Merging and Analysis of Australian ART Data

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This script explores the number of people taking antiretroviral therapy (ART) in Australia over 2000-2020. It estimates the number taking ART during each year by merging and fitting to multiple data sources.

1. Australian HIV Observational Database (AHOD) which provides estimates for ART use up to 2012. The estimates over 2010-2012 are actually projections rather than estimates from raw data.
2. The Pharmaceutical Benefits Scheme (PBS) 10% longitudinal sample provided by the company Prospection. This data is only available since 2013. It is considered a more reliable as it is a more direct estimate. As the PBS data does not include people who are ineligible for Medicare there is the option to add the estimates for the number of PLHIV ineligible for Medicare from the NAPWHA and KI report (from: <https://napwha.org.au/medicare-ineligibles/>) to the PBS data.
3. The Pharmaceutical Benefits Scheme (PBS) 100% longitudinal sample provided to the Kirby Institute directly from the department of Health. This data is only available from 2014. This data is considered to be the most reliable and direct estimate. Though there is uncertainty given the difficulties in cleaning the data to remove ART drug scripts used for other purposes such as Hep B, HIV PrEP and PEP.

The primary purpose of this analysis is to explore how to cover the change over period from the AHOD estimates to the PBS data. The results are reported in the Australian HIV Cascade manuscript.

## Fitting

Figure 1: (A) Linear regression fits to ART data. (B) Comparison of exponential and logistic curve fits to ART data. (C) Logistic function fit with uncertainty. 