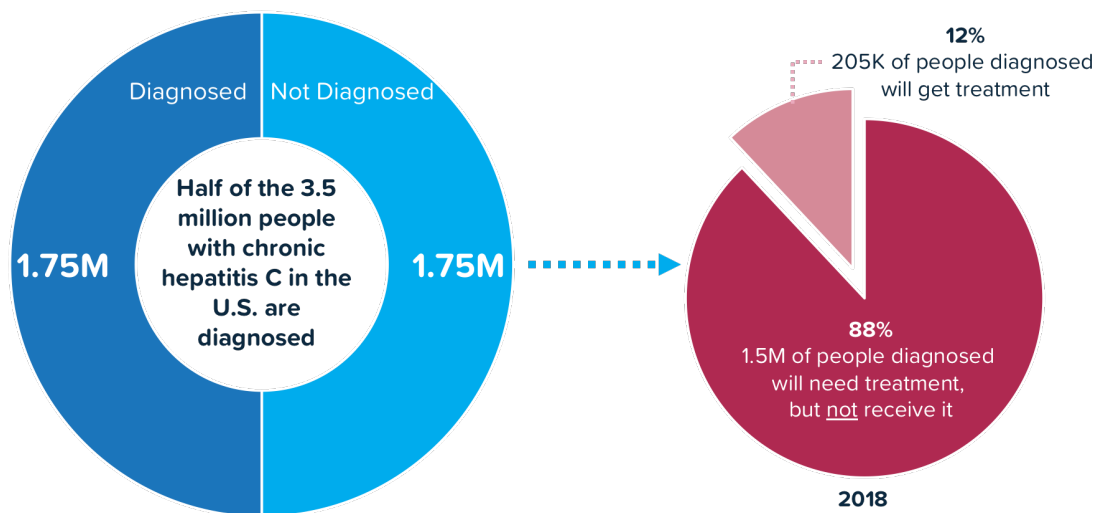


## Over 85% of Patients Diagnosed with Chronic Hepatitis C in the U.S. Are Currently NOT Receiving Treatment

### Summary & Background

- The CDC estimates there are currently about 3.5 million people in the U.S. infected with chronic hepatitis C<sup>1</sup>. These are the patients that require treatment.
- Of that total, multiple studies have shown that only about 50% or 1.75 million people with hepatitis C in the U.S. have been diagnosed and are aware of their status<sup>2,3</sup>.
- In the past four years since the introduction of direct-acting antivirals, each year anywhere from 154,000 to 256,000 patients have been put on treatment and cured of their disease: 2014 (154k), 2015 (254k), 2016 (231k), 2017 (209k).
- Treating an estimated 205k new patients in 2018 represents just 12% of the total already diagnosed chronic hepatitis C population – meaning, conversely, that 88% of all people who have been diagnosed with hepatitis C and require treatment will not receive it this year.
- This year is not an anomaly. We project, based on historical trends and conservative assumptions, that each year for the next six years (until 2024) 80% or more of patients who have been diagnosed and need treatment will not receive it.



<sup>1</sup> U.S. CDC Division of Viral Hepatitis. "Hepatitis C: Overview and Statistics." Available online at <https://www.cdc.gov/hepatitis/hcv/hcvfaq.htm#section1>

<sup>2</sup> Denniston MM, et al. Awareness of infection, knowledge of hepatitis C, and medical follow-up among individuals testing positive for hepatitis C: National Health and Nutrition Examination Survey 2001-2008. *Hepatology*. 2012 Jun; 55(6):1652-61.

<sup>3</sup> Smith BD, et al. Recommendations for the identification of chronic hepatitis C virus infection among persons born 1945-1965. *MMWR Recomm Rep*. 2012; 61: 1-32



## Analysis and Assumptions

The ratio of patients that initiate treatment in a given year versus the total number of known (already diagnosed) people with chronic hepatitis C is estimated by:

$$\text{\% of people \underline{NOT} treated per year} = 1 - \left[ \frac{\text{\# treated per year}}{\text{\# diagnosed chronic hepatitis C}} \right]$$

### Number of people being treated per year

- The projected number of new patients initiating treatment in 2018 is slightly less than in 2017, but significantly higher than the estimated figures from Gilead of 185-200k new starts in 2018.<sup>4</sup> Thus, the model is again more conservative by being generous in the assumption of the number of new patients treated each year.
- In 2019 and beyond the analysis assumes that the number of HCV patients treated will continue to decline year-on-year. This is consistent with the general expectations of Gilead and AbbVie expressed in their most recent quarterly earnings calls.

### Number of people diagnosed with chronic hepatitis C

- The total number of people with chronic hepatitis C in the U.S. is estimated at 3,500,000<sup>1</sup>. Each year going forward, the total number of people living with hepatitis C takes into account the number of people treated the previous year and new cases of chronic hepatitis C, using figures consistent with those projected by the CDC.<sup>5</sup>
- Applying the 50% diagnosis rate, the estimated number of people diagnosed with hepatitis C is 1,750,000 in 2018. Each year going forward, the number of patients treated in the previous year is deduced and the number of new cases of chronic hepatitis C are added.

	<i>Projected (numbers in thousands)</i>									
	2018	2019	2020	2021	2022	2023	2024	2025	2026	
<b>Total estimated chronic hepatitis C</b>	3,500	3,336	3,179	3,027	2,878	2,732	2,589	2,449	2,307	
<b>Diagnosed chronic hepatitis C</b>	1,750	1,586	1,429	1,277	1,128	982	839	699	557	
<b>Total treated</b>	205	200	195	190	185	180	175	175	175	
<b>Estimated new cases</b>	41	43	43	41	39	37	35	33	31	
<b>\% Diagnosed <u>not</u> being treated</b>	<b>88%</b>	<b>87%</b>	<b>86%</b>	<b>85%</b>	<b>84%</b>	<b>82%</b>	<b>79%</b>	<b>75%</b>	<b>69%</b>	

<sup>4</sup> See Gilead Q4 2017 earnings call and accompany slide #36 "HCV Total Market Starts Dynamics." Available at <https://seekingalpha.com/article/4144207-gilead-sciences-inc-2017-q4-results-earnings-call-slides>

<sup>5</sup> U.S. CDC Division of Viral Hepatitis. "Hepatitis C: Overview and Statistics." Available online at <https://www.cdc.gov/hepatitis/hcv/hcvfaq.htm#section1>