

HelmholtzZentrum münchen

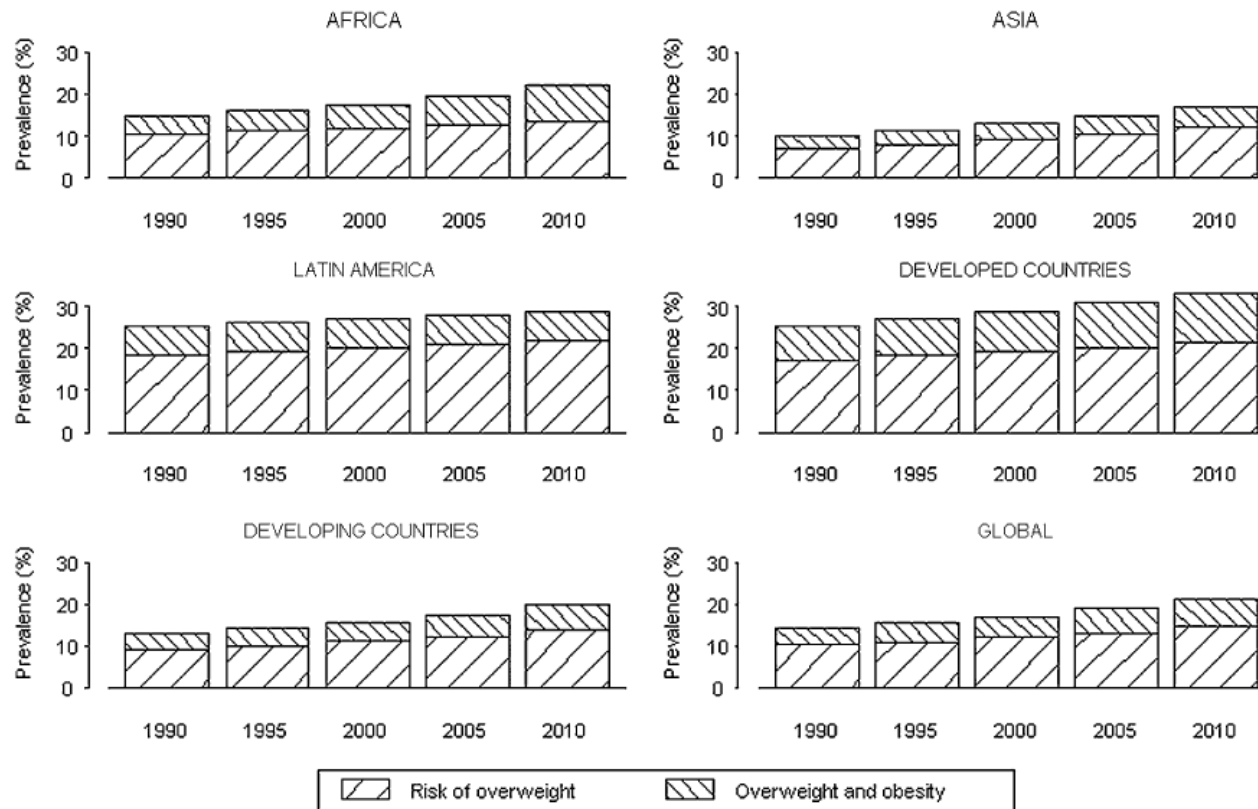
German Research Center for Environmental Health

Should overweight or obese women be encouraged to lose weight during pregnancy to improve fetal growth?

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The prevalence of childhood overweight is rising worldwide



Preschool children

Risk of overweight: BMI SDS > 1, Overweight: BMI SDS > 2

de Onis et al., AJCN 2010

Risk factors for childhood overweight

Unhealthy lifestyle:

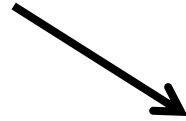
- High energy intake
- Low physical activity

Pre- and postnatal factors:

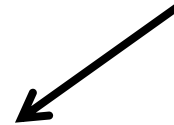
- Exclusive formula-feeding
- Maternal smoking in pregnancy
- Gestational weight gain (GWG)
- ...



