Ferrara, 21 Marzo 2014

ECCESSIVO INCREMENTO PONDERALE IN GRAVIDANZA: RISCHI MATERNO-FETALI

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INCREMENTO PONDERALE IN GRAVIDANZA

Nel 1990

Prepregnancy weight-for-height category	Mothers of singletons	
	Total weight gain (lb)	Rate of weight gain in the second and third trimesters (lb/wk)
Low (BMI[a] < 19.8 kg/m^2)	28–40	~ 1.0 (0.5 kg/wk)
Normal (19.8–26.0 kg/m^2)	25–35	1.0 (0.4 kg/wk)
High (>26.0–29.0 kg/m^2)	15–25	0.66 (0.3 kg/wk)
Obese (≥ 29.0 kg/m^2)	≥ 15	Not specified

Nel 2009

Prepregnancy body mass index category	Mothers of singletons		Mothers of twins (provisional)
	Total weight gain (kg)	Rate of weight gain in the second and third trimesters (lb/wk)	Total weight gain at term (lb)
Underweight (< 18.5 kg/m^2)	12.5-18	1.0 (1.0–1.3)	No guideline available
Normal-weight (18.5–24.9 kg/m^2)	11.5-16	1.0 (0.8–1.0)	37–54
Overweight (25.0–29.9 kg/m^2)	7-11.5	0.6 (0.5–0.7)	31–50
Obese (≥ 30.0 kg/m^2)	5-9	0.5 (0.4–0.6)	25–42

Weight Gain During Pregnancy: Reexamining the Guidelines (IOM, 2009)

- Importanza del BMI pre-gravidico per gli outcomes gravidici → GWG (gestational weight gain) sempre correlato al BMI
- Classi di BMI stabilite dalla WHO
- Conseguenze materne dell'eccessivo GWG
- Conseguenze fetali/neonatali dell'eccessivo GWG

BMI E GWG

BMI pre-gravidico ed incremento ponderale dipendono da differenti percorsi metabolici

- BMI rappresenta le condizioni nutrizionali materne pre-concezionali

- GWG è espressione delle modificazioni fisiologiche materno-fetali che dipendono da fattori genetici e nutrizionali

