Lessons From the Front: Optimizing HIV care in the Southeastern US

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Poll Question #1:

- How many people are infected with HIV every year in the United States?

- 5,725
- 11,750
- 49,500
- 69,875
- 99,125

Poll Question #2:

- What is the biggest single deterrent to eliminating HIV transmission in the US?

- Uneven, poor quality sexual education in US schools
- Cost of HIV medications (ART)
- Poverty
- Medication side effects
- Social Marginalization of HIV patients
- Insufficient volume of incoming HIV providers to Ryan White Clinics

Objectives:

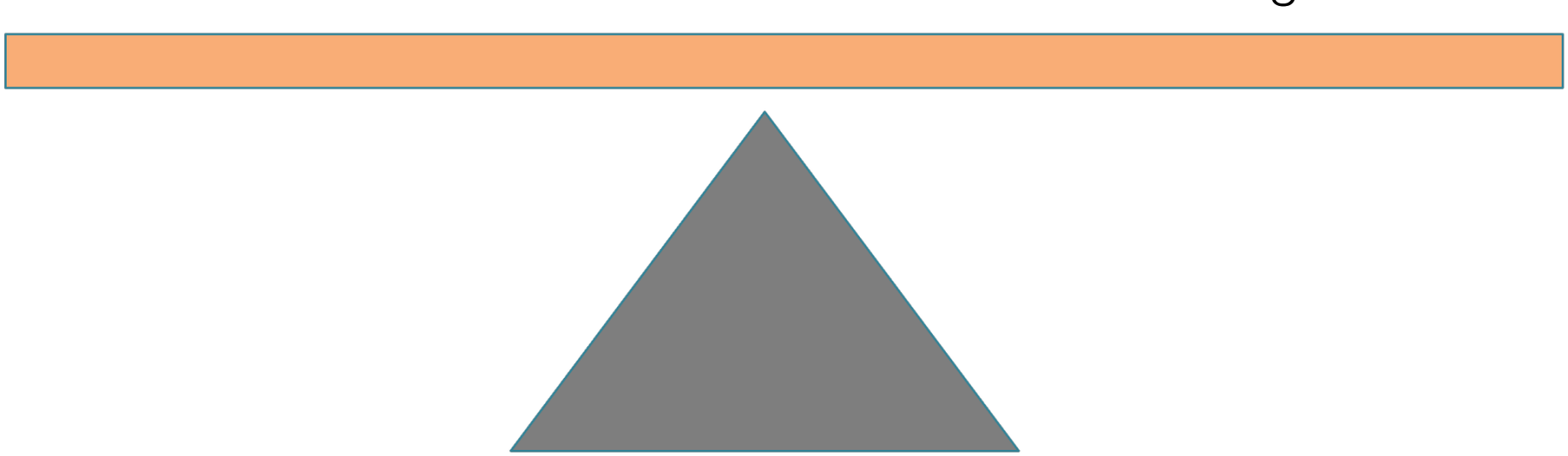
- Understand the unique roles played by structural forces in the Southeastern US as they apply to challenges our patients face
- Review pathophysiology of HIV
- Appreciate the impact of social and life history factors on our patients

Background

TENSION

Patient Needs
- Focus on Strengths
- Emphasize Belonging

Provider Needs
- Understand challenges without blaming the victim



Compassion, Empathy, Understanding

Word Cloud

- Name your profession

Homeostasis

HOMEOSTASIS: Stable internal environment of an organism

Organisms are identified as healthy whenever they have stable vital signs

Allostasis

ALLOSTASIS:
Stability of organism in a changing environment

How does the environment affect the health of the individual?

Allostatic Load

Toxic Environment -> toxic responses as individuals seek to cope with their surroundings

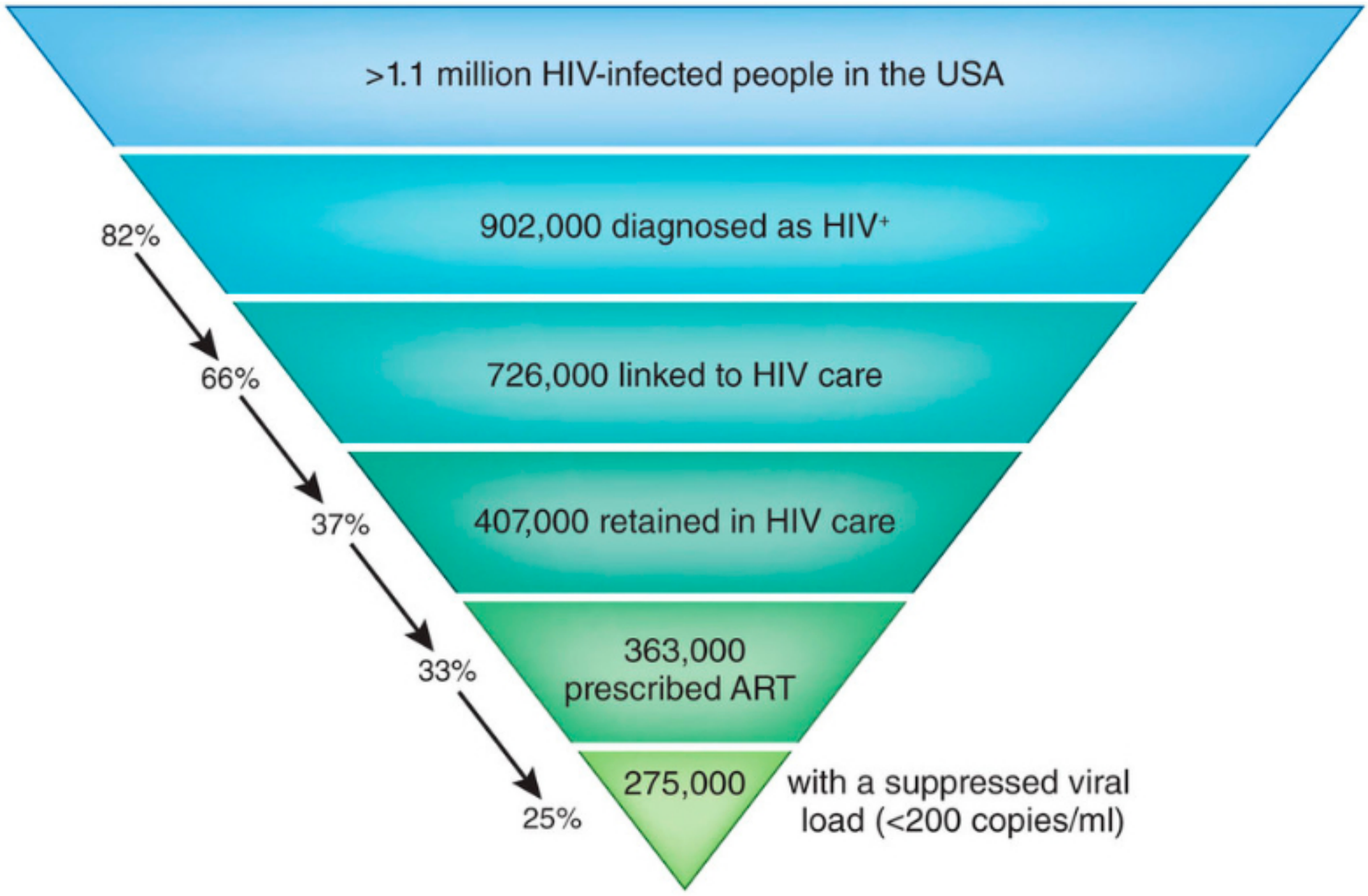
What's unique about this chronic disease?

- We have the pharmacological agents to fully suppress the virus
  - SE burden, pill burden have significantly decreased

- We have the barrier protection necessary to minimize transmission of the virus

- HIV is no longer a bio-medical challenge

Continuum of Care is the Challenge



Structural Violence

- Paul Farmer, MD, PhD
  - institutional barriers that impair the equal pursuit of human health within and across societies.

2003 – Lawrence v. Texas

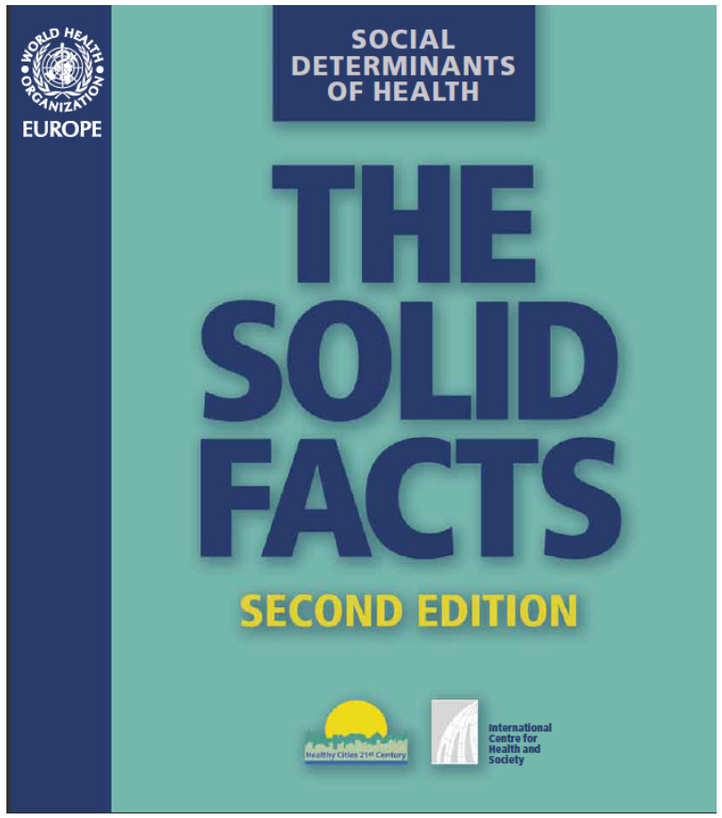
AL: "deviant sexual intercourse"
ID: "the infamous crime against nature"
SC: "the abominable crime of buggery, whether with mankind or beast"

Word Cloud

Name an example of structural violence

Social Determinants of Health

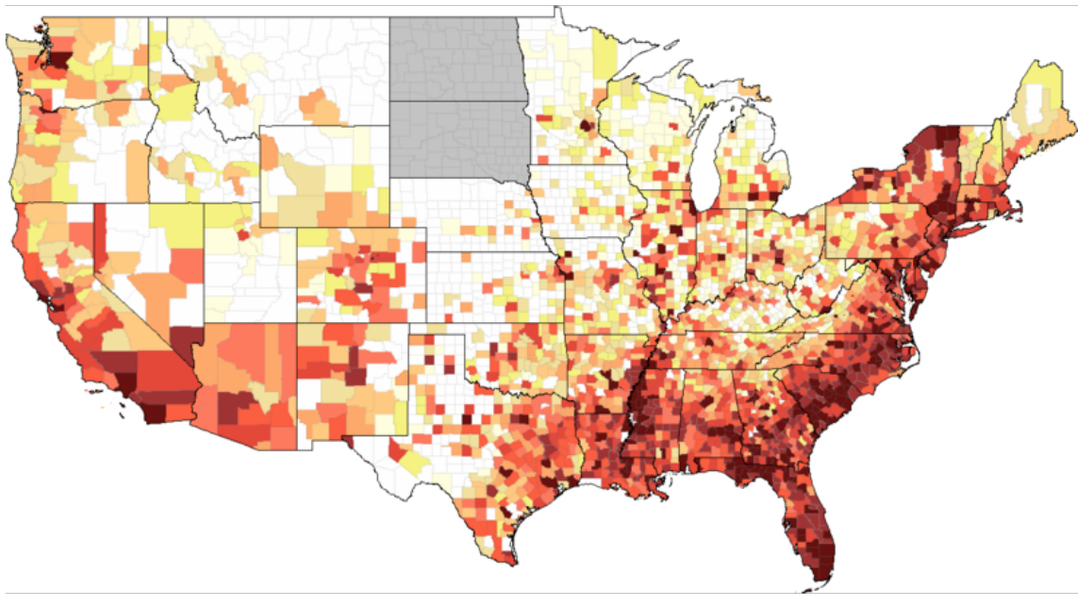
- The Social Gradient
- Stress
- Early Life
- Social Exclusion
- Work
- Unemployment
- Social Support
- Addiction
- Food
- Transportation



Human social organization is the result of human choices, and those choices have direct impact on every member of a society, especially the least powerful members.

