THE LANCET Infectious Diseases

Supplementary webappendix

This webappendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

Supplement to: Miller WC, Powers KA, Smith MK, Cohen MS. Community viral load as a measure for assessment of HIV treatment as prevention. *Lancet Infect Dis* 2013; published online March 25. http://dx.doi.org/10.1016/S1473-3099(12)70314-6.

Web Extra Material for
Community Viral Load as a Metric for HIV Treatment as Prevention: A Cautionary Note

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Table 1 provides the values for the proportions of HIV-infected persons and the viral loads in each sub-group assumed in the calculations for Figure 3 in the main text.

Table 1. Values used in calculations for Figure 3 of main text

	"Typical" US setting	"Best case"*	Explanation / Sources
% HIV-infected population in each sub-group:			
Infection-unaware with AHI	1.0	1.0	Best case: 19% of HIV-infected are unaware of infection (midpoint of estimates from 2005 and 2008 in [1])
Infection-unaware with EHI	20.0	18.0	Typical US setting: 21% of HIV infected are unaware of infection[2] Both settings: 4.65% of infection-unaware cases have AHI (midpoint of estimated proportions of newly diagnosed cases who have acute HIV in [3] and [4])
Infection-aware, not in care	39.5	30.0	Typical US setting: Fig 2 of [2] Best case: Table 1 of [1]
Infection-aware, in care	39.5	51.0	Typical US setting: Fig 2 of [2] Best case: Table 1 of [1]
Mean viral loads in each sub-group (copies/ml):			
Infection-unaware with AHI	177,828	177,828	Midpoint of mean in [5] and median in [3]
Infection-unaware with EHI	36,992	36,992	Assumed to be same as in infection-aware, not in care
Infection-aware, not in care	36,992	36,992	Table 1 of [1]
Infection-aware, in care	15,314	15,314	Table 1 of [1]

* Based on data availability in San Francisco

The general approach to calculating each value shown in Figure 3, using the values from Table 1 above, was as follows:

Estimated viral load measure in given setting = $\sum_{i=1}^{4} \delta_i p_i v_i$,

where

i=1 for those who are infection-unaware with acute HIV infection (AHI), *i*=2 for those who are infection-unaware with established (post-acute) HIV infection (EHI), *i*=3 for those who are infection-aware but not in care, *i*=4 for those who are infection-aware and in care;

$\delta_i = 0$ if subgroup *i* does not contribute to a given measure and $\delta_i = 1$ if subgroup *i* does contribute to a given measure;

$p_i = 0$ if $\delta_i = 0$ and p_i = the proportion of all those contributing to a measure who are in subgroup *i* if $\delta_i = 1$;

v_i = the mean viral load in subgroup *i*.

Thus, the estimated "true" population viral load in a typical US setting (white bar in Figure 3) was calculated as:

(1 × 0.01 × 177,828) + (1 × 0.2 × 36,992) + (1 × 0.395 × 36,992) + (1 × 0.395 × 15,314) = 29,838 copies/ml

The estimated "true" population viral load in an "ideal" setting (white bar in Figure 3, based on San Francisco data[1]) was calculated as:

(1 × 0.01 × 177,828) + (1 × 0.18 × 36,992) + (1 × 0.30 × 36,992) + (1 × 0.51 × 15,314) = 27,345 copies/ml

The estimated mean viral load for settings with viral load data available only for persons in care (gray bar in Figure 3) was calculated as:

(0 × 0 × 177,828) + (0 × 0 × 36,992) + (0 × 0 × 36,992) + (1 × 1 × 15,314) = 15,314 copies/ml

The estimated mean viral load for persons in and out of care, excluding undiagnosed, as measured in an ideal setting (black bar in Figure 3) was calculated as:

(0 × 0 × 177,828) + (0 × 0 × 36,992) + (1 × 0.37 × 36,992) + (1 × 0.63 × 15,314) = 23,348 copies/ml

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