ADHERENCE TO HEPATITIS C TREATMENT REGIMEN AMONG PEOPLE WHO INJECT DRUGS IN NORWAY: IMPLICATIONS FOR TREATMENT STRATEGIES

Razavi-Shearer D[1], Kielland KB[2], Midgard H[3], Razavi H[1], Wüsthoff LE[4], Dalgard O[3]

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

Background

- High adherence to direct acting anti-virals (DAAs) can have a positive effect on the sustained viral response (SVR12) of the treatment of hepatitis C virus (HCV)
- Norway has an extensive harm reduction program with an estimated 7,000 active PWID regularly utilizing opioid substitution therapy (OST), needle syringe programs (NSP), or both (NSP/OST)
- In 2015, there were an estimated 3,800 viremically infected active PWID in Norway
- Currently, an estimated 75 active PWID are treated in Norway each year
- The effect of adherence on the SVR12 among PWID can help inform public health policies and allocation of resources

Methods

- A modeling approach was used to estimate the effect of adherence to DAAs among active PWID treated for HCV on the reduction of prevalence and incidence in Norway
- The model was calibrated to historical data, specifically examining the population sizes, risk factors, and risk reduction among active PWID in Norway (Table 1)
- An aggressive treatment strategy was utilized to highlight the effect of adherence, and the following scenarios were considered:

Base

- The base scenario used the inputs (Table 1) and treatment paradigm in 2015 staying static moving forward (Table 2)

90% SVR12

- The second scenario utilizes a SVR12 of 90% with a treatment program that results in a 90% reduction in total viremic infection in 2030 (Table 2)

95% SVR12

- A third scenario examined the effect of increasing SVR12 to 95% and keeping all other inputs consistent with 90% SVR12 scenario

80% SVR12

- A fourth scenario examined the effect of reducing SVR12 to 80% while also keeping all other inputs consistent with the 90% SVR12 scenario

Table 1. Model inputs and 2015 estimates

Total PWID in 2015	8,000
Viremic prevalence	48%
PWID mortality	2%
Duration of injecting carrier	9.52
Regularly engaged in harm reduction (%)	87%
OST	2%
NSP	57%
OST/NSP	28%
% Sharing needles	58%
Prob. of infection from one contaminated injection	5%
Years to infection	1.83
New PWIDs	510

Table 2. Model Inputs – Norway, 2015-2030

	2015	2016	2017	2018	2020	2025
Base Average SVR12	61%	79%	88%	88%	90%	90%
PWID -Treated						
Gen Pop	2	2	2	2	2	5
NSP	17	17	330	330	330	330
OST	4	4	15	15	15	15
NSP & OST	52	52	900	450	155	100
Total	75	75	1,250	800	500	450

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)
- While total prevalence drops, new infections increases to 410 by 2030, with only 30 of these being reinfections (Figure 2 (New Infections includes Reinfections))

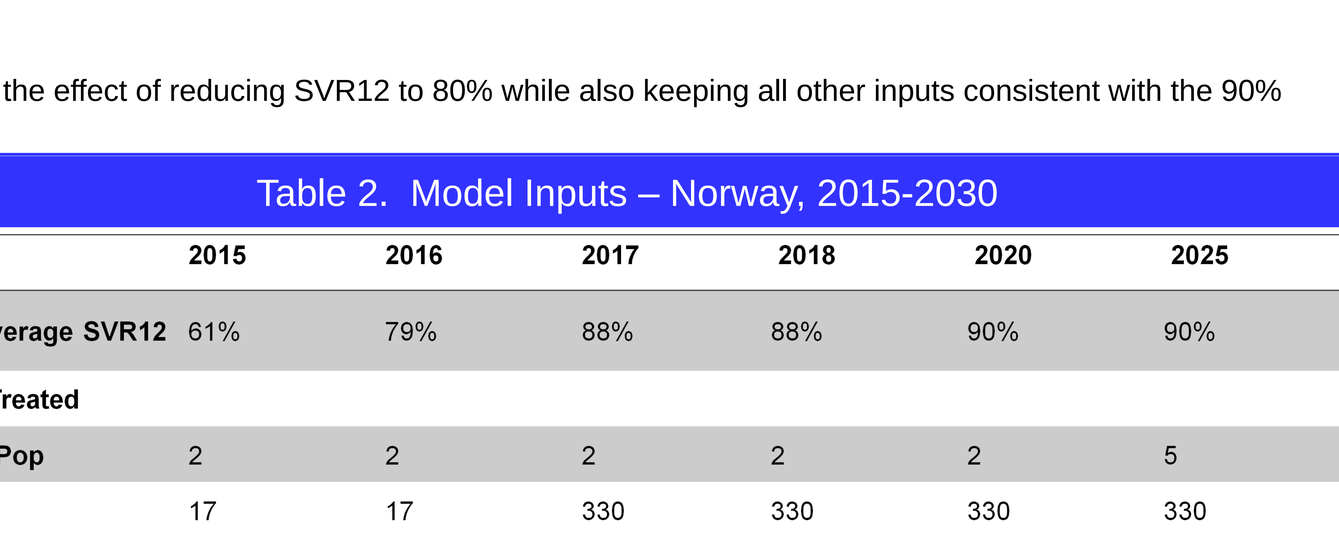
90% SVR12

- Utilizing a scenario that reduces total prevalence among PWID by 90% with an SVR12 of 90% results in lower new infections than the base starting in 2027, but higher reinfections than the base through 2030 due to a larger pool of treated PWID (Figure 2)