Rates of Persons Living with an HIV Diagnosis & Poverty Rates, by County, 2010

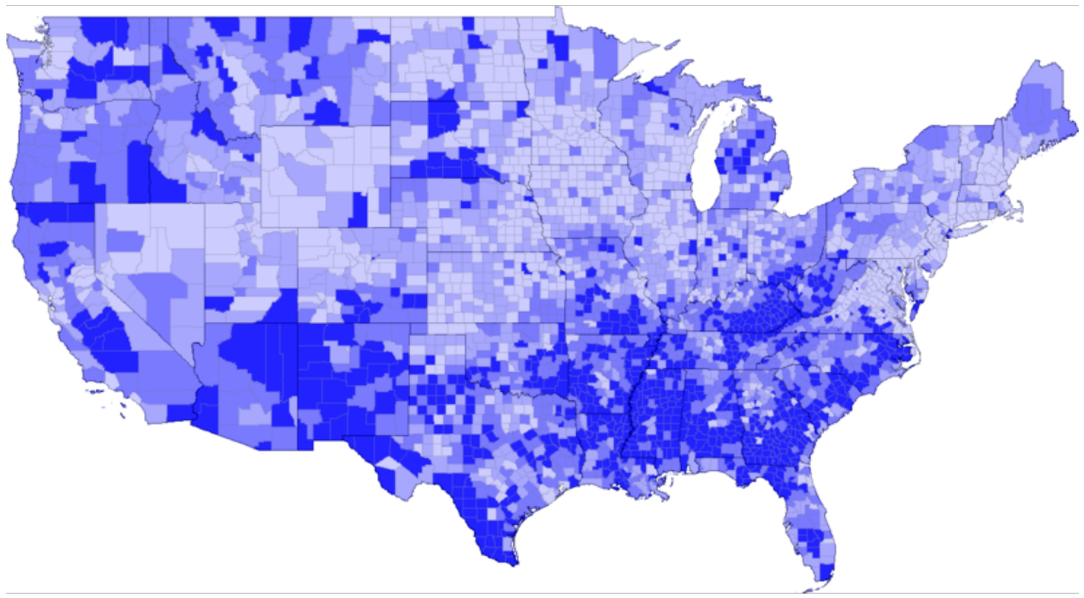
Persons Living with an HIV diagnosis



2010 Rate of adults/adolescents living with an HIV diagnosis per 100,000 population

- 0 to 40
- 41 to 54
- 55 to 67
- 68 to 82
- 83 to 103
- 104 to 134
- 135 to 174
- 175 to 244
- 245 to 383
- 384+
- Data not shown *
- Data not released to AIDSVu **

Poverty Rates



% of Population Living in Poverty, 2010

- 3.1% to 12.3%
- 12.4% to 16.0%
- 16.1% to 20.2%
- 20.3%+
- Data not Available†

* Data are not shown to protect privacy. ** State health department requested not to release data. † Data not available because the data source does not publish these data for this jurisdiction.

Note. Data include persons with a diagnosis of HIV infection, regardless of the stage of disease at diagnosis, and have been statistically adjusted to account for reporting delays and missing risk-factor information, but not for incomplete reporting.

Data Source: Centers for Disease Control and Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Division of HIV/AIDS Prevention.

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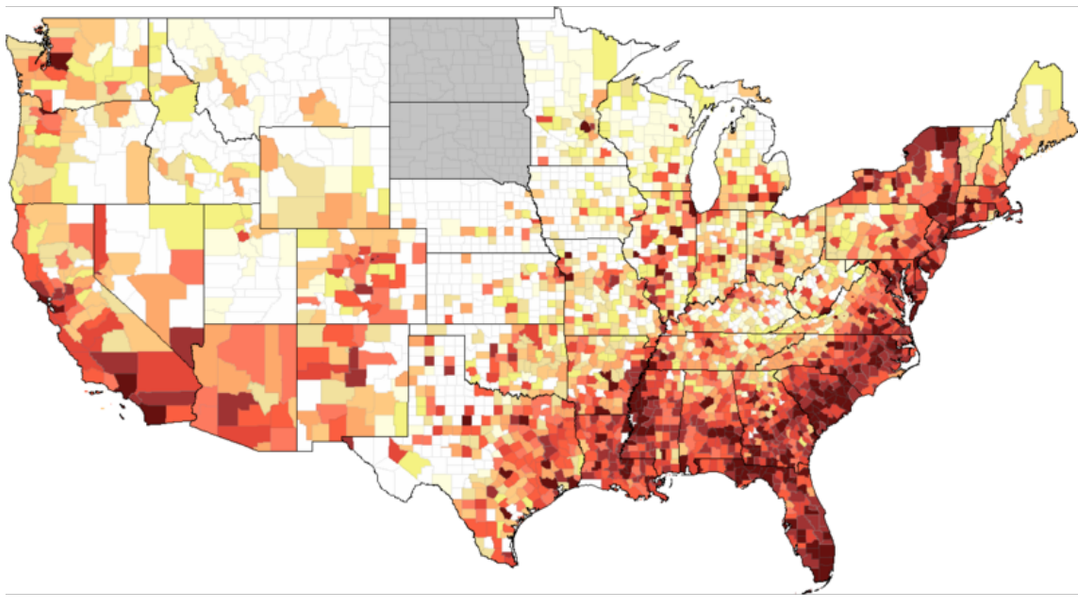
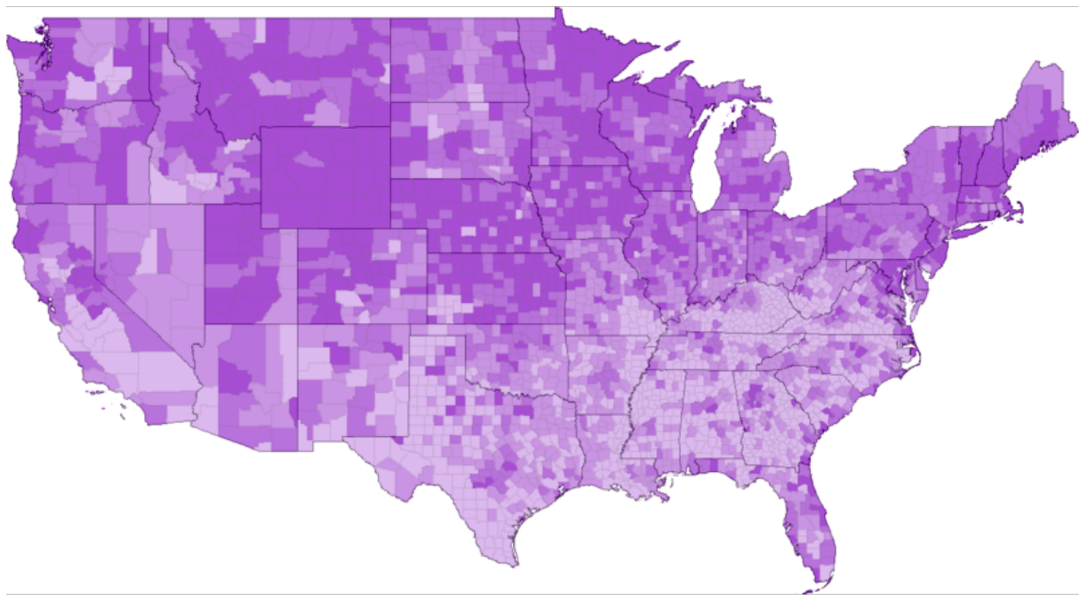
Rates of Persons Living with an HIV Diagnosis & Percent with High School Education, by County, 2010

Persons Living with an HIV diagnosis



Percent with High School Education



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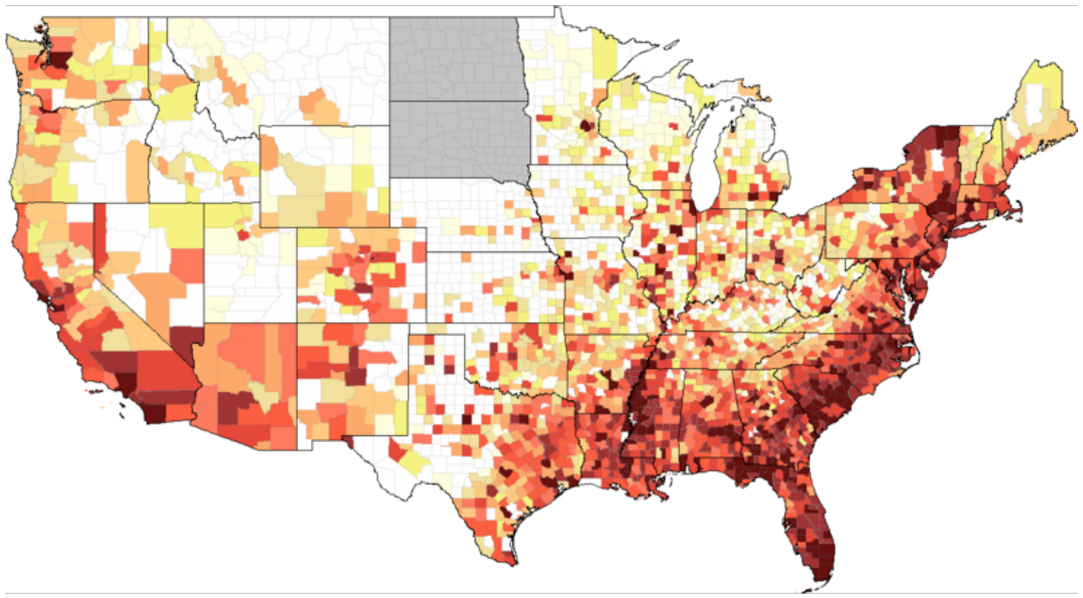
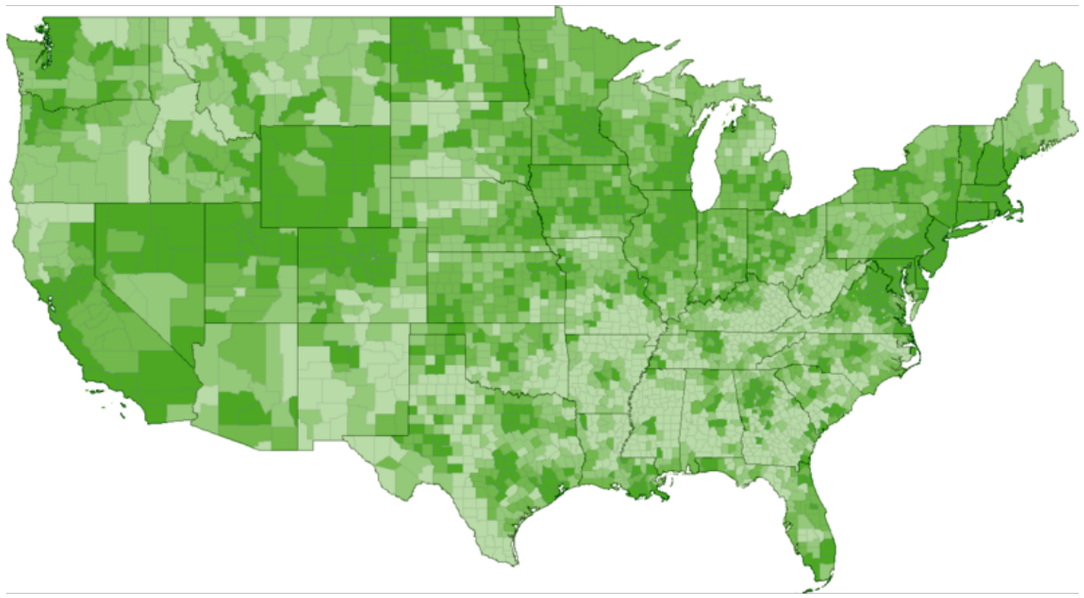
Rates of Persons Living with an HIV Diagnosis & Median Household Income, by County, 2010

