* Gestational Diabetes Update

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DES meeting – Dec 11, 2013

Agenda

* Gestational Diabetes risk for South Asians
* Preliminary descriptive data analysis for the Diabetes and Pregnancy clinic

Acknowledgements & Disclosures

* No disclosures
* Presentation sponsored by Eli Lilly
* Acknowledge Denis Tsang (Dietetic Intern, MAN program, U of G) for statistical analysis of data

High Risk Ethnic Groups

- According to the 2006 census, Canada's visible minority population is growing at a rate of 27%
  - 1 in 3 Canadians will belong to a visible minority by 2031
- In 2006, South Asians surpassed Chinese to become Canada's largest visible minority group
- South Asians have high rates of diabetes and one of the highest rates of premature cardiovascular disease (CVD) in the world
- India, together with China and the Middle East, are now considered the "hot spots" of diabetes, with a projected doubling in incidence of the disease over the next 20 years

Risk for GDM in Ethnic Groups

- Interrelationship between maternal age, BMI and racial origin

(Makgoba et al., 2011, BJOG)

  - Retrospective Study
  - 15 maternity units between 1988 and 2000
  - Data compared to White European Women age 20-24

* Odds Ratios for development of GDM

	White European	Black African	Black Caribbean	South Asian
Age 25-29	**1.16**	3.40	3.25	**3.85**
Age 30-34	**2.04**	6.28	5.23	**8.77**
Age 35-39	**2.97**	13.67	1.96	**14.05**
Age> 40	**4.08**	59.2	6.87	**27.43**
BMI 18.5-24.9	**1.00**	2.62	1.21	**3.00**
BMI 25.0-29.9	**1.77**	3.48	3.35	**7.70**
BMI > 30	**4.70**	12.83	5.85	**17.39**

Risk for GDM in Ethnic Groups Cont'd

Age

- Higher risk for developing GDM in:
  - White European women age > 30
  - Black Africans or Black Carribeans age > 25
  - South Asians age > 20
  - Rate of GDM rose more rapidly with age

Risk for GDM in Ethnic Groups Cont'd

BMI

- White Europeans and Caribbean groups
  - Significantly higher risk in overweight (BMI > 25) and obese (BMI > 30)

- Black Africans and South Asians
  - Significantly higher risk in all BMI groups

What do we know?

- South Asians develop abnormal glucose, lipids and blood pressure at significantly lower BMIs (21) compared to caucasians (30)
- Increased tendency to develop visceral abdominal fat and fatty infiltration of the liver
  - Reasons for increased metabolic sensitivity to weight gain is unknown

*South Asia

India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan, Maldives

Some Hypotheses…

- Low birth weight
  - Thin-fat phenotype
  - South Asian babies may be smaller but have similar subscapular skin-fold thickness
- Under nutrition
  - Intrauterine under nutrition and increased risk of metabolic syndrome

Intrauterine Undernutrition

Adaptation of fetal physiology to increase survival

Continues use of energy saving mechanism in a post-natal environment rich in energy

Increase adiposity and metabolic abnormalities

Hypotheses cont'd

- Micronutrients
  - Higher adipose tissue and insulin resistance in children born to South Asian mothers with low B12 and high Folate concentrations
  - Large proportion of South Asian women are vegetarians (low B12 intake)
    - B12 deficiency further masked by folic acid supplementation in pregnancy

Hypotheses cont'd

- Low adiponectin levels
  - Made by adipose tissue (and placenta in pregnancy)
  - Regulates glucose and fat oxidation
  - Association with diabetes and metabolic syndrome

Hypotheses cont'd

- Maternal glycemic status
  - Prenatal exposure to maternal diabetes associated with higher risk for overweight and obesity
  - Increased exposure to glucose, free fatty acids and amino acids results in fetal hyperinsulinemia and larger fat mass

Next steps?

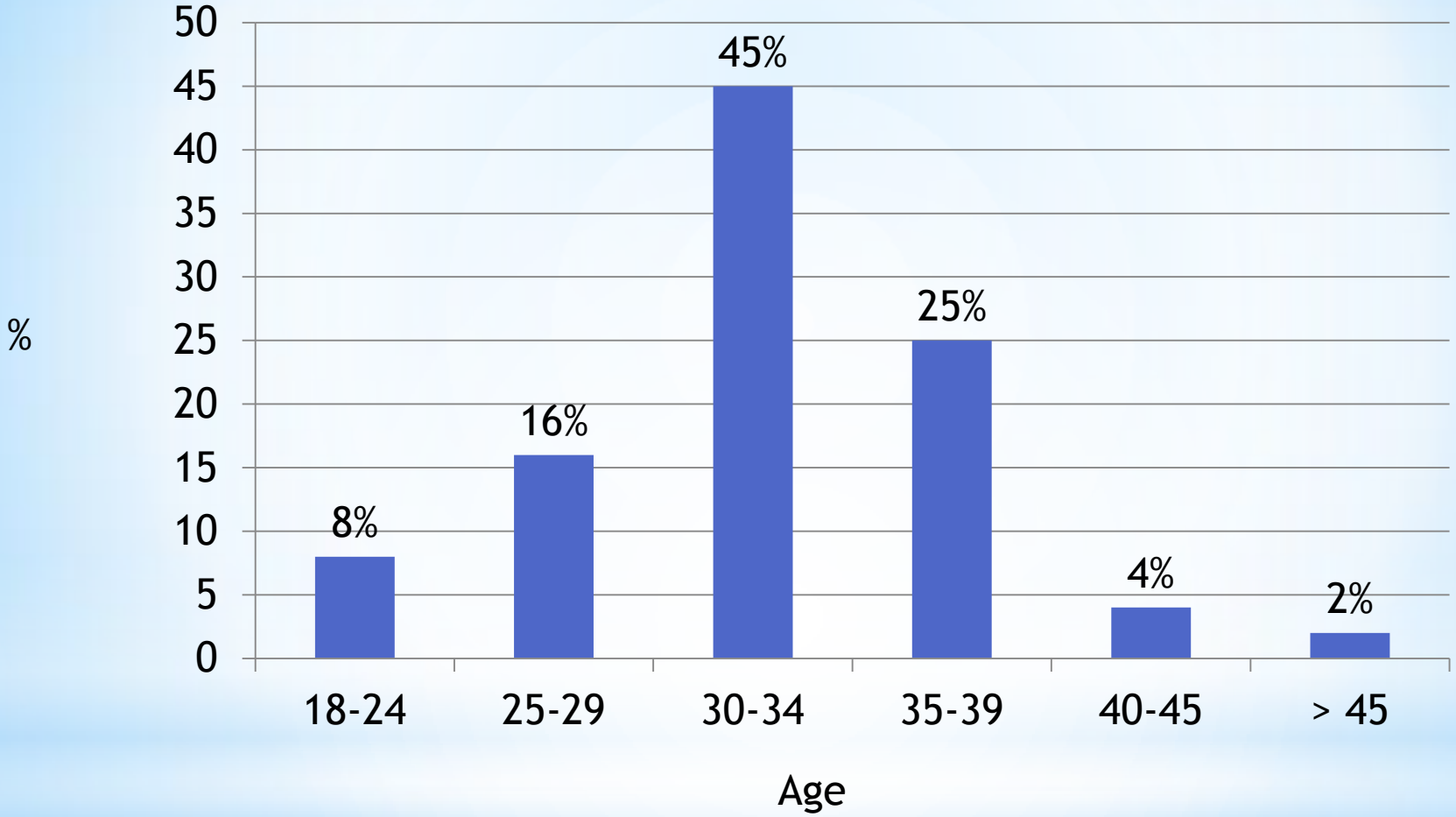
- START South Asian Birth Cohort Study
  - Find early life determinants of adiposity
- Consider early screening and intervention for high risk ethnic groups
- Interventions should also focus on long-term diabetes risk not just in pregnancy

