

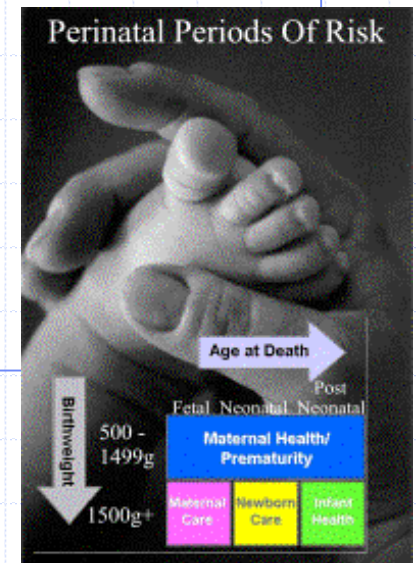
Perinatal Periods of Risk

Practice Collaborative

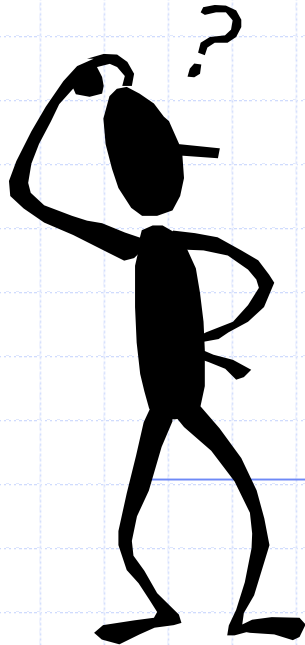
Frequently Asked Data & Analytic Questions

Bill Sappenfield

Vera Haynatzka

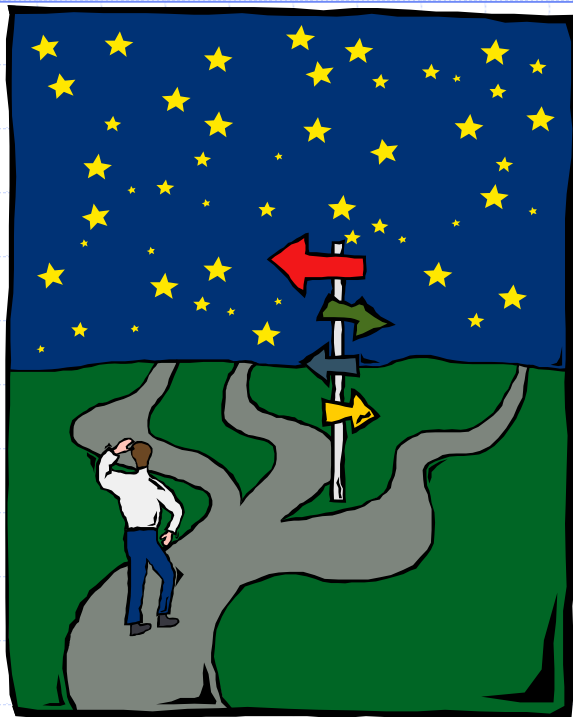


"I have just one more question..."



New PPOR User

“What do you mean by two PPOR Analytic Phases?”



New PPOR User

What do you mean by PPOR Analytic Phases?

- ◆ *Phase 1: Identifies the populations with excess mortality.* It examines the 4 mortality components—Maternal Health/Prematurity, Maternal Care, Newborn Care & Infant Health—for various populations and uses a reference group to estimate excess mortality.
- ◆ *Phase 2: Explains the excess mortality.* It examines reasons for the excess mortality through further epidemiologic studies, mortality reviews and community assessments.

Phase 1 PPOR Analysis: Boston, 1995-97

**Number of
Deaths**

Age at Death

Fetal Neonatal Post neonatal

500-
1499g

108

1500g

77

27

29

Total = 241

% of Excess Mortality

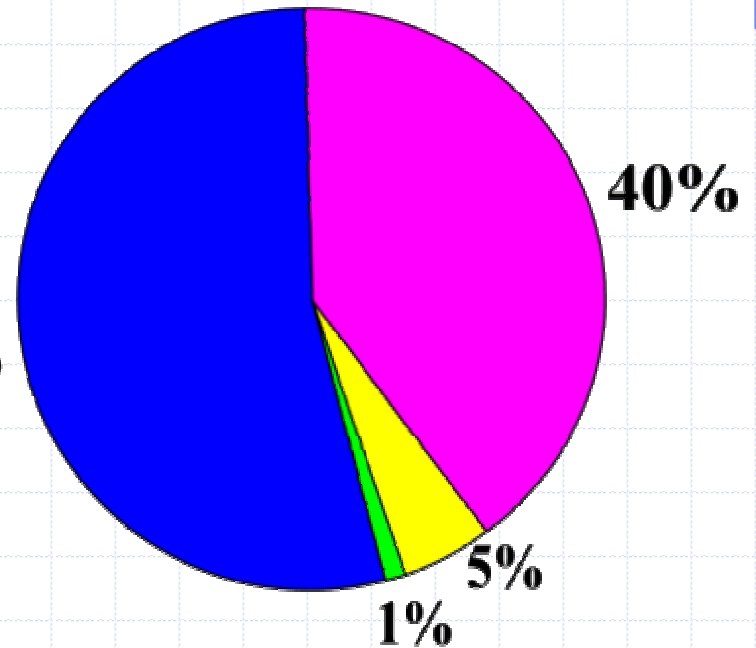
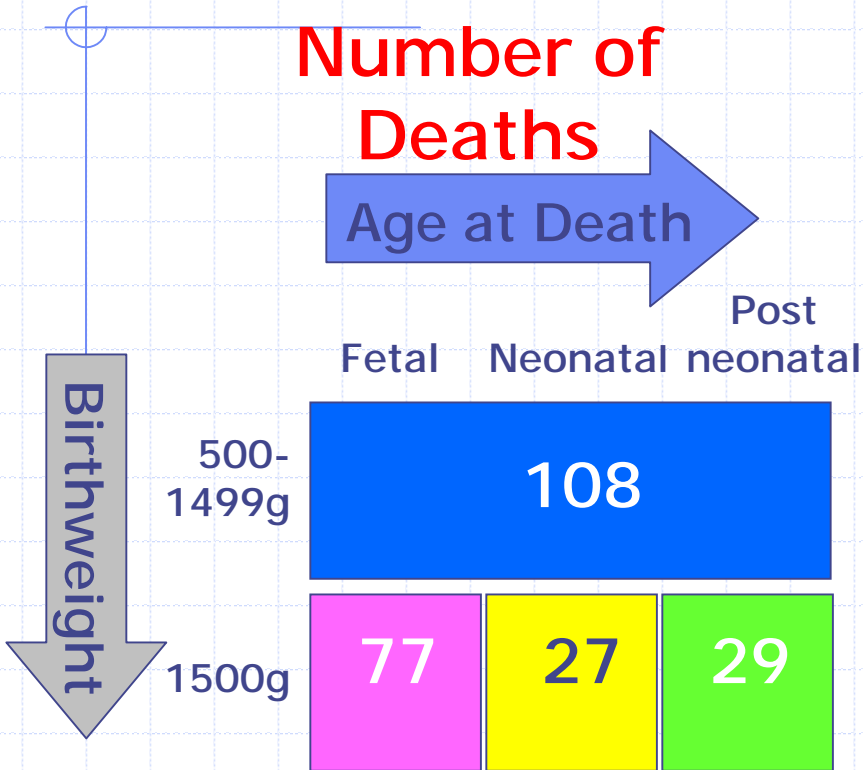
54%

40%

1%

5%

Total Excess = 106



Phase 2 Studies

**Maternal Health/
Prematurity**

**Birthweight
Distribution**

**Birthweight-
Specific
Mortality**

Infant Health

SIDS

Injury

Infection

Anomalies

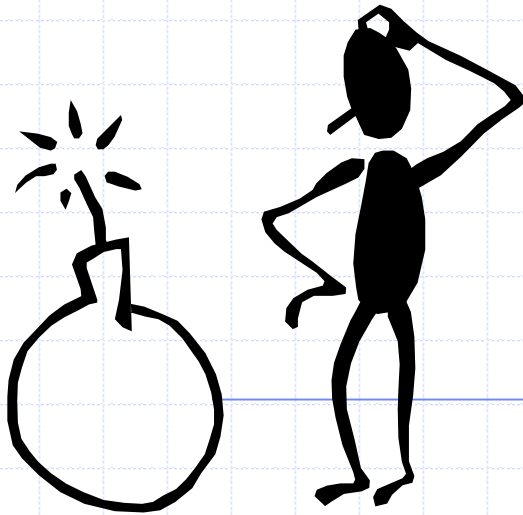
Fetal & Infant Mortality Reviews

- ◆ Focus FIMR activities on the group contributing to the gap.
- ◆ Describe in greater depth the risk factors, events or services that may contribute to the gap.
- ◆ Validate the quality of vital records and other information.

“Paint the faces behind the numbers”

“What are linked birth and infant death files?”

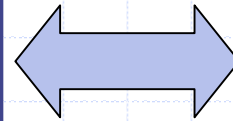
New PPOR User



Linked Birth & Death Certificates

Infant Deaths

Live Birth Certificate
Birth Characteristics



Infant Death Certificate
Death Characteristics

Fetal Deaths

Fetal Death

Certificate

Birth Versus Death Cohort

Birth Cohort

Births



Deaths



1999

2000

Death Cohort

Births



Deaths

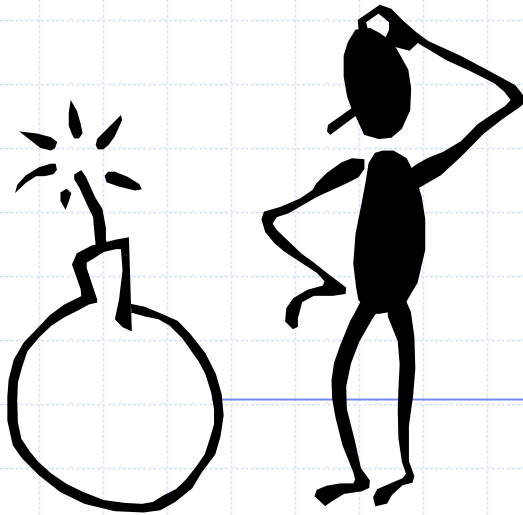


1999

2000

“What is the quality of our certificates? Can we use Fetal Deaths?”