Persons Living with an HIV diagnosis



Median Houshold Income



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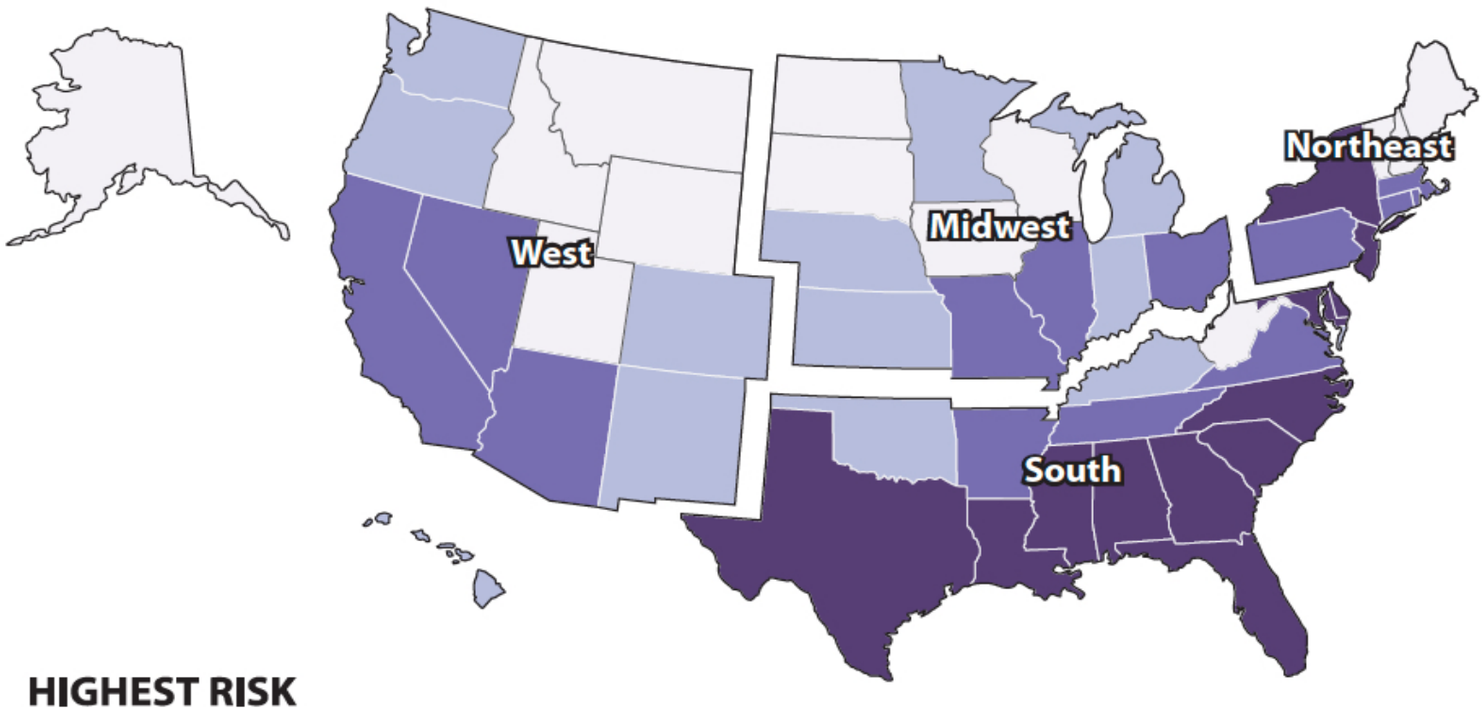
Lifetime Risk Is Higher for People in the Southern United States: People living in the South are more likely to be diagnosed with HIV over the course of their life than people in other parts of the country. States where risk is greatest include Maryland (1 in 49), Georgia (1 in 51), Florida (1 in 54), and Louisiana (1 in 56).

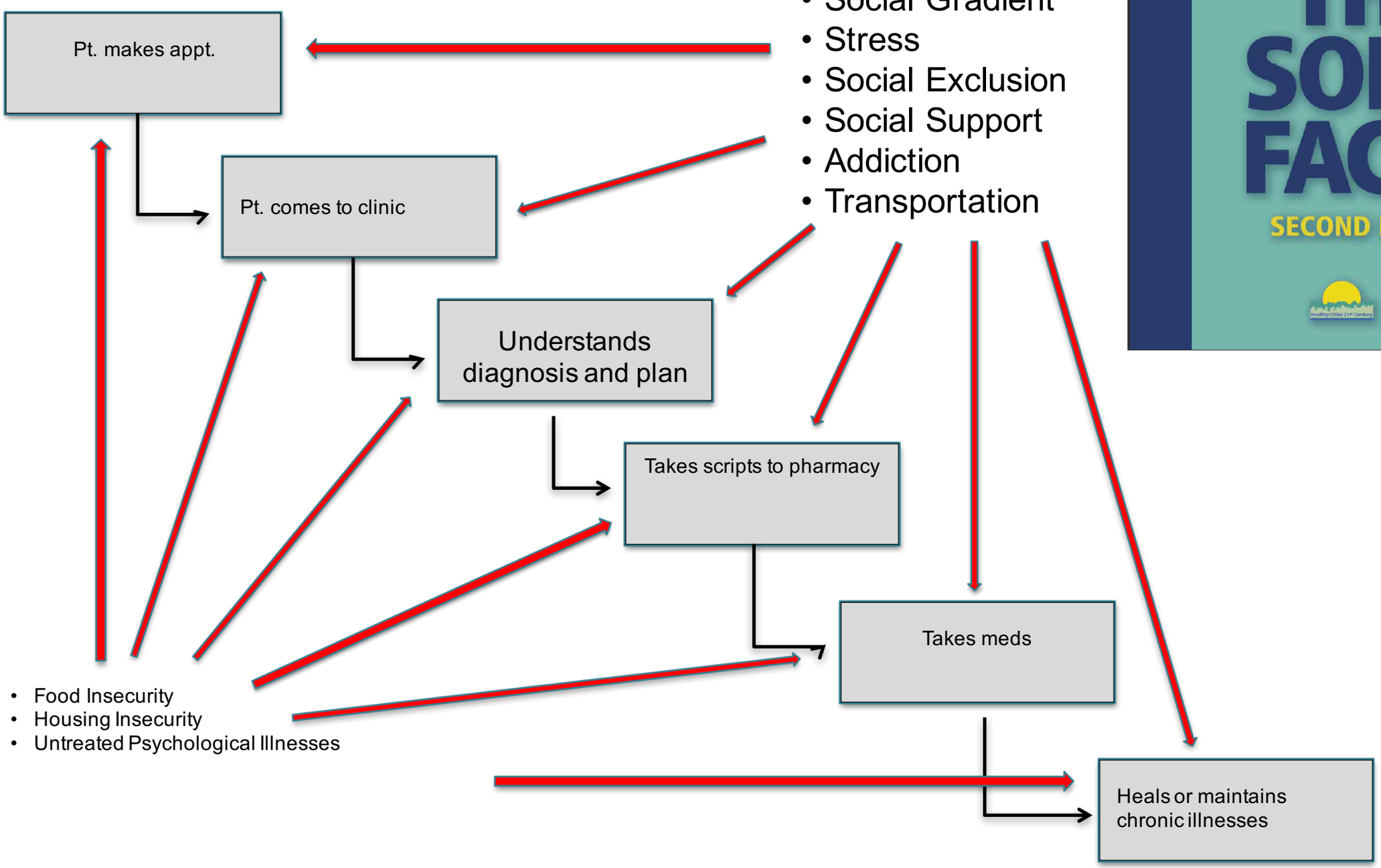
Figure 4. Lifetime Risk of HIV Diagnosis by State

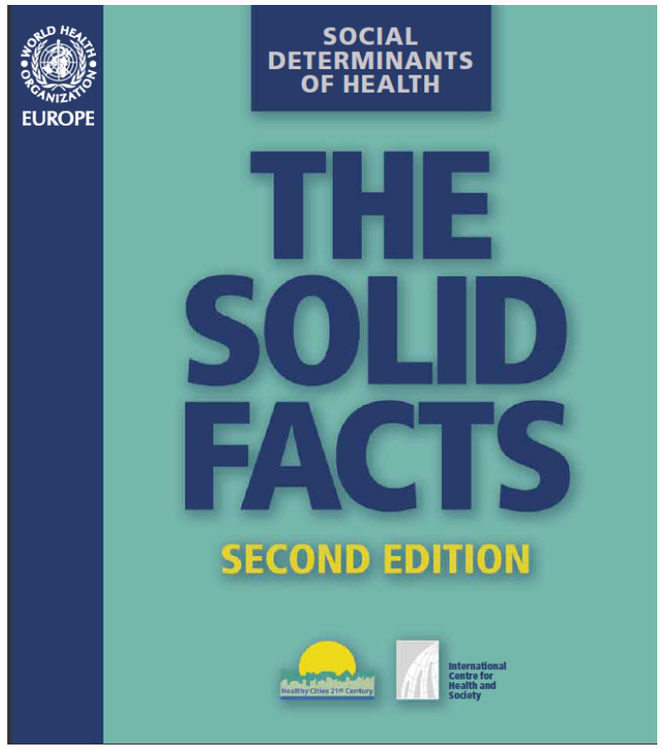


HIGHEST RISK **LOWEST RISK**

State	One in "n"	State	One in "n"	State	One in "n"	State	One in "n"
District of Columbia	13	Nevada	98	Michigan	167	West Virginia	302
Maryland	49	Illinois	101	Oklahoma	168	Wisconsin	307
Georgia	51	California	102	Kentucky	173	Iowa	342
Florida	54	Tennessee	103	Indiana	183	Utah	366
Louisiana	56	Pennsylvania	115	Washington	185	Maine	373
New York	69	Virginia	115	Colorado	191	Alaska	384
Texas	81	Massachusetts	121	New Mexico	196	South Dakota	402
New Jersey	84	Arizona	138	Hawaii	202	New Hampshire	411
Mississippi	85	Connecticut	139	Oregon	214	Wyoming	481
South Carolina	86	Rhode Island	143	Minnesota	216	Vermont	527
North Carolina	93	Ohio	150	Kansas	262	Idaho	547
Delaware	96	Missouri	155	Nebraska	264	Montana	578
Alabama	97	Arkansas	159			North Dakota	670

A tale of two visits





Knowledge gap concerning relative contribution of each Social Determinant to an individual's overall health

- Recognition is a first step to knowledge

- We do not understand the mechanisms of each social determinant, but we may find ourselves jumping to stereotype-driven conclusions

- Acknowledging social factors not equivalent to acknowledging the social choices behind these factors

Shifting Demographics of HIV

- JAMA: 2002 – 2011 for ages 13 – 24 132.5% increase in HIV cases attributed to MSM
- MMWR: Prevalance of viral suppression lowest in 18-24 YO (13%) and 25-34 YO (23%) ($p < .01$) compared to > 65 YO.
  - Linkage to care within 90 days across 19 US States: Black 76%, White 85%
- CDC HIV Surveillance Report (2011): Highest incidence rate in the SE 20.9/100,000 vs 15/100,000 national average

