisi, Georgia, <sup>2</sup>The Task Force For Global Health, Tbilisi, Georgia, <sup>3</sup>Centers for Disease Control and Prevention, Division of Viral Hepatitis, Atlanta, USA, <sup>4</sup>Health Research Union, Tbilisi, Georgia

**Background:** In 2015, Georgia launched an unprecedented Hepatitis C Elimination Program, aiming to decrease disease prevalence through comprehensive screening, diagnostic, and treatment programs. Additionally, one of the key priorities of the elimination program is prevention of new infections, including in the health care setting. Health care-related hepatitis C virus (HCV) transmission is still a major problem in Georgia, with a history of blood transfusion and surgical procedures as significant risk factors for HCV infection. However, the specific contribution of invasive diagnostic procedures to the transmission in Georgia is not known. Endoscopic procedures, such as colonoscopy, gastroscopy and bronchoscopy, have been found to transmit HCV and hepatitis B virus in studies conducted in other countries. The correlation between endoscopic procedures and HCV transmission has not been previously assessed in Georgia. The overall goal of the study was to estimate correlation of a positive HCV test with receipt of endoscopic procedures in Georgia and to estimate HCV incidence among patients undergoing gastroscopy, colonoscopy and bronchoscopy.

**Methods:** This study was conducted by the National Center for Disease Control surveillance team and

municipal epidemiologists within four endoscopy units in two different cities in Georgia. Patients (≥ 18 years of age) receiving an endoscopic procedure during April–September 2021 in the inpatient and outpatient unit were selected and invited to participate, using convenience sampling. After providing consent, they were offered an HCV antibody test (rapid diagnostic test [RDT]) at the same time they underwent an endoscopic procedure. Patients who tested positive and not aware of their infection were linked to care within the elimination program. Patients who were negative on initial testing, were retested six months after the initial test and surveyed about risk factors. Participants with a positive result on RDTs at the repeated test were retested using a lab-based antibody test and viremia test.

**Results:** Initial testing was performed on 1110 patients, of which 49 were positive, 71 died before repeat test, and 80 were excluded for other reasons (e.g., already on treatment, duplicates, planned emigration, residence in the occupied territories, etc.). Of the remaining 910 (82%) participants eligible for the repeat test, 590 (65%) were reached and tested. The most common reasons for not reaching the remaining participants were incorrect or changed contact information (67) and being abroad (35). At retesting, two out of 590 (0.3%) individuals had a positive result on RDT, both of which were negative on viremia testing. Both were negative on laboratory-based serologic testing, suggesting that the previous RDT results were false positives. A detailed analysis of the interview questionnaire did not identify any risk factors for hepatitis C in the past six months.

**Conclusions:** Our findings suggest that receipt of endoscopic procedures is not strongly correlated with positive HCV tests in Georgia. Successful implementation of the Hepatitis C Elimination Program requires a thorough examination of the risk factors for the transmission of hepatitis C in the general population and identifying other specific medical procedures contributing to the ongoing hepatitis C transmission.

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## The potential role of health literacy in linking susceptible persons to HBV vaccinations with incentivization

**Do B**<sup>1</sup>, Pham T<sup>2</sup>, Dao D<sup>3</sup>, Kim T<sup>4</sup>, Dao D<sup>5</sup>

<sup>1</sup>University of California, San Diego, San Diego, United States, <sup>2</sup>University of Illinois at Chicago, School of Public Health, Chicago, United States, <sup>3</sup>Vietnam Viral Hepatitis Alliance, , United States, <sup>4</sup>Pham Ngoc Thach University of Medicine, Department of Epidemiology, Ho Chi Minh City, Vietnam, <sup>5</sup>Johns Hopkins University School of Medicine, Division of Gastroenterology and Hepatology, Baltimore, United States

**Background:** Literature shows subsidized testing and vaccination may improve vaccine uptake, but longitudinal evidence remains limited. This study prospectively sought to 1) estimate the prevalence of vaccine uptake among HBV-susceptible persons given incentivization and 2) assess the role of health literacy regarding hepatitis B on vaccine uptake.

**Methods:** A cohort of HBV-susceptible adults aged 18 or over (negative for all HBsAg, anti-HBs, and anti-HbcAb) were followed up for 6 months after receiving coupons for a free three-shot HBV vaccine in 2016. At baseline, we collected data on sociodemographics, knowledge of viral hepatitis transmission routes (7 items) and disease severity (4 items), perceived susceptibility (1 item), perceived vaccine safety and efficacy (2 items), and stigma against HBV infection (1 item). Each knowledge of transmission and severity item was scored as 1 (correct) or 0 (incorrect). Knowledge was grouped based on the percent of correct answers: adequate (>50%), partial (1–50%), or inadequate (0%). Perceived susceptibility and stigma had answered with either Yes (1 point) or No or Don't know (0 points). Perceived vaccine safety and efficacy were grouped as Safe and Efficacious (2 points), either Safe or Efficacious (1 point), or No neither Safe nor Efficacious (0 points). Follow-up phone interviews were conducted to ascertain vaccine uptake. Poisson regression with robust variance estimation was used to model the relationships of interest. Sociodemographics were adjusted as confounders.

**Results:** 281 adults (among 3,970 susceptible cases in the original survey) were distributed with free

coupons, followed up, and included in the analyses. The prevalence of vaccine uptake was 10.3% (29 of 281, 95% Confidence Interval [95%CI], 6.8-13.9%). In simple regression, having adequate knowledge of transmission or partial knowledge of severity were associated with 221% (PR = 3.21 [95%CI, 1.32-7.84]) or 153% (PR = 2.53 [95%CI, 1.08-5.90]) increase in the probability of vaccine uptake, respectively. After adjusting for sociodemographics, only people having adequate knowledge of transmission had a significant prevalence ratio of 3.08 (95%CI, 1.24-7.67).

**Conclusion:** Adequate knowledge of transmission was prospectively associated with HBV vaccine uptake in HBV-susceptible persons. A tailored health education program may increase vaccine coverage in adults in Ho Chi Minh City, Viet Nam.

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Abstract number 41 has been withdrawn.

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### Assessing Progress Towards Hepatitis B Elimination in Canada

**Osiowy C<sup>1</sup>**, Gravel G<sup>2</sup>, Lourenço L<sup>2</sup>, Thompson L<sup>2</sup>, O'Brien S<sup>3</sup>, Binka M<sup>4</sup>, Hiebert L<sup>5</sup>, Coffin C<sup>6</sup>

<sup>1</sup>National Microbiology Laboratory, Public Health Agency of Canada, Winnipeg, Canada, <sup>2</sup>Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada, Ottawa, Canada, <sup>3</sup>Epidemiology & Surveillance, Canadian Blood Services, Ottawa, Canada, <sup>4</sup>Data and Analytic Services, British Columbia Centre for Disease Control, Vancouver, Canada, <sup>5</sup>Coalition for Global Hepatitis Elimination, The Task Force for Global Health, Decatur, USA, <sup>6</sup>Cumming School of Medicine, University of Calgary, Calgary, Canada

**Background:** Canada has met several targets set out by the WHO for hepatitis B (HepB) elimination by 2030, such as the development of national treatment guidelines and blood safety policies. Information on Canada's progress towards targets\* such as birth dose (BD) vaccination (\*90%), reduction of new cases and death due to chronic HepB (\*90% and \*65%, respectively), and the proportion of the population diagnosed with HepB

(\*90%) who enter into care and treatment (\*80%) is lacking. This study aimed to address these gaps by analysis of current national and regional data.

**Materials and Methods:** Universal publicly funded healthcare in Canada is administered by 10 provinces and 3 territories (PT) and Canadian guidelines recommend HepB diagnosed individuals are referred to viral hepatitis specialists. Data collection included: 1) Federal or PT government surveillance data; 2) published, peer-reviewed literature, and; 3) grey literature from international, academic, and advocacy websites.

**Results:** Health burden of HepB in Canada: Canada's national notifiable HepB case rate was 12.73 per 100,000 in 2019, representing a 9% decline since 2017. However, much higher rates or proportions have been estimated by targeted seroprevalence studies; in Alberta (overall 199.5 per 100,000; 2014-2018), British Columbia (overall 4.4% of all tested; 1990-2015), and among first-time Canadian blood donors (67.7 per 100,000; 2019). National rates of HepB-associated death are unavailable. Nevertheless, a burden of disease study from Ontario described HepB as the fifth leading infectious disease cause of death. Due to population increases in higher-risk group patients, Canada may struggle to reduce HepB liver-related disease and death to meet the 65% reduction target.

**HepB vaccination:** HepB BD vaccination is provided by three of the 13 (23%) PTs and is nationally advised for all infants born to mothers living with HepB. Five (38.5%) PTs start HepB vaccination at two months of age and five others initiate vaccination between 11-12 years of age (2-dose schedule). In 2017, it was estimated that three-dose vaccine coverage among Canadian 2-yr olds was 74.1% in PT with infant vaccination programs. However, several regional studies have shown gaps in infant vaccine coverage leading to infant HepB infection.

**HepB diagnosis and treatment:** Diagnosis of HepB-infected individuals was reported in regional (British Columbia) and national (modelling) studies to be 46%-58%, respectively. Potent nucleos(t)ide analogue therapies (Entecavir and Tenofovir) are approved in all PT, but clinical restrictions limit availability. Further regional (multi-PT) studies have shown only 13-41% of those diagnosed and eligible received treatment. Canada employs routine HepB prenatal screening, with HBsAg testing rates of 72% - 99%; however, there is an inadequate assessment

of pregnant people who may benefit from treatment during pregnancy.

**Conclusions:** Many challenges remain for Canada to meet the WHO 2030 targets for HepB elimination. Canada is below the 90% prevention target for infant vaccination coverage. Regional reports suggest that more work is required to meet diagnosis and treatment targets. The Public Health Agency of Canada is currently working with PT on a set of indicators to monitor Canada's progress towards elimination targets.

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## Evaluation of knowledge, attitudes, and practices for hepatitis B virus infection among primary healthcare physicians in the country of Georgia

**Zakalashvili M**<sup>1</sup>, Zarkua J<sup>1</sup>, Avalishvili T<sup>1</sup>, Tsirdava E<sup>1</sup>, Tsodolishvili M<sup>1</sup>, Metreveli D<sup>1</sup>, Surguladze S<sup>2</sup>, Shavgulidze N<sup>3</sup>, Shadaker S<sup>4</sup>, Tsereteli M<sup>5</sup>, Baliashvili D<sup>2</sup>, Tskhomelidze I<sup>2</sup>, Armstrong P<sup>4</sup>, Handanagic S<sup>4</sup>

<sup>1</sup>Medical Center Mrcheveli, Tbilisi, Georgia, <sup>2</sup>The Task Force for Global Health, Tbilisi, Georgia, <sup>3</sup>Central Republican Hospital, Tbilisi, Georgia, <sup>4</sup>Division of Viral Hepatitis, Centers for Disease Control and Prevention, Atlanta, United States, <sup>5</sup>National Center for Disease Control and Public Health Georgia, Tbilisi, Georgia

**Background:** During 2021, the country of Georgia had an intermediate hepatitis B virus (HBV) burden, with adult HBV surface antigen prevalence of 2.7%. Assessment of knowledge, attitudes, and practices toward hepatitis B among primary health care physicians (PHPs) is needed to develop a national plan to eliminate hepatitis B. The aim of this study was to evaluate knowledge, beliefs and behaviors about hepatitis B among PHP in Georgia and how socio-demographic characteristics, attitudes and practices are associated with knowledge about hepatitis B.

**Methods:** PHPs were selected using simple random sampling within medical facilities in Georgia's six biggest cities. The expected sample size was 550 PHPs based on the total number of PHPs in Georgia. Knowledge of risk factors, diagnostics, and

vaccination was assessed; the maximum score was 28, and scores were categorized as low, medium, and high using tertiles. Bivariate ordinal regression was used to calculate odds ratios (OR) with 95% confidence intervals (CI) to assess the association of socio-demographic, attitude- and practice-related factors with knowledge level.

**Results:** The overall response rate was 92% (506/550). Of 506 participants, 93% were female, 35% were from Tbilisi (capital city), 64% were ≥50 years of age, and 72% had >15 years of practice. Overall, 318 (63%) PHPs knew the correct answers for >17/28 knowledge-related questions (scoring in medium or high tertiles). To the statement "HBV can be transmitted by: sexual intercourse, needle-stick, and mother-to-child", 55%, 74%, and 43% of participants correctly responded "yes", respectively. Only 49% answered correctly that hepatitis B immune globulin and hepatitis B vaccine birth dose, but not C-section or withholding of breastfeeding, were recommended to prevent mother-to-child transmission. From the attitude and perception questions, 72% of PHPs were confident diagnosing HBV infection and 27% were confident managing patients with hepatitis B. A total of 93% agreed to engage in training to improve knowledge. From the practice-related questions, 47% of PHP patients were reportedly screened and only 26% were vaccinated against HBV infection. For the question "I recommend to my patient with HBV infection..." 27% responded "yes" to "avoid sharing food and utensils", 28% "restrict physical activity", 41% "hepatoprotective drugs", and 47% "C-section", none of which are recommended by international guidelines. Those who recommended HBV screening to their patients were more likely to receive a middle/high knowledge score compared to those who did not recommend screening (OR 4.16, 95%CI 1.59-16.67). Those who correctly responded that C-sections (OR 1.45, 95%CI 1.09-1.93), and withholding breastfeeding (OR 1.34, 95%CI 1.02-1.75) were not recommended for prevention of HBV transmission were more likely to have a medium/high knowledge score.

