

2009 Diabetes Translation Conference

Implementing Gestational Diabetes Surveillance In Connecticut HANDOUT

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Gestational Diabetes Surveillance Project

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Basic Terms

“Epidemiologic surveillance is the ongoing and systematic collection, analysis, and interpretation of health data in the process of describing and monitoring a health event.”

Source: <http://wonder.cdc.gov/wonder/prevguid/p0000112/p0000112.asp>

“Chronic disease epidemiologists collect, analyze and interpret science-based data to assess the burden of chronic disease, provide information on the distribution and risk factors of chronic diseases necessary for public health program planning and implementation, and assist in evaluating the success of public health programs.”

Source: **Essential Functions of Chronic Disease Epidemiology In State Health Departments**
<http://www.cste.org/dnn/LinkClick.aspx?fileticket=p3mU49iaDvc%3D&tabid=175&mid=716>

Basic Terms

- **Diabetes**

- **Type 1 diabetes**, formerly called juvenile diabetes or insulin-dependent diabetes
- **Type 2 diabetes**, formerly called adult-onset or noninsulin-dependent diabetes, is the most common form of diabetes.
- **Gestational diabetes** is caused by the hormones of pregnancy or a shortage of insulin. A woman who has had gestational diabetes is more likely to develop type 2 diabetes later in life

- **Pre-diabetes** – when blood glucose is higher than normal but lower than the diabetes range. At risk for getting type 2 diabetes and heart disease

Source: <http://diabetes.niddk.nih.gov/dm/pubs/riskfortype2/index.htm>

Introduction

- “It is not surprising that so little progress has been made in the treatment of pregnant women with diabetes, because progress in the treatment of uncomplicated diabetes has been so slow.” (p. 347)
- “The unfavorable course of many pregnant women has undoubtedly been due to neglect of proper treatment.” (p. 351)
- “Even when sugar appears to a slight extent in pregnant women, it should be carefully watched and controlled by diet.” (p. 352)
- “The advantages of a Cesarean section should be borne in mind.” (p. 352)

Source of Quotes

The Treatment of Diabetes Mellitus, with Observations Upon the Disease Based Upon One Thousand Cases

By Elliott P. Joslin, MD.

LEA & Febiger, Philadelphia & New York

1916

(93 years ago)

Today....

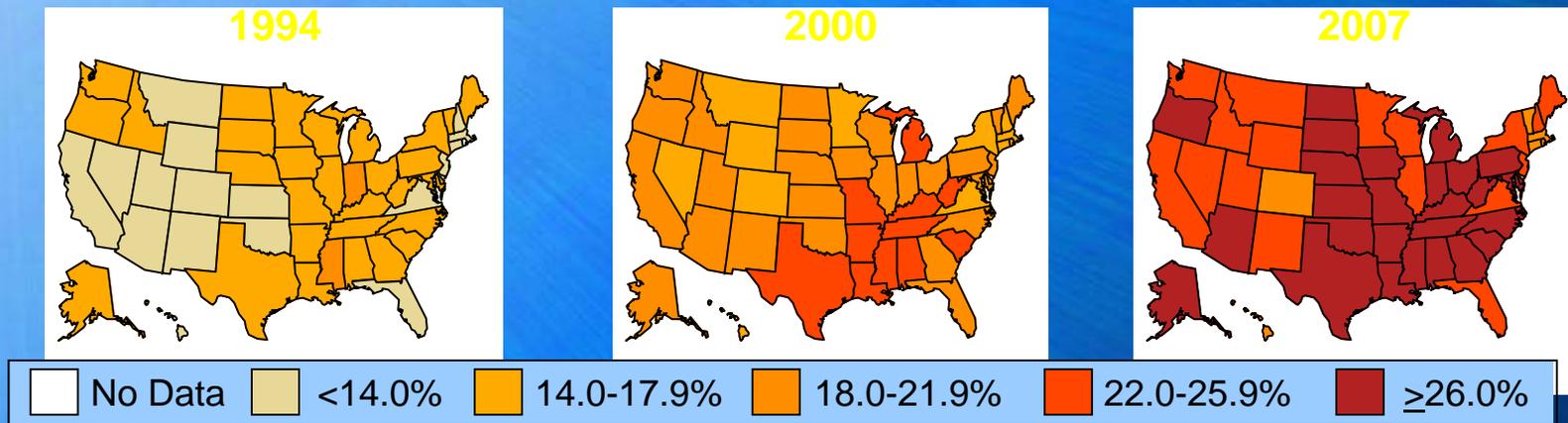
- Gestational Diabetes Mellitus (GDM) is

“the most common pregnancy related chronic condition.”

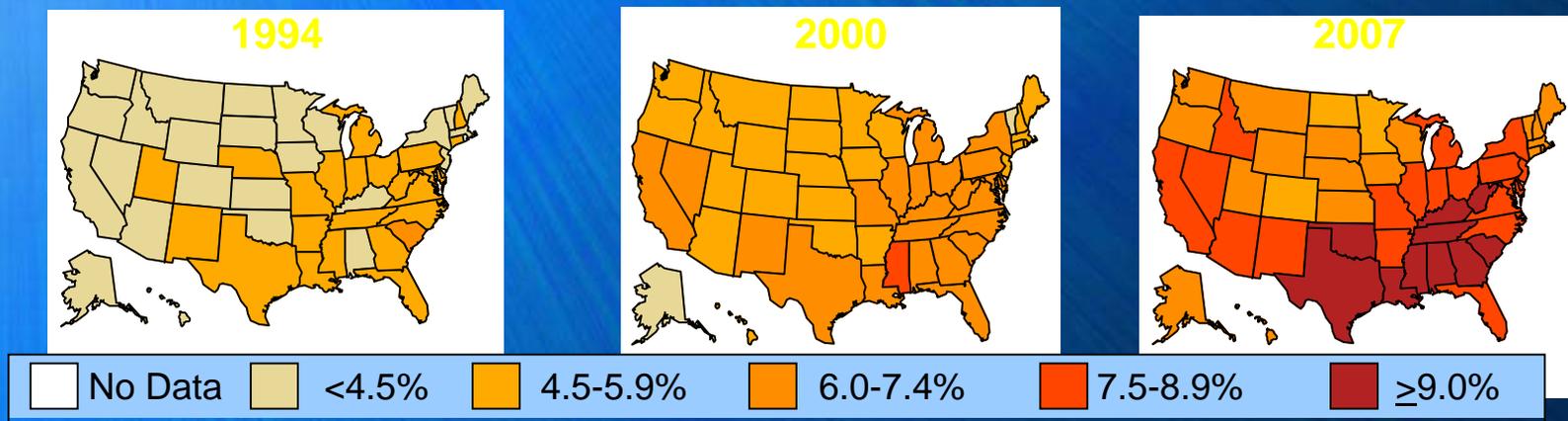
Source: Association of Maternal & Child Health Programs, “MCH & Chronic Disease”
fact sheet

