

Evaluating the 2003 Birth Certificate Data: Preliminary Findings from the PRAMS Data Quality Improvement Project

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Pregnancy Risk Assessment Monitoring System PRAMS

PRAMS

- State-based surveillance system funded by CDC
- Birth certificates are sampling frame
 - Links BC to questionnaire data

PRAMS Data Quality Improvement Project

- Goal to assess sensitivity and specificity of selected 2003 birth certificate and PRAMS items using the medical record as the gold standard.

This presentation will focus on the birth certificate items that were included in the project.

Previous Birth Certificate Evaluations

- Evaluations of the 1989 version
 - Excellent sensitivity of birth weight, sex, mode delivery
 - Moderate to low sensitivity for medical complications
 - Excellent specificity
- 2003 revised birth certificated includes
 - Maternal height, pre-pregnancy weight
 - Maternal weight at delivery
 - Augmentation/induction labor
 - Gestational diabetes, gestational hypertension

PRAMS Data Quality Improvement Project

- In FY 2011, CDC's Division of Reproductive Health and CDC's Division of HIV Prevention co-funded:
 - New York City Department of Mental Health and Hygiene
 - Vermont Department of Health

Sample

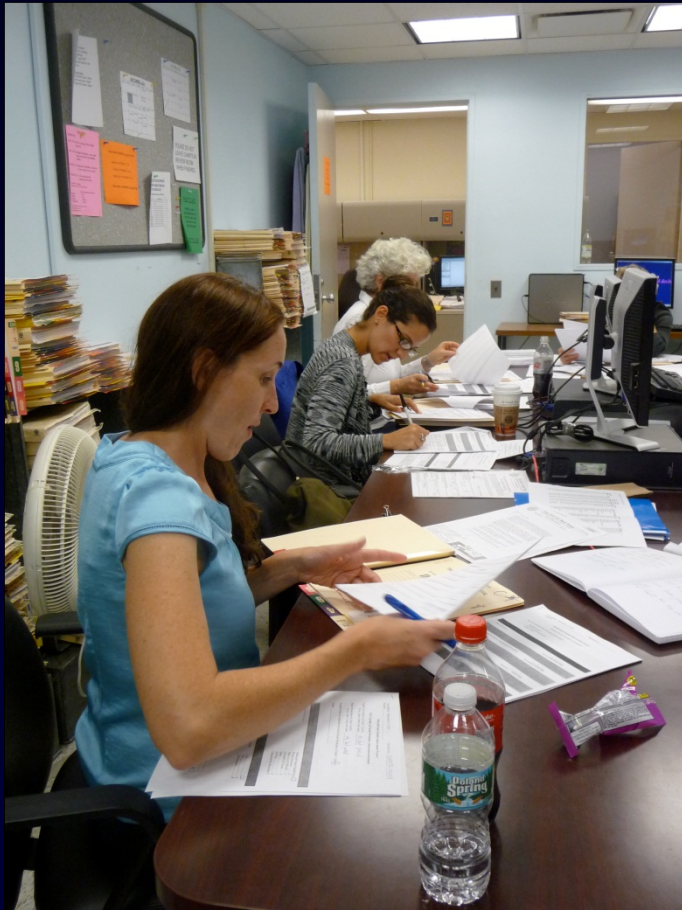
- New York City
 - All PRAMS respondents who had delivered at a city hospital January-June 4, 2009
 - N=41 hospitals
 - N=603 respondents
- Vermont
 - All PRAMS respondents who delivered at a Vermont hospital or at a New Hampshire hospital close to Vermont's state border during January-August 2009
 - N=13 hospitals
 - N=664 respondents

Abstraction of Data

- Abstracted information from parent worksheet, prenatal care and hospital delivery records onto a standardized abstraction form
- Data abstractors were nurse midwives or trained medical abstractors



Abstraction of Data cont.