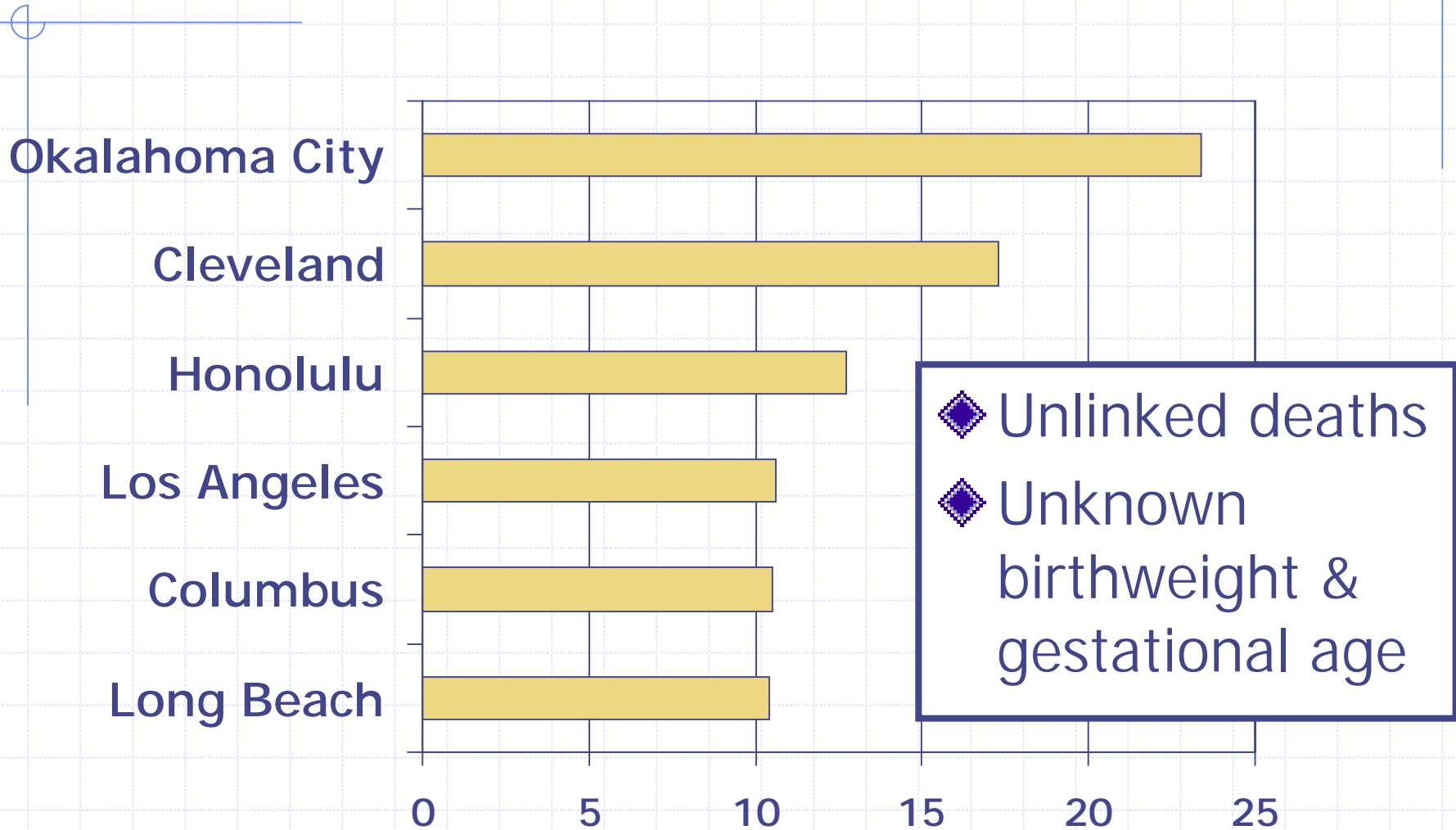
New PPOR User



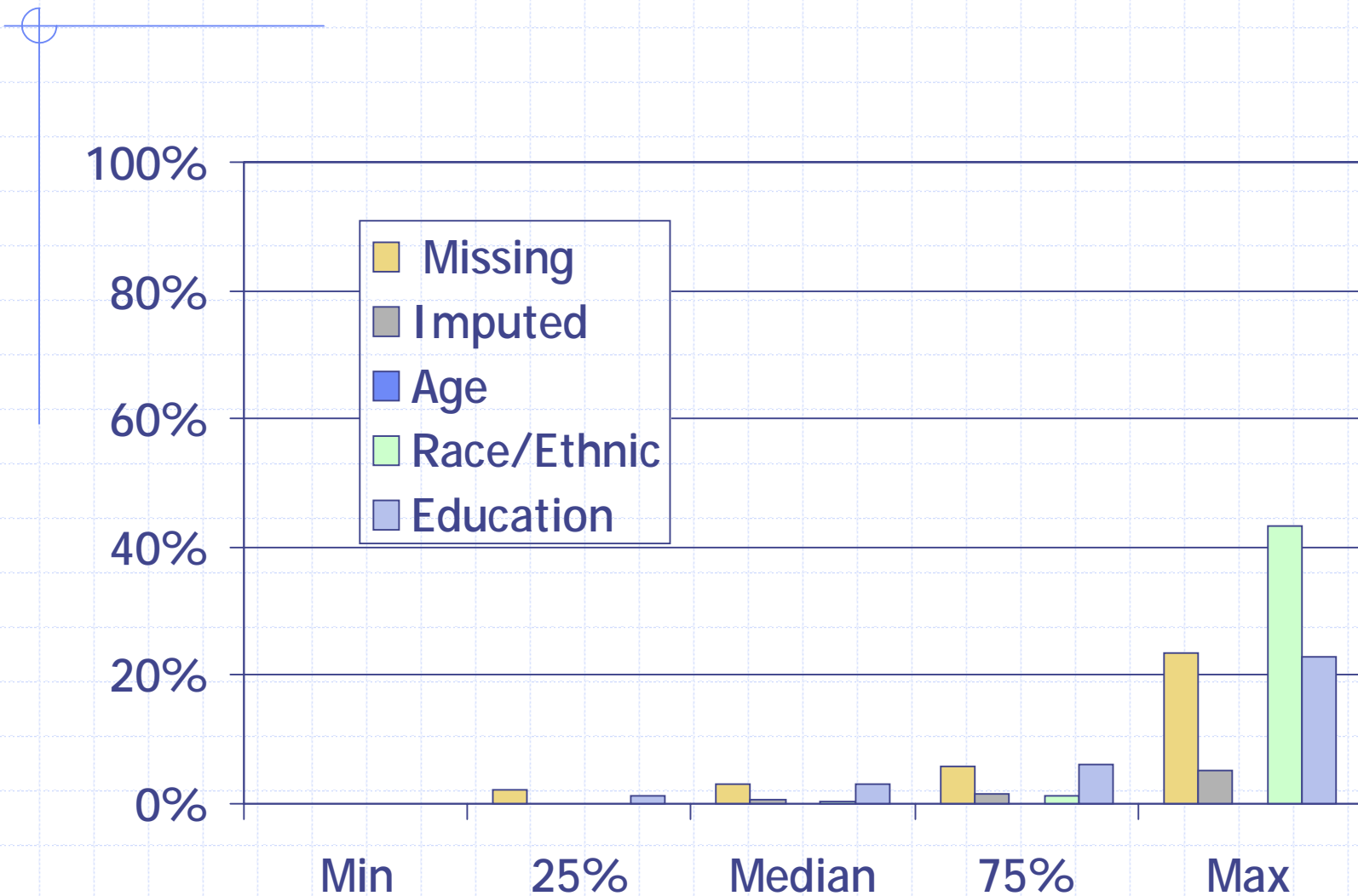
Data Quality Issues

- ◆ Unlinked certificates
- ◆ Missing birthweight & gestational age
- ◆ Missing education, race, or Hispanic origin
- ◆ Fetal death certificates

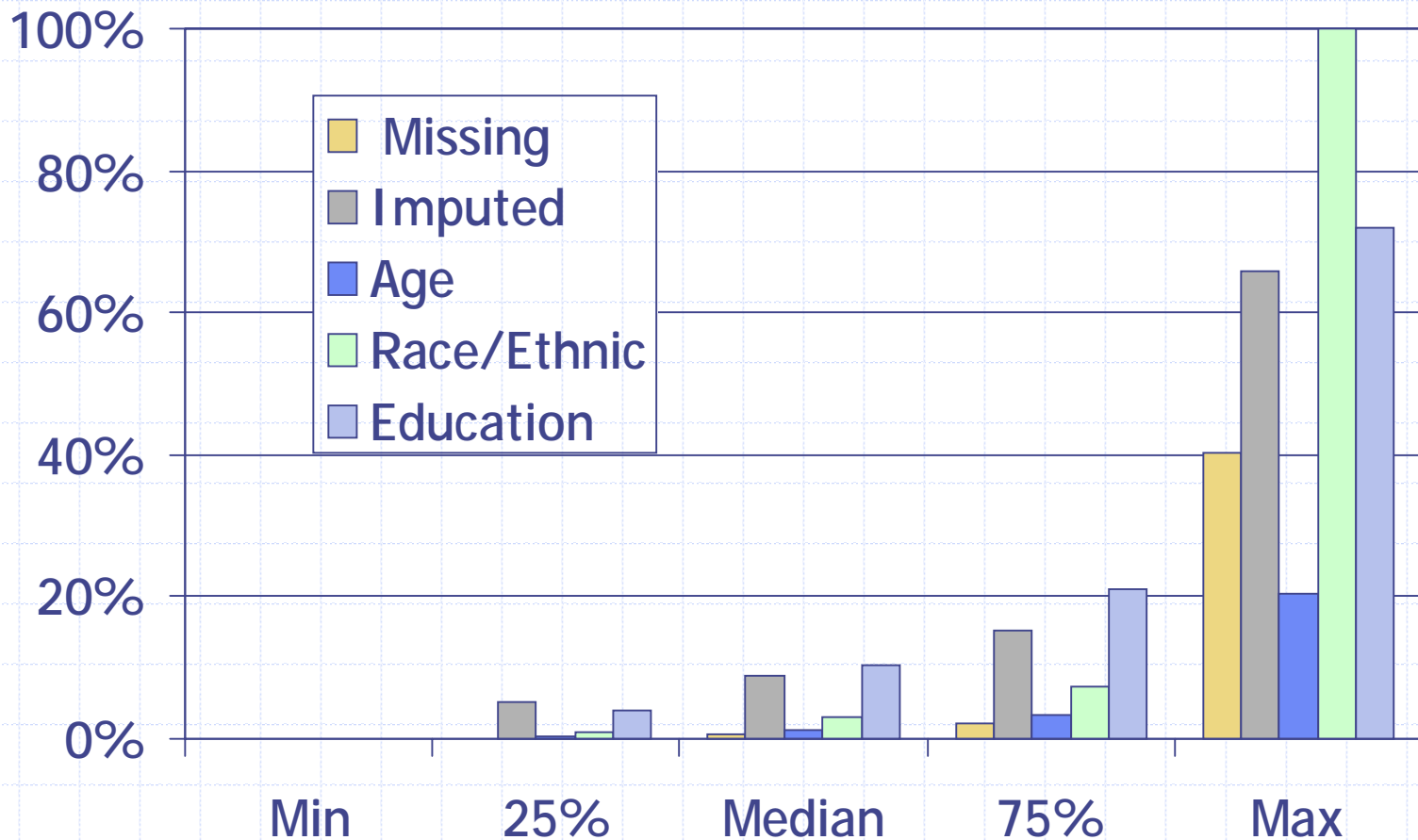
Percentage of Missing Infant Deaths, U.S. Cities, 1995-97



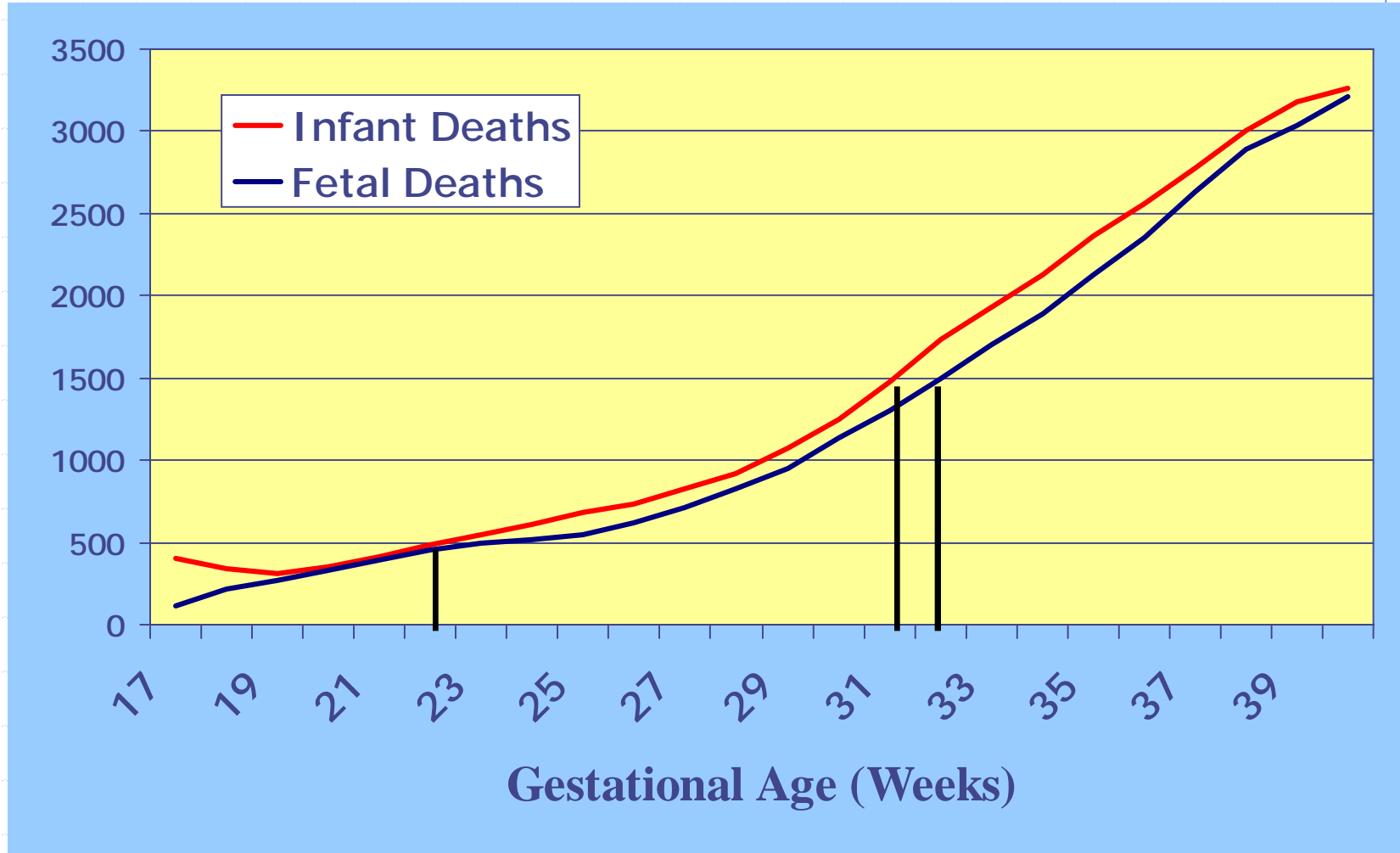
Percentage of Unknowns for Infant Deaths, U.S. Cities