Diabetes and Pregnancy Clinic

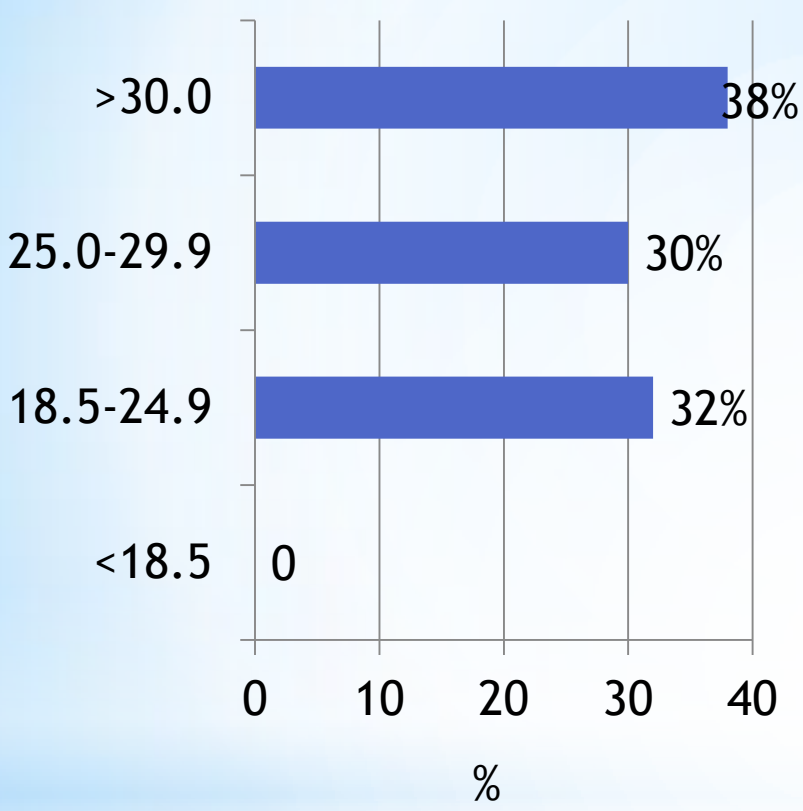
(Partnership between Dr. Liutkus and Diabetes Education Program at Cambridge Memorial Hospital)

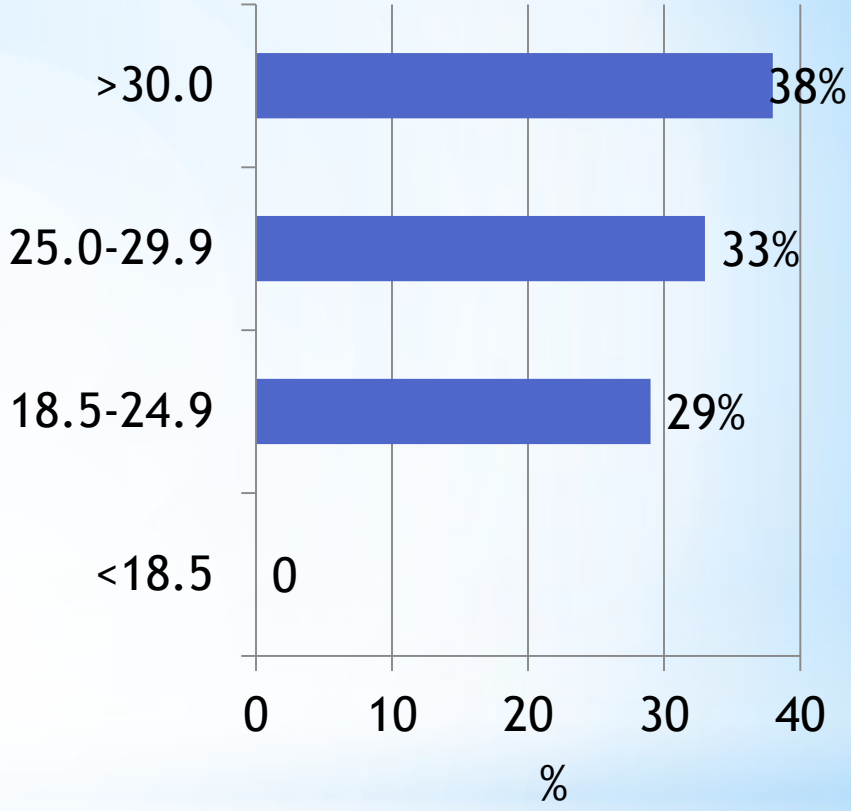
* N = 83
* Data collected Sep 2012 to Aug 2013