95% SVR12

- This scenario resulted in 180 fewer total infections than the 90% SVR scenario in 2030
- New viremic infections dropped below the base in 2026 and it is estimated that there were 150 fewer new infections than in the 90% SVR12 scenario in 2030
- This was the only scenario in which the reinfections among active PWID reached the base scenario by 2030

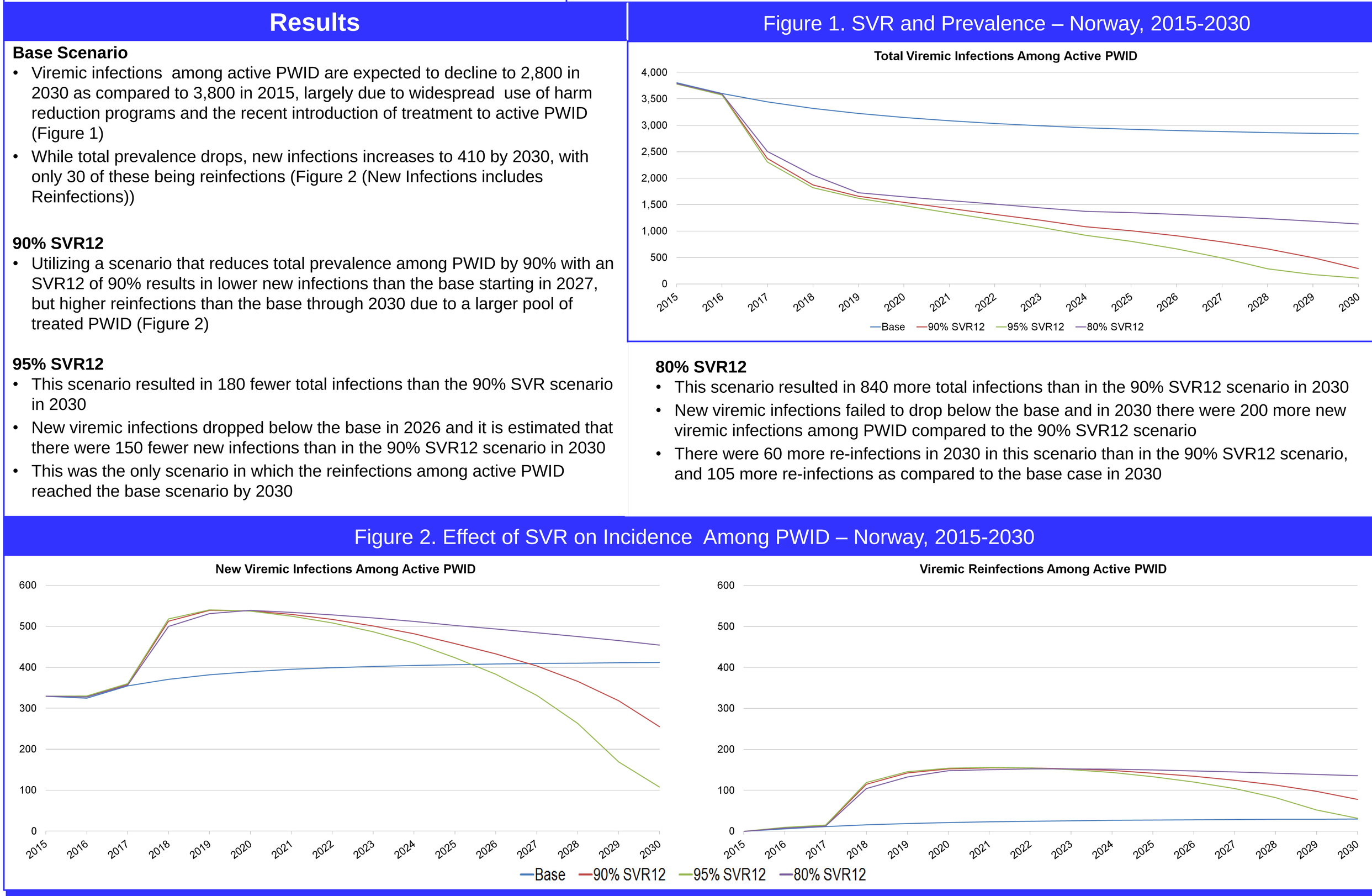
Figure 1. SVR and Prevalence – Norway, 2015-2030



80% SVR12

- This scenario resulted in 840 more total infections than in the 90% SVR12 scenario in 2030
- New viremic infections failed to drop below the base and in 2030 there were 200 more new viremic infections among PWID compared to the 90% SVR12 scenario
- There were 60 more re-infections in 2030 in this scenario than in the 90% SVR12 scenario, and 105 more re-infections as compared to the base case in 2030

Figure 2. Effect of SVR on Incidence Among PWID – Norway, 2015-2030



Conclusions

- The impact of low adherence, resulting in a lower SVR12, can adversely effect the impact of treatment programs with total infections being almost four times as high as in the 90% SVR12 scenario – 1,100 total infections in 2030 with 80% SVR12 vs 290 infections in the same year with 90% SVR12 for the same number of treated patients
- For groups that are potentially at risk for lower adherence, such as in active PWID that frequently inject, the expenditure of resources to maintain a SVR12 ≥90% through education, counseling, and other programs may prove to be beneficial and should be taken into account when creating policies to effectively target, treat, and cure this population

Contact Information: olav.dalgard@medisin.uio.no

Disclosures: This project was supported by Gilead Sciences but had no influence on the analysis.