Componenti dell'incremento ponderale

Contributo fetale: 30-40%

Contributo materno: 70%

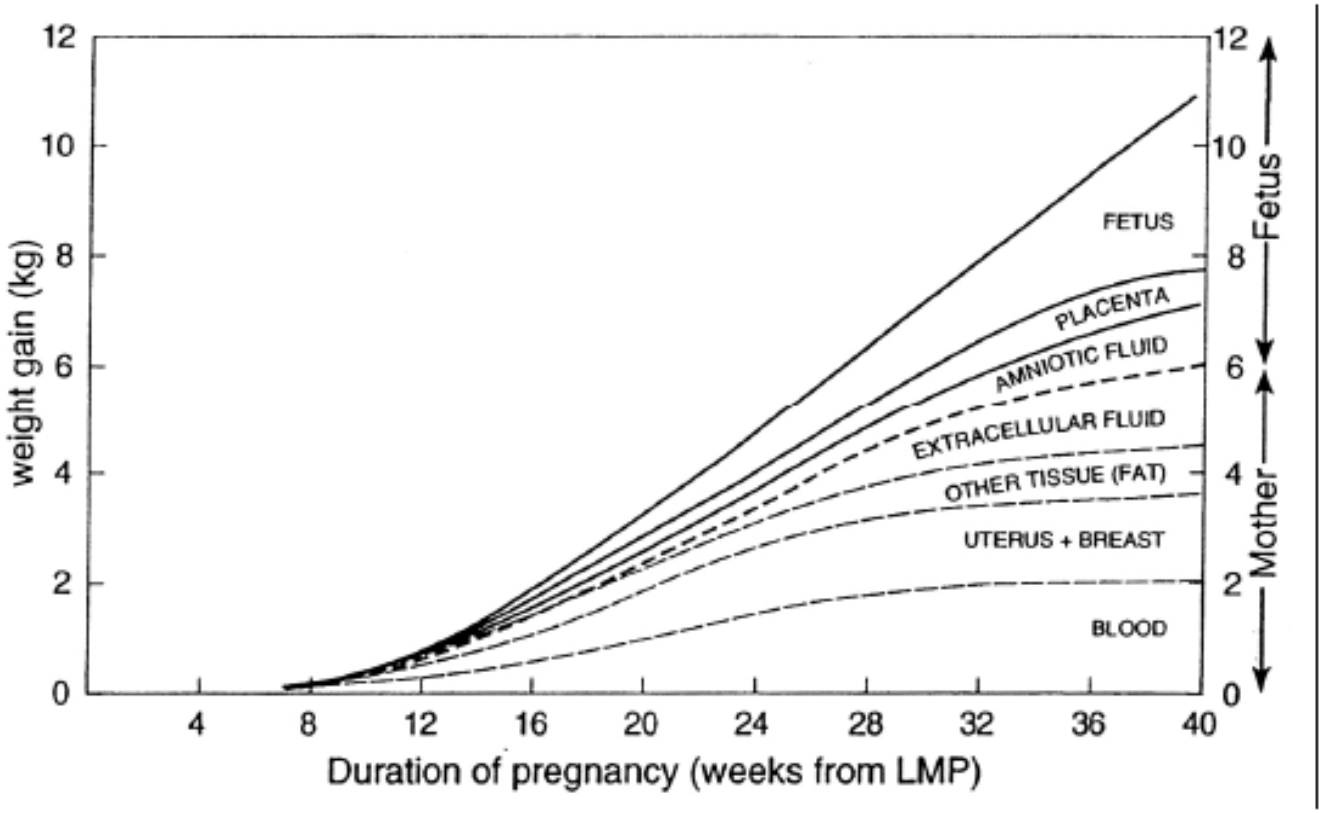


FIGURE 3-3 Components of gestational weight gain.

SOURCE: Pitkin, 1976. Nutritional support in obstetrics and gynecology. *Clinical Obstetrics and Gynecology* 19(3): 489-513. Reprinted with permission.

Simas TA et al.
Impact of updated Institute of Medicine guidelines on prepregnancy body mass index categorization, gestational weight gain recommendations, and needed counseling.
J Womens Health (Larchmt). 2011 Jun;20(6):837-44.

11,688 donne

	1990	2009
Sottopeso	10.1%	3.9%
Normopeso	52.5%	51.3%
Sovrappeso	14.1%	24.5%
Obese	23.3%	20.5%

Ridotto GWG 19.8%
Adeguato GWG 33.3%
Eccessivo GWG 46.9%

→

Ridotto GWG 16.7%
Adeguato GWG 30.8%
Eccessivo GWG 52.6%

Linee guida per popolazioni specifiche

Women of Short Stature	"unable to identify evidence sufficient to continue to support a modification of GWG guidelines"
Pregnant Adolescents	"unable to identify evidence sufficient to continue to support a modification of GWG guidelines"
Racial or Ethnic Groups	"Recommendations should be generally applicable to the various racial or ethnic subgroups"
Women with Multiple Fetuses	Provisional Guidelines for Twins (at term): –Underweight: insufficient evidence –Normal Weight: 17-25 kg –Overweight : 14-23 kg –Obese: 11-19 kg
Obesity Classes II and III	Insufficient evidence to develop more specific recommendations.

Consequences of GWG for Mother

- Strong association between high GWG and:
  - increased risk of cesarean delivery
  - postpartum weight retention
- Modest association between low GWG and:
  - failure to initiate breastfeeding
- Inconclusive evidence:
  - pregnancy complications like glucose intolerance and gestational hypertensive disorders
  - Induction and length of labour
  - long term health consequences (metabolic and cardiovascular disorders)

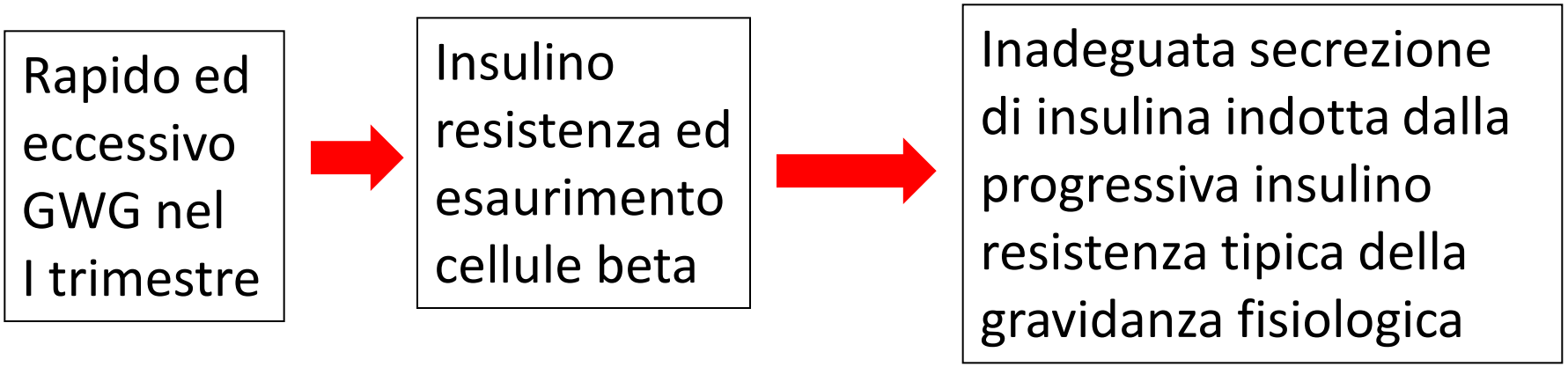
Consequences of GWG for Child

- Studies consistently show linear relationship between GWG and birthweight for gestational age.
- Some, but limited evidence for associations between GWG and:
  - Still birth
  - Preterm birth (at both low and high GWG)
  - Childhood asthma and low GWG
  - High GWG and some cancers and ADHD
  - High GWG and childhood obesity