Age Distribution



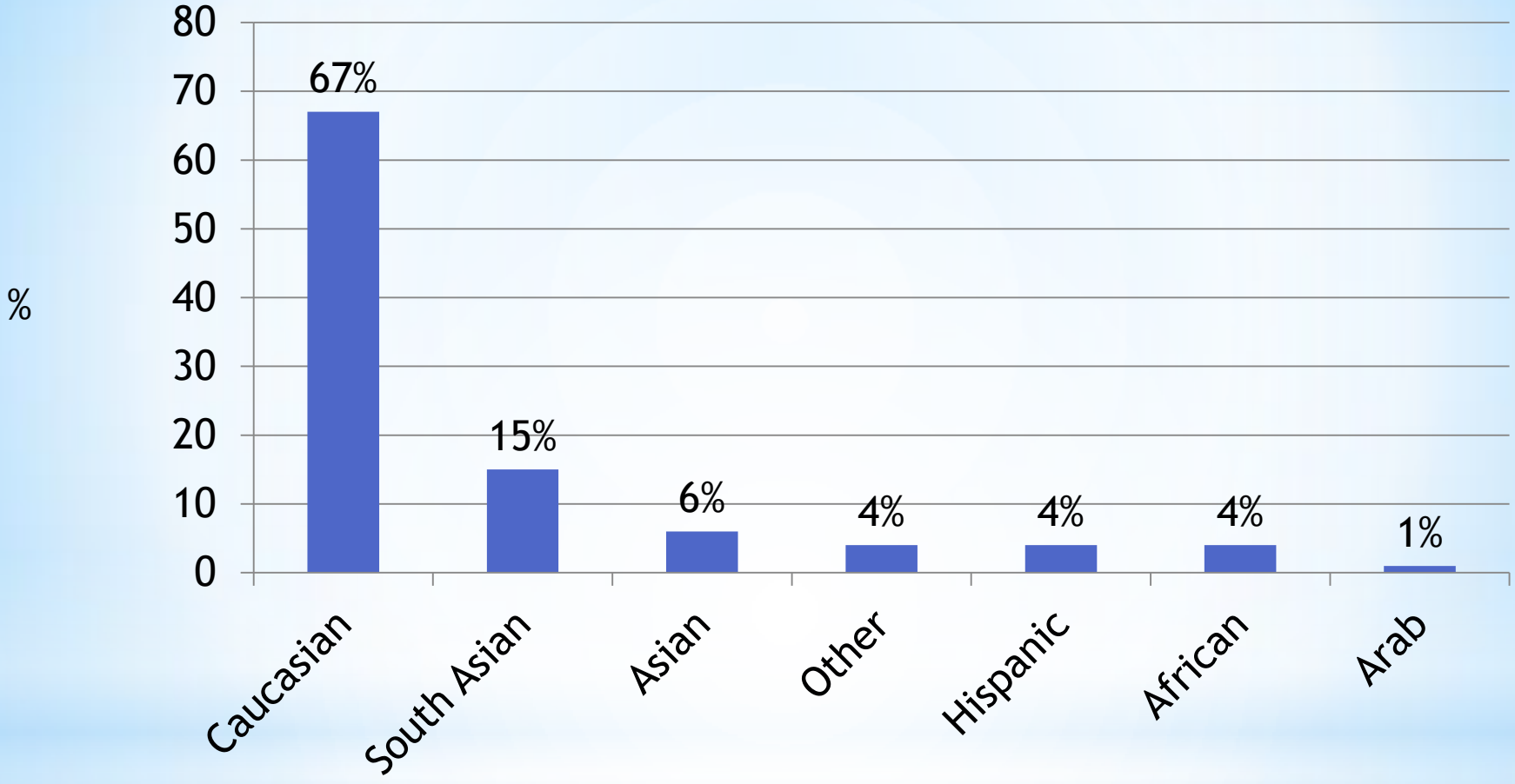
Average age = 31.8



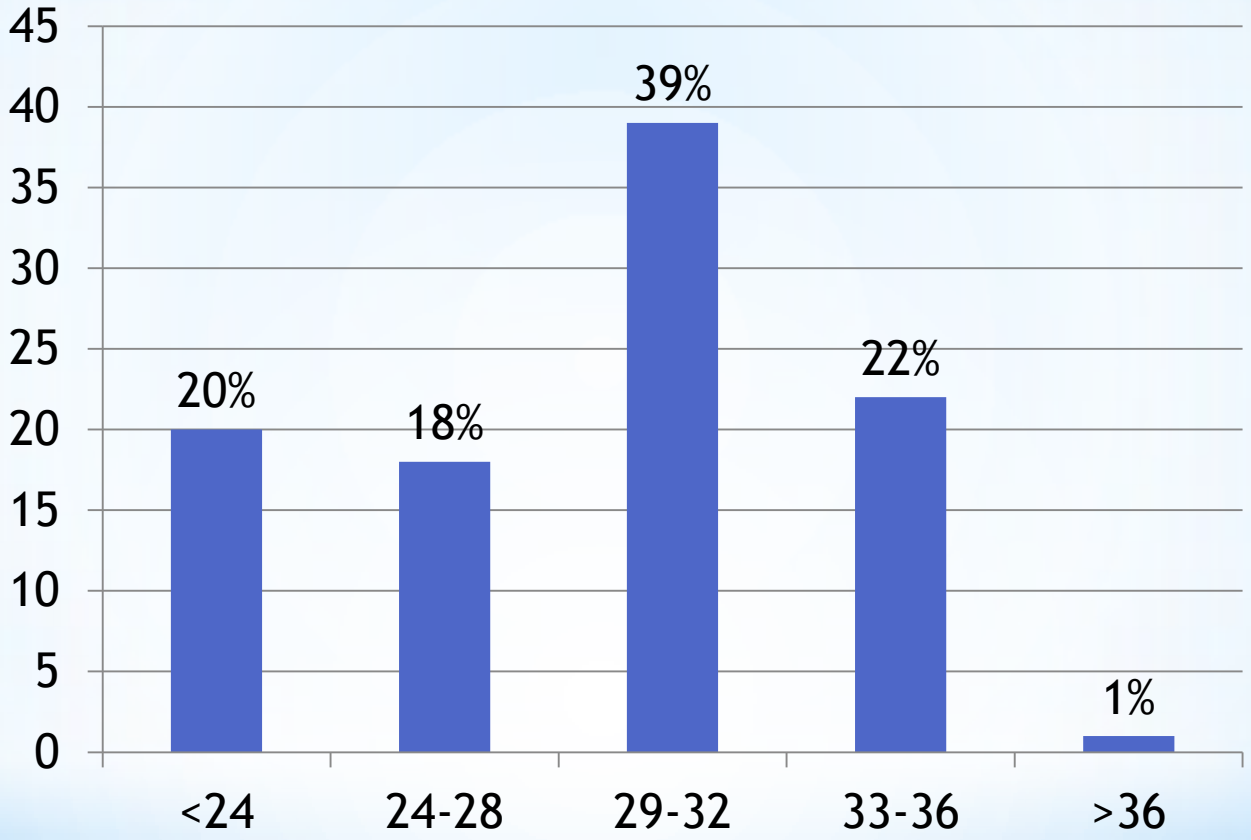


Pre-pregnancy BMI

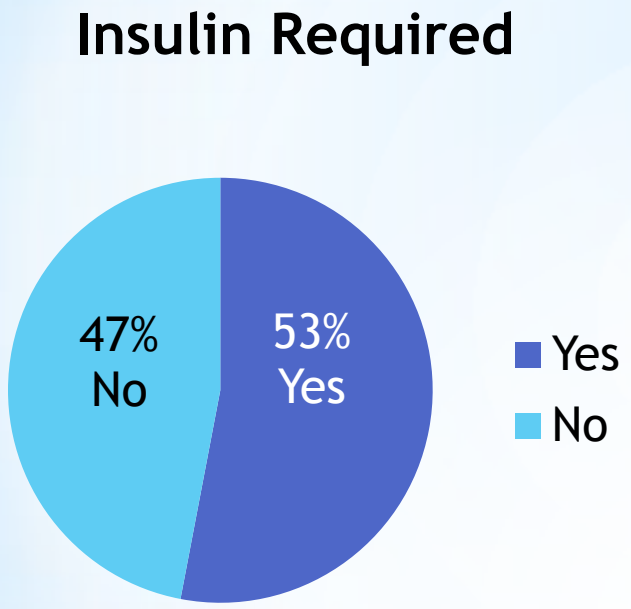