- Abstractors trained on use of abstraction form
 - To evaluate reliability of record abstraction, about 25 records in New York City and Vermont were re-abstracted
 - Errors in abstraction were noted, reviewed, and resolved

Analysis

- Weighted analyses
- Stratified by site
- Missing values ranged from
 - NYC: BMI 33%
 - VT: BMI 13%
- Calculated Sensitivity, Specificity, 95% Confidence Intervals (CI) for categorical variables
- Pearson correlations for continuous variables

Analysis

- Sensitivity and Specificity
 - High (>90%)
 - Moderate (70-90%)
 - Low (<70%)
- Continuous variables
 - Pearson Correlations - assesses linear relationship
 - 1 is perfect correlation

Analysis

- Medical record gold standard for most items
- No gold standard for height and pre-pregnancy weight
 - Based on self-report captured on parent worksheet
 - Examined correlations between data abstracted

Pre-pregnancy Items

- Mother's height
- Mother's weight
- Body mass index

- Previous live birth
- Previous C-section
- Previous preterm

During Pregnancy Items

- Gestational diabetes
- Gestational hypertension
- Weight at delivery

Labor and Delivery Items

- Augmentation
- Induction
- Prolonged labor
- Premature rupture of the membranes
- Vaginal delivery
- C-section

Infant Items

- Neonatal intensive care unit admission
- Gestational age - obstetric estimate
- Gestational age - LMP estimate

Preliminary Results

Demographics

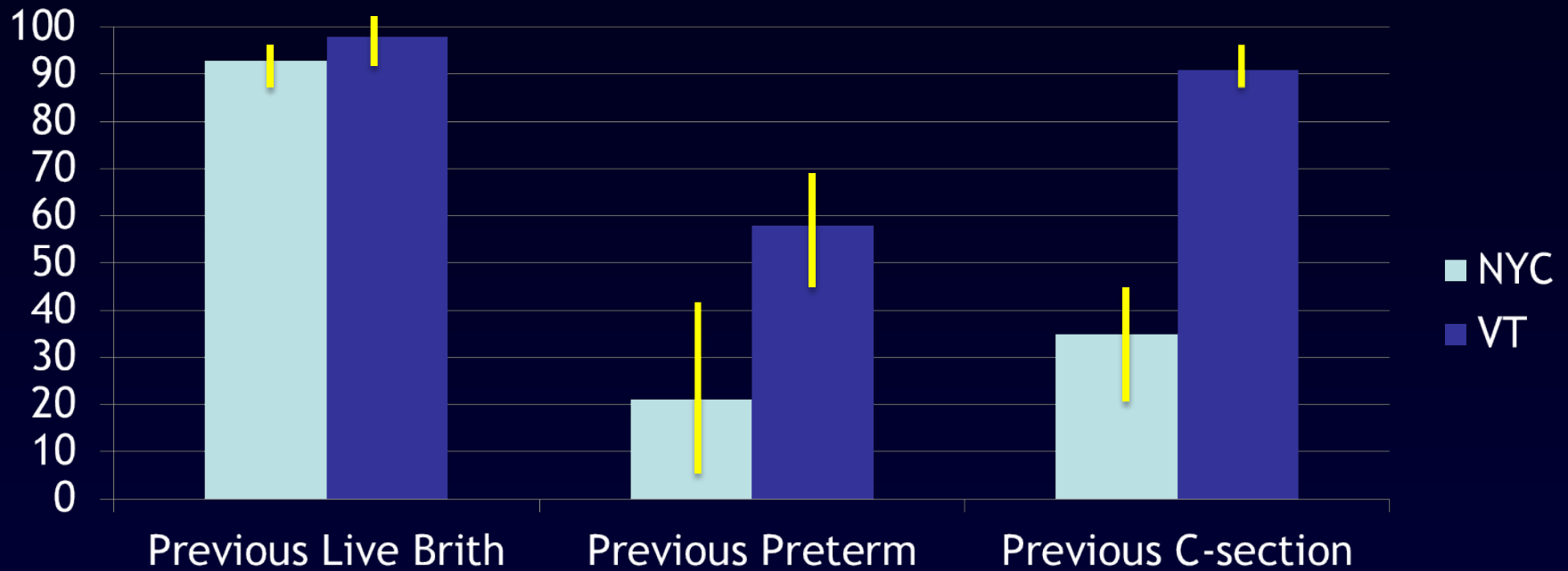
Demographic Characteristics

	NYC	Vermont
<12 Years Education	25	9
WIC	57	46
Unmarried	46	37
White-NH	22	95
Black-NH	20	0.6
Hispanic	42	1
Other	15	3

