Merging and Analysis of Australian ART Data

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This script explores the number of people taking antiretroviral terapy (ART) in Australia over 2000-2017. It estimates the number taking ART during each year by merging and fitting to two 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 avaliable since
3. It is considered a more reliable as it is a more direct estimate.

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.

For this analysis we add available data on the number of temporary residents taking ART. Temporary residents are Medicare ineligible and hence not counted in the PBS data.

## Fitting

We explored numerous fitting options to the data over 2000-2014 including standard regresion approaches with weighting towards the PBS data. The most plausible and best fit to the data was a four parameter logistic function. This is what we use for our analysis in the Australian HIV cascade manuscript.

## Results

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. 