

## UNDIAGNOSED HIV INFECTIONS AMONG GAY AND BISEXUAL MEN INCREASINGLY CONTRIBUTE TO NEW INFECTIONS IN AUSTRALIA

Gray RT<sup>1</sup>, Wilson DP<sup>2</sup>, Guy RJ<sup>1</sup>, Stoové M<sup>2</sup>, Hellard ME<sup>2</sup>, Prestage GP<sup>1</sup>, Lea T<sup>3</sup>, de Wit J<sup>3</sup>, Holt M<sup>3</sup>

<sup>1</sup> The Kirby Institute, UNSW Australia, Sydney, Australia

<sup>2</sup> The Burnet Institute, Melbourne, Australia

<sup>3</sup> Centre for Social Research in Health, UNSW Australia, Sydney, Australia

**Background:** In the context of increased HIV testing and treatment, we determined the contribution of undiagnosed HIV to new infections among gay and bisexual men (GBM) over a ten-year period in Australia using a new model of the HIV epidemic.

**Methods:** We generated annual estimates for each step of the HIV care and treatment cascade and the number of new HIV infections for GBM in Australia over 2004-2015. Using Bayesian melding we then fitted a quantitative model to the cascade and incidence estimates to infer relative infectivity parameters associated with being undiagnosed, diagnosed and not on antiretroviral treatment (ART), or on ART (virally suppressed or not).

**Results:** Between 2004 and 2015, the percentage of GBM with HIV in Australia who were undiagnosed decreased from 14.5% to 7.5%. During the same period, there was a substantial increase in the number and proportion of HIV-positive GBM on treatment and with suppressed virus, from around 3,900 (30.2% of all HIV-positive GBM) in 2004 to around 14,000 (73.7% of all HIV-positive GBM) in 2015. Despite the increase in viral suppression, the annual number of new infections rose from around 660 to 760 over this period. The increase in new infections was driven by an increase in the overall infectivity of the undiagnosed GBM population with a small proportion of infections originating from GBM with suppressed virus. The proportion of new infections attributable to undiagnosed GBM increased from 33% in 2004 to 59% in 2015.

**Conclusion:** Increased HIV treatment coverage in Australia has substantially reduced the risk of HIV transmission from people living with diagnosed HIV, yet the rate of transmission from undiagnosed GBM has increased substantially (augmented by declining levels of consistent condom use). These findings highlight the importance of HIV testing and intensified prevention for GBM at high risk of HIV in Australia.

**Disclosure of Interest Statement:** The Kirby Institute, and the Centre for Social Research in Health are supported by the Australian Government Department of Health. This work was supported by NHMRC Project Grant APP1044749. RTG's institution has received funding for his research from The World Bank Group, UNAIDS, and NSW Department of Health. No pharmaceutical grants were received in the conduct of this study.