GWG e diabete gestazionale

GWG totale è costituito per circa il 30% da incremento di tessuto adiposo, che è associato a partire dalla seconda metà della gravidanza ad una progressiva insulino-resistenza.

La composizione del GWG varia a seconda del trimestre e nel primo è rappresentato in maniera prevalente da tessuto adiposo, che influenza la successiva insulino-resistenza.



Hedderson MM, Gunderson EP, Ferrara A.
Gestational weight gain and risk of gestational diabetes mellitus.
Obstet Gynecol. 2010 Mar;115(3):597-604.

- > GWG nel I trimestre, > rischio GDM
- Eccessivo GWG ↑ rischio GDM

In tutte le classi di BMI (anche se più accentuato nelle donne sovrappeso)

Indipendentemente da età, etnia, parità

GWG e ipertensione

Ipertensione gestazionale e pre-eclampsia colpiscono fino al 10% delle gravidanze

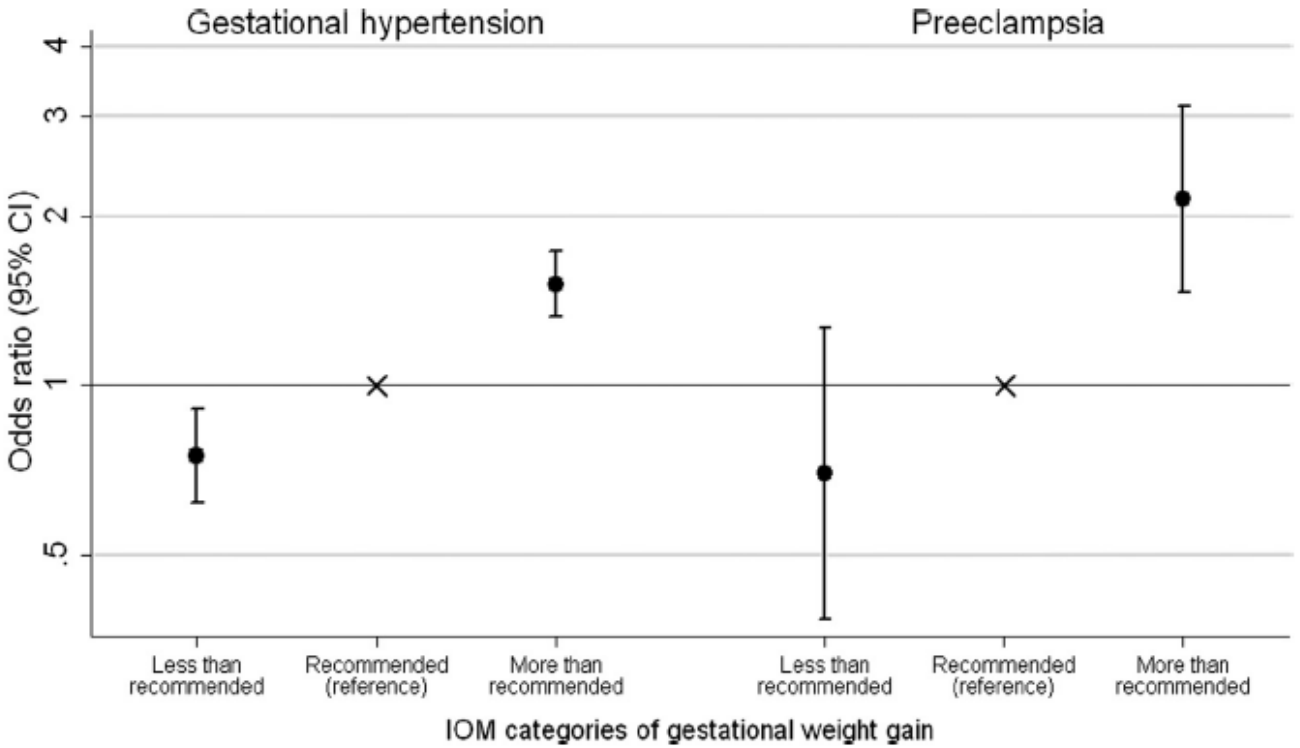
Il BMI pre-gravidico rappresenta il maggiore fattore di rischio modificabile per i disordini ipertensivi in gravidanza (ma difficilmente modificabile!)