**Conclusions:** The largest gaps in knowledge among PHP in Georgia were in the understanding of HBV transmission routes and hepatitis B management. Those who recommended screening for HBV infection and correctly understood the recommendations for the prevention of HBV transmission were more likely to score higher in knowledge. Most PHPs were willing to receive further training on HBV infection. These findings will help guide targeted educational and training

campaigns to support hepatitis B elimination in Georgia.

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## Gilead Liver Commitment and Local Elimination Programs Leading to Global Action in HCV (LEGA-C): Outcomes of Studies and Their Impact

Kwon K<sup>1</sup>, Kreter B<sup>1</sup>, Garson S<sup>1</sup>, Bam R<sup>1</sup>

<sup>1</sup>Gilead Sciences, Inc., Foster City, United States

**Background:** Since 2016 Gilead Sciences, Inc., has committed to support studies and grants for programs focused on hepatitis C virus (HCV) elimination under its LEGA-C (Local Elimination programs leading to Global Action in HCV) initiative. Focusing on Investigator-Sponsored Studies (ISR) and collaborative studies under the LEGA-C initiative, >120 studies in >30 countries have been funded by Gilead to date. Here, we report the relative impact of these studies.

**Materials and Methods:** To understand the relative impact of the initiative on participants, we describe the types of studies supported, the studies' populations, and the treatment patterns emerging from the studies. To assess the potential impact on providers' HCV awareness, we catalogued the number, types, and impact factors (IF) of studies' publications and the numbers of citations, downloads, and views of study papers. To gauge potential impacts on best practice, we reviewed recent guidelines to identify mentions of LEGA-C-supported studies and how their findings influenced recommendations.

**Results:** Regional breakdown of supported studies includes 59 in North America, 33 in Europe, 24 in Asia, 7 in Africa, 5 in Australia, and 3 in South America. 76 studies have completed, 43 are enrolling/ongoing, and 1 is planned. The most common types of study were test and treat (n=38) and screening and linkage to care (n=37), followed by epidemiology (n=12), outreach/callback/contact tracing (n=10), modeling/algorithms/cost effectiveness (n=9), and patient/HCP education (n=4). 42 studies linked patients to treatment:

278,088 persons were screened, and 29,378 (10.6%) had confirmed HCV infection and enrolled in a study. Of those enrolled, 15,570 (53.0%) received treatment, and of those, 12,945 (83.1%) received direct-acting antivirals (DAAs). Of the 120 studies described, 66 (55%) focused on special populations, including persons who inject drugs (n=33), men who have sex with men (n=8), persons with concomitant HIV infection (n=8), and persons who were homeless (n=4). Publications include 76 fully published journal articles, 30 oral presentations at professional conferences, 123 posters, and 26 abstracts, presentation type not specified. Median IF of study journals was 5.2, and 40 papers were cited a total of 254 times, with a median of 3 citations per paper (maximum citations, 51). Of 20 published papers available for download, median number of downloads per article was 293 (range, 74–2,941), and of 30 articles available for viewing online, median number of views per paper was 626 (range 6–8,540). The AASLD's 2019 HCV screening guidance and the EASL's 2020 acute HCV treatment guideline each cited the same LEGA-C-supported paper on cost-effectiveness of universal screening of pregnant women for HCV infection, in each case recommending that such screening be adopted.

**Conclusions:** Over 6 years on 6 continents, the LEGA-C initiative has supported >120 studies that enrolled ~29,000 HCV+ persons and treated >12,000 with DAAs. Special populations among whom HCV incidence is high were well represented. Supported studies have yielded 76 fully published articles in 47 different journals and have achieved high rates of citation, downloads, and views. The ongoing LEGA-C initiative is demonstrably contributing to the understanding, treatment, and ultimate elimination of HCV.



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## Differences in hepatitis B prevalence and linkage to care rates between male and female African migrants participating in a community-based screening program in the greater Barcelona area, Spain

Picchio C<sup>1</sup>, Nomah D<sup>2</sup>, Rando-Segura A<sup>3</sup>, Lens S<sup>4,5</sup>, Rodríguez-Tajes S<sup>4,5</sup>, Fornis X<sup>4,5</sup>, Pamplona Portero J<sup>6</sup>, López Núñez C<sup>7</sup>, Rodríguez-Frías F<sup>3</sup>, Buti M<sup>5,8</sup>, Lazarus J<sup>1,9</sup>

<sup>1</sup>Barcelona Institute for Global Health (ISGlobal), Barcelona, Spain, <sup>2</sup>Center for Epidemiological Studies on Sexually Transmitted Infections and HIV/AIDS in Catalonia (CEEISCAT), Department of Health, Generalitat of Catalonia, Badalona, Spain, <sup>3</sup>Liver Pathology Unit, Biochemistry and Microbiology Service, Hospital Universitari Vall d'Hebron, Barcelona, Spain, <sup>4</sup>Liver Unit, Hospital Clínic, IDIBAPS, University of Barcelona, Barcelona, Spain, <sup>5</sup>CIBER Hepatic and Digestive Diseases (CIBERehd), Instituto Carlos III, Madrid, Spain, <sup>6</sup>Department of Digestive Diseases, Hospital Santa Caterina, Girona, Spain, <sup>7</sup>Department of Digestive Diseases, Hospital Trueta, Girona, Spain, <sup>8</sup>Liver Unit, Hospital Universitari Vall d'Hebron, Barcelona, Spain, <sup>9</sup>Faculty of Medicine and Health Sciences, University of Barcelona, Barcelona, Spain

**Background:** Africans in Europe who have migrated from high hepatitis B virus (HBV) endemic areas may not know their status due to inadequate testing and vaccination in their home countries. Males are less likely to engage in health services, delaying diagnosis and linkage to care, and more frequently present with chronic HBV in comparison to females. We aimed to use point-of-care testing and simplified blood sample collection tools in community settings to identify and link to care, including vaccination, West African migrants in the greater Barcelona area, and to examine the prevalence of current and past-resolved infection, in addition to linkage to care.

**Methods:** During 21/11/20-16/07/22, 460 people were offered HBV testing in community settings by using an HBV surface antigen (HBsAg) rapid detection test (DETERMINE HBsAg 2®, Abbott Laboratories) followed by a whole blood sample collection using a plasma separation card (Roche Molecular Diagnostics, CA), which was analyzed in a

hospital laboratory. Participants who tested positive for HBsAg were immediately referred to a tertiary hospital for a full assessment, while participants who were HBsAg- were examined for past resolved infection (HBV core antibody [anti-HBc]). Linkage to care was defined as a successful first visit with a liver specialist, vaccination, or receiving post-test counselling. Basic descriptive statistics to analyze differences between males and females were carried out using Stata 16.0 and a p-value was set at <0.05 for all analyses.

**Results:** 453 participants were included for analysis (mean age 41.9 [SD 10.4] years) and were primarily from Ghana (73.5%) and Senegal (22.3%), and majority male (61.4%). The overall prevalence of current HBV infection (HBsAg+) was 9.0%; the prevalence was higher among males (11.1%) compared to females (5.7%). Past resolved infection (anti-HBc+) was 42.4% among those HBsAg-, with females having a slightly higher prevalence (44.4% vs 41.5%). Most participants had never been tested for HBV before (68.2%), with females reporting having been tested before more frequently (25.1% vs 13.7%; p=0.008). Of those HBsAg+, 93% attended a first visit with a liver specialist. Among HBV negative participants, 47% required vaccination, of which 70.4% returned for their results and were offered the first dose of the HBV vaccination series in situ; and 85% accepted. Males were more likely to accept vaccination in comparison to females (40.8% vs 35.9%). Overall, the return rate for linkage to care was 72.4% and males were more likely to have been linked to care in comparison to females (76.9% vs 65.1%; p=0.006). The mean number of days between screening and a first visit with a liver specialist was 20 (SD 15) and between screening and delivery of results was 26 (SD 16), for those requiring post-test counselling or vaccination for the latter.

**Conclusions:** This community-based HBV screening program in Spain provides an effective model for identifying and providing care to migrant populations at high risk of HBV infection, which is particularly important for males, who may otherwise not have engaged in care. More efforts to retain females throughout the cascade of HBV care should be taken.

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## Improvement of health-related quality of life (HQoL) after HCV treatment with direct acting antivirals (DAAs) in Georgia

Abzianidze T<sup>1,3</sup>, Butsashvili M<sup>1,3</sup>, Kamkamidze T<sup>1</sup>, Kamkamidze G<sup>2</sup>

<sup>1</sup>Health Research Union, Tbilisi, Georgia, <sup>2</sup>Clinic NeoLab, Tbilisi, Georgia, <sup>3</sup>The University of Georgia, Tbilisi, Georgia

**Background:** HCV causes significant morbidity and mortality worldwide. About 80% of people infected with the hepatitis C virus live in low and middle-income countries. Based on the 2015 serosurvey national HCV seroprevalence in Georgia was 7.7% with 5.4% being chronically infected (HCV RNA positive). Georgia has launched hepatitis C elimination national program in 2015, resulting in important decrease in HCV RNA prevalence (from 5.4% to 1.8%) according to the study conducted in 2021. Data are limited on the role of successful antiviral treatment in changing the quality of life among Georgian patients. The aim of this study was to determine health-related quality of life (HQoL) among HCV-infected patients in Georgia achieving sustained viral load (SVR).

**Material and Methods:** Prospective cohort study was conducted in the capital of Georgia, Tbilisi. For data collection, the patient-reported outcomes (PROs) questionnaire was used to assess the HQoL of beneficiaries involved in the hepatitis C elimination program. The questionnaire included information on demographics (age, gender, and residence) and self-reported health condition (general weakness, insomnia, lack of energy, muscle and abdominal pain, depression and etc). The data were collected two times - before the treatment and 12 weeks after the end of the treatment among patients achieving SVR.

**Results:** A total of 299 respondents were enrolled in the study. The mean age was 53 (age range 26-83) years. Most 244 (81.6%) were males. SVR test was done among 247 patients and achieved in 244 (98,79%). Respondents who did not complete the treatment or did not achieve SVR were excluded from the follow-up survey. 153 (62.7%) patients out of 244 achieving SVR agreed to participate. 294

(98.3%) participants reported that they had general weakness in the last two weeks before the start of the treatment with 62 (40.5%) after the treatment. The proportion of people with insomnia decreased 1.8 times after the treatment (from 272 (91.0%) to 78 (51.0%). After the treatment, self-perceived improvement of symptoms, such as lack of energy, abdominal pain, depression, and worries that their health condition is getting worse, was observed. There was statistically significant improvement in liver fibrosis level (mean liver stiffness decreased from 21.5 kpa to 15.1 (p <0.0001)), ALT (from 116.3U/l to 27.6U/l (p <0.0001)) and AST (from 104.7U/l to 29.1U/l (p <0.0001)). There was no significant change in the following symptoms: shortness of breath during daily activities, dry mouth, itching and concentration problem.

**Conclusion:** After the successful DAA treatment, the overall self-perceived health status improvement has been observed among patients with chronic hepatitis C.

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## Long-term persistence of high anti-HBs antibodies after adult vaccination with a 3-antigen HBV vaccine results in durable seroprotection

Larras R<sup>3</sup>

<sup>1</sup>Nordic Research Network Oy, Tampere, Finland, <sup>2</sup>VBI vaccines, Cambridge, United States, <sup>3</sup>Syneos Health, Paris, France

**Background:** Hepatitis B virus (HBV) infection is a public health problem that can be effectively prevented by immunising adults with hepatitis B vaccination in countries where neonatal immunization is absent. Immune response to HBV vaccination can be measured by serum levels of anti-HBs and their persistence, which is believed to depend upon the induced peak levels. Single-antigen HBV vaccines (1A-HBV) contain the small (S), yeast-derived, HBV surface antigen (HBsAg). 3-antigen HBV vaccine (3A-HBV) is characterized by production in mammalian cells and contains two additional hepatitis B surface antigens, pre-S1 and pre-S2. PROTECT was a multinational phase 3 trial that evaluated the immunogenicity and safety 10

µg 3A-HBV (\*PreHevbriTM) and . 20 µg 1A-HBV (Engerix-B®). In this study, higher rates of seroprotection (anti-HBs ≥ 10 mIU/mL) and peak geometric mean concentration (GMC) antibodies titers were noted with 3A-HBV compared to the 1A-HBV. This investigator-initiated study aimed to assess the long-term persistence of anti-HBs titers 2-3 years after the 3rd dose in a subgroup of subjects enrolled to PROTECT.

**Method:** Subjects were eligible for the follow-up if they had been enrolled in PROTECT study in Finland and had achieved seroprotection (anti-HBs ≥ 10 mIU/mL). Serum samples were tested for Anti-HBs titers at the central laboratory using the same validated anti-HBs quantitative assay used in the PROTECT study.

