Community Viral Load

Definition of community
Impact of missing data

Janet Tate, ScD MPH
Community viral load (CVL)

- Population based measure of HIV-1 RNA
- Indicator of
  - HIV transmission risk
  - quality of care
• Population VL: all HIV-Infected
• Community VL: ...diagnosed with HIV
• In-Care: ...and in care
• Monitored: ...and have viral load

Sometimes = CVL
Definition impacts size of community

Population Viral Load
- A. In care and with undetectable VL
- B. In care with detectable VL
- C. In care, no VL
- D. Diagnosed but not in care
- E. Undiagnosed

Community Viral Load
- A. In care and with undetectable VL
- B. In care with detectable VL
- C. In care, no VL
- D. Diagnosed but not in care

In-Care Viral Load
- A. In care and with undetectable VL
- B. In care with detectable VL
- C. In care, no VL

Monitored Viral Load
- A. In care and with undetectable VL
- B. In care with detectable VL
Methods

• 36,000 HIV-infected patients from VACS VC
• At least one documented CD4 cell count, HIV-1 RNA or ART
• 6-month periods from 2000 to 2009
• Alive at the start of a period
• HIV infected by the midpoint
  – Earliest of ICD-9 code, CD4, HIV-1 RNA, ART
Definitions of community

• Not known dead
• Visit in current period or last 2 years
• Visit in current period or last year
• Visit in current period or last 6 months
• Visit in current period
Hierarchy for status

• Died during period
• New to care = first 6 months after HIV date
• HIV-1 RNA
  – >10,000
  – 501-10000
  – 51 to 500
  – ≤50
  – No current, but had value in last 2 years
  – None
<table>
<thead>
<tr>
<th>Year</th>
<th>First Period</th>
<th>Second Period</th>
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<tr>
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</tr>
<tr>
<td>New to Care</td>
<td>New to Care</td>
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</table>
Viral load values

• Value closest to midpoint of current period

• Most recent in last 2 years
  – Last Value Carried Forward (LVCF)

• Remaining missing
  – Set to 3, 4, 5, 6 log_{10}

• Undetectable set to lower limit of detection (CDC uses 50% of LLD)
### Geometric mean

<table>
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<th>VL</th>
<th>$\log_{10} VL$</th>
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<td>50</td>
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<td>2</td>
</tr>
<tr>
<td>1,000</td>
<td>3</td>
</tr>
<tr>
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<td>4</td>
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<tr>
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<td>5</td>
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<tr>
<td>22,230</td>
<td>3.1</td>
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</table>

**Anti Log** 1,380
Study Population

VACS-VC
HIV by 9/30/2009
42,580

Alive
1/1/2000
39,219

Ever had CD4, VL, ART
36,909

Died
3,361 (8%)

Never
3,672 (9%)
Size of the “community”

↑ ~1.5%/year

Number of thousands over time:
- Not known dead
- + previous 2 years
- + previous year
- + previous 6 months
- Current 6 months
Status by six month period
Mean community viral load
Mean community viral load
Conclusions

• CVL improved tenfold from 2000 to 2009
• Absolute estimate depends on
  – Definition of community
  – Method of accounting for missing data
• 20% without current test need to be engaged in ongoing care
Strengths and limitations

- 35,500 patients, 10 years
- Can’t distinguish missing data from not done
- Veterans interact with other “communities”
Thank you for your attention.

Questions?
Survival from HIV date