

Epidemiology 101

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Community Health

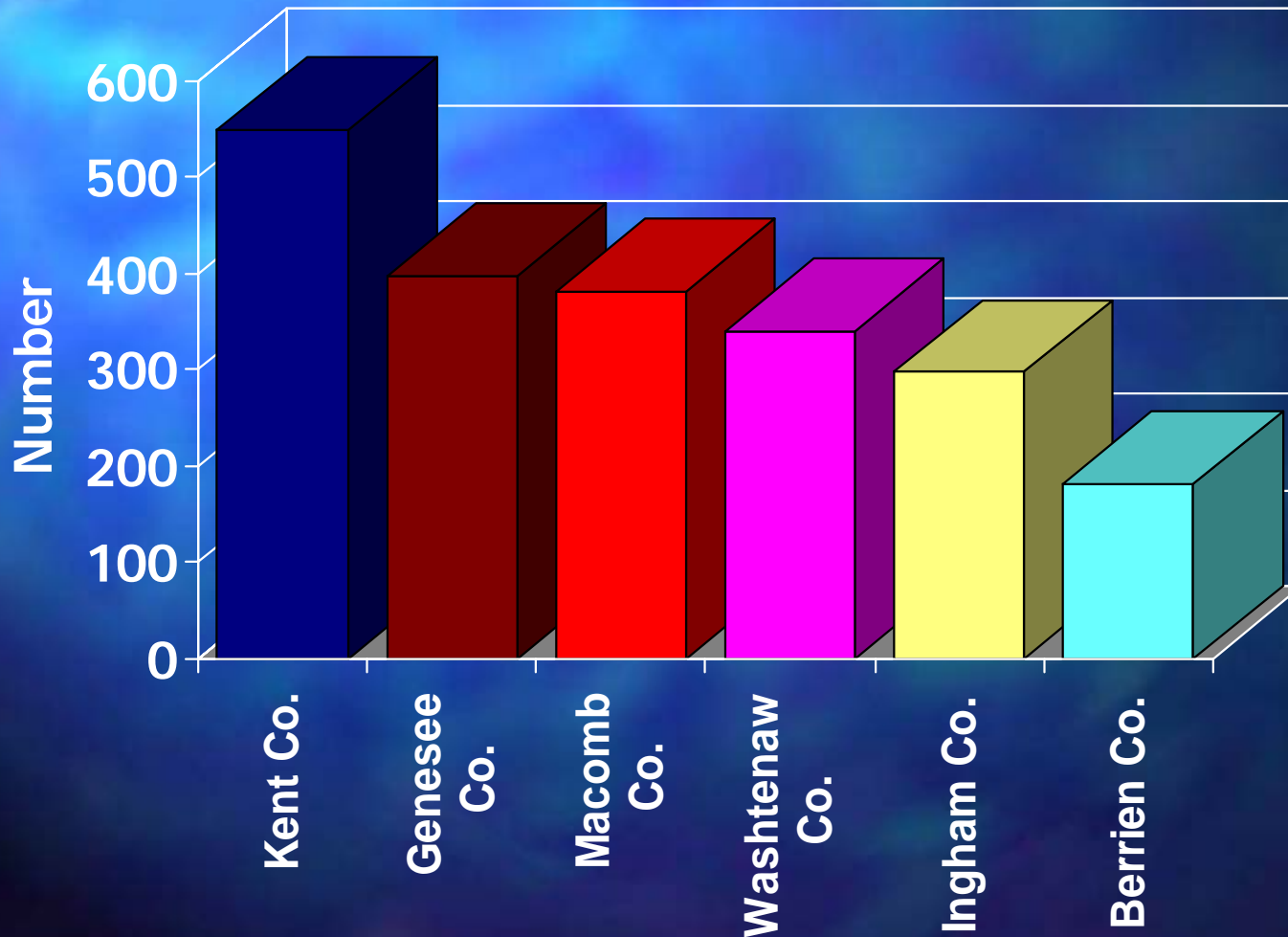
HIV/AIDS Surveillance Section

Outline

- Definitions
- Measurements
- Estimates of impact
- Tips on interpreting what you hear

Pre-test

HIV/AIDS Cases Living in Selected Counties, 1/1/04



Common Definitions

- Epidemic

- An increase above the usual or expected occurrence of an outcome (disease) within a population

- Epidemiology

- The study of the distribution and determinates of an outcome (disease) in a specified human **population**
 - Not on an individual basis