Pre-pregnancy Items - Correlations

Worksheet vs. BC	<u>NYC</u>	<u>Vermont</u>
Height	.71	.78
Pre-pregnancy weight	.82	.99
BMI	.80	.97

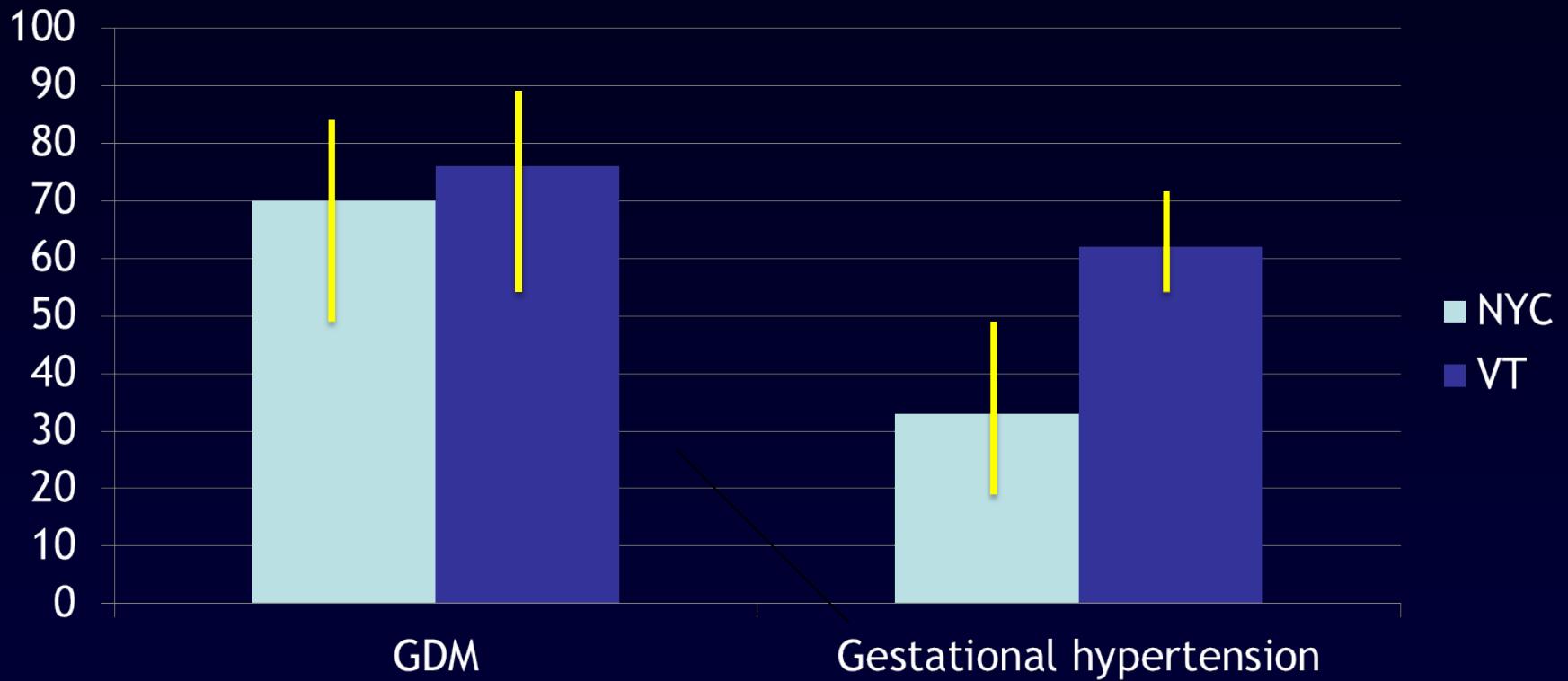