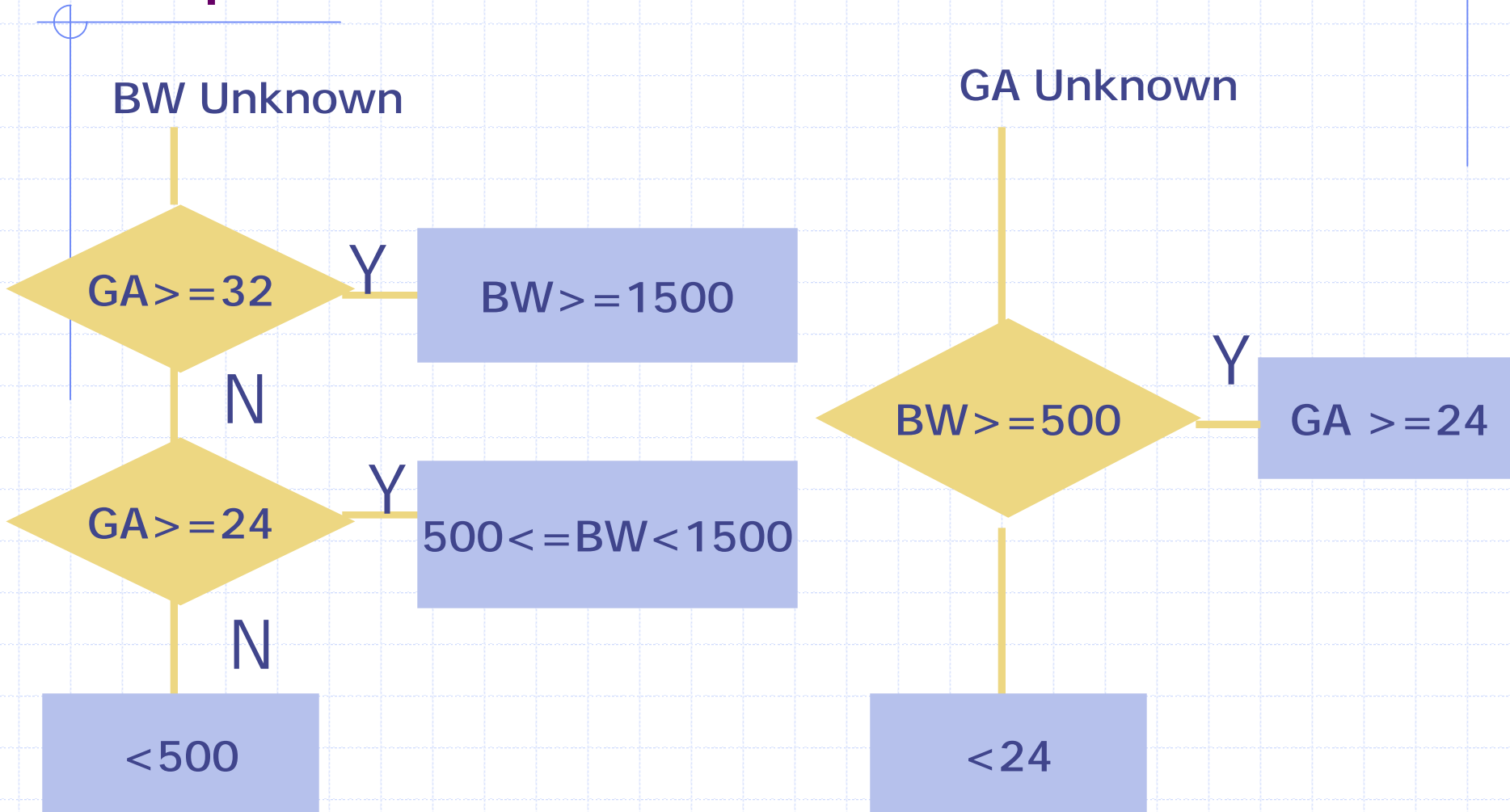
Percentage of Unknowns for Fetal Deaths, U.S. Cities



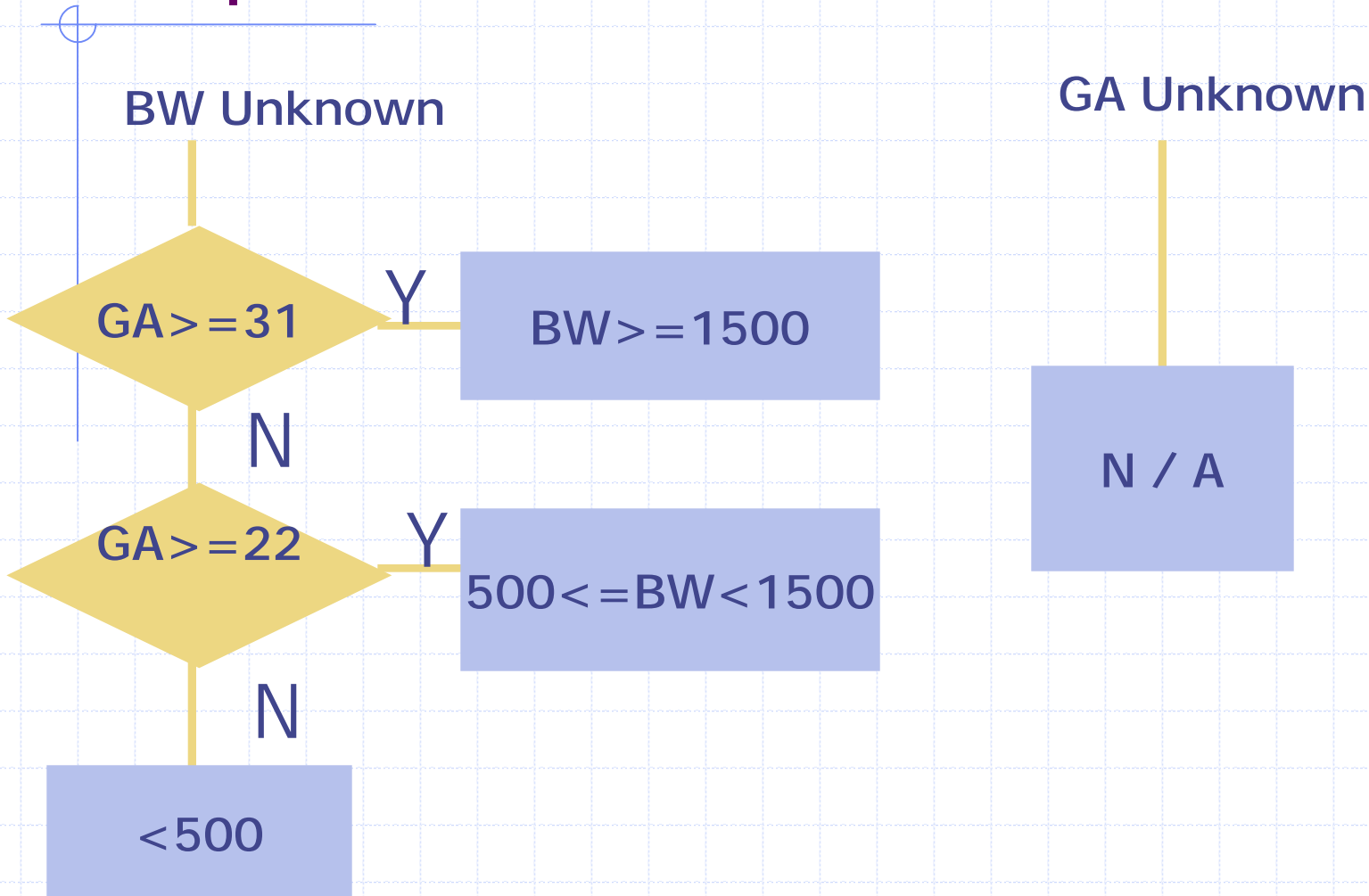
Relationship Between Gestational Age and Median Birthweight