Measurements

- Case count
 - The number of individuals with a specified disease or out come

Michigan HIV/AIDS Stats

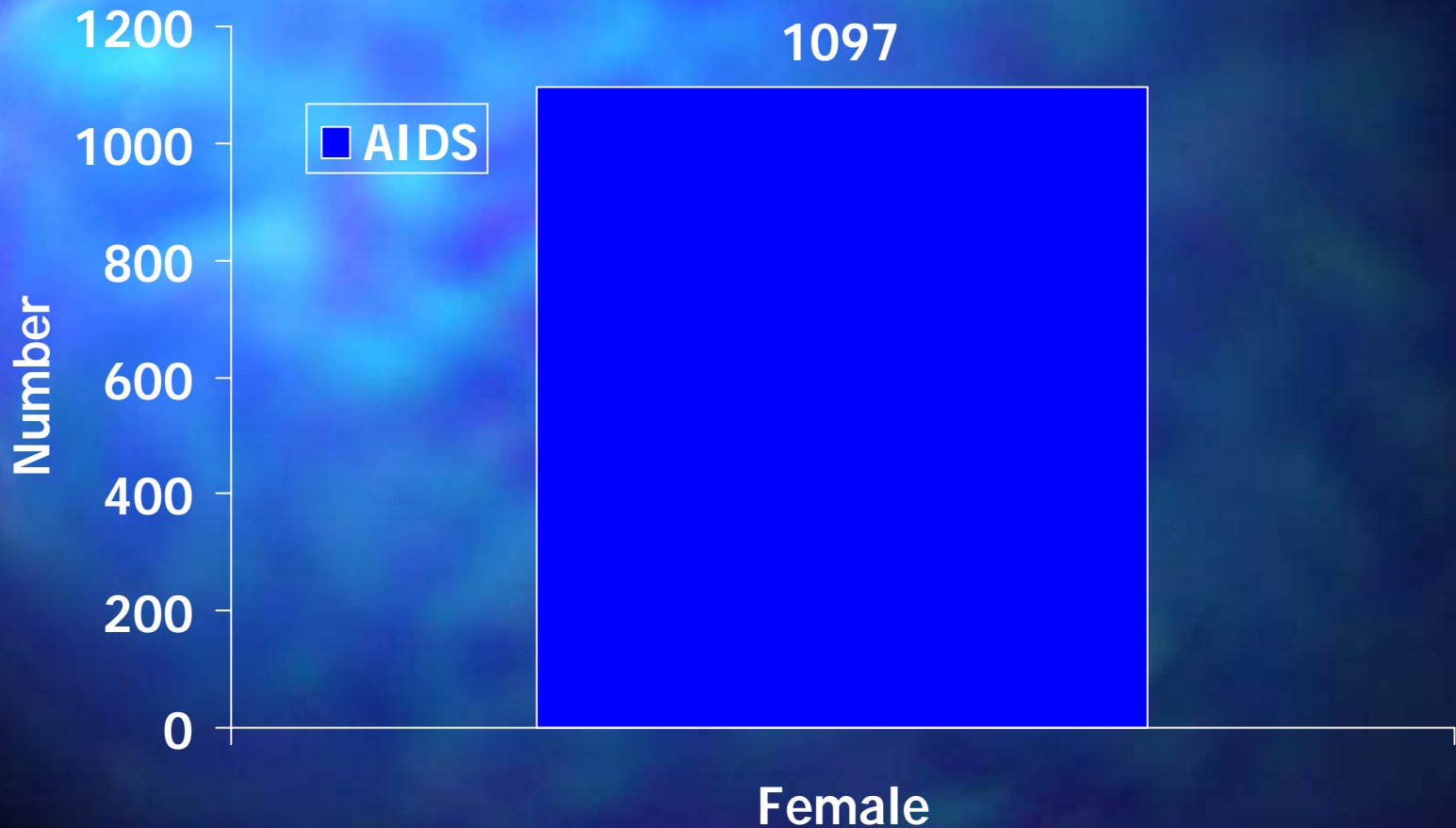
1/1/04

A	B	C	D	E	F	G	H	I	J
HIV/AIDS Surveillance Section					Quarterly HIV/AIDS Analysis				
Communicable Disease and Immunization Division					January 1, 2004 Page 1 of 10				
Bureau of Epidemiology									

**TABLE 1: Characteristics of Michigan Residents Living with HIV or AIDS
as of January 1, 2004**

	Estimate of HIV Prevalence ¹	Estimated Prevalence	Reported Living with AIDS ³		Reported Living with HIV not AIDS ³	
		Rate ²	Number	Percent ⁴	Number	Percent ⁴
MICHIGAN TOTAL	16,200	163.0	5,420	100%	5,725	100%
SEX						
Male	12,520	257	4,223	80%	4,290	75%
Female	3,680	73	1,097	20%	1,435	25%
BEHAVIOR						
Male-Male Sex	7,470	N/A	2679	57%	2459	54%
Injecting Drug Use ⁵	2,470	N/A	900	19%	798	18%
IDU w/ heterosexual	1,170	N/A	427	9%	376	8%
IDU w/o heterosexual	1,300	N/A	473	10%	422	9%
Male-Male Sex/IDU	840	N/A	294	6%	285	6%
Blood Products	180	N/A	77	2%	49	1%
Heterosexual ⁶	2,270	N/A	701	15%	858	19%
Partner IDU	700	N/A	217	5%	266	6%
Partner Bisexual	110	N/A	31	1%	43	1%
Partner Rec'd Aid	50	N/A	16	0%	21	0%
Partner HIV+	1,400	N/A	437	9%	528	12%
Perinatal	200	N/A	35	1%	102	2%
Undetermined ⁴	Not Applicable	N/A	734	(14%)	1174	(21%)
Presumed Heterosexual ⁷	Not Applicable	N/A	591	(11%)	298	(5%)

Number of Females Living With AIDS in MI, 1/1/04



Measurements



■ Proportion

- The part, portion, or share of cases in one group compared with the total number of cases
 - What part of the whole is affected?
- Usually displayed as a percent

■ Percent:

$$\frac{\text{\# of cases in one group}}{\text{Total \# of cases in population}} \times 100$$

