



## RATES OF TRANSMITTED DRUG RESISTANT MUTATIONS IN NEWLY DIAGNOSED HIV IN NSW 2004-2015

Angie Pinto | 6 November 2017



**Pinto A**<sup>1,2</sup>, Keen P<sup>1</sup>, Carrera A<sup>3</sup>, Salem H<sup>2</sup>, Thapa K<sup>4</sup>, Telfer B<sup>5</sup>, Cooper C<sup>6</sup>, Price K<sup>7</sup>, Selvey C<sup>5</sup>, Holden J<sup>8</sup>, Cunningham P<sup>3</sup>, Lee F<sup>2</sup>, Dwyer D<sup>4</sup>, Cooper D<sup>1</sup>, Grulich A<sup>1</sup>, Kelleher A<sup>1</sup>

<sup>1</sup> The Kirby Institute, <sup>2</sup> Royal Prince Alfred Hospital, <sup>3</sup> NSW state reference laboratory for HIV/AIDS & Molecular Diagnostics, <sup>4</sup> Pathology West, <sup>5</sup> Health Protection NSW, <sup>6</sup> Positive Life NSW, <sup>7</sup> ACON, <sup>8</sup> NSW Ministry of Health

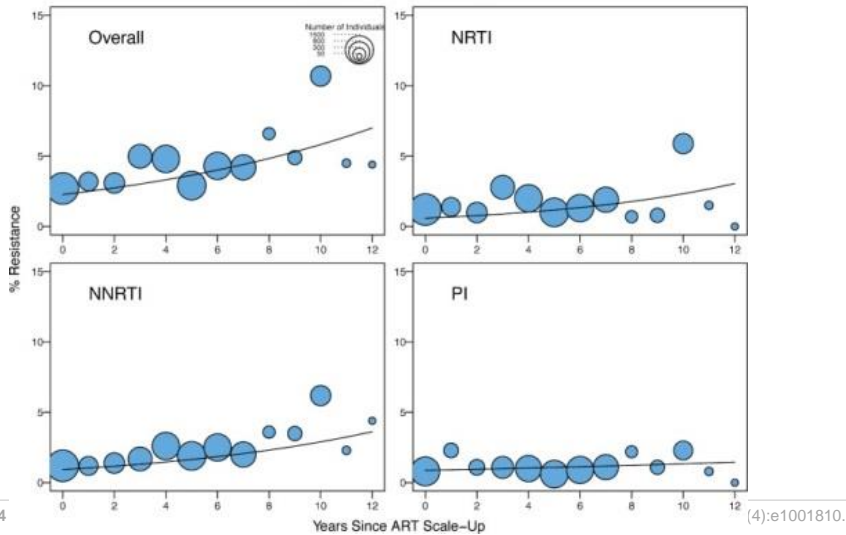
on behalf of the NSW HIV Prevention Partnership Project.

# Disclosures

Background

## Treatment scale-up and emergence of transmitted drug resistance (TDR)

Sub-Saharan Africa



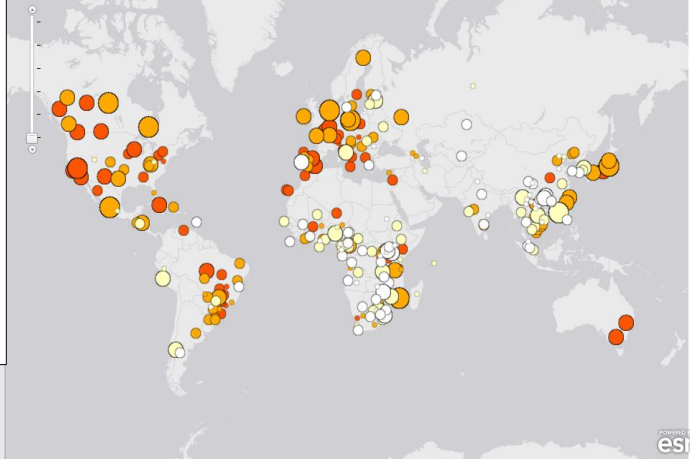
## Previously reported TDR rates in Australia among highest in world

### HIV-1 Drug Resistance in ARV-naive Populations

Compendium of published virus sequences from 50,869 persons, 287 studies according to region, year and subtype