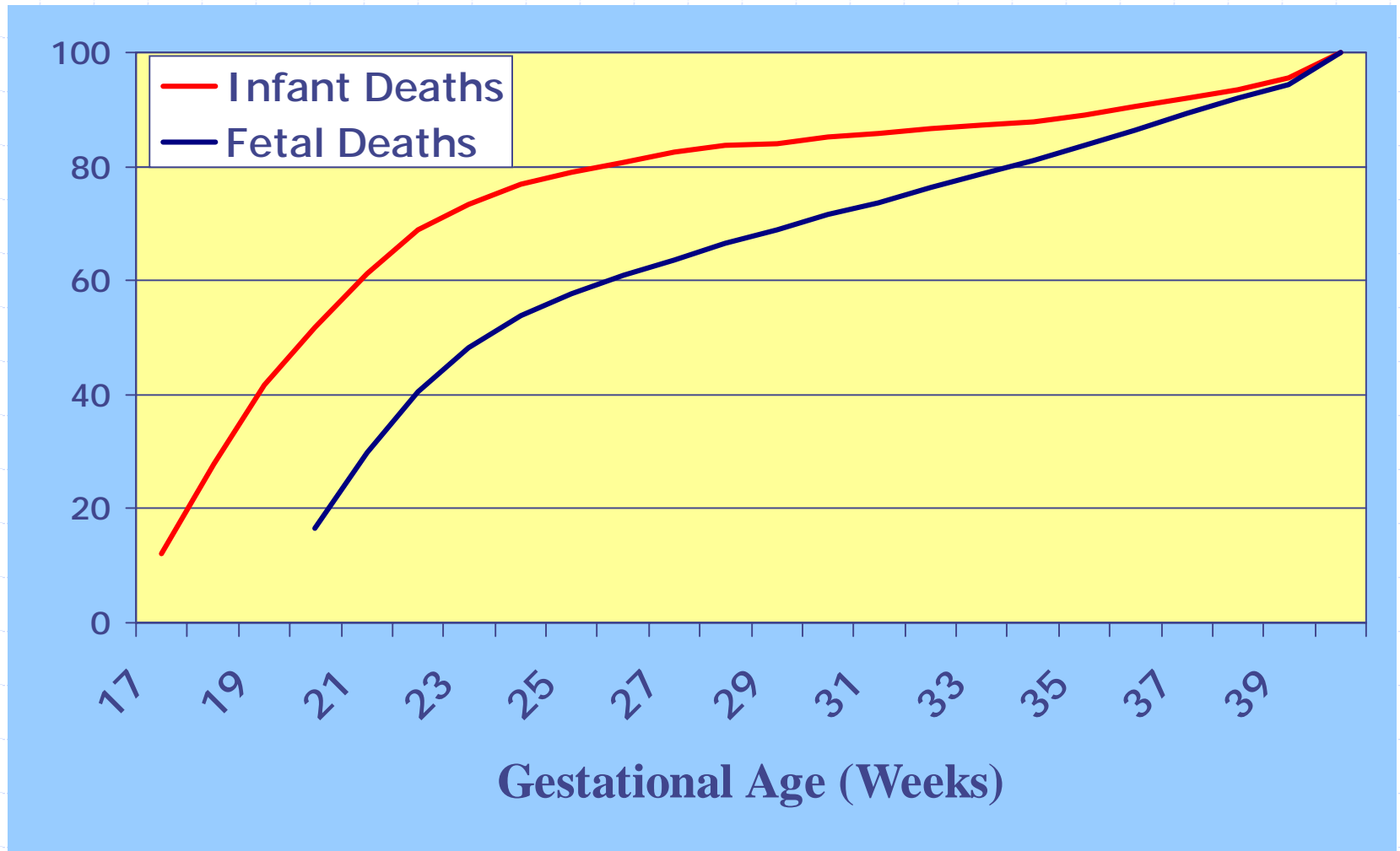
Imputation I: Fetal Deaths



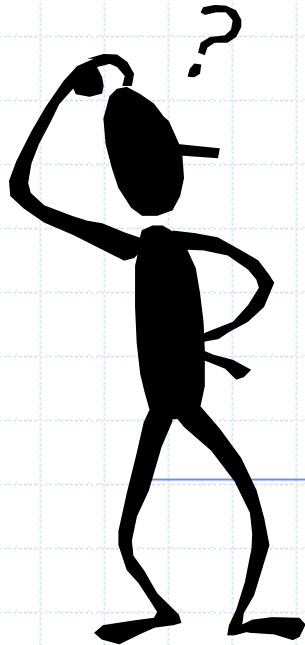
Imputation II: Infant Deaths



Cumulative Percentage of Unknown BW by Known GA

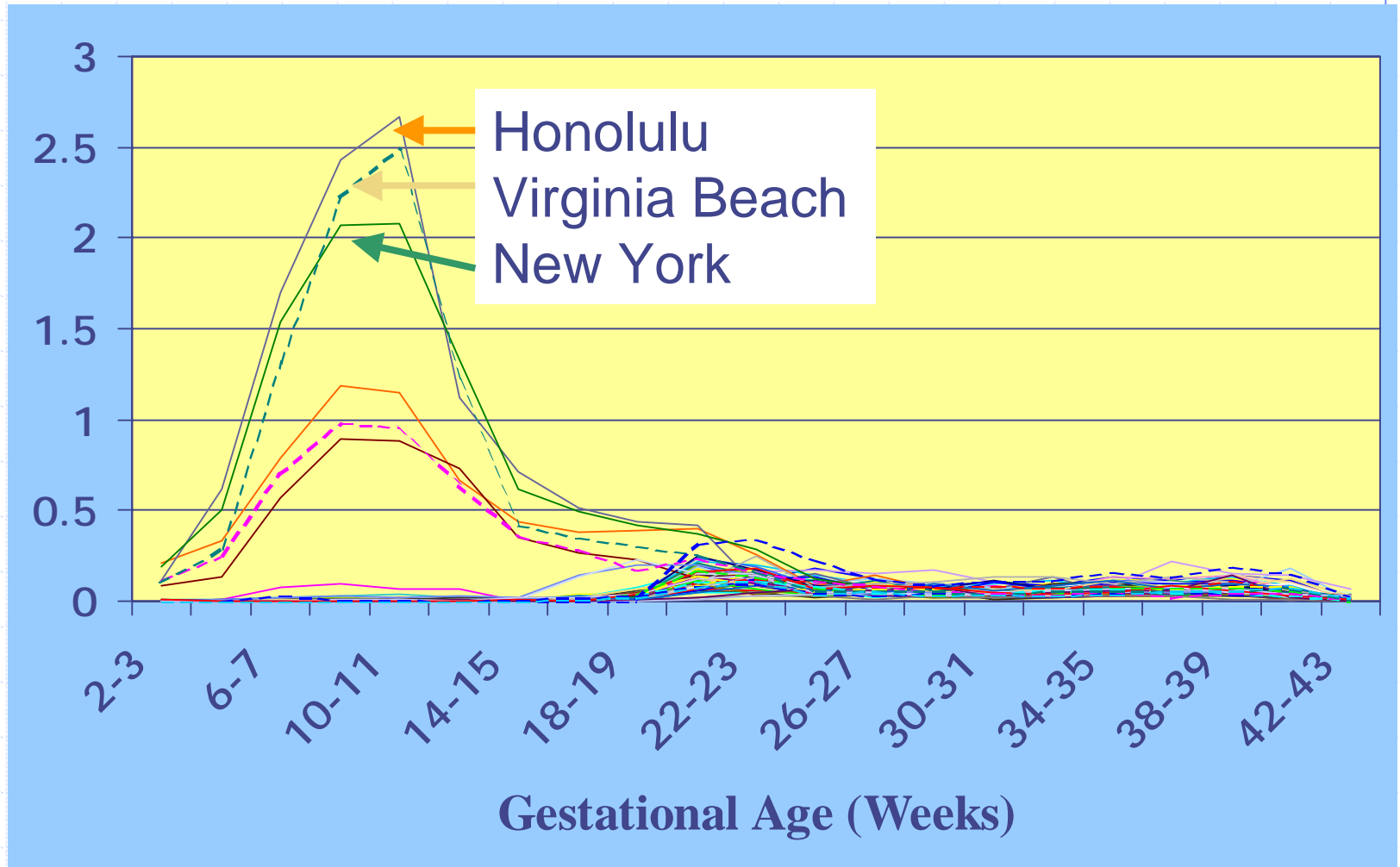


“Do we really have to eliminate <500 gram babies?
They are a large part of our deaths...”

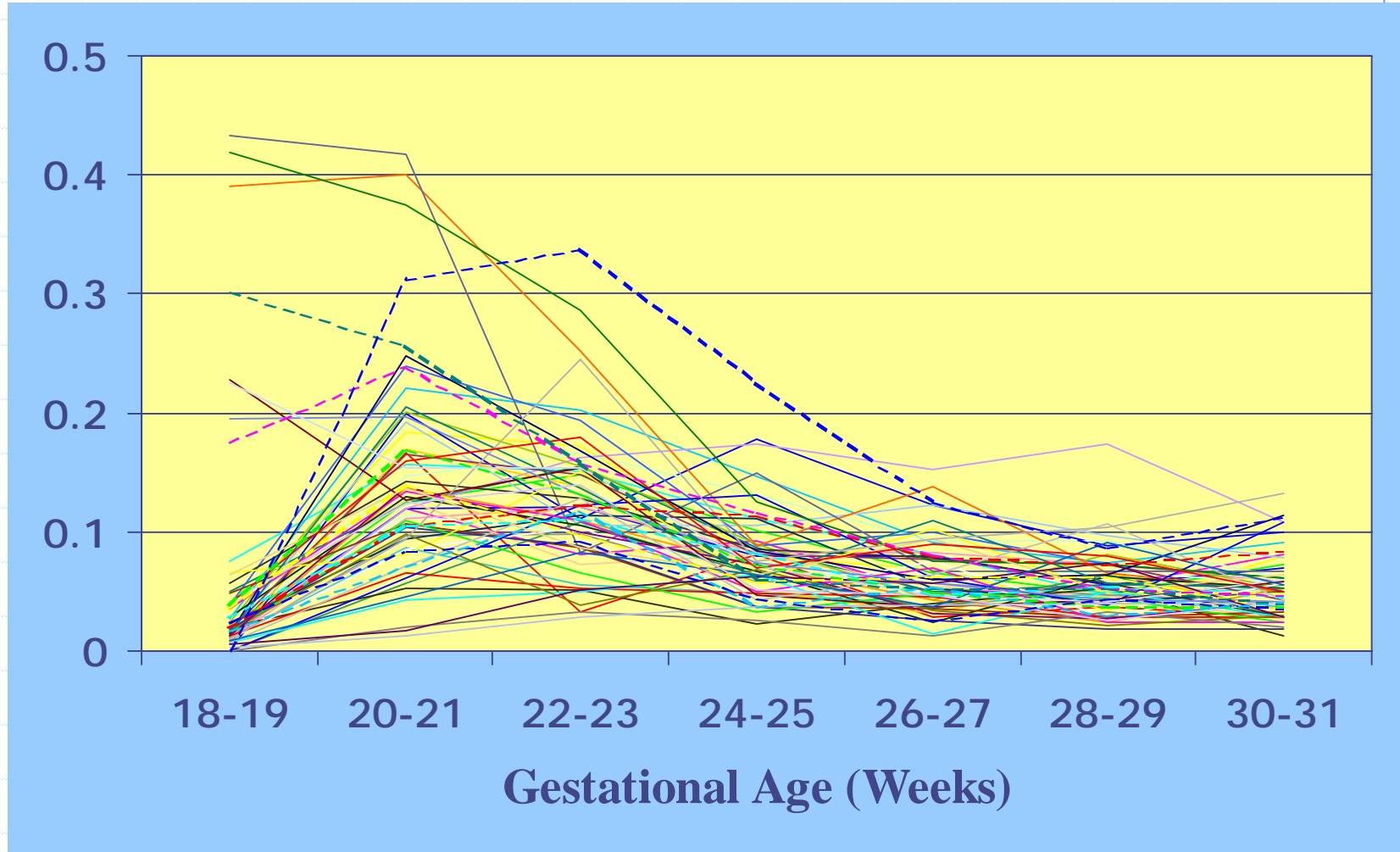


New PPOR User

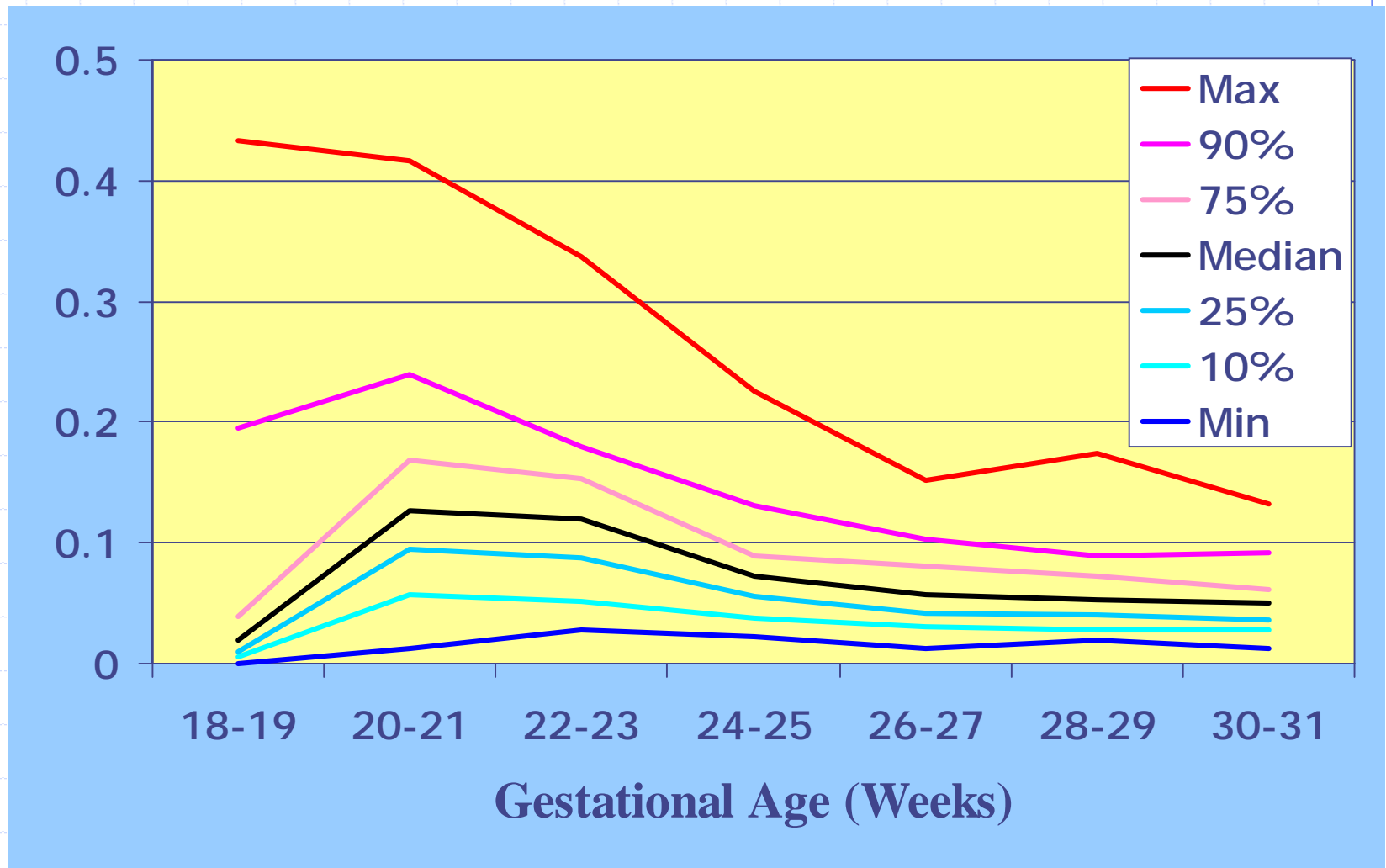
Ratio of Fetal Deaths to All Live Births < 32 Weeks



