

Optimizing HIV Prevention in Michigan

*Dr. David Holtgrave, Professor and Department Chair
Department of Health, Behavior and Society
Johns Hopkins Bloomberg School of Public Health*

Overview

- ▶ **Brief Background of HIV in Michigan**
 - ▶ Current Resource Levels in Michigan
- ▶ **Current Projects to be Presented Today**
 - ▶ Counseling and Testing Scenario Analysis
 - ▶ Resource Allocation Analysis
- ▶ **Conclusions**



HIV in Michigan

- ▶ 18,200 people living with HIV/AIDS in Michigan
- ▶ Between 2003 and 2007 the rate of new diagnoses remained stable with an average of 892 new HIV diagnoses each year
- ▶ MSM 46% of new cases and African Americans 59% of all new cases reported
- ▶ Since 2003 24% increase in adolescents



Current Resource Levels in Michigan

- ▶ Majority are Federal resources
 - ▶ \$8.2 million managed by DHWDC and approximately \$7 million are federal resources
- ▶ Increasing infection among several population groups and diminishing funding
- ▶ How can we optimize prevention efforts?
 - ▶ What array of services would result in...
 - ▶ the most HIV infections averted?
 - ▶ the lowest HIV transmission rate possible?
 - ▶ maximize the level of awareness of HIV seropositivity?



Counseling and Testing Scenario Analysis for U.S.

▶ Background

- ▶ CDC 2006 HIV testing recommendations
- ▶ “Costs and Consequences of the US Centers for Disease Control and Prevention’s Recommendations for Opt-Out HIV Testing” PLOS Medicine, 2007
 - ▶ Opt-out
 - ▶ Opt-out with counseling
 - ▶ Routine HIV testing
 - ▶ “Targeted” testing
- ▶ Conclusion: “Targeted” counseling appears preferred
 - ▶ Definition of “Targeted” is key



Counseling and Testing Scenario Analysis: Michigan

▶ Methods

- ▶ Payer's Perspective
- ▶ All costs are in 2007 US dollars
- ▶ One year time horizon
 - ▶ To examine the initial impact of each scenario



Counseling and Testing Scenario Analysis: Input Parameters - Michigan

Table 1- Input Parameter Values and Sources

Parameter	Value	Reference
Number of persons 13-64 years old in	7,066,950	Census; MI
Number of persons living with HIV in	18,200	MI
Percentage of persons unaware that they are HIV+	21%	CDC
Percentage of newly diagnosed HIV patients previously in contact with health care system	84%	CDC; MI
Uptake of screening recommendation	44%	MI
Adult population already receiving HIV testing	27%	MI
Persons testing HIV+ who are already aware of or do not receive results	37%	PLOS Medicine;
Cost of counseling and testing for one HIV-client	\$ 30.68	MI PLOS Medicine;
Cost of counseling and testing for one HIV + client	\$ 189.59	MI
Annual per patient medical costs for one HIV+ patient	\$ 30,093.00	MI Medicaid;
Transmission rate from unaware HIV+ persons	10.93%	MI PLOS Medicine;
Transmission rate from aware HIV+ persons	3.15%	MI
Percentage of persons in age group at high risk of HIV infection	11.90%	CDC
Percentage of HIV+ persons uninsured or on public health care assistance	75%	PLOS Medicine



Counseling and Testing Scenario Analysis: Results - Michigan

Table 2- Cost and Consequences of Four HIV Testing or Counseling and Testing Scenarios

Outcome	Basic Case (Opt-Out Testing)	Behavioral Offset Case	Routine Counseling and Testing Case	Targeted Counseling and Testing Case
Number of Persons Tested	1,201,382	1,201,382	1,201,382	547,973
Number of Undiagnosed HIV Positive Persons Reached	544	544	544	1,726
Number of High-Risk HIV Negative Persons Reached	142,792	142,792	142,792	128,468
Total Testing Cost	17,246,008	17,246,008	28,354,611	17,246,008
Transmissions Averted	42	42	42	134
Infections Averted	----	(7)	21	17
Transmissions and Infections Averted	42	35	63	151
Gross Cost Per Transmission or Infection Averted	407,280	488,560	448,172	114,069
Public Support for Medical Care Needed Y1	12,284,498	12,284,498	12,284,498	38,957,956



