

# Weight Gain During Pregnancy: Reexamining the Guidelines

Presented to the Maternal and Child Health  
Federal/State Partnership Meeting

October 26, 2009



*A joint project between:*

The National Academies'  
Institute of Medicine  
Food and Nutrition Board  
and  
National Research Council/  
Institute of Medicine  
Board on Children, Youth and Families



## Study Objectives

- Review evidence on the relationship between weight gain patterns before, during and after pregnancy and maternal and child health outcomes
- Within a life-stage framework, consider factors in relation to weight gain during pregnancy that are associated with maternal and infant health outcomes



## Study Objectives

- Recommend revisions to the existing guidelines, where necessary, including the need for specific pregnancy weight guidelines for underweight, normal weight, and overweight and obese women and adolescents, and women carrying twins or higher-order multiples
- Consider a range of approaches to promote appropriate weight gain
- Identify gaps in knowledge and recommend research priorities



## Important Features

In this Reexamination of the 1990 guidelines, the committee:

- Structured its report conceptually with attention to important public health models
- Did new science
  - trade-off between mother and infant
  - quantitative risk analysis
- Considered implementation broadly



## Background

American women of childbearing age are now:

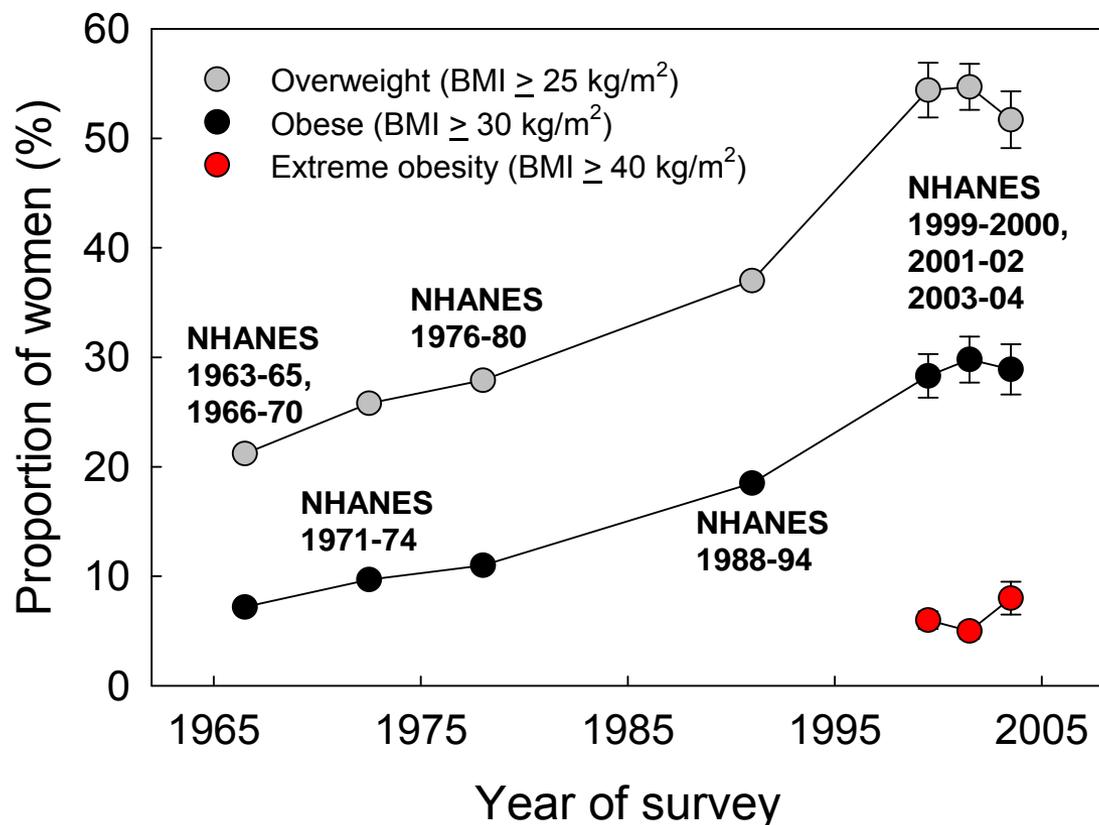


❖ Older when they get pregnant

- ❖ More diverse
- ❖ Having more twin and triplet pregnancies



## Prevalence of overweight, obesity and extreme obesity among women 20-39\* y old: US, 1963-2004



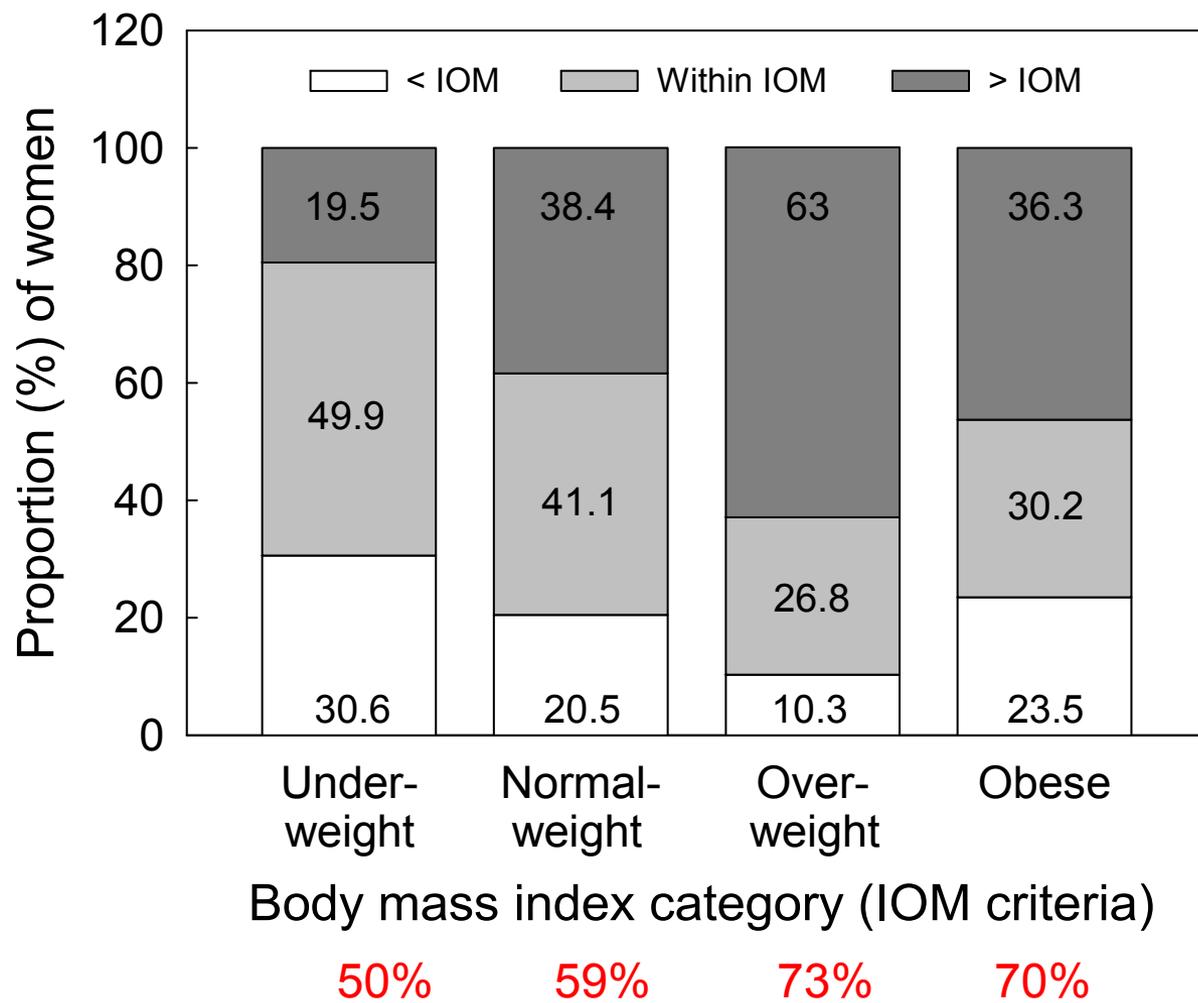
From: *Health, United States, 2005* and Ogden CL, et al. *JAMA* 2006;**295**:1549.