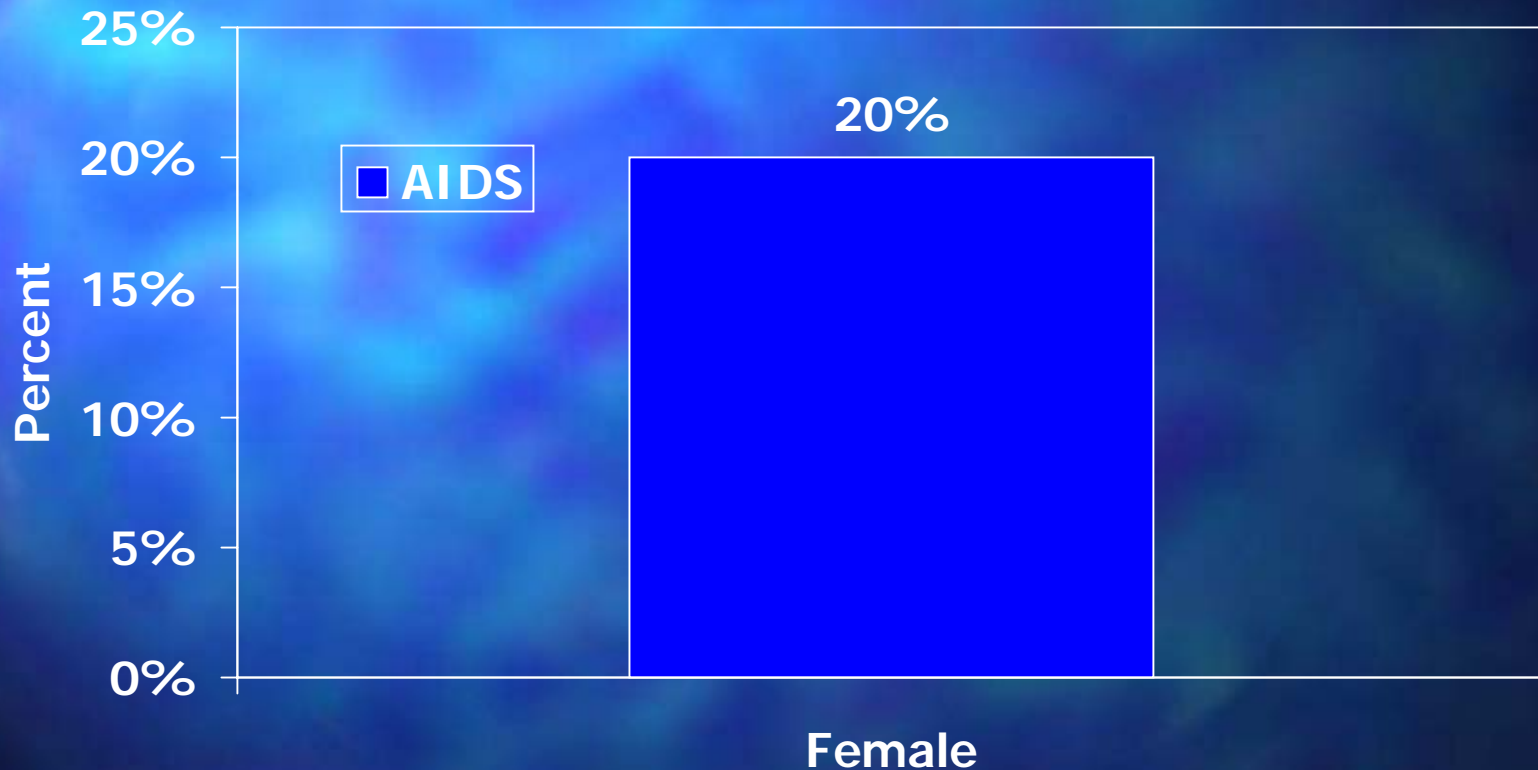
Michigan HIV/AIDS Stats

1/1/04

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Male-Male Sex/IDU	840	N/A	294	6%	285	6%
Blood Products	180	N/A	77	2%	49	1%
Heterosexual ⁶	2,270	N/A	701	15%	658	19%
Partner IDU	700	N/A	277	5%	266	6%
Partner Bisexual	110	N/A	37	1%	29	1%
Partner Rec'd Aid	50	N/A	16	0%	3	0%
Partner HIV+	1,400	N/A	437	9%	528	12%
Perinatal	200	N/A	35	1%	102	2%
Undetermined ⁴	Not Applicable	N/A	734	(14%)	1174	(21%)
Presumed Heterosexual ⁷	Not Applicable	N/A	595	(11%)	791	(14%)

Percent of Females Living With AIDS in MI, 1/1/04



Measurement

■ Rate

- The frequency of the occurrence of an outcome (disease).
- Useful when comparing the impact of disease between groups.
 - Takes into account the entire population of a group...not just those with the disease.
- Usually display as “per 100,000 population.”
- Ex.

of cases in one group

Total population (Census)

X **100,000**

Michigan HIV/AIDS Statistics, 1/1/04

White Males:

$$5,300 \text{ living in MI} / 3,836,091 \text{ (2000 Census)} \times 100,000 \\ = \mathbf{138.2 \text{ White males per } 100,000}$$

Or **1 in 724 White males** in Michigan are living with HIV/AIDS

Black Males:

$$6,710 \text{ living in MI} / 663,406 \text{ (2000 Census)} \times 100,000 \\ = \mathbf{1011.4 \text{ Black males per } 100,000}$$

Or **1 in 99 Black males** in Michigan are living with HIV/AIDS

Measurement

- Rate (con't)
 - Problems:
 - Small population numbers make rates unreliable; May artificially inflate the rate
 - Population estimates are taken from the census counts and could be out of date