Sensitivity for Pre-pregnancy Items



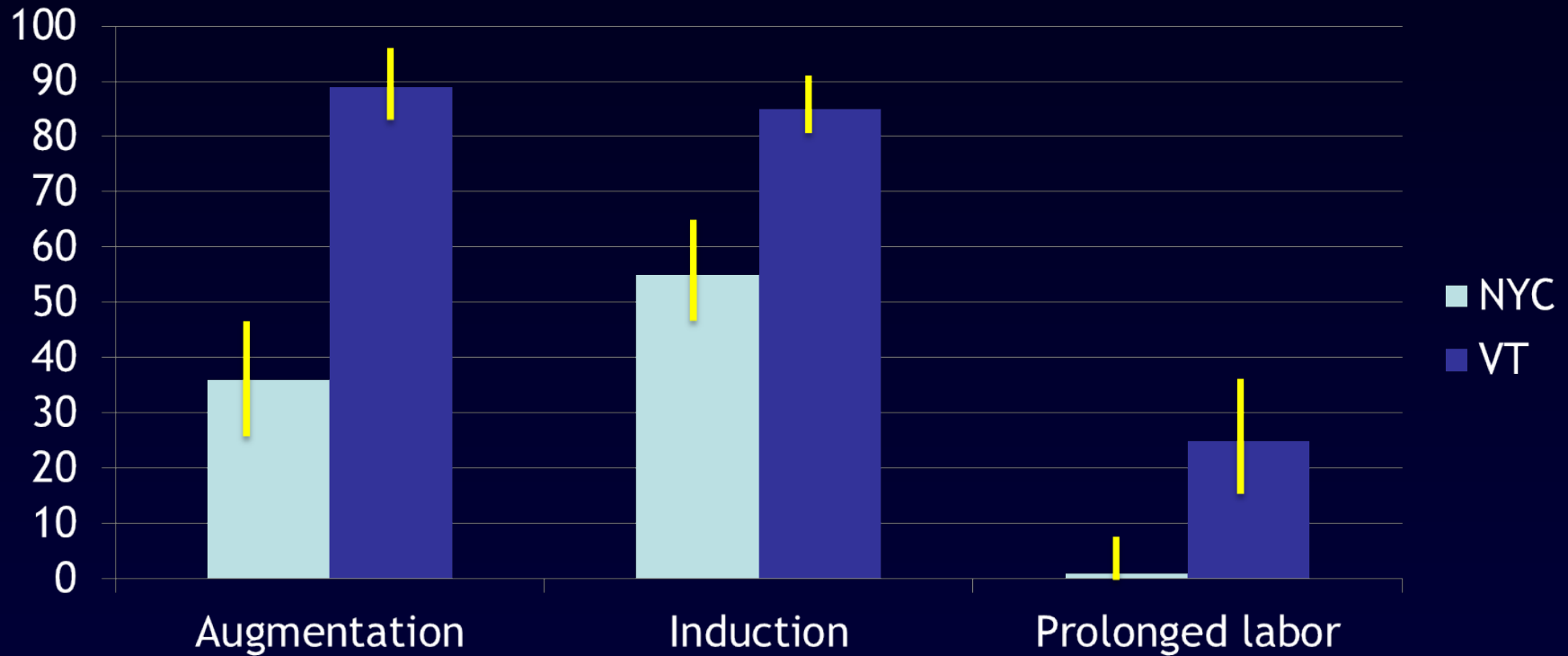
During Pregnancy Items - Correlations

	<u>NYC</u>	<u>Vermont</u>
Weight at delivery	.87	.94