Lifetime Risk of HIV (1 in 99 for all)

Figure 1. Lifetime Risk of HIV Diagnosis by Transmission Group

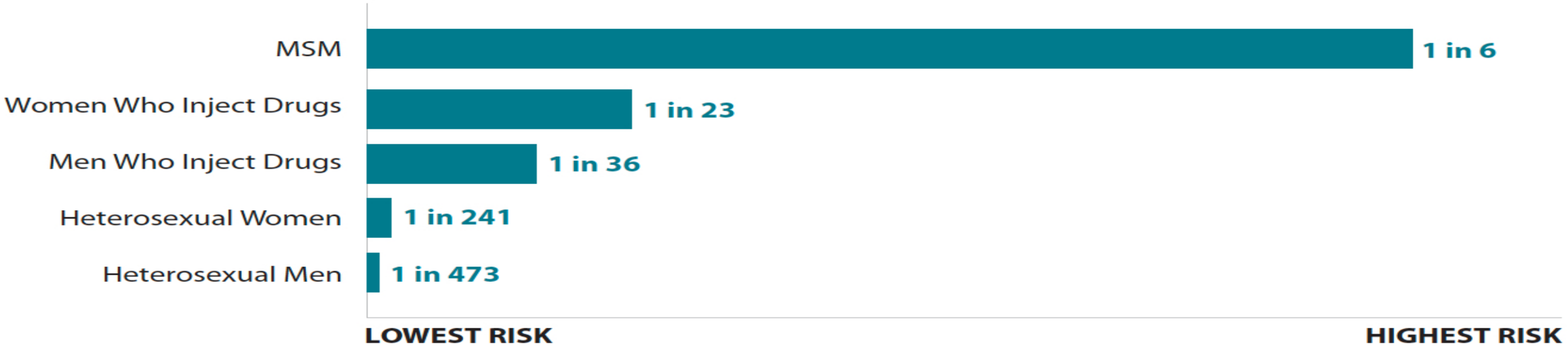
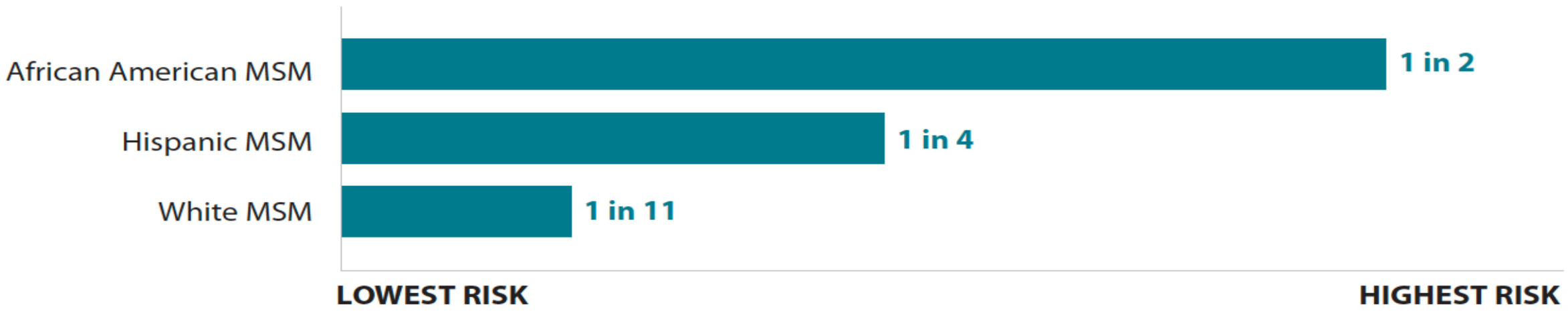


Figure 2. Lifetime Risk of HIV Diagnosis among MSM by Race/Ethnicity



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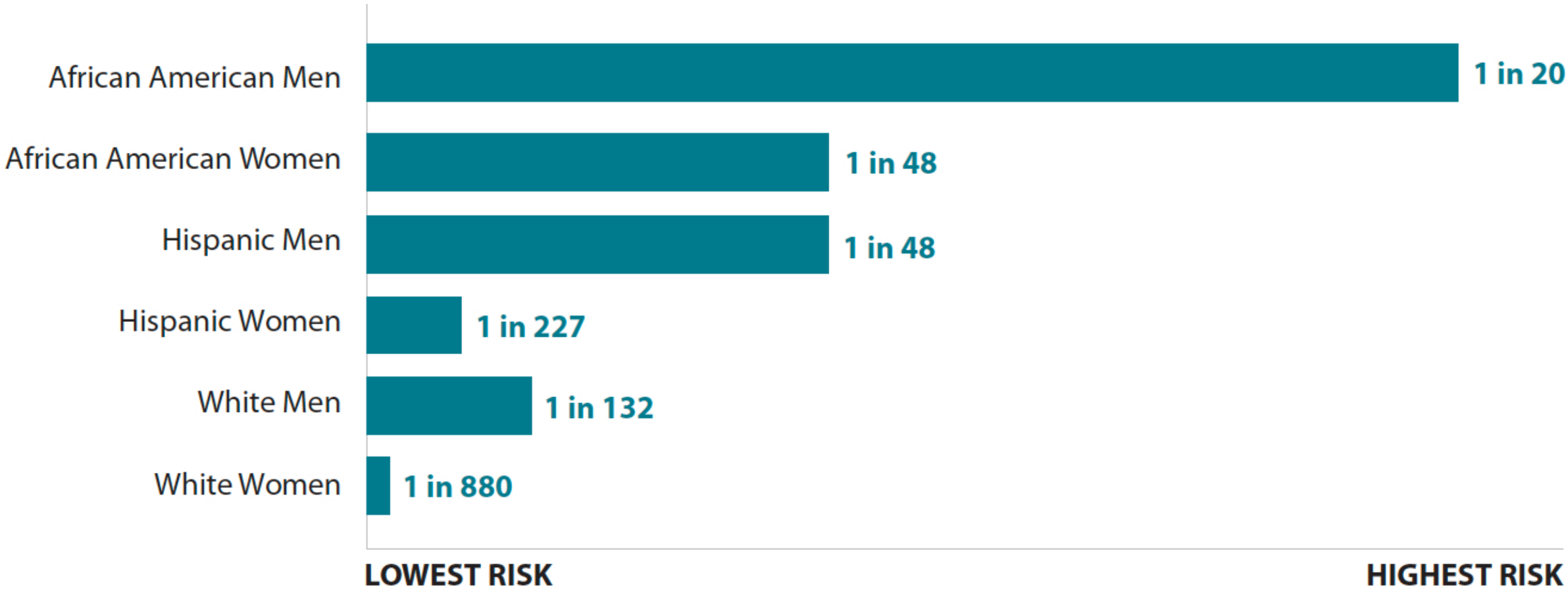
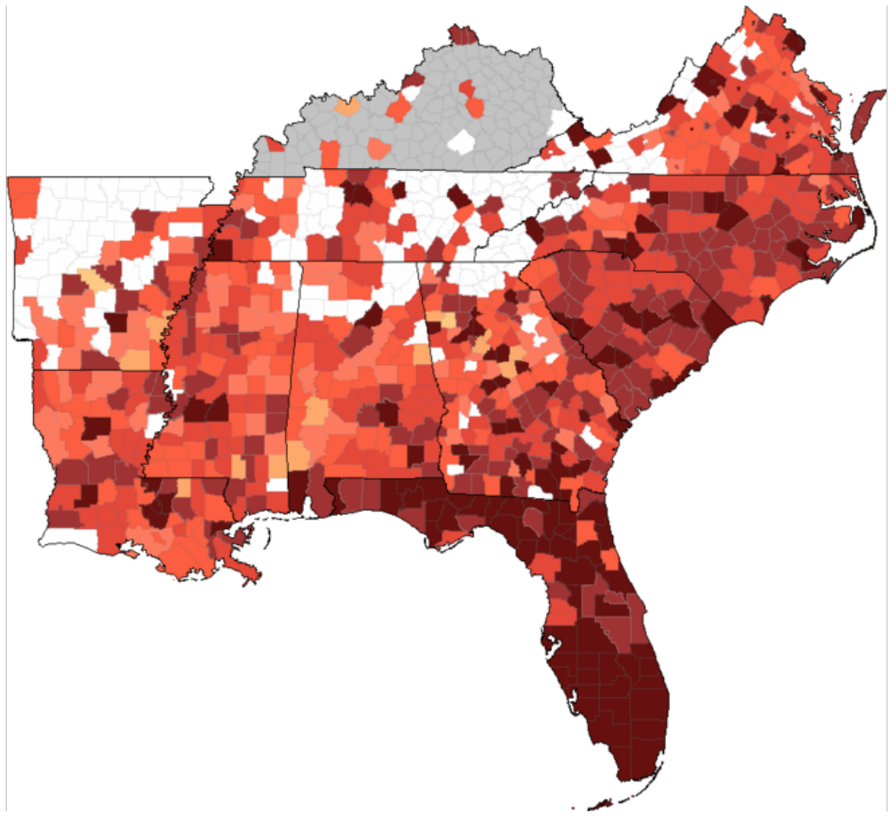
Lifetime Risk of HIV Diagnosis

Figure 3. Lifetime Risk of HIV Diagnosis by Race/Ethnicity

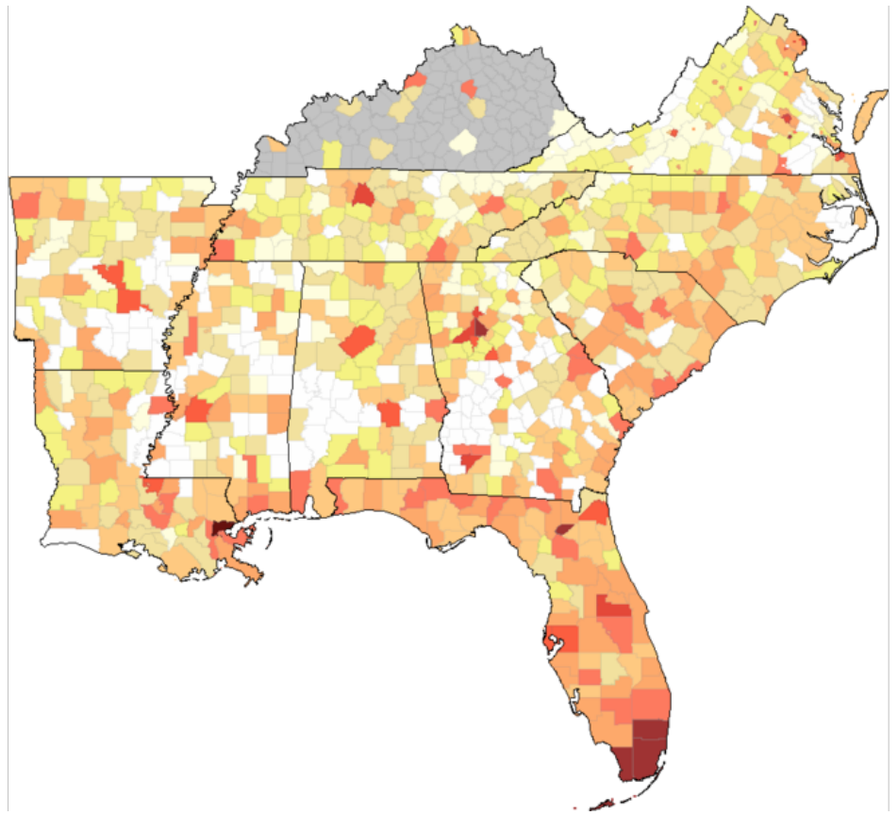


Rates of Black & White Persons Living with an HIV Diagnosis, by County, Southeastern U.S., 2010