**Results:** Of the 528 adult subjects contacted, 465 participated in the follow-up study. 244 [52.5%] were vaccinated with 3A-HBV and 221 [47.5%] with 1A-HBV. Baseline characteristics were well balanced, (mean age:59 years), however peak anti-HBs titers from PROTECT (4 weeks after 3rd dose) were higher in 3A-HBV group compared to 1A-HBV (8021.9 mIU/mL vs 3787.3 mIU/mL). Data from this study showed that approximately 2.5 years following Day 196 in the PROTECT study, the mean concentration of anti-HBs was 1382.9 mIU/mL for 3A-HBV participants and 251.4 mIU/mL for 1A-HBV participants. Additionally, twice as many subjects vaccinated with 3A-HBV retained anti-HBs ≥ 100 mIU/mL compared to 1A-HBV (72.9% vs. 32.6%) and half as many subjects in the 3A-HBV group lost seroprotective levels of anti-HBs (<10 mIU/mL) in follow-up (11.9 % vs 27.6%)

**Conclusion:** Given the high peak antibody titers achieved in PROTECT, most study subjects that received 3A-HBV remained seroprotected after 2.5 years and retained high levels of anti-HBs titers. These results suggest that 3A-HBV will provide durable protection against HBV in this population. \*Market authorization for use in adults over 18 years received in the EU and UK in 2022 (PreHevbriTM) and in the US (PreHevbrioTM) in 2021. It is the same vaccine as Sci-B-Vac®, licensed in Israel in 2000 and used in clinical trials.

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## Molecular characterization of Hepatitis B virus among close contacts of Chronic HBV cases.

Athalye S<sup>1</sup>, Khargekar N<sup>2</sup>, Bhatt B<sup>3</sup>, Shinde S<sup>1</sup>, Banerjee A<sup>1</sup>

<sup>1</sup>Dept of Transfusion Transmitted Diseases, ICMR-National Institute of Immunohaematology, Mumbai, India, <sup>2</sup>Dept of Hematogenetics, ICMR-National Institute of Immunohaematology, Mumbai, India, <sup>3</sup>G N Khalsa College, Mumbai, India

**Background:** Hepatitis B virus (HBV) is global health problem. Family members of HBV infected people are considered as high-risk groups due to frequent household transmission of HBV among contacts of HBsAg carriers.

**Aim:** The aim was to investigate the frequency of occult Hepatitis B and mutations in preC/C and S gene region among family members of chronic Hepatitis B carriers.

**Materials and Methods:** Two hundred and forty-three members of 62 cases were tested for markers of Hepatitis B, viz. HBsAg and HBcAb using commercial ELISA. The presence of viral DNA was confirmed using nested PCR targeting the S and preC/C regions.

**Results:** 9.05% (n=22) of the members tested positive for HBsAg. 37.03% (n=90) of the members tested positive for HBcAb. 15/22 (6.17%) cases showed presence of either or both molecular markers for HBV. 14/90 (5.76%) OBI cases showed presence of either preC/C or S or both. 67% (10/15) of the cases among chronic family members were genotype D, whereas 75% (9/12) of OBI carriers were genotype A1. sT118A/V (6/16) was the most frequently observed immune escape mutation among chronic cases, followed by sA128V and sT127P/A (5/16). On the other hand, sS207N (6/11) was the most common immune escape mutation observed among the OBI cases. sS207N was found in only 25% (4/16) of overt HBV cases while it was found in 54.54% (6/5) of OBI cases. Molecular analysis of viral mutations and phylogenetic analysis among the index cases and their family contacts is in progress.

**Conclusion:** The findings highlight the importance of OBI in the family setting. Our results indicate that the sS207N mutation responsible for immune escape could lead to loss of HBsAg among OBI cases. This could lead to false negative results for HBsAg among such cases, highlighting the importance of screening for HBsAg as well as HBcAb to eliminate the presence of OBI among family members. Additionally, the mutation profile among the family members and index cases provide evidence with respect to intrafamilial transmission. Since family members were at a substantial risk of intrafamilial transmission, it is necessary to direct efforts towards preventive measures to reduce the transmission in this group.

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## Serology and genotypic pattern of pediatric HBV infection: Clinical implications in transmission

**Banerjee A**<sup>1</sup>, Athalye S<sup>1</sup>, Panale P<sup>1</sup>, Khargekar N<sup>2</sup>, Shinde S<sup>1</sup>

<sup>1</sup>Dept of Transfusion Transmitted Diseases, ICMR-National Institute of Immunohaematology, Mumbai, India, <sup>2</sup>Dept of Haematogenetics, ICMR-National Institute of Immunohaematology, Mumbai, India

**Background:** Hepatitis B vaccine has been a part of the universal immunization program since 2010 in India. However, a study from NFHS-4 data found that 45% of children between 1-5 years were not vaccinated against HBV. As the risk of chronic hepatitis B infection is much higher in children compared to adults, close contact with a carrier could transmit the infection in early childhood.

**Aim:** The present study was planned to identify the serological and molecular pattern of chronic and OBI infection among children and their parents.

**Materials and Methods:** Blood samples from 192 children below the age of 10 years from 115 families referred for HBV screening were enrolled in this study. Blood samples from the parents of the enrolled children was also collected. History of vaccination among the children was recorded. Participants were tested for markers of Hepatitis B, viz. HBsAg and HBcAb and HBV DNA using

commercial ELISA and realtime RTPCR. The presence of viral DNA was confirmed using nested PCR targeting the S and preC/C regions followed by Sanger sequencing.

**Results:** Out of the 192 children tested for HBsAg and HBcAb, 7.8% (15/192) were positive for HBsAg and 11.46% (22/192) were positive for HBcAb. Only 28.64% (55/192) of the children were vaccinated against. Mean age of the HBsAg positive children was  $6.6 \pm 2.5$  years. HBeAg was positive in 62.5% (5/8) of the positive ones while mean HBV DNA level was  $7.48 \pm 1.89 \log_{10}$  IU/mL. Mean age of OBI positive children was  $5.18 \pm 2.26$  years and 42.85% (3/7) of them showed the molecular markers.

Among 11 mother-father pairs of 15 children positive for HBsAg, 9 couples had at least one of the partner positive for HBsAg. HBsAg positivity was frequent among mothers (7/11) than the fathers (3/11). HBcAb positivity was however more frequent among fathers (6/11) than the mothers (3/11). Among 19 mother-father pairs of 22 children positive for HBcAb, 16 couples had at least one of the partner positive for HBsAg. Out of the 19 couples, HBsAg and HBcAb positivity were almost equal among mothers and fathers (8/19, 7/19).

Genotype analysis showed that A1 genotype was most common (71.4%) among HbsAg positive children while D2 genotype was frequently observed among OBI children. Among both the overt and occult children and their parents, A1 genotype was associated with 100% overt cases whereas D2 showed a higher transmissibility compared to A1 (75% vs 25%). More than 50% of D2 genotype led to OBI. Detection of mutants and phylogenetic analysis for HBV are currently in progress.

**Conclusion:** Among the children positive for HBsAg, vertical transmission of HBV is suspected as majority of the mothers were positive, whereas in case of children positive for OBI, close contact with HBsAg positive parents in early childhood could be responsible for transmission. As HBeAg seroconversion status and frequency could be influenced by viral genotypes, knowledge of the (sub)genotypes and mutations among infected children circulating in a region, can guide for better management and preventive measures.

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## Sofosbuvir/Velpatasvir (S/V) for the treatment of HCV infection among vulnerable inner-city residents: extending the results of the SIMPLIFY study

Conway B<sup>1,2</sup>, Yi S<sup>1</sup>, Yung R<sup>1</sup>, Sharma S<sup>1</sup>, Truong D<sup>1</sup>

<sup>1</sup>Vancouver Infectious Diseases Centre, Vancouver, Canada, <sup>2</sup>Simon Fraser University, Burnaby, Canada

**Background:** The combination of Sofosbuvir/Velpatasvir (S/V) is approved for the treatment of chronic HCV infection. In the SIMPLIFY study of 103 active injection drug users, a cure rate of 94% was achieved, with no cases of virologic failure. To achieve HCV elimination by 2030, there is a need to develop and evaluate systems of care in populations that are even more difficult to treat among PWID. We evaluated the efficacy of a 12-week course of S/V in a prospective study of HCV-infected inner-city residents enriched for risk behaviors associated with treatment failure, including heavy fentanyl use, documented drug overdoses and unstable housing.

**Methods:** Through dedicated outreach events, we identified HCV-infected patients who were not currently engaged in health care and who were eligible to receive government-funded antiviral treatment for HCV infection. We offered them the opportunity to enroll in a multidisciplinary program of care to address medical, psychological, social, and addiction-related needs, and provide S/V therapy in this context, with enhanced supervision of adherence. The endpoint of this analysis is the achievement of SVR12 in those who initiated therapy.

**Results:** To date, we have identified 219 eligible subjects. We note median age 47 years, 28.8% female, 49.8 and 38.8% GT1 and 3, 12.3% cirrhotic, 99.1% active drug users, and 80.4% unstably housed. HCV treatment has been started in 187 cases, with 32 awaiting treatment, none lost to follow-up. Of the 187, 148 have completed treatment, 31 remain on treatment, 3 died of overdose, 4 discontinued/LTFU and 1 virologic non-

response. Of the 148, we note 136 cured, 4 virologic relapse, 8 awaiting evaluation. Of 141 in whom a final virologic response has been ascertained, cure rate is 96.5% (136/141). Other definitive outcomes include 3 deaths (1.3%), and 4 LTFU (1.8%).

**Conclusion:** In a population of PWID enriched for factors predictive of treatment failure, administration of S/V in the context of a robust outreach initiative supported by a multidisciplinary care model led to a cure rate of 96.4% with minimal LTFU.

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## Systematic anti-HDV reflex testing HBsAg-positive individuals in an emergency department in Barcelona: a valuable opportunity for screening.

Ruiz Cobo J<sup>1</sup>, Llaneras J<sup>1</sup>, Rando A<sup>1</sup>, Bañares Sánchez J<sup>1</sup>, Rodríguez-Frías F<sup>1</sup>, Monforte Pallares A<sup>1</sup>, Carrodegua Iglesias A<sup>2</sup>, Medina D<sup>2</sup>, Riveiro-Barciela M<sup>1</sup>, Esteban R<sup>1</sup>, Butí M<sup>1</sup>

<sup>1</sup>Hospital Universitario Vall d'Hebron, , Spain, <sup>2</sup>Gilead Sciences, , Spain

**Background:** In 2017 the European Association for the Study of the Liver (EASL) recommended universal testing for hepatitis D virus (HDV) in hepatitis B virus (HBV) individuals. However, previous data in Spain found that only 10-24% of HBsAg-positive patients are tested for HDV.

**Methods:** Starting from February 2020, we adopted systematic and opportunistic HBV screening in our emergency department. All patients over 18 years-old without prior testing records that required blood test for any purpose and could provide oral opt-out consent were tested for HBV. Since April 2022 we implemented reflex testing for HDV. In this context, a positive HBsAg test triggers sequential HDV antibody (HDV-Ab) and HDV ribonucleic acid (HDV-RNA) tests on the same specimen, without physician or patient initiation.

**Results:** From April to August 2022, 2555 HBsAg tests were performed, with 20 (0.78%) HBsAg positive results. All of these patients were subsequently tested for HDV, with 3 (15%) HDV-Ab and 1 (5%) HDV-RNA positive results. In regard of baseline characteristics of HDV-Ab positive patients, 2 were male and migrant citizens from endemic countries (Georgia and Romania), 2 patients presented a history of alcohol abuse and 1 of them also had record of injected drug use. We identified that 1 patient was coinfecting with human immunodeficiency virus and also had hepatitis C virus antibodies without detectable viral load. The patient with positive HDV-RNA had 575000 IU/mL and cirrhosis at diagnosis. This patient was successfully linked to care after diagnosis.

**Discussion:** Implementing reflex HDV testing at the emergency department successfully enabled testing for 100% of HBsAg positive patients as recommended in EASL guidelines and diagnosis of one HDV case that would otherwise likely have received their diagnosis at a later stage. Given our results, we propose reflex HDV test in HBsAg-positive as a standard of care. This could increase both detection and linking-to-care of infected subjects.

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## Evaluation of alcohol use behavior among patients cured in Georgia's HCV elimination program (preliminary results)

**Butsashvili M<sup>1,4</sup>**, Kamkamidze G<sup>1</sup>, Gudavadze S<sup>4</sup>, Gulbiani L<sup>1</sup>, Gvinjilia L<sup>2</sup>, Kuchuloria T<sup>2</sup>, Tskhomelidze I<sup>2</sup>, Shadaker S<sup>3</sup>, Armstrong P<sup>3</sup>

<sup>1</sup>Health Research Union/Clinic NeoLab, Tbilisi, Georgia, <sup>2</sup>The Task Force for Global Health, Tbilisi, Georgia, <sup>3</sup>Division of Viral Hepatitis, Centers for Disease Control and Prevention, Atlanta, United States, <sup>4</sup>The University of Georgia, Tbilisi, Georgia

**Background and Aims:** Georgia has one of the highest rates of wine consumption in the world. Combined with a high prevalence of chronic hepatitis C virus (HCV) infection, the synergistic effects can lead to worse liver-related outcomes. There is no data on the role of alcohol consumption on the progression of liver disease among HCV-infected patients in the country. This study

evaluates alcohol consumption behaviors among patients in the HCV program.