Diet



Physical activity

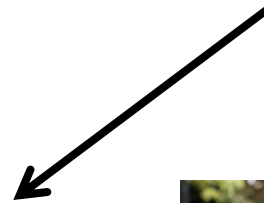


Gestational weight gain



Fetal growth / birth weight

Small for gestational age (SGA) --- *Large for gestational age (LGA)*



Overweight



GWG: What is “optimal”?

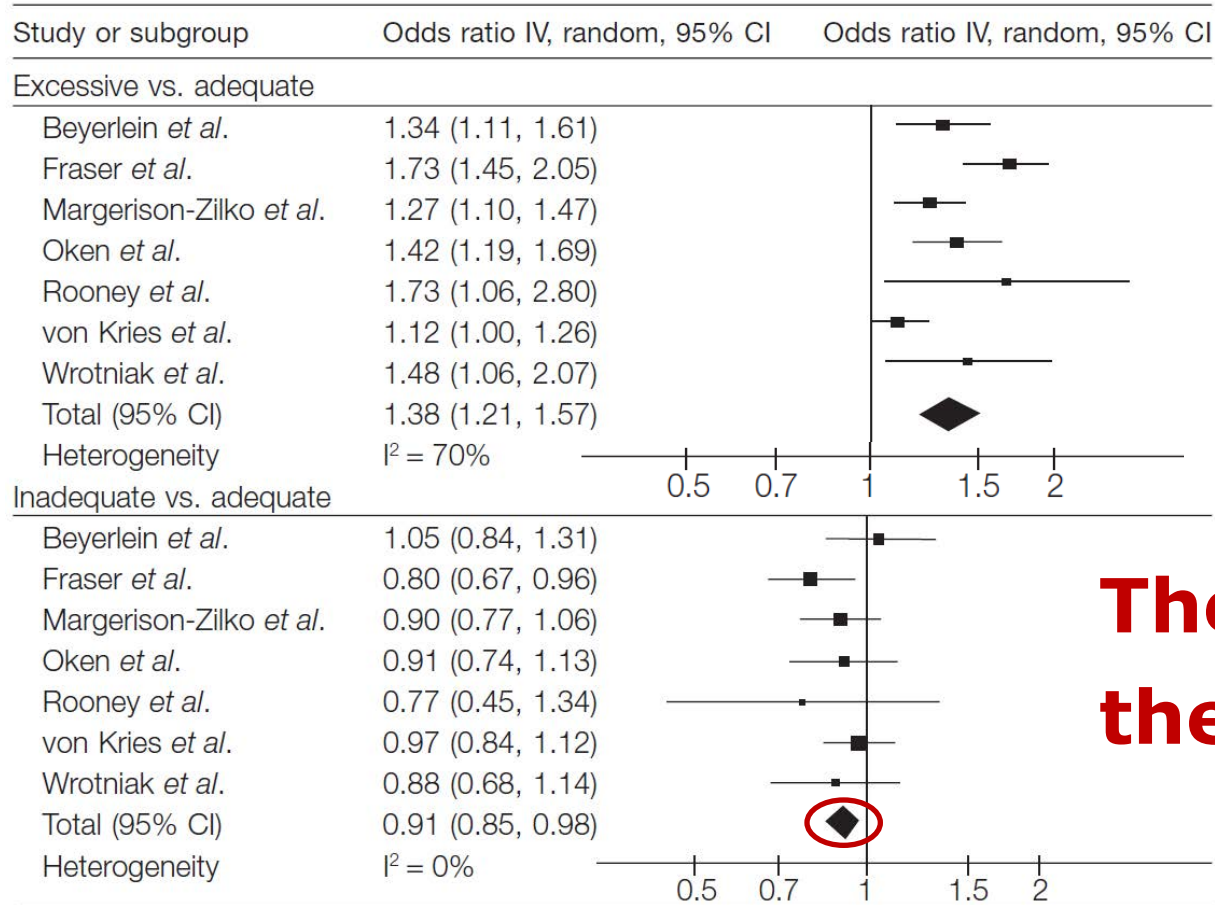
Recommendations of the US Institute of Medicine (IOM, 2009):