Estimate of Impact

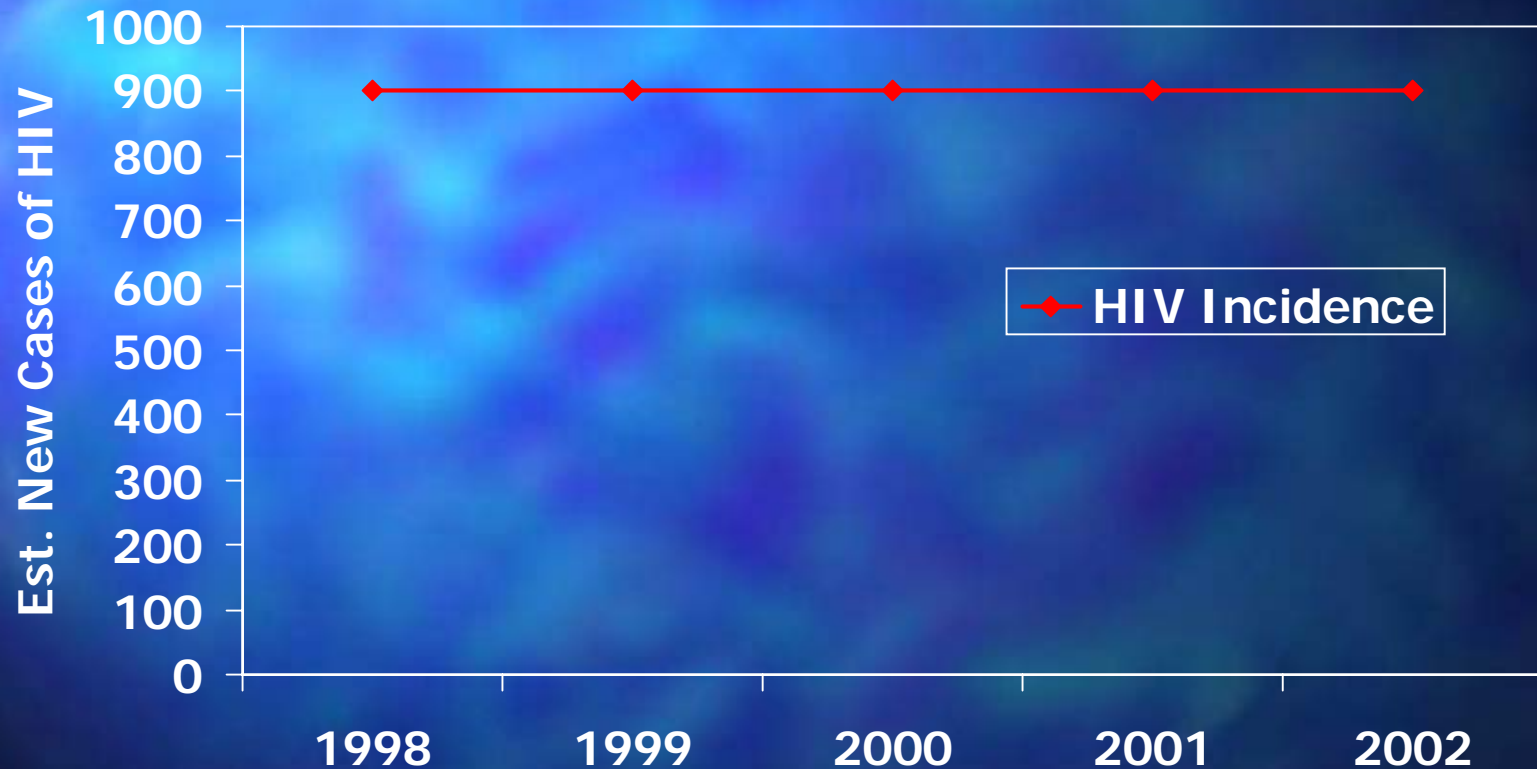
- Incidence

- The number of new cases of a disease in a defined population during a specified time period (usually a year)

- Cumulative incidence

- The total number of new infections that have occurred over an extended period of time, regardless of death status

Trend for HIV Incidence for State of Michigan, 1/1/04



Estimate of Impact

■ Prevalence

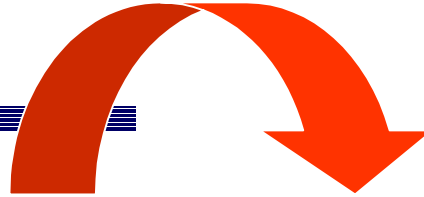
- The total number of persons living with a disease at any given time

■ Equation:

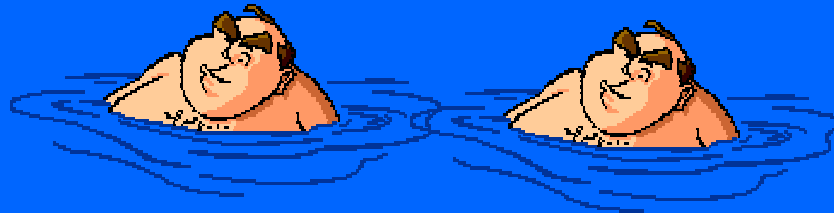
Cumulative Incidence - Cumulative Death



New HIV Diagnoses (Incidence)

