Table. Characteristics of the study population (n=214)

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Characteristic	Value
Median age, (range, years)	64 (27-84)
Male sex	127 (59%)
Race	
White	180 (84%)
Black	18 (8%)
Asian	9 (4%)
Native American	1 (0.5%)
Other	6 (3%)
Hematologic neoplasm	
Lymphoid [a]	149 (70%)
Myeloid [b]	65 (30%)
HCT	15 (7%)
Allogeneic	3/15 (20%)
Autologous	12/15 (80%)
Anti-HCV positive	3 (1%)
HCV RNA positive	2/3 (67%)
HCV RNA negative	1/3 (33%)
HCV RNA positive	2 (1%)
Anti-HCV positive	2/2 (100%)
Anti-HCV negative	0/2
Seronegative HCV infection [c]	0
HCV genotype	
1b	2/2 (100%)

Data are median (range) or n (%).

HCT=hematopoietic cell transplant; HCV=hepatitis C virus.

[a] Lymphoid neoplasms included the following categories based on the 2016 World Health Organization classification: mature B-cell neoplasms and Hodgkin lymphoma.

[b] Myeloid neoplasms included the following categories based on the 2016 World Health organization: myeloproliferative neoplasms, myelodysplastic/myeloproliferative neoplasms, myelodysplastic syndromes, acute myeloid leukemia, and related neoplasms, and B-lymphoblastic leukemia/lymphoma.

[c] Seronegative HCV infection: negative anti-HCV test, positive HCV RNA test.

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1053. The Ecological Relationship Between County-Level HCV Case Rates and Office-Based Buprenorphine in Ohio.

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Background. The United States is experiencing an epidemic of hepatitis C virus (HCV) infections due to injection drug use, especially in rural areas. Counties may be expanding access to buprenorphine, an evidence-based treatment that has been shown to reduce injection drug use, to control the HCV epidemic. We assessed the county-level relationship between HCV rates in 2013-2015 and office-based buprenorphine prescribing in 2018 in Ohio. We also assessed if this relationship varied between rural and urban counties.

Methods. We fit crude and adjusted negative binomial models to assess the relationship between HCV incidence rates in 2013-2015 and office-based buprenorphine prescribing capacity and frequency in Ohio in 2018. We examined effect measure modification of this relationship by rural-urban status using an interaction term.

Results. We found that a 1% higher acute HCV rate was associated with an 18% (95% Confidence Interval [CI]: -3%, 44%) higher office-based buprenorphine prescribing capacity and an 22% (95% CI: -4%, 55%) higher office-based buprenorphine prescribing frequency. We found that a 1% higher total HCV rate was associated with a 239% (95% CI: 179%, 317%) higher office-based buprenorphine prescribing capacity and a 273% (95% CI: 183%, 405%) higher office-based buprenorphine prescribing frequency. We found no evidence of effect measure modification by rural-urban status.

Conclusion. Counties across Ohio may have expanded access to office-based buprenorphine in response to high rates of total HCV. Expansion of office-based buprenorphine may be less associated with acute HCV rates due to the low frequency with which these cases are seen in outpatient settings.

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1054. A Randomized Controlled Trial of Hepatitis B virus (HBV) Revaccination among Men Who Have Sex with Men and Were Born in the Era of Universal Neonatal HBV Immunization

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Background. People who have lost anti-HBs antibody decades after neonatal vaccination but are at high risk of acquiring HBV are recommended to undergo HBV revaccination. The optimal revaccination strategy remains unknown, however. We aimed to compare the efficacy of revaccination with standard- (20-μg) vs double-dose (40-μg) of HBV vaccine among men who have sex with men (MSM).

Methods. MSM aged ≥ 20 years who had undergone HBV vaccination at birth and tested negative for HBsAg and anti-HBc with anti-HBs titer < 10 mIU/ml were randomized to receive standard- or double-dose HBV vaccine (1:1 ratio with a block size of 4) at weeks 0, 4, and 24. Plasma HIV RNA < 50 copies/ml for ≥ 6 months was required for HIV-positive MSM. The primary endpoint was the proportion of participants achieving anti-HBs ≥ 10 mIU/ml at week 28. The secondary endpoints were high-titer response (≥ 100 mIU/ml) at weeks 28 and 48, serological response at week 48, and adverse events (AE).