Mother	BMI [kg/m²]	GWG [kg]
Underweight	< 18.5	12.5 - 18.0
Normalweight	18.5 - 24.9	11.5 - 16.0
Overweight	25.0 - 29.9	7.0 - 11.5
Obese	≥ 30.0	5.0 - 9.0

Higher than recommended: “Excessive”

Lower than recommended: “Inadequate”

GWG and offspring's overweight risk



**The lower,
the better?!**

*Nehring et al.,
Pediatr Obes 2012*

What about weight loss during pregnancy?

Certainly an extreme approach!

- But some evidence for potential beneficial effects
- Oken et al., Am J Epi 2009: **Lowest risk for offspring's overweight in overweight / obese mothers by weight loss**

Could it make sense for overweight / obese mothers?

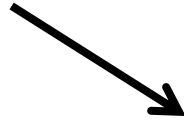
- High LGA rates
- Offspring are high risk group for overweight
- Maybe also beneficial for the mother?

Weight loss and fetal growth restriction

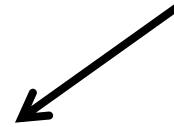
1. Does it work?
2. Is it safe for the mother?
3. Is it safe for the child?



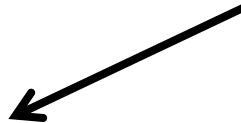
Diet



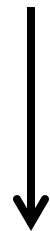
Physical activity



Gestational weight gain

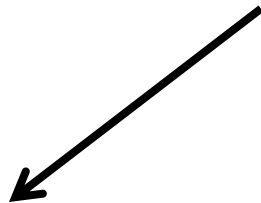


Other adverse short-term outcomes

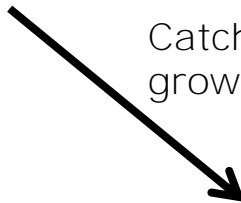


Fetal growth / birth weight

Small for gestational age (SGA) --- *Large for gestational age (LGA)*



Other adverse long-term outcomes



Catch-up growth

Overweight



Setting and participants

Data:

- Birth records from obstetric units in Bavaria, Germany, 2000-2007
- n = 445,323 singleton deliveries
- n = 87,212 (19.5 %) overweight / obese mothers
- No follow-up after birth

Variables:

- Weight at first visit (median date: 8 weeks) and delivery
- Pregnancy outcomes of mother and child
- Demographic variables

Data analysis

- Odds ratios (OR) for weight loss vs. non-excessive GWG:

- Birth weight
- Pre-eclampsia
- Emergency sectio
- Preterm delivery (prior to 37+0 weeks)

Mother	Non-excessive GWG
Overweight	0 - 11.5 kg
Obese	0 - 9.0 kg

- **Adjusted for diabetes, smoking, offspring's sex, parity, maternal age**
- Stratified for overweight and three obesity categories (I-III):
30-34.9, 35-39.9, ≥ 40 kg/m²

Observational study → Associations, no causal relations!