**Method:** An interviewer-administered questionnaire was used to collect data on demographic, clinical, and drinking behavior. Patients were enrolled from three clinics, one in Tbilisi and two in other large cities in Georgia. Participants were then randomly selected from the list of patients treated with direct acting antivirals (DAAs), and who subsequently achieved sustained virologic response (SVR). Data on baseline and post-treatment fibrosis levels (measured by FIB4 score or liver elastography) were abstracted to evaluate the association of alcohol use with liver fibrosis progression.

**Results:** As of December 2020, 256 patients were enrolled in the study. Of those, 11.1% were ≤35 years old, 81.7% were male, 69.8% were married, 38.9% had a university degree, and 61.5% were employed. The majority of participants (93.7%) report ever using alcohol in their lifetime, and 10.3% consider themselves heavy drinkers. Nearly all (94.1%) participants knew that heavy alcohol consumption can accelerate the development of liver fibrosis, and 97.5% abstained from alcohol during treatment. Among those, 75.7% resumed drinking after achieving SVR. More than half (52.1%) of the patients felt moderate alcohol intake is normal for those with low fibrosis scores; 12.8% of patients thought drinking is unacceptable among people with HCV infection.

In bivariate analysis, patients who abstained from alcohol after achieving SVR were 4 times more likely to have an improvement in liver fibrosis compared to those who resumed drinking (29.5% vs 7.4%, respectively; P<.02).

**Conclusion:** Drinking alcohol is common in Georgia and a high proportion of people in the HCV treatment program consume alcohol. Abstaining from alcohol is advantageous to improvement in fibrosis, even after SVR has been achieved. However, the majority of HCV patients do not drink alcohol during treatment but resume drinking after achieving SVR. The findings present an opportunity to focus messaging and education for patients during DAA treatment to improve outcomes even after completion of treatment.

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## Dearth of Hepatitis awareness amongst students of north-eastern states- important issues related to Hepatitis elimination in India.

Mukherjee P<sup>1</sup>, Sarkar P<sup>1</sup>, Bhaumik P<sup>2</sup>, Phempu D<sup>3</sup>, Sarmah A<sup>4</sup>, Medhi B<sup>5</sup>, Das D<sup>1</sup>, Mukherjee P<sup>1</sup>, Chatterjee S<sup>1</sup>, Chowdhury A<sup>1</sup>

<sup>1</sup>Liver Foundation, West Bengal, Kolkata, India, <sup>2</sup>Hepatitis Foundation of Tripura, Agartala, India, <sup>3</sup>Freedom- a unit of L.T. Mirakai Wellness society, Sikkim, Gangtok, India, <sup>4</sup>North East Liver Foundation Society, Guwahati, India, <sup>5</sup>We care Foundation, Shilang, India

**Background:** Education campaign is a major component in the Global Health Sector Strategy (GHSS) adopted by WHO to eliminate viral hepatitis. It has been one of the critical acute and chronic public health issues in India, but a massive percentage of the population, in India, both urban and rural, remains ignorant to the subject of Hepatitis. While students are at increased risk of acquiring viral hepatitis, very few initiatives are taken to educate them. Creation of GHSS has led India to create its National Viral Hepatitis Control Program (NVHCP) that has been launched in 2018. We have conducted a baseline survey in 5 northeastern states of India to understand the hepatitis awareness amongst the students prior to the implementation of a hepatitis education project named "Stepping stones towards a Hepatitis-free world: Grass-root Advocacy Program".

**Materials and Methods:** Total 251 students (Girls 59%, Boys 41%) from fifty different schools and colleges across the four different states (Rural 45%, Urban 45%) of North-East of India, i.e., Assam (33%), Tripura (19%), Sikkim (20%) and West Bengal (28%) participated in this study. Students of eighth standard to Graduate level were included in this study (Eighth-Secondary level 49%, Higher Secondary level 38% and Graduate level 13%). A pre-tested, structured, close ended questionnaire comprising 10 questions was designed to understand the level of hepatitis knowledge of students and their awareness about the NVHCP in the country. SPSS 16.0 software was used for data analysis. Descriptive statistical analysis was

performed and the Chi - square test was done to check the level of significance.

**Results:** It was observed that 62.5 % (n= 251) students are aware that Hepatitis is a virus affected liver while 22.7 % (n= 251) understand the means of prevention. It was also observed that only one third of the students those who are aware about hepatitis, 33.1 % are informed about the NVHCP. A significant rural vs. urban difference (p<0.05) observed with regard to the hepatitis awareness including NVHCP.

**Conclusions:** Raising awareness is an important key in achieving the global hepatitis goals under the Sustainable Development Agenda 2030. Unfortunately, except testing and treatment, community awareness through education campaigns is not in the priority to the policy makers of NVHCP. Systematic knowledge empowerment on Hepatitis was not observed amongst the students neither they are informed about NVHCP after 4 years of its launch. Though viral Hepatitis has come to the forefront universally as the 'silent killer'. Students are the future; we have to protect them from this fatal disease. Hepatitis education in the school curriculum is a necessity, community awareness about NVHCP through national service scheme using college students can bring a change.

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## Hepatitis B Cure: Documenting public health implementation challenges, barriers and enablers

Wallace J<sup>1</sup>, Richmond J<sup>1</sup>, Howell J<sup>1</sup>, Treloar C<sup>3</sup>, Power J<sup>2</sup>, Revill P<sup>4</sup>, Stoope M<sup>1</sup>, Hajarizadeh B<sup>5</sup>, Hellard M<sup>1</sup>

<sup>1</sup>Burnet Institute, Melbourne, Australia, <sup>2</sup>Australian Research Centre in Sex, Health and Society (ARCSHS), La Trobe University, Melbourne, Australia, <sup>3</sup>Centre for Social Research in Health, UNSW, Kensington, Australia, <sup>4</sup>VIDRL, Peter Doherty Institute for Infection and Immunity, Melbourne, Australia, <sup>5</sup>The Kirby Institute, UNSW, Kensington, Australia

**Background:** An effective hepatitis B cure will revolutionise the public health response to hepatitis B, radically change the lives of people with hepatitis B, and make the elimination of viral hepatitis as a public health threat a reality. Scientific

activity and academic literature describing hepatitis B cure research predominately focuses on its scientific and clinical development with this study addressing a gap in literature by documenting the potential social and public health implications of a hepatitis B cure, including identifying essential elements to effectively implement a cure, and possible challenges and enablers for hepatitis B cure implementation.

**Materials and Methods:** Exploratory semi structured qualitative interviews were conducted with 31 key informants with responsibilities in, or who have contributed to, global, regional or local public health policy and program development, scientific and/or clinical investigation or translational research, or engagement with the populations most affected by hepatitis B. The interviews documented knowledge, understanding and expectations of the cure, the trajectory of hepatitis B cure research and its implications for public health, clinical service provision and people with hepatitis B and their communities. Interview recordings were professionally transcribed, checked for accuracy and de-identified with the inductive thematic analysis conducted using the stages as described by Braun and Clarke with data coded using NVivo 12 (QSR International Pty Ltd., Vic, Australia).

**Results:** Interview data identified barriers and enablers to implementing a hepatitis B cure with a variety of expectations of cure outcomes at virological, public health, clinical, individual and social levels, with differing interpretations of cure science based on professional expertise. Formulation of the cure will inform implementation including how and who accesses the cure, with equity and resources identified as key issues. Global political, cultural, resource and social factors will affect the capacity of any cure to achieve elimination goals. While health structures are available to deliver the hepatitis B cure, many need to be reorientated to address the needs of people with hepatitis B, and resources to deal with current cascade of care challenges. Innovative resourcing structures will be required for equitable access, particularly for lower and middle income countries and where advanced planning is imperative.

**Conclusion:** Viral hepatitis elimination requires effective prevention interventions and curable biomedical treatments. Current hepatitis B policy and program settings at global and local levels are inadequate for the purposes of hepatitis B cure implementation. While cure science steadily progresses, the true potential of this revolution will

not be realized unless the cure is scalable and accessible for people with hepatitis B across the globe, especially in middle and low-income settings.

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Abstract number 55 has been withdrawn.

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## Impact of the COVID-19 pandemic on Brazil's hepatitis C elimination plan

Almeida Jr. C<sup>1</sup>, Dal Ri L<sup>1</sup>, Silva A<sup>1</sup>, Tonini K<sup>1</sup>, Almeida E<sup>1</sup>, Santos B<sup>1</sup>, Gomes J<sup>1</sup>, Pereira G<sup>1</sup>, Ferreira A<sup>1</sup>

<sup>1</sup>Brazilian Ministry Of Health, Brasília, Brazil

**Background:** In 2016, Brazil became a signatory of the proposal made by WHO to eliminate hepatitis C (HCV) as a global public health problem by 2030. The country has been developing strategies to expand access to diagnosis and treatment of people affected by HCV. Several prevalence estimates were made to understand HCV epidemiological situation in order to support establishing effective measures for prevention and control. It was estimated that 0.31% of the Brazilian population (632,000 people) had active HCV infection, and the amount of treatments to reach the goal of elimination would be approximately 50,000 treatments per year from 2019. However, the average number of treatments per year was 25,555 between 2016-2018. The world was surprised in 2020 with the emergence of the novel coronavirus pandemic, whose impacts made the commitment to HCV elimination as a public health problem even more challenging. The actions to confront viral hepatitis, as well as other diseases, were interrupted in order to concentrate efforts on the control of covid-19.

**Material and Methods:** Descriptive analysis of reported HCV cases and offered treatments in the Unified Health System (SUS), throughout the entire national territory between 2019-2021. Anonymized data from the reported case system and treatment dispensing system were used.



**Results:** In 2019, a pre-pandemic year, 23,111 new HCV cases were reported and 36,658 treatments were provided. Regarding the number of new cases, in 2020 there was a 42% decrease, and in 2021 there was a 52% decrease, both compared to 2019. Besides that, there was a 48% and 60% decrease in treatments provided in 2020 and 2021, respectively.

**Conclusions:** It is assumed that these results, in general, are possibly tied to the context imposed by the covid-19 pandemic, which limited users' access to health services, as well as community interventions by health professionals and collective actions due to social distancing, decreasing the screening for new cases and, consequently, the opportune offer of treatment for viral hepatitis, especially HCV. After the most critical pandemic period in Brazil, it is necessary to resume discussions about the elimination of HCV in the country, and the development of micro-elimination strategies in the territory, in an articulated and accorded by all levels of health management way, keeping in mind the estimated number of people living with HCV not yet diagnosed. This strategy will make it possible to offer all available technologies to SUS users.

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Abstract number 57 has been withdrawn.

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## Factors associated with HbsAg Seropositivity among Pregnant Women receiving Antenatal Care at 10 Community Health Clinics in Freetown, Sierra Leone: A Cross-sectional Study

**Ghazzawi M**<sup>1</sup>, James P<sup>2</sup>, Salata R<sup>3</sup>, Yendewa G<sup>4</sup>

<sup>1</sup>Knowhpe Foundation Sierra Leone, Freetown, Sierra Leone, <sup>2</sup>Southern Cross University, Newsome, Australia, <sup>3</sup>Case Western Reserve University School of Medicine, Cleveland, USA, <sup>4</sup>Case Western Reserve University School of Medicine, Cleveland, USA

Hepatitis B (HBV) is a major public threat in Sierra Leone. Although pregnant women represent a high-risk group, access to antenatal screening services is suboptimal in Sierra Leone, and the characteristics of HBV infection in this group remain poorly understood. Prevalence and associated factors of hepatitis B surface antigen (HbsAg) seropositive status were assessed among pregnant women attending antenatal clinics in Freetown, Sierra Leone. We conducted a cross-sectional study of pregnant women aged  $\geq 16$  years, who received antenatal care across 10 community health clinics in Freetown, from May to September 2021. Logistic regression was used to assess predictors of HbsAg seropositive status. Three Hundred and Ninety Four (394) pregnant women were screened, with a mean age of  $24.4 \pm 4.9$  years. Of the high-risk practices explored, 76.6% reported female genital circumcision, 29.0% reported multiple sexual partners, 23.6% endorsed a history of sexually transmitted infections, and 2.3% had received a blood transfusion. Only 4 (1.0%) of study participants had received HBV vaccination. The prevalence of HbsAg was 7.9%, while the prevalence of HIV was 5.8%. In multivariate logistic regression analysis, having a husband/partner known to have HBV (adjusted odds ratio (AOR) 6.54; 95% confidence interval (CI) [1.72-24.86];  $p = 0.006$ ) and residing in the Central versus Eastern or Western area of Freetown (AOR 4.00; 95%CI [1.46-11.00];  $p = 0.007$ ) were the only independent predictors of HbsAg seropositivity. HBV infection rates remain unacceptably high among pregnant women over a decade after introduction of HBV vaccination in Sierra Leone in 2009. Our findings support current calls advocating for increasing HBV services to pregnant women to help reduce the high mother-to-child transmission rates in this setting.

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## Prevalence of hepatitis B among MSM in Rwanda 2021

**Dushimiyimana D**<sup>1</sup>, Mukandori D, Kayitesi C, Umutesi J, Serumondo J, Remera E

<sup>1</sup>Rwanda Biomedical Centre, Kigali, Rwanda

**Background:** Men who have sex with men (MSM) are at an increased risk of exposure to hepatitis B virus (HBV) infection compared to the general

population. The aim of this study was to estimate the prevalence of HBV infection among MSM in Rwanda.