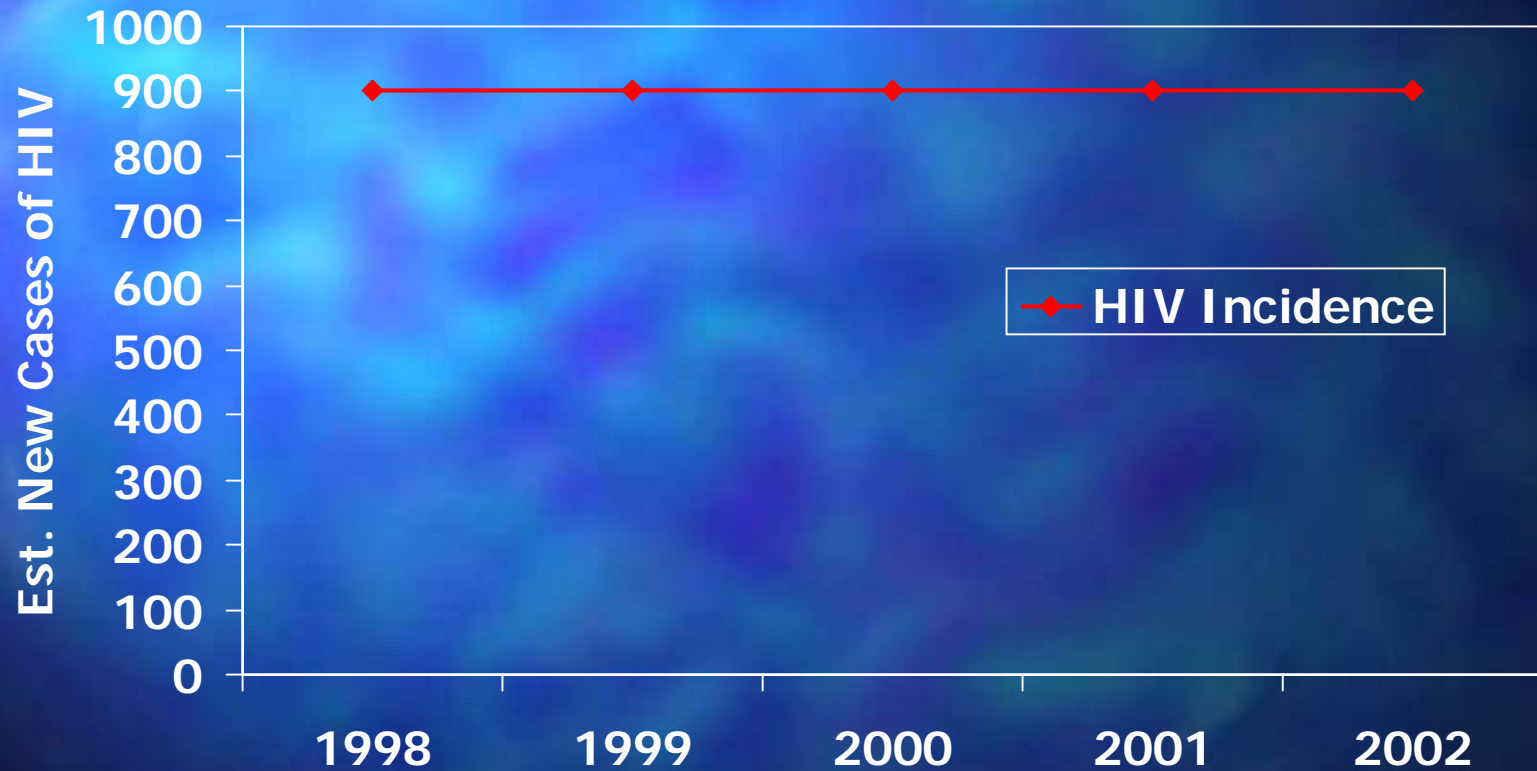


**People living with HIV/AIDS
(Prevalence)**

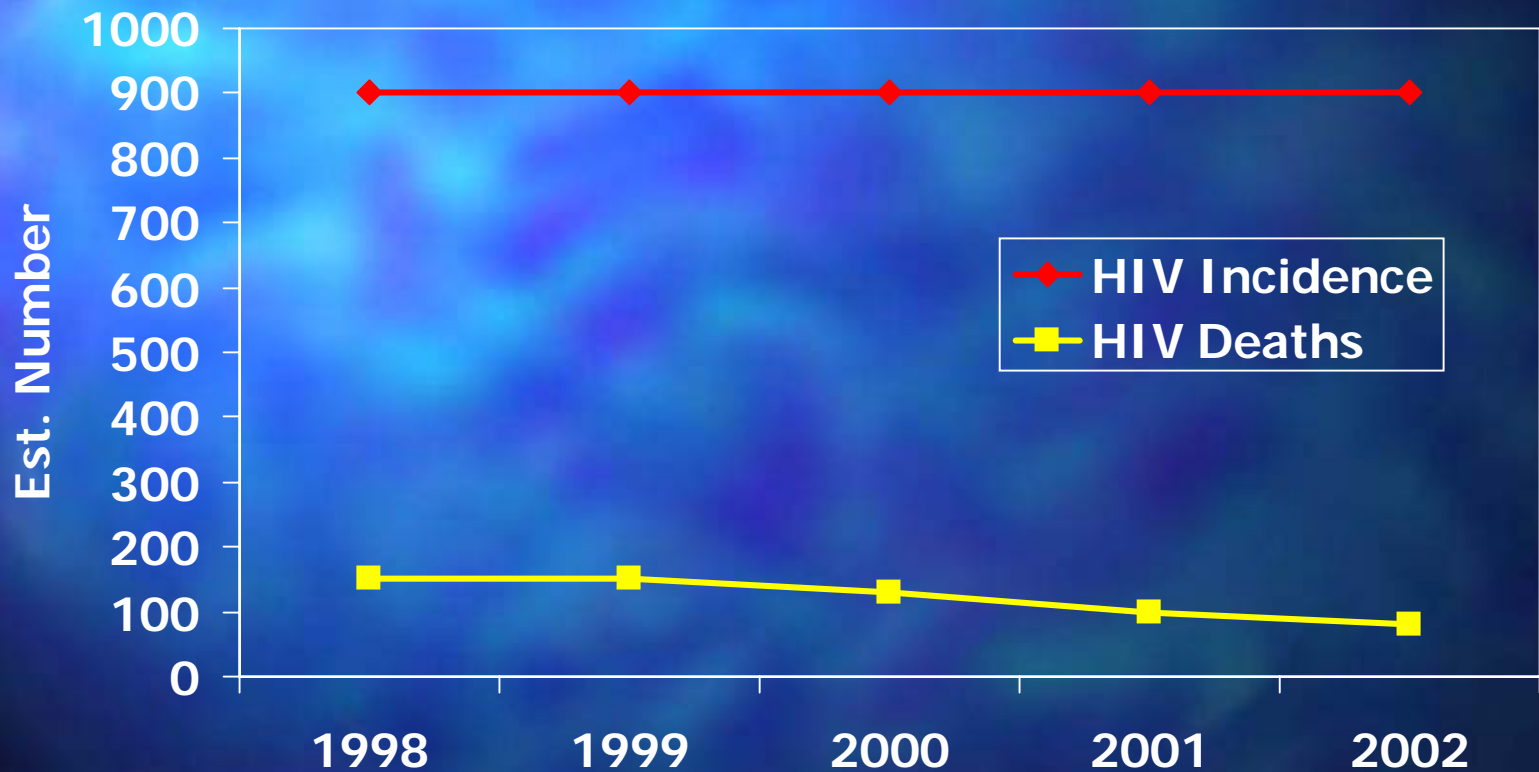


Deaths Due to HIV

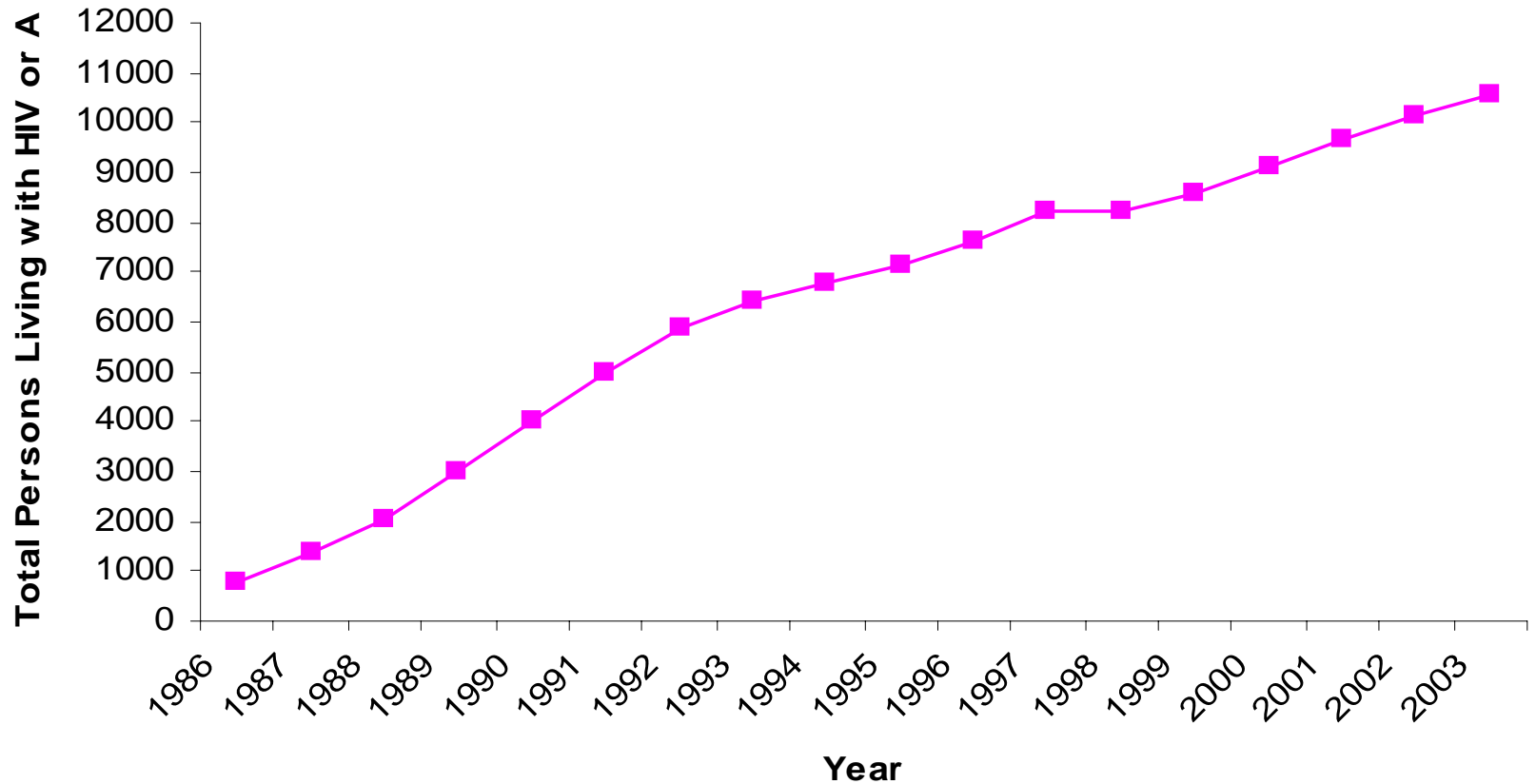
HIV/AIDS Incidence



HIV/AIDS Incidence & Deaths



HIV/AIDS Prevalence for Michigan, 1/1/04



Estimates of Impact

- Trends

- Directions of change

- Increase

- Decrease

- Stable

- Amount (or extent) of change

- Presented as a "percent increase or decrease"