Counseling and Testing Scenario Analysis

▶ Conclusions

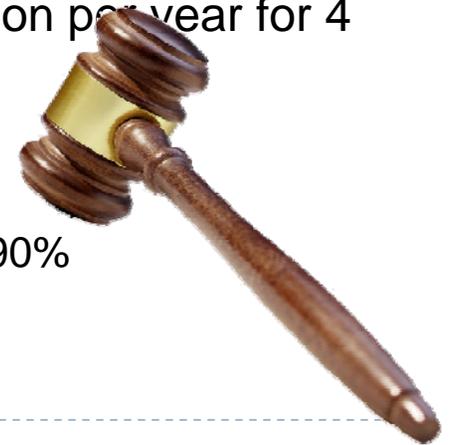
- ▶ Better investment for Michigan would be a highly targeted program of HIV counseling and testing
- ▶ Targeted program could combine a mixture of clinical and community-based counseling and testing
- ▶ Again, definition of “targeted” is key



Resource Allocation Model

▶ Background

- ▶ September 2008 Congressional Hearing Chaired by Representative Henry A. Waxman
 - ▶ Assessed Resources and Programs needed to reduce HIV incidence in the U.S.
 - ▶ Testimony was given by CDC and Dr. David Holtgrave among others
 - ▶ Holtgrave Congressional Testimony
 - If HIV prevention budget were increased to \$1.3 billion per year for 4 years the following could be achieved
 - Reduction of HIV incidence by $\frac{1}{2}$
 - Reduction of HIV transmission rate by $\frac{1}{2}$
 - Increase in awareness of HIV serpositivity to just over 90%



Resource Allocation Model- Michigan (1)

- ▶ **Background**

- ▶ National model applied to Michigan

- ▶ At the current level of resources available for HIV prevention activities in the State

- What array of services would result in the most HIV infections averted?
 - Result in the lowest HIV transmission rate possible?
 - Maximize the level of awareness of HIV seropositivity?



Resource Allocation Model- Michigan (2)

▶ Methods

- ▶ Information on HIV incidence and prevalence is used to calculate the HIV transmission rate for the state
- ▶ Assumes Year 1 large-scale targeted counseling and testing campaign
 - ▶ Lowering the unawareness rate of HIV seropositivity
 - Nationally it has been demonstrated persons who are aware of their seropositivity have an HIV transmission rate 3-4 fold lower than persons who are living with HIV and are unaware
- ▶ Assumes level of capacity building and public information constant Year 0 to Year 1
- ▶ Intervention effect sizes based on HIV prevention literature and costs of interventions per client based on same literature



Resource Allocation Model- Michigan (3)

▶ Methods Continued

- ▶ Results from Year 1 used as an input for Year 2 calculations
- ▶ Calculations for Year 2 mimic Year 1 except there is no longer the assumption made that a massive targeted counseling and testing campaign is the best intervention option
- ▶ This model aims to invest in
 - ▶ A persistent effort to maximize serostatus awareness (based on number of persons unaware of HIV seropositivity)
 - ▶ Evidence-based prevention services for all persons aware of their HIV positive serostatus *but who continue to engage in risk behavior (a small minority of PLWH/A)*
 - ▶ Persons newly learning they are living with HIV via the recommended program are covered with partner notification services
 - ▶ Prevention for HIV negative persons at risk of infection
- ▶ Year 2 approach is repeated for Years 3 and 4



Resource Allocation Model- Michigan (4) Results

Summary of Resource Allocation Model Results (Base Case)

	Year 0	Year 1	Year 2	Year 3	Year 4
Model Outputs (Yrs 1-4)					
Incidence (est.)	870	822	729	672	640
Prevalence (est.)	18,200	18736	19,172	19,546	19,882
Transmission Rate (est.)	0.0478	0.0439	0.0380	0.0344	0.0322
Seropos. Unawareness (est.)	0.21	0.18	0.15	0.13	0.10
Total Costs	\$ 8,635,000	\$ 8,640,855	\$ 8,660,784	\$ 8,640,856	\$ 8,554,930
Unaware (VCT services)	\$ 4,934,361	\$ 5,350,000	\$ 3,383,365	\$ 2,947,099	\$ 2,479,559
HIV+, Aware (prev svcs)	\$ 332,568	\$ 535,469	\$ 2,456,461	\$ 2,595,981	\$ 2,730,583
HIV- high risk (prev svcs)	\$ 1,123,071	\$ 797,057	\$ 1,467,791	\$ 1,821,109	\$ 2,125,639
Partner services	\$ 610,000	\$ 267,735	\$ 275,623	\$ 257,475	\$ 262,494
Capacity building (fiat)	\$ 450,000	\$ 450,000	\$ 450,000	\$ 450,000	\$ 450,000
Lab (fiat)	\$ 660,000	\$ 715,594	\$ 452,545	\$ 394,192	\$ 331,656
Public Info/Newsltr (fiat)	\$ 525,000	\$ 525,000	\$ 175,000	\$ 175,000	\$ 175,000

Resource Allocation Model- Michigan (5)