Black Rates



White Rates



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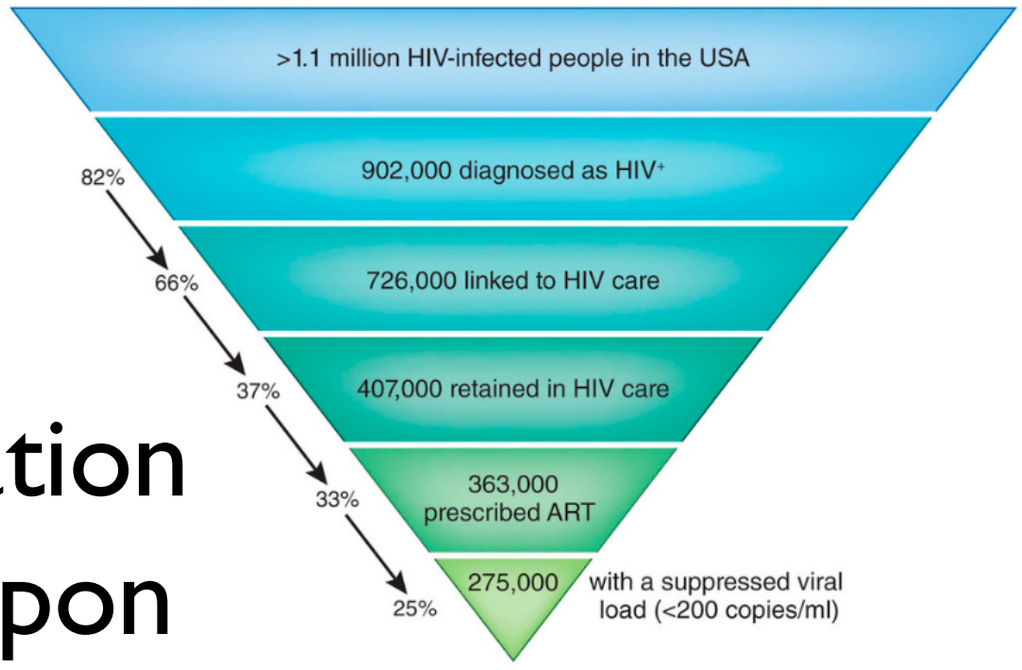
The Power of Sexual Networks

- What percentage of sexual encounters occur with no preferences save for gender? Is intercourse random or selective?
- What can we learn from analyzing patterns of sexual partnering within subpopulations?

- Laumann study (1999)
- "Peripheral" Blacks (one partner last 12 mons) are five times more likely to choose "Core" Black (≥ 4 partners in the past year) partners than "peripheral" Whites are to choose "core" whites
- Segregation by skin color limits pool of partners – 30% increased likelihood of STD based on this factor

Continuum of Care is a reflection . . .

- Any expression of non-majority-sanctioned behaviors or attributes can trigger stigmatization
- Access to and full participation in HIV care is contingent upon acknowledgment of belonging to a stigmatized group or groups

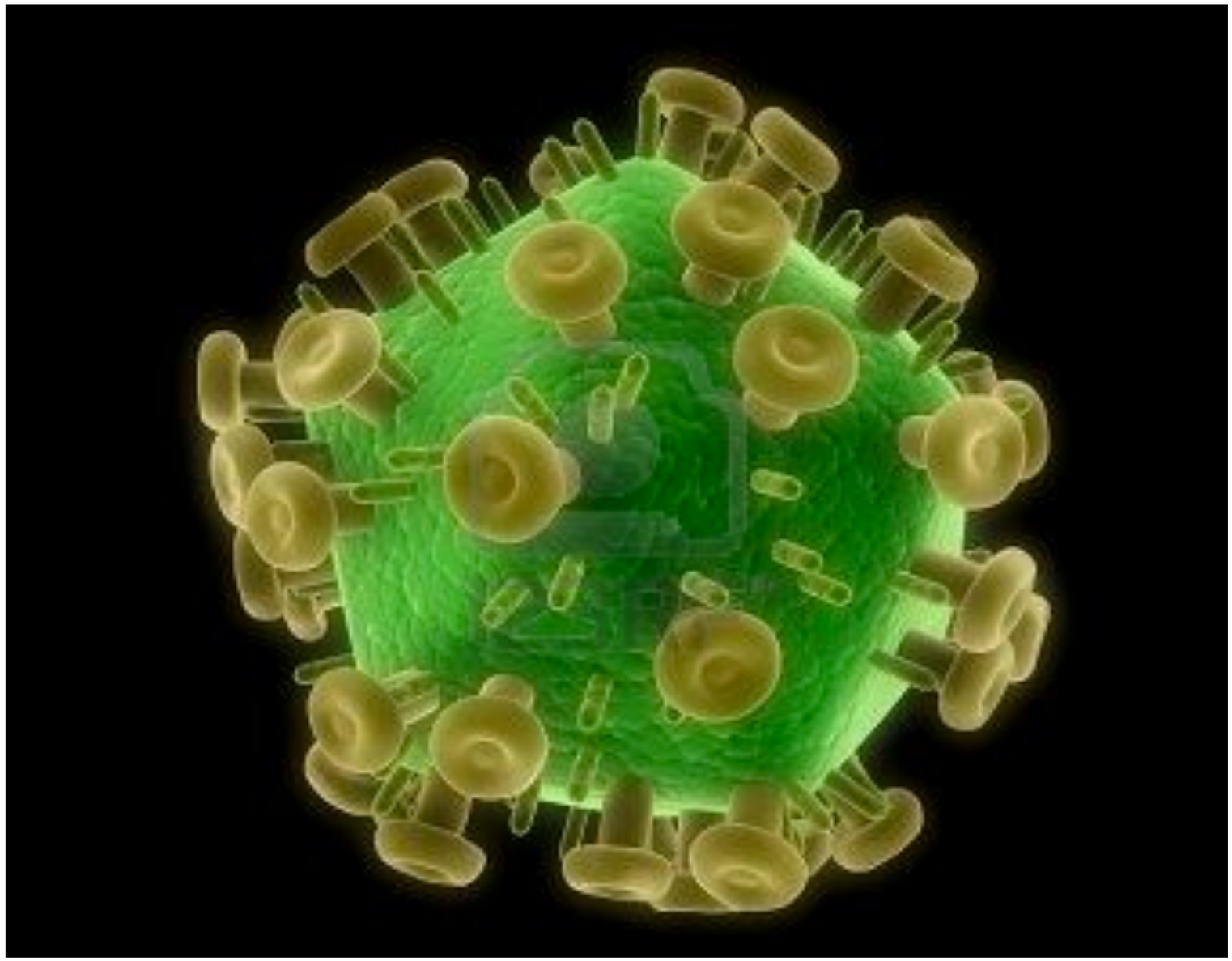


Word cloud

- Submit one word that summarizes why you feel that people with HIV living in the Southeastern US struggle so much ("structural violence" is not a word)

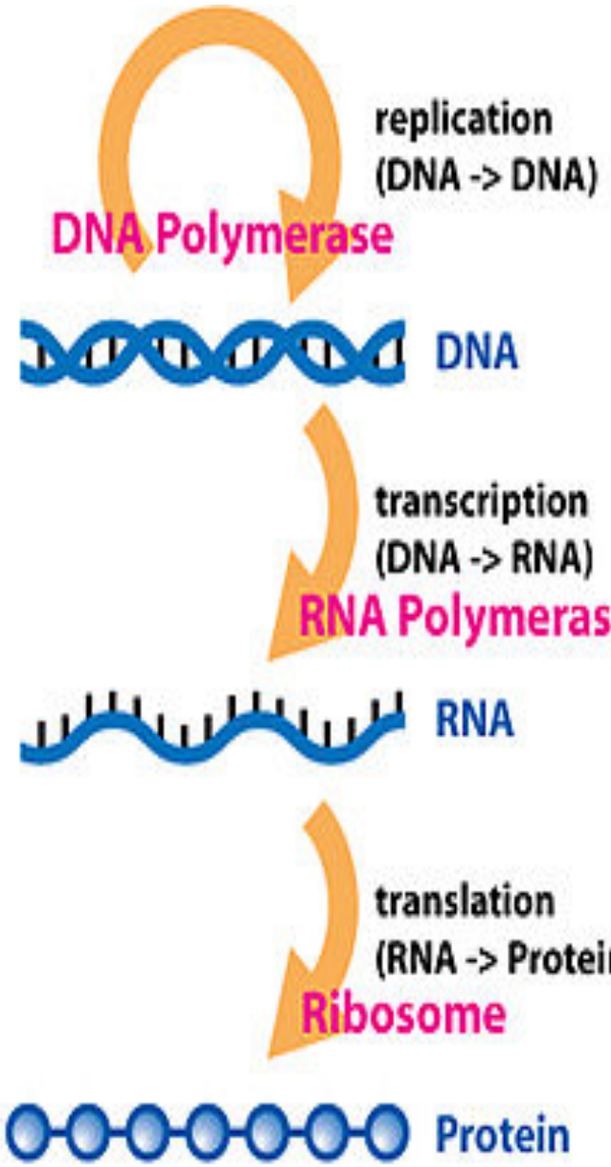
Pathophysiology

- Structure of the Virus
- Life Cycle of the Virus
- HIV and Syphilis



Microbiology 101 (in 5 minutes)

- DNA Replication (nucleus)
- DNA Transcription (nucleus)
- DNA Translation (cytoplasm)



- Central Dogma of Microbiology:
  - DNA -> RNA - > Proteins

http://en.wikipedia.org/wiki/Central_dogma_of_molecular_biology

Virology 101 (in 5 minutes)