Estimates of Impact

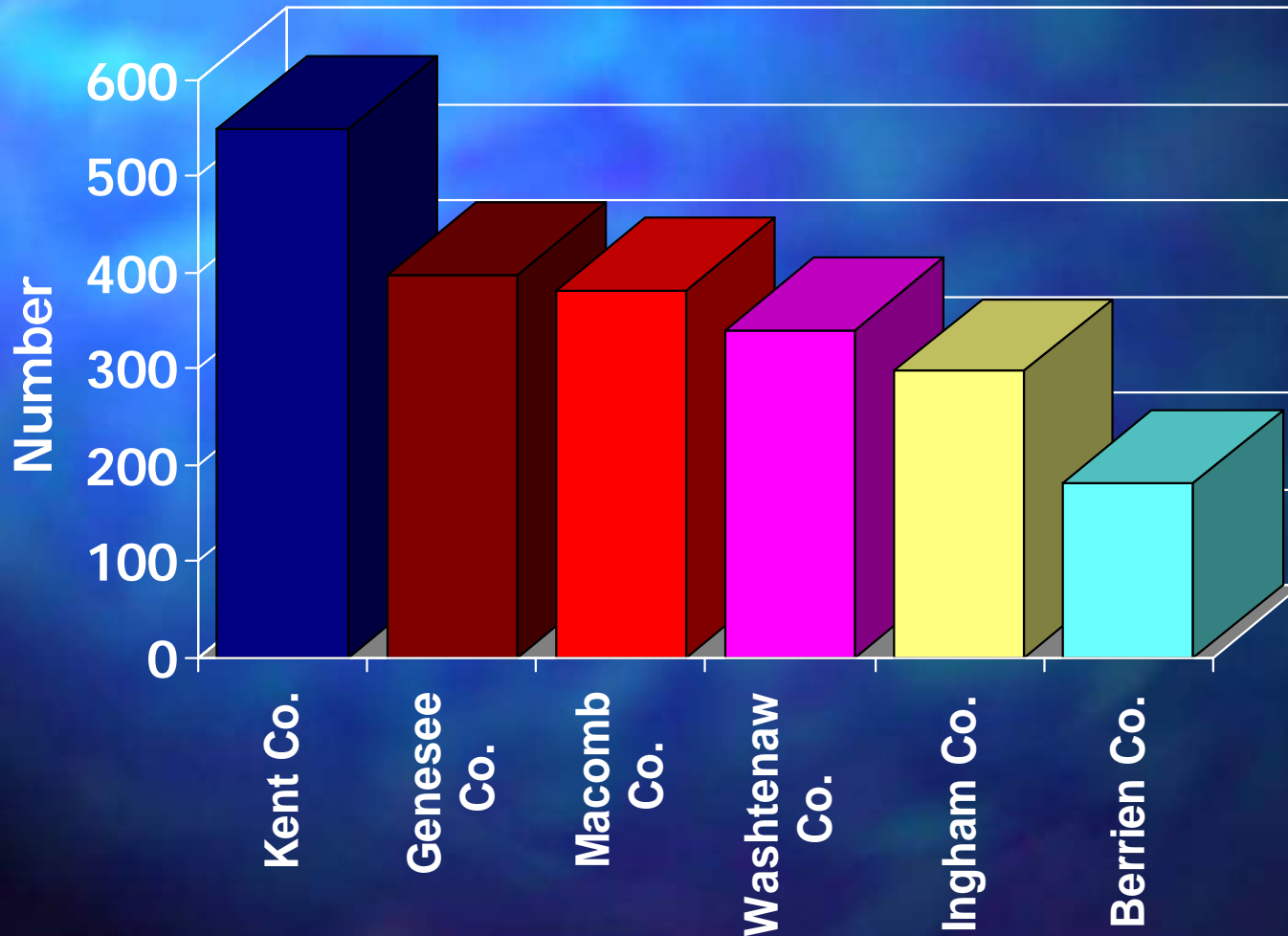
- Date variables
 - Date of report vs. Date of diagnosis
 - Date of report: the date that the case report form is entered into Michigan's HIV/AIDS reporting system
 - Date of diagnosis: the date that the patients tests positive for HIV infection or for any aids-defining illnesses

Take Home Points

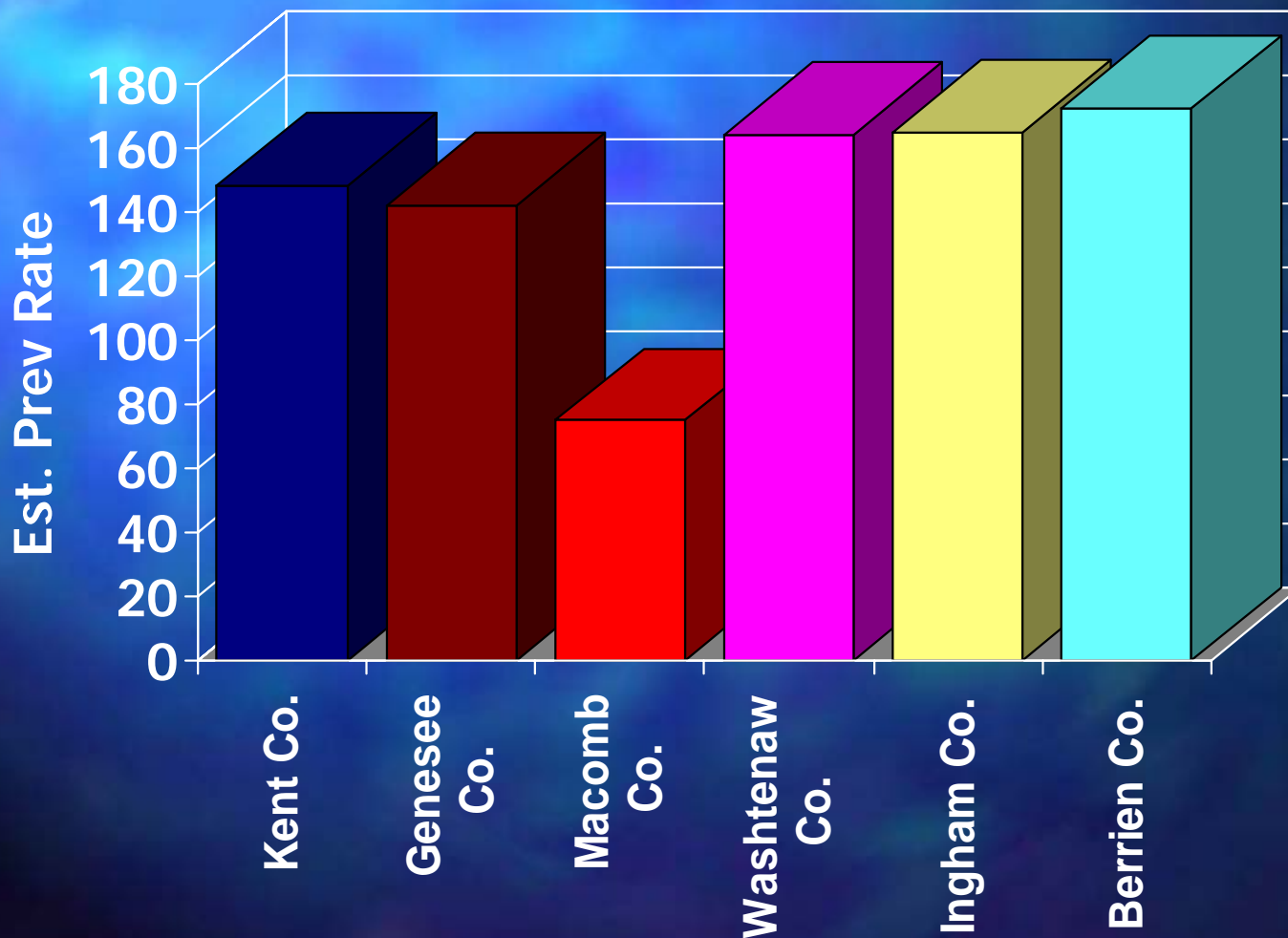
- Understand what you are looking at
 - Number v. Percent v. Rate
 - Time periods
 - Populations
- Don't over interpret small changes or differences
- Check for complete presentation of data
 - Graphs on TV...do they have labels and titles?