**Methods:** We conducted an integrated behavioral and biological surveillance survey among MSM using respondent-driven sampling among self-reported MSM aged 18 years and older nationwide in 2021. At the study sites, an interconnected fingerprints tool was used to limit duplicate participants. Hepatitis B screening was performed using SD Bioline HBsAg as recommended by the national hepatitis B screening and diagnosis algorithm. Data collected at the study site were entered on the android tablet computer and extracted into STATA for analysis.

**Findings:** The overall prevalence of hepatitis B among 2,211 MSM respondents is 3.9% (95%CI: 3.0-5.2), highest (9.2%) among MSM older than 35 years old and lowest (1.8%) among MSM younger than 25 years. The prevalence was higher (4.7%) among uncircumcised MSM than among circumcised MSM (3.8%). Regarding the province of residence, the prevalence of Hepatitis B was highest in the Kigali city (4.7%), followed by East (4.3%) and the other provinces ranged between 2.5% and 3.8%. Hepatitis B prevalence was highest among MSM with higher education (10.7%) and lowest among MSM with Secondary education 3.0%.

**Conclusion:** HBV prevalence among MSM is not different from that found in other high-risk populations in Rwanda, but is much higher than that found in the general population, underscoring the importance of public health interventions among them.

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## Seroprevalence and associated risk factors for Hepatitis B virus infection among barbers and their clients in two cities in Cameroon

Joël Brice N<sup>1,7</sup>, Patrick N<sup>1</sup>, Eric N<sup>3</sup>, Tamufe U<sup>4</sup>, Michel K<sup>2</sup>, Daniel T<sup>5</sup>, Julius Mbekem N<sup>6</sup>

<sup>1</sup>University of Buea, Buea, Cameroon, <sup>2</sup>Department of Microbiology/Immunology, Catholic University of Central Africa, Yaounde, Cameroon, <sup>3</sup>Department of Military Health, Douala Military Hospital, Douala, Cameroon, <sup>4</sup>Metabiota Cameroon Ltd, Yaounde, Cameroon, <sup>5</sup>Department of Nursing Science, University of Fort Hare, Fort Hare, South Africa, <sup>6</sup>Military Health Health Research Center (GRESAR),, Cameroon, <sup>7</sup>Cameroon Baptist Convention Health Services, Southwest, Cameroon

**Background:** Hepatitis B virus (HBV) infection is a serious public health problem in Africa and worldwide. Barbers are regularly in contact with the blood fluid of their clients, who could develop skin cuts and abrasions during shaving practices. In addition, HBV is 50–100 times more infectious than HIV and 10 times more infectious than (HCV), hence has a lower infectious dose. Furthermore, it has been documented that HBV can survive outside the body for seven days or more on tabletops, workbenches and other instruments, making it highly transmissible through contaminated razors and blades. In Cameroon, very limited data are available on the prevalence of HBV among barbers and their clients. The objective of our study was to determine the seroprevalence, the associated risk factors and knowledge of HBV among barbers and their clients.

**Methods:** A total of 262 participants were recruited in this study. Information on barbers and clients was collected in the salon using a well-structured questionnaire containing sociodemographic characteristics, knowledge of HBV infection, observed shaving practices, characteristics of barbers' salons and potential risk factors of HBV infection. Plasma component was obtained from 3ml of whole blood sample collected from each of the participants. These samples were all tested for HBsAg using the Rapid Diagnostic Test. All reactive samples were confirmed with an antibody sandwich ELISA technique. Ethical clearance was obtained from the Institutional Ethics Committee

for Human Health Research of the Catholic University of Central Africa. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 21. Demographic and other characteristics were compared using Pearson chi-square tests.

**Results:** Of the 319 participants approached, 262 completed the enrolment process and 33 participants tested positive giving an overall prevalence of 12.6%. An overall seroprevalence of 15.0% and 10.6% was obtained for barbers and their clients respectively. The frequency of HBsAg in yaounde and Douala amongst barbers and clients was; 14.9% and 10.4% and 15.4% and 11.1% respectively.

Among barbers and clients, 17% had not heard of HBV while 36.3% had more than one source of information about HBV. Most of the participants did not know about barbers' shaving instruments, blood transfusion, sexual intercourse, tattooing and mother-to-child as modes of transmission. In this study, there was a significant association between the practice of using sodium hypochlorite solution as an antiseptic for skin cuts and HBV infection status ( $p < 0.05$ ). Those who carried out this practice had twice the chance of being infected by HBV than those who did not (OR = 2.079). There was a significant association between having multiple sex partners and HBV infection ( $p = 0.043$ ).

**Conclusion:** The seroprevalence of HBV infection is quite high in Yaounde and Douala. There was no association between the modes of transmissions and the HBV status, hence HBV status might be independent of the knowledge regarding modes of transmission and highly dependent on the level of exposure. Proper sterilization of shaving instruments, immunization and education of the general population should constitute an important package in a prevention program.

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## A randomized trial to evaluate interventions aimed at reducing risk of HCV reinfection in men who have sex with men: the ICECREAM study protocol

**Hage K<sup>1</sup>**, Boyd A<sup>1,2</sup>, Davidovich U<sup>1,3</sup>, Zantkuijl P<sup>4</sup>, Hoornenborg E<sup>1</sup>, Generaal E<sup>1</sup>, Matser A<sup>1,5</sup>, Schinkel J<sup>6</sup>, Todesco E<sup>7</sup>, van der Valk M<sup>2,5</sup>, Rougier H<sup>8</sup>, Lacombe K<sup>9</sup>, Prins M<sup>1,5</sup>

<sup>1</sup>Department of Infectious Diseases, Public Health Service of Amsterdam, Amsterdam, Netherlands, <sup>2</sup>stichting hiv monitoring, Amsterdam, Netherlands, <sup>3</sup>University of Amsterdam, Department of Psychology, Amsterdam, Netherlands, <sup>4</sup>Soa Aids Nederland, Amsterdam, Netherlands, <sup>5</sup>Department of Internal Medicine, Division of Infectious Diseases, Amsterdam Institute for Infection and Immunity, Amsterdam University Medical Centers, University of Amsterdam, Amsterdam, Netherlands, <sup>6</sup>Department of Medical Microbiology & Infection Prevention, Section of Clinical Virology, Amsterdam Infection & Immunity Institute, Amsterdam UMC, University of Amsterdam, Amsterdam, Netherlands, <sup>7</sup>Sorbonne Université, INSERM, Institut Pierre Louis d'Epidémiologie et de Santé Publique (IPLESP), APHP, Hôpital Pitié-Salpêtrière, Laboratoire de virologie, Paris, France, <sup>8</sup>IMEA, Institut de Médecine et d'Epidémiologie Appliquée, Paris, France, <sup>9</sup>Faculté de médecine, Sorbonne Université, Inserm IPLESP, Hôpital St Antoine, APHP, Paris, France

**Background:** Despite high uptake of direct acting antivirals and declining rates of primary hepatitis C virus (HCV) infection among men who have sex with men (MSM), reinfection rates are still high. Modelling data indicate that a reduction in risk behaviour is needed to eliminate HCV infections. There is then a need for effective interventions aimed at reducing risk behaviour and preventing reinfections in MSM.

**Materials and Methods:** We are conducting a multi-centre, 3-arm, randomised, pre-/post-intervention comparison trial evaluating the effect of (1) an online behavioural intervention offered in a tailored fashion, (2) home-based self-sampling for HCV RNA testing intervention, or (3) both on HCV risk behaviour. Both interventions are partially based on interventions embedded in previous studies. Participants are recruited from HIV treatment and STI/PrEP/sexual health centres. These individuals are followed for a 6-month interval without intervention, after which

participants are randomly assigned to a study arm and followed at 6-monthly visits for an additional 18 months. Questionnaires on risk behaviour are offered to participants at all visits. The primary endpoint is the proportion at risk of HCV infection (as determined by the previously validated HCV-MOSAIC risk score), which are compared between the pre- and post-intervention periods, within each arm. The HCV-MOSAIC risk score is calculated by summing up the coefficients specific to six self-reported risk factors when present: receptive condomless anal sex, sharing sex toys, unprotected fisting, injecting drug use, sharing of straws, and an ulcerative sexually transmitted infection. Secondary endpoints include incidence of HCV reinfection, changes in the individual risk behaviour items and changes in sexual wellbeing.

**Results:** The study initially started in November 2019, but was forced to restart in September 2021 due to the COVID-19 pandemic. Including a control comparator arm with no intervention was deemed unappealing to MSM. Hence, we opted for a 6-month run-in period instead. In September 2022, seven centres in the Netherlands were actively recruiting participants and five centres in France were preparing to recruit participants. On September 1, 2022, 106 participants had been included.

**Conclusions:** If significant decreases in risk behaviour occur between pre- and post-intervention periods for a given intervention, this intervention could contribute to reducing incident re-infections and achieving HCV micro-elimination and we would be keen on implementing this intervention into standard of care. Regardless, the interventions developed herein may help in offering information on prevention or easing access to HCV RNA testing.

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## Descriptive analysis of risk factors among HCV seroconverted adults in Georgia

**Galdavadze K<sup>1</sup>**, Tsereteli M<sup>1</sup>, Tskomelidze I<sup>2</sup>, Handanagic S<sup>3</sup>, Shadaker S<sup>3</sup>, Armstrong P<sup>3</sup>, Gamkrelidze A<sup>1</sup>

<sup>1</sup>National Center for Diseases Control and Public Health, Tbilisi, Georgia, <sup>2</sup>The Task Force for Global Health, Tbilisi, Georgia, <sup>3</sup>Centers for Disease Control and Prevention, Atlanta, United States

**Background and Aims:** Georgia embarked on the world's first Hepatitis C Virus (HCV) elimination program in 2015. Monitoring progress and trends toward HCV elimination require a well-functioning surveillance system. Currently, surveillance collects data on patients diagnosed with HCV infection, but does not differentiate between acute and chronic infections. As Georgia gets closer to HCV elimination, understanding risk factors associated with acute HCV cases will be important to prevent new infections. The aim of this study was to use an existing HCV screening registry to identify persons with HCV seroconversion and explore their risk factors for HCV transmission.

**Methods:** We used the HCV elimination program screening database to detect cases of seroconversion from January 2019 to November 2020. We considered a case a seroconversion if the HCV antibody test result dates were >12 days apart and a negative result was followed by a positive. We detected 803 seroconverted cases and we randomly selected a sample of 299 persons. We conducted phone interviews using a standardized questionnaire to assess risk factors for the transmission of HCV in the period of 2-6 months prior to seroconversion. We conducted a descriptive analysis.

**Results:** We successfully interviewed 206 of 299 respondents (69% response rate) with a median age of 53 years (interquartile range 39-64), 60% (n=123) were men, and 29% (n=59) were unemployed. In total, 90% (n=186) of respondents knew they had HCV infection and 72% (n=149) of them have been treated for hepatitis C. In the period of 2-6 months before HCV seroconversion, 46% (n=94) reported

undertaking surgery or invasive medical procedure, 29% (n=59) spent 24 hours or more in the hospital, 9% (n=19) reported injecting drugs, and 7% (n=13) had a blood transfusion. Only 3% (n=6) were vaccinated against hepatitis B.

**Conclusion:** The results of our study show that most participants who seroconverted have had contact with the healthcare sector in the period 6 months prior to seroconversion, either through inpatient admission or medical procedures, and 1 in 10 reported injection drugs. Further comparison to a group that did not seroconvert will be helpful in assessing the most relevant risk factors for incident HCV infection. To achieve hepatitis C elimination, ongoing prevention efforts in infection prevention and control in health care settings, blood safety, and harm reduction should be enhanced.

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## Early Detection of Hepatitis B in Pregnant Women: Effort to Prevent Mother-to-Child Transmission

Nuraliyah F<sup>1</sup>, Tandy G, Sukmaputri I, Tarmizi S, Waworuntu W

<sup>1</sup>Ministry Of Health, Jakarta Selatan, Indonesia

Indonesia is one of the countries endemic of hepatitis B. The National Basic Health Research 2013 data shows the proportion of positive HBsAg is 7.1% in all age groups and 4.2% in children aged 1-4 years. As a measure to prevent mother-to-child transmission (MTCT) of hepatitis B virus (HBV), every pregnant woman must perform HBsAg testing at the first antenatal visit. Pregnant women with positive HBsAg tests are monitored until delivery. Babies born to HBsAg-positive mothers are given the routine birth dose (HB-0) followed by three doses of hepatitis B vaccination, with the addition of immunoglobulin within the first 24 hours. Babies aged 9-12 months will be tested for HBsAg for early detection of hepatitis B, and for anti-HBs to determine whether they are protected from HBV infection.

In 2021, early detection of hepatitis B for pregnant women was performed on 2,946,013 (60.3%) of an

estimated national number of 4,887,405 pregnancies in 478 of 514 districts across 34 provinces in Indonesia. This program identified 47,550 (1.61%) HBsAg reactive pregnant women and monitored them until delivery. Of 36,733 babies born to HBsAg-positive pregnant women, 35,581 were given HB-0 and HBIg immunizations within 24 hours of birth. The number of infants who could be followed for HBsAg testing was 9,206. This data reveals significant gaps in the cascade of hepatitis B care: only 60.28% of the predicted number of pregnant women could have HBV early detection, and only 74.82% of the babies born to these mothers received HB-0 and HBIG, with only 26% could be monitored for their hepatitis B protection.