Results. From Sep 2017 to Jun 2020, 161 HIV-positive and 77 HIV-negative MSM were enrolled. The serological response at week 28 was 86.2% for the standard-dose group and 94.9% for the double-dose group (p=0.070). The proportion of high-titer response was higher for the double-dose group than the standard-dose group at 28 weeks (84.6% vs 70.1%, p=0.041). The respective serological response and high-titer response at week 48 were 81.3% and 58.7% for the standard-dose group vs 94.2% and 78.3% for the double-dose group (p=0.023 and p=0.013, respectively). In generalized estimating equations model, double-dose HBV revaccination (aOR, 1.7; 95% CI, 1.1-2.8) and baseline anti-HBs ≥ 2.5 mIU/ml (aOR, 7.5; 95% CI, 4.3-13.5) were associated with high-titer responses. HIV infection was not associated with serological response (aOR, -1.2; 95%CI, -2.47-1.60) and high-titer response (aOR, -1.1; 95%CI, -1.95-1.49). The double-dose group had a higher rate of local AEs (27.2% vs 38.7%, p=0.118). One (0.8%) severe AE occurred in the double-dose group, which resolved without sequelae.

Table 1. Baseline characteristic of participants

	Standard dose (n=119)	Double dose (n=119)	p-value
Baseline characteristics			
Age, mean (SD)	27.4 (3.1)	27.4 (3.3)	0.881
Anti-HBs titer at baseline, <2.5 mIU/ml, n (%)	76 (36.1)	78 (34.5)	0.786
HIV infection, n (%)	80 (67.2)	81 (68.1)	0.890
Syphilis, n (%)	29 (24.4)	47 (39.5)	0.012
HCV, n (%)	5 (4.2)	10 (8.5)	0.194

Table 2. Serological response after revaccination

	Standard dose (n=119)	Double dose (n=119)	p-value
Response after the first dose (W4)			
Responder (anti-HBs ≥10 mIU/ml), n (%)	76/108 (70.4, 61.0- 78.3)	80/107 (74.8, 65.6-82.2)	0.470
High titer responder (Anti-HBs ≥100 mIU/ml), n (%)	49/108 (45.4, 36.1-55.0)	53/107 (49.5, 40.0-59.1)	0.541
Geometric mean titer (GMT) (mIU/ml) (IQR)	43.7 (4.9-337.5)	67.6 (11.8 – 632.0)	0.213
Response after the second dose (W24)			
Responder (anti-HBs ≥10 mIU/ml), n (%)	65/91 (71.4, 61.1-79.9)	71/83 (85.5, 76.0-91.7)	0.024
High titer responder (Anti-HBs ≥100 mIU/ml), n (%)	42/01 (46.2, 36.0-56.6)	53/83 (63.9, 52 .8-73.6)	0.019
GMT (mIU/ml) (IQR)	51.8 (6.6 – 362.8)	152.3 (41.1 – 1001)	0.015
Response after the third dose (W28)			
Responder (anti-HBs ≥10 mIU/ml), n (%)	75/87 (86.2, 77.0-92.1)	74/78 (94.9, 86.9-98.1)	0.070
High titer responder (Anti-HBs ≥100 mIU/ml), n (%)	61/87 (70.1, 59.5-78.9)	66/78 (84.6, 74.6-91.2)	0.041
GMT (mIU/ml) (IQR)	192.4 (71.5-1001)	476.3 (470.6 – 1001)	0.242
Long-term response (W48)			
Responder (anti-HBs ≥10 mIU/ml), n (%)	61/75 (81.3, 70.6-88.8)	65/69 (94.2, 85.2-97.9)	0.023
High titer responder (Anti-HBs ≥100 mIU/ml), n (%)	44/75 (58.7, 47.0-69.4)	54/69 (78.3, 66.7-86.6)	0.013
GMT (mIU/ml) (IQR)	109.3 (30.4-959.3)	327.3 (167.8-1001)	0.002