Prevalence of weight loss by BMI category

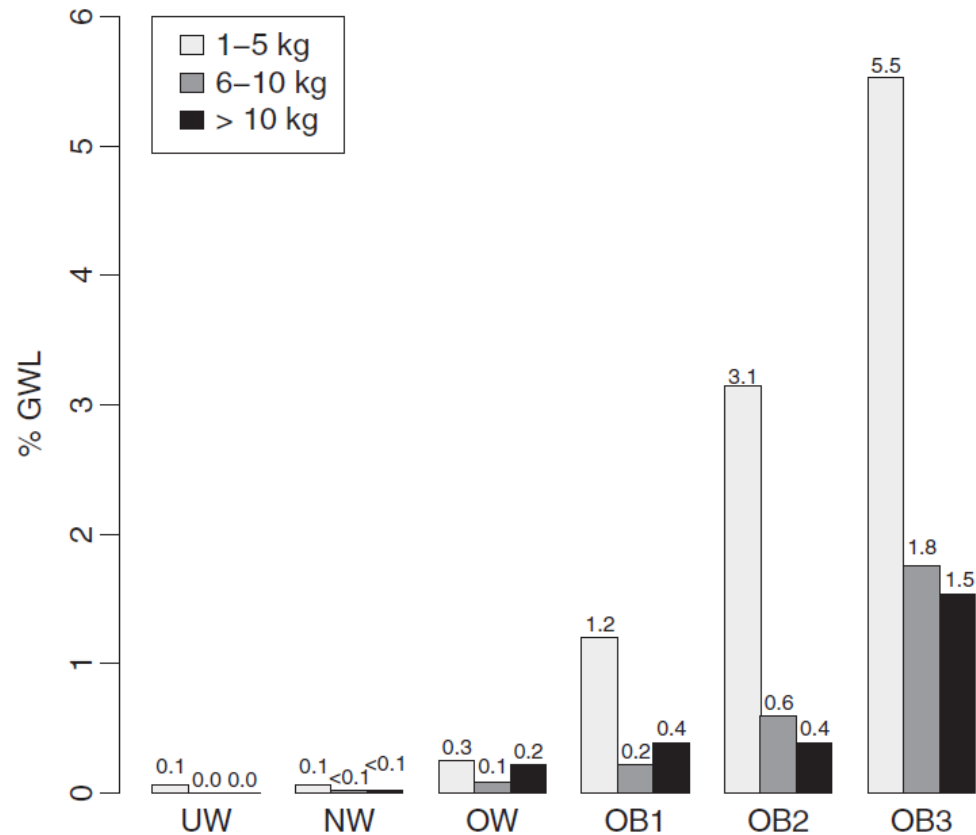
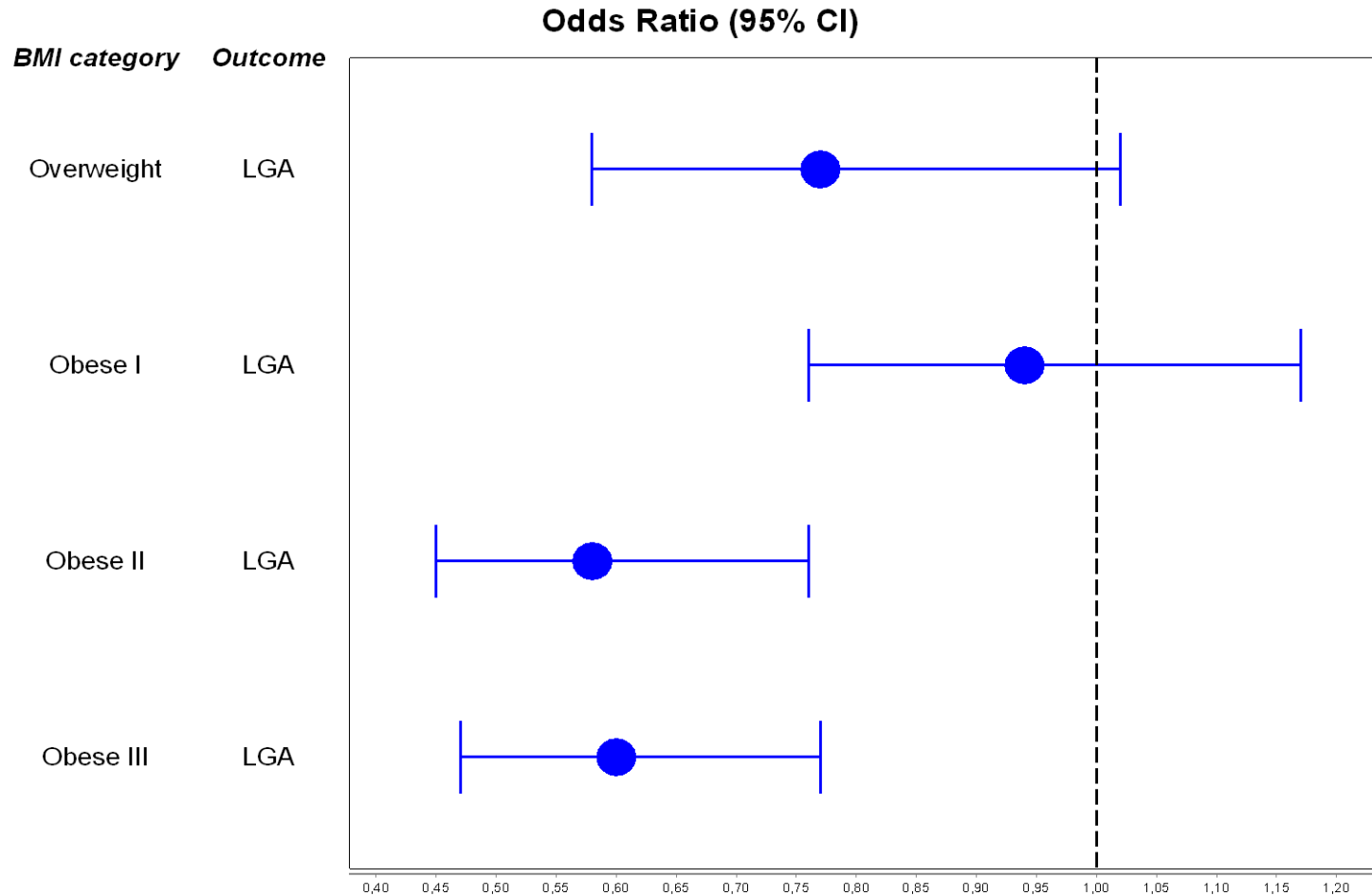
