# National Examination of HCV Linkage to Care in the United States (2013-2016) Based on Large Real-World Dataset

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## INTRODUCTION

- Advancements in the screening and treatment of Hepatitis C virus (HCV) infection, including the widespread availability of direct acting antivirals, have dramatically improved the prognosis of patients diagnosed with HCV, including difficult-to-treat patients.[1,2]
- However, current estimates report that only 10-50% of individuals with HCV in the United States (US) have been diagnosed and treated, suggesting significant barriers to eliminating HCV.[3,4,5,6]
- While reports of system-specific HCV linkage to care have been published, limited data is available on nationally representative populations.[3,5,6,7]
- In order to strive to meet the World Health Organization (WHO) target of HCV elimination by 2030, it is critical to better understand current gaps in the HCV linkage to care in the United States (US).

## OBJECTIVE

- Assess the HCV linkage to care (2013-2016) in the US by year, physician specialty, and by state.

## METHODS

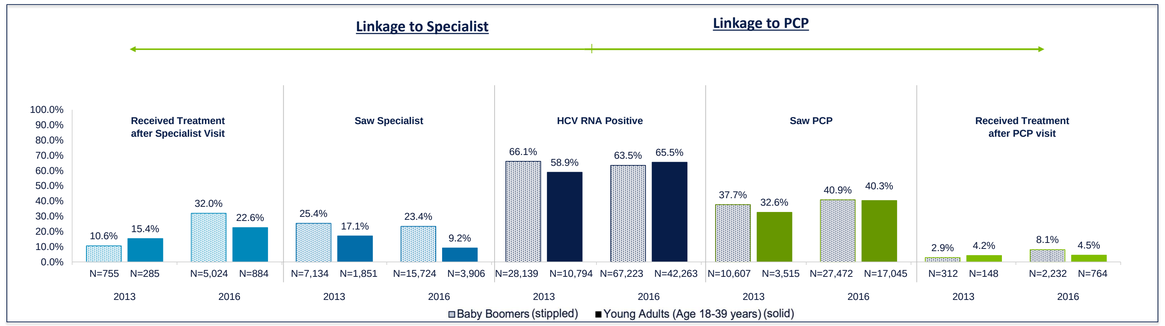
- The study used a comprehensive dataset derived by combining clinical tests results and patient characteristics from 2 large national laboratory companies, as described in previous literature.[8]
  - In order to determine which patients received treatment, a machine learning algorithm was applied to predict HCV RNA decline, which was data available in the laboratory datasets.[8]
- The HCV linkage of care cascade was defined as: HCV antibody (screening), HCV RNA (diagnosis), Seeing HCV specialist (gastroenterology/hepatology/infectious disease) or primary care physician PCP (general practitioner/family medicine/internal medicine), and receiving HCV treatment. The analysis was limited to patients that had undergone HCV antibody (AB) screening. Patients who tested AB positive and were administered HCV RNA test were longitudinally assessed to determine the steps of the care cascade they completed.
- Given the evolving disease epidemiology with the influx of young newly infected people, the analysis was stratified by two age cohorts: baby boomers 48-71 years old and young adults 18-39 years old.
- The care cascade was delineated for 2013 compared to 2016 by age cohort and by patient's state of residence.

## RESULTS

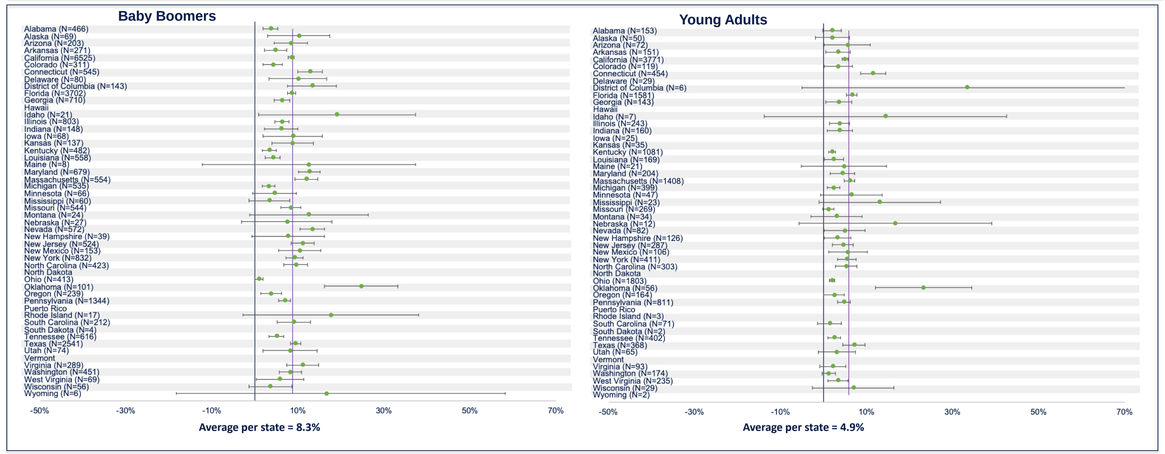
- In 2013, among the 179,144 persons with HCV AB positive test, 45.0% had a follow-up HCV RNA test, of whom 63.8% RNA positive.
- In 2016, among the 287,130 persons with HCV AB positive test, 76.5% had a follow-up HCV RNA test, of whom 63.9% RNA positive.
- Only a minority of those RNA positive went on to see a specialist: 21.2% (N=24,358) in 2013 and 17.4% (N=10,903) in 2016.
- Linkage to care varied substantially for young patients compared to baby boomers **(Figure 1)**:
  - Treatment rates increased from 2013 to 2016, with baby boomers having a much higher increase in the rate of treatment over time than young adults, regardless of whether they saw a specialist or PCP.
  - In 2016, having seen specialist was associated with much higher probability of treatment (32.0% for baby boomers and 22.6% for young adults) compared to having seen a PCP (8.1% and 4.5%, respectively).
  - While referral to a specialist had higher probability of linking care to treatment, patients who saw a specialist declined from 2013 to 2016 (25.4% vs 23.6% for baby boomers and 17.1% vs 9.2% for young adults), while PCP visits increased.

