Background and Aims: All-oral direct-acting antiviral (DAA) treatment regimens achieve SVR rates in >90% of patients with hepatitis C virus (HCV) infection. However, virologic failure was observed in 1–7% of patients in the DAA approval studies and these numbers are expected to rise in the “real world”. Given the emergence and persistence of resistance associated variants (RAVs) retreatment in these patients remains a challenge.

Methods: Patients with failure to DAA combination therapies were drawn from a large European HCV DAA-resistance database comprising more than 3300 patients. Only patients with guideline recommended interferon-free DAA regimens were included. Postfailure serum samples were analyzed for the presence of RAVs by direct sequencing of the NS3, NS5A and NS4B genes. Baseline characteristics as well as initial DAA-therapy and choice and outcome of re-treatment were recorded.

Results: In total, 192 patients with failure to 8-24 weeks of DAA combination treatment were identified (GT1, n = 151; GT2, n = 2; GT3, n = 26; GT4, n = 11). Patients with GT1 had been treated with sofosbuvir (SOF)/simeprevir (SMV) ± ribavirin (RBV; n = 44), SOF/daclatasvir (DCV) ± RBV (n = 28), SOF/ledipasvir(LDV) ± RBV (n = 60), or paritaprevir/ombitasvir/dasabuvir (3D) ± RBV (n = 19). Patients with GT3 had been treated with SOF/DCV ± RBV (n = 16), SOF/LDV ± RBV (n = 9) or SOF/RBV (n = 1). Among patients with GT1, 59% had cirrhosis, and 69% had failed prior PEG/RBV ± protease inhibitor treatment. RAVs were detected in 1-3 targets in 83% of patients. Complete absence of negative predictors (cirrhosis, prior