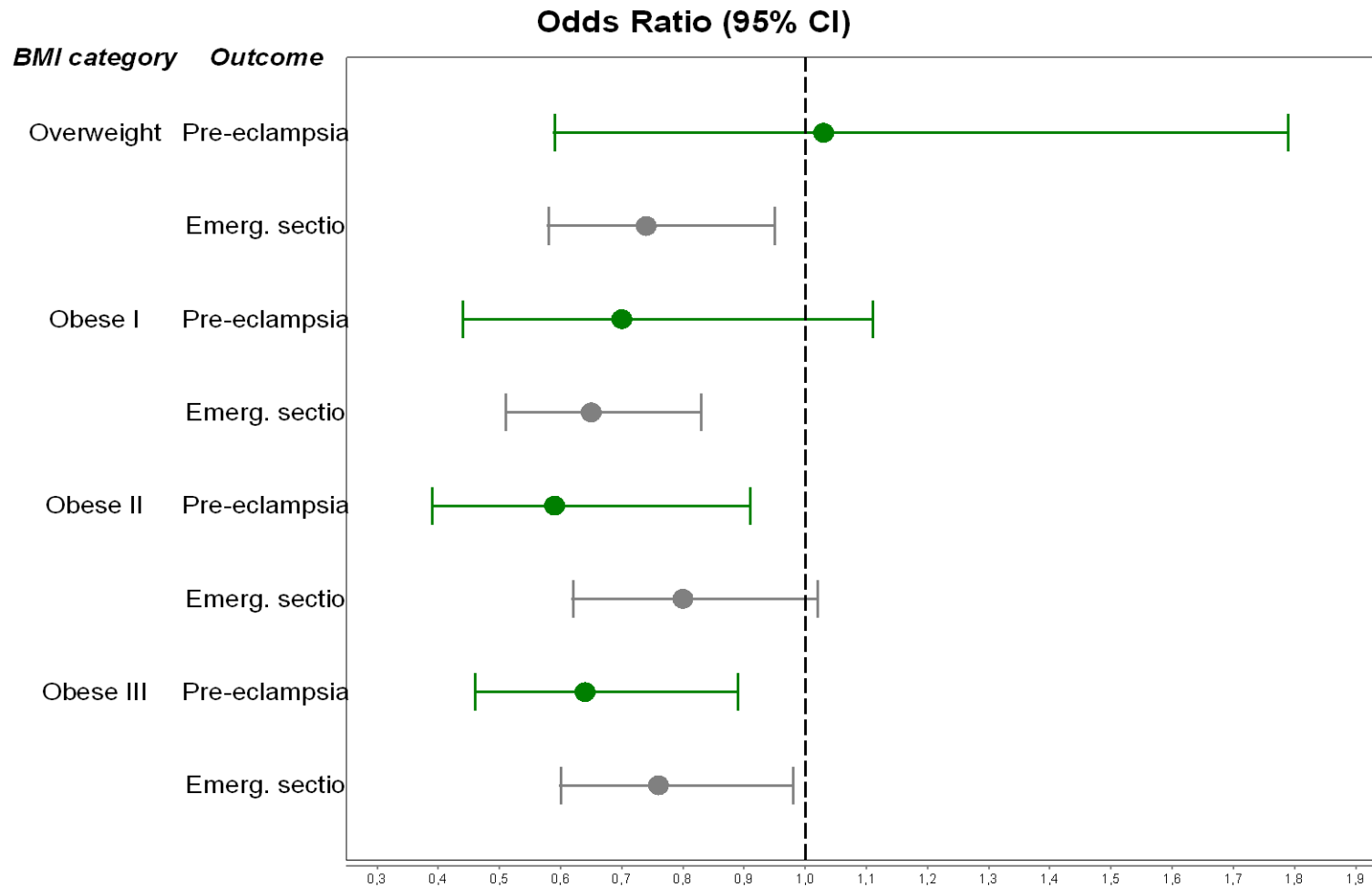


