

# Recent detectable viral loads among adults living with HIV in the Asia-Pacific between 2015 to 2020

Maylin Palatino<sup>1</sup>, Dhanushi Rupasinghe<sup>2</sup>, Alvina Widhani<sup>3</sup>, Ngoc Chi<sup>4</sup>, I Ketut Agus Somia<sup>5</sup>, Nagalingeswaran Kumarasamy<sup>6</sup>, Suwimon Khusuwan<sup>7</sup>, Vohith Khol<sup>8</sup>, Man Po Lee<sup>9</sup>, Sasisopin Kiertiburanakul<sup>10</sup>, Thach Ngoc Pham<sup>11</sup>, Sanjay Pujari<sup>12</sup>, Anchalee Avihingsanon<sup>13</sup>, Jun Yong Choi<sup>14</sup>, Romanee Chaiwarith<sup>15</sup>, Yu-Jiun Chan<sup>16</sup>, Iskandar Azwa<sup>17</sup>, Rossana Ditangco<sup>18</sup>, Rohidas T Borse<sup>19</sup>, Oon Tek NG<sup>20</sup>, Junko Tanuma<sup>21</sup>, Fujie Zhang<sup>22</sup>, Yasmin Gani<sup>23</sup>, Jeremy Ross<sup>24</sup>, and Awachana Jiamsakul<sup>2</sup>, on behalf of the International Epidemiology Databases to Evaluate AIDS (leDEA) Asia-Pacific

<sup>1</sup>University of Maryland, USA, <sup>2</sup>The Kirby Institute, UNSW Sydney, Australia, <sup>3</sup>Faculty of Medicine Universitas Indonesia - Dr. Cipto Mangunkusumo General Hospital, Jakarta, Indonesia, <sup>4</sup>Bach Mai Hospital, Vietnam,

<sup>5</sup>Faculty of Medicine Udayana University - Prof. Dr. I.G.N.G. Ngoerah Hospital, Indonesia, <sup>6</sup>CART CRS, Voluntary Health Services, India, <sup>7</sup>Chiangrai Prachanukroh Hospital, Thailand

<sup>8</sup>National Center for HIV/AIDS, Dermatology & STDs, Cambodia, <sup>9</sup>Queen Elizabeth Hospital, Hong Kong SAR, <sup>10</sup>Mahidol University, Thailand, <sup>11</sup>National Hospital for Tropical Diseases, Vietnam, <sup>12</sup>Institute of Infectious Diseases, India,

<sup>13</sup>Faculty of Medicine, Chulalongkorn University, Thailand, <sup>14</sup>Yonsei University College of Medicine, South Korea, <sup>15</sup>Chiang Mai University, Thailand, <sup>16</sup>Taipei Veterans General Hospital, Taiwan, <sup>17</sup>University of Malaya, Malaysia,

<sup>18</sup>Research Institute for Tropical Medicine, Philippines, <sup>19</sup>BJ Government Medical College and Sassoon General Hospital, India, <sup>20</sup>Tan Tock Seng Hospital, Singapore, <sup>21</sup>National Center for Global Health and Medicine, Japan,

<sup>22</sup>Capital Medical University, China, <sup>23</sup>Hospital Sungai Buloh, Malaysia, <sup>24</sup>TREAT Asia, amfAR - The Foundation for AIDS Research, Bangkok, Thailand

## BACKGROUND

A proportion of people living with HIV (PLWH) continue to have detectable viral load (VL) while on robust antiretroviral therapy (ART) regimens and risk onward HIV transmission. We aimed to estimate the proportion and factors associated with having a detectable VL between 2015 and 2020 in two Asia-Pacific HIV observational cohorts.

**Figure 1. Asia-Pacific countries and territories included in TAHOD and TAHOD-LITE cohorts**



## METHODS

This analysis included available data from adult PLWH enrolled in two prospective observational cohort studies of leDEA Asia-Pacific: the TREAT Asia HIV Observational Database (TAHOD) and TAHOD Low Intensity Transfer (TAHOD-LITE) cohorts (Figure 1). Eligible participants were on ART for  $\geq 1$  year, in follow-up between 2015 and 2020, and with  $\geq 1$  VL measurement during the follow-up period.

Detectable VL was defined as having  $\geq 1$  VL measurement  $\geq 50$  copies/mL during 2015-2020. The proportion with detectable VL during the follow-up period and the distribution of VL measurements per year were obtained. The proportions with viral blips, i.e., detectable VL measurements followed by a VL  $\leq 50$  copies/mL on retesting within 6 months, were likewise computed. Factors associated with detectable VL were analyzed using repeated measures logistic regression.