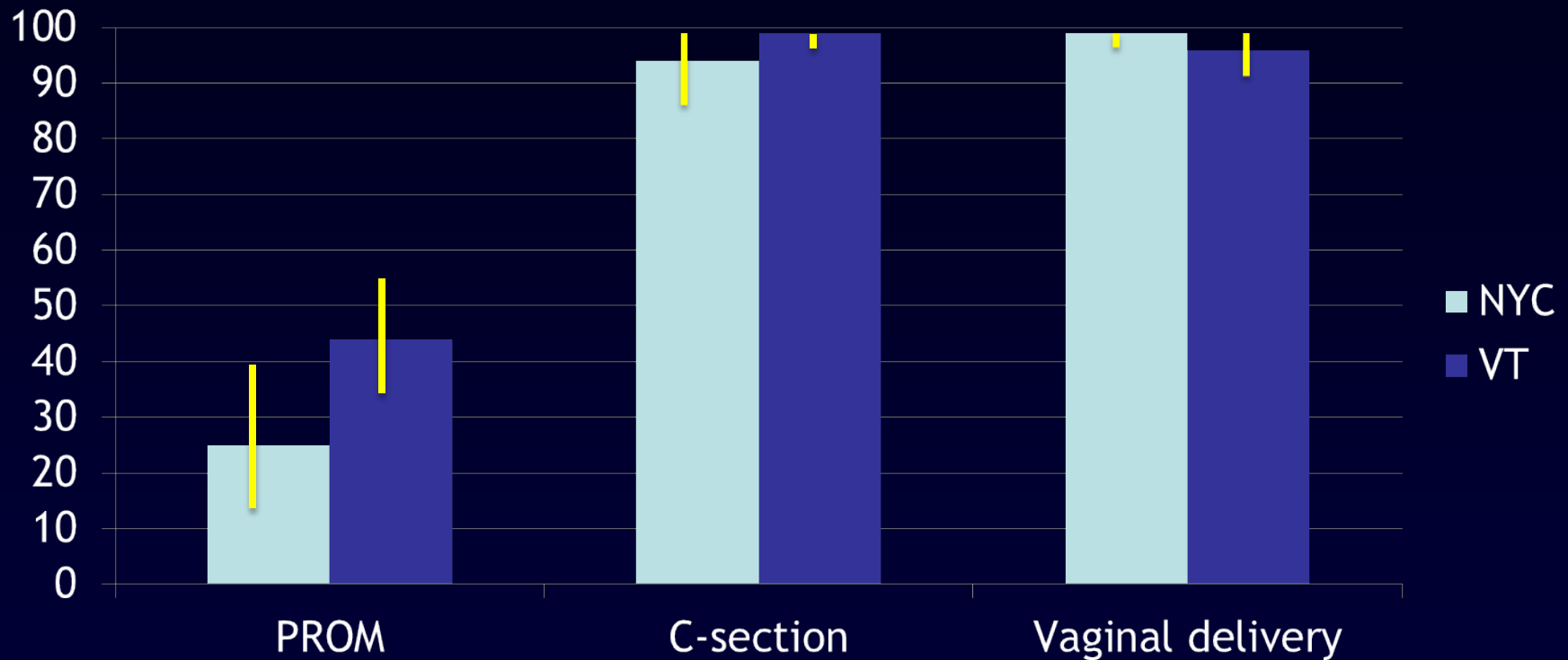
Sensitivity for Pregnancy Items



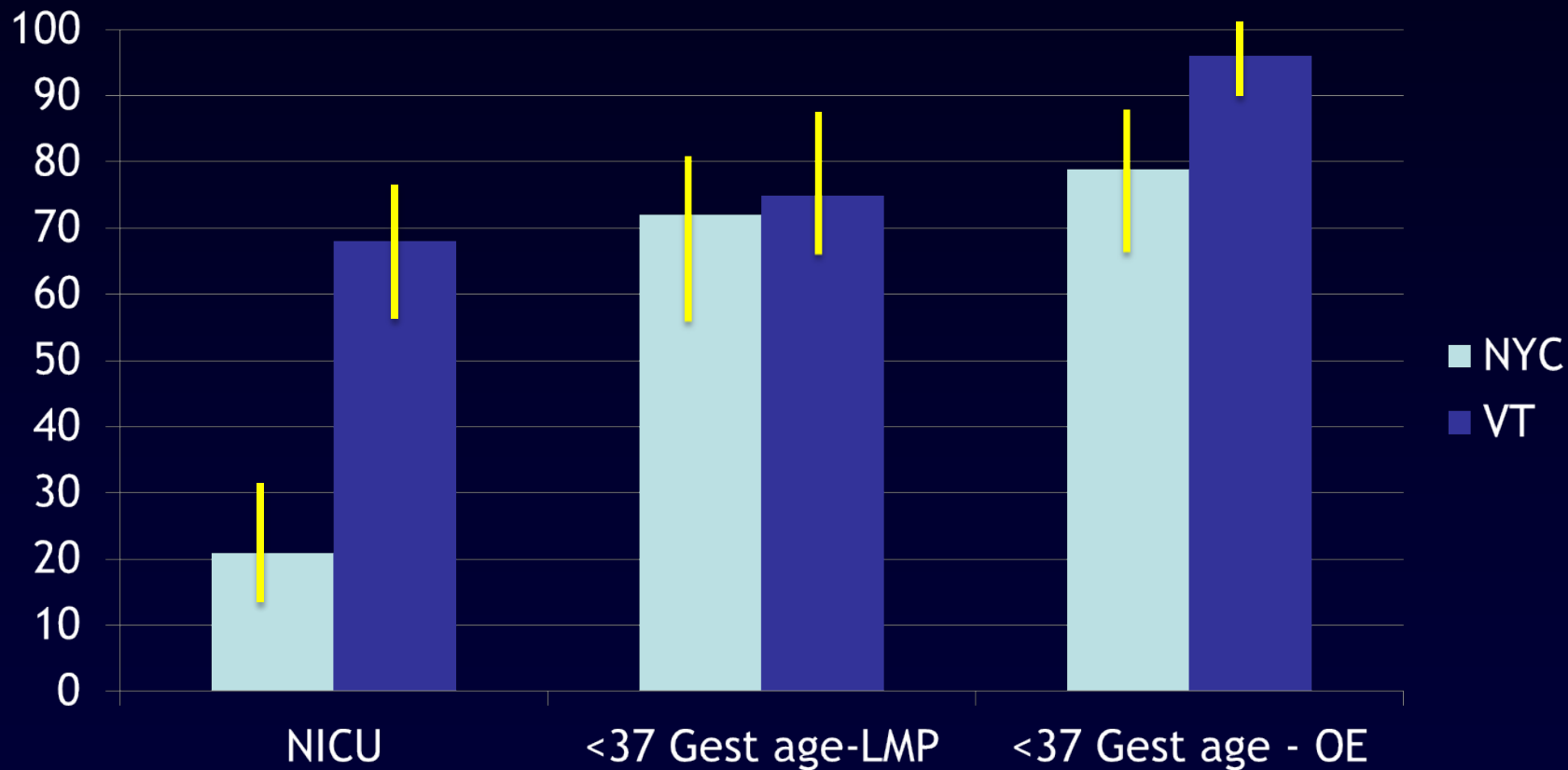
Sensitivity for Labor and Delivery Items