\*Ages 20-35 through NHANES 1988-94





## Distribution of GWG Relative to 1990 Guidelines by Prepregnancy BMI Category



# Determinants of GWG

Weight Gain in Pregnancy is Determined by Many Factors:

## Maternal Factors

- Socio-demographic
  - Adolescent
  - Older Mothers



- Race/Ethnicity
- Socioeconomic Status
- Medical, Psychological and Behavioral



# Determinants of GWG

## Neighborhood/ Community Factors

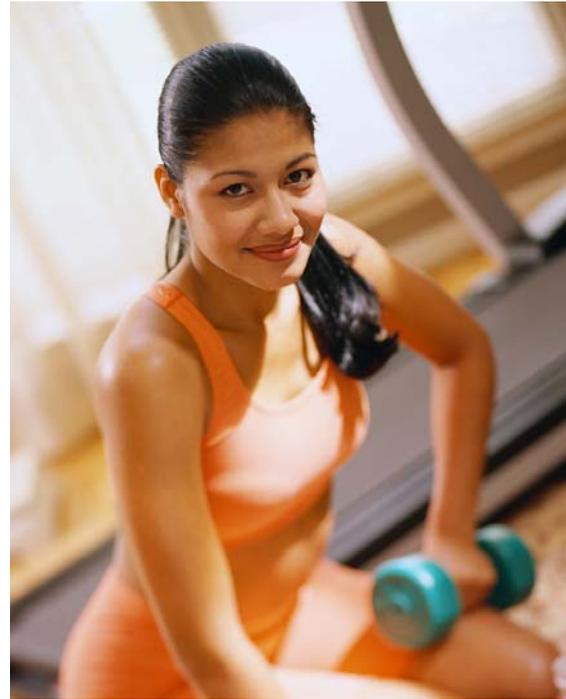
- Access to Healthy Food



# Determinants of GWG

## Behavioral Factors

- Diet
- Physical Activity



## Maternal Outcomes of GWG from AHRQ

Outcome category	Evidence rating
<p><i>Antepartum outcomes</i></p> <p>Maternal discomforts of pregnancy, hyperemesis, abnormal glucose metabolism, hypertensive disorders, gallstones</p>	<p>Weak</p>
<p><i>Intrapartum outcomes</i></p> <p>PROM, preterm labor, post-term pregnancy, induction of labor, length of labor, <b>mode of delivery</b>, VBAC, vaginal lacerations, shoulder dystocia, cephalopelvic disproportion, labor/delivery complications</p>	<p>Weak (except moderate for cesarean delivery)</p>
<p><i>Postpartum outcomes</i></p> <p>Lactation, fat accrual, <b>short-, intermediate- and long-term weight retention</b>, interpregnancy weight retention, premenopausal breast cancer</p>	<p>Weak or no evidence (except moderate for intermediate-term weight retention)</p>



# Infant Outcomes of GWG from AHRQ

Outcome category	Evidence rating
<i>Birth outcomes</i> <b>Preterm birth, macrosomia, large-for-gestational age, small-for-gestational age, Apgar score</b>	Strong (except for Apgar score)
<i>Postnatal outcomes</i> Perinatal mortality, neonatal hypoglycemia, neonatal distress, hyperbilirubinemia, neonatal hospitalization, other infant morbidity, infant BMI, other infant growth	Weak

From: Viswanathan M, et al. AHRQ Publ. No. 08-E09, 2008.



# New Approaches to Development of the Guidelines

- Considered outcomes for the mother, not just the infant, and the inevitable trade-offs between them
- Commissioned new analyses
  - Ellen Nohr: DNBC (1996-2002), extension of trade-off analyses
  - Amy Herring: NIMHS (1988), black and white women
  - Cheryl Stein: NYC subsample (1995-2003), black and white women
  - Jim Hammitt: quantitative risk analysis





# New Weight Gain Recommendations

Prepregnancy BMI category	Total weight gain (lb, kg)	Rate of weight gain 2 <sup>nd</sup> and 3 <sup>rd</sup> trimester (lb/wk, kg/wk)
Underweight (< 18.5 kg/m <sup>2</sup> )	<b>28-40</b> , 12.5-18	1.0 (1.0-1.3), 0.51 (0.44-0.58)
Normal-weight (18.5-24.9 kg/m <sup>2</sup> )	<b>25-35</b> , 11.5-16	1.0 (0.8-1.0), 0.42 (0.35-0.50)
Overweight (25.0-29.9 kg/m <sup>2</sup> )	<b>15-25</b> , 7-11.5	0.6 (0.5-0.7), 0.28 (0.23-0.33)
Obese (≥ 30.0 kg/m <sup>2</sup> )	<b>11-20</b> , 5-9	0.5 (0.4-0.6), 0.22 (0.17-0.27)



# Provisional Guidelines\*: Mothers of Twins

Prepregnancy BMI category	Weight gain at term
Normal-weight	37-54 lb, 17-25 kg
Overweight	31-50 lb, 14-23 kg
Obese	25-42 lb, 11-19 kg