Age-adjusted Percentage of U.S. Adults Who Were Obese or Who Had Diagnosed Diabetes

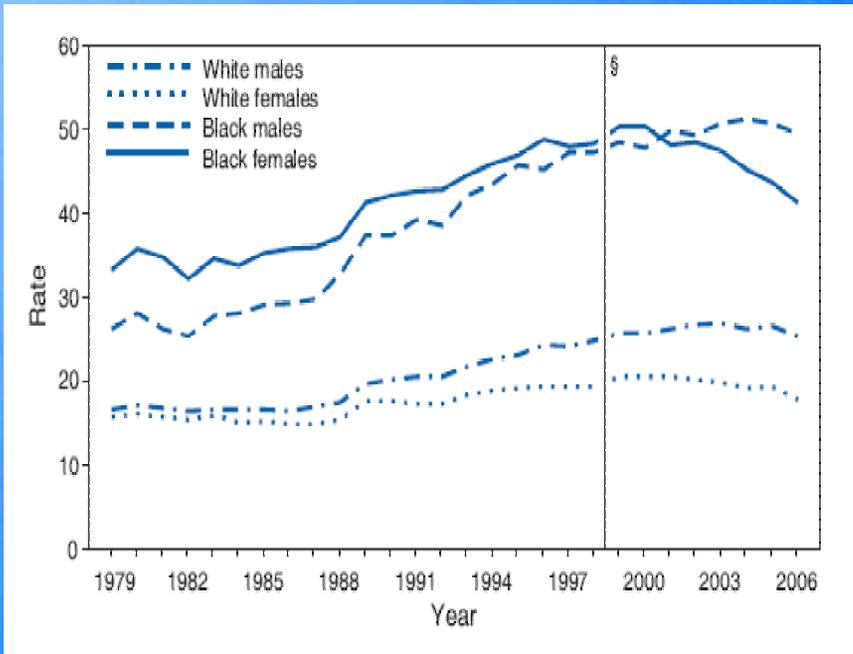
Obesity (BMI >30 kg/m²)



Diabetes



National Burden of Diabetes



Age-Adjusted Death Rates* for Diabetes, by Race and Sex --- United States, 1979--2006[†]

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5731a5.htm?s_cid=mm5731a5_e (8/2008)

Age-Adjusted Prevalence of Adult Diabetes

United States

- Overall population 8.0%
- White non-Hispanic population 6.6%
- Black non-Hispanic population 11.8%
- Hispanic population 10.4%

Source: <http://www.cdc.gov/media/pressrel/2008/r080624.htm>

Connecticut

- Overall population 6.3%
- White non-Hispanic population 5.5%
- Black non-Hispanic population 15.9%
- Hispanic population 10.5%

Source: Unpublished 2006-2008 CT BRFSS data

Connecticut Burden of Diabetes

- About 6% of the CT population have diagnosed diabetes (157,600 adults 18 years and older). An additional 63,000 are estimated to have undiagnosed diabetes
- Diabetes is the 7th leading cause of death for all Connecticut residents (but it's the 6th leading cause for the CT Latino/Hispanic residents), and a major cause of disability
- Hospitalization Costs (DPH, 2005):
 - ~ \$77 million billed with diabetes as a principal diagnosis
 - ~ \$1billion billed for diabetes-related in 2002
- **At risk: 2.0 million Connecticut adults:**
 - Overweight
 - Have a sedentary lifestyle
 - **History of gestational diabetes**

Source: Connecticut Diabetes Surveillance System

http://www.ct.gov/dph/cwp/view.asp?a=3132&q=388098&dphNav_GID=1601&dphPNavCtr=|46973|#46994

Gestational Diabetes Mellitus (GDM)

- Between 2.5 to 4 percent of women in the United States develop gestational diabetes during pregnancy
- Source: <http://www.cdc.gov/od/oc/media/pressrel/r010509.htm>
- ~200,000 cases of GDM, average 7% of all pregnancies, are diagnosed annually
- Untreated GDM increases the risk of having a child who will be obese at age 5 – 7 years
- Adult offspring born to women with GDM had high rates of type 2 diabetes and pre-diabetes (20%)
(n = 597 offspring, 18-27 years old, Denmark 1978-1985)

CDC Division of Reproductive Health

Part of CDC's National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP)

“Maternal and child health to encompass the health of women, children, and families across the life course.”

“At the most basic level, the link is forged during pregnancy and the postpartum period, when health care providers have the opportunity to screen and treat mothers for chronic diseases, such as diabetes, and to counsel mothers on associated risk factors, such as poor nutrition and smoking.”

“Maternal and child health is an essential building block for preventing chronic disease.”

Source: Ties That Bind: Maternal and Child Health and Chronic Disease Prevention at the Centers for Disease Control and Prevention Janet L. Collins, PhD, John Lehnerr, Samuel F. Posner, PhD, and Kathleen E. Toomey, MD, MPH

<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2644605>

CDC Division of Reproductive Health

- Supports maternal and infant research

Source: <http://www.cdc.gov/reproductivehealth/MaternalInfantHealth/index.htm>

- **“the risk for developing GDM increased substantially as women’s BMI increased.”**

(Chu SY, Callaghan WM, Kim SY, Schmid CH, Lau J, England LJ, Dietz PM. Maternal obesity and risk of gestational diabetes mellitus. *Diabetes Care*. 2007 Aug;30(8):2070–2076.)

Source: <http://www.cdc.gov/reproductivehealth/maternalinfanthealth/PregComplications.htm>

- **“40% of the charts reviewed had a GDM diagnosis that was not recorded on the birth certificate. Sixteen percent had no documented GDM testing during pregnancy. Of those women who had an elevated 1-hour glucose tolerance test (GTT) only one-third received a 3-hour GTT. (Utah PRAMS data)**

Source: Gestational Diabetes Surveillance: Improving Interconception Health Presentation (DDT, DRH, NACDD collaboration; Joan Ware et al (<http://cdc.confex.com/cdc/pcs2007/techprogram/P13781.HTM>

CDC Division of Reproductive Health

GDM Activities Address 4 Areas:

- Building partnerships to strengthen prevention efforts of type 2 diabetes mellitus among women diagnosed with GDM
- Monitoring trends and risk factors in GDM
- Improving postpartum screening for diabetes
- Improving long-term follow up of women with a history of GDM (e.g. periodic glucose testing, counseling about diabetes prevention)

Source: <http://www.cdc.gov/reproductivehealth/maternalinfanthealth/PregComplications.htm>

Risk Factors for Developing GDM

- **Increasing maternal age**
- **Family history of diabetes**
- **History of GDM in a prior pregnancy**
 - Women with GDM have up to a 45 percent risk of recurrence with the next pregnancy and up to a 63 percent risk of developing type 2 diabetes later in life
Source: <http://www.cdc.gov/od/oc/media/pressrel/r010509.htm>
 - 3 Pregnancies with GDM = 100% risk for Type 2 diabetes

Source: Beckles GL, Thompson-Reid PE (Eds.): *Diabetes and Women's Health Across the Life Stages: A Public Health Perspective*. Atlanta, Centers for Disease Control and Prevention, 2001.
(<http://docnews.diabetesjournals.org/cgi/content/full/3/5/8#REF2>)

- **Increased pre-pregnancy Body Mass Index (BMI)**
 - “For every 1 kg m(-2) increase in BMI, the prevalence of GDM increased by 0.92% (95% CI 0.73 to 1.10).”