Postnatal BMI

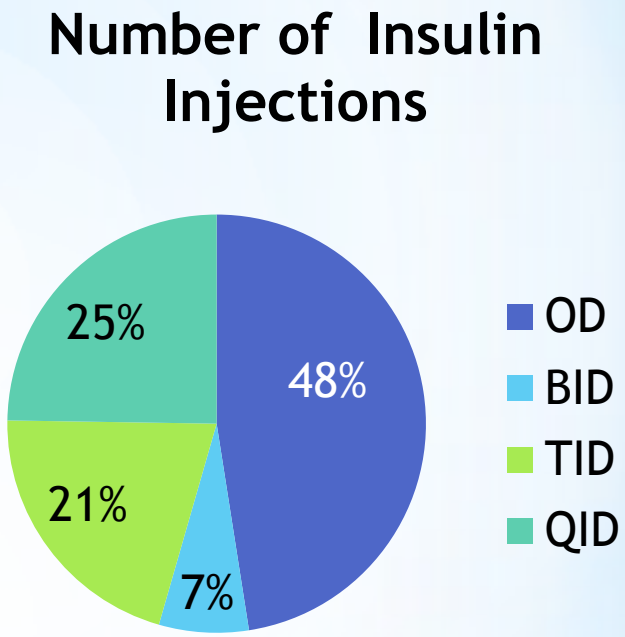

%
80
70
60
50
40
30
20
10
0
67%
15%
6%
4%
4%
4%
1%
Caucasian
South Asian
Asian
Other
Hispanic
African
Arab

