Increasing Hepatitis C Virus (HCV) Screening and Confirmatory Testing in the Birth Cohort in a Large Integrated Health System

Carla V. Rodriguez PhD, MPH[1], Kevin B. Rubenstein[1] MS, Haihong Hu[1] MS, Benjamin Linas[2,3] MD, MPH, Michael Horberg[1] MD, MAS

[1] Kaiser Permanente, Mid-Atlantic Permanente Research Institute, Rockville, MD; [2] HIV Epidemiology and Outcomes Research Unit, Section of Infectious Diseases, Boston Medical Center; [3]Department of Epidemiology, Boston University School of Public Health, Boston, MA

Objective: Describe trends in screening and confirmatory testing in Kaiser Permanente Mid-Atlantic States (KPMAS) relative to the 2013 release of the U.S. Preventative Services Task Force "birth cohort" (born 1945-1965) screening recommendations.

Methods:

- Cohort study, patients ≥ 18 yrs with ≥8 months of enrollment from 1/1/2003-12/31/2014 and ≥1 clinical visit.
- Annual screening rate estimated as the number antibody (Ab) tested per persons enrolled each year.
- Survival methods used to describe factors associated with time to Ab testing.
- Stratification by Service Area, interactions with time and robust standard errors to address non-proportional hazards.
- Among Ab+, we describe the cumulative probability and predictors of confirmatory RNA or genotype testing.

Conclusion:

- High screening prevalence, yet >16% of Ab+ were not confirmed, particularly MSM and those with elevated ALT.
- Higher screening rate in non-birth cohort underscores continued focus on risk-based screening.
- Increased screening rate over time in birth-cohort suggests shift.
- More time is needed to confirm this trend, which may be confounded by the advent of new DAAs and increased screening outreach.

Results

1. We observed **665,345** members over 11 years. The KPMAS population is **ethnically diverse**, slightly **more female** and has **above average median income** (nationally and regionally*). A higher proportion of the "Birth Cohort" were seen in GI/ID clinic and had elevated ALT compared with non-cohort members.

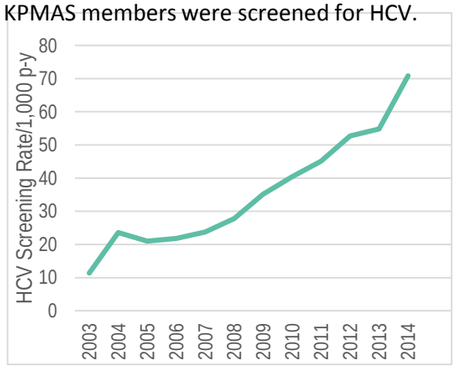
	Not Birth Cohort	Birth Cohort
	404522	260823
Age at Enrollment, mean (sd)	37.5 (17.1)	49.5 (6.53)
Median Household Income[1], mean (sd)	82559.59 (36599.65)	86366.32 (38527.86)
Race[2]		
Black,%	35.3%	36.4%
American Indian/Alaskan Native	0.2%	0.2%
Asian/Pacific Islander	9.8%	9.5%
Hispanic	12.0%	10.9%
Multi-Racial	1.8%	1.8%
White	40.8%	41.2%
Sex, % (n)		
Female	58.1% (235035)	55.0% (143450)
Male	41.9% (169487)	45.0% (117373)
HBV+, % (n)	0.5%(2080)	0.6% (1521)
HIV+, % (n)	0.5% (2051)	0.8% (2032)
Seen by GI/ID (ever), % (n)	11.2% (45400)	16.1% (41920)
MSM, % (n)	1.6% (1101)	1.6% (720)
Illicit Drug Use (ever), % (n)	<0.1%(28)	<0.1%(50)
Elevated ALT[3], % (n)	2.4%(9548)	4.5% (11790)

1 Derived from 2013 US Census; *U.S. Census Bureau, 2013 American Community Survey.

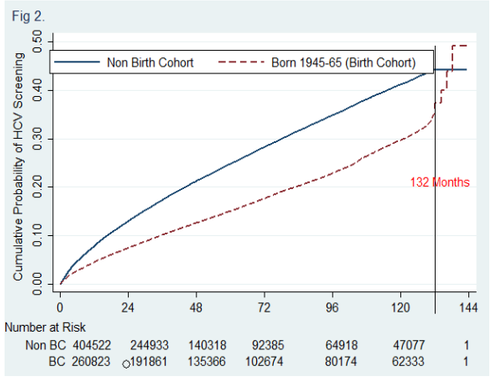
2 Race from self-report; missing values imputed using the Bayesian Improved Surname Geocoding Algorithm (Elliott, M. et.al. (2008); *Health Services Research*, *43*(5 Pt. 1), 1722-1736.)