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**The TREAT Asia HIV Observational Database:** V Khol<sup>\*</sup>, V Ouk, C Pov, National Center for HIV/AIDS, Dermatology & STDs, Phnom Penh, Cambodia; FJ Zhang<sup>\*</sup>, HX Zhao, N Han, Beijing Ditan Hospital, Capital Medical University, Beijing, China; MP Lee<sup>\*</sup>, PCK Li, TS Kwong, TH Li, Queen Elizabeth Hospital, Hong Kong SAR; N Kumarasamy<sup>\*</sup>, C Ezhilarsai, Chennai Antiviral Research and Treatment Clinical Research Site (CART CRS), VHS-Infectious Diseases Medical Centre, VHS, Chennai, India; S Pujari<sup>\*</sup>, K Joshi, S Gaikwad, A Chitalkar, Institute of Infectious Diseases, Pune, India; RT Borse<sup>\*</sup>, V Mave, I Marbaniang, S Nimkar, BJ Government Medical College and Sassoon General Hospital, Pune, India; IKA Somia<sup>\*</sup>, TP Merati, AAS Sawitri, F Yuliana, Faculty of Medicine Udayana University - Prof. Dr. I.G.N.G. Ngoerah Hospital, Bali, Indonesia; E Yuniastuti<sup>\*</sup>, A Widhani, S Maria, TH Karjadi, Faculty of Medicine Universitas Indonesia - Dr. Cipto Mangunkusumo General Hospital, Jakarta, Indonesia; J Tanuma<sup>\*</sup>, S Oka, T Nishijima, National Center for Global Health and Medicine, Tokyo, Japan; JY Choi<sup>\*</sup>, Na S, JM Kim, Division of Infectious Diseases, Department of Internal Medicine, Yonsei University College of Medicine, Seoul, South Korea; YM Gani<sup>\*</sup>, NB Rudi, Hospital Sungai Buloh, Sungai Buloh, Malaysia; I Azwa<sup>\*</sup>, A Kamaruzaman, SF Syed Omar, S Ponnampalavanar, University Malaya Medical Centre, Kuala Lumpur, Malaysia; R Ditangco<sup>\*</sup>, MK Pasayan, ML Mationg, Research Institute for Tropical Medicine, Muntinlupa City, Philippines; YJ Chan<sup>\*</sup>, HP Chen, PC Wu, E Ke, Taipei Veterans General Hospital, Taipei, Taiwan; OT Ng<sup>\*</sup>, PL Lim, LS Lee, T Yap, Tan Tock Seng Hospital, National Centre for Infectious Diseases, Singapore (note: OT Ng is also supported by the Singapore Ministry of Health's (MOH) National Medical Research Council (NMRC) Clinician Scientist Award (MOH-000276). Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not reflect the views of MOH/NMRC.); A Avihingsanon<sup>\*</sup>, S Gatechompol, P Phanuphak, C Phadunphon, HIV-NAT/Thai Red Cross AIDS Research Centre, Bangkok, Thailand; S Kiertiburanakul<sup>\*</sup>, A Phuphuakrat, L Chumla, N Sanmeema, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand; R Chaiwarith<sup>\*</sup>, T Sriisanthana, J Praparattanapan, K Nuket, Chiang Mai University - Research Institute for Health Sciences, Chiang Mai, Thailand; S Khusuwan<sup>\*</sup>, P Payoong, P Kantipong, P Kambua, Chiangrai Prachanukroh Hospital, Chiang Rai, Thailand; TN Pham<sup>\*</sup>, KV Nguyen, DTH Nguyen, DT Nguyen, National Hospital for Tropical Diseases, Hanoi, Vietnam; CD Do<sup>\*</sup>, AV Ngo, LT Nguyen, Bach Mai Hospital, Hanoi, Vietnam; AH Sohn<sup>\*</sup>, JL Ross<sup>\*</sup>, B Petersen, TREAT Asia, amfAR - The Foundation for AIDS Research, Bangkok, Thailand; MG Law<sup>\*</sup>, A Jiamsakul<sup>\*</sup>, D Rupasinghe, The Kirby Institute, UNSW Sydney, NSW, Australia. (\* TAHOD Steering Committee member)

## RESULTS

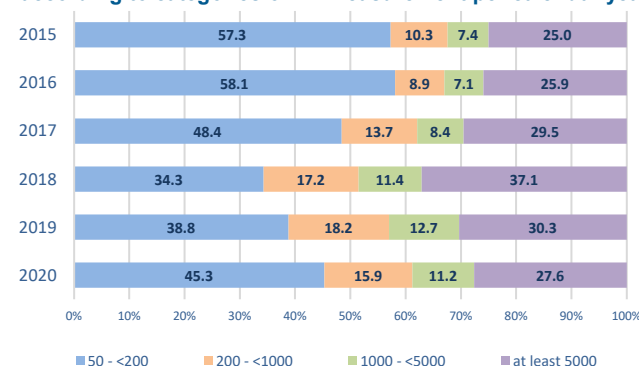
Of the 20,765 PLWH included, the majority were male (64%) and had heterosexual contact as their mode of HIV exposure (72%). The median age was 36 (Table 1).

