

# AGGRESSIVE TREATMENT OF HEPATITIS C IN PEOPLE WHO INJECT DRUGS IN NORWAY: AN INTEGRAL STEP TO ERADICATE THE INFECTION IN THIS POPULATION

Razavi-Shearer D<sup>1</sup>, Dalgard O<sup>2</sup>, Midgard H<sup>2</sup>, Razavi H<sup>1</sup>, Wüsthoff LE<sup>3</sup>, [Kielland KB](#)<sup>4</sup>

<sup>1</sup>Center for Disease Analysis, Lafayette, Colorado, USA; <sup>2</sup>Department of Infectious Diseases, Akershus University Hospital, Norway; <sup>3</sup>Agency of Social and Welfare Services, City of Oslo, Norway; <sup>4</sup>Norwegian National Advisory Unit on Concurrent Substance Abuse and Mental Health Disorders, Innlandet Hospital Trust, Norway

Background	Methods
<ul style="list-style-type: none"><li>In 2015, there were an estimated 8,000 active people who inject drugs (PWID) in Norway</li><li>Norway has extensive harm reduction programs with 7,000 active PWID engaged in opioid substitution therapy (OST), needle syringe programs (NSP), or both (NSP/OST)</li><li>Approximately 1,000 active PWID were not engaged in any harm reduction programs (General Population)</li><li>An estimated 3,800 active PWID were viremically infected with Hepatitis C (HCV) in 2015</li><li>In 2015, 75 active PWID were treated for HCV, the majority of whom were engaged in harm reduction programs</li></ul>	<ul style="list-style-type: none"><li>A modeling approach was used to estimate HCV transmission among active PWID in the General Population, OST, NSP and NSP/OST</li><li>The model was calibrated to historical data, specifically examining the population sizes, risk factors, and risk reduction among active PWID in Norway (Table 1)</li><li>The Base scenario maintained the treatment and harm reduction assumptions of today into the future (Table 1)<ul style="list-style-type: none"><li>75 active PWID treated annually held constant during 2015-2030 with the same distribution among groups of PWID as in 2015 (Table 2)</li></ul></li><li>Aggressive Strategy<ul style="list-style-type: none"><li>Treat 1,000 active PWID starting in 2018 while focusing treatment on those individuals most engaged in harm reduction programs (Table 2)</li></ul></li><li>The total number of viremic infections, new infections, and re-infections among active PWID was tracked from 2015-2030 in all active PWID as well as in harm reduction, or general population groupings (Figure 2)</li></ul>

Table 1. Model inputs and 2015 estimates		Table 2. Aggressive Stratgey Inputs – Norway, 2015-2030						
Total PWID in 2015	8,000	2015	2016	2017	2018	2020	2025	2030
Viremic prevalence	48%	Average SVR	61%	79%	88%	88%	90%	90%
PWID mortality	2%	PWID -Treated						
Duration of injecting carrier	9.52	Gen Pop	2	2	2	2	5	5
Regularly engaged in harm reduction (%)	87%	NSP	17	17	17	272	856	126
OST	2%	OST	4	4	4	36	18	5
NSP	57%	NSP & OST	52	52	52	690	124	23
OST/NSP	28%	Total	75	75	75	1000	1000	154
% Sharing needles	58%	HCV Prevalence Among PWID	48%	45%	43%	31%	15%	1%
Prob. of infection from one contaminated injection	5%							<1%
Years to infection	1.83							
Annual number of new PWIDs	510							

## Results

- Base Scenario**
- Viremic infections among active PWID are expected to decline to 2,800 in 2030 as compared to 3,800 in 2015, largely due to widespread use of harm reduction programs and the recent introduction of treatment to active PWID (Figure 1)
  - This correlates to a decrease in viremic prevalence from 48% in 2015 to 35% in 2030 when the prevalence levels out
  - While total prevalence drops, new infections increase to 410 by 2030, with only 30 of these being re-infections (New Viremic Infections includes reinfections)

- Aggressive Strategy**
- Viremic prevalence among active PWID are expected to decline to <1% representing a >99% reduction in prevalence in comparison to the base
  - New infections (including reinfections) peak in 2020 at 530, dropping below the base in 2022, reaching only 5 in 2030 representing a 99% reduction in incidence in comparison to the base
  - Similarly, reinfections are expected to peak in 2021 before dropping below the base in 2025
  - This scenario requires the treatment of 1,000 active PWID for four years before treatment declines to below the base in 2027