## RESULTS CONTINUED

### Figure 1. Linkage to Care in 2013 vs. 2016 in the United States

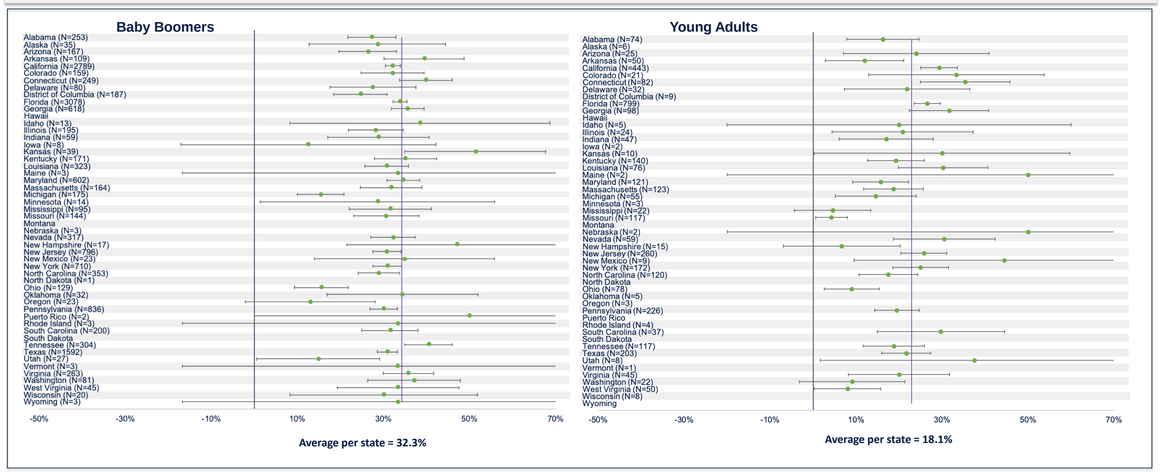



### Figure 2. Received Treatment After PCP Visit by Age Cohort and by State, Year 2016




*Please note that data for some states is not presented due to small or not available sample size.*

### Figure 3. Received Treatment After Specialist Visit by Age Cohort and by State, Year 2016




*Please note that data for some states is not presented due to small or not available sample size.*

- Treatment receipt results by state in 2016 were heterogeneous **(Figure 2 & 3)**.
- Among young adults in 2016, a larger number of states exceeded the average treatment rate post specialist visit compared to post PCP.
- The opposite was observed among baby boomers in 2016, with a larger number of states exceeding the average treatment rate post PCP visit compared to post specialist.

## DISCUSSION

- Despite the more than double increase in PCP's treatment rate in baby boomers from 2013 to 2016, PCP treatment rates were substantially lower than those by specialist.
- Undiagnosed and untreated young adults represent a growing proportion of the chronic HCV patients and addressing gaps in care among young patients is essential to treating HCV infection.
- These findings suggest that health systems need to not only redouble efforts to diagnose and treat baby boomers, but also develop additional screening efforts among younger patients.
- Increases in HCV antibody testing with HCV RNA testing over time may have been influenced by the use of use of reflex testing in 2016.
- Several state programs have lifted restrictions; yet, the proportion of patients treated still remains low.
- Further analysis of other physician specialists and referral patterns needs to be explored, especially among younger adults.

## LIMITATIONS

- There is a chance that a patient may appear in both laboratory datasets; however, this data is limited to those with a positive HCV RNA viral load test.
- Patients identified as HCV RNA positive in 2016 may not have had enough follow up time to initiate HCV treatment.
- Patients of certain states were of small sample size resulting in wide confidence intervals for the estimate of proportion treated.

## CONCLUSION

- This is the largest study assessing real-world HCV linkage to care in the US from 2013 through 2016.
- Linkage to HCV specialist remains a large hurdle in the HCV care cascade, especially in those young patients at highest risk to transmit HCV.
- WHO elimination goals are unattainable at current rates of linkage to HCV care in the US; there are notable areas in the care cascade that should be addressed to increase the number of patients who receive treatment.

## DISCLOSURES

The design, study conduct, and financial support for the study were provided by AbbVie. AbbVie participated in the interpretation of data, review, and approval of this publication.

- Nancy Reau has received research support from Abbott, and has served as a consultant for AbbVie, Gilead, Merck, Abbott.
- Steve Marx, Shivaji Manthena, and John Strezewski are employees of AbbVie and may own AbbVie and/or Abbott stock.
- Viktor Chirikov is an employee of Pharmerit International and has received funding from AbbVie to conduct this research.

Authors thank Jarjieh Fang (Pharmerit International) for providing editorial assistance and Youngmin Kwon (Pharmerit International) for providing analytical support.

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