Source: Prepregnancy BMI and the risk of gestational diabetes: a systematic review of the literature with meta-analysis. Torloni, MR; Betran, AP; Horta, BL; Nakamura, MU; Atallah, AN; Moron, AF; Valente, O
OBESITY REVIEWS 10 (2): 194-203 MAR 2009 (Meta Analysis)

Current Trends – Hyperglycemia and Adverse Pregnancy Outcomes (HAPO) Study

Seven year international epidemiologic investigation of the association of various levels of glucose intolerance during the third trimester of pregnancy and risk of adverse outcomes (N = 23,316 women). PI: Boyd Metzger, MD

Source: <http://www.preventivemedicine.northwestern.edu/hapo.htm>

- **Reported findings:**

- “Strong, continuous associations of maternal glucose levels below those diagnostic of diabetes with increased birth weight and increased cord-blood serum C-peptide levels.” (a surrogate marker for fetal insulin levels)

(Source: <http://content.nejm.org/cgi/content/abstract/358/19/1991> [2008])

- Even a small rise in blood sugar above what is considered normal was associated with an increase in adverse outcomes, including high birth weight, C-section delivery, and preeclampsia, a complication that can lead to premature birth and can be deadly if not treated.

- Elevated blood sugar has a direct negative impact on pregnancy and delivery.

(Source: <http://www.medicinenet.com/script/main/art.asp?articlekey=89329> [2008])

Current Trends – Hyperglycemia and Adverse Pregnancy Outcomes (HAPO) Study

- Link between maternal glucose and neonatal adiposity
(Source: <http://diabetes.diabetesjournals.org/cgi/content/abstract/58/2/453> [2009])
- Direct correlation between a mother's increased hyperglycemia during pregnancy and the child's increased risk of childhood obesity

(Source: <http://www.endocrinetoday.com/view.aspx?rid=26585> [2008])

- **Future:** “The level of maternal blood glucose at which a diagnosis of gestational diabetes is made will soon be lowered based on the findings of this study”

(Source: Symposium: Hyperglycemia and Adverse Pregnancy Outcome (HAPO) Highlights
<http://professional.diabetes.org/UserFiles/File/Scientific%20Sessions/Media/2007/HAPO%20Final.doc>)

- **Related research:** “insulin sensitivity and pancreatic beta-cell function, both during pregnancy and at 3 months postpartum, fell as glucose homeostasis during pregnancy went from normal to gestational diabetes ($p < 0.0001$)”

Source: *Diabetes Care*. 2008;31:2026-2031.
<http://medgenmed.medscape.com/viewarticle/581856>

Current Trends – Treating Mild GDM

- **Mild gestational diabetes** was defined as a fasting glucose greater than 95 mg/dL and abnormal glucose tolerance test results at two of three following time points: one hour (>180 mg/dL), two hours (>155 mg/dL), and three hours (>140 mg/dL).
- Treated women were significantly less likely to develop gestational hypertension or preeclampsia ($P=0.015$) and babies born to women in the treated group had a mean birth weight that was about 100 g lower than those born to untreated women ($P=0.0005$).

Source: Landon M, et al "A prospective multicenter randomized treatment trial of mild gestational diabetes (GDM)" Society for Maternal-Fetal Medicine (SMFM) 2009; Abstract 2.

Reported February 03, 2009 at:

http://www.medpagetoday.com/MeetingCoverage/SMFM/12726?utm_source=WC&utm_medium=email&utm_campaign=Meeting_Roundup_SMFM

Current Trends – Metformin in Gestational Diabetes Trial

- Birth weights were similar for both groups, as was frequency of adverse perinatal outcomes. Patients markedly preferred treatment with metformin over insulin-only treatment (76.6% vs. 27.2%). Almost half the patients in the metformin group required supplemental insulin.

Source: Rowan JA et al. Metformin versus insulin for the treatment of gestational diabetes. *N Engl J Med* 2008 May 8; 358:2003, as reported at <http://womens-health.jwatch.org/cgi/content/full/2008/507/1#> (2008)

Current Trends – Link to Postpartum Depression

- “Women with diabetes have nearly twice the risk of being diagnosed with depression during pregnancy or in the year following delivery.”
- “15.2% of women with pre-pregnancy or gestational diabetes were diagnosed with depression or filled a prescription for an antidepressant during pregnancy or after delivery compared with only 8.5% of women who did not have diabetes.”
- “Among women who had no indication of depression during the prenatal period, those with diabetes had higher odds of postpartum depression (OR 1.69, 95% CI 1.27 to 2.23).”
- “Because diabetes affects glycemic control and thyroid function -- hormonal changes may contribute to the development of depression during the perinatal period,...

Source:

Kozhimannil KB, et al "Association between diabetes and perinatal depression among low-income mothers" *JAMA* 2009; 301(8): 842. Reported at:

http://www.medpagetoday.com/Geriatrics/Depression/13017?utm_source=mSpoke&utm_medium=email&utm_campaign=DailyHeadlines&utm_content=GroupB&userid=36040&impressionId=1235539418244

Issues – Postpartum Visits

- Women with GDM have a 45% risk of recurrence with the next pregnancy and up to 63% risk of developing type 2 diabetes later in life.²
- About half of all women with gestational diabetes mellitus will develop type 2 diabetes within the next five - ten years.