Hepatitis B data on pregnant women and babies has not been adequately reported by several health facilities. There are obstacles to the MTCT program, one of which is the difficulty in distributing vaccines to reach locations. Limited resources and difficulties in obtaining reagents and vaccines, several health facilities have not provided hepatitis B services to pregnant women and their babies. Outreach efforts to evaluate the outcome of vaccination of infants could not be carried out because of the lack of information on the whereabouts of mothers and their babies after the babies reached the age of 9-12 months. Furthermore, based on the field problem identification many mothers refused to be screened.

Education of pregnant women and their family members on the significance of hepatitis B screening and immunization must be intensified. To ensure that vaccines reach remote health care facilities at the appropriate time, better scheduling and distribution systems are required. Capacity building of health personnel for hepatitis B services must be developed and improved, supported by Information Technology to monitor mothers and infants up to one year of age. These things are needed for Indonesia's readiness to achieve the target of HBsAg prevalence <0.1% in children under five years by 2030, which will be complemented by a project to administer tenofovir prophylaxis to pregnant women with high HBV viral loads, starting as a pilot in 6 provinces next year.

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## Factors associated with uptake of hepatitis B vaccine by MSM in sexual health and genitourinary medicine clinics in Wales

**Bera S<sup>2</sup>**, Smith J<sup>1</sup>

<sup>1</sup>Public Health Wales, Cardiff, United Kingdom, <sup>2</sup>Public Health Wales, Cardiff, United Kingdom

Hepatitis A and B (HBV) has been a public health threat especially to men who have sex with men (MSM). MSM are often left behind when it comes to accessing essential hepatitis testing, treatment and vaccination which has led to outbreaks and increased infections in comparison with the general population. Targeted vaccination of the most vulnerable MSM who face structural barriers to accessing testing, treatment and vaccination can be essential in eliminating HBV by 2030.

Data for the cross sectional survey was collected from sexual health and GUM clinics from the seven health boards in Wales from 2017-2021 using the Sexual Health Wales Surveillance Wales. Sexuality and Age were fitted into the multivariate logistic model as priori variables. Risk factors were identified using the multivariate logistic regression model to identify risk factors. The Mantel Haenszel method was used for stratified analysis of the age groups. Analysis was done using STATA version 14.

The prevalence for HBV vaccination for MSM in Wales from 2017-2021 was 1.29% (n=143,417). MSM who identified as homosexual were more likely to take up vaccination as compared to MSM who identified as bisexual aOR 1.1(1.05-1.20, p<0.001). Vaccination uptake by health board was a factor for taking up the hepatitis vaccination as out of the seven health boards Swansea Bay aOR 0.57; 0.52-0.63, p<0.001 and Cwm Taf aOR 0.67, 0.57-0.79, p<0.001. Furthermore, HIV status was a risk factor for uptake of the HBV vaccine with people living with HIV (PLHIV) aOR 0.54, (0.39-0.74). Moreover, age group was seen as a risk factor for taking up the HBV vaccine with age groups such as 15-24 years having an odds risk of aOR 0.4 (0.17-0.94, p<0.04) and 25-34 year olds having aOR 0.21, 0.09-0.51, p<0.001).

MSM who identified as bisexual were at risk of not taking up the HBV vaccination as shown by the strong evidence of lower uptake of the HBV vaccine as compared to MSM who identified as homosexual. Hence there is need to provide more awareness and education to MSM who identify as bisexual to take up the HBV vaccine. Furthermore, comparing to other age groups there was good evidence that young MSM aged 15-24 years were at risk of not taking up the HBV vaccine as compared to other age groups. Moreover, there was strong evidence of risk of not taking up the HBV vaccination for people aged 25-34 years of age. Therefore, there is need for tailor made HBV vaccination targeted interventions which promote HBV vaccination for people aged 15-34 years in Wales. Furthermore, of all the seven health boards there was strong evidence which showed that MSM in Swansea Bay University Health Board and Cwm Taf Morgannwg University Health Board were at risk of not taking up the HBV vaccine. This might suggest the need for targeted vaccination programs in Swansea Bay University Health Board and Cwm Taf Morgannwg University Health Board. Generally the prevalence of HBV vaccine uptake was low in the MSM population attending sexual health and GUM clinics.

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## HCV: Check mate in three steps

**Messina v<sup>1</sup>**, Romano M<sup>2</sup>, Nuzzolo L<sup>3</sup>, Parente E<sup>3</sup>, Ferrara S<sup>3</sup>, Marra P<sup>3</sup>, Andreozzi G<sup>3</sup>, Stella L<sup>4</sup>, Scioli A<sup>5</sup>, Izzi A<sup>6</sup>, Anecchiarico A<sup>1</sup>, Mensorio M<sup>1</sup>, Maggi P<sup>1</sup>

<sup>1</sup>UOC Malattie Infettive A.O. S. Anna E S. Sebastiano Caserta, Caserta, Italy, <sup>2</sup>Università degli Studi della Campania Luigi Vanvitelli, Caserta, Italia, <sup>3</sup>Dipartimento delle Dipendenze, ASL Caserta, Caserta, Italia, <sup>4</sup>SerD48, ASL Napoli 3, Somma Vesuviana, Italia, <sup>5</sup>UOC SerD regionale, ASREM Molise, Isernia-Campobasso, Italia, <sup>6</sup>A.O. Dei Colli, P.O. D. Cotugno, Napoli, Italia

DAA treatment in PWUD is universally considered very difficult due to their abnormal behavior as early treatment discontinuation, lack of adherence, alcohol and illicit drugs concomitant intake, all causes of treatment failure and clinical complications. For these reasons PWUD are considered unreliable and to be needed a tight control with seriate clinical and lab evaluations. DAA treatment, in Italy, require a mandatory monitoring with clinical and lab evaluations and drug dispensing every 4 weeks, at the End Of

Treatment (EOT) and 12 weeks after treatment completion (SVR 12). This therapeutic schedule is unpleasant to these patients and the risk of treatment discontinuation is high.

On the other side, the Italian healthcare model for PWUD is based on SerDs Units that offer a holistic care as clinical, psychological, psychiatric, logistical and legal. PWUD are daily or weekly seen for routinely interview or OST near SerDs and the healthcare contacts are universally well accepted by PWUD.

We strongly believed SerDs as the best place in which apply a “super simplified” strategy for HCV elimination that could meet the main two needs to reach HCV microelimination among PWUD: a wide elimination through a simplified pathway Following protocol was universally applied to all PWUD:

Inside SerDs they were screened for HCV and HBV and HCV RNA RT-PCR and HCV Genotype was immediately performed on the same blood sample when detected Anti-HCV positive. All those tests are still mandatory for national (AIFA) and regional (Saniarp) regulatory authorities. 119 PWUD were consecutively enrolled to DAA treatment. Further lab controls were scheduled at EOT and at SVR 12. Patients with evidence or history of decompensated cirrhosis were excluded from this simplified pathway.

From January 2020 to December 2021, 102 male and 17 female HCV infected treatment-naïve PWUD registered inside SerDs, were enrolled. Median age was 51 years. Genotype distribution: GT 1a: 51 (46 male, 5 female), GT 1b: 8 (6 male, 2 female), GT 2: 6 (5 male, 1 female), GT 3: 49 (41 male, 8 female), GT 4: 5 (4 male, 1 female). Only pangenotypic DAA regimens were used.

Disease staging and drug assignment were performed on the FIB4 score result, Fibroscan evaluation was excluded.

**Results:** Patients showed a great adherence to treatment: all enrolled PWUD completed treatment and a SVR-12 was obtained in 98.9% of subjects.

These great results were obtained by the continuous interaction of PWUD with healthcare workers inside SerDs that monitored the adherence to treatment and offered a strong and effective counselling. Both the different drug regimens applied resulted safe and no relevant adverse event was observed.

**Conclusions:** This innovative protocol not only enhanced the DAA treatment access and the cascade of care, resulting highly cost savings in terms of avoiding intermediate controls and drop-out among PWUD, but also confirmed that task-sharing is the best practice, allowing that healthcare workers inside the SerDs, different from specialists, if well trained by clinical hepatologists, were able to easily manage DAA treatment. HCV among PWUD was defeated in three steps!

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## Hepatitis B and Hepatitis C Prevalence among Female Sex Workers in Rwanda, 2019.

Dushimiyimana D<sup>1</sup>, Mukandori D<sup>1</sup>, Mukashyaka M<sup>1</sup>, Kayitesi C<sup>1</sup>, Umutesi J<sup>1</sup>, Serumondo J<sup>1</sup>, Remera E<sup>1</sup>

<sup>1</sup>Rwanda Biomedical Centre, Kigali, Rwanda

**Background:** Female sex workers (FSW) are exposed to sexually transmitted infections, including hepatitis B and C, due to their high-risk sexual behaviour. The aim of this study is to estimate the prevalence of hepatitis B and C among female sex workers in Rwanda.

**Methods:** A national wide cross-sectional behavioral and biological surveillance survey (BBSS) was conducted among 1,741 FSW age 15 years and above using time-location sampling approach. Blood samples for hepatitis B and C testing were collected, HBV testing was done using SD Bioline while Hepatitis C was done using Ora Quick HCV Ab Test and followed by HCV-RNA to confirm chronic HCV infection. Logistic regression was performed to assess the factors associated with HBV and HCV infection and data were analyzed using STATA 15 software.

**Findings:** Overall prevalence of hepatitis B is 2.5% and HCV prevalence is 1.0% among 1,741 female sex workers tested. HBV prevalence is almost equally distributed across provinces, ranging from 2.0% in Southern province and highest in Eastern province with 3.6%. The prevalence did not vary significantly by socio-demographic characteristics. However, some small differences were found in the age group category, with a higher HBV prevalence among FSWs aged 35-39 and 40+ years old (3.8%

and 4.0%) respectively. HBV and HIV coinfection stands at 2.8% Hepatitis C prevalence does not vary significantly with socio-demographic characteristics with exception among older FSWs (40+ years) with a prevalence of 2.5%. FSWs with marital status of divorced or separated were two times more likely infected with Hepatitis B virus compared with single FSWs (OR: 2.04, 95% CI: 1.12 – 3.73, p-value: 0.020).

**Conclusion:** This analysis reveals that HBV and HCV prevalence is slightly higher than among the general population in Rwanda. Integration of HBV and HCV services among health package of FSW is needed.

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## Integrating Lived Experience into Hepatitis B Cure Research: The Role of Community Advisory Boards

Zovich B<sup>1</sup>, Cohen C<sup>1</sup>, Racho R<sup>1</sup>B J<sup>1</sup>, L W<sup>1</sup>, R D<sup>1</sup>

<sup>1</sup>Hepatitis B Foundation, Doylestown, United States

As pre-clinical and clinical research lead to progress towards development of a functional cure for hepatitis B, it is critical to include community perspectives and experiences in this process, to ensure that the voices of those living with chronic hepatitis B (CHB) and chronic hepatitis D (CHD) are represented and centered in decision-making by industry, governments, and nonprofits. People living with and affected by these diseases have an instrumental role to play in driving progress toward better treatments, approaches, and possible cures for hepatitis B and D. It is important to establish and maintain opportunities for them to meaningfully interact with researchers to provide their input and recommendations for drugs and clinical trials that are designed and implemented with them in mind.

To this end, the Hepatitis B Foundation created two global Community Advisory Boards (CABs), focused on hepatitis B and hepatitis D infection. This presentation describes the process, initial outcomes, and learnings from the CABs. Each CAB consists of 8-15 members, from all WHO regions, who were selected through an open call for applications. CAB membership reflects the

demographics of CHB and CHD globally, to highlight their different experiences, and emphasizes the inclusion of traditionally underrepresented communities. Members complete training modules that include hepatitis B and D education, current treatment landscape, clinical trial processes, best practices for engaging with researchers, and storytelling strategies for scientific impact. Members also engage with experienced CAB members in the HIV and hepatitis C spaces, to share strategies and lessons learned. A private online community creates a safe space for CAB members to engage, debate and share ongoing feedback and support.

After training completion (expected December 2022), CAB members will lead and participate in meetings with drug and clinical trial developers. The CABs were designed to be member-led, where members assist with CAB operations and defining goals, activities, and processes. As such, designated CAB members will develop relationships with drug and clinical trial developers, create meeting agendas, and drive ongoing communication. The Hepatitis B Foundation will continue to provide oversight and support and create opportunities for CAB members to provide their input/recommendations on drug development and clinical trials. Members will also represent patient communities at public events and conferences and participate in community outreach and education.

The hepatitis B and D CABs highlight the need for - and benefits of - community-researcher partnerships. CAB processes, outcomes, and experiences will be collected throughout the lifespan of each CAB, and evaluation is co-designed with CAB members and public health advisors. It is expected that the CABs will effectively integrate lived experience, patient perspectives, desires and needs into drug and clinical trial development. This will result in patient-focused drug development and design of clinical trials that best meet the needs of people living with hepatitis B and D worldwide. Ultimately, patient-focused drug and clinical trial development will result in improved clinical trial participation and completion, diverse community representation, and increased uptake of approved treatments.