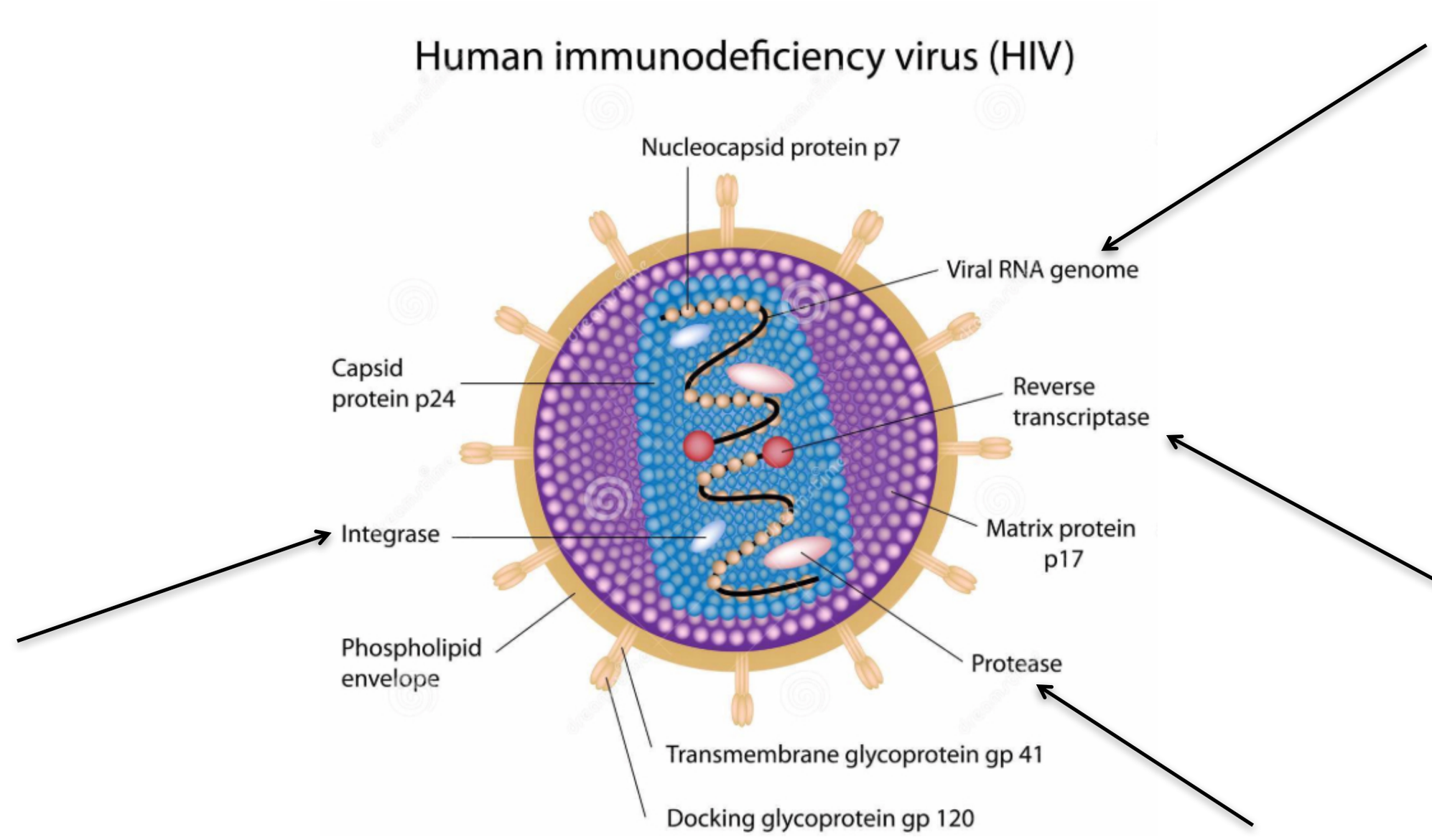
- Smallest infectious particles
- Inert
  - Replicate only in living cells
- Viral nucleic acid (DNA or RNA) programs infected cell to synthesize proteins required for viral replication
- Host cell may or may not die as a result of infection

Virology 101 (in 5 minutes)

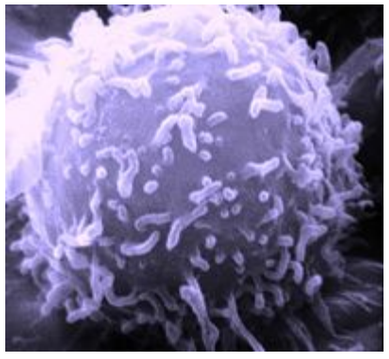
- DNA viruses
  - Papillomavirus - HPV
  - Hepadnavirus – HBV
  - Herpesvirus – HSV I, HSV II, HV8, HZV

- RNA viruses
  - Coronavirus – common cold
  - Picornavirus (HAV); Flavivirus (HCV)
  - Retrovirus - HIV

What's in the Virion?

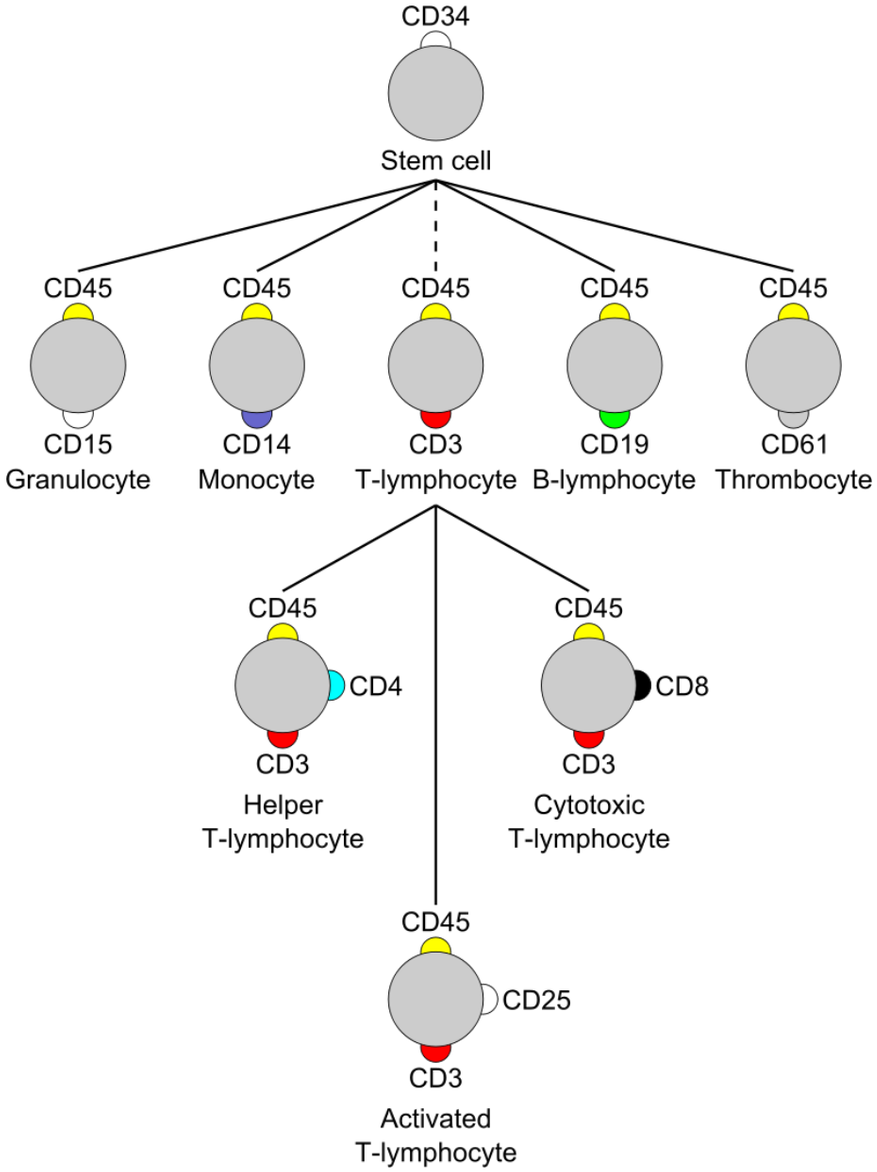


http://www.dreamstime.com/stock-photography-structure-hiv-image23617032

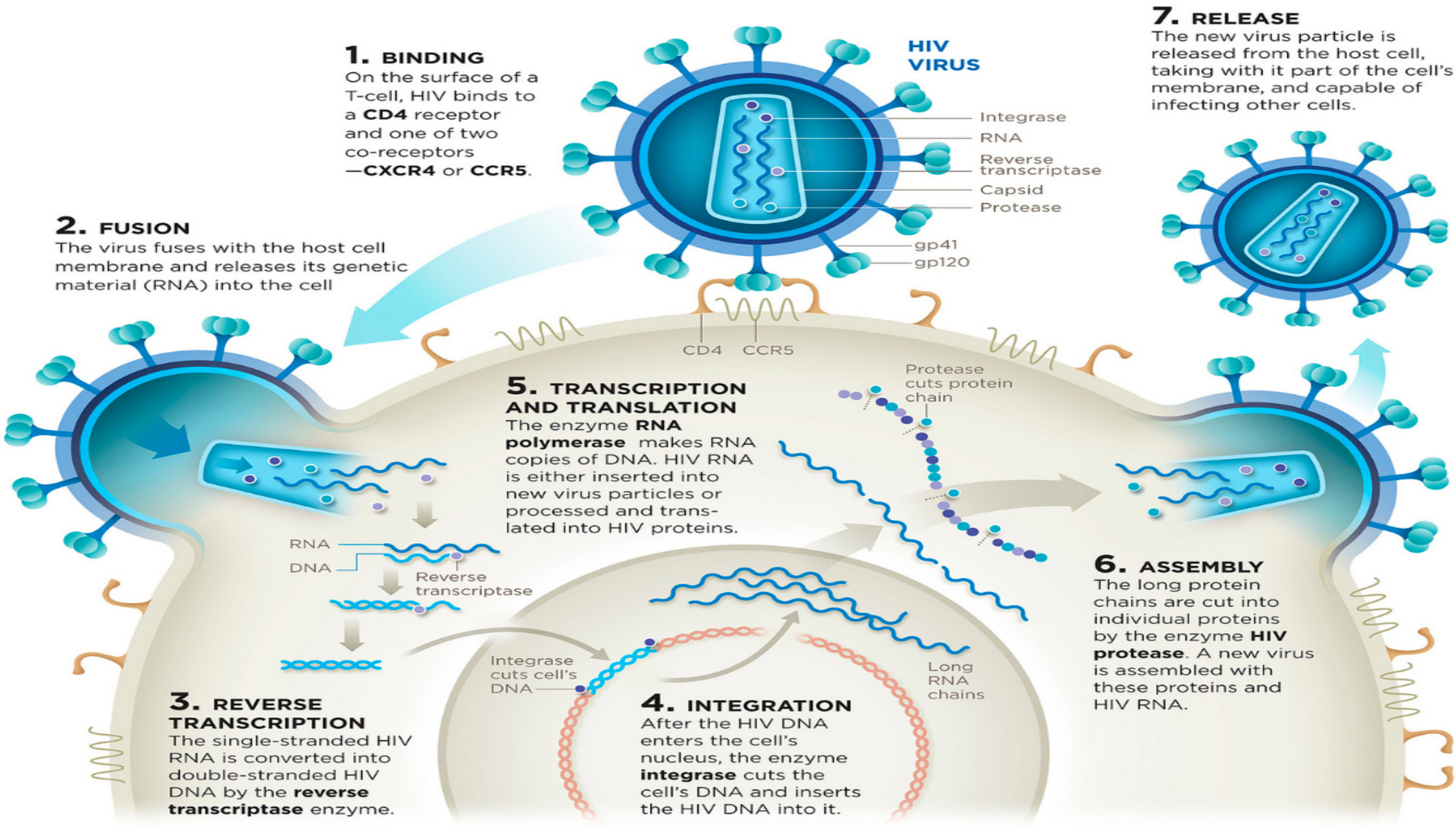


What is a CD4-T cell?