\*Based on the interquartile (25<sup>th</sup>-75<sup>th</sup> percentile) of gains of women who delivered twins at term (37-42 wk gestation) with birth weights  $\geq 2,500$  g

Note: Insufficient data are available to offer a guideline for underweight women

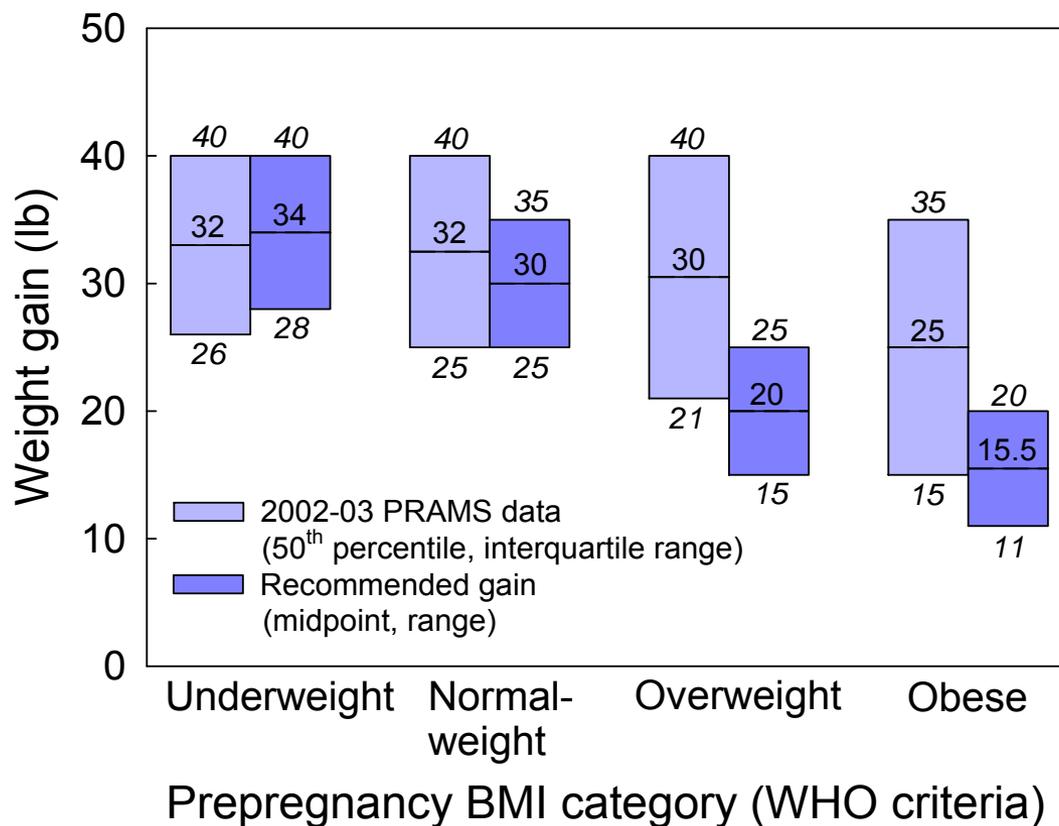


## Recommendations for Special Populations:

- Short stature: no modification
- Young age: no modification; use adult BMI tables
- Racial/ethnic subgroups: no modification
- Primiparity: no modification, but trade-off should be studied further
- Smokers: no modification, but stop smoking



## Comparison of Current GWG\* and New Guidelines by Prepregnancy BMI Category



## Action Recommendation: Adoption of Guidelines

- Federal agencies, private voluntary organizations, and medical and public health organizations should adopt these new guidelines for GWG and publicize them to their members and also to women of childbearing age.



# Action Recommendation:

## Data Needed

- HHS should conduct routine surveillance of GWG and post-partum weight retention on a nationally representative sample of women
  - Report results by prepregnancy BMI, age, racial/ethnic group and socioeconomic status
- States should adopt the revised birth certificate
  - Contains prepregnancy weight, height, weight at delivery and gestational age at last weight



## The Challenges Ahead

- Conceive at a normal prepregnancy BMI
  - Requires preconceptional counseling and, for some, weight loss
- Gain within the guidelines
  - Inform women and their health care providers of the guidelines
  - Provide individualized assistance with meeting the guidelines
    - Monitor GWG, guidance on diet and exercise



# Action Recommendation: Inform Women and Health Care Providers

- Federal, state and local agencies as well as health care providers should inform women of the importance of conceiving at a normal BMI and all those who provide health care or related services to women of childbearing age should include preconceptional counseling in their care