▶ Uncertainty in Results

- ▶ Every mathematical model has some uncertainty in its results
 - ▶ Uncertainty in input parameters leading to uncertainty in results
- ▶ Sensitivity analysis relatively reassuring
 - ▶ Examines the impact of constraining the HIV transmission rate to be constant year to year (for both persons aware and unaware they are living with HIV)
 - ▶ Incidence results are not as favorable because the “flat” transmission rate by serostatus awareness underestimates impact of counseling and testing



Resource Allocation Model- Michigan (6)

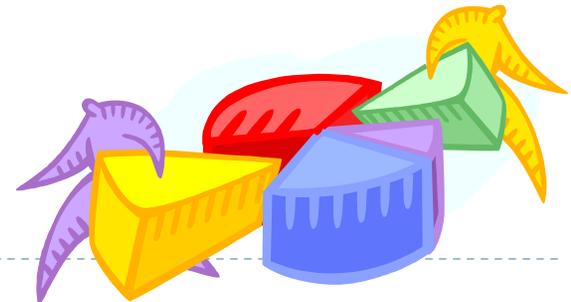
▶ Conclusion and Discussion

- ▶ Model is focused on maximizing epidemic impact given resource constraints
- ▶ Model suggests with some resource reallocation improvements in HIV prevention outcomes may be possible
- ▶ Small fraction of all people in need of HIV prevention services in Michigan can currently access these services
 - ▶ Guarantees a continued epidemic
- ▶ Model projects growing HIV prevalence
 - ▶ Plans to clearly link prevention to care and treatment are essential
 - ▶ Medical costs will grow
- ▶ Investments should take into account racial and ethnic health disparities
 - ▶ Money should not follow but anticipate the epidemic community to community



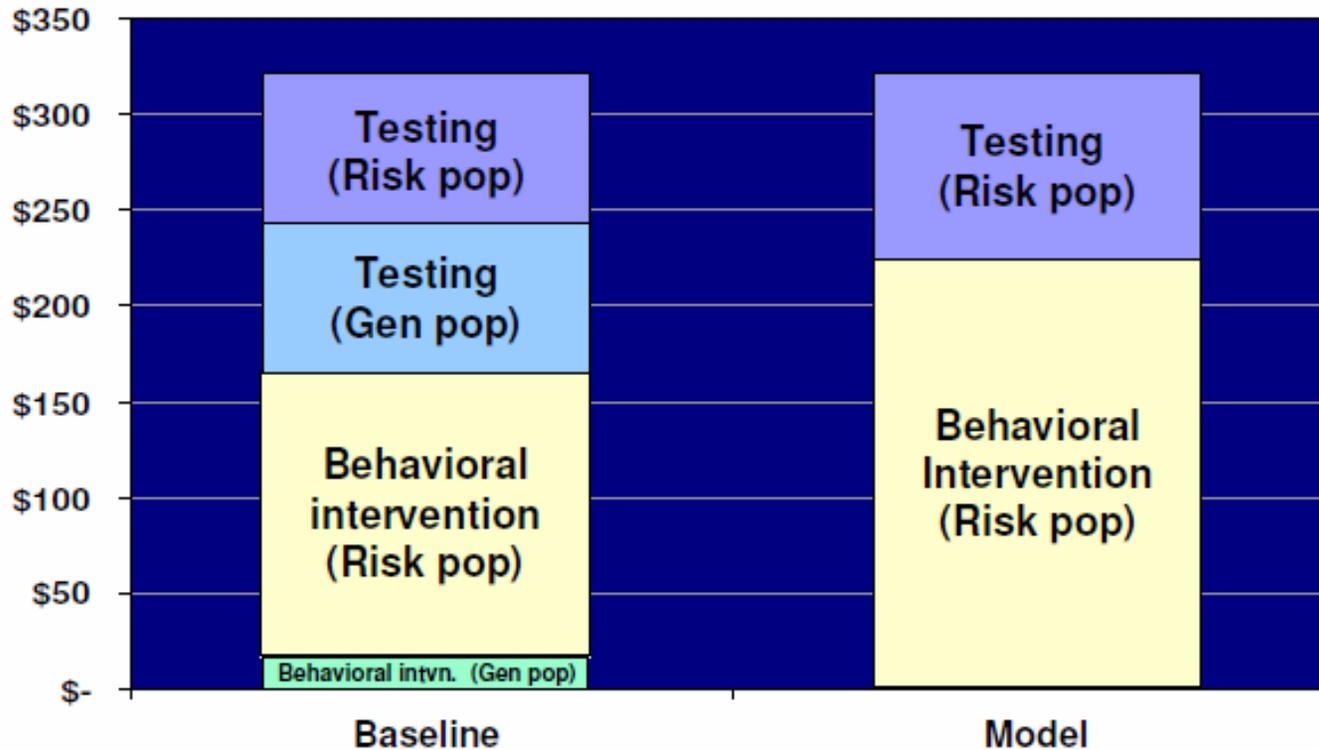
Resource Allocation Model- Michigan (7)