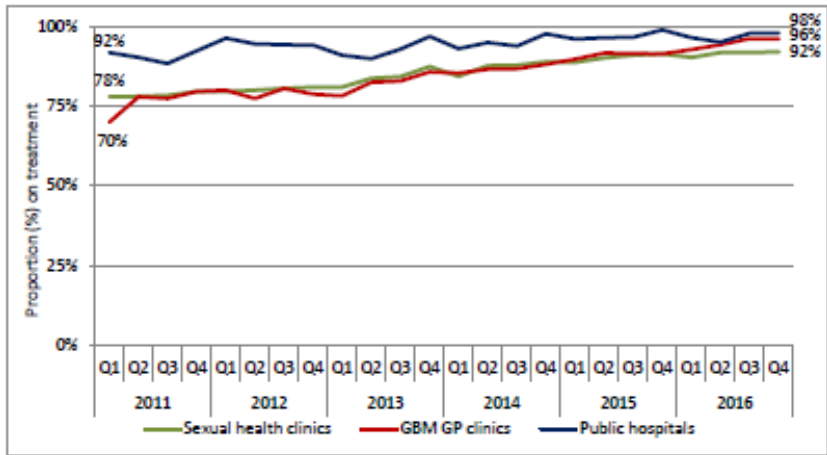
**Rates reported in Australia:**

17.5% Baxter *et al* 2015  
15.5% Pham *et al* 2014



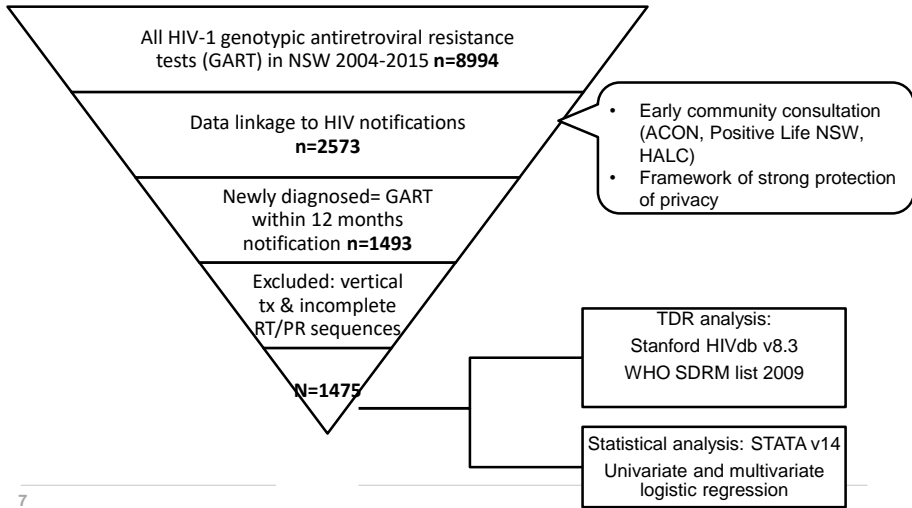
© 1998-2014. All Rights Reserved. Questions? Contact [Stanford HIVDB](#)

## NSW has targets to ↑ number on Rx & ↓ time from diagnosis to Rx



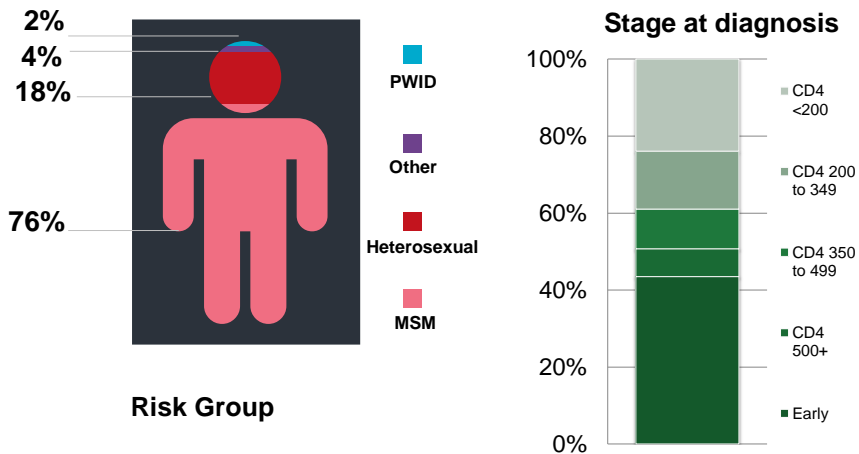
Data source: ACCESS Database, The Kirby Institute and the Burnet Institute