Figure 1. Proportions of women with different amounts of gestational weight loss (GWL) by body mass index (BMI) category: underweight (UW), normal weight (NW), overweight (OW), obese class I (OB1), obese class II (OB2) and obese class III (OB3).

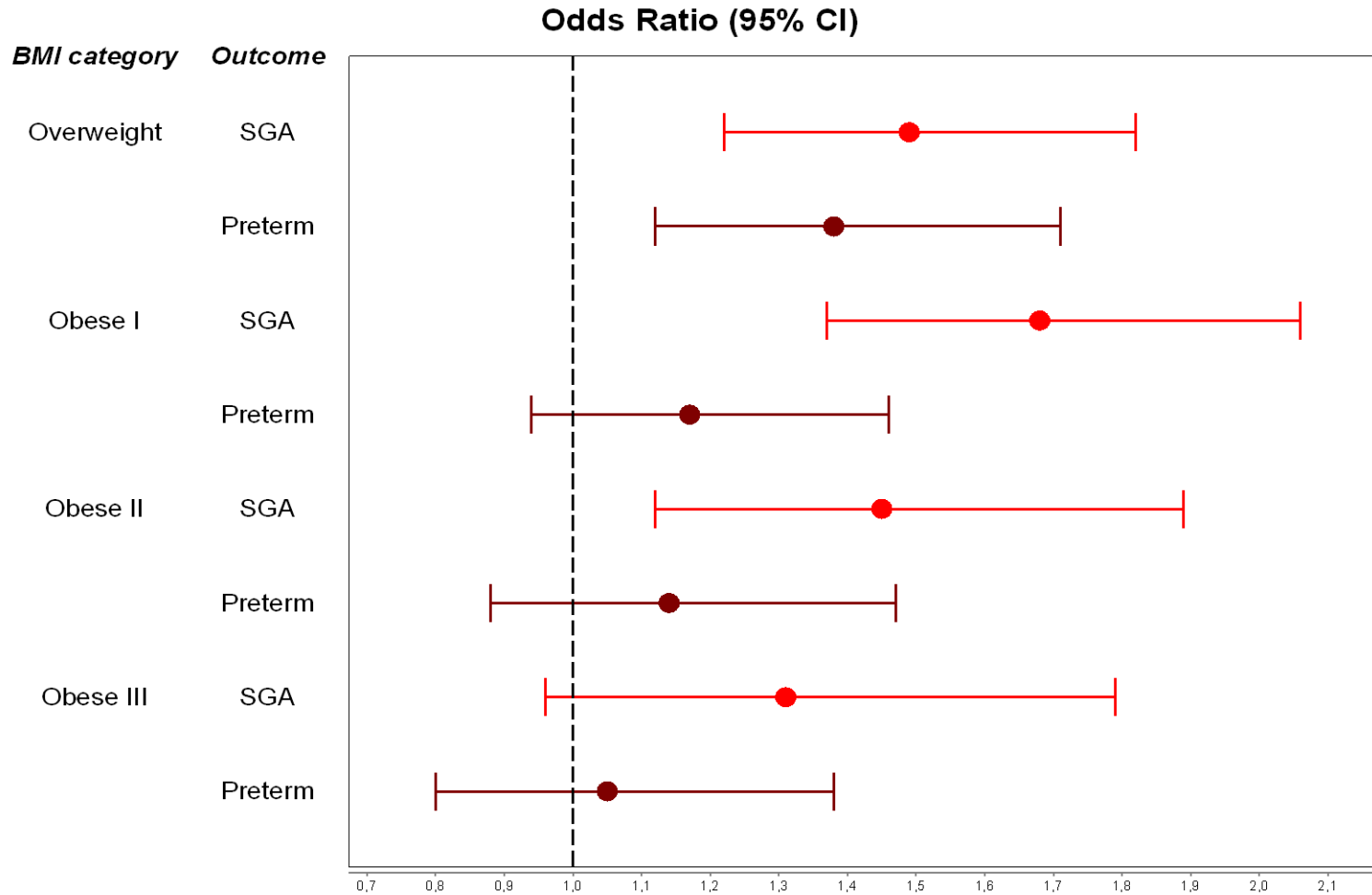
Gestational weight loss seems to 'work'...



... seems to be safe for the mother ...



... but not for the child!

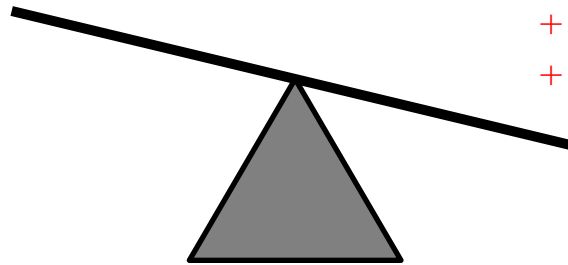


If 1000 ... women lost weight in pregnancy:

... overweight :

-21 emergency sections
-26 LGA births

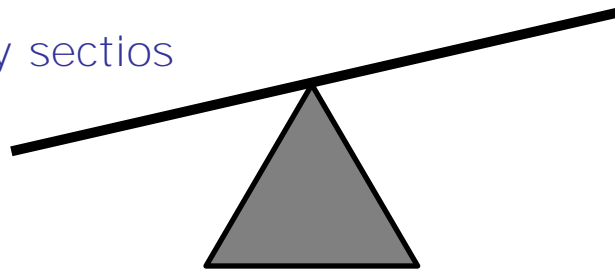
+34 preterm deliveries
+50 SGA births



... obese class III:

