Background
Studies comparing efficacy of PI- and NNRTI-based initial ART regimens have shown inconsistent results, possibly due to different lengths of follow-up and the PI and NNRTI drugs used.

Objective
To assess factors at ART initiation associated with virological response (viral load (VL) <400 copies/ml) by 12 months among children in 16 European countries and Thailand in EPIICC.

Methods
Inclusion criteria: age<18 years at start of combination ART; VL at start of ART ≥400 copies/ml; ≥1 VL measurement within 15 months of ART initiation.

Factors associated with response were explored using a proportional hazards model, with baseline hazard modelled using a spline function.

Missing values for VL (22%) and CD4% (18%) at ART initiation were multiple imputed (n=20).

Results
• Of 291 children included in the analysis 90% were perinatally infected, 53% female.
• Median (IQR) age at ART initiation was 6.1 (1.6–10.6) years, with 33% <5 years, 15% >10 years at ART start.
• 55% were WHO immunosuppression stage “severe” at ART initiation, 12% had an AIDS diagnosis before ART start.
• Type of initial regimen varied by age, calendar year and region (Figure 1). 93% of those starting a bPI regimen took LPV; 94% of those taking NRTI+2NRTI were on NVP. The most common NRTI backbone were AZT+3TC (39%), 3TC+ABC (26%) and 3TC+d4T (18%).

Virological response: overall, an estimated 89% (95% CI: 88%, 90%) achieved virological response by 12 months.

In the multivariable analysis, the effect of initial ART regimen on time to suppression differed according to age at initiation. In those <5 years old, time to response was fastest in those starting a bPI-based regimen (aHR 1.20 (95% CI: 1.03, 1.39), p=0.02). Time to response was significantly faster in those ≥3 years of age, but did not vary significantly by regimen (p=0.11) (Table 2, Figure 2).

Higher CD4%, lower VL, and use of abacavir were all associated with faster time to virological response.

Children in Russia and Ukraine had slower time to response than those in other regions (Figure 3).

There was no significant effect of gender, AIDS diagnosis before ART start, calendar year of ART start, HCV, HBV or TB co-infection on ART start or mode of infection.

Complete case analysis (n=2061) gave very similar results.

Conclusions
• The majority of children and young people in our cohort achieved virological response by 12 months.
• Response was faster in older children, with no difference between regimens; younger children responded fastest on a bPI-based regimen.
• Faster response in those with higher CD4% adds weight to recent recommendations for early ART initiation in all children irrespective of age or CD4 count.
• The faster response time for children with an abacavir-containing initial regimen supports the results of the PENTA 5 trial (PENTA, Lancet 2002).
• The slower response seen in Russia and Ukraine may be partly explained by a selection bias related to targeting children with immunological/clinical treatment failure for VL testing before this was universally available.