Sensitivity for Labor and Delivery Items



Sensitivity for Infant Items



Sensitivity-Summary

Both
 VT Only
 NYC Only

High
 >90%

Previous LB
 Vaginal delivery
 C-section

Previous C-section
 GA <37 OB

Moderate
 70-90%

GDM
 GA <37 LMP

Augmentation
 Induction

GA <37 OB

Low
 <70%

Previous preterm
 Prolonged labor
 NICU
 Gest. hypertension
 PROM

Augmentation
 Induction
 Previous C-section

Specificity

>90% for all items

Summary

- Consistent with previous studies
 - High specificity overall
 - High sensitivity for mode of delivery
 - Moderate to low sensitivity for pre-pregnancy and pregnancy items, complications
- New items
 - Good correlations for pre-pregnancy BMI - VT
 - Moderate to low sensitivity for induction and augmentation - varied by site

Limitations

- Possible data abstraction errors
- Conducted in only 2 sites
- Large percent of missing values pre-pregnancy BMI
- Wide confidence intervals for rare conditions

Implications

- New item, pre-pregnancy BMI, collected from mother good addition
- Differences between sites suggests medical record documentation, hospitals procedures for birth certificate reporting affects sensitivity
- Items with poor data quality for both sites suggest poor documentation in medical record
 - Link items with low sensitivity to other data sources
 - Possibly drop in next revision

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CDC Disclaimer

- The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention

Evaluating the Accuracy of Birth Certificate Data: Preliminary Findings from the PRAMS Data Quality Improvement Project (DQIP)

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Analysis

Condition
(according to medical record)