Source:

http://www.coloradoguidelines.org/pdf/guidelines/gestationaldiabetes/cdphe/gdm_nutrition_guideline_7-06-07.pdf

- Women with 3 GDM pregnancies are at 100% risk for developing Type 2 diabetes

Source: Postpartum Follow-up Crucial in Women With Gestational Diabetes (Kurt Ullman) *DOC News* May 1, 2006

Volume 3 Number 5 p. 8 © 2006 American Diabetes Association
(<http://docnews.diabetesjournals.org/cgi/content/full/3/5/8#REF2>)

Reclassification Criteria for Postpartum Maternal Glycemic Status *

Time	Normoglycemia	Pre-diabetes	Type 2 Diabetes Mellitus
Fasting	<100 mg/dL	≥ 100 mg/dL and <126 mg/dL Impaired Fasting Glucose (IFG)	≥ 126 mg/dL
2-hour	< 140 mg/dL	≥ 140 mg/dL and < 200 mg/dL Impaired Glucose Tolerance (IGT)	≥ 200 mg/dL

*American Diabetes Association criteria

Source: http://www.coloradoguidelines.org/pdf/guidelines/gestationaldiabetes/cdphe/gdm_nutrition_guideline_7-06-07.pdf

Issues – Postpartum DM Screening

- Women with GDM should go for a follow-up glucose tolerance test at six to 12 weeks postpartum

Source:

http://www.coloradoguidelines.org/pdf/guidelines/gestationaldiabetes/cdphe/gdm_nutrition_guideline_7-06-07.pdf

- HEDIS Postpartum Visit Compliance Rates in Managed Care Programs
National figures (NCQA, 2003)
 - Commercial plans: 80.3% (74.1% in 2000)
 - Medicaid: 55.3% (49.8 % in 2000)

Source: Women's Health and Preconceptional Care Between Pregnancies: Development of Internatal Care Programs (Boston) www.ihs.gov/medicalprograms/mch/f/documents/Internatal10606.ppt

- NCQA Quality Profile (2003)
 - Only 63% return for postpartum checkups

Source: Klerman LV. (June 21, 2005). Interconception Care. Retrieved June 3, 2009 from http://www.marchofdimes.com/files/PR_Klerman.ppt

Issues – Postpartum DM Screening

- Postpartum Glucose Tolerance Screening in Women with Gestational Diabetes in North Carolina (January – February 2009)
 - Health care professionals: 21% always screen; 16% never screen postpartum for GDM
 - About 3/4s screened postpartum (vs. 98% screened for GDM in pregnancy)

Source: <http://ncmedicaljournal.com/Jan-Feb-09/Baker.pdf>

- Obstetricians seldom provide postpartum diabetes screening for women with gestational diabetes (May 2008)
 - 20% of women with history of GDM were screened by Ob-Gyn;
 - 33.3% (if you include primary care physicians)

Source: <http://download.journals.elsevierhealth.com/pdfs/journals/0002-9378/PIIS0002937807021084.main-abr.pdf>

New Idea – Internatal Care

2006's MMWR's Recommendations to Improve Preconception Health and Health Care – United States (April 21, 2006/v. 55/RR-6)

Recommendation 5. Interconception care.

Use the interconception period to provide intensive interventions to women who have had a prior pregnancy ending in adverse outcome (e.g., infant death, low birthweight or preterm birth).

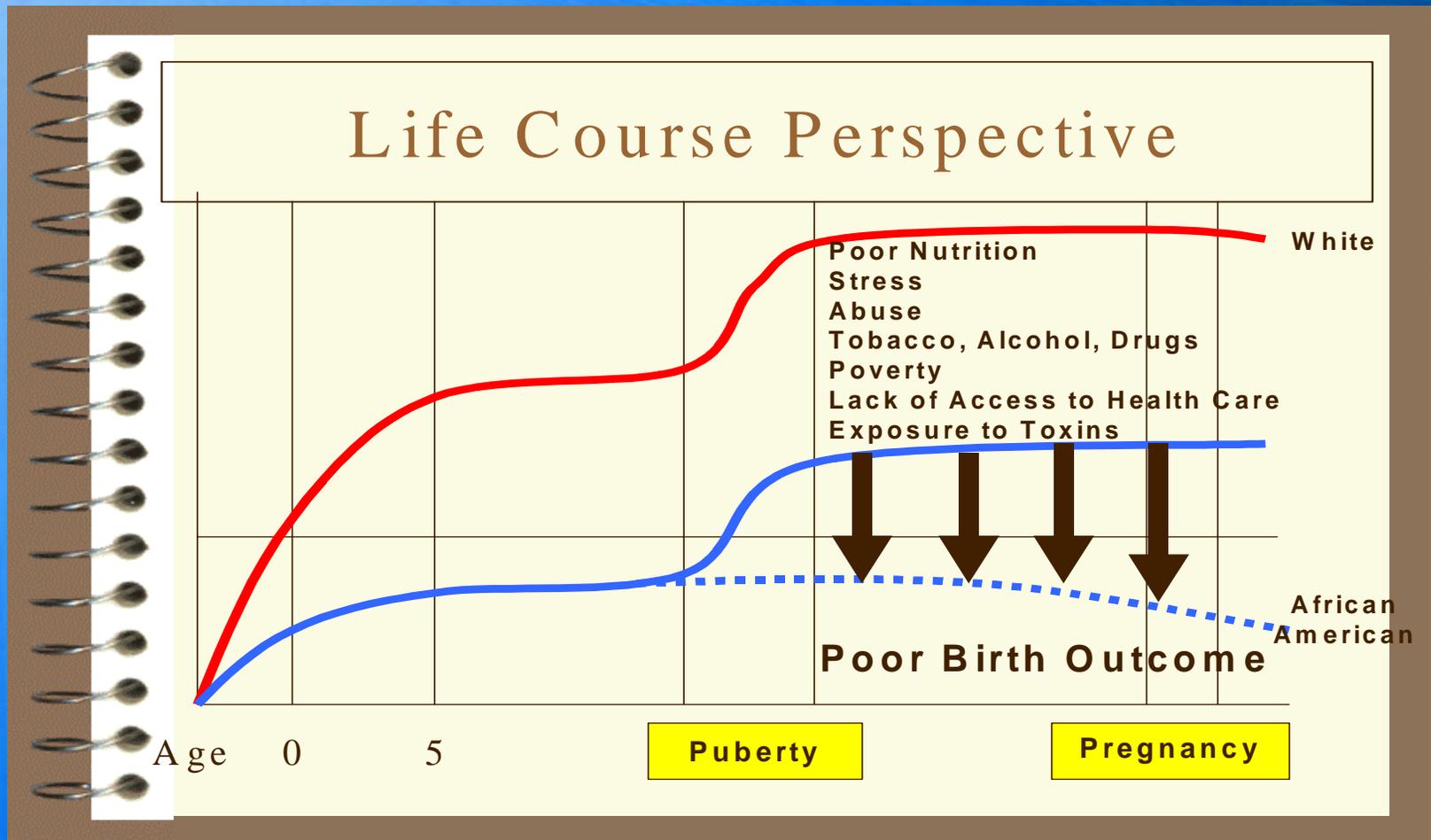
Internatal (Interconception) care represents an extension of prenatal care, providing clinical care specified for the following health problems:

- Hypertensive disorders before or during pregnancy
- Pre-gestational or gestational diabetes
- Underweight, overweight or obesity
- Cigarette smoking or problems with alcohol or substance use