- ▶ **Conclusion and Discussion Continued**
 - ▶ Recommendation for specific interventions for HIV seronegative persons not so clear
 - Current resource level constrained
 - Only a tiny fraction of at-risk seronegatives needing services will receive them in Michigan
 - ▶ Identify the 3.5% to 5.5% of HIV seronegative persons most at risk of infection in a given year, then identify for the specific population represented in that 3.5% to 5.5% the interventions that can prevent the most infection for a given limited resources level



CDC National Resource Allocation Model Results

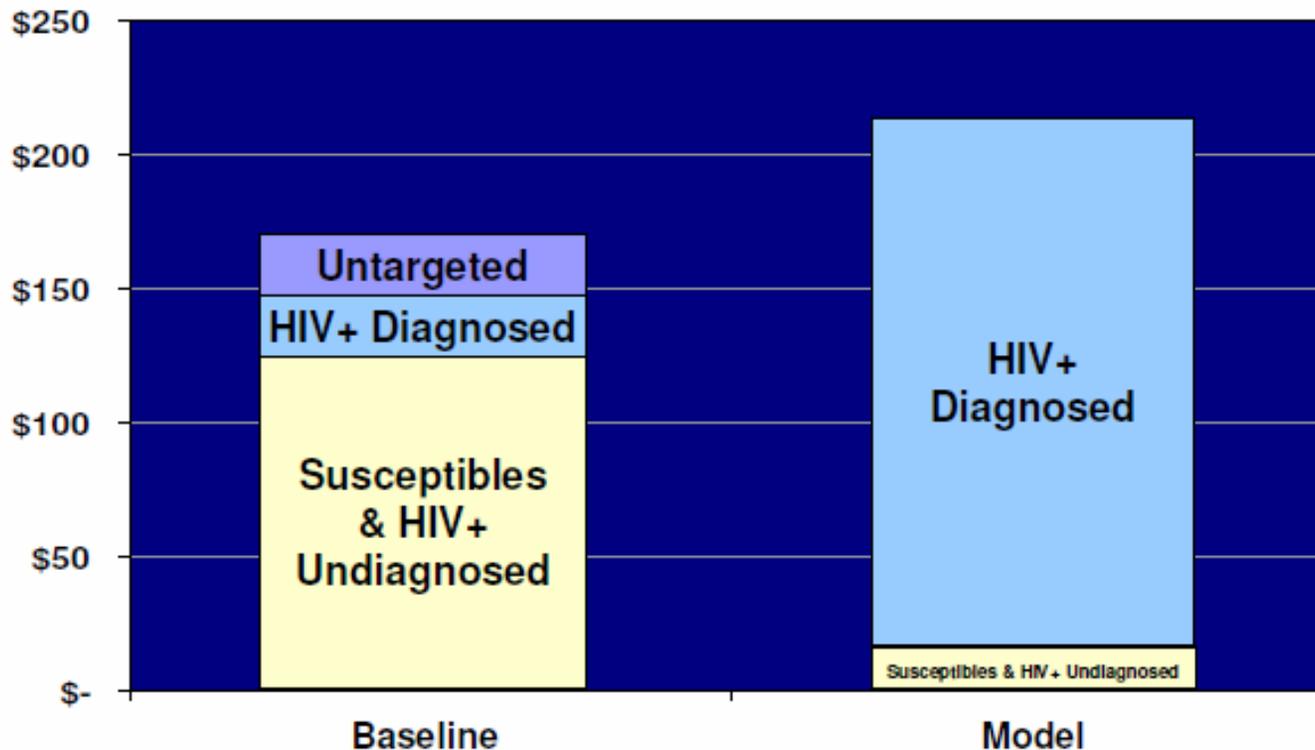
Allocations by Intervention type



▶ * Reference: Lasry, A. et al. "A Model for Allocating HIV Prevention Resources in the United States" National HIV Prevention Conference, Aug 2009

CDC National Resource Allocation Model Results

Allocations to behavioral Interventions by serostatus



▶ * Reference: Lasry, A. et al. "A Model for Allocating HIV Prevention Resources in the United States" National HIV Prevention Conference, Aug 2009

Review

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- ▶ **Current Projects**
 - ▶ Counseling and Testing Scenario Analysis
 - ▶ Resource Allocation
- ▶ **Conclusions**



Questions / Reactions / Suggestions