## Objective: to determine rate of transmitted drug resistance in newly diagnosed HIV



7

## Baseline demographics



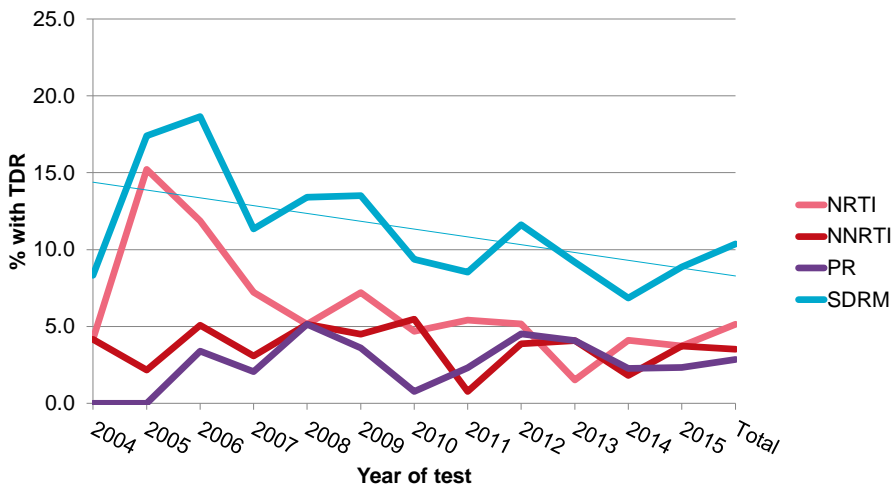
## Baseline demographics


|                      | n    | %    |
|----------------------|------|------|
| Place of Birth       |      |      |
| Australia            | 831  | 56.3 |
| South East Asia      | 158  | 10.7 |
| Sub-Saharan Africa   | 67   | 4.5  |
| Other                | 419  | 28.4 |
| Place of acquisition |      |      |
| Australia            | 748  | 50.7 |
| Overseas             | 305  | 20.7 |
| Unknown              | 422  | 28.6 |
| Region of residence  |      |      |
| Metropolitan NSW     | 1239 | 84.0 |
| Rural and regional   | 151  | 10.2 |
| NSW not specified    | 27   | 1.8  |
| Outside NSW          | 58   | 3.9  |