GWG ➡ effetto dell'elevato aumento dell'adiposità materna sulla PA

IL-6 e PCR (↑in corso di obesità) contribuiscono alla disfunzione endoteliale

FIGURE

ORs (95% CI) for gestational hypertension and preeclampsia associated with IOM categories of total weight gain (n = 9596)[a]



CI, confidence interval; *IOM*, Institute of Medicine; *OR*, odds ratio.

[a] Adjusted value for maternal prepregnancy body mass index, age, parity, smoking, education, and offspring sex.

Macdonald-Wallis. Weight gain and blood pressure in pregnancy. Am J Obstet Gynecol 2013.

- GWG eccessivo, in particolar modo entro la 18 settimana, ↑ rischio di disturbi ipertensivi, indipendentemente dal BMI pre-gravidico
- GWG in ogni momento della gravidanza è associato positivamente all'aumento della PA

Thangaratinam S et al. Effects of interventions in pregnancy on maternal weight and obstetric outcomes: meta-analysis of randomised evidence. BMJ. 2012 May 16;344:e2088.

Riduzione del GWG (dieta e/o attività fisica)

↓ del 33% del rischio di Pre-eclampsia

↓ del 70% del rischio di ipertensione gestazionale

Trend in calo per diabete gestazionale, parto pretermine e MEF

Association of Second and Third Trimester Weight Gain in Pregnancy with Maternal and Fetal Outcomes

Michele Drehmer[1]*, Bruce Bartholow Duncan[1], Gilberto Kac[2], Maria Inês Schmidt[1]

Table 3. Association of cesarean section and preterm birth with weekly gestational weight gain in the 2nd and 3rd trimesters and total weight gain (according to Institute of Medicine, 2009, categories). Brazilian Study of Gestational Diabetes (EBDG).

	Cesarean section (n =2,219)†		Preterm birth (n =2,241)†	
Weekly gestational weight gain	**Model 1 Crude RR (95% CI)**	**Model 2* Adjusted RR (95% CI)**	**Model 1 Crude RR (95% CI)**	**Model 2** Adjusted RR (95% CI)**
2nd trimester				
Insufficient	0.81 (0.69–0.94)‡	0.82 (0.71–0.96)‡	1.28 (0.89–1.83)	1.00 (0.69–1.46)
Excessive	1.05 (0.93–1.19)	0.98 (0.86–1.11)	0.79 (0.54–1.13)	0.80 (0.55–1.18)
3rd trimester				
Insufficient	0.90 (0.77–1.04)	1.01 (0.85–1.21)	1.40 (0.91–2.16)	1.13 (0.69–1.84)
Excessive	1.19 (1.03–1.36)‡	1.21 (1.03–1.44)‡	1.58 (1.04–2.42)‡	1.70 (1.08–2.70)‡
Total weight gain				
Insufficient	0.74 (0.64–0.86)‡	0.78 (0.68–0.91)‡	1.42 (1.01–2.01)‡	1.45 (1.00–2.11)‡
Excessive	1.26 (1.12–1.42)‡	1.17 (1.04–1.33)‡	0.95 (0.64–1.38)	1.18 (0.74–1.67)

Eccessivo GWG totale e nel III trimestre aumenta il rischio di TC

Association of Second and Third Trimester Weight Gain in Pregnancy with Maternal and Fetal Outcomes

Michele Drehmer[1]*, Bruce Bartholow Duncan[1], Gilberto Kac[2], Maria Inês Schmidt[1]

Table 4. Association of small for gestational age and large for gestational age birth with weekly gestational weight gain in 2nd and 3rd trimesters and with total weight gain (according to Institute of Medicine, 2009 categories).

	Small for gestational age (n = 2,191)†		Large for gestational age (n = 2,191)†	
Weekly gestationalweight gain	**Model 1 Crude RR (95% CI)**	**Model 2* Adjusted RR (95% CI)**	**Model 1 Crude RR (CI 95%)**	**Model 2** Adjusted RR (95% CI)**
2nd trimester				
Insufficient	1.71 (1.25–2.34)‡	1.72 (1.26–2.33)‡	1.15 (0.78–1.69)	1.08 (0.72–1.62)
Excessive	0.66 (0.46–0.94)‡	0.79 (0.55–1.17)	2.00 (1.45–2.77)‡	1.64 (1.16–2.31)‡
3rd trimester				
Insufficient	1.30 (0.93–1.81)	1.10 (0.79–1.53)	0.74 (0.52–1.05)	0.78 (0.54–1.13)
Excessive	0.73 (0.50–1.06)	0.85 (0.58–1.25)	1.27 (0.93–1.74)	1.06 (0.77–1.48)
Total weight gain				
Insufficient	1.41 (1.06–1.87)‡	1.60 (1.19–2.15)‡	0.99 (0.69–1.43)	0.92 (0.63–1.34)
Excessive	0.51 (0.34–0.75)‡	0.53 (0.35–0.81)‡	2.24 (1.65–3.03)‡	2.12 (1.55–2.89)‡