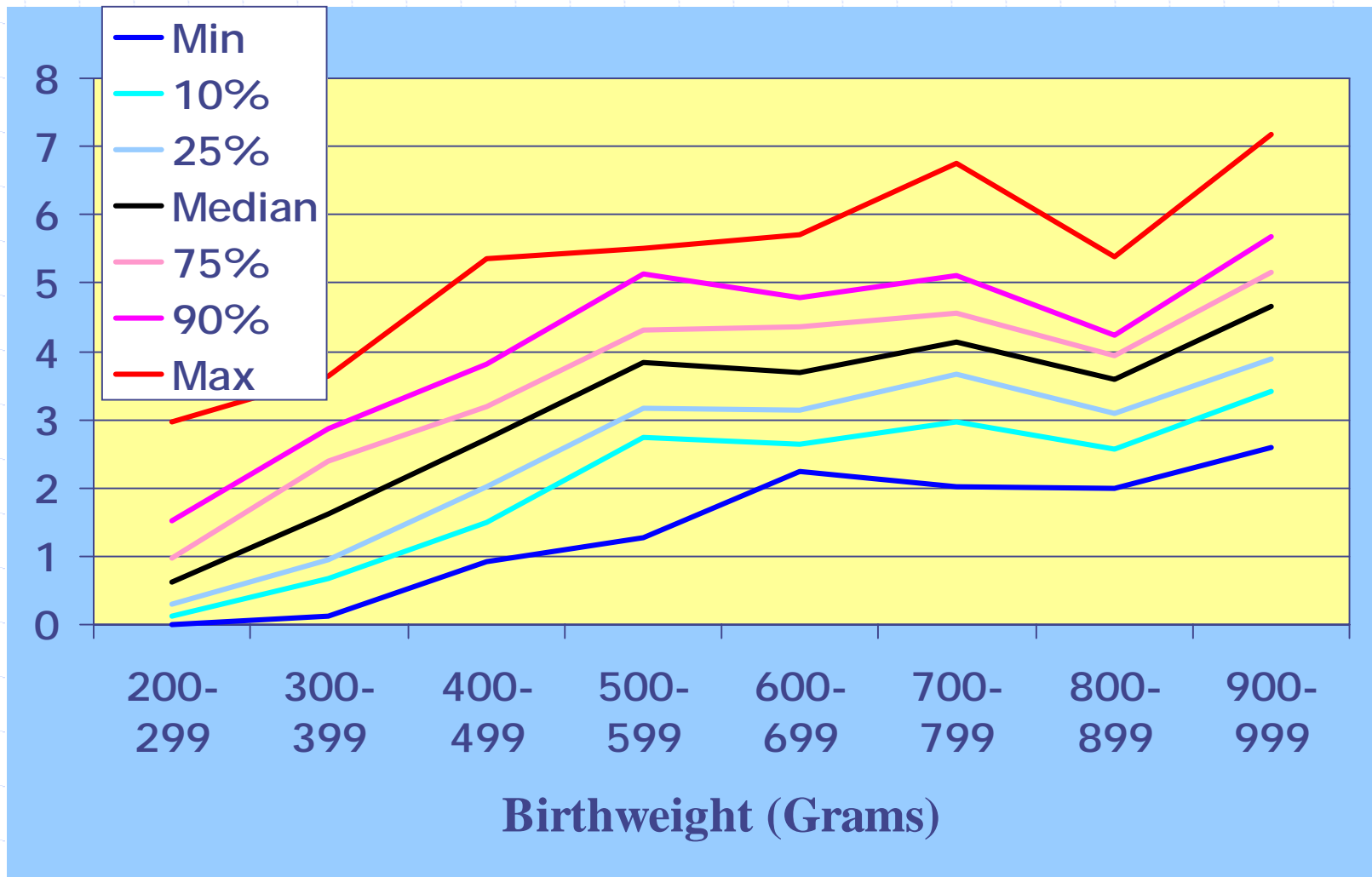
Ratio of Fetal Deaths to All Live Births <32 Weeks



Ratio of Fetal Deaths to All Live Births < 32 Weeks



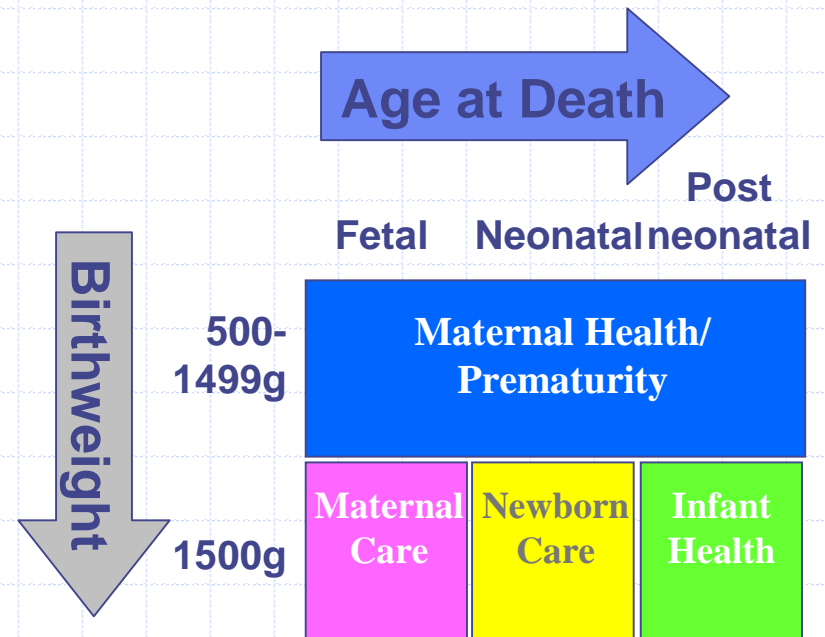
Percentage of All Live Births < 2000 grams



Alternative Categories for Perinatal Periods of Risk

Extra Categories

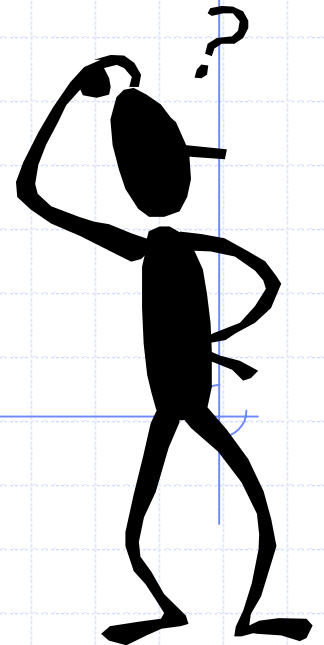
- ◆ <500g category(ies) for live births
- ◆ <24 wks category(ies) for fetal deaths



Warning: Extra categories are not a good way to meet the minimum criteria of 60 deaths.

“Why are fetal deaths of less than 24 weeks gestation excluded from the analysis, but infant deaths of all gestations are considered if they are of 500 grams or more?”

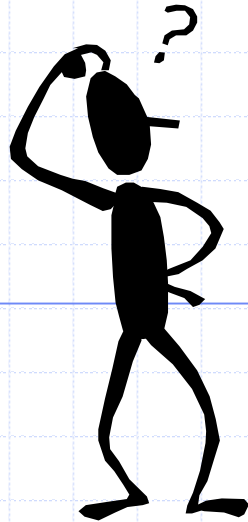
New PPOR User



Differences in Reporting of Fetal and Infant Deaths

- ◆ Differential reporting requirements for fetal deaths depending on States
- ◆ Uniform reporting requirement for live births/infant deaths
- ◆ Differential reporting of very small babies (or fetuses)

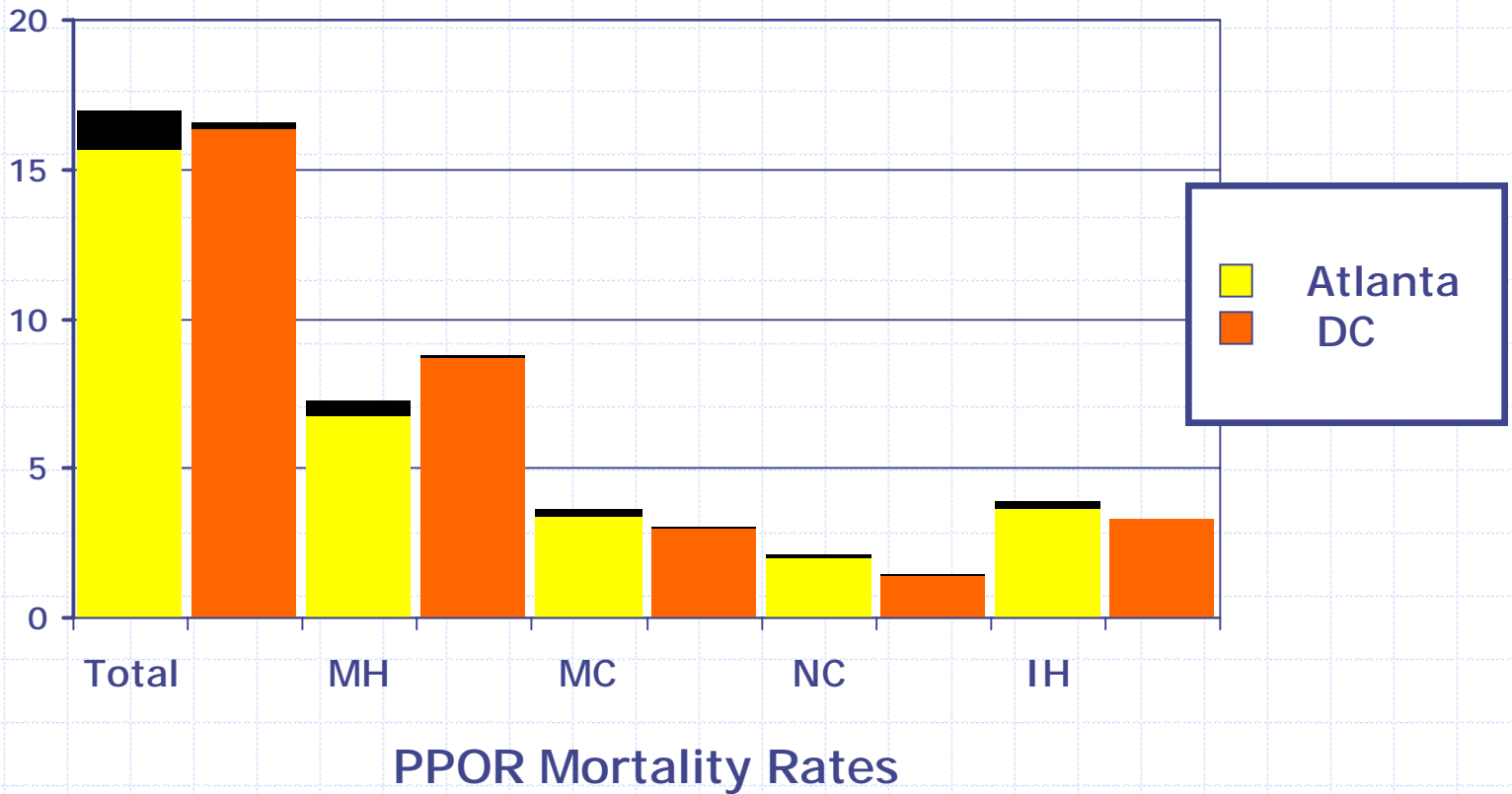
"Do we need to exclude babies of less than 500g and fetal deaths of less than 24 weeks gestation from the denominator of feto-infant mortality rates?"