- T-helper lymphocytes
- Organize and activate other immune cells
- CD4 is a surface protein expressed by these cells in order to allow them to react to an antigen-presenting cell

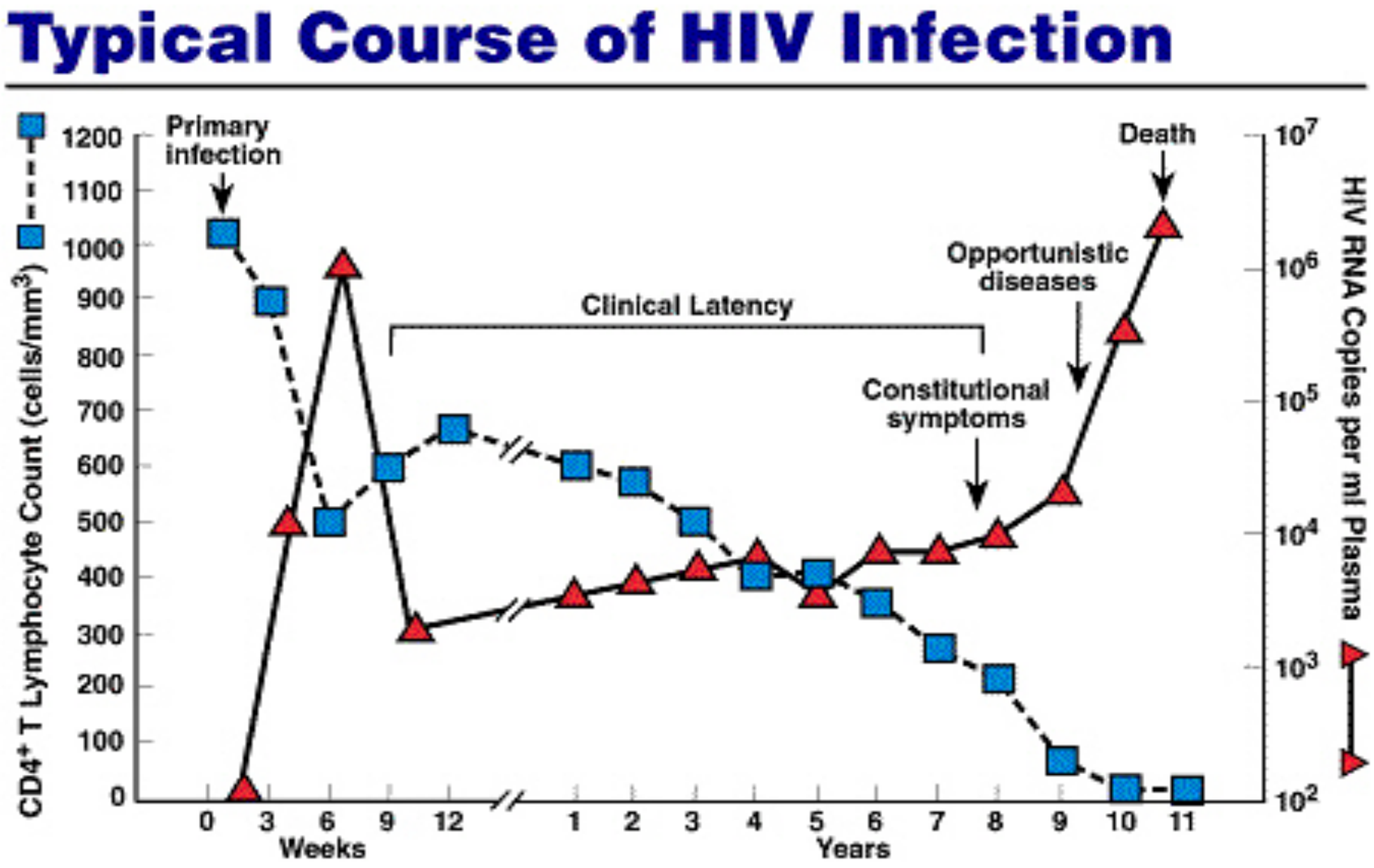


What happens inside an infected cell?



https://www.flickr.com/photos/5winfographics/9037451756

Natural course of HIV



Modified From: Fauci, A.S., et al, *Ann. Intern. Med.*, 124:654, 1996

Positional Risk of Transmission

Vaginal Intercourse Risk Rates for HIV Infection	Female with HIV (+) Male	Male with HIV (+) Female
High Income Countries	0.08% (1/1250)	0.04 (1/2500)
Low Income Countries	0.30 (1/333)	0.38 (1/263)

Anal Intercourse Risk Rates per Act	Per-Act Probability
Insertive – Circumcised	0.11 (1/909)
Insertive – Uncircumcised	0.62 (1/161)
Receptive – No Ejaculation	0.65 (1/154)
Receptive - Ejaculation	1.43 (1/70)

http://www.aidsmap.com/HIV-risk-levels-for-the-insertive-and-receptive-partner-in-different-types-of-sexual-intercourse/page/1443490/

Barriers Reaching Carriers

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Why 45,000 new infections/year?

- We have the pharmacological agents to fully suppress the virus
  - SE burden, pill burden have significantly decreased

- We have the barrier protection necessary to minimize transmission of the virus

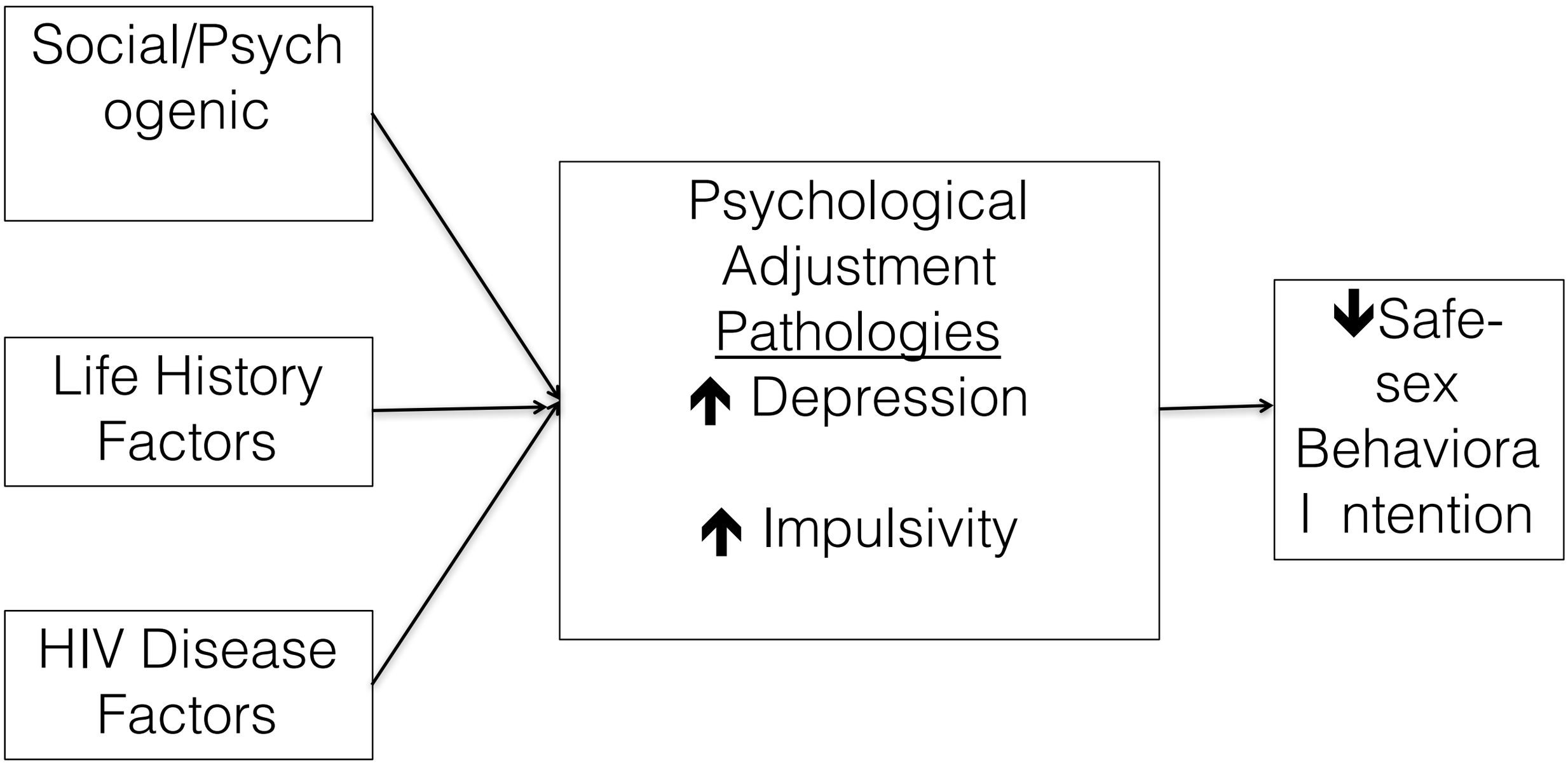
- For a majority of our patients, HIV is no longer primarily a bio-medical challenge

Complicating Factors/Possible Clues

- Relative to the general population,
  - **Increased** rates of **depression**,
  - **Increased** levels of **impulsivity**,
  - **Significantly higher** prevalence of **childhood sexual abuse**,
  - **Significantly higher** prevalence of **shame** and **stigma**,
  - **Lower** levels of **self-efficacy**

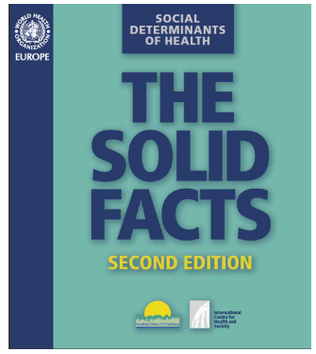
➢ **All of which are correlated with increased risk of risky sexual behaviors**

Organizing Framework



Social/Psychogenic Factors

Social Determinants of Health



Uncontrollable Stress

The Social Gradient

Chronic Stress

Social Exclusion

Work Stress

Unemployment

Social Support

Early Life Health
Long-term impact of LBW/ELBW

Addiction
Alcohol

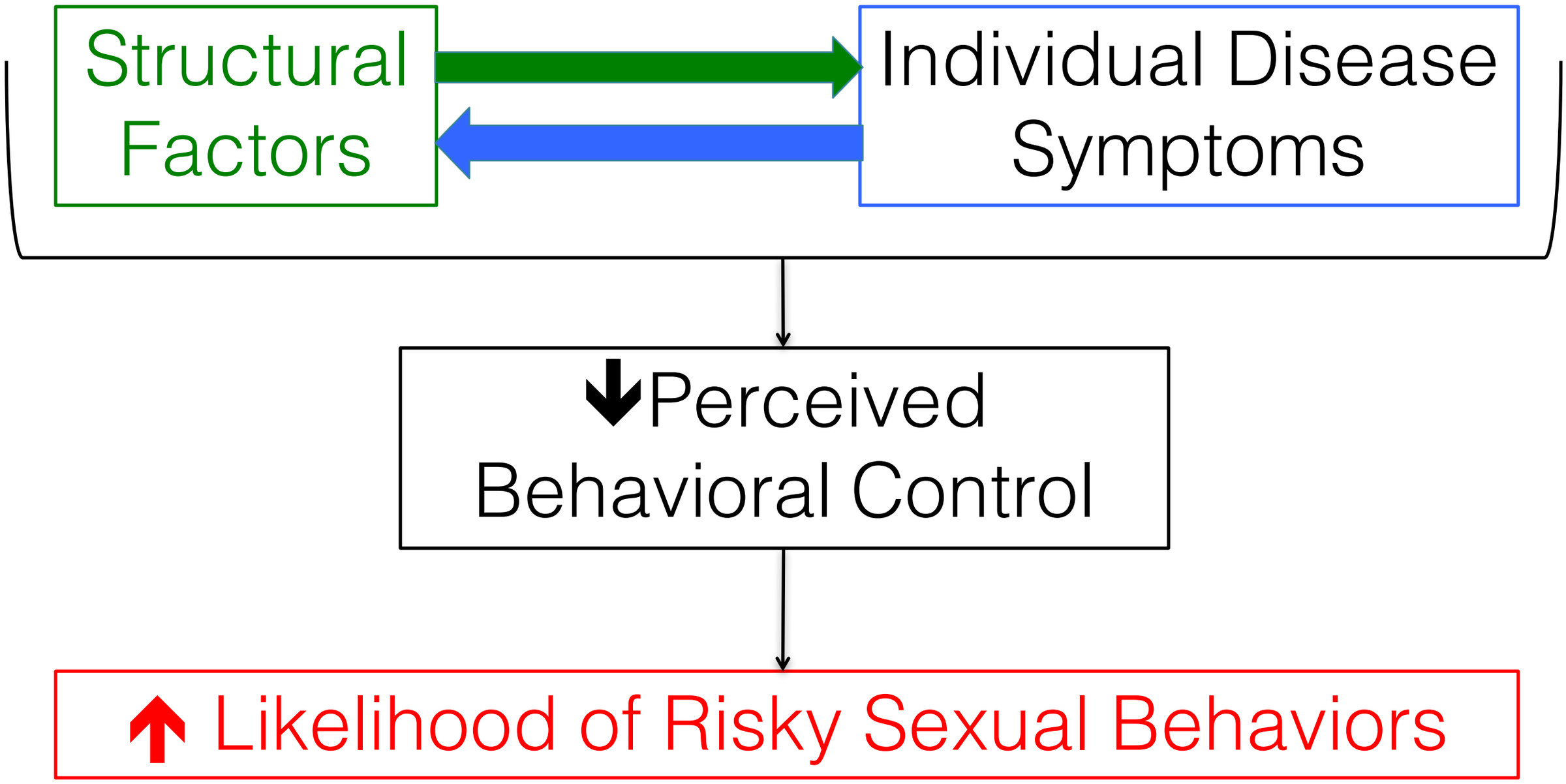
Illicits

Food
Lack of access to healthy diet

Transportation
Focus on walking, cycling and better public transportation

Human social organization is the result of human choices, and those choices have direct impact on every member of a society, especially the least powerful members.