-38 emergency sections
-62 LGA births

+5 preterm deliveries
+16 SGA births



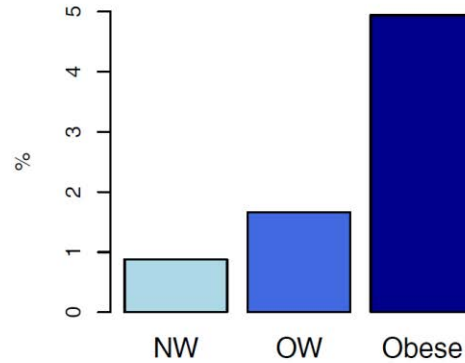
**Pregnancy is probably not the right time
to lose weight even for overweight
and (most) obese women...**

... but the time before pregnancy might well be!

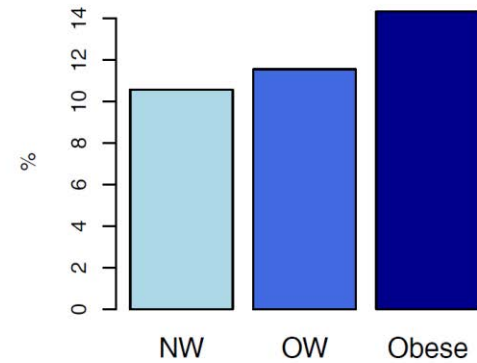
Outcomes differ by pre-pregnancy BMI!

Prevalence of outcomes for GWG within IOM recommendations:

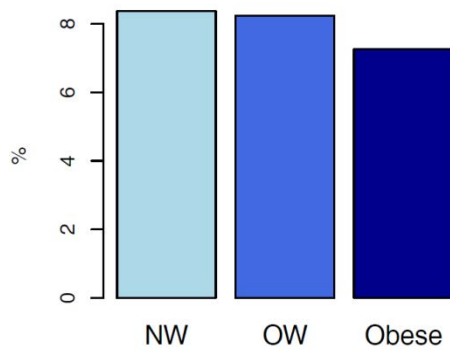
Pre-eclampsia



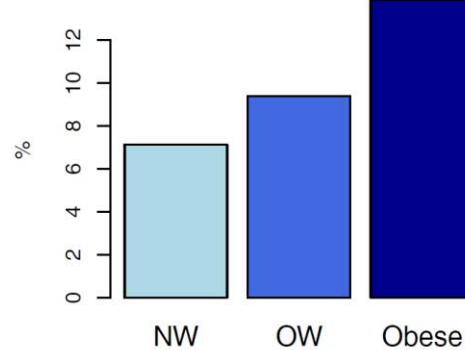
Emergency sectio



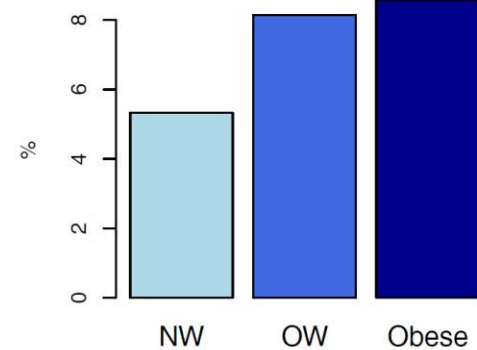
SGA



LGA



Preterm delivery



Conclusion

Gestational weight loss...

... occurs almost exclusively in overweight / obese women

... may be **beneficial** with respect to **maternal pregnancy outcomes** in overweight / obese women

... is associated with **adverse pregnancy outcomes related to the child** in all women (except maybe obese class III)

→ **Weight reduction before pregnancy might be more promising!**

Many thanks to...

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