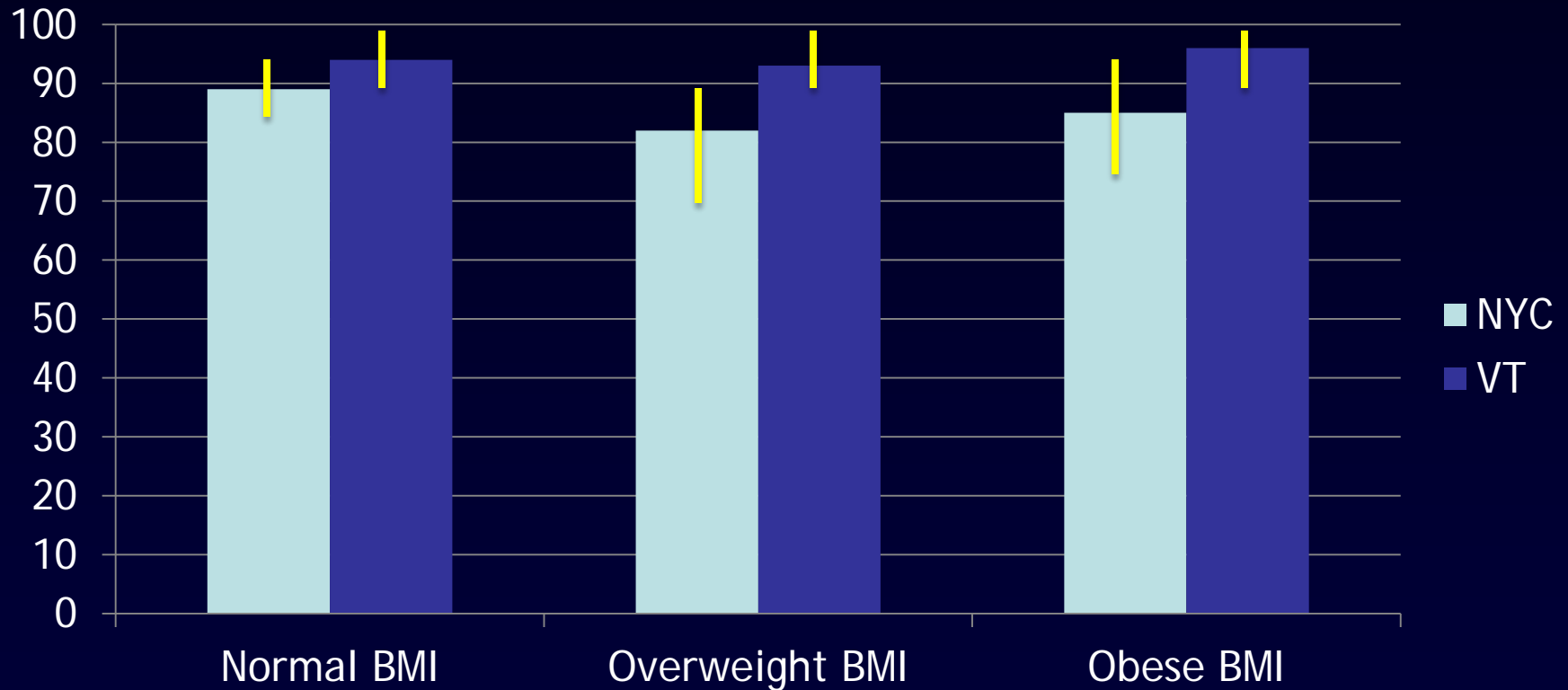
	Yes	No
Yes	True Positive	False Positive
No	False Negative	True Negative

Data Source

Sensitivity=
True Positive
Condition (Yes)

Specificity=
True Negative
Condition (No)

Sensitivity for Pre-pregnancy Items



Analysis

Condition
(according to medical record)

	Yes	No
Yes	True Positive	False Positive
No	False Negative	True Negative

Data Source

Sensitivity=
True Positive
Condition (Yes)

Specificity=
True Negative
Condition (No)

Analysis

Condition
(according to medical record)

	Yes	No
Yes	True Positive	False Positive
No	False Negative	True Negative

Data Source

Sensitivity=
True Positive
Condition (Yes)

Specificity=
True Negative
Condition (No)

2003 Birth Certificate

- Parent Worksheet
 - Pre-pregnancy weight
 - Height
- Facility Worksheet
 - Medical complications
 - Pregnancy history
 - Labor and Delivery complications
 - Infant items

Availability of records

- New York City
 - Prenatal record (50.8% full, 43.6% partial)
 - Hospital record (99.4%)
- Vermont
 - Prenatal record (89.3% full)
 - Hospital record (99.8%)

Analysis

- Sensitivity
 - % of people who have a condition that are correctly classified with the condition on data source

- Specificity
 - % of people who do not have a condition that are correctly classified without condition on data source

Strengths

- Representative of live births in each locality
- Two different locations: one urban and one rural