Table 3. GEE model of vaccine efficacy and associated factors

	Serological response (anti-HBs≥10 mIU/ml)		High-titer response (anti-HBs≥100 mIU/ml)	
	Odds ratio (95% CI)	P value	Odds ratio (95% CI)	P value
Dose (double)	1.87 (1.04-3.37)	0.037	1.72 (1.07-2.77)	0.025
Age (year)	-1.08 (-1.19-1.01)	0.117	-1.05 (-1.13-1.03)	0.241
HIV infection	-1.24 (-2.47-1.60)	0.535	-1.14 (-1.95-1.49)	0.624
Anti-HBs titer ≥2.5 mIU/ml at screening	17.11 (5.75-50.91)	<0.001	7.54 (4.25-13.46)	<0.001
HCV coinfection	1.32 (-1.81-1.47)	0.533	1.23 (-1.80-2.71)	0.615
Syphilis	-1.11 (-1.81-3.15)	0.668	-1.30 (-2.00-1.18)	0.228

Conclusion. Double-dose HBV revaccination results in sustained serological and high-titer responses among MSM who were born in the era of universal neonatal HBV vaccination. Anti-HBs titer ≥ 2.5 mIU/ml at baseline is associated with high-titer response.

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1055. Assessing the Impact of the Routine Childhood Hepatitis B Immunization and the Need for Hepatitis B Vaccine Birth Dose in Sierra Leone, 2018

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Background. All African countries recommend 3 doses of hepatitis B vaccine (HepB3), most at 6, 10, and 14 weeks of age, but few recommend a HepB birth dose (HepB-BD). To evaluate the role of mother to child transmission (MTCT) of hepatitis B virus (HBV) with the 3 dose HepB schedule, we conducted a serosurvey in Sierra Leone among 4–30 month old children and their mothers, and 5–9 year old children.

Methods. We conducted a multi-stage cluster survey in 3 districts. Enumeration areas (EA) were selected by probability proportional to size, followed by random selection of eligible households to identify 1901 children per age group. We tested all participants for HBV surface antigen (HBsAg) by rapid test and collected children's HepB vaccination history. Serum from all HBsAg+ mothers and 1 HBsAg- mother per EA was tested for total antibodies to HBV core antigen (anti-HBc), HBsAg, HBV e antigen (HBeAg), and HBV DNA. We assessed the association of HBsAg prevalence with HepB vaccination and maternal HBV markers.

Results. Among 1889 children aged 4–30 months, 20 (1.3%; 95% CI:0.8%–2.0%) were HBsAg+; HepB3 coverage was 85%. Among 2025 children aged 5–9 years, 32 (1.6%; 95% CI:1.1%–2.3%) were HBsAg+; HepB3 coverage was 77%. Of HBsAg+ children, 70% (14/20) of younger and 56% (18/32) of older children received HepB3. Among 1776 mothers of younger children, 169 (9.8%; 95% CI:8.1%–11.7%) were HBsAg+. HBsAg prevalence for children with HBsAg+ mothers was 5.9% (10/169) and 0.7% (6/1605) for those with HBsAg- mothers (adjusted OR=10.6 [95% CI:2.8–40.8]). Of 139 HBsAg+ mothers, 13 (9%) were HBeAg+ and 126 (91%) had detectable HBV DNA. Maternal HBsAg (p=0.026), HBeAg (p< 0.001), and HBV DNA levels ≥ 200,000 IU/mL (p< 0.001) were associated with HBsAg positivity in younger children (Table 1).