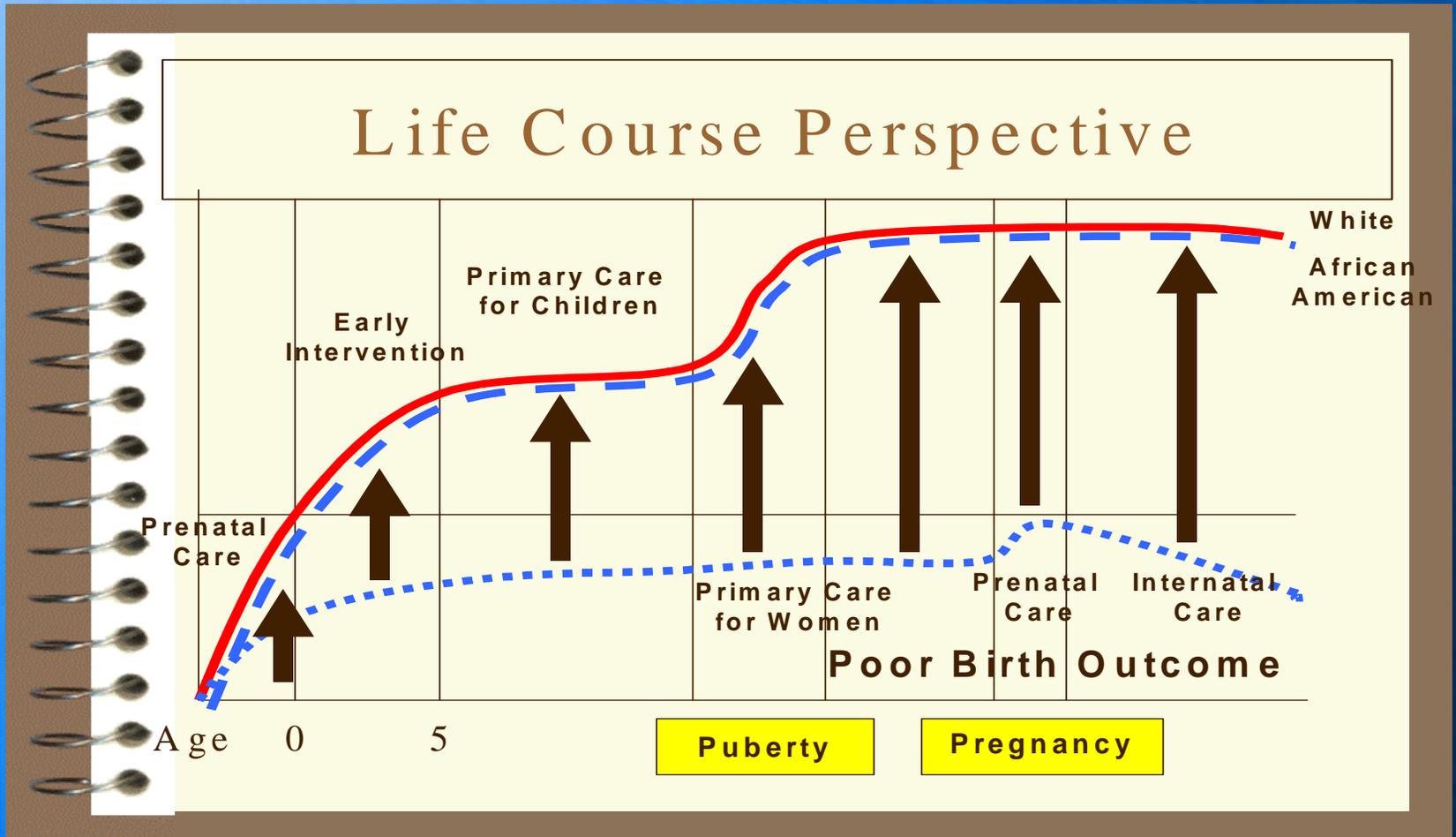
Source: Women's Health and Preconceptional Care Between Pregnancies: Development of Internatal Care Programs

<http://www.ihs.gov/medicalprograms/mch/f/documents/Internatal10606.ppt>

Negative environmental factors and health behaviors compromise birth outcomes



Internatal Care Improves Birth Outcomes



New Idea – Internatal Care

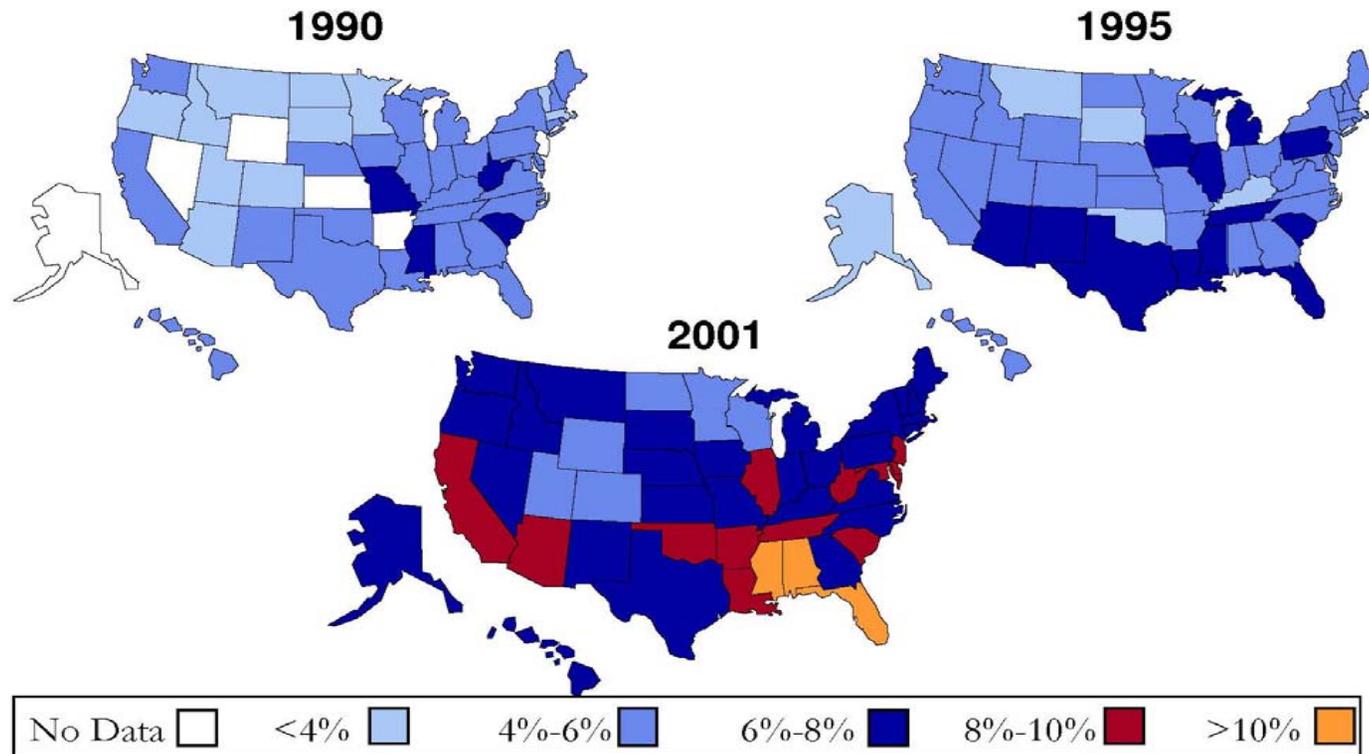
- Recommended Content and Schedule of Internatal Care:
Enhanced Content of Internatal Care for all Women