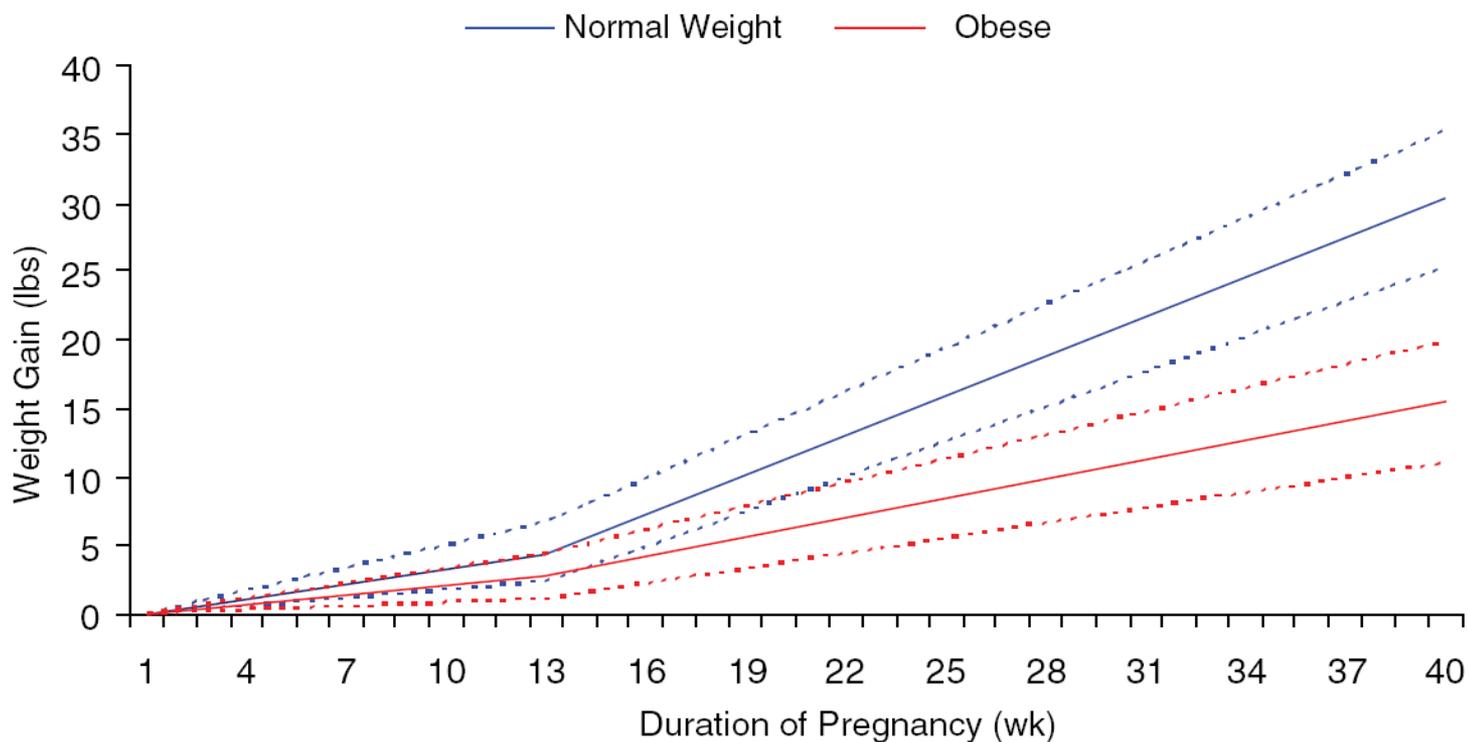


# Action Recommendation: Assist Women to Gain Within the Guidelines

- Those who provide prenatal care to women should offer them counseling, such as guidance on dietary intake and physical activity, that is tailored to their life circumstances



# Model Charts that can be Adapted for Use in Counseling Women



# Research Recommendation: Preparing for the Future

- Studies are needed on:
  - Dietary intake, physical activity and other factors affecting weight gain
  - Impact of weight gain on both maternal and child outcomes
  - Ways to assist minority and underserved populations achieve weight gain within the new guidelines
  - Cost-effectiveness of interventions to assist women in meeting the new guidelines



## Conclusions

The guidelines themselves are not that different, but what it will take for women to gain within them represents a **radical** change in the care of women of childbearing age!

- Preconceptional care
- Improved care during pregnancy
- Postconceptional care



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