**Table 1. Characteristics at ART initiation of study population**

Characteristics	Total PLWH	PLWH who never had detectable VL	PLWH who ever had detectable VL ( $\geq 50$ copies/mL)
Total, N (%)	20,765 (100)	14,727 (71)	6,038 (29)
Sex, N (%)			
Males	13,376 (64)	9,290 (63)	4,086 (68)
Females	7,389 (36)	5,437 (37)	1,952 (32)
Age (years) at ART initiation, median (IQR)	36 (30-43)	36 (30-43)	36 (30-42)
HIV Exposure, N (%)			
Heterosexual contact	15,012 (72)	10,454 (71)	4,558 (75)
MSM	2,985 (14)	2,322 (16)	663 (11)
Injecting drug use	755 (4)	612 (4)	143 (2)
Other/Unknown	2,013 (10)	1,339 (9)	674 (11)
CD4 cell count (cells/ $\mu$ L) at ART initiation, median (IQR)	168 (59-287)	174 (54-299)	158 (67-262)
Viral Load ( $\log_{10}$ (copies/mL) at ART initiation, median (IQR)	2 (2-3)	2 (2-3)	2 (2-2)
Hepatitis B surface antigen, N (%)			
Negative	13,682 (66)	10,388 (70)	3,294 (55)
Ever positive	1,451 (7)	1,138 (8)	313 (5)
Not reported	5,632 (27)	3,201 (22)	2,431 (40)
Hepatitis C antibody, N (%)			
Negative	12,802 (62)	10,405 (68)	2,757 (45)
Ever positive	1,418 (7)	1,131 (8)	287(5)
Not reported	6,545 (31)	3,551 (24)	2,994 (50)
World Bank country income, N (%)			
Lower Middle	10,215 (49)	6,035 (41)	4,180 (69)
Upper Middle	7,514 (36)	6,410 (44)	1,104 (18)
High	3,036 (15)	2,282 (16)	754 (13)

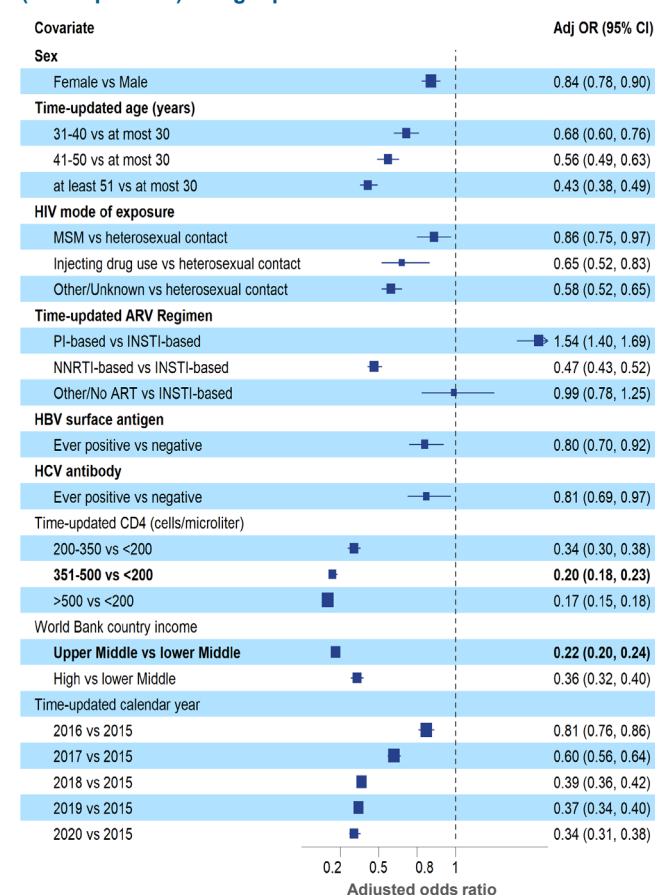
During the study period, 6,038 (29%) had  $\geq 1$  detectable VL. Of these, 2,881 (48%) had VL measurements between 50 and  $< 200$  copies/mL, 684 (11%) between 200 and  $< 1000$ , 495 (8%) between 1000 and  $< 5000$ , and 1,978 (33%)  $\geq 5000$  copies/mL. The highest and lowest proportions with VL measurements  $\geq 5,000$  copies/mL were in years 2018 (37%) and 2015 (25%), respectively (Figure 2). The proportions with viral blips varied over time: 2015 (10%), 2016 (11%), 2017 (13%), 2018 (17%), 2019 (21%), and 2020 (14%).

**Figure 2. Distribution of participants with detectable VL according to categories of VL measurement per calendar year**



The factors associated with decreased odds of detectable VL included female sex compared to males; older age compared to  $\leq 30$  years; male-male sex and injecting drug use compared to heterosexual contact as mode of HIV exposure; non-nucleoside reverse transcriptase inhibitor-based ART (NNRTI) compared to integrase strand transfer inhibitor (INSTI)-based regimens; hepatitis B or hepatitis C co-infection, higher CD4 count compared to CD4  $< 200$  cells/ $\mu$ L; and higher country income compared to lower-middle. Detectable VL was more likely among those on protease inhibitor-based ART regimens compared to INSTI-based ART (Figure 3).

**Figure 3. Factors associated with having detectable viral load ( $\geq 50$  copies/mL) using repeated measures**



## CONCLUSIONS

Almost one third of PLWH in our analysis had detectable VL between 2015 and 2020, of these, a third had VL measurements  $\geq 5,000$  copies/mL, indicating the need for strengthening life-long adherence counselling and follow-up, particularly among those with increased odds of detectable VL.