<u>Risk assessment, health promotion, clinical & Psychological Interventions</u>	<u>Organization</u>
Chronic hypertension	NHLBI
Gestational hypertension	NHLBI, ACOG
Pre-gestational diabetes	ADA
Gestational diabetes	ADA, ACOG
Overweight/Obesity	ACS, ACOG

Why Gestational Diabetes Surveillance?

- Currently, there is no national GDM surveillance system in place
- Screening is risk-based and not universal
- Standards for GDM screening and management are yet to be set
- We need to better understand who is at risk for GDM so we can intervene to prevent the development of type 2 diabetes in those individuals, and to identify women who can benefit from prenatal care

Diabetes Trends* Among Adults in the U.S., (Includes Gestational Diabetes)



Source: Mokdad et al., *Diabetes Care* 2000;23:1278-83; *J Am Med Assoc* 2001;286:10.

National GDM Surveillance Sources

- **Division of Reproductive Health (CDC)**
 - Infant mortality, fertility, low birth weight
 - http://www.cdc.gov/reproductivehealth/Data_Stats/index.htm
- **CDC MMWR: Diabetes During Pregnancy – United States, 1993-1995 (May 1998)**
 - US birth records; type of diabetes (pre-gestational, gestational) was not recorded (weakness of this report).
 - Maternal diabetes rate – 25.3/1000; 2.5% of pregnant women (1993-1995); 2.1% of pregnant women (1989)
 - Foreign-born mothers had higher rates than US-born mothers
 - <http://www.cdc.gov/mmwr/preview/mmwrhtml/00053037.htm>

National GDM Surveillance Sources

- **Behavioral Risk Factor Surveillance System (BRFSS) 2007**
 - National GDM estimate is 0.9%
 - Connecticut GDM estimate is 1.4%
- **CDC Pediatric and Pregnancy Nutrition Surveillance System (PEDNESS) [40 states] 2006 (WIC programs)**
 - Pre-pregnancy BMI for Connecticut: 42.9% overweight (vs. 43.8% nationally)

Source: http://www.cdc.gov/pednss/pnss_tables/pdf/national_table5.pdf

- **CDC Pregnancy Risk Assessment Monitoring System (PRAMS) [37 states] 2007**
 - Pre-pregnancy diabetes 1.8% (24 states) [2006]
 - GDM Validation Project (6 states) – PRAMS + Birth + Medical Discharge Data (Owens)

Source: <http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5610a1.htm>

- **CDC Wonder – Healthy People 2010**
 - 05-08 Gestational Diabetes (no data) – deleted at Mid-course Review

Source: <http://wonder.cdc.gov/data2010/obj.htm>

Other GDM Surveillance Sources

State and Local Related Data Sources

- **Diabetes and Pregnancy -- Michigan, Missouri, South Carolina, Washington**

1983 - rates of perinatal morbidity and mortality, resulting mainly from poor glycemic control both before conception and during gestation, are approximately three to five times higher than for infants of nondiabetic women (**vital statistics and hospital discharge data**). Included pre-existing and GDM mothers.

<http://www.cdc.gov/mmwr/preview/mmwrhtml/00000187.htm>

- **Los Angeles County** - age-adjusted prevalence of gestational diabetes increased more than threefold, from 14.5 cases per 1000 women in 1991 to 47.9 cases per 1000 in 2003 (**hospital discharge records**)

http://www.cdc.gov/pcd/issues/2008/jul/07_0138.htm

Other GDM Surveillance Sources

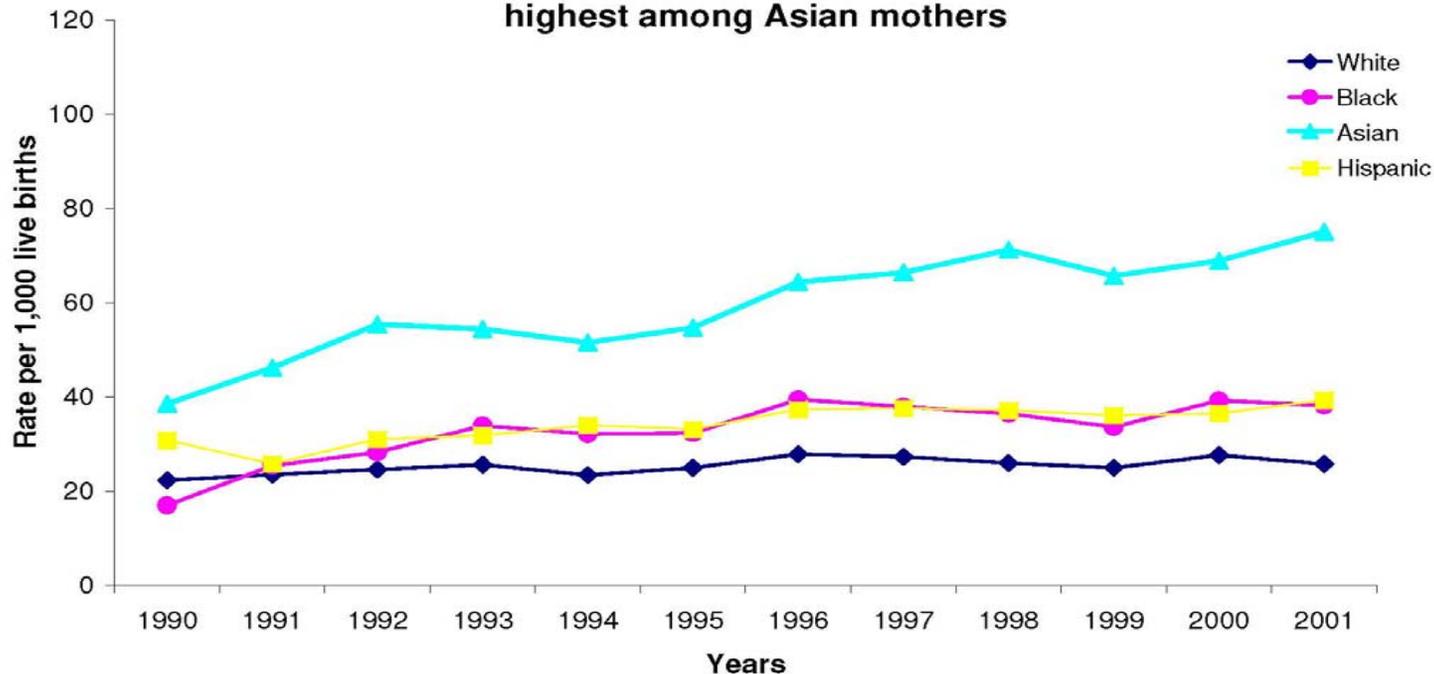
- **MA (2007) – Data Integration: Pregnancy to Early Life Longitudinal (PELL) Data System. Birth Related Core + Hospital Discharge data +Other sources.**
[http://www.astho.org/pubs/Massachusetts Gestational Diabetes Summit-Kotelchuck Slides.pdf](http://www.astho.org/pubs/Massachusetts_Gestational_Diabetes_Summit-Kotelchuck_Slides.pdf)
- **New York City – Ethnicity and Gestational Diabetes (1995 – 2003 birth records and hospital discharge data).** Varied by ethnic groups, foreign-born women consistently at higher risk than US-born women. GDM risk increased over time among South Central Asians (Bangladesh), some Hispanic groups, and African-Americans
BJOG, Vol 115, No. 8 (969-978), June 28, 2008