Table 1: Association of maternal HBV serological and molecular markers with HBsAg positivity in 4–30-month old children — Sierra Leone hepatitis B serosurvey, 2018

Maternal HBV Marker	No. of mothers (N=336)	No. of HBsAg+ 4–30-month olds	OR	95% CI	P value (Wald)
Total anti-HBc					
Negative	62	1	Ref		
Positive	274	9	1.4	0.5 – 4.1	0.494
HBsAg					
Negative	197	2	Ref		
Positive	139	8	2.4	1.1 – 5.3	0.026
HBeAg	(N=335)				
Negative	322	3	Ref		
Positive	13	7	11.1	5.1 – 24.5	<0.001
HBV DNA levels* (IU/mL)					
<200,000	321	3	Ref		
≥200,000	12	7	12.2	5.5 – 27.4	<0.001

HBV – hepatitis B virus, HBsAg – hepatitis B surface antigen, No. – number, HBsAg+ – hepatitis B surface antigen positive, OR – odds ratio, 95% CI – 95% confidence interval, Total anti-HBc – Total antibodies to hepatitis B virus core antigen, HBeAg – hepatitis B virus e antigen, Ref – reference, IU/mL – International Units per milliliter. Serum was collected from 137 HBsAg positive and 200 HBsAg negative mothers as determined by the Alere Determine HBsAg rapid test, and then tested for anti-HBc, HBsAg, HBeAg, and HBV DNA on commercially available assays in the laboratory. HBsAg confirmatory testing identified 139 mothers of those who provided serum to be HBsAg positive. Results presented include mother-child pairs where both have valid test results. *Limit of detection is 250 IU/ml and the limit of quantification is 316 IU/ml.

Conclusion. HBsAg prevalence was much lower among children than among mothers, for whom HepB would not have been available, indicating that routine infant HepB vaccination has substantially lowered HBV burden. Increasing HepB3 coverage could further reduce HBsAg prevalence among children. As HBsAg positivity in young children was strongly associated with having a mother with active HBV infection and > 50% of HBsAg+ children received HepB3, HepB-BD is needed to prevent MTCT of HBV and chronic HBV infections in children.

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1056. At the Intersection of Drug Use, Motherhood, and Hepatitis C: An Evaluation of Our Present State

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Session: P-48. Hepatitis

Background. The epidemic of drug abuse has led to increased incidence of hepatitis C virus (HCV) infection in young adults, including women of childbearing age. Infected pregnant women can transmit HCV vertically to their infants, and exposed infants require close follow-up. Few studies focus on illicit drug use during pregnancy in HCV positive mothers. We sought to describe rates of illicit drug use during pregnancy in a convenience cohort of infants perinatally exposed to HCV in an area with high rates of HCV and illicit drug use.

Methods. Infants born to HCV positive mothers in the Louisville, KY metro area and surrounding hospitals were followed at a pediatric infectious disease clinic after institution of a clinical protocol. Records of exposed infants attending the clinic between 2012 and 2018 were analyzed retrospectively. Cases were identified using V01.79 (ICD9) and Z20.5 (ICD10) billing codes. Maternal information was extracted from the infant electronic medical record or the maternal record if available. Demographic and clinical information was collected using a standardized instrument. Descriptive statistics described the data and logistic regression was used to assess associations.

Results. A total of 505 infants attended the clinic for evaluation of perinatal exposure to HCV. Records with no information regarding maternal drug use during pregnancy were excluded, leaving 440 for analysis. Mean maternal age was 28 years (IQR 25-31), and parity 2 (IQR 1-3). The majority of mothers (89.0%, N=380) had a history of any illicit drug use and 81.1% (N=355) had a history of intravenous drug use (IVDU). Most (63.2%, N=278) reported continued illicit drug use during pregnancy. The most common drugs used during pregnancy were heroin (45.4%), THC (22.9%), and amphetamines (25.4%). Prenatal care was associated with less maternal illicit drug use during pregnancy (aOR, 0.33; p < 0.0001).

Conclusion. HCV positive pregnant women have high rates of prior and continued use of illicit and IVDU during pregnancy. Pregnancy represents a unique opportunity to link HCV infected women to care. Public health programs supporting these women and elimination of state restrictions to treat this population will prevent future exposures. Additional qualitative studies to identify needs for this population are needed.