How many people need to take PrEP to prevent 1 HIV infection?

A review of 63 HIV incidence studies

Gary Whitlock, Victoria Houghton-Price, Nneka Nkwolo, Gary Whitlock, Anton Pozniak, Andrew Hill

BACKGROUND: In 2016, there were 1.8 million new HIV infections worldwide. Whilst HIV mortality is reducing, incidence is not falling at the same rate, resulting in a ballooning prevalence which strains health systems. Oral TDF/FTC use has shown an 87% reduction in the risk of HIV transmission in MSM (PROUD/PERGAMY trials), with reductions of 50-60% in studies in Sub-Saharan Africa. A 12-month course of generic TDF/FTC costs as little as £50pp/y in Sub-Saharan Africa. High quality generic PrEP is available online for UK import for £40 per month. This analysis aims to estimate how many people would need to take PrEP for each new HIV infection prevented.

METHODS: A systematic search identified cohort studies reporting data on HIV incidence in key risk groups: Men who have sex with men (MSM), female sex workers (FSWs), IV drug users (IVDU) and adolescents. Estimates were from a range of countries in Europe, Asia, America and Africa. HIV incidence data was used to calculate the number of people who need to take PrEP to prevent 1 HIV infection (NNTB). This is calculated based on the incidence of HIV in the baseline risk populations, compared to the incidence of HIV in those taking PrEP, given a set PrEP efficacy.

RESULTS: HIV incidence data was obtained from 63 studies. The pooled annual incidence of HIV infections was 3.3/100PY for MSM, 1.7/100PY for FSW, 1.4/100PY for IVDU and 2.0/100PY for adolescents. There were wide ranges of incidence within risk groups and between countries (Table1). The number of people needed to take PrEP to prevent 1 HIV infection (NNTB) was 35 for MSM assuming 87% efficacy of PrEP. With 2810 new HIV infections in MSM in the UK in 2016, this would translate to over 88,000 MSM taking PrEP each year in the UK to achieve a 90% reduction in new HIV infections. There were larger NNTB estimates for other populations, especially if PrEP efficacy falls to 50%.

CONCLUSIONS: Worldwide, to prevent 1.8 million new HIV infections each year, tens of millions of people at high risk of HIV infection will need to take PrEP. Current use of PrEP in the UK needs to be upscaled significantly to maximise the potential benefits in HIV prevention. Given the 2810 new HIV infections in MSM in the UK in 2016, an estimated 88,000 would need to take PrEP to achieve a 90% reduction in new cases. In Australia, with 20% of the UK population, 20,000 people are already receiving PrEP. The use of low-cost generic TDF/FTC would minimise the NHS budget impact to the NHS.