Correlazione protettiva tra GWG eccessivo e SGA (ridotti del 42%)

Mamun AA et al. Associations of maternal pre-pregnancy obesity and excess pregnancy weight gains with adverse pregnancy outcomes and length of hospital stay. BMC Pregnancy Childbirth. 2011 Sep 6;11:62.

Obesità ed eccessivo GWG ↑ rischio di

- complicanze gravidiche (disordini ipertensivi e diabete gestazionale) (OR 2.1)
- TC (OR 1.29)
- maggior peso alla nascita

- durata maggiore del ricovero dopo la nascita, indipendentemente da BMI pre-gravidico → un giorno in più per ogni kg di GWG (TC, persistenza delle complicanze materne, complicanze post partum)

Crane JM et al. The effect of gestational
weight gain by body mass index on maternal and neonatal outcomes.
J Obstet Gynaecol Can. 2009 Jan;31(1):28-35.

NORMOPESO: ↑ rischio: Ipertensione gestazionale (OR 1.27)
Augmentation del travaglio (OR 1.09)
Macrosomia (OR 1.21)
SOVRAPPESO: ↑ rischio: Ipertensione gestazionale (OR 1.31)
Macrosomia (OR 1.30)

OBESITÀ: ↑ rischio: Macrosomia (OR 1.20)
Patologie metaboliche neonatali (OR 1.31)

In ogni classe di BMI un adeguato GWG è associato ad un minor tasso di complicanze (TC, disordini ipertensivi, peso alla nascita < 2500 gr o > 4000 gr)

Gallagher K et al. Impact of Nulliparous Women's Body Mass Index or Excessive Weight Gain in Pregnancy on Genital Tract Trauma at Birth. J Midwifery Womens Health. 2014 Jan;59(1):54-9.

- Presence and severity of genital tract trauma did not vary between obese and nonobese women (51% vs 53%, P = .64).
- Women who had more than the IOM-recommended weight gain did not have a higher incidence of perineal lacerations (52% versus 53%, P = .69).
- Obese women were more likely to gain in excess of the IOM guidelines during pregnancy (75% vs 50% excessive weight gain in obese vs nonobese women, respectively; P < .001).

A woman's BMI or excessive weight gain in pregnancy did not influence her risk of genital tract trauma at birth.

GWG e parto pretermine

Associazione consistente con sottopeso, controversa con obesità

- **<7-9 kg**: fattore protettivo per PPT spontaneo con e senza PPROM nelle sovrappeso ed obese (ma è fattore di rischio nelle sottopeso)
- **9.5-12 kg**: fattore di rischio per PPT su indicazione medica

Masho SW et al. Childbirth. 2013 May 24;13(1):120.

Esperienza ferrarese

Studio retrospettivo (gennaio 2005-Gennaio 2013)

332 donne

	BMI 18.5-29.9 (67.1%)	BMI >30 (32.9%)	Totale
GWG adeguato	114	52	166
GWG eccessivo	109	57	166