3 Alkaline Amino Transferase; elevated = 2 consecutive measures >60 IU/L

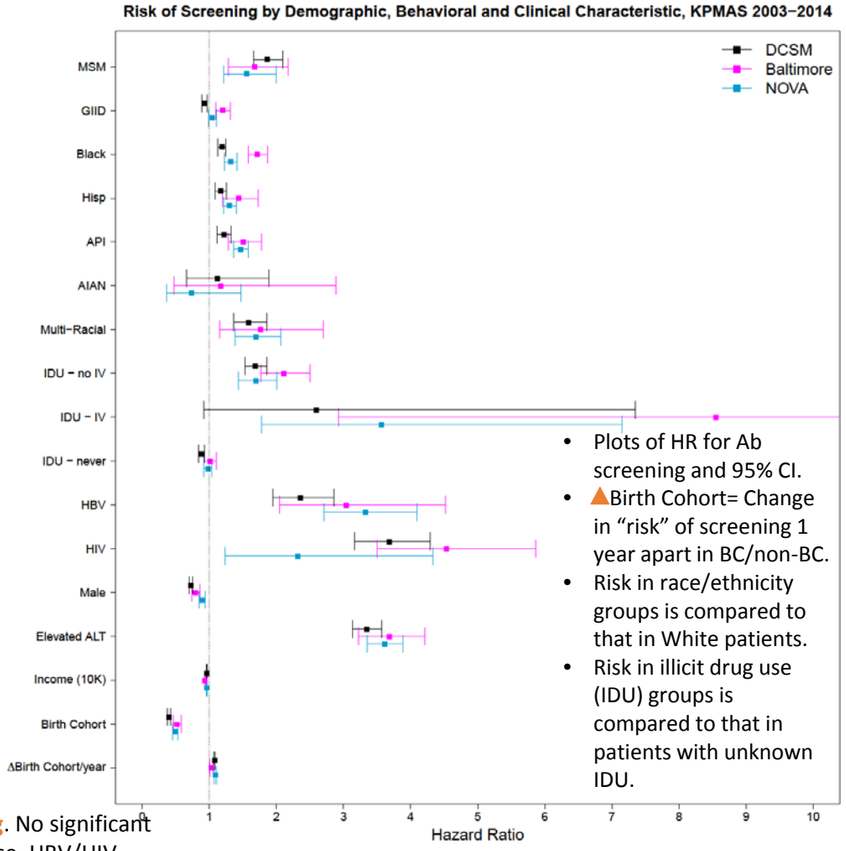
2. Screening rates increased over time: 23.6 (2004) to 70.8 (2014) per 1000 person-years; sharpest increase after 2013. In total, **18.6%** of KPMAS members were screened for HCV.



3. By 120 months, **66%** of the non-birth cohort population was left unscreened; compared to **74%** of the birth cohort.



4. Although patients in the birth cohort had a lower screening rate, their **risk of screening increased faster over time** compared to those in the non-birth cohort. Other important predictors of screening included female sex, MSM, Black, Hispanic and Asian Race, IDU, HBV and HIV co-infection, and elevated ALT.



- Plots of HR for Ab screening and 95% CI.
- ▲Birth Cohort= Change in "risk" of screening 1 year apart in BC/non-BC.
- Risk in race/ethnicity groups is compared to that in White patients.
- Risk in illicit drug use (IDU) groups is compared to that in patients with unknown IDU.

5. Among Ab+, 84% received confirmatory testing. No significant differences by service area, race, history of drug use, HBV/HIV status were observed. **MSM** (aHR=0.66; 95% CI: 0.47, 0.97) and those with **elevated ALT** (aHR=0.85; 95% CI: 0.76, 0.95) were **less likely to receive confirmatory testing**. A total of **2.9%** of the screened population had **confirmed HCV**.

KAISER PERMANENTE® thrive