Pre-test...revisited

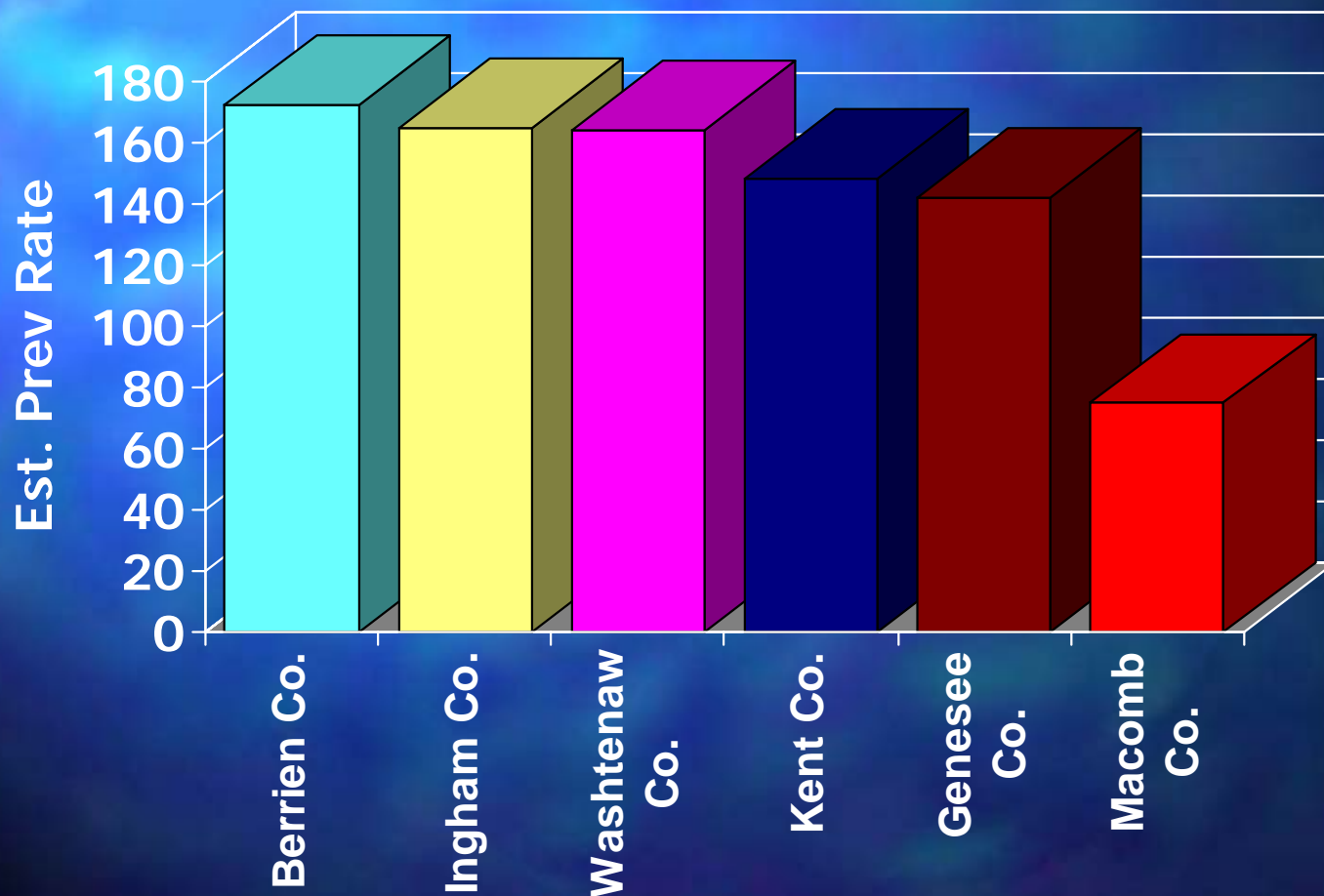
HIV/AIDS Cases Living in Selected Counties, 1/1/04



HIV/AIDS Estimated Prev. Rate for Those Living in Selected Counties, 1/1/04



HIV/AIDS Estimated Prev. Rate for Those Living in Selected Counties, 1/1/04



Thank you so much for your attention!!

Questions????

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