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## Strategic Approaches to Achieving Micro-Elimination in Nasarawa State Nigeria, a Step towards HCV Elimination

Agwuocha C<sup>1</sup>, Adisa O<sup>1</sup>, Nwobi O<sup>1</sup>, Akanmu M<sup>1</sup>, Kama J<sup>1</sup>, Lufadeju F<sup>1</sup>, Wiwa O<sup>1</sup>, Chan Y<sup>2</sup>, Azania A<sup>2</sup>, Adamu I<sup>3</sup>, Ahmed Y<sup>3</sup>, Bello R<sup>3</sup>

<sup>1</sup>Clinton Health Access Initiative, Lafia, Nigeria, <sup>2</sup>Clinton Health Access Initiative, Boston, USA, <sup>3</sup>Nasarawa State Ministry of Health, Lafia, Nigeria

**Background:** A cross-sectional study in Nasarawa and program data from the mono and HCV/HIV co-infected populations, reveal an average seropositive rate of 13.2%, significantly higher than National prevalence of 1.1% for both populations. Clinton Health Access Initiative supported Nasarawa State viral hepatitis response leading to Government commitment to a 5-year HCV Elimination plan in 2020, aimed at screening 2.4M persons and treating an estimated 141k chronically infected persons. The Technical Working Group (TWG) adopted a phased approach to elimination, prioritizing micro-elimination in a high-risk population – People Living with HIV (PLHIV); with service delivery deployed in 13 facilities. The abstract aims to highlight the approaches used in the first two facilities to achieve HCV micro-elimination as stipulated in WHO elimination guidance which recommends 90% diagnostic and 80% treatment coverage.

**Approach/Methods:** Healthcare workers working with ART patients were trained on management of hepatitis and data tools provided. Using facility screening and HIV enrollment data, the following approaches were employed in General Hospitals (GH) Keana and Awe.

Facility level approach – Reviewed the existing HIV patient flow pathway to identify integration points for HCV services which resulted in effective counselling by healthcare workers at ART clinic sessions, screened and linked to care via an opt-out approach.

Community level approach – Transitioning to community service delivery by the HIV program negatively impacted patient facility visits. In response, the TWG resolved to deliver HCV

screening, viral load, and treatment services at the community, facilitated by patient navigators, who are primarily HIV program defaulter trackers. Various service delivery models, such as reflex viral load sample collection, multi-month dispensary, and cascade streamlining (ensuring DAAs are dispensed at ancillary sample collection for viremic patients), were employed to maximize limited resources.

**Mixed approach:** A hybrid of facility and community level approaches which was adopted due to subpar patient coverage at the time the HIV program transitioned to a community service delivery.

The facility approach was deployed at GH Keana and the other facilities, while the mixed approach was uniquely piloted in GH Awe.

**Results:** As of October 2021, General Hospital Keana had 126 actively enrolled patients on ART. 90% (113) were screened, 17 patients were identified seropositive with seropositivity rate of 15%. About 82% (14) of the seropositive patients were linked to confirmatory testing. 5 patients were confirmed viremic, with viremic rate of 30%. Out of the 5 viremic patients, 80% (4) were initiated on treatment.

General Hospital Awe had 643 patients actively enrolled on ART. 92% (591) of patients were screened, 104 patients were identified seropositive with seropositivity rate of 17.6%. About 91% (95) of the seropositive patients were linked to confirmatory testing. 46 patients were confirmed viremic with viremic rate of 48%. Out of the 46 viremic patients, 87% (40) were initiated on treatment.

**Conclusions:** Micro elimination was achieved in two facilities in Nasarawa state showcasing the need for a flexible program integration strategy demonstrated by the implementation of both facility and community level approaches.

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## Treatment and elimination of hepatitis C with direct acting drugs (DDAs) in patients undergoing hemodialysis, a single center experience in Tripoli, Libya

Bousifi N<sup>1,2</sup>, Belhaj I<sup>1</sup>, Barka R<sup>1</sup>, Alamin A<sup>1</sup>

<sup>1</sup>Tripoli dialysis center, Tripoli, Libya, <sup>2</sup>organ transplant department, Tripoli, Libya

**Background and aims:** In Libya it is estimated that hepatitis C Sero-prevalence among patients undergoing hemodialysis was 31%, hepatitis C viremia and treatment was not well evaluated and documented. With the availability of direct acting antiviral (DDAs), that have very high cure rate. We aimed to evaluate hepatitis c viremia and to eliminate hepatitis C at Tripoli hemodialysis center.

**Methods:** From April 2019 to December 2020 HCV antibodies, liver enzymes was done to all patients on hemodialysis, patients with positive HCV and high liver enzymes were further evaluated for viremia by HCV quantitative PCR, Patients with negative PCR, with a previous history of treatment were considered cured, those with no history of treatment considered naturally cured, and those with positive HCV PCR were offered treatment, PCR was repeated at end of treatment, and 3months after finishing it.

**Results:** A total of 603 patients were evaluated. 138/603(22.8%) were anti-HCV antibodies positive, 5/138(3.6%) were positive before starting hemodialysis, median age was 49.5years, ranged from 18 to 89 years, 82(59%) were males. HCV quantitative PCR was not detected in 57(41%), of them 25/138(18%) were naturally cured, and 32/138(23%) were treated with Pegylated interferon and cured.

68 patients were started treatment 55(80%) were treated with daily fixed-dose combination of elbasvir (50 mg)/grazoprevir (100 mg), 9(13%) were treated Daklatasvir (60mg), and sofosbuvir (400 mg), 3patients were treated with Ombitasvir-Paritaprevir-Ritonavir and Dasabuvir (Viekira Pak)

and 1 patient treated with Glecaprevir/pibrentasvir (Mavyret). Acute hepatitis C was diagnosed in 24 patients, whom treated within the first 3 months, liver enzymes were elevated in 15(62%). Relapser or non-responder to previous treatment with Pegylated interferon was 9 patients. End of treatment (EOT), sustained biological response (SVR) were not detected in all patients treated with different DDAs.

**Conclusion:** Hepatitis C outbreaks still common in hemodialysis center, strict infection control strategies to be implemented and early diagnosis with monthly liver enzymes, and treatment of hepatitis C to prevent further spread of infection.

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## A Novel Technology For Extraction And Enrichment of HCV Antigen using Temperature-sensitive Smart Polymer: A comparison With PCR, A pilot study

Soliman R<sup>1</sup>, Nabil A<sup>2</sup>, Yoshihara E<sup>3</sup>, Hironaka K<sup>4</sup>, Hassan A<sup>1</sup>, Shiha G<sup>1</sup>, M.Ebara M<sup>4</sup>

<sup>1</sup>Egyptian Liver Research Institute And Hospital, Mansoura, Egypt, <sup>2</sup>National Institute for Materials Science, Ibaraki, Japan, <sup>3</sup>National Institute for Materials Science,, Tsukuba, Japan, <sup>4</sup>Tokyo University of Science, , Tokyo, Japan

**Background:** WHO introduced global targets for care and management of HCV including “90% reduction in new cases of chronic hepatitis C, 65% reduction in hepatitis C deaths, and treatment of 80% of eligible people with chronic hepatitis C infections”. Most infected people (75-90%) remains unaware of their infection. To achieve WHO goals, it is essential to scale up diagnosis and treatment capacities in low-income and middle-income countries, where HCV is highly endemic. However, in these regions, access to HCV diagnostic tools is severely limited. The current diagnostic algorithm is based on using two steps; rapid diagnostic test (RDTs) and viral load confirmation

**Objectives:** Our aim is to design a novel method for extraction and enrichment of HCV antigen using temperature-responsive smart polymer "NIPAAm-

co-HIPAAm-co-SAKIPAAm" (Patent: 2019/2002) for enabling affinity enrichment of HCV antigen to be used as a part of POC test to improve the cascade of care.

**Method:** We used temperature-responsive smart polymer "NIPAAm-co-HIPAAm-co-SAKIPAAm" (Patent: 2019/2002) for extraction and enrichment HCV antigen for 15 positive HCV serum samples and 5 negative HCV serum samples confirmed by PCR technique. After extraction and enrichment of HCV antigen, samples undergo amplification and detection by thermal cycler as amplification and detection of PCR technique

**Results / Outcomes:** The results showed that HCV antigen extracted and enriched by temperature-responsive smart polymer gave the same results with positive and negative HCV samples detected by PCR

Sensitivity 100%

Specificity 100%

**Conclusions:** The novel temperature-responsive smart polymer "NIPAAm-co-HIPAAm-co-SAKIPAAm" (Patent: 2019/2002) is able to extract and enrich HCV antigen in the same sensitivity and specificity like the current PCR.

The time needed for this simple technique may make it be suitable to be apart of POC test for rapid, affordable, easy-to-use test in comparison to PCR technique which needs dedicated facilities and highly qualified personnel.

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### D-Mongolia: screening and linkage-to-care for viral hepatitis in Mongolian nationals living in Spain. Preliminary results.

**Palom A**<sup>1,2</sup>, Almandoz E<sup>3</sup>, Rando-Segura A<sup>4</sup>, Pérez-Castaño Y<sup>3</sup>, Vico J<sup>1</sup>, Rodríguez-Frías F<sup>2,4</sup>, Battulga N<sup>1</sup>, Gomez-Prat J<sup>5</sup>, Arenas Ruiz-Tapiador J<sup>2,3</sup>, Buti M<sup>1,2</sup>

<sup>1</sup>Liver Unit, Hospital Universitari Vall d'Hebron, Barcelona, Spain, <sup>2</sup>Centro De Investigación Biomédica En Red De Enfermedades Hepáticas y Digestivas (CIBERehd), Instituto de Salud Carlos III, Madrid, Spain, <sup>3</sup>Department of Liver and Gastrointestinal Diseases, Clinical Research Unit, Donostia University Hospital-Biodonostia Health Research Institute, San Sebastián, Spain, <sup>4</sup>Microbiology Department, Hospital Universitari Vall d'Hebron, Barcelona, Spain, <sup>5</sup>Preventive Medicine Unit, Drassanes, Hospital Universitari Vall d'Hebron, Barcelona, Spain

**Background and aim:** Mongolia is one of the countries with the highest prevalence of viral hepatitis (B, C and D). In total, 853 Mongolian nationals are reported to be living in Spain mainly in 3 regions (Barcelona, Madrid and San Sebastián). The aims of the study are to screen Mongolians living in Spain for viral hepatitis, and to comprehensively characterize chronic viral hepatitis among them.

**Methods:** The program is an adult community-based screening consisting of several events that include a specific educational activity regarding viral hepatitis (audiovisual informing about epidemiology, transmission and therapy) followed by hepatitis B and C testing using HBsAg and anti-HCV point-of-care testing. Those positive will be tested by point new tools (dried blood test for HBV-DNA, HCV-RNA, anti-HDV), and by regular serology and virology blood test, and will be linked to care. The first pilot events were performed in Barcelona on April 2022 and San Sebastián on September 2022.

**Results:** From 82 Mongolians living in Barcelona and 410 in San Sebastián, a total of 210 were appointed to be screened, and 166 (79%) subjects performed the educational activity and were tested. One-hundred and four subjects were female (63%), median age 42.6±11.1 years, and 57 (34%) subjects had one or more viral hepatitis risk factors.

Among them, 14 were anti-HCV+ (8.4%) and 2 with HCV-RNA detectable (14%); 7 were HBsAg+ (4.2%) and 6 with detectable HBV-DNA (86%). One patient had hepatitis B/D (0.6%) with undetectable HDV-RNA and HBV-DNA. Amongst the 21 diagnosed patients, 13 (62%) were unaware of having viral hepatitis.

All positive patients have an appointed visit with the specialist by the end of the year.

**Conclusions:** Almost 80% of the appointed adult Mongolians living in Barcelona and San Sebastián attended our community-based educational and screening program for viral hepatitis. The prevalence of HBV, HDV and HCV infections are higher than the Spanish population. In addition, 62% of those tested are unaware of their infection.

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## High frequency of drug-resistant mutation to nucleos(t)ide analogues in hepatitis B virus (HBV) infected people living with HIV, in the Northeast region of Colombia.

Bautista-Amorocho H<sup>1</sup>, Picón-Villamizar J<sup>1</sup>, Silva-Sayago J<sup>1</sup>, Sánchez-Alvarado N<sup>1</sup>, Goyeneche-Patiño D<sup>1</sup>

<sup>1</sup>Grupo de Investigación en Manejo Clínico - CliniUDES. Universidad de Santander - UDES, Bucaramanga, Colombia

**Background:** In 2021, 38,4 million people were living with Human Immunodeficiency Virus (HIV) and 610.000 died of causes related to acquired immunodeficiency syndrome (AIDS) (1). Hepatitis B virus (HBV) infection is common among patients with HIV because of shared routes of viral transmission. Liver disease due to chronic HBV is considered an important risk factor for morbimortality with an estimate of 2-5 million HIV/HBV coinfections (2). Antiretroviral therapy includes drugs that are active against both infections such as potent nucleos(t)ide analogues (NAs). However, some patients develop drug-resistant to NAs with a negative impact on liver disease progression (3). In this study, we aimed to determine the prevalence of HBV, HBV genotypes, and drug resistance

mutations to NAs in dually infected cases, in a cohort of HIV patients in Northeast Colombia.