Ethnicity

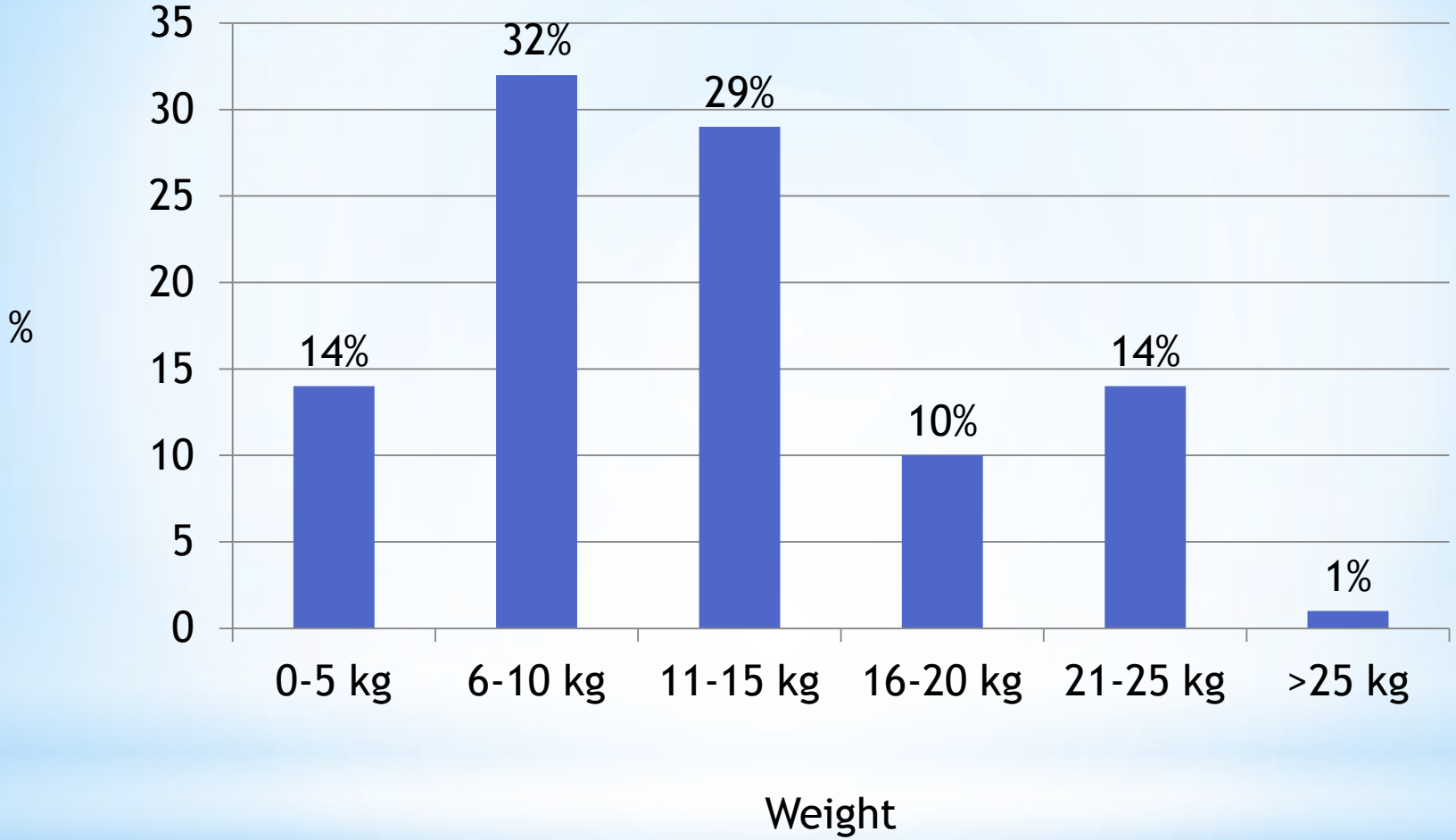


*Weeks gestation at 1st visit



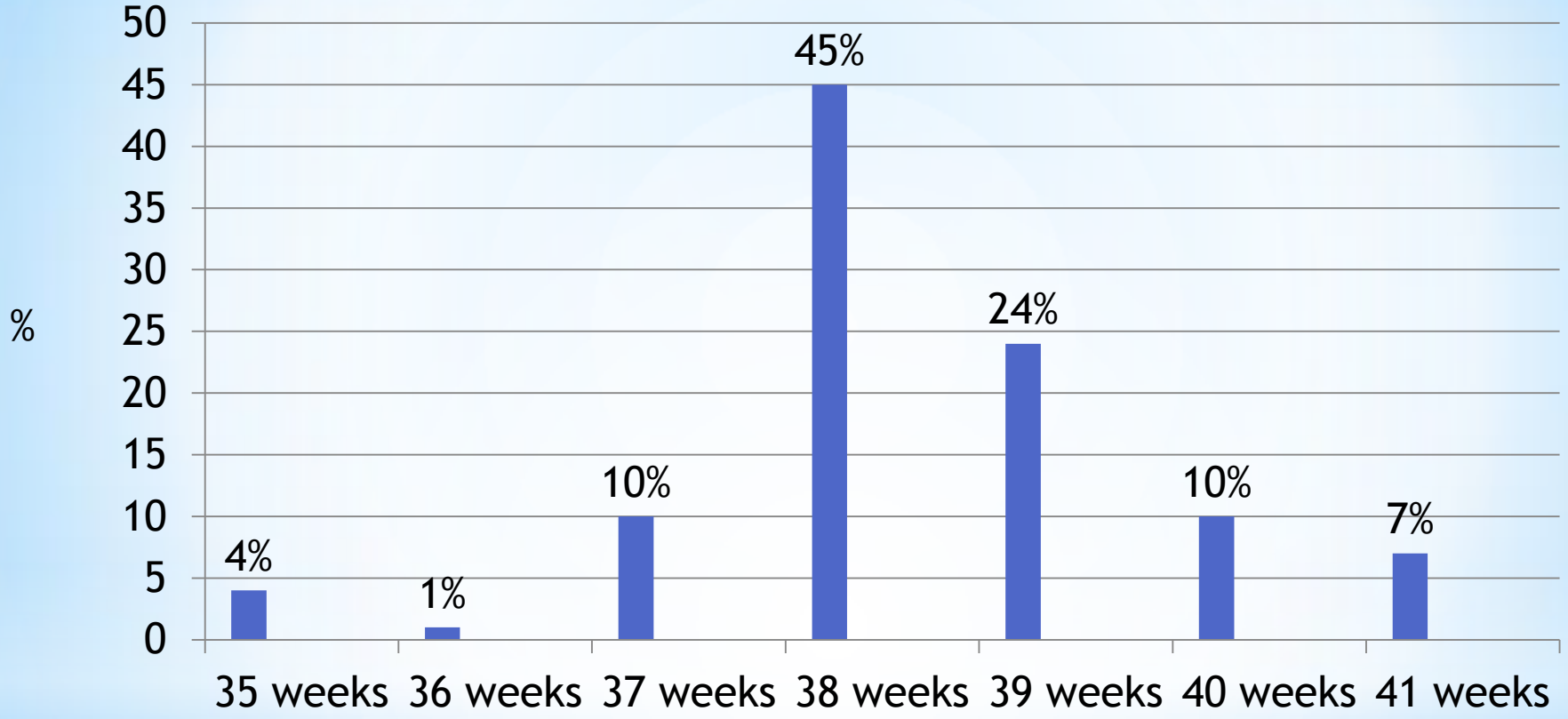


Insulin requirement

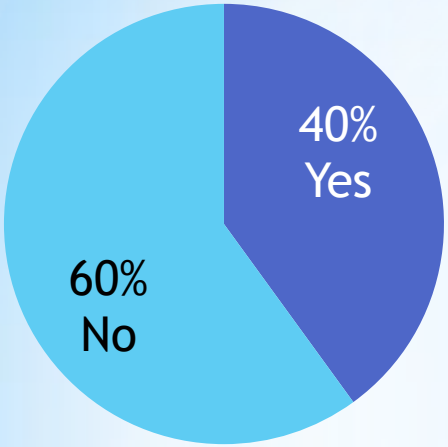


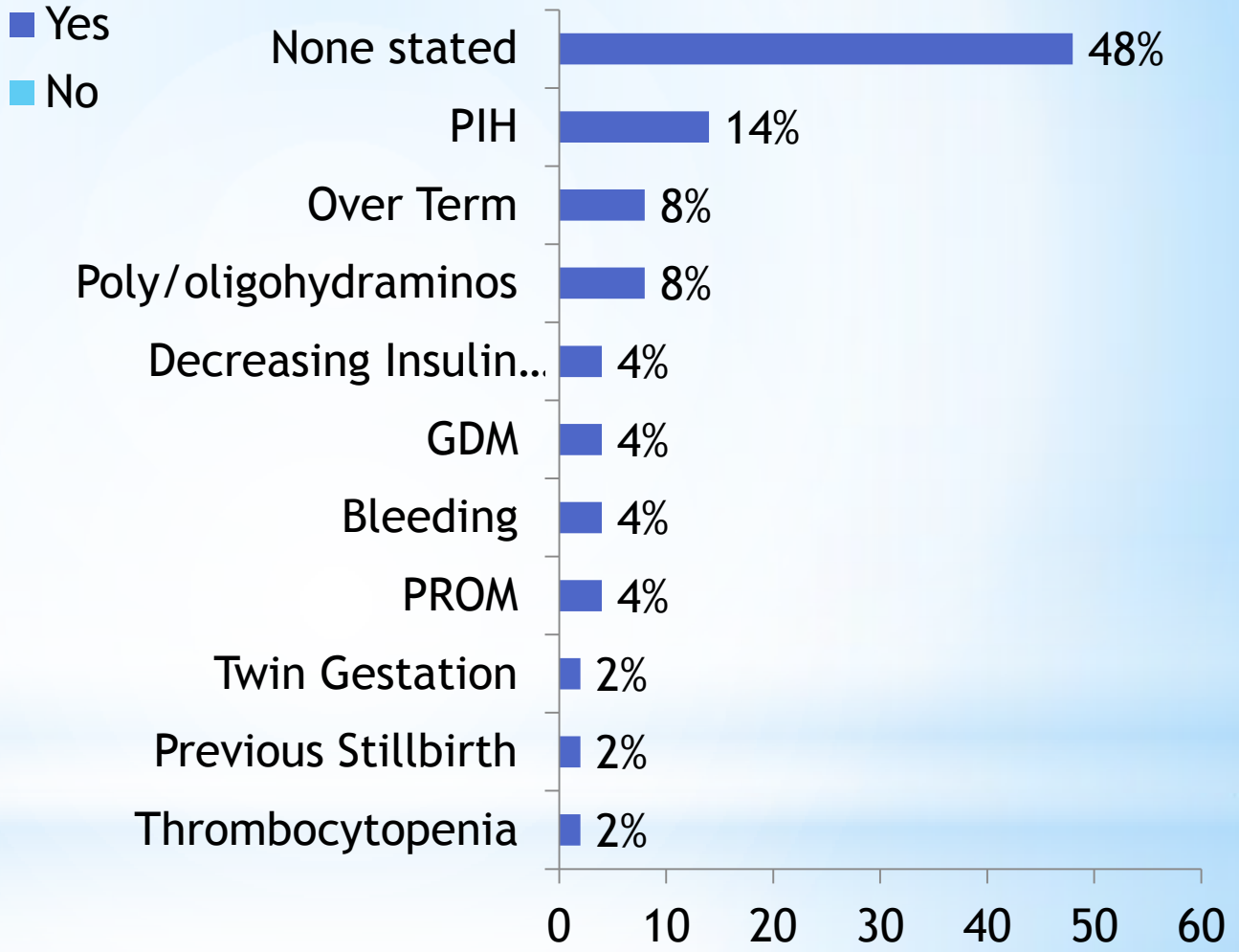
Total Weight Gain in Pregnancy

Average weeks = 38.4