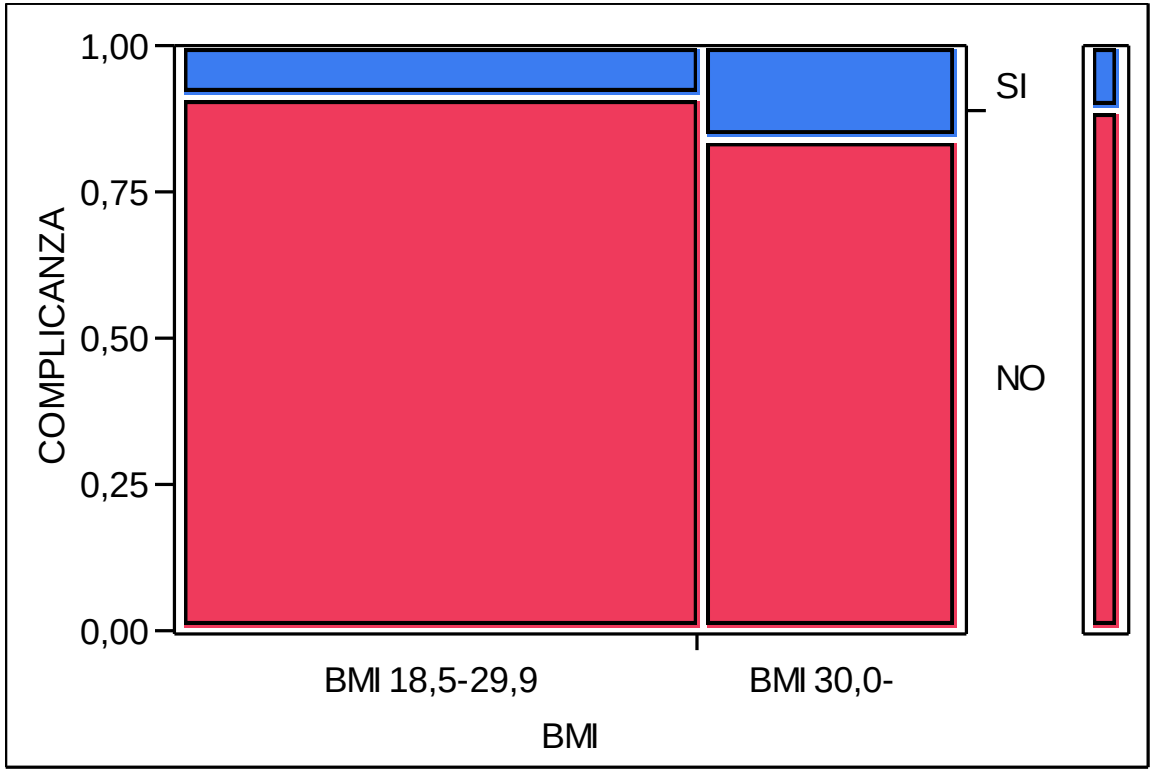
Complicanze materne: disordini ipertensivi, diabete gestazionale, modalità del parto

Outcome neonatale: aborto, MEF, peso alla nascita, traferimento in TIN

Complicanze materno-fetali

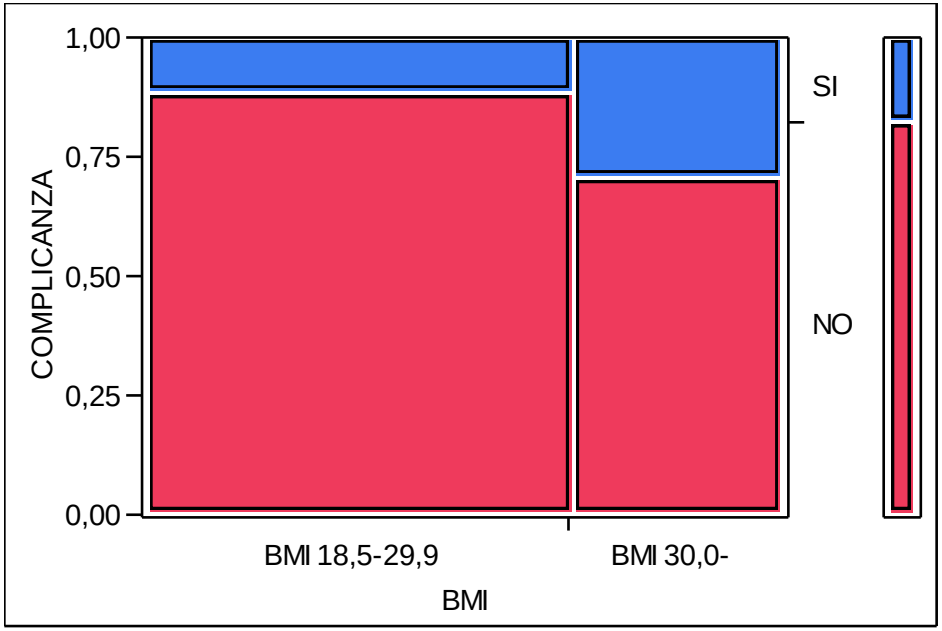
	Excessive GWG (n=166) BMI 18,5-29,9 / BMI >30 (n=114) / (n=52)	**Adequate GWG** (n=166) BMI 18,5-29,9 / BMI >30 (n=109) / (n=57)
Hypertensive disorders	8 / 19	1 / 9
Gestational diabetes	15 / 16	11 / 16
Caesarean section	21 / 10	14 / 4
Macrosomy	13 / 7	8 / 3
Neonatal intensive care	3 / 1	1 / 0