International Studies

- **GDM in Victoria, Australia 1996 – estimated incidence 3.6% (60,000 births – birth and hospital linked data)**
http://www.mja.com.au/public/issues/177_09_041102/sto10788_fm.html

Gestational Diabetes: Getting Ahead of the Curve

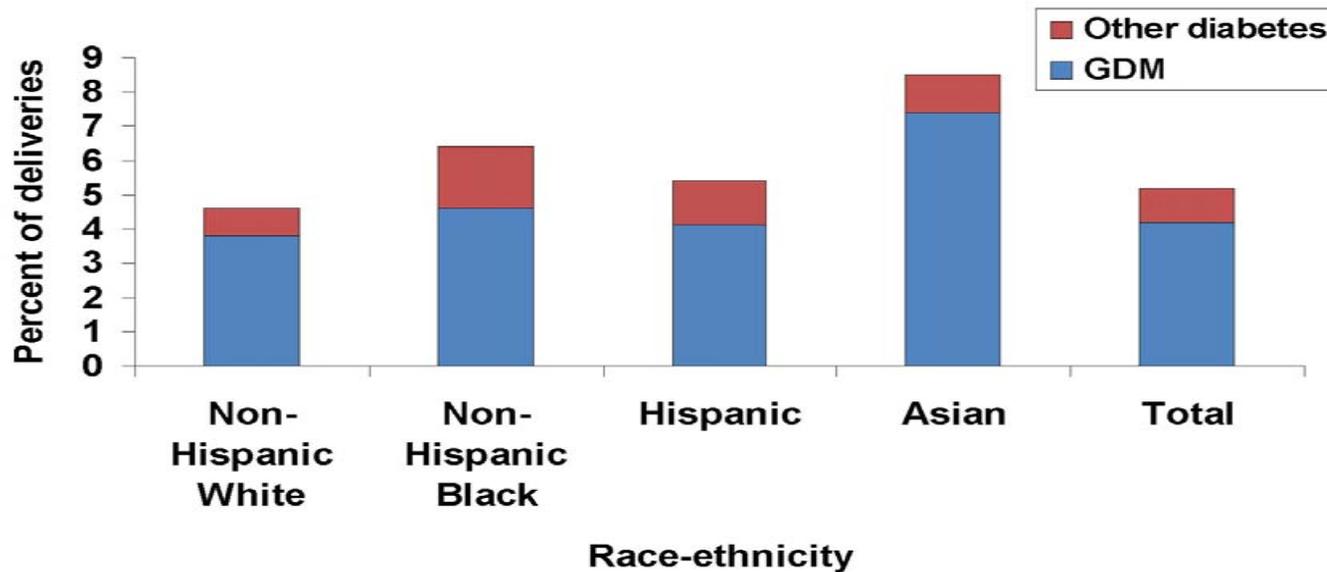
Between 1990 and 2001, rates of diabetes during pregnancy have been highest among Asian mothers



Source: Bureau of Vital Statistics, 1990-2001

MA's PELL Data System

Percent of deliveries with gestational diabetes or other pre-existing diabetes* by race-ethnicity, MA residents, 1998-2004



* Diabetes reported on birth or fetal death certificates, or hospital discharge delivery record

Source: Massachusetts Pregnancy to Early Life Longitudinal Data System (PELL)

Data Sources for GDM Surveillance

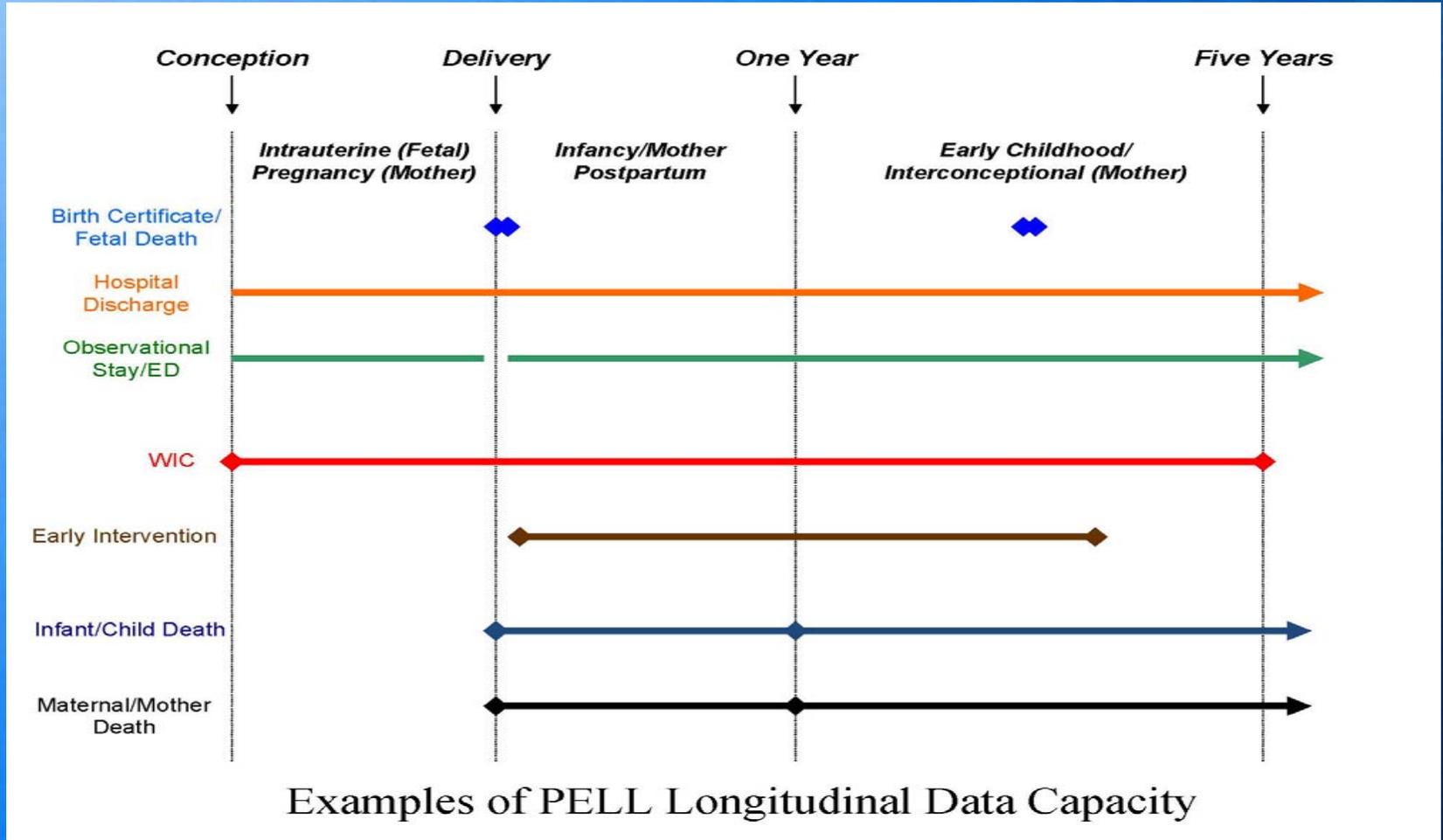
Birth certificate records and hospital discharge records