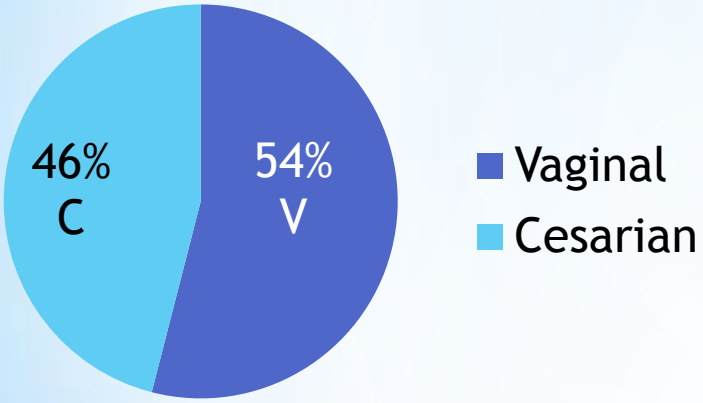
Weeks Gestation at Delivery


40%
Yes
60%
No

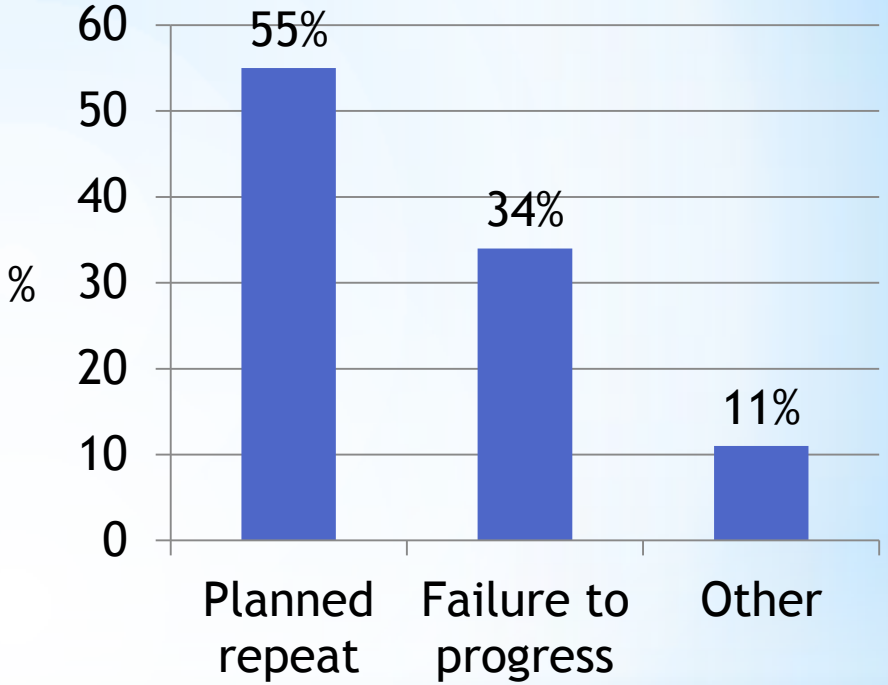

Yes
No
None stated
48%
PIH
14%
Over Term
8%
Poly/oligohydraminos
8%
Decreasing Insulin...
4%
GDM
4%
Bleeding
4%
PROM
4%
Twin Gestation
2%
Previous Stillbirth
2%
Thrombocytopenia
2%
0
10
20
30
40
50
60