Complicanze e BMI pre-gravidico



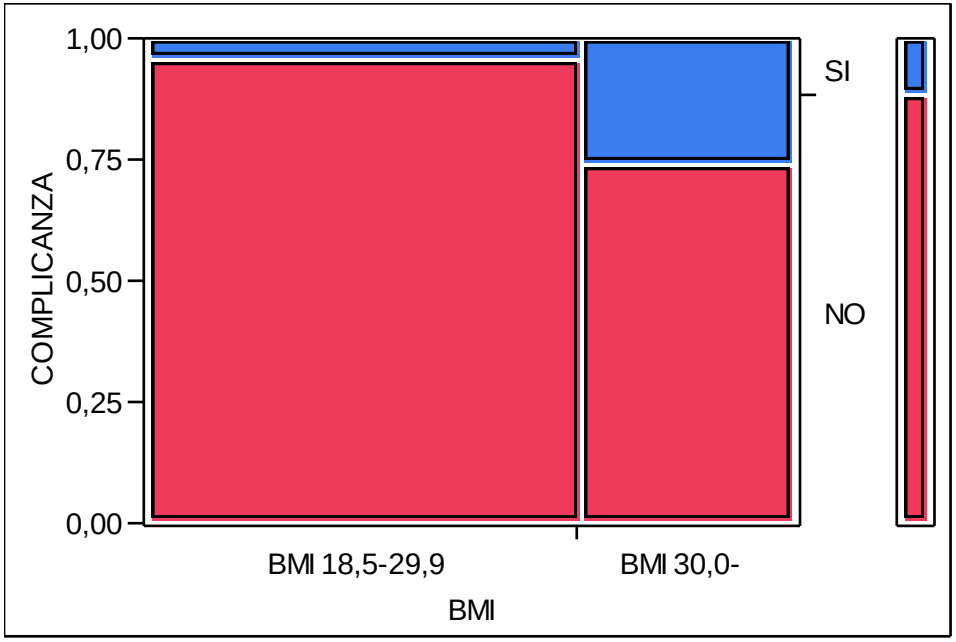
Complicanze materno-fetali totali
(P<0.0001)

Complicanze e BMI pre-gravidico

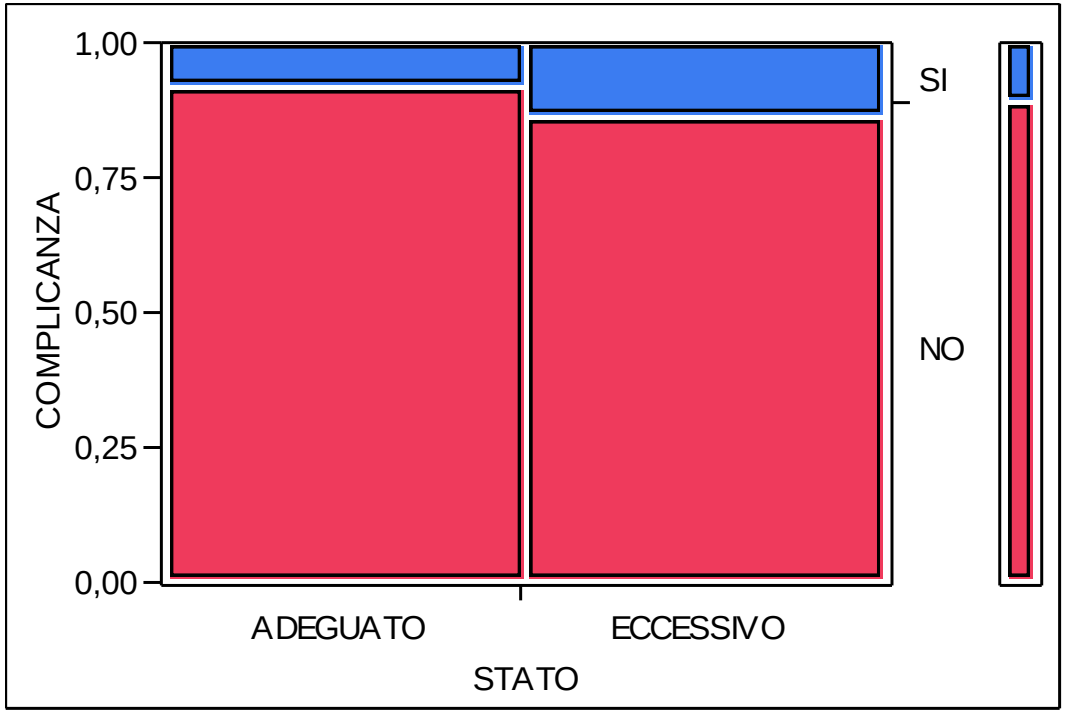


Diabete gestazionale
(P<0.0001)

Disordini ipertensivi
(P<0.0001)