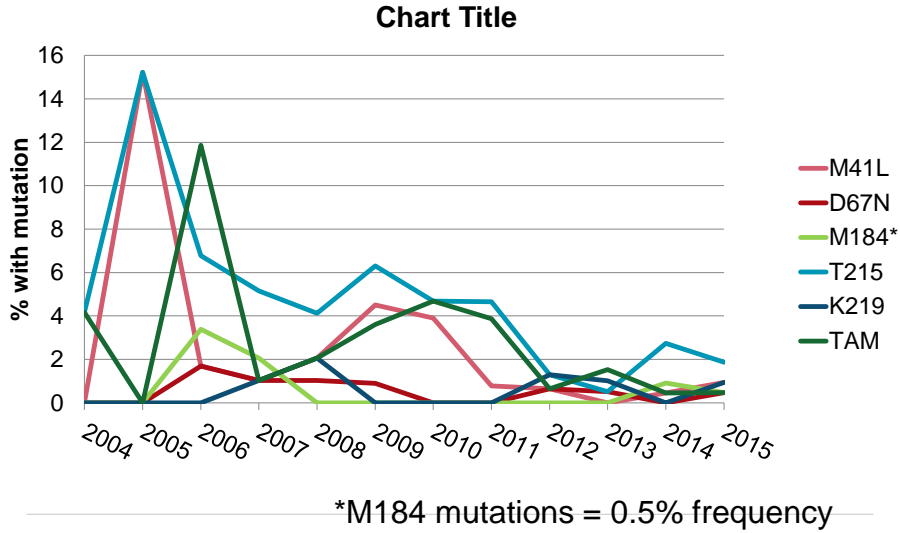
9

## Decreasing rate of transmitted drug resistance over time



Results UNSW Sydney 

## Most common NRTI mutations



Results UNSW Sydney 

## Factors associated with TDR

| Multivariate analysis |      |                     |         |                      |       |           |
|-----------------------|------|---------------------|---------|----------------------|-------|-----------|
|                       | n    | Adjusted odds Ratio | P value | [95% Conf. Interval] |       | Overall P |
| Age at diagnosis      |      |                     |         |                      |       |           |
| 19 to 29 [ref]        | 391  | 1.0                 |         |                      |       | <0.01     |
| 30 to 39              | 461  | 0.48                | <0.01   | 0.31                 | 0.75  |           |
| 40 to 49              | 348  | 0.67                | 0.07    | 0.43                 | 1.04  |           |
| 50 and over           | 275  | 0.36                | <0.01   | 0.21                 | 0.64  |           |
| Region of residence   |      |                     |         |                      |       |           |
| Metro [ref]           | 1239 | 1.0                 |         |                      |       | <0.01     |
| Rural and regional    | 151  | 1.19                | 0.54    | 0.68                 | 2.10  |           |
| NSW not specified     | 27   | 4.40                | <0.01   | 1.84                 | 10.51 |           |
| Outside NSW           | 58   | 2.69                | 0.01    | 1.32                 | 5.48  |           |
| Year of test          |      |                     |         |                      |       |           |
| Year of test          | 1475 | 0.95                | 0.08    | 0.90                 | 1.01  |           |
| Non B                 | 402  | 0.28                | <0.01   | 0.17                 | 0.48  |           |

## TDR lower rates overall, but higher in non-metropolitan and younger age groups

- Truvada(TDF/FTC) currently used for PrEP in >7000
  - No TDF mutations
  - FTC: 7 x M184 mutations observed (3 in last two years)
- Strengths
  - Inclusive of all risk groups and geographical regions
  - Population-based linkage to HIV register → differentiation of transmitted resistance from acquired resistance
- Limitations
  - Low rates of data linkage but representative of NSW epidemic

---

13

## Decreased rates of TDR during ART rollout in NSW

- Differs to increasing rates reported in similar populations
- Need for routine surveillance for emerging mutations and high risk groups

---

14



Kirby Institute



Health

## NSW HIV Prevention Partnership Project

### Investigators and Steering

#### C'ttee

Professor Andrew Grulich  
 Dr Christine Selvey  
 Professor David A Cooper  
 A/Professor Rebecca Guy  
 A/Professor Garrett Prestage  
 A/Professor Martin Holt  
 Ms Jo Holden  
 Professor Anthony Kelleher  
 A/Professor Iryna Zablotska  
 Mr Tim Duck  
 A/Professor Levinia Crooks  
 Mr Craig Cooper  
 Ms Karen Price  
 Professor John de Wit  
 Professor John Kaldor  
 Mr Bill Whittaker  
 Dr Denton Callander  
 Dr Heather-Marie Schmidt  
 Ms Barbara Telfer  
 Mr Phillip Keen  
 Professor David Wilson  
 Mr Alan Brotherton

#### PrEP Working Group

Professor Andrew Grulich  
 Ms Jo Holden  
 A/Professor Martin Holt  
 Mr Scott McGill  
 A/Professor Iryna Zablotska  
 Dr Heather-Marie Schmidt  
 Ms Karen Price  
 Dr Ben Bavinton  
 Mr Dale Halliday  
 Mr David Crawford  
 Mr Phillip Keen

#### HIV Treatment Working Group

Professor Tony Kelleher  
 Ms Jo Holden  
 Dr Limin Mao  
 Professor Andrew Grulich  
 Mr Craig Cooper  
 A/Professor Rebecca Guy  
 Ms Marlene Velecky  
 Mr Neil McKellar-Stewart  
 Ms Katy Roy  
 Ms Barbara Telfer  
 Ms Nishtha Dwivedi  
 Mr Phillip Keen

#### HIV Testing Working Group

A/Professor Rebecca Guy  
 Mr Tim Duck  
 Dr Denton Callander  
 Professor Andrew Grulich  
 Mr James Gray  
 Ms Vickie Knight  
 Mr Philip Cunningham  
 Mr Stephen Watkins  
 MS Vickie Bowden  
 Professor John de Wit  
 Mr Phillip Keen

#### Molecular Epidemiology Working Group

Professor Tony Kelleher  
 Ms Jo Holden  
 Dr Angie Pinto  
 Professor Andrew Grulich  
 Dr Christine Selvey  
 Mr Craig Cooper  
 Mr Tim Duck  
 Ms Karen Price  
 Dr Heather-Marie Schmidt  
 A/Professor Levinia Crooks  
 Mr Neil Fraser  
 Mr Phillip Keen

#### Behaviour Working Group

A/Professor Garrett Prestage  
 Mr Tim Duck  
 A/Professor Martin Holt  
 Professor Andrew Grulich  
 Dr Ben Bavinton  
 Ms Karen Price  
 Mr George Andrews  
 Mr Johann Kolstee  
 Mr Jack Bradley  
 Mr Phillip Keen



**PositiveLifeNSW**  
 the voice of people with HIV since 1988