Induction

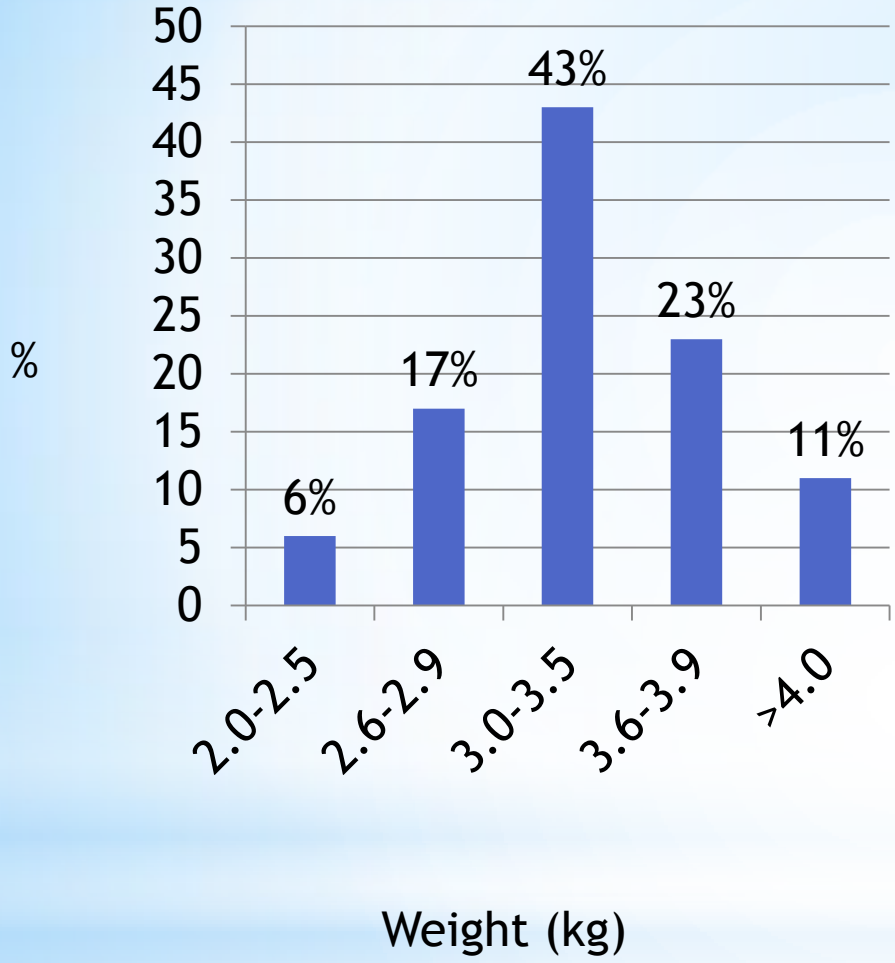
Delivery Type

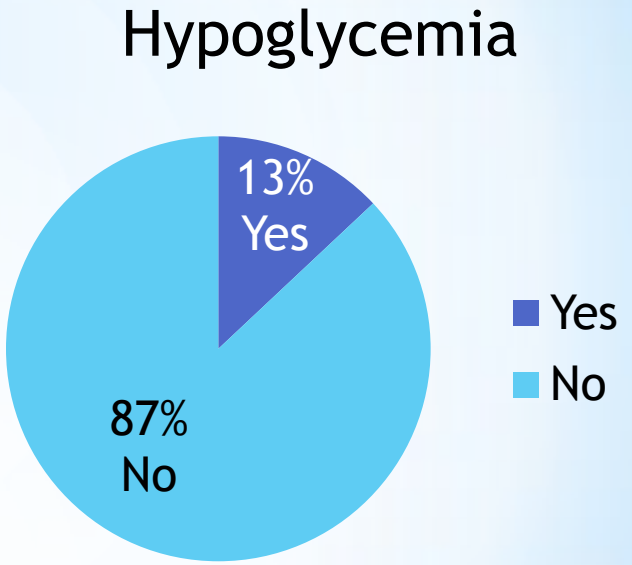


Reason for C-section

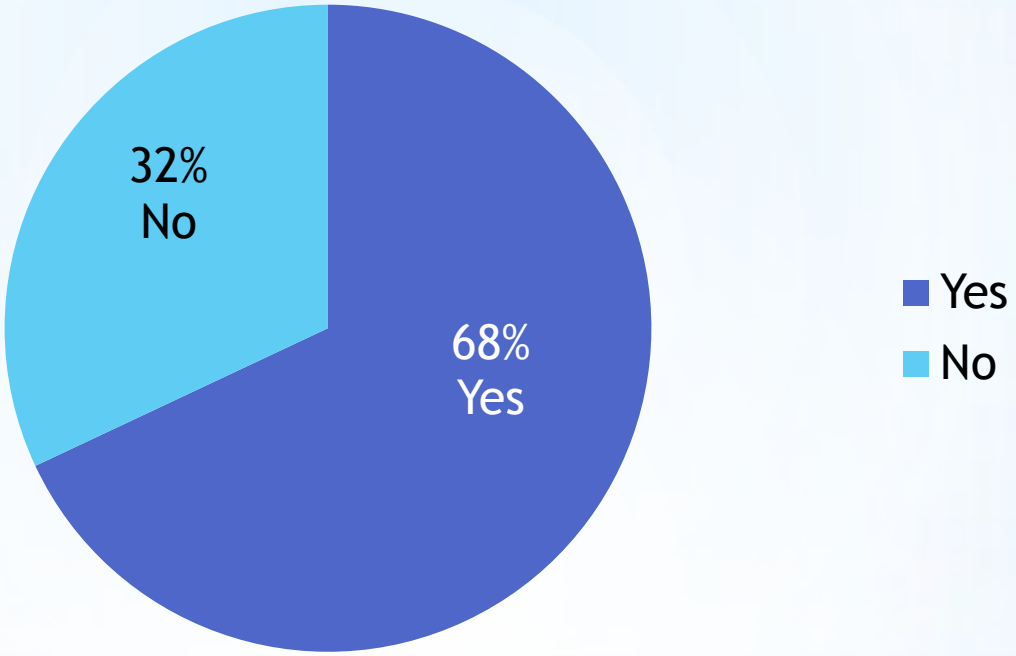


Delivery





Neonatal data



*Breastfeeding

at 3 months postpartum

Diabetes and Pregnancy Clinic Outcome Analysis

Postpartum Glucose Tolerance Screening

* 50% return for postpartum glucose tolerance testing

(CPG 2013, Schaefer 2009, Kwong 2009)

* Women who do not complete postpartum testing tend to:
  * Previous history of GDM
  * Have higher diagnostic glucose levels
  * Required insulin during pregnancy
  * Had more living children

(Hunt et al 2009, Ferrara et 2009, Kwong 2009)

* Barriers to completion of postpartum screening:
  * Discontinuity of care after delivery
  * Underestimating diabetes risk
  * Lack of child care
  * Stress of adapting to caring for a new baby

(Schaefer-Graf 2009, Kwong 2009)