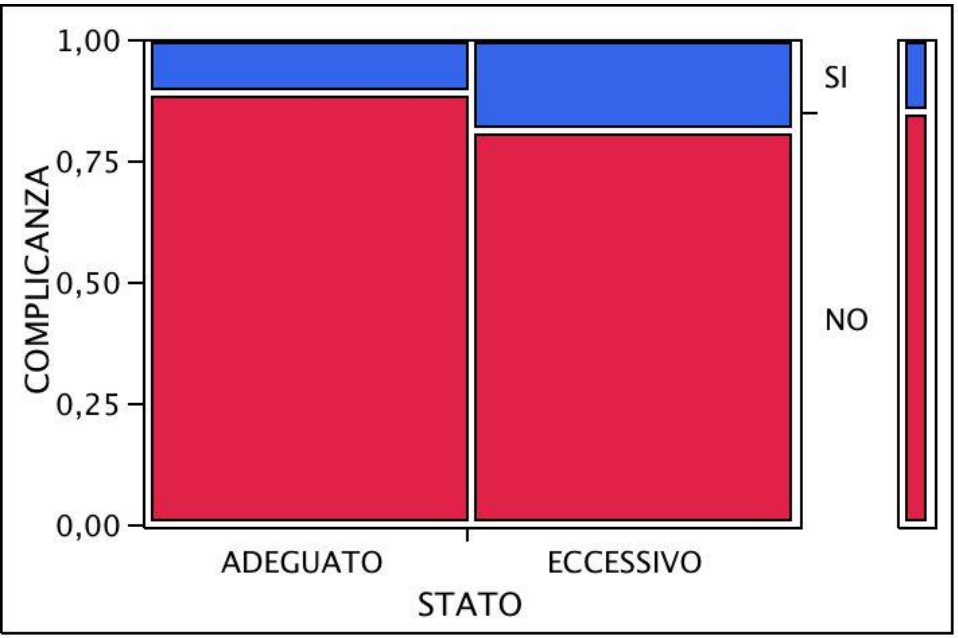


Complicanze e incremento ponderale



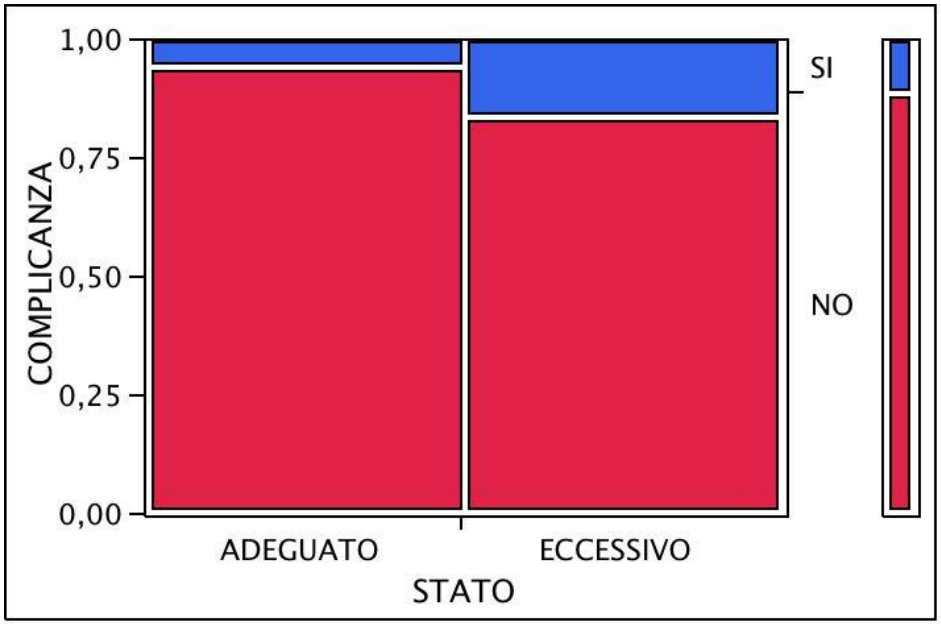
Complicanze materno-fetali totali (P<0.0003)

Complicanze e incremento ponderale



Taglio cesareo
(P<0.04)

Disordini ipertensivi
(P<0.003)



Complicanze e incremento ponderale

- Diabete gestazionale sovrapponibile nei due gruppi (p=0,56)

- Macrosomia sovrapponibile nei due gruppi (p=0.08); tuttavia le donne con eccessivo GWG tendono a sviluppare più frequentemente Macrosomia

- Trasferimento in TIN sovrapponibile nei due (p=0.37)

BMI pre-gravidico

↓

Disturbi ipertensivi

Diabete gestazionale

Eccessivo GWG

↓

Disturbi ipertensivi

Taglio cesareo

Macrosomia?

Team multidiciplinare

Ginecologo

Nutrizionista-dietista

Psicologo

Anestesista

Pre concezionale (perdita di peso preconcezionale, non è ancora stata determinata la sicurezza della perdita di peso in corso di gravidanza)

In corso di gravidanza

Grazie per l’attenzione