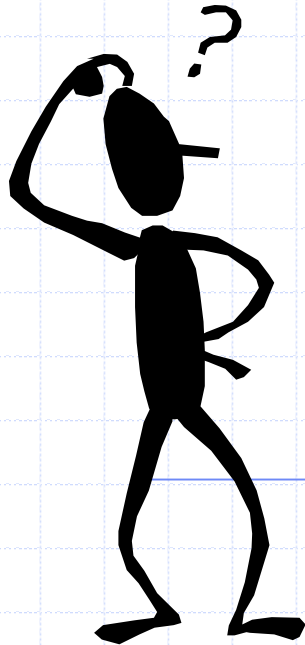
New PPOR User



PPOR Mortality Rates for Atlanta, GA, and Washington, DC, Computed with Different Denominators



“Which reference group should we use? Do I need to use a national reference group? Where can I find one?”



New PPOR User

Examine the “Opportunity Gap”

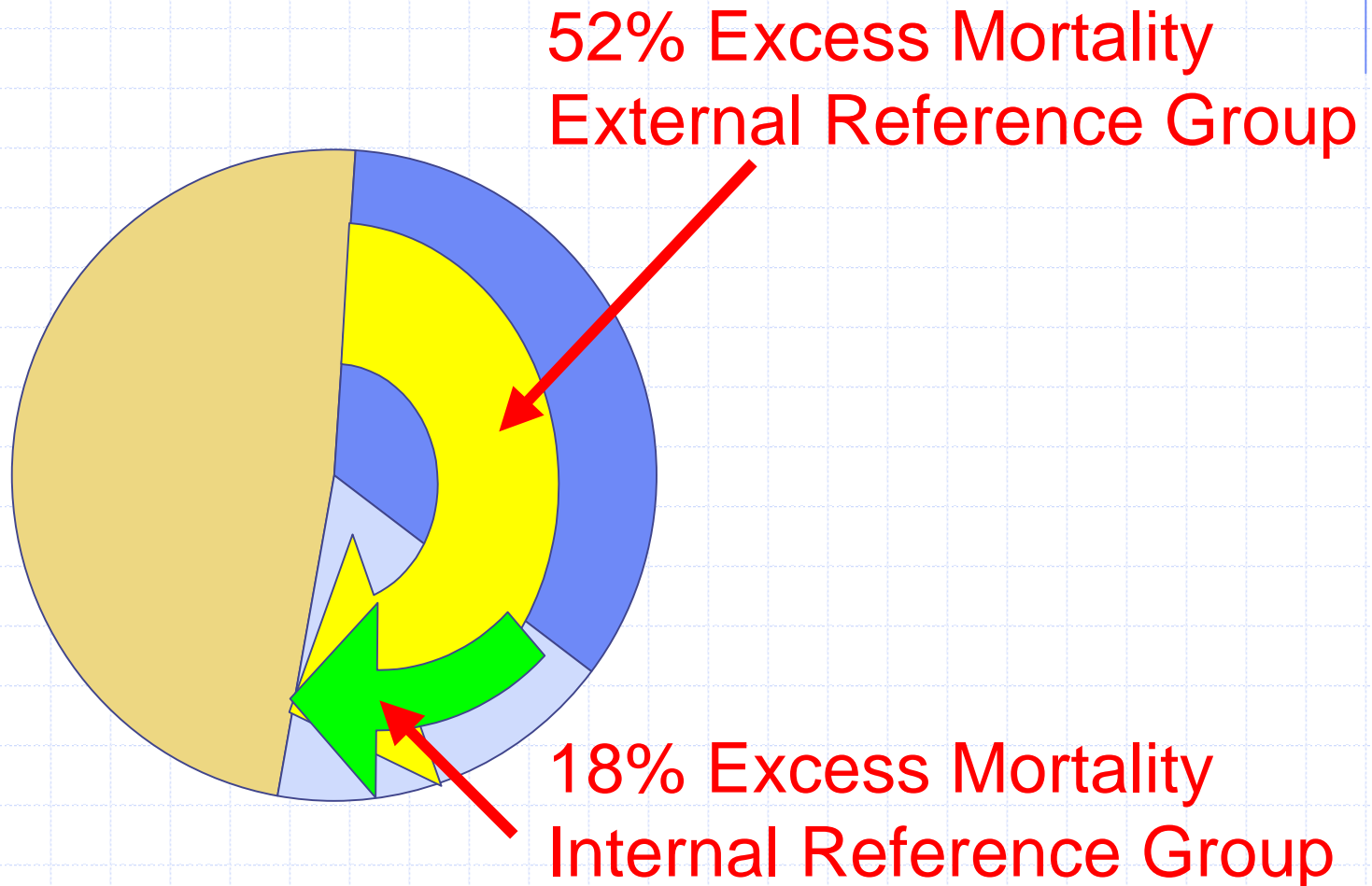
Reference Groups

Attempt to choose a simple optimal group; at least 15% of the population

U.S. studies:

- ◆ 20 or more years of age
- ◆ 13 or more years of education
- ◆ Non-Hispanic white women

Overall Feto-Infant Mortality Rate Omaha, Nebraska, 1995-97



Potential Reference Groups

- ◆ Traditional group: non-Hispanic white women of 20+ years with 13+ years of education.
- ◆ Population under study (internal)
- ◆ Population from the larger community (external)
- ◆ National reference group (external)
- ◆ Same as above but with new characteristics

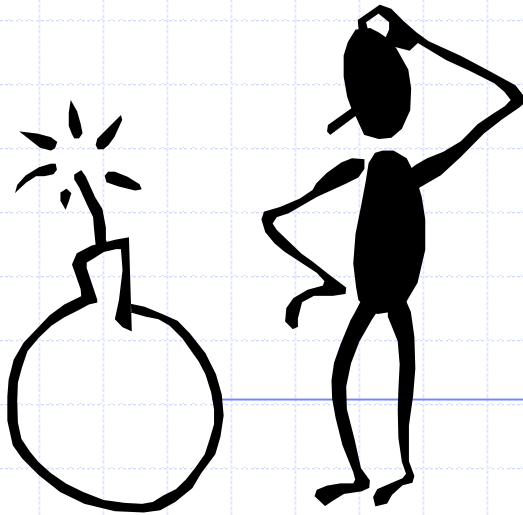
Potential Reference Groups

Recommendations

- ◆ Need at least 60 deaths in the group.
Harder to do in-depth analyses
- ◆ Acceptable to community; redefines the target
- ◆ At minimum, use standard group along with a new reference group
- ◆ External reference groups are useful when the number of events for the reference group are < 60 deaths or data quality problems.

“What is the difference between residence and occurrence? Which one should we use?”

New PPOR User

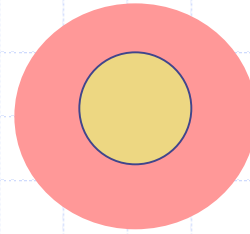


Place of Residence Versus Occurrence at Birth

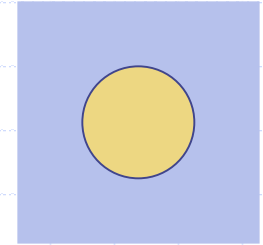
**Residence
at Birth**



Residence

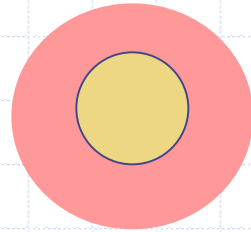


Occurrence

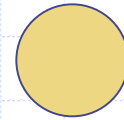


Death

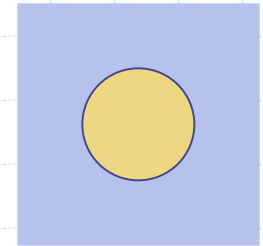
**Occurrence
at Birth**



Residence



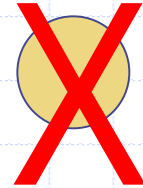
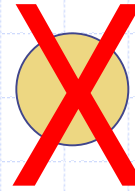
Occurrence



Death

Place of Residence Versus Occurrence at Birth

Residence
at Birth

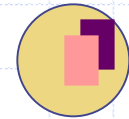
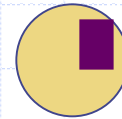


Residence

Occurrence

Death

Residence
at Birth

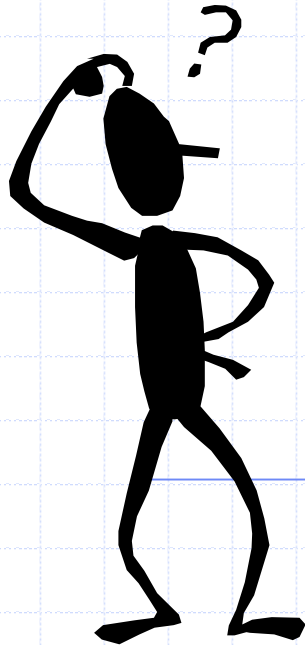


Residence

Occurrence

Death

“Who should we include in our PPOR analysis? Can I just study a high risk area or population?”



New PPOR User

Communities Want to Target Specific Groups

- ◆ High risk geographic area(s)
- ◆ Specific racial or ethnic group
- ◆ Teens
- ◆ Clients
- ◆ Healthy Start Area

Targeting Recommendations

- ◆ Need to have at least 60 feto-infant deaths and the more the better
- ◆ Generally better to have bigger than your target and measure your targets contribution to the whole
- ◆ Study multiple groups at one time
- ◆ Be careful not to bias your study due to selection bias