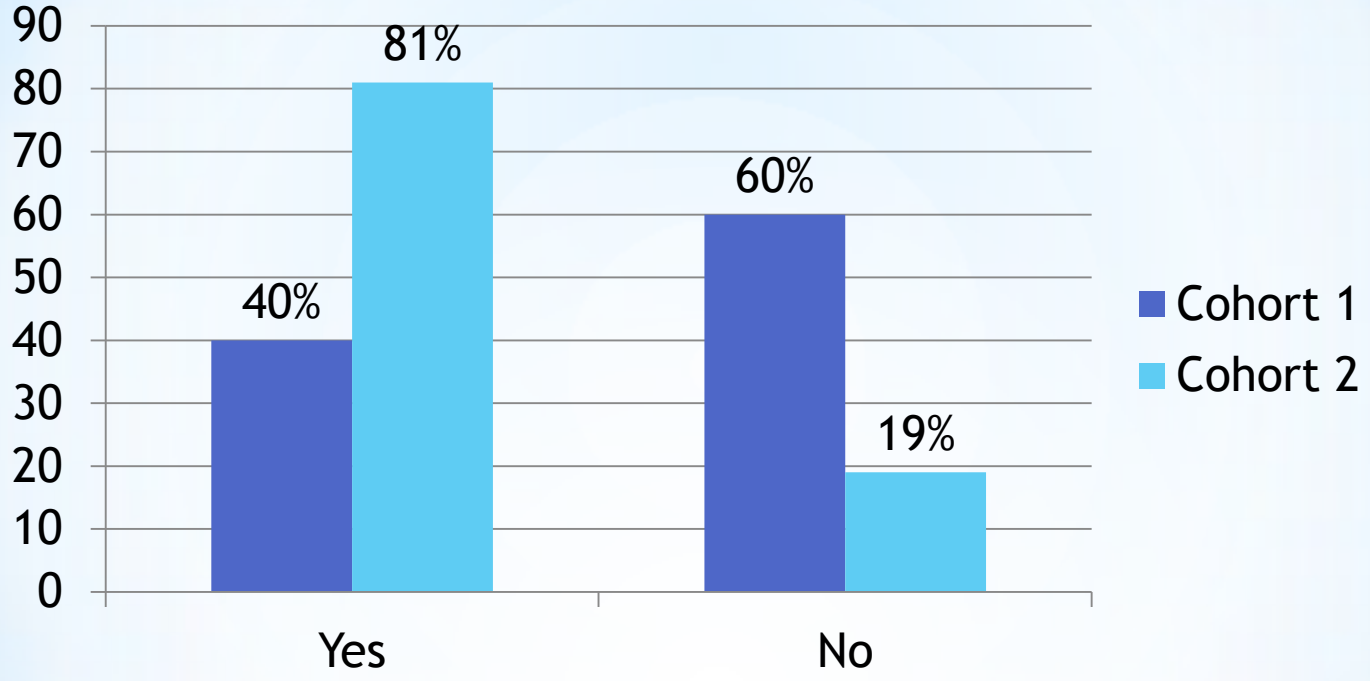
Postpartum OGTT

Cohort 1

- Sep 2011 to Aug 2012
- N=78
- Given postpartum OGTT requisition at initial consult
- No postpartum follow-up

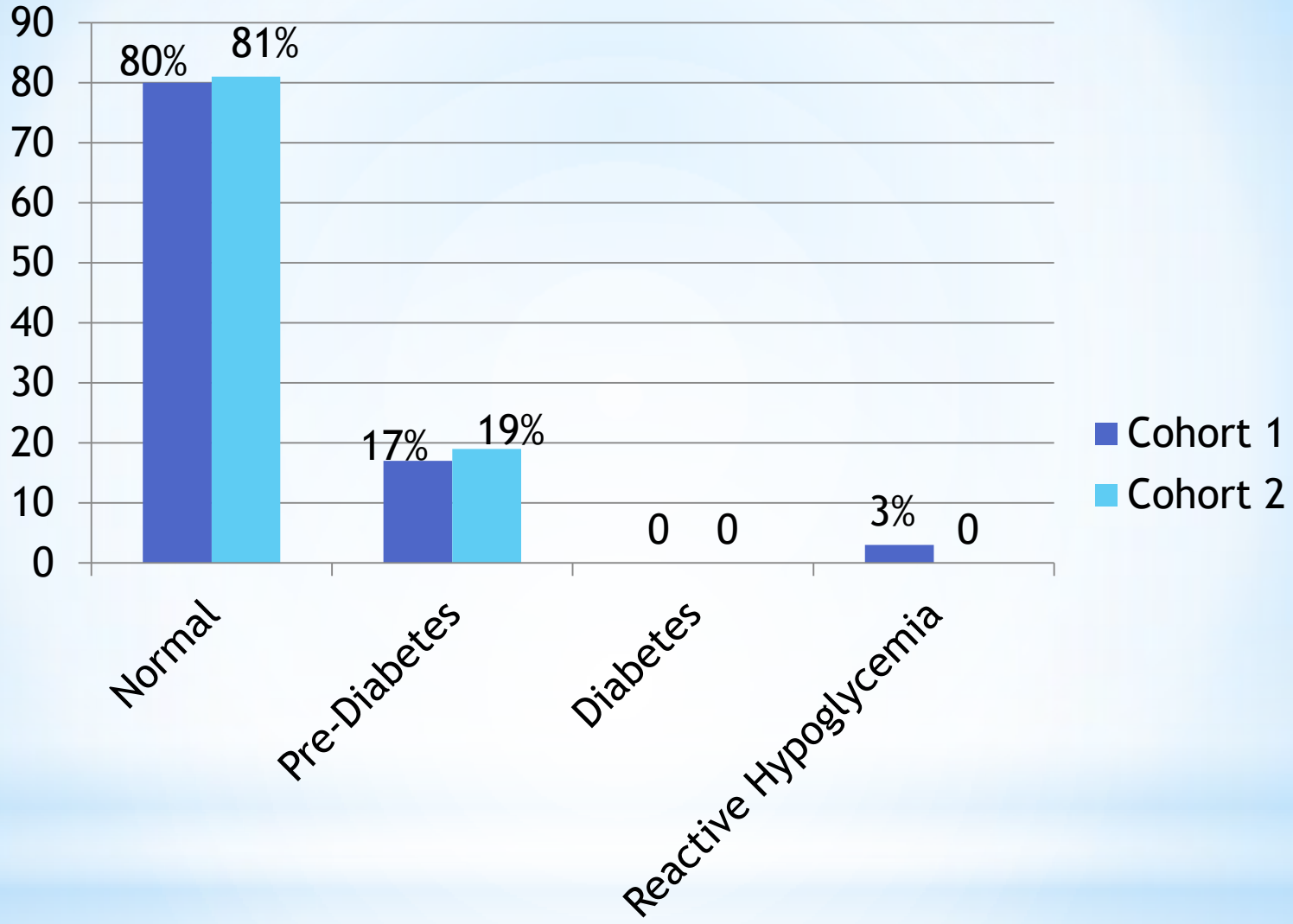
Cohort 2

- Sep 2012 to Aug 2013
- N=71
- Given postpartum OGTT requisition at initial consult
- Given 3 month postpartum follow-up visit



81% completion rate with implementation of a 3 month postpartum follow-up visit

* Postpartum OGTT completion



*Postpartum Diagnosis

Still to come…

- Further data to be analyzed
  - Comparison of weight gain before and after intervention
    - Mean weight gain is 79% less after counselling compared to pre counselling.
  - Covariate analysis to determine any significant associations
    - No significant association between weight gain and need for insulin

* Thank you

References

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