**Material and Methods:** A cross-sectional study of 475 HIV-positive patients from Bucaramanga city, Colombia, were enrolled in the study during 2010. All sera from blood samples were tested for HBV DNA detection using an in-house nested PCR that amplified the whole RT domain of Pol gene. Serological markers of HBV, HIV viral load, and immunophenotype in white blood cells data were collected from recent clinical records. A 920 base pair fragment from each positive HBV DNA was sequenced by the Sanger method. Drug resistance mutations (DRMs) were characterized with the Geno2pheno (hbv) 2.0 program, and viral genotype was classified by maximum likelihood and Bayesian inference with MEGA 11

**Results:** 65% of HIV patients were male while the mean age was 37,32 years old (range 18-66); the mean CD4+ counts were 384 cells/μL (median 342 cells/μL) and 36% were in the AIDS stage. HBV was found in 11,6% (n=32) of which 8,4% corresponded to occult hepatitis B (OBI) and 81,3% of coinfecting patients were on NAs treatment. HBV rt180M, rt204V, rt80I lamivudine (3TC) and rt204V, rt80I telbivudine (LdT) mutations were present in 78,1% while rt250V entecavir (ETV) mutation was identified in one patient. No differences in HIV viral load or CD4+ counts were observed in HIV/HBV vs HIV mono-infected patients. Genotype F subtype F3 was observed in all HBV DNA samples.

**Conclusions:** In this study, we found 11,6% of HBV/HIV coinfecting patients, most of them OBI cases. Most were receiving the first-generation anti-HBV therapy with a low genetic barrier to resistance, such as 3TC and LdT. However, no tenofovir mutations against HBV were observed. These results emphasize the importance of HBV molecular screening to identify OBI cases. Likewise, DNA sequence analysis is recommended to characterize NAs mutations for better management and prevention of severe liver disease.

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## Patient Navigators for Persons Living with Hepatitis: A Needed Professional in the Multidisciplinary Team

Schweitzer A<sup>1</sup>, Stoian F<sup>1</sup>, Bogdan M<sup>1</sup>, Cirjila A<sup>1</sup>

<sup>1</sup>Baylor Black Sea Foundation, Constanta, Romania

**Background:** Baylor Black Sea Foundation is the first NGO in Romania to add to its team the Hepatitis Patient Navigators (PN) as team members since 2017. PN is crucial in linking new patients to care and helping those diagnosed at other sites by acting as the main point of contact for all patients. An effective PN needs skills to solve problems quickly, organize information and restate it in a health-literate manner, and build relationships that patients may use further.

**Description:** At BBSF, PN is responsible for assisting patients in accessing the available health services in the public system and building self-management skills for all beneficiaries living with viral hepatitis. PN helps patients living with hepatitis improve their quality of life. Our team has two to three PN responsible. PNs have multiple responsibilities, such as:

- screening patients for psycho-emotional challenges;
- unfolding lifestyle interventions to support health goals;
- guiding within the public health system;
- helping patients stay engaged in medical care and adhere to their medications;
- offering direct support for coverage of blood tests costs;
- facilitating access to medical services and counseling for family members;
- counseling about the rights and benefits of people with chronic diseases under Romanian law and supporting against stigma and discrimination.

**Lessons learned:** Before setting up the PN team, BBSF had a lower number of patients supported in the long term (143 average number of patients during 2013-2016, around 38% patients diagnosed at other sites). PNs expanded the overall numbers, with a significant increase in enrollment of external patients and the long-term retention of the cases,

including those with a sustained viral response (334 average number of patients, around 57% of patients diagnosed at other sites from 2017 to the present).

PNs also help ensure patients' satisfaction. A recent assessment showed that 68,18% of the evaluated patients were satisfied with health counseling services during treatment, 59,24% with health support services after treatment, 87,88% with medical analysis support services, 81,83% with lifestyle counseling services at the clinic, 72,52% with tele-counseling, 41,94% with pre-diabetes assessment service.

**Next steps:** Patients living with hepatitis are older adults and generally have more than one chronic condition. Therefore, our team needs to continuously learn how best to tailor interventions for these patients to maintain good results after achieving SVR. At the same time, many things we develop for patients with hepatitis can later be adapted for our HIV-aging population, helping us transfer back the knowledge and skills within the team.

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## SEROEPIDEMIOLOGY OF HEPATITIS B VIRUS INFECTION AMONG PREGNANT WOMEN IN NIGERIA

Tiwah John O<sup>1</sup>, Adda D<sup>1</sup>, Ande R<sup>1</sup>, Bantar H<sup>1</sup>, G. Gabriel E<sup>1</sup>, Umaru M<sup>1</sup>

<sup>1</sup>Center For Initiative And Development In Taraba, Jalingo, Nigeria

**Background:** The World Health Organization (WHO) reported that Hepatitis B is a potentially life-threatening liver infection caused by hepatitis B virus (HBV). If a pregnant woman is infected with Hepatitis B virus (HBV), management of such problems must involve both the mother and the newborn. The World Health Assembly has identified prevention of mother-to-child transmission of HBV as one of the key interventions towards elimination of viral hepatitis. There are scanty studies carried out among pregnant women particularly in Nigeria.

**Objectives:** This study sought to determine the seroprevalence of hepatitis B virus among pregnant women in Nigeria.

**Methods:** This was a cross sectional survey carried out in 7 states of Nigeria including FCT Abuja (Taraba, Kano, Nasarawa, Enugu, Akwa Ibom and Bauchi States). A total of 2746 pregnant women were included in this study. All Pregnant women who were attending antenatal clinic in hospitals across target states and were willing/agreed to participate in the survey were included, whereas those pregnant women who were unable to show willingness due to any problem, and did not agree to give informed consent were excluded from the survey. This was followed by administration of a structured questionnaires after which blood sample were collected by well-trained lab scientists to test for hepatitis B surface antigen in line with WHO. Data was analyzed using SPSS version 25. Simple percentages was used as the method of data analysis.

**Results:** A total of 2,746 pregnant women were enrolled for the study. Overall, a prevalence rate of 159/2746(5.8%) was reported among pregnant women in all the six target states out of which the proportion distribution of the prevalence rates based on states were 4.7%, 7.6%, 5.1%, 4.2%, 6.7%, 1.3 and 7.7% which represent FCT Abuja, Kano, Nasarawa, Enugu, Bauchi, Akwa Ibom and Taraba respectively.

**Conclusions:** The seroprevalence of HBV as recorded in this study is slightly high based on WHO classification of endemicity. The study suggests for routine screening of pregnant women at Antenatal care for HBV, and subsequent management in accordance with current WHO guideline for both the mother and child. Further studies can consider risk factors among this population in order to register more successes.

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## Low Hepatitis C Reinfection in People Who Inject Drugs Treated with Direct Acting Antivirals in Kenya

**Nyakowa M<sup>4</sup>**, Muller A<sup>1,2</sup>, Kurth A<sup>1</sup>, Akiyama M<sup>3</sup>, Cherutich P<sup>4</sup>, David V<sup>1</sup>, Ramachandra S<sup>5</sup>, Khudyakov Y, Musyoki H<sup>4</sup>

<sup>1</sup>School of Nursing, Yale University, New Haven, USA, <sup>2</sup>Boston University Medical Center, Boston, USA, <sup>3</sup>Albert Einstein College of Medicine, Montefiore Medical Center, , USA, <sup>4</sup>National AIDS & STI Control Program, Ministry of Health Kenya, Nairobi, Kenya, <sup>5</sup>Centers for Disease Control and Prevention, , USA

**Background:** Hepatitis C virus (HCV) is a global epidemic affecting over 70 million people. The WHO Global Health Sector Strategy on Viral Hepatitis provides guidance to direct resources to low- and middle-income countries (LMICs) by focusing on high-risk populations like people who inject drugs (PWID), although data in LMIC settings are sparse. Despite all-oral direct acting antiviral regimens that are highly effective with few side effects, concern remains about possible treatment failure and reinfection among PWID due to high cost.

**Methods:** We used a prospective longitudinal cohort design to assess the rate of HCV recurrence following DAA therapy in PWID (n=100) in Kenya at two timepoints following HCV treatment completion (9 and 15 months). Peripheral blood samples were collected to detect recurrent HCV viremia and a behavioral survey was administered at the 9-month timepoint. Phylogenetic analysis was used to differentiate reinfection from relapse. The reinfection rate was calculated using the mid-point between the end of treatment and the last positive HCV viral load.

**Results:** Four of the 100 participants had recurrent HCV viremia (1.76 per 100 person-years, 95% CI 0.67-4.67) over a total of 226.6 person-years. Two of the recurrent cases were determined to be relapses resulting from virologic breakthrough and two were cases of reinfection for a reinfection rate of 0.88 per 100 person-years (95% CI, 0.22-3.51). Both reinfected participants were male, younger than 30 years old, who reported daily injected heroin 2-3 times/day and accessing NSP but not

medications for opioid use disorder. One of the reinfected participants reported unstable housing.

**Conclusion:** In this cohort of PWID in Kenya, HCV reinfection was noted to be low overall. While additional support is needed for those at highest risk of reinfection, this study supports expanding DAA treatment access in LMIC settings, to achieve the WHO strategic plan to eliminate HCV.

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## Impact of Didactic Counselling Strategies on Hepatitis Awareness among Internally Displaced Persons (IDPs) Camps in Jalingo Metropolis, Taraba State, Nigeria

Bakari U<sup>1</sup>

<sup>1</sup>Centre For Centre For Counselling, Advocacy And Social Inclusion Jalingo, Taraba State Nigeria, Jalingo, Nigeria

The study examines the Impact of Didactic Counselling Strategies on Hepatitis Awareness among Internally Displaced Persons (IDPs) camps in Jalingo Metropolis, Taraba State, Nigeria. Quasi-experimental design of pre/post was used. A sample of 210 Internally Displaced Persons (IDPs) was drawn from the population using purposive sampling technique. The instrument for data collection was titled "Impact of Didactic Counselling Strategies on Hepatitis Awareness Questionnaire (IDCSHAQ)" was constructed by the researchers and validated by the experts and it has a reliability index of 0.98 established through test-retest method and Pearson correlation coefficient technique. The results of the study show that didactic counselling strategies has impact on hepatitis awareness among Internally Displaced Persons (IDPs) in Jalingo Metropolis; no significant difference in didactic counselling strategies awareness existed between male and female Internally Displaced Persons (IDPs) in Jalingo metropolis. It was therefore recommended that world hepatitis alliance, government of Taraba State should take it as matter of necessity to employ professional counsellors and deploy them to Internally Displaced Camps (IDCs) as staff to

provide the much-needed counselling services to the Internally Displaced Persons (IDPs) in the state.

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## The D.I.T. model was successful for HCV elimination in Caserta Prisons

Messina v<sup>1</sup>, Nese G<sup>2</sup>, Romano M<sup>3</sup>, Anneckiarico A<sup>4</sup>, Mensorio M<sup>4</sup>, Matano A<sup>4</sup>, Maggi P<sup>1</sup>

<sup>1</sup>UOC Malattie Infettive A.O. S. Anna E S. Sebastiano Caserta, Caserta, Italy, <sup>2</sup>UOC Tutela della Salute in Carcere, ASL Caserta, Caserta, Italia, <sup>3</sup>Università degli Studi della Campania Luigi Vanvitelli, caserta, Italia, <sup>4</sup>Direzione Sanitaria A.O. S. Anna E S. Sebastiano Caserta, Caserta, Italia

**Background:** HCV prevalence in Italian prisons is not well known and HCV Ab screening is not mandatory at the access in prisons. When HCV infection is diagnosed, prisoners are poorly linked to care because of several difficulties. Many authorizations of different authorities are required to start and complete a diagnostic and therapeutical pathway and the stay of the patient in the same prison is not ensured. We work in Caserta Province, a high HCV prevalence area and we expected the same evidence in the 1300 prisoners in four prisons and five REMS of this area.

**Description of model of care/intervention:** We contacted and involved all the authorities who rule the prisoners' life, planned a complete training of all personnel of prisons (clinicians, nurses, probation officers) about the state of the art of HCV infection, control and elimination possibility and DAA management.

We applied first to all prisoners, not tested for HCV Ab at the prison admission, a counselling and then an oral HCV testing (Oraquick®) and we obtained a whole HCV Ab+ prevalence in Caserta prisoners. Than we fulfilled and applied a definite and unique "Statement" with the universal HCV Ab screening at the prisons admission, fast track of blood sample collection, clinical evaluation and treatment assignment, with exact timing and responsibility for any action.

**Effectiveness, conclusion and next steps:** The HCV Ab+ prevalence detected in Caserta Province prisons was 9.6%.

If from 2016 to 2018, 5 prisoners only were diagnosed for HCV infection and linked to care, in an evaluation length from 6 to 18 months (2 of them not completed the treatment because of prison transfer). On 2019, in the six months after the “Statement” subscription, 60 prisoners were diagnosed, evaluated and linked to HCV care in a maximum length of 30 days with a 300% increase in treatment initiations. All completed the treatment with 98.3% SVR 24.

The D.I.T. model ruled by an exact “Statement” resulted the successful approach for prisoners’ linkage to HCV care and elimination.



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