PPOR Analysis: Boston, 1995-97

Number of
Deaths

Age at Death

Fetal Neonatal Post neonatal

500-
1499g

108

1500g

77

27

29

Total = 241

% of Excess Mortality

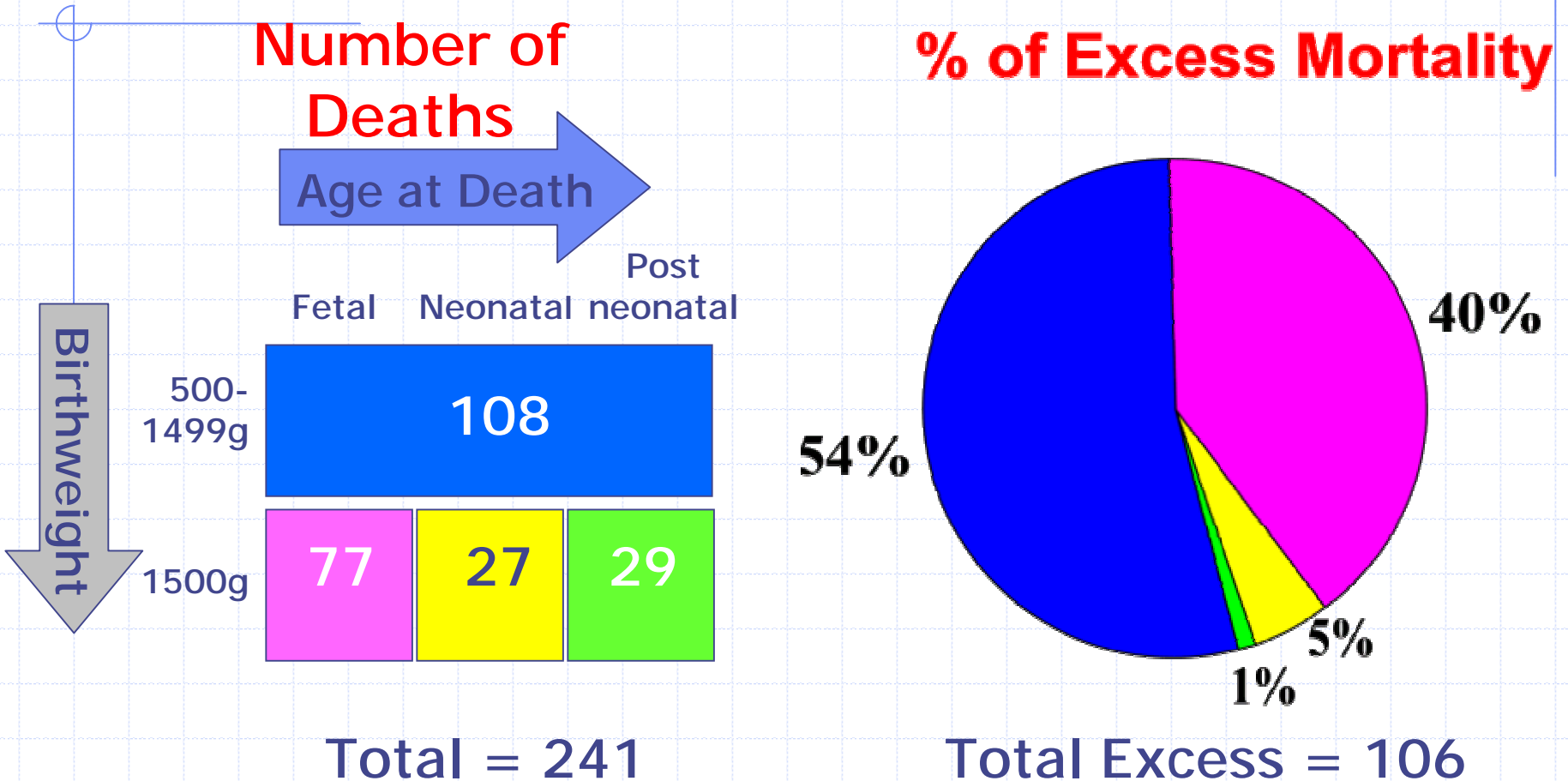
54%

40%

1%

5%

Total Excess = 106

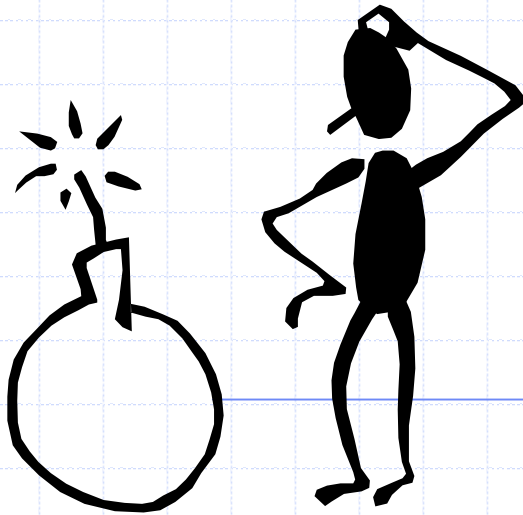


Communities Want to Exclude Specific Groups

- ◆ Congenital anomalies
- ◆ Twins and multiple gestation births
- ◆ Occurrences out of the community

“Why do we need at least 60 deaths in all cells?”

New PPOR User

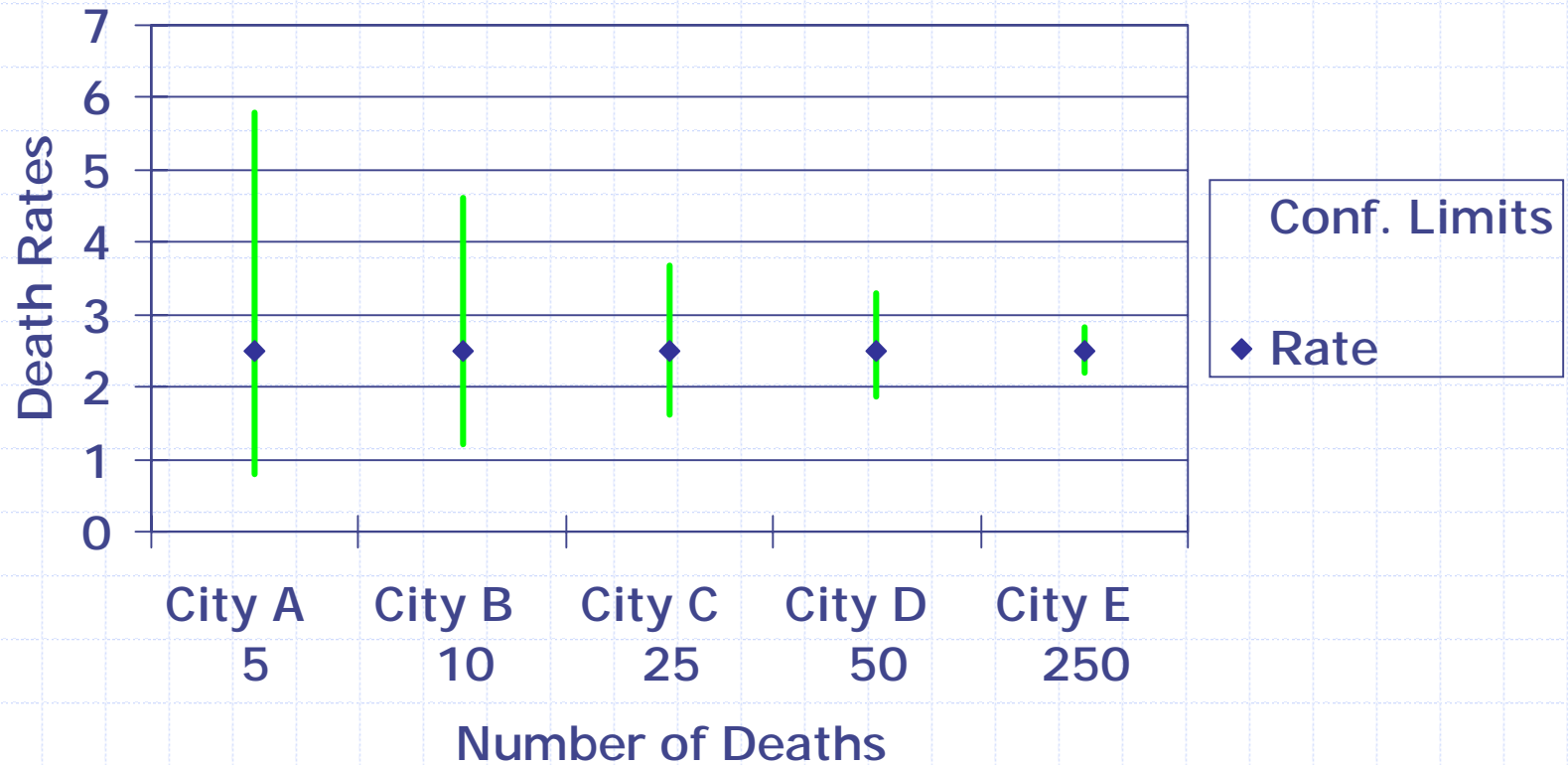


Question:

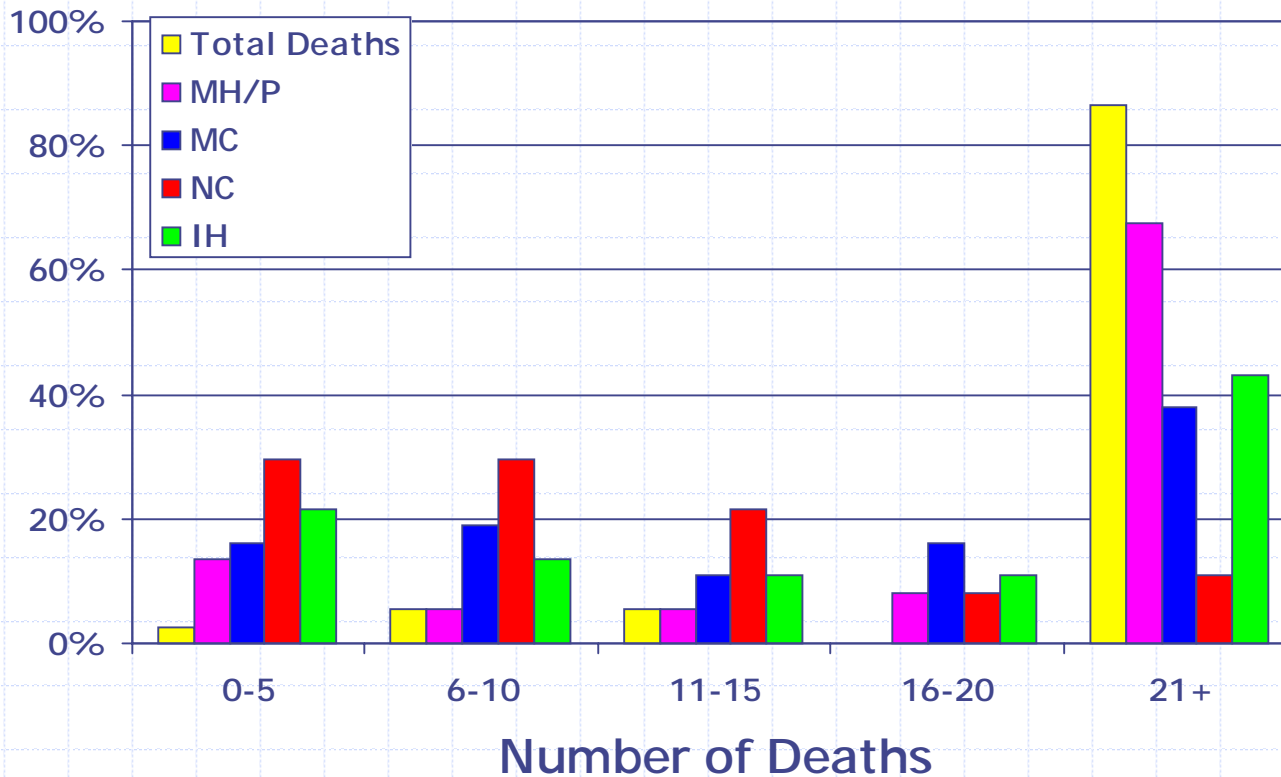
During a single year, MC mortality rate increased to 4.0 in one of the five cities. In which of the following cities do you think that is more likely to happen?

	City A	City B	City C	City D	City E
Number LB+FD	2,000	4,000	10,000	20,000	100,000
MH Deaths	10	20	50	100	500
MC Deaths	5	10	25	50	250
NC Deaths	2	4	10	20	100
IH Deaths	5	10	25	50	250
MH Rate	5.0	5.0	5.0	5.0	5.0
MC Rate	2.5	2.5	2.5	2.5	2.5
NC Rate	1.0	1.0	1.0	1.0	1.0
IH Rate	2.5	2.5	2.5	2.5	2.5

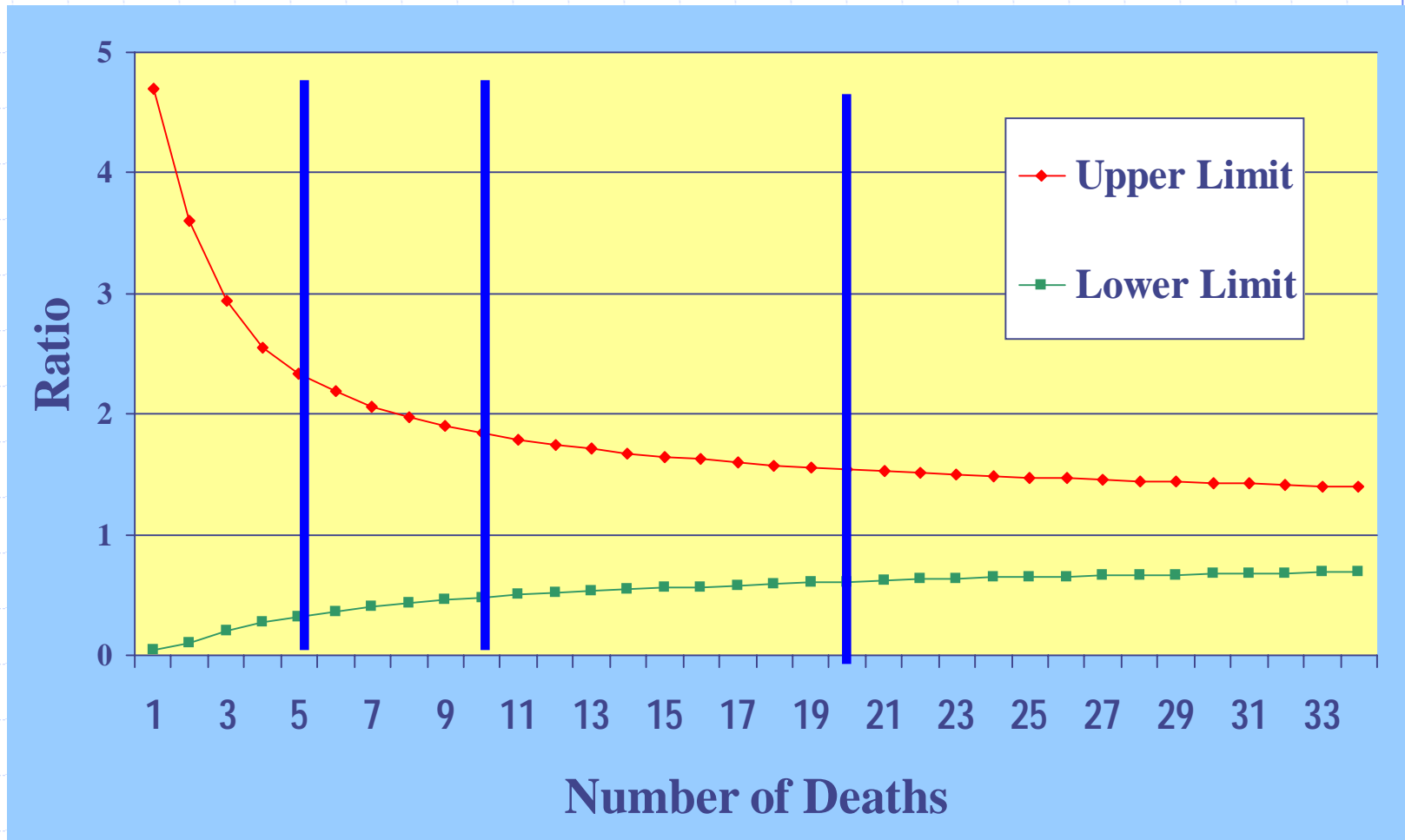
Death Rates and 95% Confidence Limits for Increasing Numbers of Deaths