- Hospital discharge records better for identifying pre-pregnancy diabetes (PDM)
- Hospital discharge records, only marginally better than birth certificates for identifying GDM
- **Use birth certificates only to identify GDM, not PDM**
- Both under-report the number of diabetes-complicated births (GDM, PDM or both combined)

Outpatient prenatal care records – best source for maternal diabetes status

Source: Reviewing Performance of Birth Certificate and Hospital Discharge Data to Identify Births Complicated by Maternal Diabetes. Devlin HM, Desai J & Walaszek A. Maternal Child Health Journal DOI 10.1007/s10995-008-0390-9; 2008.

Perhaps, the Ideal....



[http://www.astho.org/pubs/Massachusetts Gestational Diabetes Summit-Kotelchuck Slides.pdf](http://www.astho.org/pubs/Massachusetts_Gestational_Diabetes_Summit-Kotelchuck_Slides.pdf)

Gestational Diabetes in Connecticut Issue Brief

- **2003-2006 birth certificate data**
 - **4.1% (6,890) of births were to mothers with GDM (N = 167,183 births/4 years)**
 - **Mothers with GDM were significantly more likely to deliver by C-section (43.7%) than mothers without GDM (31.2%)**
 - **County distribution of GDM births was similar to distribution of all Connecticut births**

Next Steps: Connecticut GDM Surveillance

- **Currently working with Vital Statistics Section to develop annual data tables of GDM data.**
- **Disseminating the availability of GDM data to public health programs addressing diabetes, maternal child health issues (school-based health centers, community health centers, newborn screening, family planning, women's health), chronic disease risk factors (e.g., obesity, nutrition, physical activity, tobacco)**

Gestational Diabetes Mellitus Surveillance in Connecticut Issue Brief

**Available on the Connecticut Department of
Public Health Web site at:**

Connecticut Diabetes Surveillance System Webpage

<http://www.ct.gov/dph/diabetesdata>

**Issue brief was developed with funding from the Centers for
Disease Control and Prevention Grant #U32/CCU122689-
05 Systems-Based Diabetes Prevention and Control
Program**

What's Going on In Connecticut

Yale Maternal Fetal Medicine (Stephen F. Thung MD MSCI)

1. We are looking at fasting glucoses on postpartum day #1 to see if they would be predictive of an abnormal 2 hour GTT at the postpartum visit (we have such a poor adherence to postpartum screening).
2. We are exploring group prenatal care in our GDM population. We only do this when we have at least 4 patients who are pregnant around the same time. The patients love it, especially our Spanish speaking patients.
3. I presented a cost-utility analysis on the 130 vs 140mg/dL cut-off for glucose challenge tests last year. I am writing it up now.

Other GDM Resources

- **Annotated Bibliography about Gestational Diabetes**
- http://www.cdc.gov/diabetes/pubs/economics/biblio_120-133.htm
- **Diabetes & Pregnancy**
- <http://www.cdc.gov/Features/DiabetesPregnancy/>
- **Fetal Surveillance for GDM**
- http://www.jfponline.com/pdf%2F5503%2F5503JFP_ClinicalInquiries2.pdf
- **Gestational diabetes listserv**, contact: Michelle D. Owens, Ph.D., Behavioral Scientist. Centers for Disease Control and Prevention, Division of Diabetes Translation. E-mail: MOwens1@cdc.gov
- **Gestational Diabetes – CDC Division of Reproductive Health**
- <http://www.cdc.gov/reproductivehealth/maternalinfanthealth/PregComplications.htm>

Other GDM Resources

- **Gestational Diabetes: National Institute of Child Health and Human Development**

http://www.nichd.nih.gov/health/topics/Gestational_Diabetes.cfm

- **Colorado Health Department** – Gestational Diabetes Guideline

<http://www.coloradoguidelines.org/guidelines/gestationaldiabetes.asp>

- **Massachusetts PELL Data System; 2007 Birth Report**

http://www.astho.org/pubs/Massachusetts_Gestational_Diabetes_Summit-Kotelchuck_Slides.pdf

- http://sph.bu.edu/index.php?option=com_content&task=view&id=356&Itemid=452

- http://www.mass.gov/?pageID=eohhs2pressrelease&L=1&L0=Home&sid=Eeohhs2&b=pressrelease&f=090211_birth_report&csid=Eeohhs2

Other GDM Resources

- **South Dakota Gestational Diabetes Care Guidelines**
<http://www.cdc.gov/diabetes/pubs/gestational/components.htm>
- **POSTPARTUM COUNSELING: A Quick Reference Guide for Clinicians®** From Association of Reproductive Health Professionals
<http://www.arhp.org/uploadDocs/QRGpostpartumcounseling.pdf>
- **Postpartum Follow-up Crucial in Women With Gestational Diabetes**
<http://docnews.diabetesjournals.org/cgi/content/full/3/5/8#REF2>