Impact of SDH on HIV and HIV Care



The Effects of Housing Status on Health-Related Outcomes in People living with HIV: A Systematic Review of the Literature

Adherence

Unstable housing as a predictor of poor adherence:
OR: 2.76, 95% CI 1.30 – 5.85
Poor housing as a predictor of poor adherence:
OR: 1.88, 95% CI 1.15 – 3.08

Residence in long-term vs short term housing/shelter linked to better ART adherence:
75% vs 42%, $p = 0.03$

Increased likelihood of poor adherence associated with history of homelessness:
OR 1.38, 95% CI 1.02 – 1.85, $p < .035$

Health Outcomes

Homeless > 1-yr at baseline vs never homeless associated with HCV co-infection:
62% vs 38%, $p < 0.020$

Stable housing link to lower risk of HCV co-infection:
OR: 0.16, 95% CI 0.04 – 0.59

Risk Behaviors

Likelihood of hard drug use in homeless vs stably housed groups:
OR 3.58, 95% CI 2.31 – 5.53

Likelihood of sex exchange behaviors in participants with worsening housing situation vs stable housed:
OR 5.11, 95% CI 1.05 – 24.8

Leaver, CA, Bargh, G, Dunn, JR, Hwang, SW (2007). AIDS and Behavior, 11: S85 – S100.

Conceptual framework for understanding the bidirectional links between food insecurity and HIV/AIDS[1–4]

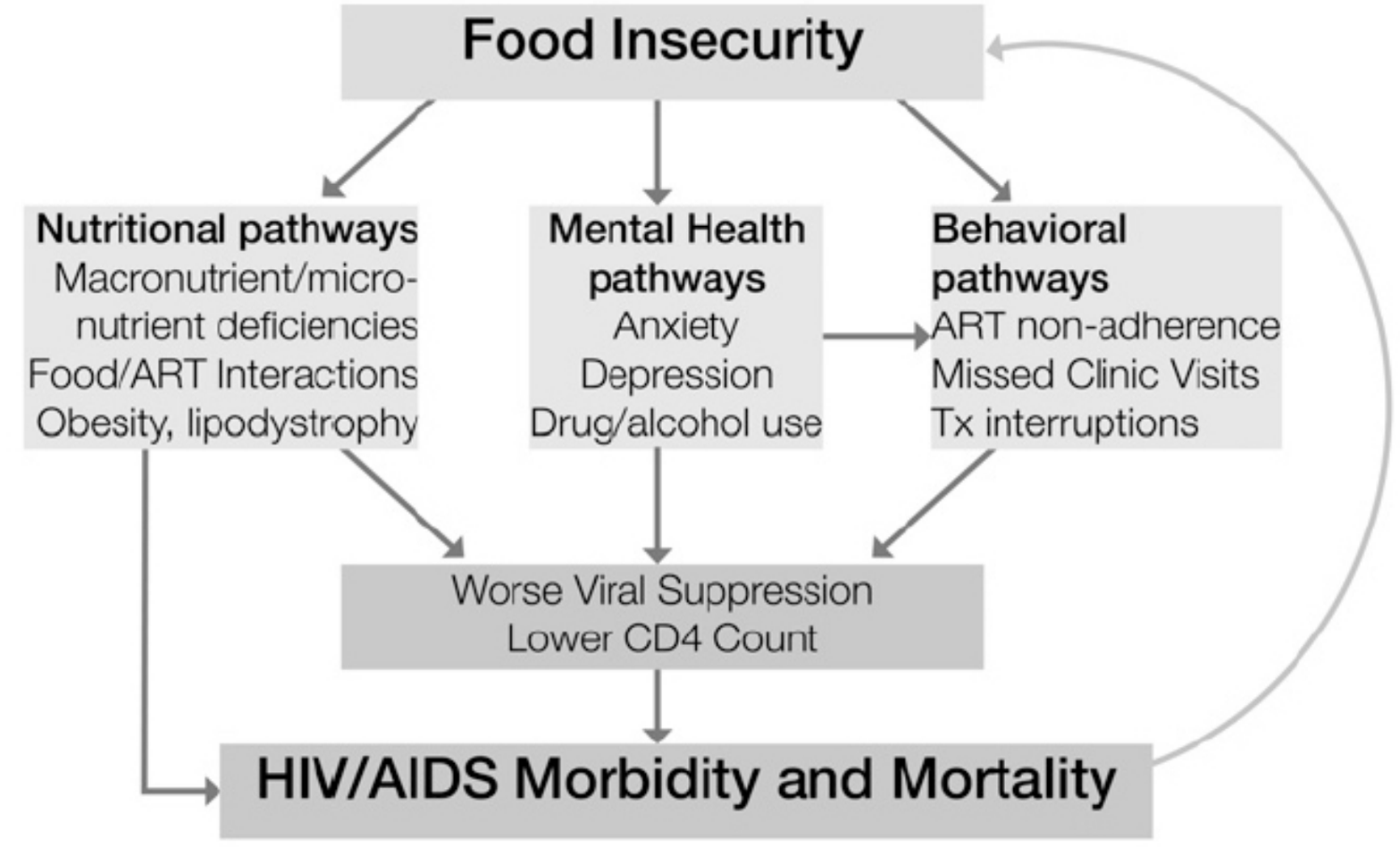


FIGURE 3. Food insecurity and HIV/AIDS morbidity and mortality. ART, antiretroviral therapy; Tx, treatment.

Weiser, SD, Young, SL, Cohen, CR, Kushel, MB, Tsai, AC, Tien, PC, et. al. *Am J Clin Nutr* 2011; 94(suppl):1729S-39S.

Food Insecurity is Associated with Incomplete HIV RNA Suppression Among Homeless and Marginally Housed HIV-infected Individuals in San Francisco

Characteristic	All Participants N=104	Food Secure Category 1-3 N=78 (75%)	Severely Food Insecure N=26 (25%)
Pill Adherence > 80%	58 (56%)	48 (62%)*	10 (38%)*
VL < 50 copies/ml	58 (56%)	49 (63%)**	9 (35%)**
History of Drug use, last 30 days	35 (34%)	21 (27%)**	14 (54%)**
BDI Score (mean, SD)	11.7 (10.1)	10.1 (9.2)**	16.6 (11.3)**

Note: *p*-values compare severely food insecure vs all others per characteristic. * $p<=.05$, ** $p<=.01$.

Weiser, SD, Frongillo, EA, Ragland, K, Hogg, RS, Riley, ED, Bangsberg, DR (2008). Journal of General Internal Medicine. 24(1), 14-20.

Life History Factors

Pair and Share: 2 mins

- With all that we have talked about so far this morning, what might you think could be the biggest obstacle that some of our patients have to overcome in order to get engaged in care?

Stigmatization and Shame

- Stigmatization: Social construction, based on power structures, resistant to change (Persons, et al, 2010)
  - Tightly linked to structural violence

- Shame: Internalized, painful, response to self-perceived social miscues, may be amenable to change (Persons, 2010)

Persons, E, Kershaw, T, Sikkema, KJ, Hansen, NB (2010). Impact of Shame on HRQoL Among HIV-Positive Adults with a History of CSA. AIDS Patient Care and STDS, 24(9).

Childhood Sexual Abuse in Adults Living with HIV/AIDS

- CHASE Study (2001-02) N = 611
  - 8 clinics, 3 MSAs, 5 Deep Southern states
  - ~ 25% sexually abused by 13 YO
  - 30% men and 38% women (+) lifetime sexual abuse
  - > 50% reported sexual or severe physical abuse

- Demographics consistently failed to achieve statistical significance.

Whetten, K, Leserman, J, Lowe, K, Stangl, D, Thielman, N, Swartz, M, et. al. (2006). Prevalence of Childhood Sexual Abuse and Physical Trauma in an HIV-Positive Sample from the Deep South. *American Journal of Public Health, 96*( ), 1028-1030.

Childhood Sexual Abuse in Adults Living with HIV/AIDS

- Kalichman Study (2000-2001) N = 357
  - 45% reported at least one sexual assault since 15 YO
  - 68% of women, 35% of men reported sexual assault in their lifetime.
  - Among the abused, mean number of events was 9.7 (SD = 2.7)
  - 80% abused more than one time.

Kalichman, SC, Sikkema, KJ, DiFonzo, K, Luke, W, Austin, J. (2002). Emotional Adjustment in Survivors of Sexual Assault Living with HIV-AIDS. *Journal of Traumatic Stress*, *15*(4), 289-296.

CSA Screening: Guidelines and Results

Screening for Childhood Trauma in Adult Primary Care Patients: A Cross-Sectional Survey (N=313)

- 79% believe that rate of CSA in women is > 10%, usually/always screen 33% of the time

- 41% believe that rate of CSA in men is > 10%, usually/always screen 32% of the time

Factors Associated with Adult Screening for CSA in Primary Care

- Knowledge of Prevalence (correct vs incorrect):
  - Usually/always screen 2.297 (0.993 – 5.312)

- Confidence in Screening (mod/very vs not/somewhat)
  - Usually/ always screen2.548 (1.385 – 4.688)

- Perceived Role to Screen (mod/great vs not/somewhat)
  - Usually/always screen 11.800 (2.701 – 51.555)

Chronic Stress as a Health Ramification of Shame

"Fight or Flight" response: helpful in 10,000 BC:

- Adrenaline release
- Hyper-coagulation to minimize blood loss
- Release of blood sugar and fats for emergency fuel
- Increased anxiety and aggression to respond to threat

"Fight or Flight" response: turned upside down in 2015:

- Chronic adrenaline release weakens immune system
- Chronic hyper-coagulation increases clotting risks
- Chronic release of blood sugar and fats fuels inflammation, diabetes, high cholesterol, obesity
- Chronic anxiety and aggression may drive substance abuse, eating disorders, depression

Research on Shame and HIV Outcomes

- Cole, Kemeny, Taylor (1997)
  - 9-year longitudinal study, more rapid CD4 cell decline in men who are more sensitive to rejection due to their sexuality (all participants healthy at baseline).

Cole, SW, Kemeny, ME, Taylor, SE. Journal of Personality and Social Psychology, Feb 72(2), 320-35.

- Segerstrom et al (1996)
  - HIV-positive men with self-blaming attributional style had swifter CD4 cell declines than controls over 18 mons followup

Segerstrom, SC, Taylor, SE, Kemeny, ME, Reed, SM, Visscher, BR. Health Psychology, Nov 15(6), 485-493.

Word cloud

- List a profession other than your own that you would like to work with to help optimize care for your patients with HIV

Poll Question #2 (again):

- What is the biggest single deterrent to eliminating HIV transmission in the US?

- Uneven, poor quality sexual education in US schools
- Cost of HIV medications (ART)
- Poverty
- Medication side effects
- Social Marginalization of HIV patients
- Insufficient volume of incoming HIV providers to Ryan White Clinics

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