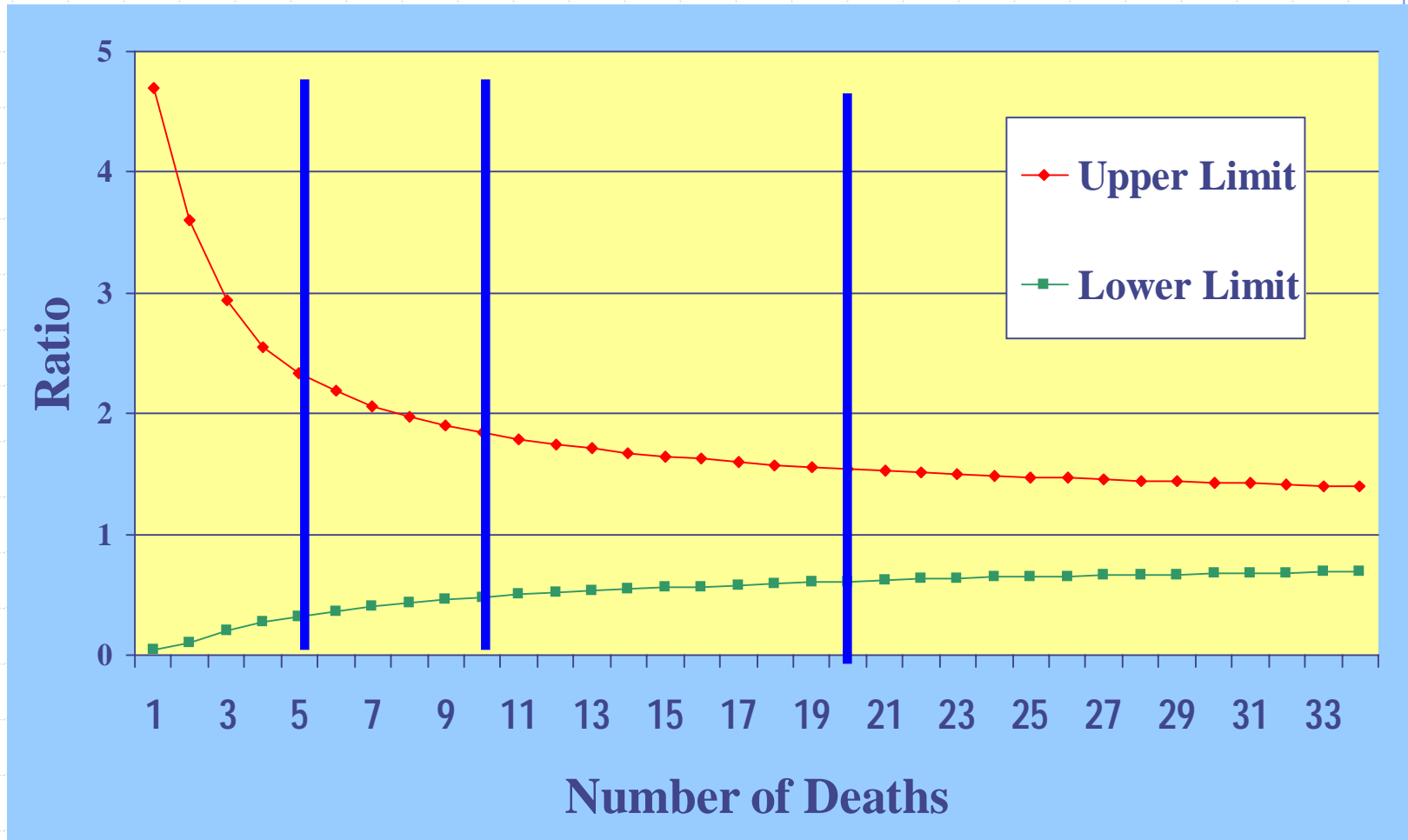
Non-Hispanic Blacks: Percentage of Number of Deaths by PPOR Category, 37 Cities



Width of the Ratio of the 95% Confidence Limit to the Number of Events



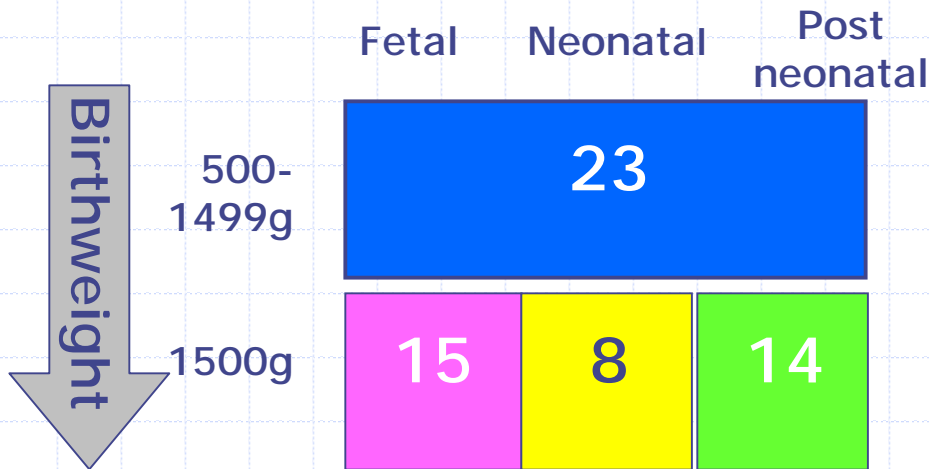
Width of the Ratio of the 95% Confidence Limit to the Number of Events (cont'd)



Minimal Number of Deaths

Number of Deaths

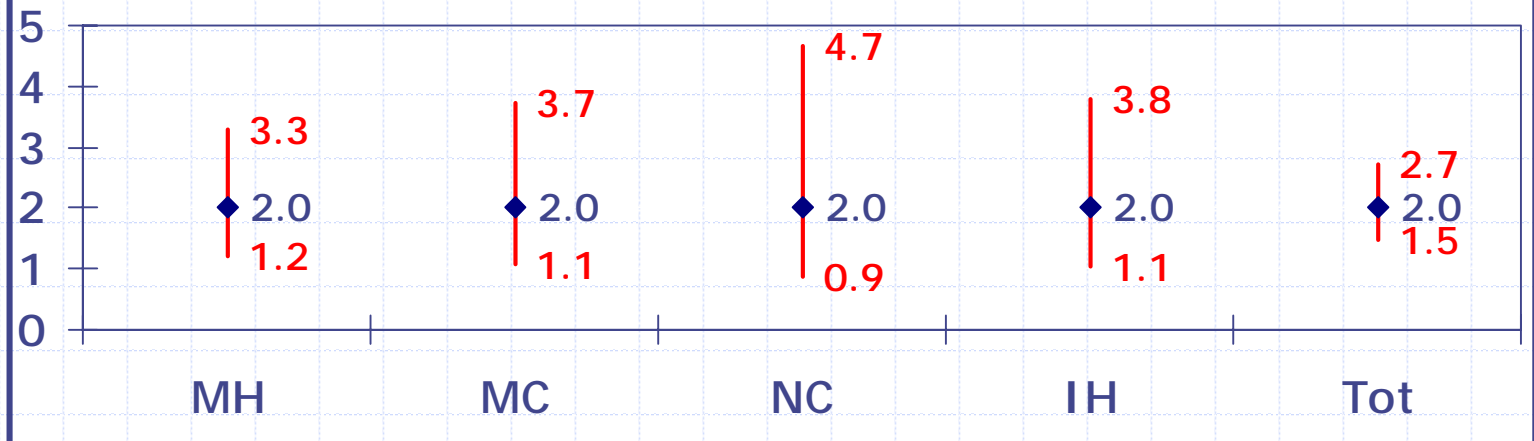
Age at Death



Total = 60

Minimal Number of Deaths

95% Confidence Intervals for the Ratio of
 $\text{Rate}_2 / \text{Rate}_1$ by PPOR Category



$$\text{MH}_T:\text{MH}_R = 46/8000 : 23/8000 = 2.0$$

$$\text{MC}_T:\text{MC}_R = 30/8000 : 15/8000 = 2.0$$

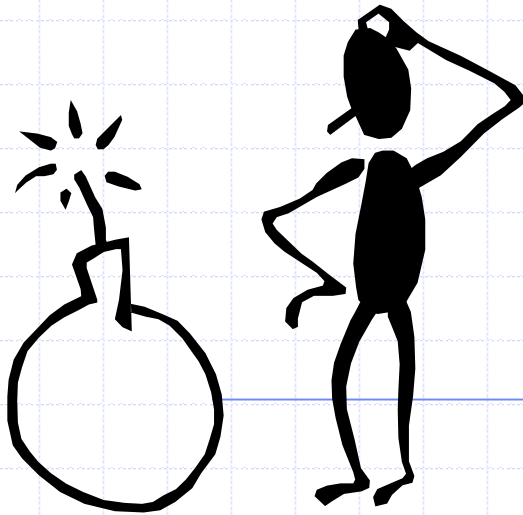
$$\text{NC}_T:\text{NC}_R = 16/8000 : 8/8000 = 2.0$$

$$\text{IH}_T:\text{IH}_R = 28/8000 : 14/8000 = 2.0$$

$$\text{TOT}_T:\text{TOT}_R = 120/8000 : 60/8000 = 2.0$$

“What to do if there are less than 60 deaths in the reference group?”

New PPOR User



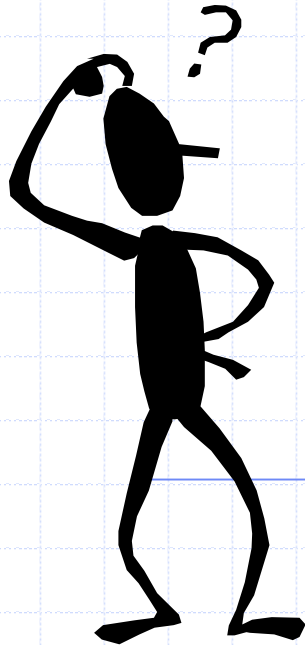
Small Number In the Reference Group

- ◆ Usually less deaths because of lower rates.
- ◆ Usually more missing data because it requires more data elements.
- ◆ For precise Excess rates, Reference rates need to be precise (narrow confidence limits).

Should We Use the Internal Reference Group Then?

- ◆ Check your data quality.
- ◆ Check how different internal rates are from external rates – large differences may be due to instability.
- ◆ Measure variability using Confidence Intervals.
- ◆ Bottom line – you can always use an external reference group.

"How many years should we combine?"



New PPOR User

Recommendations on the Number of Years to Use

- ◆ No more than 5 years due to changes in medical practice
- ◆ Need at least 60 deaths in every population you want to study
- ◆ Phase 2 analyses require even more deaths. Combine as many years as possible and appropriately.
- ◆ Time trends can be studied separately.