Figure 1. Effect of HCV Treatment Among PWID – Norway, 2015-2030

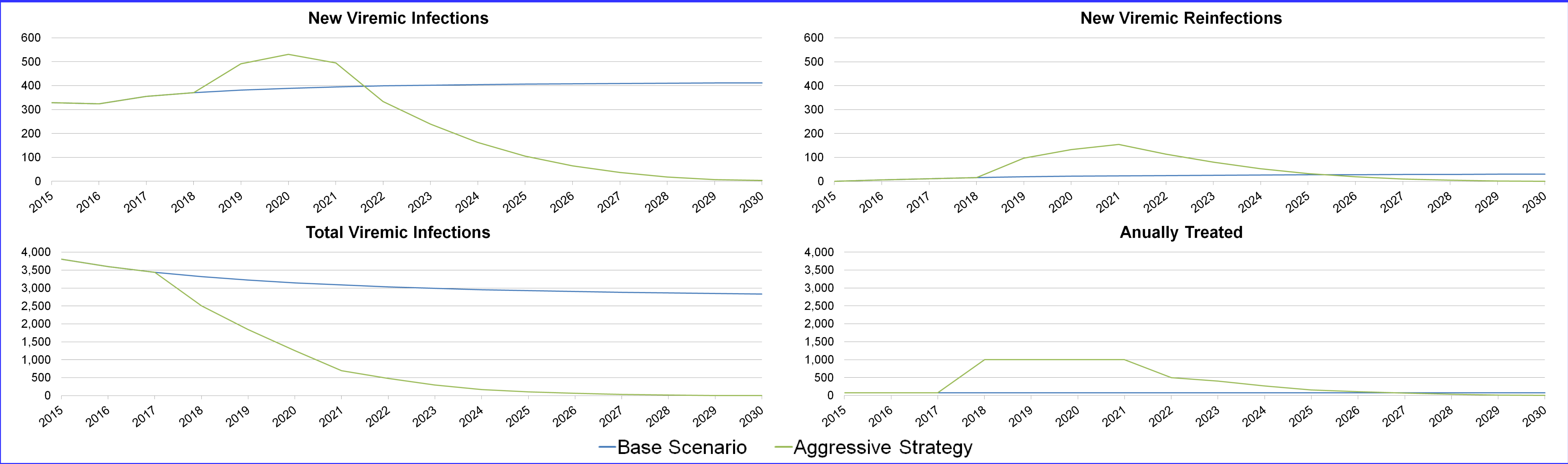
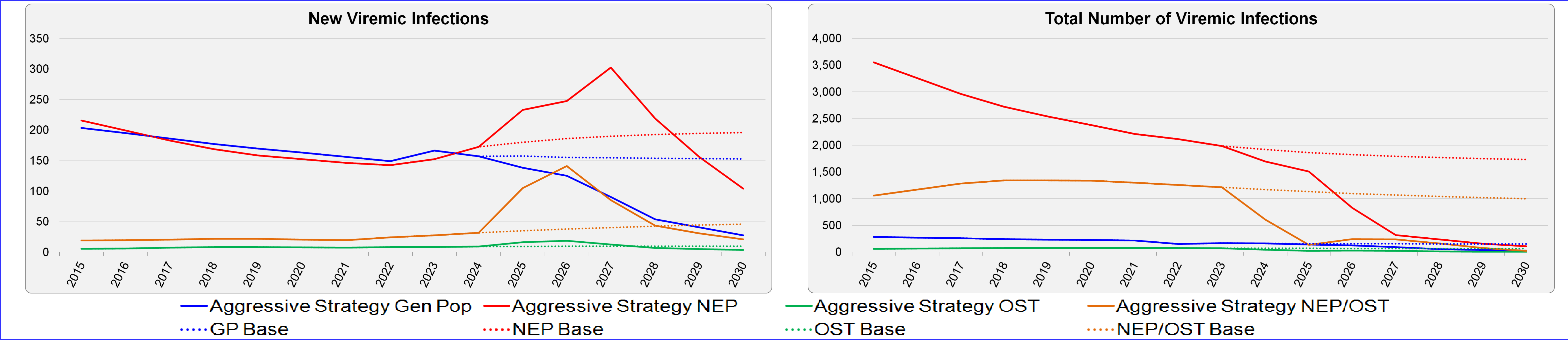


Figure 2. Subgroup Outputs – Norway, 2015-2030



## Conclusions

- The treatment of 1,000 active PWID for four years approaches the elimination of HCV in this population in Norway
- Due to the widespread availability and use of harm reduction programs, treatment can be focused on those most engaged in these programs
- In countries such as Norway, with a low prevalence and incidence that occurs primarily in high risk populations, the treatment of PWID is necessary not only to meet the WHO recommendation of 90% reduction in new infections by 2030, but is required to achieve elimination of HCV in the country as well